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The Butler Book

The History of Italian Sculpture.*

THE author of "Tuscan Sculptors" has now completed a history of sculpture in Northern, Southern, and Eastern Italy. He has divided his subject into seven parts, or chapters, for the purpose of making the necessary geographical distinctions; and in each of these divisions he has given a very complete, if not exhaustive, notice of the works of the principal sculptors. As we might expect from an expert workman who has the best of materials before him, and good tools with which to set to work, he applies himself to his task with the shortest preface. On his first page we find ourselves in the bright land of wine and fruits, art and song,

We see the same plains radiant with oranges, lemons, citrons, pomegranates, almonds, and other fruit rare to our northern clime; the same blue waters, the same hanging woods, the same mountains glorified with marble, alabaster, jasper, and porphyry, as the Crusaders saw as they marched hurriedly to the seaports whence they were to sail for Palestine; the same purple and gold horizon the Greeks and Lombards saw as they fought and fell; and, looking southwards, the scene of the prowess of successive bands of Norman knights, the last of whom overran the whole of that portion of Southern Italy once known as Apulia, and during the period of their rule erected buildings that we now look upon as legacies of price. Mr. Perkins tells us there is a visible change, however, in the aspect of this southernmost country so far as its social development is concerned. The magic iron rods, called railroads, have performed their usual wonders here. He says, "the ports whence the followers of Peter the Hermit embarked for Palestine, are being widened and deepened; Brindisi has renewed her relations with the East, and the track which, Horace followed in his

memorable journey to that long-neglected haven, will soon be familiar to tourists. They will gaze with wonder upon the noble churches of Apulia, with their storied gates of bronze, their portals covered with mystical sculptures and Oriental ornament, and their pulpits and bishops' thrones resting upon Saracen prisoners, lions, or elephants; and upon her Mediaeval castles, one of which still stands in such perfect preservation, that were Frederic and his infidel hosts to return to earth, they might again find shelter within its marble halls." When this time comes, the tourists hastening to tread in the steps of Horace, will be all the better prepared for an appreciation of the art-wonders they will see by the way if they make themselves acquainted with the information Mr. Perkins has collected and digested. Meanwhile thinkers and workers, more than pleasure-seekers, will find matter of great artistic interest in his pages.

The historian of Italian sculpture takes us up, as we have indicated, in Southern Italy, and from Apulia and the Ahruzzi, conducts us northwards to Naples, Rome, Lombardy, and Venice; and thence crossing Northern Italy westwards, carries us to Verona, Vicenza, Padua, Mantua, Brescia, Bologna, Ferrara, Modena, Reggio, Parma, and Piacenza; and thence to Genoa and Carrara, where he sets us down. The southernmost portion of Italy has this peculiarity. Whereas in Rome we may trace remains of the kingly republic and imperial epochs, and then again of Mediaeval and Renaissance days, showing the successive phases of art in many centuries, in Apulia we are limited only to a short period for the chief stores of art-work, and this brief space is strongly marked by foreign influences. In the tenth century Apulia was ruled by the emperors of the East in the person of a Greek officer deputed by them, and was a frequent prey to the incursions of Saracens who had located themselves at Malta and Sicily. At the beginning of the eleventh century, when pilgrimages to the Holy Land were the order of the day, a band of Norman knights on their way home from Jerusalem landed at Salerno at a critical time. A fleet of Saracen ships approached the coast and landed a force large enough to intimidate the inhabitants, who, with their Duke Guinar III., would have complied with their demand for ransom from pillage, as on similar occasions, but for the interference and protection of these Normans. Many of the marauding Saracens were massacred, and the survivors were put to flight. About ten years afterwards a second band of pilgrim Norman knights arrived in Italy at the right time to assist the inhabitants in their endeavour to throw off the tyrannical rule of the Greek catapan. Unlike their predecessors, they did not depart when their work was accomplished, but they established themselves in a fortress near Naples; and, reinforced by frequent arrivals of adven-

tarous spirits from Normandy, maintained their position for nine years. This was about twenty years before the conquest of England by a larger body of Normans. In those days there was a Norman knight, Tancred de Hantville, who had twelve sons. Three of these brothers joined their countrymen in their stand against the Saracens and Greeks, and within three years after this accession to their strength the Normans became masters of the whole of Apulia, with the exception only of Bari, Brindisi, Otranto, and Tarentum, which were still in the hands of the Greeks. They divided their conquests among twelve Norman counts, and established a seat of government at Melfi. Walter Guiscard, a fourth son of Tancred de Hantville, soon joined his brothers, bringing with him his famous son Bohemund, afterwards the first prince of Antioch, whose name still glitters as brightly as ever the sun shone on his lance as he led on the European hosts to the walls of the Holy City. It is to this short period of strife between Greek, Saracen, and Norman that the most important of the art-work of Apulia belongs. The sculpture is chiefly found in the façades and portals of the churches built at this time, and bears evidence of Greek, Saracenic, and Norman impressions upon the minds of the sculptors. It consists principally of bas-reliefs representing Scriptural personages or scenes from holy writ placed in the lunettes and upon the architraves and side-posts of the doors, and of ornaments carved in relief upon the archivolts of the portals, or sculptured in the round and half set into the walls. In the former there are Byzantine influences to be traced; in the latter we may see Oriental and Classical elements blended. Many of the Apulian churches have suffered in the hands of restorers, who have substituted, Mr. Perkins affirms, false glitter for solid splendour; but the marble work has been more fortunate; much of it has been left untouched. The famous grotto on the summit of Monte Gargano, which drew so many pilgrims after the Archangel Michael notified, to the Bishop of Sipontum, in the fifth century, that it was to be henceforth sacred to himself and the angels, now contains nothing of artistic interest but its bronze gates cast at Byzantium 800 years ago, and a marble catædra of twelfth-century workmanship, enriched with Arabic ornaments, of which the seat is supported by crouching lions. The duomo at Bari, founded by a Greek bishop about 500 years after the consecration of the grotto, has been still more unfortunate. The ciborium, made for the successor of the founder by Alfansa da Termoli, and the pulpit made shortly afterwards for a subsequent bishop, have been both removed, and the edifice "restored" in the "very worst modern taste." At the neighbouring church of San Nicolo, erected early in the twelfth century, there is, however, a ciborium, the details of which correspond almost

* Italian Sculptors: being a History of Sculpture in Northern, Southern, and Eastern Italy. By Charles C. Perkins. With Etchings, by the Author, and engravings on wood, from original drawings and photographs. London: Longmans, Green, & Co. 1863.

exactly with the descriptions given of that of Alfanus. It is described as having a pyramidal roof divided by colonnettes and upheld by marble columns, the capitals of which were sculptured with angels, leaves, branches, climbing serpents, and deeply-cut ornament, and inscribed with the artist's name and laudatory verses. One of the illustrations on the first *planche* is a capital from the San Nicolo ciborium, in which somewhat ill-proportioned angels are represented kneeling upon large leaves which droop as with their weight. Mr. Perkins points out, "What strikes us most in this Apulian marble-work is its firm, decided character, and we are led to observe that the artist, though apparently ignorant of the first principles of form, deals as boldly with the human figure as he does with the leaves and animals which he has studied from nature." A *cattedra* placed in the same church by its founder is supported in front by two grotesque Arabs who are kneeling, and a standing figure of a man with a staff, and at the back by a lion holding a man's head in his paws. On the portal and facade of the same edifice are bas-reliefs of Samson and the lion, lions and syrens, vines and arabesques, and presentations of various heads encircled by winding lines springing from vases. Two angels fill up the portal arch, bulls standing upon consoles are placed below the cornices, and a seated sphinx tops the gable of the facade. Richer still is the facade of the cathedral at Traja, built in the last years of the eleventh century. The "most bizarre of all Apulian facades" must be described by Mr. Perkins. He says,—

"Not only is it peopled with all created things, but its surface glows with yellow and green stones, after the fashion of the Sicilian churches, uniting the sharp-cut, clear-lined sculpture of the East with the polychromatic decoration of the Saracens. It is divided into two parts by a cornice, richly carved with heads of men, lions, and leaf-work. In the upper one is placed a great wheel window, encircled with a row of rudely-sculptured heads, and surmounted by the figure of a man seated upon the back of a nondescript animal. Eleon, elephants, porcupines, and apes protrude from the wall on each side. Four columns, with lions above their capitals and the last bases, support a plain round arch above the window; and six smaller arches, with dentellated archivolts and leaf-work capitals, are set against the wall in the lower portion of the facade, on either side of the great central arch over the portal. The slabs of marble which decorate the central arch are covered with Arabic ornament, and the reliefs on the architrave are composed of rudely-chiselled figures, of a Byzantine type, representing Christ embroiled between the Virgin and St. John, SS. Secundinus and Eleutherius, and the symbols of the Evangelists, in medallions; while in the lunette of one of the lateral doors, whose side-posts and architrave are sculptured with ornament, is a bas-relief of Christ treading on the lion and the dragon, with two rudely-carved angels of a Byzantine type. The varied and elaborate capitals of the many columns, which divide the nave from the side aisles, furnish another example of rudely-chiselled heads, surrounded by rich and tasteful ornaments, whose patterns are intricate, but never confused in line."

We must content ourselves with this presentation of the art-work at the disposal of Bohemund and his contemporaries. The church built by this Norman hero at Canosa on his first return to Italy from the East, contains a characteristically designed *cattedra* and pulpit; and the Grave Chapel adjoining it, built to his memory by his mother, is treated with similar feeling. This is surmounted by an octagonal drum pierced with round-headed windows. Around the exterior of the chapel run a series of pilasters with carved capitals connected by round-headed arches. The entrance is closed with bronze gates, which bear, besides various decorations and the name of their maker, Roger from Amalfi, Latin inscriptions setting forth the exploits of the illustrious dead. Bearing true witness to the mixed foreign influences of the day, these gates have discs filled with Arabian ornament in the upper panels, while below them are figures, standing and kneeling as unmistakably Byzantine in character, as though formed in a Byzantine MS. In like manner these conflicting elements illustrate the life of the hero, whose thoughts were so constantly in the East, that as he stood upon the altar-steps at Chartres with his bride, the daughter of the French monarch, by his side, he turned to the spectators of his marriage, and preached a new crusade, promising "castles, cities, and rich possessions in Asia to all who would follow him."

In Naples Mr. Perkins finds only one instance of marble-work previous to the middle of the thirteenth century. This is a set of bas-reliefs in the chapel of San Giovanni a Fonte adjoining the cathedral, which originally formed part of a pulpit made for the old church of Sta. Reparata, and in which the figures are as minute as those upon an ivory casket. In the cathedral of neighbouring towns there are some early sculptures, as at Salerno, where there are two twelfth-century marble pulpits on which mosaic work is

introduced; and at Ravenna, where there is a third pulpit of similar workmanship, and still handsomer design, made by Nicolo di Bartolomeo. The dawn of Mediaval art in Naples has a veil of the supernatural thrown over it, as is the case in other instances. Just as Jupiter, in the old Greek legend, condescended to assure the sculptor that his representation of his form met his royal approval, so a crucifix by an early Neapolitan master is said to have spoken. The name of the artist of this miraculous crucifix has been handed down; but one of his pupils, Masuccio I., enjoys considerable local reputation. In former years many works were attributed to this sculptor which are not now to be found, or which have been proved to have been executed by other hands. He is said to have designed the *duomo* and the church of S. Dominic Maggiore. His godson enjoys still more popular regard. De Dominic, indeed, goes so far as to accredit him with every church and tomb of this epoch. Mr. Perkins attributes to this godson, who was the pupil and namesake of Masuccio, the monument of Pope Innocent IV., which has been pointed out by Neapolitan writers as the elder master's work. This was several stages high, and ornamented with mosaics and bas-reliefs, but all that remains of it now is the effigy of the pontiff lying upon the sarcophagus. Our author also accepts Masuccio II. as the sculptor of the tomb of the Duchess Catherine of Austria at San Lorenzo, which is a quadrangular structure having a pointed roof supported upon spiral columns, in which the sarcophagus is raised sufficiently high to admit of a doorway affording access to the choir being placed below it. An effigy lies upon the sarcophagus, and SS. Peter, Paul, Catherine, and Louis of Toulouse stand at the head and feet of it. The spirals of the columns, the pinnacles at each end of the architrave, and the lunette, are enriched with mosaics; and the front of the sarcophagus is ornamented with roundels containing half-figures in relief of the Madonna, SS. John the Evangelist, Anthony of Padua, Francis and Santa Chiara. The fourteenth century is filled with the name of Masuccio, although, says Mr. Perkins, the inscriptions and documents of the time make no mention of him, "and no better proof of his ever having existed is to be found than vague tradition and bold assertion, which fix the date of his death in 1387, at the age of 96." In some of the works ascribed to him our author perceives a Tuscan character, which he thinks proves them to have been executed by the Tuscan artists who are known to have resided in Naples in the fourteenth century. This Tuscan influence is especially remarkable in the Angevine monuments in the church of Sta. Chiara, which appear, indeed, to have been modelled after the type of the monument of Queen Maria, widow of Charles II. of Anjou, in the church of Sta. Maria Donna Regina, executed by Maestro Tino or Lino da Camino. But all these monuments are alike attributed to Masuccio by Neapolitan writers, although Tino da Camino was appointed in conjunction with Gallarudo da Sermona, in the last will and testament of Queen Maria to make her monument. Mr. Perkins sees at least six distinct styles in the sculptures at Sta. Chiara, not one of which could be that of Masuccio. His pupils, Andrea Ciccone and Abbatè Bamboccio, hold nearly as high a place in popular regard among fifteenth-century artists as he did among those of the previous age. The first of these built the churches of Santa Marta and Monte Oliveto, and the latter the facade of San Giovanni a Pappacoda and the portal of the *duomo*, both being, as was most frequently the case, architects as well as sculptors. They were both, also, the authors of several monuments. We will describe one that is attributed to Ciccone in Mr. Perkins's words, as a specimen of the taste of the day. It was executed at the command of Queen Joanna II., to the memory of her brother King Ladislans, for the church of San Giovanni a Carbonara:—

"It is a towering pile, three stories in height, rising above the door which leads from the choir into the sacristy. Four colossal statues of Temperance, Prudence, Justice, and Fortitude, flank this doorway, and serve as caryatides to support an open arched gallery, within which are placed six seated statues of life-size, representing King Ladislans and his mother, Royalty, Charity, Faith, and Hope. Above this gallery is a certain recess, which contains a sarcophagus, bearing the recumbent effigy of the king, watched over by curtain-drawing angels, and figures in relief of the king and queen, and two other royal persons. Upon the topmost pinnacle of the structure Ladislans is again represented, seated upon his war-horse and holding a sword in his right hand. The eyes of the statues and statuettes are coloured, their hair and robe borders are gilded, and they are relieved against backgrounds painted blue, and adorned with gilt fleur-de-lis."

From this gaudy, though doubtless, to some extent, imposing monument, with its statues, statuettes, arched gallery, gilding, and colouring, we turn to the great centre of art-work, Rome. "How can you," writes Petrarca to Pope Urban V., "sleep peacefully upon the banks of the Rhone, beneath ceilings fretted with gold, while the Lateran, mother of all churches, lies roofless upon the ground, exposed to wind and rain, while the houses of the Holy Peter and Paul tremble, and while the temple of the Apostles is a ruin, a shapeless heap of stones, fitted to extort sighs from breasts of stone?" Notwithstanding this extreme desolation pictured by the sweet-hearted poet, we need not say Mr. Perkins finds many noble specimens of sculpture in Rome that must have been there then. With bare mention of the widely-known fourth-century monument of the Prefect Janus Bassus, the fifth-century bronze statue of the titular Saint, cast in commemoration of the deliverance of the city from Attila; and the sixteenth-century statue of St. Hippolytus, in the Lateran Museum, he shows us some of the earliest Papal tombs, now reposing in the crypt of St. Peter's, but which were originally in the atrium of the basilica before the rebuilding of the edifice.

Among these, and peculiarly interesting to Englishmen, is the large Roman sarcophagus of the one English Pope, Nicholas Breakspere. The lid of this monument is carved with masks, and its sides with festooned ox-skulls. Of more artistic interest is the tomb of Boniface VIII., which is as removed from the showiness of the Neapolitan monuments as it is from the homine simplicity. It is a sarcophagus, with a fringed and embroidered altar-cloth falling in folds over the front, on which lies an effigy of the deceased wearing his pointed tiara with a double crown, embroidered gloves and slippers. This Mr. Perkins identifies as the work of a member of the Cosmati family, successive generations of which wrought at Rome for a hundred and fifty years, dating from the middle of the twelfth century. He finds in the course of his survey of Roman sculpture no artist's name mentioned in any inscription between the fifth and ninth century.

In the tenth century Magister Christianus placed his name on a monument to a Cardinal Peter, and his example was followed by many marble-workers in Rome, and within a range of fifty miles around it. "These inscriptions," says our author, "are engraved upon arches, friezes, and monuments, as well as upon the pulpits, bishops' thrones, and ciboria." After Magister Christianus, come the names of Giovanni and Guido, inscribed upon the architrave of the ciborium of the church of Santa Maria di Castello, at Corneo; and after them the names of a family, consisting of father, four sons, and grandson, the father's and sons' being found upon the architrave of the choir of San Lorenzo, and that of the grandson, Nicolo di Angelo, upon the paschal candlestick at St. Paul's. This candlestick is one of the most curious remains of Mediaval work in Rome. It is a marble column, about 18 ft. in height, sculptured in relief with subjects from our Lord's life, resting upon a quadrangular base, having animals like sphinxes at the corners. No fewer than five peters are made out in various inscriptions, one of whom is the Peter le Orfever, who, with an artist named Odericus, accompanied Abbot Waro to England, and executed the mosaic work in Westminster Abbey. These bring us to the Cosmati family; and here we must stop for the present, the value of the book justifying another article.

THE METROPOLITAN DISTRICT RAILWAY.

THE works upon the first section of this important line, namely, those between South Kensington and Westminster Bridge, have been completed, and the line was opened for passenger traffic the day before Christmas. The designations of railways commencing with the word "Metropolitan," and which are intimately connected with the Metropolitan underground system, are a little perplexing to the uninitiated, and a few words of explanation as to their relations may not be thought needless or out of place. The continuous railway girdle of London, so often referred to as the inner circle, is already constructed, or is to be constructed, under Parliamentary powers granted to two companies,

the Metropolitan and the Metropolitan District. The portions of the inner circle belonging to the Metropolitan Company commence, or will do so, at Trinity-square, Tower-hill; and, taking the northern and western portions of the circuit, embrace about two-thirds of the whole distance. This portion of the communication includes the Metropolitan proper from Moorgate-street to Paddington; the Metropolitan Extensions from Paddington to Brompton, opened a few months since; and the Extension in the East from Moor-gate-street to Trinity-square: this last, about a mile in length, is the only portion of the Metropolitan system now remaining to be executed, the works not being as yet commenced. The remainder of the circuit, which runs mainly east and west on the southern side, is in the hands of the Metropolitan District Company, and fills up the space between Trinity-square and Westminster Bridge. The first portion of this line upon which the running will be taken up, so to speak, from the Metropolitan, commences at South Kensington, and, for the present, terminates at Westminster Bridge. A short length of the Metropolitan Extension, from Gloucester-road Station to South Kensington, has also been completed since the line was opened from Paddington to Brompton, so that the communication is now complete from Moorgate-street round to the north and west, and, turning southwards and eastwards, reaches at Westminster a point considerably to the east of the centre of the whole distance, and leaves only about a fourth of the whole distance in the south-eastern quarter remaining to be executed and opened. This inchoate portion of the Metropolitan District line will pass under the Thames Embankment to Blackfriars Bridge: thence it will be carried under the new street in progress, from the intersection of that street with Cannon-street, from which it will be carried along Cannon-street, and by way of Eastcheap to Trinity-square. The other "Metropolitan" works outside of the circuit are, the double line of the Metropolitan District between South Kensington and Brompton Stations, and a double junction which the same company is providing between the inner circle at Kensington and Gloucester-road Stations, and the West London line at West Brompton and Hammersmith-road. The other tangential adjuncts, as they may be called, of the Metropolitan, are the Metropolitan and St. John's Wood line, in which the Metropolitan has a joint interest, and the Metropolitan and Hammersmith and City line, leased jointly by the Metropolitan and the Great Western Companies, at 5½ per cent. All the lines referred to are worked by the Metropolitan Company, which will also supply the engines and rolling stock for the Metropolitan District Line; and will, further, take the receipts upon that line, of which it will hand over to the District Company 55 per cent. of the gross takings, for local traffic and the proportion of through traffic carried upon it. The train service over the Metropolitan and the Metropolitan District Lines will be one and the same, excepting the extra trains that are thrown off for St. John's Wood and Hammersmith.

The works upon the additional portion of the circuit now completed; the design and finish of the stations and booking-offices; the form of the covered ways; the character of the retaining walls; the rails and fixings of the permanent way; the system of signalling employed, and other features of the line, are all similar in the main, and the same description applies generally to them, as those of the last section opened. In a railway of such a peculiar character as a metropolitan underground line, however, a variety of difficulties is presented by streets, roads, and buildings aboveground, and by communications of various kinds underground, that are not met with in the construction of an ordinary line, and that necessitate a resort to a variety of expedients and modifications, and to numerous novelties in engineering practice. The new portion from Westminster Bridge to South Kensington, and thence over the Metropolitan Extension to Gloucester-road, Brompton, is about 2½ miles in length. The Westminster booking-office is a temporary erection, as it is in contemplation, we believe, to erect upon the site, at some future time, a more imposing and extensive building than a railway booking-office. The permanent platform has been provided at Westminster Bridge, which will be a terminus for a time. It is situated at the west end and inner side of the Thames Embankment. From the station the line passes under Bridge-street, obliquely, and onwards to the front of Westminster Hospital, and thence along by the back

of the Westminster Palace Hotel to the Broadway, where there is a station within a short distance of Birdcage-walk, St. James's-park. The covered ways are generally of the same form throughout,—elliptical,—the strength at different places being regulated by the superincumbent weight to be borne,—namely, from five to as many as ten courses of brick. Extra strength, again, is obtained in particular situations by strong cast-iron girders at short distances between centres, and jack-arches thrown across between them. Under the operation of a feeling of reverence, a padding of peat, 3 ft. thick, has been packed behind the wall of the covered way for about 300 ft. on the side, and in the part of its course, nearest to Westminster Abbey. The Broadway Station is similar in character to the others already described; the same effective elliptical roof, ornamented and coloured as the others are; the same regulation platform, 300 ft. long by 14 ft. wide, adequate for a train of six carriages of the extra size run on the Metropolitan. There are galleries for entrance and exit in this, as, indeed, in all other cases. Of stations and works generally, it would seem that the engineers, Messrs. John Fowler, engineer-in-chief of the Metropolitan system, and T. Marr Johnson, have bestowed much care and forethought in fixing designs, sections, and types, in the outset, and have adhered to these as closely as possible, and with only such modifications as peculiar circumstances in the different situations may have suggested. Westminster station has a provision for required at all the stations,—a gas-holder for the supply of the trains; and the Broadway station has another special provision—a short side tunnel at each end of the station for spare locomotives. There is no refreshment-room at the Broadway station, but it, in common with the others, has a convenient cloak-room, waiting-rooms, closets, &c., on the ground level; the accommodations for passengers being properly arranged that the booking-office has to be passed through in reaching the rooms and closets. In passing generally, it is satisfactorily evident that the engineers have been able to construct a much larger proportion of the line open to the open intervals are comparatively numerous, many of them 100 ft. long, and upwards. The retaining walls, when so deep as to require it, are supported by cast-iron cross struts. The walls have in many instances a thickness at the base of about 10 ft., of which about 2.5ths is concrete, and the remainder brickwork. Between the retaining walls, as well as in the covered ways, inverts are introduced wherever the line is carried through watery or unstable material. The Victoria station is exceptional in its arrangement, a mezzanine floor being introduced for the booking-office, which is on a level, about half-height between the platforms of the Brighton and the Chatham companies and the street, for the more easy access of passengers from these lines. The Victoria Station is extra commodious, and is well adapted for the traffic likely to be done in that locality. The galleries and booking-office are here also across the west end of the station. The galleries are across the west end of the next station, which is at Sloane-square, and across the east end at South Kensington, or the last, exclusive of the present station at Gloucester-road. The South Kensington Station is also of extra size, being a joint station for the Metropolitan and the Metropolitan District, which, from that point, duplicates the line to Brompton Station with the West London line. The platforms at South Kensington are 400 ft. long. Among the special difficulties presented in the execution of the works were the treacherous nature of the stuff which had to be passed through, and the copious water-springs that were encountered. Pumping-engines were kept at work night and day during the progress of the works. The water taken up was about 4,000 gallons a minute. Permanent pumping-stations will be established at South Kensington, Sloane-square, and Victoria: from all other points the line will be drained by gravitation in the ordinary way. In this section some very lofty and heavy buildings overhead have necessitated great caution in the execution of the works, and resort to roofs for the covered way of enormous strength. As illustrations, we may mention Messrs. Elliot, Watney, & Co.'s brewery in Pimlico, part of which stands over a portion of the line, and also the lofty houses

in Victoria-street, the backs of which are almost perpendicular with one side of the covered way. No injury has been sustained by any of the buildings over the line. The most remarkable obstructions met with were probably two main sewers which the line had to be carried under, but not so far below them as to leave them undisturbed. In each case lengths of the sewer brickwork the width of the line had to be removed, and the sewer service carried on by temporarily placed wooden troughs. These, in turn, gave way to cast-iron cylinders, supported by side wrought-iron girders, which were fitted to the brick work of the sewers at each side. One of these conduits, 9 ft. diameter, carries the Ranelagh sewer in an oblique direction across the Sloane-square Station, leaving headroom for the engine funnels and no more. The other, the King's Scholars' Pond Sewer, is of much larger dimensions, and the 14 ft. diameter in passage is oval in form, and 11 ft. in diameter in one direction,—the horizontal,—by 11 ft. in the other. Both of these sewers are tide locked. The Ranelagh Sewer crosses under the Metropolitan Extension line at Baywater.

For assistance in obtaining these particulars we are indebted to the polite attention of Mr. T. Marr Johnson.

It is not yet quite determined at what intervals trains will be run; a commencement has been made with a ten minutes' service. The trains travel the distance between Moorgate-street Station and Westminster Bridge in forty-five minutes, stopping at all the stations.

DESIGN IN RELATION TO MATERIAL.

AMONG the anomalies resulting from the system of architectural reproduction which has now for so long a time prevailed amongst us, the rehabilitation of this or that extinct form or manner of design in place of thoughtful original invention, it has come to pass that we have become singularly indifferent as to the relation which should subsist between the texture and peculiar capabilities of any given material and the artistic form which is to be impressed upon it. During the cold reign of the pseudo-classic tendency, when the mere repetition, in any material, of the leading features of Greek architecture formed the Alpha and Omega of our art, it was, of course, all in the natural order of things that there should be columns formed from channelled segments of wood glued together into a cylinder, and that imitations of stone-coffered ceilings should be artfully attained by the aid of plaster and bracketing. These things were openly done, and no one raised an eyebrow or lifted a shoulder at them. But when there arose the spirit of modern Gothic, mighty, as we were assured, to the pulling down of the strongholds of plaster capitals and wooden plinths, *ad id genus omne*, then was it confidently prophesied that the spirit of "sham" had been demolished, and great were the paeans sung over the demolition. Nor let us by any means question, in the main, the received opinion that much good fruit has been borne by that notable movement. If it was connected with much of blind and bigoted exclusiveness and copyism, it at least brought us back to study a style which on the whole was verily a style of *building design*, of design capable of accomplishment nowhere save in building, and in no material save stone; and the treatment of this grandest of architectural materials was concerned, the teaching of the Mediaeval monuments was an exceptional one. They belonged to a time when men may be said to have literally thought in their material to a degree never attained since. Yet from this very fact it arose that the stone type of design took such possession of the minds of the old builders, that they could not shake it off even when working in other material, and much of their treatment of woodwork became only so much stone design dignified, if we may coin a word. To the enthusiastic revivers of Mediaevalism there could be no such thing as error in Gothic work, and accordingly they complacently imitated and reproduced the wooden battresses which resisted no thrust, the wooden arches cut from the solid, and all the other little anomalies consequent on the translation into this material, of design formed in a totally different one. The style was to be reproduced with reverence, faults and all, just as it was found. The particular result just alluded to is, however, only a single instance of the manner in which this enthusiastic copyism

mitated against thoughtfulness in design. It is to be feared that, independently of such partial and inevitable results, the copying system which has so long prevailed has acted much more widely than this, in inducing a carelessness and want of thought as to the æsthetic use of materials, and habituating us to a sort of routine method of treating them, rather in accordance with pre-existing examples than with considerations of the nature and quality of the material, and the special treatment demanded thereby. The effects of this want of consideration are apparent all round us. We may endeavour, however, to indicate some of the forms in which it is most prominent.

Stone, which may be considered, in spite of all newly applied materials that are coming into fashion, to be *par excellence* the architect's medium for design, is a material best used under compression, very weak under cross-strain, and which in general can only be used in superimposed blocks of a limited size. These conditions would seem to indicate unmistakably enough the proper and architectural method of using stone. We should naturally conclude that an arched form of construction should be the rule in a stone building, or that if a lintel form be adopted, the width of the opening should not only be limited, but that as much as possible of the material should be left in the lintel, which should on no account be weakened by cutting away from it for so-called ornamental purposes. Yet we constantly see buildings in which both these obvious conditions are utterly disregarded. There are positions, indeed, in which a lintel construction becomes desirable in stone, as when no sufficiently secure abutment can be obtained, or when a row of window-heads are ranged immediately under a horizontal cornice. But a fashion has now sprung up, and is gaining ground greatly among the architects of the new Gothic school, the absurdity of which cannot be too strongly insisted upon. A lintel construction is adopted, but in order to assimilate the lintel with what is supposed to be the Gothic spirit, it is cut up into the form of a shallow arch, pointed or otherwise. Thus the lintel is materially weakened, and a large portion of the stone literally goes to waste, along with the labour expended on it. We have actually seen a full half of a stone lintel cut away in this manner, to a horizontal line, the ends being left in the form of brackets turning down upon the brick jambs of the opening. Where a soft stone is used, this may increase the difficulty, but the effect it is to have it would be difficult to say. One of the very worst forms in which we have seen this absurdity was in the case of a building where the lintel was cut into the form of an ogee arch (a very bad form as it observed, at the best), the point of the ogee slitting up the centre of the stone of course, in a charming manner; we almost expected to see the split go right through the lintel as we looked at it. The capabilities for effect, again, resulting from the necessity for arranging the material in courses, are not nearly enough considered in walling. There is hereby a natural opportunity presented for the use of a selection of stones of varied tints, but of similar texture and formation; and also for obtaining a picturesque character in the walling, which can be imparted by varying the depth of the courses, or by here and there a thinner course, exactly in the manner best calculated to bond the walling securely; so that here construction and effect go hand-in-hand, as in all true architecture they almost invariably do. The capabilities of wall-surface, in this kind of way, are not by any means made the most of at present. A current vulgarity in wall-treatment, on the other hand, is the use of panelling, which is also an example of the sin of appropriating a method of treatment originating in the qualities of another material. When we see a panelled wooden cabinet or side-board, or a panelled door, the system appears perfectly natural and satisfactory; because we know then that we are dealing with a substance of a fibrous texture, sufficiently tough to cohere even when sawn into very thin layers, and which will consequently bear joining by tenons and other such contrivances. A panelled door, therefore, is a fitting and economical method of applying the material used; but it is an absurdity to apply panelling, merely as such, to a wall-surface, thus conveying to the eye the idea that it is framed of thin slabs and angle-pieces, when we know the material is, in fact, too friable for any such treatment. The

only legitimate application of panelling to stone wall-surface is introduced (a raised panel of marble veneer is introduced (a proceeding, however, which on some grounds is questionable), or when the panel mould is merely introduced as the boundary-line of some decorative carving, in which case the sinking should not be so deep as to conceal any part of the ornament, but merely sufficient to mark it off from the plain wall-surface adjoining. But the placing of new panelling over the surface of a building, as ornament, is always evidence of poverty of designing power and want of perception of the true requirements of architectural design. The constant use of it was one of the great blots on the Italian Renaissance, many of the best buildings of this school being deprived of a great deal of their effect, and almost taken out of the category of architecture altogether, by their being covered over with a feature which masked their real construction and gave to the whole an æsthetic, quite alien from the effect which a construction of solid blocks of bonded stone ought to present. A similar error is the employment of that hideous feature, as it appears to us, a rusticated column. Where the column is really built up of isolated parts in shallow courses, this method is constructively far inferior to the use of a monolith, where one can be obtained; and if the column is really a monolith, artificially rusticated, the case is worse, as involving a waste of material to produce a sham.*

As to wood, there is no end to the misuse that has been made of this useful and pliable material; the misuse in the majority of cases resulting from the imitation of stone treatment. It is made into sham pilinths and surbases, put together with much careful joinery; ineb pieces are "boxed" into the imitation of a solid cornice or soffit; it is twisted round, under the influence of steam, into sham arches; forms foreign to its erection of separate pieces is often made, when and been more durable. In erecting large stone gate piers, it is a natural plan to foot the shaft of the pier on a plinth stone larger than itself, and to crown it with a heavy projecting cap. But for smaller piers, where a monolith is easily obtainable of sufficient size, it is an absurdity to do this, as the monolithic gate-pier on this scale will be far stronger than a built one; and the absurdity is still greater when (as we have seen) a monolith is used, and the greater part of the surface chipped away 2 in. deep all round, in order to get a sham plinth at the base. The same sort of blunder is constantly made with stair-newels. A newel should be a solid piece of wood, to receive the handrail and notch-board, and should be so treated, any ornamental finish worked out of the solid. But in many cases it should imitate a large pier, and so a cap and round the bottom, and the cap nailed on the top. In due course of time the plinth shows signs of separating from the core to which it is attached, and the head gets loose; whereas the simple post might have lasted for generations. A common misuse of wood is found in such erections as summer-houses and conservatories, especially in buildings of a Classical tendency; where, instead of the upright stiles being treated as wood and moulded solid, they are developed into apparent pilasters, composed of 1½ in. stuff, with all the insignia of caps and bases, and "everything proper." We have actually seen such a thing as a kind of handbox pedestal elaborately framed round iron columns, which, in fact, went through the floor on to a hollow square box with plinth, surbase, and all adroitly put together. This is, perhaps, a flagrant case; but the shams that have been perpetrated in wood are such as to make one doubt sometimes whether there is such a thing as architectural principle at all. The Gothic school are certainly foremost in deprecating such things as we have just alluded to; but they have their own little shams in the treatment of woodwork, too. The wooden buttress designs for bookcases and organ-cases, with inlaid and variously-coloured wood, which we constantly see, there is frequent use made of the

* We speak, of course, of columns of moderate dimensions, such as would occur in an entrance porch; a situation in which rusticated columns have been a good deal used.

shab and arch, on a small scale, which is simply a stone feature translated into wood. In such pieces of furniture the quality of wood as a material, its resistance to cross-strain, and its comparative softness and facility for carving, point to its suitable employment in square and diagonal moulded bracing, and in carved brackets, while its cobesiveness in thin layers authorises, as we before remarked, a panel construction; and panels, let us note, may be made highly ornamental in cases where *bonâ fide* carving is too expensive, by being simply pierced through in some carefully-designed flat pattern,—a source of decoration which might have been made more of and been more artistically developed than it has been. As to the "centre-bit" style of decoration, so much in fashion, formed by piercing round holes in the wood every where, it is only worthy of very young children. We say nothing of designs for roofs, for there timber is, so to speak, master of the situation; if you do not treat it on true "wooden" principles, the roof will revenge itself upon its clumsy constructor by falling, and pushing out the walls.

The sententious ejaculation of Butler,—

"Ah, me, what perils do environ
The man who meddles with cold iron!"

may apply to architectural as well as to military aspirants. So far as construction is concerned, we need scarcely, we hope, at this time of day, urge that iron when used constructively in the form of girders or columns, should be shown as such, and not be masked by a *quasi* stone or wood construction. Nor does the treatment of wrought iron in ornamental work call for special comment here, so far at least as principles of design are concerned. Wrought iron is so peculiar a material, and demands so much arduous labour in the treatment of it ornamentally, that there is little fear that it should ever be used except to produce those effects which are peculiar to it, and which nothing else can well imitate. It is when we come to that too often pernicious compound, cast-iron, that our critical spirit is aroused: *hæc opus, hæc labor æst*—or rather the *saving* of labour. As to the use of cast-iron for ornament generally, perhaps the best advice to those about to use it would be comprised in one word,—*"Don't!"* There are cases, however, where much money cannot be spent on ornament, and where a certain amount of decorative effect can be attained by the aid of cast-iron; but then it must be designed with due regard to the deficiencies of the material. Let no one suppose that highly ornamental carved work, when once executed in wood, can be reproduced *ad infinitum* in cast-iron, with any but the most lamentable and poverty-stricken results. It is in the attempt to get too much out of cast iron that the material has been so vulgarised and misused. It must be remembered that we are here dealing with a material coarser than sandstone, which is utterly incapable of giving sharp cuttings and under-cuttings, delicate surface-work, or anything which goes to produce that crispness necessary to the proper effect of elaborate carved designs; yet we see foliated capitals and leafage ornament perpetually attempted in this material, sometimes cast from models themselves coarsely executed in lead, the coarseness being necessarily exaggerated in the casting. This sort of cast-iron ornament is alone sufficient to remove the stamp of art from a building, and throw over it a flashy, tradesman-like appearance. What can legitimately be attempted with cast iron in the way of ornament is whatever depends on simple lines and square decided sections, without aiming at delicacy of surface-work. Brackets, for instance, with pierced ornamental spandrels, the ornament produced merely by the flat perforations in the material, without any attempt at a moulded edge, will generally have a satisfactory result. Similarly, capitals to cast-iron columns may be designed, consisting of simple flat leafage forms, defined only by the sinking between them, and not attempting to take the place of the carved foliage ornament, which can only be satisfactorily executed in wood or stone. In designing capitals of this kind, suitable for the material, there would be scope for some novel treatment of the crowning feature of a shaft or column. As to the kind of so-called ornament we meet with on our iron lamp-posts and area-railings, the leaves, and wreaths, and festoons, with their details only half made out, straggling, as it were, to show themselves through the coarse material, year by year more choked and filled up with paint and dust,—with regard to such things the only consolation (if it

can be called so) is that the design is generally worthy of the material in which it is attempted.

What we have said about cast iron will also apply in great measure to that other material for cast ornament, plaster. A growing distaste for this perishable though showy vehicle of ornament is one of the main things for which we have to thank the modern Medival movement, though the pioneers of this movement carried the matter too far, in the inclination which they showed to ignore even the efficacy of plaster in rendering the interior of a building comfortable and warm, and to return to bare brick or stone walls. And plaster has also its legitimate uses as an ornamental material,—uses which, in a future number, we may endeavour to define more minutely. But, though more dnoitic than cast iron, it can never have the sharpness and crispness of actual carving; and therefore all attempts to execute elaborate and delicate ornament in this material must result in a sort of pie-crust effect, and be classed with that sort of ornament which may be designated generically as *flummery*.

We have indicated a few of the leading and most obvious points in which the relation between material and design appears to us to be habitually and constantly overlooked; to those among our readers who are accustomed to think before they work, many others will doubtless occur. We would draw attention, in conclusion, to the importance of such considerations as regard the future of architectural art. The simplest path in art is often the truest, and leads most directly to the goal; and we cannot but think that in the present day there would be less diversity as to what really constitutes good architecture, less confusion and jumbling of old styles, and a better chance of arriving at the "new style"—that mirage constantly hanging before the eyes of the modern architect, and ever receding from his grasp—if architectural designers would often adopt the simple plan of considering, first, what material will be practically best for the building they are to erect; and, secondly, what is the nature and property of that material, in what method it can be constructively used so as to insure its utmost efficiency, and what class of ornament its peculiar texture and surface render it fitted to give full value to.

METROPOLITAN ASYLUM COMPETITION.

THE Metropolitan Asylum District Board having decided to erect additional hospitals in the different districts of the metropolis for fever and small-pox cases, purchased land for the purpose at Hampstead, at Stockwell, and at Homerton.

For the Hampstead Fever Hospital, as we have before mentioned, six architects were invited to submit designs, and the first and second premiums were awarded to Messrs. Pennington & Brigen, of Manchester, and Mr. J. H. Fowler, of London.

Certain alterations and modifications of these designs have, however, been required by the Board, and the plans have not yet been sanctioned by the Poor-law Board. The original estimate of the successful plan was £5,500, but these alterations have raised it to about 19,000l. The number of patients accommodated here is a little over 100.

For the Stockwell Fever and Small-pox Hospitals, which are to accommodate about 150 and 90 patients respectively, the following gentlemen submitted designs—Mr. Marrable, Messrs. Pennington & Brigen, Mr. Worthington, Mr. T. H. Wyatt, Messrs. Nesfield & Shaw, and Messrs. Beeson & Co. The first premium for the Fever Hospital has been awarded to Mr. Marrable; the second to Mr. T. H. Wyatt. The first premium for the Small-pox Hospital has been awarded to Mr. Wyatt and the second to Mr. Marrable. The estimate for the Fever Hospital is about 33,000l., and for the Small-pox Hospital about 25,000l. The plans are now before the Poor-law Board for their approval.

Of the Homerton competition we speak more at length, under a separate heading.

Designs are being prepared for a sick asylum for the Newington district, to accommodate 600 patients, on a site purchased at Peckham-rye, six architects having been invited to compete—Messrs. John Giles & Biven, Mr. T. E. Knightley, Mr. Jarvis, Mr. Lepard, and Mr. D. Barton. The plans are to be sent in on the 14th of January.

It is to be hoped that as one of the competitors has been long connected officially with the parish, the managers will, for their own sakes, take the opinion of some qualified person on the

designs. Either some architect well acquainted with hospital plans, or the inspectors of the Poor-law Board, would assist them materially in arriving at a just decision, and relieve them of the grumbings of disappointed candidates. The Lambeth managers have invited the before-mentioned gentlemen and others to submit designs for a similar building.

THE FEVER HOSPITAL AND SMALL POX HOSPITAL, HOMERTON, COMPETITONS.

METROPOLITAN ASYLUM DISTRICT.

SIX architects were invited to furnish designs for the proposed Fever Hospital and the Small Pox Hospital, at Homerton. With reference to the first, a premium of 200l. was offered for the best design, and 150l. for the second best; the successful competitor, if required, to carry out the works for a payment of 1,000l. less the amount of the premium; but not to be entitled to any premium or payment unless a substantial contractor undertake the work at a price not being more than 10 per cent. above the estimate of the cost sent in with the plans.

For the Small Pox Hospital, the premiums were 150l. and 100l.; and the payment to the successful competitor, if he carry out the work, 700l. less the amount of premium, and under the same condition as to estimate as the former.

The Fever Hospital to have 182 beds; the Small Pox Hospital 102. The instructions prescribe pavilions, not more than two stories in height, placed, if practicable, north and south; 2,000 ft. cubical space to each case; Parian cement or other impervious material for the walls; open windows reaching to the ceiling; ventilating stove-grates to bring in fresh warmed air; outlet shafts; hot-water pipes in some of the wards; double-action lifts; staircases of iron with wood treads and fire-proof landings; and that no expense is to be incurred for any kind of ornamental work. The names of the competitors and the estimates they sent in stand thus:—

	£	s.	d.	£	s.	d.
Mr. Gilbert Scott, Jun., for the Fever Hospital	42,000	0	0			
Ditto, for the Small-pox Hospital	22,000	0	0	64,000	0	0
Mr. E. L. Bracebridge, for the Fever Hospital	29,800	0	0			
Ditto, Small-pox Hospital ..	21,700	0	0	51,500	0	0
Messrs. Giles & Biven, for the Fever Hospital	27,000	0	0			
Ditto, Small-pox Hospital ..	17,000	0	0	44,000	0	0
Mr. T. H. Watson, for the Fever Hospital at	25,000	0	0			
Ditto, Small-pox Hospital ..	16,800	0	0	42,700	0	0
Mr. A. Wilson, for the Fever Hospital (A)	26,000	0	0			
Ditto, Small-pox Hospital (A) ..	15,350	0	0	41,350	0	0
Ditto, for the Fever Hospital (Alternative Plan) (B)	24,000	0	0			
Ditto, Small-pox Hospital (B) ..	14,350	0	0	38,350	0	0
Mr. T. E. Knightley, for the Fever Hospital	19,950	0	0			
Ditto, Small-pox Hospital ..	13,050	0	0	33,000	0	0

The committee arrived at the conclusion that the designs submitted by Messrs. Giles & Biven and Mr. Wilson best carried out the instructions and displayed a very improved arrangement of the several wards and the administrative department; they therefore recommended that the premiums of 200l. for the best design for the fever hospital, and of 150l. for the best design for the small-pox hospital, be awarded to Messrs. Giles & Biven, subject to the terms and conditions contained in the instructions; and that the premiums of 150l. for the second-best design for the fever hospital, and of 100l. for the second-best design for the small-pox hospital, be awarded to Mr. Andrew Wilson. This recommendation the Board have, we believe, confirmed, nor are we disposed to question it.

The designs by Messrs. Giles & Biven have some excellent points, and are generally good. The staircases which lead to the upper wards have no communication with the wards, a gallery, open on both sides, completely separating them in each case. Again, the "administration," which forms the centre of each hospital, well away from the wards, is divided into four distinct blocks of building,—the medical and official, the attendants' department, the store and kitchen department, and the laundry department, which are all unconnected, except

by the ground-floor corridor, open on both sides if required. The plan of the small-pox hospital is particularly compact, the two pavilions for each sex radiating from the two ends of a short corridor, the administrative blocks, divided as before, being in the centre.

Mr. Wilson's plans resemble those we have already mentioned more nearly than the others; but he lessened his chance of adoption by using well-ventilation, so to say, in one part; that is, ventilating by an area surrounded by buildings. In both Mr. Knightley's plans this same error, to a larger extent, is obvious. Mr. Scott, Jun., has brought the administration into too close proximity to the wards. The design has several meritorious points, and the same may justly be said of the designs by other competitors not specifically mentioned.

PRICE-BOOK FOR CIVIL ENGINEERS AND CONTRACTORS.*

THE plan of this work is well conceived, and it appears intended to supply a definite and well-ascertained want. There is nothing, as it truly implies, in which the professional reputation of the engineer and architect, and the interest of the contractor, are more directly concerned than the preparation of estimates for public works; and "there are very few duties which require greater consideration of almost innumerable subjects and conditions, varying with localities and circumstances, all of which affect labour and materials."

The book is divided into two sections. The first consists of tables or price-lists for various works and materials, accompanied by some railway specifications; and the second contains a good compendium of the legal liabilities of engineers, architects, builders, contractors, and workmen.

The price-lists in the first section are in the main correct, according to the present London standard; yet we regret to be unable to speak of this section with wholly unqualified commendation. It is, in our view, a serious deficiency in it, that no attempt is made to furnish the data upon which the prices are based; such, for instance, as the rate of wages assumed to be paid, which is never once alluded to. This defect is the more noticeable, as no date of publication is stated on the title-page, so as to give the book the appearance of referring to any year or period, notwithstanding the great fluctuation in wages which is constantly occurring.

Moreover, the price-lists, though correct in the main, are not wholly free from error. Thus, under the head of "Earthworks" (Table 1), a barrow-run is assumed at 25 yards, whereas the practice in London is to confine it to 18 yards, or three 18-ft. planks, which invalidates any calculation founded on the author's assumption. Again, the item given for pumping (No. 12) is absolutely useless. The cost of pumping cannot be arrived at in any average way, and can only be estimated from the experience acquired in any given locality. In fact, it varies in practice from 3d. to 5s., or more, so that the table in this respect is more calculated to mislead than to inform. The cost of timbering the sides of excavations, though not referred to in the table, is alike an important item; the cost of which has been found to vary from 3d. to 2s. per yard, according to the nature of the soil and the quantity of water.

We would also refer to the item of carting. Without objecting to the prices given by the author in No. 13, it must be seen that they are almost wholly dependent on the rate of wages paid, and liable to mislead if that rate be not stated. It is found in practice that a horse will travel about fifteen miles a day, and this independently of the length of lead, as, with short leads, and consequently more frequent rests during the filling of the cart, a horse will walk faster than on long leads; so that the distance of his daily travel is nearly the same in either case. For example, assuming half a mile lead, and the cart to hold a cubic yard, there would be 15 cubic yards per day carried; which, at the wages of 6s. 6d. for horse, cart, and driver, would be 61d. per yard for cartage; and with an addition of 1d. per yard for filling, depositing, plaut, and profit, the entire price for transport would be 11d. per yard.

The concrete prices also show clearly the lead-

* Atchley's Civil Engineer and Contractor's Estimate and Price-Book. By W. Davis Haskoll, C.E.

ing defect of the book to which we have alluded. Given the proportion of gravel and lime, the price of concrete varies according to the separately varying values of ballast, lime, and labour; and the cost of ballast alone has varied around London from 1s. to 8s. per yard, according to locality and demand. Fixed prices are also given in the tables for the cost of coffer-dams; whereas the labour of pile-driving alone, even when the rate of wages and materials is unaltered, varies from 1s. to 4s. per foot of pile driven, according to the nature of the soil.

The culvert quantities given in Table 2, and also the tunnel estimates in Table 3, are of great practical utility and convenience. We would recommend, however, that the bottom of the excavation for culverts should be got out horizontal rather than following the curve of the invert as shown in figs. 20 to 29; the curvature of the invert bottom being made up to the required form out of either a concrete or brickwork bottom, instead of by cutting it out of the natural soil. Thus in brick culverts, where concrete is not used, we would, in ordinary soils, lay two clear level courses under the invert.

In the prices for brickwork given in Table 4, the assumed cost of bricks is stated, but no further particulars are supplied as to the data on which the value of labour, mortar, plant, and profit are assumed, so as to enable the tables to be used under varying circumstances. It is due to the author to state, however, that the prices of both brickwork, timber, and iron are fairly applicable to present rates.

This book, on the whole, possesses the merit of great comprehensiveness, and of present correctness and utility to the classes for whom it is designed, especially in London. But it appears to us worthy of the author's attention to produce a work on an extended basis, which would have a wider and more lasting application. By tabulating, as far as possible, materials and labour as well as money; or, in other words, by stating the known proportionate quantities of materials used and daily work done, the engineer and contractor would from these quantities and the known rate of wages and materials in any given locality, be able to form their estimates with confidence, and with a degree of convenience hitherto unknown. Nor is there any peculiar difficulty in such a task; the materials for which are either known or can be gathered from observation by any one who has the opportunity of observing the progress of engineering works.

HOSPITAL BUILDING.

ARCHITECTURAL INSTITUTE OF SCOTLAND.

At the first meeting for the new session, held on the 23rd ult., Mr. Jas. Gowans read a paper on "The Edinburgh Infirmary and its Site," a subject just now greatly interesting the people of Edinburgh. In the course of his paper Mr. Gowans said.—In designing any building, the primary consideration of an architect is to plan it so that it may in the fullest degree be suitable for the purpose for which it is intended; and the most prominent requirements in a hospital appear to me to be the following:—

1st. That the buildings should have a full supply of light and pure air.

2nd. That they should be detached from each other, and classified for the particular diseases for which they are to be used.

3rd. That the ward buildings should be constructed so that they might be easily taken to pieces, and removed to other situations; or if they are constructed in a permanent manner, they should be built of material which would prevent as far as possible the absorption of diseased air.

4th. That the drainage should neither contaminate the building itself nor those other buildings which may be in the neighbourhood.

As to the first. No one can dispute but that plenty of light and pure air is of the greatest importance for the healing of the sick or hurt, and large windows on either side of an apartment afford the best means of their receiving both. A south-easterly exposure for chambers appears to me to be the most conducive to health, as the air that comes with the rays of the morning's sun is always the freshest and best; and just as you would place the bedrooms of your dwelling-house in that direction, so should they be in the wards of an infirmary.

As to the third. Following out the camp or

cottage idea, the structures could be made either of iron, in pieces that would be easily detached and removed when necessary, or to attain the same ends, and have more permanent buildings, they could be constructed of stone, and lined with concrete, cement, or other inside casing, which would prevent the absorption of those gases leading to the various diseases which stick to hospital buildings after they have been used for any length of time. The sort of apartment I aim at is one that could be only affected by bad air so long as the immediate cause existed, which could be thoroughly expelled by the through and through ventilation of the opposite windows, and the thorough cleansing by water ejected from the hose of a fire-engine. In fact, I would have it as easily cleansed as the drug bottle of a chemist, and I see no difficulty in doing this, as the walls, floors, ceilings, incoings of windows, and other surfaces, could be altogether made of some vitrified substance; and as I believe the timber of floors, doors, and finishings, absorb these unhealthy gases, I would have no finishings about either, but have the framing-work made of iron, with opaque glass for panels. The windows also I would have of iron frames, so that, at least as far as I know, the work would have nothing about it admitting of the least absorption.

If the drainage from the hospital is allowed to pass without being treated in some manner so as to destroy the contagion it necessarily carries, the drainage of the houses connected with detrimentally affected; and if there should be the slightest leakage in the drains, or any failures in the cesspools (which is often the case), the inmates of such dwellings would run great risk of contagion. The ventilation of the drains is also another matter that should not be overlooked. The outlet, therefore, of the drainage of a hospital should not be of a sluggish nature, but should have fall enough to carry it off as rapidly as possible.

A great consideration is, to provide such buildings and such devices as will aid our surgeons in the successful issue of their operations, or the medical men in the treatment of those diseases which often baffle the skill of the highest in the profession on account of the absence of such aids.

It would be as idle to expect that the surgeon could go through with his operation satisfactorily, unless he had the help of the best of instruments, or the medical man to cure without being provided with the best of drugs, as to expect that they can do all that is required of them in the old hospitals, which we are now about to remove. Again, if we can aid our physicians or surgeons in this way, we are aiding ourselves as well as others, because that, apart from the success which our diseased poor get in infirmaries, the contagious diseases which now and then come across such cities as ours must be checked, and kept from our own doors, by the removal of the afflicted to within the walls of a hospital.

To come down to a commercial view of the whole thing, I think it will pay the community to provide all that is best. If it is possible, by the aid of sanitary and other contrivances, to cure the patient in eight days instead of eight weeks, there must be a gain; so why not invest a little more money now that we have the opportunity of doing the right thing, and saving as we go on? I believe, from all that I have heard, that the result of the operation of the surgeon, or the means adopted by the physician for the cure of the sick, is not what either dread; what they dread is, the baneful influences which seem to adhere to the walls of the building itself, or the want of the restoring atmosphere which should come from the outside.

The Chairman (Mr. Peddie) invited discussion on the paper.

Mr. Lessels, architect, thought that if the buildings were to be temporary, it would be better to put up glazed buildings made of fire-clay and white on the surface. They could build the walls hollow, and the interior walls could be made of glazed fire-bricks, which could be quite impervious, and could be washed perfectly clean. For himself, however, he confessed that he should not like to see any building of that temporary nature erected in this city. He thought it would be quite possible to design a permanent building so as to meet the requirements of an excellent hospital. The difficulty as to bad gases might be overcome by lining the walls with fire-brick, and coating them with cement.

Sir James Simpson said he thought that Mr. Gowans's suggestion of building on a raised platform on the present site was most valuable,

because the building would then have the best ventilation and exposures far as the circulation of air was concerned. Sir James proceeded to refer to the question whether the buildings should be temporary or fixed, repeating the views which he expressed at the meeting of the Medico-Chirurgical Society in favour of having the administrative portion of the buildings fixed, and the buildings for patients of a temporary kind, made of iron, which could easily be taken down and put up again. He referred to statistics which he had prepared two years ago, showing that out of a million of midwifery cases treated in the hospitals throughout Europe, the proportion of deaths was 1 in 29; while out of a million of similar cases treated in their own homes, the proportion of deaths was only 1 in 210. He also contrasted the results of amputations in the Edinburgh Hospital with those of amputations performed in the country, stating that out of upwards of 400 amputations performed by country practitioners there were 40 deaths, or 1 in 10; while the statistics of the Edinburgh Infirmary three years ago showed, that out of 70 or 72 operated upon, 30 died, or 1 in 2½—the mortality being thus three times greater in the cases of the operations in the hospital than in those in the country. That was a startling fact, he said, and what was true of amputations was true of all other operations, and of the treatment of other diseases. He did not think it would be sufficient to wash the wards, because the large new hospital in Paris, where the walls were of Parian imitation of marble, and where there was the most cleanliness, was found to be the most deadly in Paris. No one had yet succeeded in getting rid of the miasma that seemed to gather in old hospitals, and they might succeed if they would build hospitals of some material that could be built readily, and put up again. After suggesting that iron might be used with advantage, and that layers of charcoal might be placed to operate as a disinfectant in interstices of the iron walls, Sir James concluded by insisting on the necessity of providing a hall for the patients, and of providing a large number of rooms with one bed, to prevent patients retarding the recovery of others, maintaining that it was better to treat one hundred patients perfectly and kindly than two or three hundred imperfectly and to the destruction of their health and lives.

Dr. Stevenson Macadam said that whatever might be the mode of construction of the hospital, the introduction of charcoal would render it more healthy than it would otherwise be, owing to the value of charcoal as an absorbent of gases.

Dr. Dunsinore said that Sir James Simpson's statistics were calculated to injure, not only their hospital, but hospitals in general. He did not call in question the rates of mortality Sir James had quoted, of 1 in 3 in hospitals, and 1 in 10 in country practice; but as an old hospital surgeon he thought it was not fair to compare the two at all. In the hospital a great many persons, who had met with severe railway accidents, were brought from a great distance, bleeding for hours before they got to the hospital. Dr. Dunsinore went on to say that he approved of hospitals being built of iron, though he did not think they could be built of that material for large towns. He also approved of the suggestion made as to the use of charcoal. He saw no reason why the washing of hospitals should not be attended with benefit; and, referring to the remarks of Sir James Simpson on the mortality of the Paris hospital, he said that might be accounted for by the fact that it was ventilated artificially instead of naturally.

Dr. Alexander Wood wished some scientific gentlemen, with Sir James Simpson at their head, would endeavour to ascertain what this miasm was that lurked in hospitals; for if no amount of washing would remove it, he confessed he was a little sceptical of any great effect being produced by the unscrewing of iron bolts and laying the iron upon the grass. Before advocating the substitution of iron for stone and lime, he would like some more certainty about the end justifying the means.

The Chairman said that in Paris the large new hospital to which Sir James Simpson had referred had 612 beds, and it required the whole space of about ten acres. St. Thomas's Hospital in London would have 638 beds, and required six acres; and it was to be built four stories high in consequence of the limited space. In these circumstances they might safely say that five acres of infirmary ground would not properly accommodate 500 beds.

THE HEALTH OF PLYMOUTH.

PLYMOUTH is, perhaps, the largest and the most important English town of which the Registrar-General does not publish weekly returns of births, deaths, and mortality. The information bearing upon its vital statistics recently prepared and presented by Dr. A. C. Hingston, Senior Physician of the Plymouth Public Dispensary, is therefore a welcome contribution to sanitary intelligence.

Plymouth may be said to comprise the three registrative districts of Plymouth, Devonport, and East Stonehouse, and to include a population estimated by the Registrar-General to the middle of this year at nearly 140,000; but Dr. Hingston's return deals only with Plymouth borough, which, at the census of 1861, contained 62,599 persons, and is now estimated to have 71,373 inhabitants. The element of population in the necessary calculation for obtaining the death-rates in towns is but too often a source of much difficulty and probable error. The interval of ten years between one census and the next may not be too long between the numbering of the nation at large; but ten years in the life of a town may be as eventful as fifty years in a rural district. The rise of a fresh branch of trade, or the decline of another, not infrequently so changes the rate of increase of population in a town as to render the use of the rate which prevailed between 1851-61, for instance, worse than valueless for the greater part of the decade 1861-71. The question of a quinquennial census of all town districts is one of sufficient importance to deserve the attention of the Royal Sanitary Commission, for a reliable estimate of the population is necessary to lend preliminary value to vital statistics. To return to Plymouth. Dr. Hingston does not, unfortunately, state the population upon which his calculations are based; but from local inquiry there appears no reason to doubt the accuracy of the estimate given above, founded upon the rate of increase between 1851-61, and it is probably this which has been used. It is to be somewhat regretted that the returns relate to the three months September, October, and November, instead of for one of the more usually recognised quarters, as useful comparison with the returns published by the Registrar-General for other large towns is thus rendered almost impossible.

During the three months ending November last, 334 deaths were registered in the borough of Plymouth, against 364 and 339 in the corresponding three months of 1866 and 1867. These deaths give an annual rate of mortality during those three months of 19 per 1,000, against 23 per 1,000 last year. During the same period the death-rate was 20 per 1,000 in Bristol, 23 in London, 24 in Birmingham, 29 in Liverpool, and 33 in Manchester; indeed, Plymouth was healthier during that period than any one of the large English towns furnishing weekly returns, Bristol coming nearest with 20 per 1,000. In explanation of this result, Dr. Hingston says,—"We may consider the town as definitely assuming a more healthy condition, which is clearly due to the improved drainage, and other sanitary arrangements which have been carried out during the last few years."

Many of our large towns have recently been suffering from the prevalence of zymotic disease, resulting in excessive death-rates. Different forms of fever have been very fatal in Manchester, Liverpool, and Leeds; scarlatina in Manchester, London, Birmingham, and Newcastle-upon-Tyne; and small-pox in Sheffield. Plymouth, however, has been unusually free from this class of diseases: there appears, indeed, not to have been a single death from scarlatina in the town during the past five months. During the three months ending November, of the 334 deaths recorded, only 48 resulted from zymotic diseases; whereas, in the same period of 1867, 73 were so returned out of 339 deaths. Perhaps the most conclusive evidence of the improvement in the health of the town is the steady decline in the proportion of these deaths from zymotic, or, as Dr. Hingston plainly calls them, preventable, causes in recent years. In the three months of 1865 ending November, 33 per cent. of the total deaths were referred to this class of disease. In the same period of 1866 this proportion fell to 25 per cent.; in 1867, to 22; and in the corresponding three months of the present year the proportion has been but 14 per cent.

Of the 48 deaths from zymotic disease, no less than 19 occurred from diarrhoea, mostly infantile; 15 were fatal cases of fever, and one

of small-pox; the only death resulting from this disease in the past two years. This speaks well for the efficient performance and general adoption of vaccination, as seaport towns are especially liable to the importation of the disease from other places, with the spread of infection if this precaution be neglected. Hull has recently been suffering from this cause.

We are glad to see that the most influential of the local papers, in noticing Dr. Hingston's report, has taken the opportunity to urge the advisability of appointing an efficient medical officer of health. It is but too often the case that such a measure is not mooted in a town until some epidemic, by its fatality, spreads death and terror among its inhabitants; and the trite saying, "Let well alone," is too frequently urged against taking any important sanitary step if it can be proved that other towns are worse off, and suffering from higher death-rates. The inhabitants of Plymouth should, however—rather encouraged by the success of what has already been done—still further show their earnestness by making a judicious appointment of a medical officer. The improvement in the health of the town would then probably continue, and we should no longer have to chronicle even 15 fatal cases of fever in three months, with their probably five times as numerous cases of attack with subsequent recovery. It is well worthy of local consideration whether Plymouth, Devonport, and East Stonehouse could not, for sanitary purposes, be formed into one district, with one medical officer of health. The duties of such an appointment are always more efficiently performed if they are sufficient to occupy the whole time and attention of an efficient officer.

CELTIC, ROMAN, MOORISH, AND OTHER REMAINS IN ALGERIA.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the last meeting of the Institute, Professor Hayter Lewis gave some particulars of a recent visit to Algeria. The time which he could afford allowed him to make but few sketches, which had been enlarged by Mr. Taverner Perry, the Messrs. Hensman, and Mr. Hanson. The country described comprised the town of Algiers and the districts around it, the geographical position and topographical features of which were pointed out on a map, after which the author gave a succinct history of the various races by whom the province was successively peopled, from the ante-Christian era down to the middle of first century, when it became a province of Rome. The Vandal conquest led to the coming of one of the great regenerative nations of Medieval times, the Byzantines. About a century after that the power of the Vandals was destroyed by Belisarius, the famous general of Justinian, and they henceforth and for ever disappeared; but it was different with the Byzantine. Wherever he had gone his mark had been left, and all over the province something for ever cropped up to show that this half-Greek, half-Persian, had been there. The Byzantine power was short-lived; for, little more than 100 years after their conquest, occurred the advent of the religion and conquests of Mahomet. In A.D. 612 the Saracens invaded Northern Africa, and in thirty years more they had overrun and conquered the whole, and for 1,200 years it remained, in the main, Mahomedan. It was not, however, till 1050 that the conquerors summoned their countrymen from the deserts of Arabia to people those of Algiers. With them there came, of course, another style of architecture, which lasted well nigh to our own day; but it was seriously modified at various times, chiefly under the Turks, who had entire possession of the Government from the sixteenth century. In 1830 the French landed at Sidi Feruch, and destroyed the government of the Algerine Beys. In 1837 they stormed Constantine, and from that time Algeria had been a half-civilized province of France.

Of the various works of all these different peoples he took, first, those usually termed Celtic or Druidic, for want of a better name. Of these works vast numbers exist in Algeria, and many of a most curious kind, particularly in the northern French village of Gnyotville. These old monuments were little prized by the men who have just preceded us; but the French Government has now awakened to the calls of its savans. The remains at Gnyotville are simple cromlechs, formed of large rude unworked stones, set up edgewise, so as to make a small

chamber, which is covered with one or more large stones at top. That these were sepulchres there could be no doubt, as bones have invariably been found in those newly opened. He could neither see nor hear of any trace of a tumulus over any of the cromlechs, and none of them bear any mark or moulding, or possess even a tradition to tell of their authors or dates.

He now came to a very great advance indeed. On the top of a hill in the Sahel range, rising there 850 ft., is the famous Khour-el-Mouria, or Tomb of the Christian Lady, which can be seen for an immense distance along the plain or from the sea, standing holly out above the range of the Sahel as a great conical tumulus. The site is now utterly desolate, and up to the time of the present Emperor's visit to Algeria it was an entirely confused mass of stones. The lower part having been buried by the rain of the upper, his Majesty having provided the requisite funds, the work of clearance was begun in 1865, under the direction of Messrs. Berbrugger & MacCarthy. The clearance occupied eight months. The author proceeded to give a minute description of the architectural features of this monument, and exhibited specimens of the stone. Of the purpose of it nothing could be discovered. There were no records on the walls: the chambers were all empty,—no sarcophagus,—no skeleton,—no trace of sepulture or shrine. A few beads of a coral necklace and some trinkets of Egyptian make were all that the most careful search could find. The openings broken in the portullis communicating with the central chamber were barely large enough to admit a man, and no sarcophagus could ever have been removed through them. It must, therefore, be supposed that the chambers had contained the ashes only of the dead, easily removed, and now scattered by the winds. As to the date of this very grand work the whole of the details gave one the idea of their having been copied by Roman artists from Greek originals, and Mr. Berbrugger assigned the structure to Julia II., who died A.D. 19, and to his queen, Cleopatra, daughter of the celebrated Egyptian.

Of a similar type to the above, but of somewhat smaller size, is the tomb (still it is thought unrisen) in the eastern province, near Batna, known as the Medracen, a name of which no probable meaning or derivation has yet been given. This monument, which stands upon a lofty hill commanded for a long distance from the plain, is also utterly without inscription or tradition to assign its date, origin, or purpose. The more probable purpose seemed to be that it served as a royal mausoleum for the kings of Numidia as the Kolea edifice did for those of Mauritania. Structures similar to the foregoing were met with in the south-east province of Oran, the existence of which he believed was not known until 1842. These were three in number, built of large stones on a square base, with a pyramidal top formed of steps as in the Medracen and Khour.

The above were the only remains of Roman or earlier art which seemed to the author so peculiar to the province as to require special notice. Between the time of the Romans and Byzantines there was nothing architectural to remark; but amongst the records of this date in the museums are several of great curiosity.

At Tipasa were said to be the ruins of a large church, now filled up by the huts of an Arab village; but the author was by an unfortunate accident prevented seeing them, nor could he meet with any description of them. At Bon Ismail he found the lower part of a building which appeared clearly to be the ruins of a very early church, with some very curious features still remaining in a totally perfect state. At Constantine there are the remains of a church said to be those of the original one founded in the time of that emperor; but the ruins are very scanty, and there was no assurance that the church had not been rebuilt over and over again since its foundation.

He now came to the Arabs. Their works, so far as he could personally speak of them, are chiefly in the town of Algiers, the whole of which was really comparatively modern, and its architecture, whatever its style, could date only from about the same period as that of the chief Renaissance architects of Italy. It is built on the side of a steep hill, in a wedge-shaped form, starting from the harbour at the foot, and finishing with the Turkish citadel of the Kasba at a height of 387 ft. above the sea. There is nothing in the Arab part that we could fairly call a street, nor any part through which a carriage of any kind could be drawn. The thoroughfares

are mere alleys winding about the sides of the hill, in paths so tortuous and irregular that a stranger has but one means of discovering his way of escape from them, viz., by persistently going down-hill, wherever that may lead, by which means he must of course at last find himself at the bottom of it. The houses, mosques, and palaces, their domes and minarets are white. Their roofs are flat, with no gable or slanting covering, to mark from a little distance one building from another, either in outline or colour; so that the general appearance of the city from the sea is really that to which it is likened, as a stone quarry. The most ancient and interesting of all its buildings is the grand mosque, the Djama Kahir. It stands close to the sea, and is common enough looking outside, being a simple square-walled building, with a few small apertures in it for light. A lofty minaret above proclaims to the stranger that this building, which it crowns, is one of the great native edifices of Algiers. [The author, by the aid of a sketch, described the principal features of this building.] All this, he said, was genuine Arabic, as its date would show, the mosque having been built in 1000, and the minaret in 1322. The author then proceeded to give a description of another mosque close by,—that of the Fishery, or the new mosque, Djama Dejedid, which he said was evidently the work of a master mind, and well carried out externally, as shown by the sketch exhibited, the outlines declaring to the eye of the architect that they were designed by a Christian architect of Greek extraction, who, as tradition recorded, was either bewitched or burned to death by the Turks in the sixteenth century.

In walking through the Moorish quarters one sees nothing whatever of the interior of the houses, and the narrowness of the streets allows little enough even of the exterior to be seen. In the Jewish quarters it is different: there the doors of the houses are constantly left open, and in the various other parts of the town so many houses and palaces are now occupied by the French for public and private purposes of various kinds, that a good idea of the old arrangements can be easily obtained. He then called attention to a sketch of the archbishop's palace, whose exterior, he said, was one of the finest specimens of Moorish work in Algiers, which he described. He knew nothing more beautifully designed or worked out than the small domes of the archbishop's palace or of the beautiful palace of the governor. A curious circumstance struck him, which was this,—that nearly every doorway he saw throughout the town was of the same identical pattern.

The doors inside and outside the houses, no matter where or of what size, were of this same identical pattern, or so near it as to show that it was copied from the same original. The columns, he added, are well nigh as curious. They are nearly always of marble, and the capitals and mouldings very well and boldly carved. None that he saw were antique, or copies of the antique. In the corridors the columns, which are necessarily short, have spiral shafts, as also many of those to the colonnades, as also many of the latter are octagonal about one-third up, and spiral above. The same pattern of tiles, too, is seen everywhere. The design of the large windows is equally curious with the other parts, as they are as invariably square as the doors are circular, and almost always have wide architraves, with ornamental scroll-work. The construction of the houses and marques is simple enough. They are built chiefly of bricks, very hard, about 4½ in. square, and are much better than the bricks now made. When the walls were very thick, each side was of brick, and the interior filled in with rubble. The mortar used was red earth, with a very small portion of lime. The floors and staircases were formed of wooden joists, on which a second boarding was laid. On this was a thick layer of the red earth, then a flooring of stone, marble, or tiles. In the common houses the joists were of round logs only; in the better class they were squared, and the chief beams were moulded. The joists projected through the walls to carry the overhanging parts, and the ends were supported by round slanting timbers, which effectively carried down the thrust to a low level, but without any attempt at ornamental effect. The tiles were of coarse earthenware of a light tint, which was covered with a very thick white: on this the pattern was painted, and then lined in (all by hand), and the whole glazed over.

In respect of modern Algiers he need say but little; for, although there have been great works

done of late years, there is little to interest the architect. The whole of the buildings on the seaboard of the town are new, and most of them erected by our countryman, Sir Morton Peto, to whose zealous officers, Mr. Jackson and Mr. Akman, the author was deeply indebted during his stay, as also to our English chaplain, the Rev. Mr. Guisberg. The steep shelving shore, which till lately existed, has been transformed by them into a series of magnificent terraces, which rise boldly up from the harbour, and which form the roofs of warehouses of great size; the whole producing a combination of grandeur and utility unequalled in effect by that of any commercial town he knew.

He wished if it were only in gratitude for the great good the French have done in Algiers he could say a good word for their architecture, but he really could not; and those who wished to see good specimens of it need not travel so far. One thing he would say, in conclusion: whether the modern Algerian architecture be good or bad, it is clearly French. However, in carrying with them to a foreign land an architecture of their own, the French had gone on the right path, and would leave their mark to succeeding times, as the Turk, the Roman, and the Celt had done before them. But in their ecclesiastical works the French had given up this principle. The cathedral erected on the site of an ancient mosque, and the costly Notre Dame d'Afrique, which overlooks the sea and the town from a most conspicuous eminence, have been built in the likeness, so far as the altered services of religion would allow, of the mosques the place of which they have supplied.

SCHOOLS OF ART.

The Maidstone School.—The attendance at the distribution of prizes in this school was not large. The walls of the ancient room in which the meeting took place were hung with drawings made by the pupils. The Rev. H. Collis read the report. From this it appeared that the school was opened upon the 29th January, 1867, under the care of Mr. J. B. Williamson. Three classes had been formed from the commencement, and 127 students had passed through the school, sixty-two being now under instruction. Builders, clerks, bricklayers, ticket-writers, upholsterers, carpenters, engineers, masons, apprentices (various), schoolmasters, bluecoat boys, shoemakers, hakers, and surveyors had attended the school. The numbers presented in free-hand drawing were 45—passed, 35; models, 22—passed 18; geometrical drawing, 4—passed, 2. Two of the artisans had obtained two prizes each. The first examination was held in March last. The Government grant had been 14l. 10s., but from the first the school had been self-supporting. The teaching in the school was thorough, and therefore slow,—real progress being aimed at, and not the gratification of unskilled eyes. The report closed with a suggestion that prizes should be offered by the townspeople. Mr. Monckton, in seconding a resolution that the school deserved support, remarked that Woollett, the eminent engraver, had been a pot-boy at the Turk's Head public-house, and commenced his artistic labours by engraving upon a pewter pot. In the Town-hall would be found also the name of Jeffreys, the painter, another native of Maidstone, who painted the altar-piece which formerly stood in All Saints' Church, but was now in the Museum.

The Lincoln School.—The annual exhibition of drawings, paintings, and designs executed by the students of this school has been opened for one week. The number of works exhibited was about 500, exclusive of elementary drawings, hung in groups to economise the room. The distribution of the prizes has also taken place. The mayor presided. The room was well filled by the pupils and their friends, and the general public. Mr. Taylor the headmaster's report said,—“Commencing with the results of the different competitions and examinations conducted by the Science and Art Department, extending from March to August, the following prizes were awarded to all the Schools:—National competition of all the Schools of Art in the United Kingdom,—One national bronze medal, two Queen's prizes, and nine works selected in London for the National Art Competition; nine free studentships to students in the advanced section, admitting them free to all the advantages of the school; eight prizes for light-and-shade drawings from the

cast, &c.; nine prizes for drawings executed within one hour in freehand, geometry, perspective, model, and mechanical drawing; forty-nine certificates for the same; two full certificates.” “The attendance has been for each class,—morning, 29; afternoon, 35; evening, 106; pupil teachers, 26; total number of individual students, 180.” The report of the committee stated that “some alterations in the building have been made during the past year. The staircase has been very much improved, and the ladies' cloak-room also. Considerable additions have been made to the art-library.”

The Manchester School.—The annual meeting and distribution of prizes in connexion with this school have taken place in the Lecture Theatre of the Royal Institution. The chair was occupied by Mr. Thomas Bazley, M.P. The secretary read the annual report, which stated that in the financial affairs of the Institution there was a considerable deficiency, the annual subscriptions, from deaths and other causes, continuing to decline in amount, not a single money donation having been added during the past two years. It was painful to the committee to have to make continued appeals to the public, whilst the internal working of the school, under the judicious and effective management of the headmaster (Mr. Mackley), continued in so satisfactory a state. During the past year Mrs. Abel Heywood had presented the munificent donation of 500l., the interest of which was to be annually distributed in prizes.

Mr. Mackley, in course of his report, said,—

“With reference to the new regulations of the Department, and the establishment of art studentships, I am sorry to say that the measure does not appear to apply to this school, as no inquiries for the privilege have yet been made. At the national competition which took place in London this year, we were so fortunate as to obtain a larger amount of first-class prizes than any other school in the United Kingdom, although the number attending this school is not nearly so large as several others which competed. Many of the students are now applying themselves to art with the sole object of becoming draughtsmen. At the second-grade examination, which took place here in March last, fifty-nine ‘passed,’ and twenty-five obtained prizes; and at the national competition held in London, one gold medal, four silver medals, three bronze medals, and five third-grade prizes were awarded.”

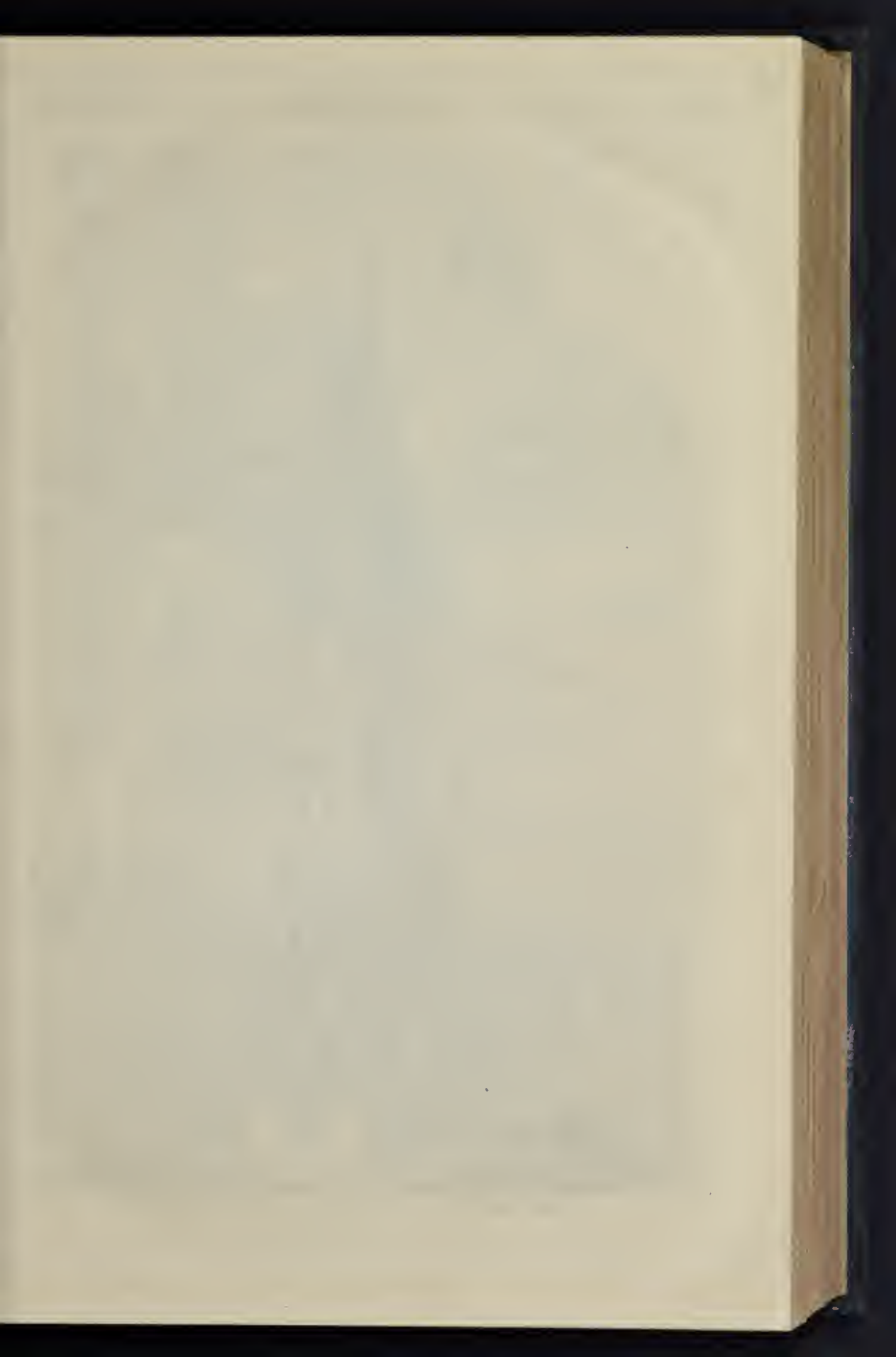
MEMORIAL CLOCK TOWER, LEICESTER.

About a hundred designs were sent in competition by architects for the above work, and were publicly exhibited. The town-council having consented to supply the clock, lamps, foundation, and lighting, the subscribers' committee felt it was due to that body that they should have a voice in the selection; the committee, therefore, adopted three designs by ballot, and from these the council selected the one by Mr. Joseph Goddard, of Leicester, architect. The total height of the tower is about 80 ft. The figures are 10 ft. 8 in. from the platform, and 7 ft. in height. The larger shafts are of polished granite, and the smaller ones of polished serpentine marble. The base is of Mount-Sorrel granite, with hammer-dressed face. The figures are of Portland stone, and the remainder of the edifice is of stone from the Heiton quarries. The style is Decorated Gothic. The four benefactors represented on the building are Simon de Montfort, Earl of Leicester; William Wigton, the founder of a hospital for aged men and women; Sir Thomas White, whose monetary loans to tradesmen are still granted yearly; and Alderman Gabriel Newton, founder of the “Green-coat School.”

But a little more than a year ago some half-dozen gentlemen met by invitation, when a small committee was appointed, with a working honorary secretary, the pecuniary results of whose exertions show receipts by subscription of over 872l. The total cost will be about 1,000l. The corner-stone was laid on the 16th of March last, and the top stone fixed on the 8th of June. The work has been executed from the designs and under the superintendence of the before-mentioned architect, by Mr. Barfield, of Leicester. The clock, which is understood to be a good piece of work, was made by Messrs. Gillett & Bland, of Groydon.

Progress in the United States.—“First-class New York residences” now contain a billiard-room, a chapel, and a theatre or concert-saloon.

The spire of the new cathedral in Pittsburgh is to be surmounted by a hollow iron cross, 14 ft. in height, which is to be illuminated by 300 gas jets.





MEMORIAL CLOCK TOWER, LEICESTER.—MR. JOSEPH GODDARD, ARCHITECT.



THE ILLINOIS STATE CAPITOL: SPRINGFIELD, UNITED STATES OF AMERICA.—Messrs. COCHRANE & GARNSBY, ARCHITECTS.

THE NEW STATE CAPITOL, ILLINOIS, AMERICA.

WE give a view of the New State Capitol now in the course of erection in Springfield, the capital of Illinois, in the United States of America. The ground plan of the building is that of the Greek cross, arranged to present four fronts of similar style. The order adopted is the Corinthian. The north, east, and southern fronts of the superstructure are each to be supplied with a portico of eight detached columns in front, the outer two on each side being coupled. The western façade presents the same exterior, except that when entering the building you pass into the basement through a stylobate, the portico not projecting as far as on the opposite front. The tambour of the dome comprises two stories, the first ornamented with disengaged columns in pairs; and the second with pilasters. From the top of the latter springs the dome, surmounted by a lantern. There is a balustrade on the top of the entablature of the first story, consisting of pedestals and balusters. The height from the ground to the top of the lantern is 254 ft. The dome at its base is 83 ft. in diameter, outside the walls. The building is 354 ft. long by 240 ft. wide; the height is 95 ft. The interior is to be finished in the same elaborate style. Messrs. Cochrane & Garnsey, of Chicago, are the architects; Mr. J. W. Ackermann (late of London), acting as draughtsman. The corner-stone was laid with Masonic ceremonies on the 5th day of October, 1868. The whole structure will cost 3,000,000 dollars.

THE TECHNICAL INSTRUCTION MOVEMENT.

THE Workmen's Technical Education Committee, appointed at a conference held at the Society of Arts, have just issued a report. The committee express a decided opinion that there is at present no provision in the metropolis for scientific and detailed instruction to workmen, the fees charged at the School of Mines, the Royal School of Chemistry, and the evening classes at King's and University Colleges, being beyond the means of those receiving weekly wages, and the artisan class being practically excluded by the lectures being given in the daytime. The committee, admitting that the Department of Science and Art encouraged the formation of science classes, complain that it does not provide the means of instruction. The committee recommend the establishment of science and art classes in the industrial quarters of the metropolis, the formation of technical schools for instructional detail where work shall be actually produced, and central schools for foremen and managers, like the *École des Arts et Métiers* in France, as well as a normal school for the training of science teachers, in connexion with the existing Science and Art Department. Finally, the committee strongly urge the paramount importance of establishing museum schools. Having obtained the services of Mr. J. C. Buckmaster in organising such classes, the committee urgently appeal for aid to all classes of the community, and also to Government, while they express dissatisfaction with the report of the recent select committee of the House of Commons on the subject.

MANCHESTER ARCHITECTURAL ASSOCIATION.

THE opening meeting of the Session was held in the Society's rooms, Corporation-street, December 15th, the president, Mr. Isaac Blackwell, in the chair. Mr. Darbyshire, the Honorary Secretary, read the annual report, which reviewed at some length the operations of the Association during the past session. Several interesting papers had been read, including one by Mr. Horner, of the Liverpool Society, which paper had been printed and circulated among the members. The report referred to the Students' Class, recently established in connexion with the Association; and from the report presented to the Council from the Student's Class Committee, it would appear that the efforts made some twelve months ago to establish these classes have been attended with a success scarcely expected by those most interested in their formation. The class for design and construction is presided over by Mr. J. Battye; Mr.

Gregory conducts the modelling; Mr. J. Redford the free-hand drawing; and the services of Mr. Bagot have been secured for instruction in water-colour drawing. The classes are well attended. An exhibition of the students' production has been held, and it is hoped that the study and instruction these classes afford will be of considerable benefit to the younger members of the profession located in Manchester.

The president read his inaugural address, which touched upon matters of local interest, and referred to the facilities now offered by the association for the study of those branches of an architect's education not to be had in the routine of the office.

GLASGOW ARCHITECTURAL SOCIETY.

THE SEWAGE QUESTION.

THIS Society met in their rooms, 138, Bath-street, last week, Mr. Campbell Douglas, president, in the chair. Mr. John Honeyman, jun., read a paper on the sewage question, in which he advanced the opinion that the most obnoxious sanitary defects would not in any measure be remedied by the purification of the river. The question, as he understood it was, "What are we to do with our sewage, and especially how are we to deal with it in the earlier stages of its existence, so as most effectually, and comfortably, and healthfully to get rid of it?" The fact was the sewage had done its worst before it made its appearance at the harbour at all. In its long and, it might be, sluggish course it had become almost completely oxidised, and had contributed its quota to those poisonous products of putrefaction which, unsuspected, carried sickness and death to many a home. Arrived at the river it was comparatively harmless, though still offensive. The purification of the river, therefore, might be safely left alone till we had overcome the more serious defects of our system—want of proper arrangements for flushing, ventilating, and trapping the sewers. Having made sure of this, we should go on to provide for the ultimate disposal of the sewage. Although he denied that there was any danger in continuing to send the sewage into the river, he considered such a course to be exceedingly objectionable. While free to make as much use as possible of the river, we were not free to abuse it—we were bound to let it pass on through the city undefiled. If the water-closet system were retained, we must make up our minds to provide a suitable outfall for the sewers. But this was probably necessary in Glasgow in any case. He thought the scheme proposed by Messrs. Bateman & Bazalgette ought to be carried out, and he had every confidence that in such hands it would prove thoroughly satisfactory. It was of course a difficult and very expensive undertaking, but most really good things were expensive, and he hoped that in this they would be preserved from any "cheap and nasty" substitute.

SANITARY MATTERS.

Kilderminster.—The present state of the public health here causes considerable anxiety to the inhabitants, who naturally inquire how far the alarming increase in the rate of mortality is due to the want of sanitary precautions by the local authorities. An official report by Mr. Stretton, the medical officer of the Poor-law Union, presented to the Board of Guardians, throws some little light on the subject. This document calls attention to the bad water and inefficient drainage of the town. No attempt, it seems, has been made by the local governing body to remedy the former, but the medical officer bears willing testimony to the fact that where any efforts have been made to improve defective drainage, they have invariably been followed by a decrease of sickness in the locality. He suggests that, as the town authorities have so long disregarded "the constant gratuitous admonition of the medical profession" on this vital question, a special commission of inquiry should be obtained from London. He reports that from 1st October to 21st December last there occurred at least 350 cases of preventable diseases; and at least fifty have died, while "very many poor wretches have been left deteriorated in health for life." The Board of Guardians, though apparently also slow to move, have consented to appoint a deputation to urge

upon the Town Council the desirability of introducing an efficient system of town drainage and water supply.

Bromley.—A system of drainage is now being agreed upon by the local Board of Works, who have purchased 10½ acres—part of Holloway Farm—to which the whole of the sewage of Bromley is to be conducted, and used on the irrigation system. Whether it is to be conveyed there by gravitation or pumping, is not decided upon. Mr. Lawson, C.E., is in favour of the former; and Mr. Jacobs, the engineer and surveyor to the Board, of the latter. The Board have left these two gentlemen to agree between themselves, and by their opinion the Board will be guided.

THE TRADES MOVEMENT.

THE strike of masons at Aberdeen has terminated, and an arbitrator has been appointed mutually by the masters and workmen to decide upon the wages question. Parties have been named as witnesses by the operatives, and the chairman of the operatives has, in the name of the combination, formally declared the strike at an end.

A case of considerable interest to the building trades, though only involving a small sum (£s. 2d.), was brought before Mr. Boushara, in the North Shields County Court, lately. A joiner summoned Mr. Addison Potter, of Willington Quay, for the recovery of the sum mentioned. The plaintiff, with some other men, had been engaged in out-door joiner work in Mr. Potter's factory, and a day's work in such circumstances is from daylight to dark. Mr. Potter has a workshop where joiner-work goes on before daylight and after dark by gas, or from six to six. The plaintiff, with some other men, had been working in the open air; but between two and three o'clock in the afternoon, the material necessary to keep them employed ran short, and the foreman of the joiners told the plaintiff he must go into the workshop and get some doors ready. He went, but at dark he knocked off. Next morning he returned, but there was no employment for him, and he had to go home. He summoned Mr. Potter for the quarter day he lost. The Judge maintained that he was entitled to it. It was quite clear that the plaintiff was employed upon a definite class of work, viz., in the open air, the time for which was from day-break to dark; and the defendant having failed to keep him supplied with material, it did not entitle him to order him into the workshop to get ready material that should have been got ready for him, except in the time for which he had been working previously. He gave judgment for the plaintiff with costs, and his day's pay as a witness.

A deputation of working men who are shareholders in a "Mutual Land, Emigration, and Colonisation Company," have waited upon the American Minister for the purpose of soliciting his advice and co-operation with reference to an emigration scheme which has been devised by that company, with the view of ameliorating the condition of the artisans of this country. The deputation wish to found a colony in Nebraska, the land to be held on Communistic principles; but Mr. Johnson could not assure them that they would be allowed to do so in any part of the United States. He promised to communicate with the Governor of Nebraska, and farther their object in any other way within his power.

NEWS FROM MELBOURNE, VICTORIA.

ABOUT six miles from Melbourne, beyond Hawthorn, lies the small but rapidly-increasing village of Camberwell. Five years since some members of the Anglican Church commenced the erection of a small edifice for public worship there. In a very short time it became necessary to enlarge this building. Then followed the erection of a parsonage and a common school. It has become necessary to enlarge the church again, and there is no room for the children attending the Sunday-school, who exceed 120 in number. Plans have been prepared by Mr. Billing, architect; and if the works are completed as proposed, it will make Camberwell one of the prettiest villages in the suburbs of Melbourne. The Rev. C. Isaacson, the present incumbent, has already raised a large sum towards the building fund. The Melbourne Meat-preserving Company's works, at Marlybrough, on the Salt-water River,

near Melbourne, consist of a group of buildings, some old and others new. The establishment is capable of disposing of 3,000 sheep and 50 head of oxen per week. In a room, 90 ft. long by 30 ft. wide, the slaughtered animals are cut up into joints. They are then sent to the kitchen adjoining, where they are cooked. Over the cooking-up room is the tin-shop, capable of accommodating forty tinsmiths, where tin is soldered into canisters, at the rate of about 12,000 per week, by twenty tinsmiths. Adjoining is a machine-room, where the tin is cut up, rolled, stamped, &c. The meat is put into the canisters in the kitchen, and carried up by a lift to the preserving department to be soldered down, a hole being left for the extraction of the air, after which they undergo other processes, such as cooling the canisters, testing, &c. The whole of the alterations, new buildings, &c., have been carried out under the inspection of Mr. A. Purchas, by Messrs. Piggem, contractors, North Melbourne. The boilers and engine have been supplied by Mr. Enoch Chibber, while the preserving apparatus, soap-vats, &c., have been constructed by Messrs. Robison, Brothers, of Flinders-street, from designs supplied by Mr. Ritchie, the manager of the company.

The Duke of Edinburgh, as captain of the *Galatea*, has reported very favourably of the meat prepared by this company, and the Government is giving it a trial. We may here add, that it is to be hoped the spicing of meat, such as that which has been prepared in Australia and sent home since we urged this as one available form of preserving Australian mutton and beef, will be more skillfully done than that lately sent home, which the writer has tried, and found to be quite unfit for human food.

The Colony of Victoria.—The area of the colony is estimated at 56,644,160 acres, or 80,944 square miles. At the commencement of the year 1867 nearly 7,500,000 acres had been parted with in fee simple, and the roads, &c., in connexion therewith made up the quantity to 7,710,438 acres; 2,571,172 acres were let on lease for agricultural purposes at a rental of 2s. or 2s. 6d. per acre per annum, and roads, &c., in connexion therewith made up the quantity to 2,699,758 acres; 226,150 acres were held under license for residence and cultivation in the vicinity of the gold-fields at a rent of about 2s. 6d. per acre; 1,848,444 acres were occupied as commonage, principally around the various gold-fields; 20,848,623 acres were available land held under pastoral licence by squatters for grazing purposes at a rent of 2-0-7d. per acre; 6,850,000 acres were unavailable land held by squatters in connexion with the above; and 15,463,747 acres were waste lands unoccupied. The Crown parted with the fee-simple of only 104,684 acres in 1867.

IMPORTANT DECISION ON A CLAIM AGAINST A BUILDER FOR HOARDING IN.

At the last sitting of the County Court at Margate, before Mr. W. C. Scott, the judge of the court, a claim was tried by Mr. W. Hills, a partner, against Messrs. Brown & Sons, of Margate, builders, for the sum of 50*l.*, for loss of trade and damages suffered by the plaintiff, by reason of the defendants having erected a hoarding, and carried on certain building operations contiguous to the shop occupied by plaintiff, &c.

Mr. Towne, of Margate, appeared for plaintiff, and Mr. John Thomas Moss, of London, for the defendants. A large number of witnesses were called on each side, and the case occupied several hours before the court.

Plaintiff's case was, that defendants were employed as contractors to erect certain maltings and brewery premises for the eminent brewers, Messrs. Cobb & Co., in Trinity-square, Margate, under the direction and superintendence of Mr. W. Lane Sear, the architect to the firm; and that the hoarding erected by defendants, and the dust raised by the building operations, kept away custom from his shop, and damaged his stock and business to the amount of 50*l.*

The case was somewhat peculiar from the fact that the respective premises stand at right angles to each other, in the form of the letter *L*, the short leg of the *L* representing the front of the cutter's shop, and the longer leg the maltings; the entrance to the shop being in the internal angle formed by the two buildings, and the hoarding having been erected parallel to the longer leg, to the distance of 10 ft. from the plaintiff's shop-window, whence it was returned in a slanting direction to within 3 in. of the shop door.

For the plaintiff it was contended that his shop-window having been blinded by this hoarding, for some three months, and much carting going on in front of his premises, which were also damaged by dust, he had of necessity suffered in his trade, and that such damage having been occasioned by work carried on by defendants, they should be held liable for his loss.

For the defendants, Mr. Moss contended himself with calling evidence to prove that no special negligence was

to be imputed to the defendants, who used the customary mode of hoarding, and turned it inward (at some inconsiderable distance from the site), at such a distance from plaintiff's window as to allow reasonable access to his shop window and door; and contended that the carrying away of some rubbish, caused by pulling down an old building, which occupied part of the site, and the dust caused thereby, were not matters in respect of which (although, no doubt, very inconvenient and annoying to the plaintiff), the defendants should be held liable to make compensation in damages.

The court, without any hesitation, adopted this view, and held that no special negligence or carelessness having been proved against the defendants, the case must be dismissed with costs against the plaintiff.

Verdict accordingly.

THE "ART MUSEUM."

In continuation of my notes, in the *Builder* of December 19th, let me add the following remarks on the South Kensington Museum. But, first of all, Why such a long name as "South Kensington Museum?" As this most delightful of all collections is now constantly in everybody's mouth, it would be only kind to give the said "everybody" a rather smaller mouthful. The South Kensington Museum is, *par excellence*, the Art Museum of London; then why not call it so? "The Art Museum" would be sufficiently definite for all general conversation, directing to servants, carriages, and so forth; and when a more precise address were needed it might be worded, "The Art Museum, South Kensington."

There is an abbreviation of the long title creeping into use, which must not be tolerated, namely, "the S. K. M." This is too suggestive of skim-milk, and is, therefore, altogether inappropriate as applied to our art-museum, where everything is *crème de la crème*.

I remember some years ago, when two utterly incongruous things were going the round of the London papers,—the *Great Eastern* that would not start, and the clergymen who would not stop in their silly practice of sounding as a separate syllable that detestable, sanctimonious "ed" at the end of their words throughout the Church service,—an amusing computation was made in an article in the *Times*, to the effect, that if all the muscular energy which was annually wasted throughout Protestant churches in pronouncing the exploded and silent "ed" could have been hrought to bear on the *Great Eastern*, it had moved her from her moorings long before.

Soon after that article appeared, most clergymen had the good sense to drop the objectionable termination, greatly to the increase of the manliness and good taste of their elocution; and now, I am thankful to say, it but seldom offends the sensitive ear, that is as keenly alive to the musical inflections of the human voice as to the sweet notes of a fine-toned organ: the best of both of which, by the way, is not too good for employment in God's house. The application of this long digression is that I hope the *Builder* will raise its powerful voice to spare all of us the present useless "waste of muscular energy" required for repeating the long title, "South Kensington Museum," and transform it into the short, sharp, and appropriate cognomen, "Art Museum."

In my former notice I was too hurried to do full justice to the case of exquisite specimens made at and lent by the Royal Porcelain Works, Worcester. The centre jewelled vase, or wine-cooler, resembling an adaptation of Henri Dent ware, is a charming thing, of elegant form and proportions, and the admirable, high-relief heads, on deep blue plaques, call to mind Sansovino's beautiful bronze sarcophagus door in St. Mark's, Venice. The helmeted head is especially pleasing. The large pilgrim-bottle, with a nicely-drawn miniature in greys,—"*Orféus aux Enfers*," I presume,—is another gem; the gilded, winged, semi-figures at the junction of the body and neck of the vase have a beautiful seraphic expression on their perfectly original faces. Another lovely thing is the tall, delicately-shaped jewelled jug, with the broad grey band around it, on which is painted most exquisitely a procession of coloured figures, the subject being, as the inscription under the lip of the jug tells, "*Diogenes seeking for a Man*" (*Quæri: seeking for an honest man*). The handle is formed of a terminal figure gilt, with flowered blue drapery, of a singularly metallic, or rather unmetallic appearance; and the stem and foot have a delicate scrollwork in black, running over a gold ground, relieved by four bosses of foliage in light blue, harmonizing with the

drapery of terminal figure. The ewer and tazza, with Limoges grey designs on deep blue ground, taken from the Art-Union work "*The Norman Conquest*," has been already mentioned. Pity Mr. Macleise did not place his kneeling Harold in a less distorted attitude, and that the proprietors of the Worcester works did not select a more pleasing illustration from that fine series for the decoration of their otherwise so elegant ewer, the tazza of which is very beautiful. In an entirely different style the tea-service, with delicate garlands on white ground, and dark medallions, containing charmingly painted heads, is well worthy of notice and commendation.

Before closing, I must draw attention to the magnificent slab of Roman mosaic, mounted as a table, and lent by Mrs. T. Hope. It stands immediately on the left, after descending the three or four steps that lead into the grand hall of the Art Museum. The ground is white, covered with most delicate scroll-work of conventional flowers and leaves, with two large masks; three medallions are placed along the centre of the slab, each bearing an elegantly-shaped vase or brazier. A volume of smoke rises from two braziers, formed of so minute tessera, and of such tender gradation of shade and colour, as to seem almost impalpable, and to deceive the beholder into believing the vapour is in motion, and that the slab is seen athwart the curls of smoke. The bordering of this slab consists of a cleverly-involved double fret, the two frets being elongated, and an open box-form inserted between, which has a novel and singular effect. At the corners where the frets join, and especially at the lower corner of the right-hand side, the pattern is very well arranged, and forms beautifully sharp angles. It is singular that, possessing such great manipulative skill, the mosaicist was ignorant of perspective, as witness the laurel wreath—which looks as if standing up, instead of leaning against the brazier—and the front leg of the tripod.

Apreros of tripods, how excellently the three human feet and legs, with the classic short skirt forming the junction, support the bronze Etruscan and lamp, lent by the Hon. A. G. Ponsenby, and which will be found in one of the glass cases wherein the Lowestoft china was lately exhibited.

ART-LOVER.

"HOW TO KEEP OUT THE WET."

ALLOW me to make a few "practical" remarks upon this subject, and in reply to the letter from "Anti-Sham" in your last paper, as I can speak from experience in nearly all the counties of England.

1st. The house built by "Anti-Sham," with a fire-brick outside facing to a "slaty-rubble" stone wall, may be said to be built *inside* out. Bricks, generally speaking, and fire-bricks in particular, are of a porous nature, and the wet coming against them will travel both vertically and horizontally; whereas a "slaty" formation of stone must necessarily be of a laminated texture, and will only allow of wet travelling horizontally; and if the outer edge of the stones have a willing inclination downwards, the wet will not run in at all.

2nd. Where a blue brick, like those made and used in Staffordshire, with a glaze on them, can be met with, it will do as an *external* facing to a stone wall.

3rd. If stone of a flinty nature or glazed bricks are used as an external facing, it is essential to attend all the more carefully to the pointing, both as to form and quality, in order to keep out wet, and to have the walls lined with common bricks or porous stone internally, to prevent the condensation which would otherwise occur on the plastering during changes of atmosphere.

4th. The pointing, whether of Portland cement or stone-lime (mixed with clean sharp sand) has much to do with keeping out the wet. It is frequently made too wide, overlapping the edges of stonework or brickwork, so that every drop of rain is caught in the tiny fissure, which will, in such case, occur at the upper edge of such pointing.

It is difficult to get bricklayers and wallers to point a joint back *behind* the face-line of the wall; but it should always be insisted upon in exposed positions; the upper edge of each point should be pressed inwards, the lower edge coming forward to the face of the brick or stone below it. To all practical men this is known as "weathered" pointing.

5th. After all the care that may be taken in

the construction of solid walls, wet will sometimes penetrate. The only safety is in the hollow wall, banded with twisted iron ties; or still better, with Jennings's glazed ware bricks, at all points of contact between outer and inner portions of walls, not excepting the jambs to windows and doorways, and the angles of the building. Over the lintels to doors and windows slates bedded in cement, and cemented over, should cover the backs of all relieving arches where exposed to droppings of wet in the cavity of the walls.

Gth. A difficulty with the stonework used in cills, jambs, mullions, and heads, still occurs, which should have some effectual coating applied externally.

I have, during the past autumn, and in previous years, had ocular demonstration of the wet striking quite through 9 in. and 10 in. thickness of Box ground, Bath, and other stonework, turning green and mouldy on the inside, as well as causing dampness to joinery attached, and to plastering or internal jambs, &c.

W. H. ESPENETT.

FALL OF HOUSES, LIVERPOOL.

SIR,—In a new street called Fullford-road, at Fair-field, a suburb of Liverpool towards St. Helen's, were two double-fronted houses in course of erection. These adjoined each other, and were the beginning of that side of the street. They were up three stories above ground, and nearly ready to receive the roof. The front and back walls were up to the eaves, the party-walls up and topped, and it only remained to bring up the internal walls. This was being done from a scaffold loosely piled up off the top floor. We were had a great deal of rain here lately. On Saturday evening it began, and rained hard and continuously till Monday at noon, and again for two hours very heavily during Monday night. The work was done on the walls during Monday; and on Tuesday morning, before it was fairly dry, four bricklayers, with three labourers, attended to their work, and had not well begun the whole of the internal walls when a heavy rain fell, and the poor fellows were precipitated a depth of at least 30 ft. amongst the falling joists and timbers. One was got out dead; another, I fear, died during the last night; and others are severely injured that they are not expected to live.

The cause of the accident was undoubtedly the looseness of the walls, and the want of bond. In the basement the wall was 9 in., but from the ground-line to the roof it was only 4½ in., with no bond of any kind, although the joists of the brick rooms rested in it. The joists of the front rooms are laid in the other direction parallel to the 4½ in. wall. This wall, then, with the other, forming one side of staircase, and which was 30 ft. high in 4½ in. work, seems to have yielded like a sheet of paper, and fell.

The camp-work in London is bad enough, but dry-work here is worse. There is, I believe, a surveyor for the district, which is outside the city boundary!

G.

BOSTON CHURCH CHIMES.

SIR,—I read in your valuable paper of Dec. 18th a letter from Mr. Thomas Walsley, highly complimentary to the Boston Church chimes, and I was much interested in such matters, and I determined to visit the town and hear them, realising myself a great treat, and expecting, from the tenour of his letter, to hear music of the highest good citizens of Boston might be justly proud of. I much regret to say that my gratification was in reverse ratio to my expectations. It was a jumble, I venture to think, was never music before; and on all sides I heard numerous expressions of disappointment, not only disgust. The tone of the bells is unendurably very fine, with the exceptions, as pointed out by Mr. Walsley. This much every one allows. Having very carefully studied the chimes, and being fully convinced of the practical value of the principle contained in Mr. Walsley's patent, I was anxious to see so large an application of it, and, upon asking, was courteously admitted to the machinery-room. My opinion of the value of the principle was confirmed by my visit; but I venture to think that the mode of applying is most defective and faulty. The result, without other con-

siderations, would certainly bear me out in this assertion. Your correspondent seems to imply in his letter that the barrel ought to be made of horizontal bars of metal, between which the pins could be shifted by loosening the screw-nuts underneath, and not of mahogany "pricked" as now, and that therein lies the great fault.

This, to my mind, is one of its greatest recommendations, that with pins no larger than ordinary pins for domestic use, bammers of 3 cwt. and 4 cwt. can be discharged upon bells with the greatest precision, and that any number of barrels can be pricked and momentarily applied and the previous one preserved; whereas metal barrels, as he desires, would be much larger; and when once the pins were shifted, the same tune could not be played again until the pins were readjusted.

I will, in a future letter, if you will kindly allow me, state my reasons for thinking that the present result is so very unsatisfactory, and thereby endeavour to assist those who are desirous to see introduced into this country open-air bell-music which it shall be a pleasure to listen to, and not, as notably at the Royal Exchange, and Cryptologic Church, London, and St. Patrick's, Dublin, miserable failures. To show you how much dissatisfaction is expressed in Boston, I will state that I was asked by persons who have subscribed largely to the fund for supplying the chimes, to take the matter up on public grounds, and see whether something cannot be done to get them some music fit to listen to for the large sum of money expended, or stop the public nuisance altogether.

G. L.

WET THROUGH WALLS.

SIR,—About two years and a half since I applied the soap and alum process, as recommended by you, to different parts of three houses much exposed; in each case it has been a failure, the heavy rains having beaten completely through the walls, which were only 9 in. Nothing else could be expected. Time and weather will wear out anything,—nothing will entirely resist the weather. The owner of one of the houses called my attention to this matter last week, and I examined the walls. At the top of the house, under some brick and mortar were mortar joints, and rain down as if it had been poured from the roof of a water-pot. I advised him to give the brickwork and Bath stone dressings a coat or two of linseed oil when sufficiently dry; but even this will not last for ever, as the water and atmosphere will destroy its resisting qualities, and then the process must be renewed. A little more attention to the battening of walls is, I believe, desirable, the battens should be kept at greater distance, and less mortar than between the laths. Some plasterers are not so particular in this as they might be. It was evident at the house in question that the key of the work was in some places in contact with the wall.

With regard to "Anti-Sham" in your letter, he must not be surprised. In the winter season of 1865-6 there was much rain. I was working at a new house at Moreton, near Dartmouth (see exposure to Dartmouth is no joke), the walls were 20 in., or 21 in., built of granite rubble masonry with granite sand, much harder stuff it is difficult to find. The incessant rain beat completely through, streamed down, and settled on the floors in pools. In this case it did not come through the stone; the mortar, I take it to be, was the vehicle that conveyed the water through; nor do I believe any walls impervious to wet. Mortar, make it of what you may, will absorb moisture; and hence, if the moisture be continued for a sufficient time it will penetrate the mass.

NATHANIEL BESLEY.

"OYSTERS O!"

WHITTABLE oysters have been noted for their plumpness and pearly shells in our. Poor, lean, insipid oysters are brought from Jersey, and other places, and deposited at the bottom of the sea off Whitstable and the Isle of Sheppy; and in a short time they, too, acquire the same flavour and agreeable flavour. What is the cause of this? It may be owing to the healthy nature of the sea water, or to the sea-water by the locality. This blue clay is of the same character as that which overlies the bed of chalk under London. If this theory be right, would not the oysters, sold in the oyster-shops, be better fed, and improved in flavour, by putting a lump of this blue clay in each tub over night? This experiment is simple and worth trying. In the event of success, probably some good-natured oyster dealer would be kind enough to forward the writer a barrel of them for the suggestion.

J. P.

ARCHITECTS' ACTIONS.

Liverpool: Fisher v. Jackson.—This was an action for commission, brought by the plaintiff, an architect and surveyor, against the defendant, Mr. Jackson, a landed proprietor at Birkenhead, and formerly M.P. for North Derbyshire.

Mr. Quaife, Q.C., and Mr. C. Russell were for the plaintiff; Mr. Hoiker, Q.C., and Mr. Leofric Temple for the defendant.

Plaintiff's claim was for 15*l.*, which he grounded on a special contract. It appeared that it was the defendant's custom, in selling his land to builders for villa or other sites, to advance the buyers' money while the buildings were in course of erection. In April, 1864, the contract out of which this suit arose was entered into between defendant and plaintiff, whereby it was agreed that the plaintiff should act as surveyor to the defendant, it being his duty to inspect the buildings so being erected on Mr. Jackson's property, and report to him their value, so that he might know what money advances he might safely make.

Plaintiff's account of the terms of his engagement was that defendant promised him 5*l.* for each report so made on each villa, cottage, and shop.

The defendant's version was that payment was to be made not on the rate alleged by the plaintiff for all buildings, but at that rate for villas only, and that for a bare report on a shop he was to receive 2*l.*, and on a cottage 1*l.*, and that he had been paid on that scale. This was the whole point in dispute.

The jury, after having been looked up for some hours, returned into court, having been unable to agree, and were discharged without giving a verdict.

CASES UNDER METROPOLITAN BUILDING ACT.

SEPARATE BUILDINGS UNDER ONE ROOF.

At the Woolwich Police Court, on Tuesday last, Messrs. Oxford & Whillier, contractors, appeared to answer a summons on the complaint of Mr. Collis, the District Surveyor for Charlton, for an infringement of the regulations as to the construction of buildings enacted by the statute 18 and 19 Vict. cap. 122.

The defendants were represented by Mr. Samuel Poynter, barrister, instructed by Messrs. Boys & Tweedies.

Mr. Collis deposed that he had received notice from the defendants, as required by the statute, of the erection of four tenements under one roof, intended to be used as almshouses, on a piece of land adjoining Charlton Church; that on inspection of the structures he found that the several tenements had separate entrances from the street, but that the party-walls dividing them had not been carried up through the roof to a height of 15 inches above the gutters, as required by the 17th section, read in conjunction with the third paragraph of the 27th section: he accordingly gave notice to the builders, requiring the provisions of the statute to be complied with. This notice having been neglected, the present proceedings were taken.

On cross-examination by Mr. Poynter, the witness said that the internal party-walls had been constructed, so far as they were built, in the manner required by the statute, and that communication by internal doors had been established between each of the tenements, all of which were under one roof.

Mr. Poynter submitted that Mr. Collis had mistaken his remedy. This was a penal proceeding intended to compel owners of property to see that their builders executed work conformably to certain regulations which the Legislature had deemed necessary to secure the public safety; so far it was a penal statute, and must therefore be construed strictly. The Act had itself indicated against whom it intended the penal clause as meaning the person for the time being in the receipt of the rents and profits. Mr. Poynter, therefore, contended that the test as to whether this non-compliance constituted a penal offence, was whether there was a beneficial occupation; because, if not, the Act had pointed out another mode of securing compliance with its constructive regulations. Now, what were the facts of this case? About the year 1825, a benevolent old Dutchman left by will certain funds to provide lodging, light, and fire, and to pay a weekly allowance to some poor infirm elderly people connected with the Dutch Church in Austin Friars. Under that will certain almshouses had been erected and tenanted until they were required by a railway company, and in consequence of their demolition it became necessary to erect new buildings. The trustees of the Dutch Church, who had the administration of the funds, had purchased an acre of ground adjoining Charlton churchyard, and had contracted with the defendants to erect a building capable of accommodating a certain number of old married couples, entirely separate and detached from any other building, the designs for which had been furnished by Mr. William Wignatton. The effect of an entire compliance with Mr. Collis's requisition would destroy the harmony of the elevation, besides cutting heavy and entirely unnecessary expense, without giving any additional security. It appeared, without giving any additional security, that the building in paragraph 2 of clause 3, and intended to be an almshouse came within the contemplation of the Act *quod generis* with the word hospital. Here the tenancy was by a superintendent, who had apartments provided for him, and who was, in fact, the head of what might be considered one family, inasmuch as there was a

perfect internal communication with every room. The Metropolitan district surveyors had evidently taken this view of the statute, as they had not compelled the builders of the Peabody Model Lodging-houses to carry their party-walls through the roof, and this was a much stronger case for the defence, for here the occupation, so far from being even remotely beneficial, was of the nature of providing fire, light, and lodging, and paying the lodgers for living there. Thus, the learned counsel contended that this was a public building, and that a difference of opinion as to construction of a public building, being in his opinion as to construction of a public building, should be submitted for the arbitration of the Metropolitan Board of Works.

The magistrate, after having inspected the plans and elevations, said he thought that the counsel's objection must prevail. His only difficulty was supposing the Metropolitan Board refused to arbitrate?

Mr. Poynter said the Court of Queen's Bench would compel them by writ of mandamus, but it was not to be apprehended that that would ever become necessary. In fact, in this case, he considered that he was in reality fighting the battle of the superior Board by contending that their jurisdiction should not be encroached on.

The magistrate said he thought that this was a public building analogous to a hospital, and that therefore the mode pointed out by the 39th section of settling a difference of opinion as to construction must be adopted. It was for the Metropolitan Board of Works to decide between the architect and the district surveyor. The summons must therefore be dismissed.

MONUMENTS OF REMOTE AGES.

A WORK "On Tree and Serpent Worship, or Illustrations of Mythology and Art in India in the First and Fourth Centuries after Christ," by Mr. Jas. Fergusson, is announced. The sculptures of the Buddhish Temples at Sanchi and Amaravati will supply the illustrations. Mr. Fergusson writes:—

"The earlier of these two monuments is that at Sanchi, near Bhopal, in Central India. Its gateways belong to the first century of the Christian era, and are covered with sculptures which represent the worship as principally addressed to the Dagona itself, or to trees, and only occasionally to other Buddhish emblems. The serpent is but rarely worshipped, and Buddha himself is nowhere represented either as receiving homage or even as an ascetic. No priests appear anywhere, and asceticism as such afterwards understood certainly formed no part of the religion when these sculptures were executed."

The Temple at Amaravati belongs to the fourth or fifth century, and the sculptures of its wall represent a state of things much more nearly approaching to what we find in books than those at Sanchi. Buddha does appear as an ascetic, both preaching and receiving homage. Priests are occasionally present, and many of the legends of the Lalita Vastara are represented there; but the whole is mixed up with Tree and Serpent Worship to an extent not hitherto suspected, though the sculptures are still far from most of the absurdities of modern Buddhish literature."

A work "On the Stone Monuments, Tumuli, and Ornaments of Remote Ages; with some Notes on Early Irish Architecture," collected and described by Mr. Waring, is preparing for publication. This book will consist of more than a hundred plates, each containing on the average four or five subjects. About seventy plates are dedicated to the class of subjects called Druidical.

PRIZE PLANS FOR LABOURERS' COTTAGES.

Royal Agricultural Society of Ireland.—With reference to the designs in competition for the prize offered by his Grace the Duke of Abercorn for the best plan and specification of a labourer's cottage, the council have selected that sent in by Mr. Thomas Mallinson, marked "Experience," for a double cottage, as combining a due regard to economy with the most suitable accommodation in a class of buildings the improvement of which is so desirable in this country. The plans will be issued as soon as possible.

The Salopian Society. — We have received, with a packet of papers and plans, the following letter from Dr. Stryp, of Shrewsbury:—

"The directors of the Salopian Society for Improving the Condition of the Industrial Classes having, as they believe, good reason for dissenting from the opinion enunciated by the council of the Society of Arts in their letter of the 23rd November, as to the originality of Mr. Birch's designs, published in the *Agricultural Gazette* of December 23rd, 1837, venture to trouble you with the correspondence, and the plans therein alluded to; and will feel greatly obliged if you will kindly undertake to examine and compare them."

The directors regret the necessity for adopting such a course, but feel that the council's unsatisfactory communication of the 11th December leaves them no alternative but to solicit the opinion of a professional tribunal; hence their appeal to the *Builder*.

The correspondence enclosed to us includes a letter from the secretary of the Society of Arts, saying in reply to Dr. Stryp:—

"Whilst the council admit a certain similarity of plan in the two designs, they do not consider that it amounts to more than might naturally arise from independent minds applied to the solution of a problem, the conditions of which did not admit of great variety of treatment; and they see no reason to believe that Mr. Birch has in any

way copied the design of the Salopian Society. The council are, therefore, not prepared to reopen the question of award."

Going beyond our province, we have examined the plans, and consider the council of the Society of Arts were right in declining to reopen the question. It seems to us that the recipient of the Denton premium was not more indebted to predecessors than was the designer of the Salopian Society's cottages. We have by us plans made by ourselves years ago which both the plans in question strongly resemble, though never seen by the designer of either. It is as well we should state that the design published by the author in the *Agricultural Gazette* (December, 1837) is not the design originally submitted, and to which the premium was awarded. This will be found in the *Builder* of December 31st, 1834.*

EXAMINATION PAPERS, PUBLIC WORKS, INDIA.

THE examination papers for competitive examination of candidates for appointment in the engineer establishment of the Department of Public Works in India, held at the India Office, London, in December last, were set by Mr. George Preston White, C.E., and are now before us. They are not very practical, so much so that questions are a separate examination in science is required. A very good examination on these papers might be passed by a man who does not know the multiplication table. The headings are "On Cement, Concrete," "On Building Materials, Brick Stone, &c.," "On Suspension Bridges, and Screw Piles," "On Architecture and Building," and "On Iron and its Applications." The papers are so much easier than those set by the same Examiner in June last, that we are curious to learn if the results on that occasion showed that the latter were too stiff. Mr. White is particularly anxious "to direct attention to the importance of the study of architecture and design in building," and we applaud him for it; but a better example should be placed before the candidates for description than that which accompanies the papers. This is an "original design for a range of public buildings," with three domes, in the worst style of the green-house builder, a campanile with doors in the upper part of it leading into the air, and detached columns round the building carrying nothing but blocks of the entablature which crowns the front.

A MORTUARY FOR MARYLEBONE.

THE vestry of the parish of Marylebone have erected a large public mortuary in the burial-ground at Paddington. The mortuary has been formally opened. The building is in the Egyptian style, and has been built by Messrs. Temple & Foster, of Paddington, from drawings prepared by Mr. Browning, the vestry surveyor. Within, there is a row of four ornamental cast-iron columns down each side, which not only help to support the iron bearers fixed into the walls to hold shelves for the reception of a large number of dead bodies, but they also sustain the girders which uphold the roof, from the centre of which the room is lighted with gas on a new principle.

ACCIDENTS.

Weem.—An accident occurred at Weem, near Aberfeldy, on the 22nd, by the falling of a portion of the wall of the new Episcopal Chapel in the course of erection there, whereby four men were injured, two of them fatally. It appears that the gable at the west end had been completed, and the workmen were engaged re-erecting the scaffolding, when, by the overhanging of some beams which rested horizontally on the bottom of the end window, the whole of the wall above the window was thrown inward, falling upon the men.

Colchester.—On Sunday and Monday the wind blew a perfect hurricane at Colchester. On Monday evening a portion of the spire of the Lion-walk Congregational Church fell with a loud crash, breaking through the roof and doing considerable damage to the interior fittings.

* Vol. xlii, pp. 951, 952.

This church, Gothic in style, has been built only five years, at a cost of 5,000*l.* The damage done can hardly at present be accurately estimated, but it will probably amount to several hundreds of pounds.

Gateshead.—The bridge in connexion with the road leading from Rowland's Gill railway station, to Burnopfield, Gateshead, and crossing over the river Derwent, has fallen. Happily, no one was upon the structure at the time.

It appears that some large holes in the centre of the structure had fallen in to the extent of about a yard. The bridge, it is stated, for some time past has presented large cracks; and the strong and rapid flow of the water, after the recent heavy rains, had caused the serious collapse which has now taken place. The bridge is an old stone structure, situated on the township road to Burnopfield, at the foot of a steep hill, spanning the river Derwent with two stone-built semi-arches built into the rock, and the land abutments built into the rock. The heavy rains had washed up the surface of the bridge, thus letting a great weight of water into the hearting of the structure, which, unfortunately, is only sand and soil. As this material subsided it acted as a wedge, forcing one side of the Burnopfield arch into the Derwent, leaving only about 3 ft. of footpath on the other side.

Rochdale.—A shocking calamity occurred at Rochdale on Sunday. The wind blew in fearful gusts. In a new street off Spottland-road a row of houses had just been completed, and two of them are so constructed as to answer the purpose of a Sunday school, or it could be altered into two houses. Mr. Bewick, of Manchester, was the contractor. On Sunday the place was open for divine service for the first time; and in the afternoon Mr. John Ashworth, author of "Barrage Tales," preached. There were present about 400 persons. Shortly after the congregation had met, one of the windows was blown out by a gust of wind. Little notice was taken of it, and the service proceeded, when another violent blast lifted up the roof, the gable end fell in, and the two side walls fell inward, after which the roof crashed in upon the whole. A distressing scene of confusion and horror ensued. Strange to say, no one seems to have been killed, but various persons were seriously injured.—The front wall of a Methodist New Connexion Chapel, in course of erection in John-street, Rochdale, was also blown down on the same occasion; as also was the top part of a factory chimney; and the bricks penetrated the roof of a cottage in Dawson-square, but fortunately none of the occupants were injured.

KEIGHLEY MECHANICS' INSTITUTE, AND SCHOOL OF ART.

A PROJECT long contemplated is now in progress of realisation. Involving the sale of the old building, 5,000*l.* have been obtained. Accordingly, plans have been prepared by Messrs. Lockwood & Mawson, architects, of Bradford near London, the carrying out of which, exclusive of fittings, will cost above 10,000*l.*; and the whole of this, it is hoped, will be obtained before the new institution is completed. The building is to be in the Gothic of the thirteenth and fourteenth centuries; and a prominent feature will be a spire. The site is one of the best in Keighley, a plot of ground at the corner of Cavendish street and Skipton-road. The foundation stone of the new edifice has been laid by Mr. I. Hold of Oakworth Hall. The basement story will entirely devoted to class-rooms, except the curator's house and the retiring-rooms for the ladies. The windows and floor all round will be completely out of the ground, so that it will be basement floor only in name. The ground-floor will be approached by the principal entrance the Skipton-road, and, at this point, will rise to a height of nearly 100 ft. To the left the entrance vestibule will be the large room, lectures, &c. The hall will be 87 ft. long 44 ft. wide, and will accommodate more than 1,000 persons. To the right of the vestibule be the reading-room, 28 ft. by 18 ft.; the library 23 ft. by 15 ft.; the patent-room; the penk; and the secretary's office. Immediatly opposite to the principal entrance in Skipton road is the grand staircase leading to the roof devoted to the School of Art. These rooms an important portion of the building. They consist of the painting-room, lighted entirely from the north, which will be 30 ft. by 18 ft.

modelling-room, casting-room, mechanical-room, and masters' room, with a convenient retiring-room. Attached is a large exhibition-room, lighted from the top. The cost of the land and buildings will be about 12,000*l.*, and the works are being executed almost entirely by Keighley contractors. The contractors and amounts of contract are as follow:—Mr. John Smith, mason, 5,850*l.*; Mr. Robert Sngdon, joiner, 1,860*l.*; Mr. John Scholefield, plumber and glazier, 503*l.*; Mr. Benjamin Dixon, plasterer, 371*l.* 12*s.*; Messrs. Clapham, Brothers, ironfounders, 367*l.* 9*s.*; Mr. Thomas Wilson, slater, 314*l.* 10*s.*; and Messrs. Briggs & Mensforth, painters, 167*l.* 12*s.* 6*d.*

HARBOUR WORKS.

Carnarvon.—The first stone of the proposed additional harbour works at Carnarvon has been laid by the Mayor. The proposed new harbour is on the north side of the town, near to the station of the London and North-Western Railway Company. The improvement of the present harbour is also contemplated. The estimated cost of the portion of the plan now about to be carried out is 24,000*l.*, which will be obtained from the Public Works Loan Commissioners. The estimated cost of the entire works is 50,000*l.* Mr. Frederick Jackson, C.E., supplied the plans, and the contractors are Messrs. Bughrd & Jones.

The Lizard.—The Board of Trade have received an application for a provisional order to constitute a Harbour Authority to alter, deepen, and improve the harbour, or cove, usually known as Million Cove. These improvements, as at present contemplated, are sought to be effected by the construction of three breakwaters, a quay or landing-place, and slip. The first breakwater is to be 630 ft. long; the second, about 25 ft. long; and the third, 55 ft. long. The quay is intended to be 130 ft. long and 20 ft. wide. The slip will be 90 ft. in length and 10 ft. wide. Money is to be borrowed on mortgage of the dues.

St. Just.—An application is to be made in favour of St. Just-in-Penwith to the Board of Trade, it being proposed that a company shall be incorporated to make a harbour and pier, to occupy the site of Porenven beach, between Bolloval Cliff on the north, and Letcher Cliff on the south. On the west pier or breakwater is to be erected, extending from Bolloval Cliff for 70 ft. towards Crow Rock. Another pier, 120 ft. long, will extend from Letcher Cliff towards a southern extremity of the first pier. On the north 225 ft. long, east 230 ft. long, four wharfs, the respective lengths of 225, 230, 250, and 200 ft., are to be erected adjoining the piers. From the south end of the pier, extending from Letcher Cliff, another pier with a south face of 10 ft., and a north face of 225 ft., will spring in a westerly direction; four piers 700 ft. long will extend from under Bolloval Cliff in a southerly westerly direction.

GENERAL MEETING OF THE INSTITUTION OF CIVIL ENGINEERS.

At the annual general meeting, held on the 1st of December, the report of the council was read, with respect to the new building, upon which it was determined to retain the existing house, with the addition of the lack part of an adjacent house, as recommended by the council, and was taken for ninety-nine years of each year two properties, for 450*l.* per annum in the case of No. 25, Great George-street, with the option of purchase within ten years for 12,000*l.*; and in the case of the lack part of No. 24, Great George-street for 208*l.* 13*s.* 4*d.* per annum, and a like power of making it freehold for 11*l.* 13*s.* 4*d.* It was mentioned that the two last named were the net amounts which should have to be paid, after making allowance for the very liberal gifts of two of the owners, the entire of Mr. G. R. Stephenson's interest, one-third, and 500*l.* in diminution of Mr. Stephenson's interest, also of one-third. At the same time the specifications and cost drawings for the works were prepared with such qualitative conditions; one for their completion to be delivered in five months, so as to be ready for opening of the present session; the other for their performance in eight months. The tenders were received from several builders, and that of Messrs. Holland & Hannen being the lowest was accepted. That firm undertook to finish the

building according to the architect's designs in five months for a sum of 11,650*l.*, and in eight months for a sum of 11,100*l.* The contract was based on the first-named alternative, and had been duly fulfilled. In maturing the details of the plans of the new building several important modifications had been made, the principal being the addition of a newspaper and tea room on the ground floor, by which the area of accommodation for the general use of the members had been doubled.

The council were enabled to state that, whereas the estimated outlay, including all contingent expenses of moving, furniture, &c., amounted to 14,810*l.*, they fully believed the actual cost, including some furniture not yet delivered, would not exceed 17,250*l.* To meet the liabilities of the building fund, being the accumulations of fees received from members and associates on joining the Institution; next to realize the unconditional bequest; investments made from time to time out of surplus income. The first two sources would, of course, be entirely exhausted, but as far as the council could judge, when every liability was discharged, stock would still remain in future contingencies. The Stephenson bequest of 2,000*l.*, the Miller bequest of 2,000*l.*, the Errington bequest of 1,000*l.*, and the Locke bequest of 2,000*l.* would hereafter disappear from the accounts, but the names of these benefactors would be held in grateful remembrance as connected with the erection of the new building.

A notice had recently been served on the Institution the evening session for an Act, under the title of "Public Offices Conscription (Acquisition of Lands)," to empower the Commissioners of her Majesty's Works and Public Buildings to acquire the property held by the Institution. The council had, in reply to this notice, intimated their dissent to the proposed undertaking.

The council, having decided to institute an inquiry as to the systems of engineering education (other than military and naval) in different countries, the cost to the student and to the respective Governments, and the effect, or profession, of such preparatory training upon the technical establishments and private individuals abroad and at home. This circular had previously been presented to a mass of materials which yet remained to be arranged, but which it was hoped would in due time be presented to the members.

During the past session forty-five members and 105 associates had been elected, while the deceased, resignations, and emsures together amounted to 116, or at the rate of 7.41 per cent. on the present number of members of all classes. It was shown by the abstract of accounts for the year ending the 30th of November, 1868, that the income proper, exclusive of all receipts from life compositions, building-fund fees, and dividends of every kind, had amounted to 5,633*l.* 3*s.* 3*d.*, while the ordinary disbursements had only been 3,677*l.* 4*s.* 8*d.*, thus leaving a surplus of 1,956*l.* 18*s.* 7*d.* But when to this sum was added the above excluded items, still disregarding all trust moneys, the surplus became 3,210*l.* 8*s.* 6*d.*

PROVINCIAL NEWS.

Burnham.—A market-house is to be erected here, by a company formed for the purpose. On the ground floor will be the market, also Board of Health and other rooms. Above this is to be a town-hall. The corner stone of the building has been laid.

Worcester.—The new Orphan Asylum at Upper Henwick, which the friends and supporters of that institution were enabled to erect chiefly through the munificence of Mr. T. Padmore, late M.P. for this city, who presented 4,000*l.* to the funds, is now nearly completed. A site was secured on a large piece of elevated ground near the Henwick railway station, and the building has so far progressed as to be now receiving its roof. The architects are Messrs. Wtakin, of Lincoln, and Walker, of Nottingham; builders and principal contractors, Messrs. Slinm & Vickers, of Nottingham. Materials, brick, with Bath stone facings; style, mixed Gothic. The front facade, which faces Henwick-road, has three projecting bays, with gabled tops, the central bay being on an arcade forming the porch. Two stone circular columns support the front of the porch, and the back rests on strong carved corbels inserted in the wall. These columns, which are of red Mansfield stone, have capitals carved by Mr. Legge, representing stiff conventional foliage and male and female heads, with the dog-tooth moulding; the capitals, ribs in centre of columns, and bases, are of Bath stone. Above the porch is a semi-circular apartment, forming part of the central projecting bay, the two side bays here named being flat. The windows are square-headed, with mullions and transoms; the dormers and bottom windows in front having canted heads. The building has three stories in front

and two behind. The roof is steeply pitched and slated. The building is divided into two equal parts by a central passage or corridor leading straight from the porch to the dining-room. The apartments on the right will be entirely appropriated to the girls and those on the left to the boys. Two corridors, running at right angles with the central passage, divide each compartment or wing of the building. The larder is an octagonal building in the centre of the area, and is approached by a covered way. The dining-room is 20 ft. wide by 40 ft. long, and has a doorway leading to the girls' wing; another to the boys'; and a third to the central passage communicating with the front porch. In each wing of the building are school and class rooms. The plan of both wings is exactly alike. The upper stories are occupied with dormitories, baths, &c. The honorary-wall runs close at the back of the building, and at the front and sides will be gardens. The whole will cost some 5,000*l.*

Shiffnal.—The new Assembly-room and Market-hall building has been opened. The architect was Mr. George Bidlake, of Wolverhampton; the builder, Mr. Clark, of Shiffnal.

Finedon.—The new Temperance Hall and Institute, which has been for some time in course of erection here, has just been opened. The grand front consists of dwelling for hall-keeper, entrance and two wide staircases to upper room, reading-room, large club-room, kitchen, and offices. The upper room covers the whole area; is lofty, well lighted, and has an open-timbered roof, which makes it admirably adapted for music. The platform is reached by a private staircase at the upper end of the hall, communicating with an ante-room below. The building, which is Gothic, and has a row of buttresses on each side, is of Finedon stone, with Box stone dressings to the doors and windows. A cloak has been placed at the south end, by subscription, and is from Bennett's, of Cheapside. The works have been executed by Mr. W. Henson, builder, Finedon, from the designs of Mr. R. W. Johnson, of Melton and Leicester, architect.

MANCHESTER FIRE BRIGADE.

From the annual returns just issued by Mr. A. Toyer, the superintendent of the Manchester fire-brigade, it appears that during the year ending September 29th, 1868, there were 301 fires exclusive of false alarms. Of these thirty were classed as serious, or more than one-sixth destroyed.

The brigade consists of one superintendent, two engineers, two assistant engineers, thirty-four firemen, two coachmen, and one messenger. There are sixteen stations where men are on duty at various parts of the city. The apparatus is as follows:—Six engines (manual), three horse hose-carriages, nine hand hose-carts, seven fire-escapes, with hose, &c., and thirty-seven hand pumps. The original cost of the apparatus was 3,523*l.* 17*s.* 1*d.* The insurance companies contribute to this brigade nearly a third of the amount they pay to the London fire-brigade; this fact alone showing how the insurance companies appreciate the efficiency of this brigade.

CHURCH-BUILDING NEWS.

Appleton Roebuck.—A new church, situated at Appleton Roebuck, in the parish of Bolton Percy, and about nine miles from York, has been consecrated by the Archbishop of York. The site is the gift of Sir W. E. Mitner, bart. The edifice consists of a nave, chancel, bell-turret, south porch, and vestry. Its inside dimensions are—nave, 56 ft. by 25 ft., and chancel 25 ft. by 17 ft., or a total internal length of 81 ft. The material employed in its erection is Bradford stone for the walls, which are lined inside with red brickwork exposed to the view. Ancaster stone has been used for the dressings, and the structure is covered in with grey tiles. At the west end of the church is a bell-turret, rising above the extremity of the nave gable, and supported by a buttress. This turret is 60 ft. in height. The east window is of three lights; those pierced in the north and south walls of the chancel are of single lights; and the west wall contains two windows of the same character as those in the nave, the buttress of the bell-turret separating the two. All the windows have geometric traceries heads, and

ing wings, two of which will contain a stone rising to ascend into the upper part of the ceiling. Above the staircase, and in the other gables, will be constructed class-rooms, committee-rooms, &c. The large school-room will have an open floor, the timber being painted and finished. The material which is to be used in the erection of the building is Horsforth stone. The cost of the building, it is estimated, will be about 2,000l. In the new building accommodation will be provided for nearly 500 day scholars and a larger number of Sunday pupils.

STAINED GLASS.

Trinity Chapel, Brighton.—A committee of gentlemen has been formed with a view to the erection of a window in this chapel to the memory of its late minister, the Rev. Frederic Robertson. This, we believe, will be only a portion of a larger memorial to him in Brighton.

Great Church, Worcestershire.—A window has been placed in the chancel of this church, subscribed for by the tenants on the estate of Mr. Thomas Henry Hope Edwards, of Great Worcestershire, and Nettle Hall, in memory of a late Captain William J. Hope Edwards, of the 5th Shropshire Rifle Volunteers. It consists of three lights. In the centre is our Saviour, and on the side lights are St. Matthew and St. Mark. The whole is in keeping with the ancient character of the church. The window was supervised by Mr. John Robinson, of Shrewsbury and Warrington.

Wiford Church.—In addition to a stained window and medallion bust in memory of the late Kirke White, this church has been further adorned by a window to the memory of Mr. Thorpe, the late rector. The Kirke White memorials have been raised by public subscription, but the window in memory of Mr. Thorpe has been put in at the expense of that gentleman's nephew, the Rev. H. J. Beach, of Tisbury. As Mr. Thorpe's window occupies the post of honour, viz., the east end of the church, it ought first to be described. The design is the resurrection of our Lord, the centre compartment being devoted to the figure of Christ, just descended from the tomb, and those on either side worshippers. The Kirke White window is on the south side of the chancel, and represents the scene of Bethlehem. In the upper part of the principal light are the Magi on their journey to Bethlehem, and in the lower they are worshipping the Child. The upper part represents angels. At the base are the words, "In memory H. K. W." Mr. A. W. H. O'Connor, of London, was the artist. The medallion head of Kirke White, to which we have referred, is in Carrara marble, from the studio of Mr. W. T. Cole, medallist of the Royal Academy. It is a representation of the poet's features as gathered from a picture in the possession of some friends at Nottingham. The medallion is 20 in. by 16 in. and has been placed in the chancel under the direction of the artist.

Books Received.

Historic Ninetins: a Book of Curiosities, where Old and Young may read Strange Matters. By JOHN TIMBS. London: Lockwood & Co. 1868.

How clever fellow, such as those Mr. Timbs are often quoted, is ever and anon knocking down some old and popular idea, or setting up a new one of his own in its stead. In many cases these clever fellows are quite right, but they are, as I doubt, sometimes wrong; and not a few of them are much more bent upon the display of their own ingenuity than upon either knocking down the wrong idea or setting up the right one; and had the right one been the ninetins that was in these clever fellows would have exerted themselves quite as diligently and ostentatiously in knocking down that one as the other, or in setting up the other in its stead. There is just such a severity in science, sometimes, as well as in history. Mr. Timbs has here made assertions and interesting talk on "historical ninetins," as he quaintly calls it. The items are condensed and concise, and I much of the matter seems to be not mere repetition from historical or other sources, but well-written, so as to give the kernel of a story in nutshell. It is evident, on the whole, from a great store of examples, that much we call

history is mere fiction, even as regards not very ancient times. The "strange stories" told us here by Mr. Timbs relate to a great variety of subjects, including characters and chronicles; doubts and difficulties; fictions and fabulous histories; ifs and incredibilities; legendary stories, marvels, and misrepresentations; myths and mythologies; parallels and periods; popular errors; prophecies and guesses; prehistoric times; reckonings and refutations; tales and traditions; universal history and readings with new lights.

MORE ALMANACS.

WHITAKER'S Almanac for 1869 contains a very large amount of necessary information, with a wider range of subjects than hitherto included in such works. Readers will learn to realize the fact that the British dominions extend far beyond the British Islands, and that there are other important countries in the world. Much attention has also been given to financial matters, showing how the national income has been expended. The commercial, scientific, and Parliamentary summaries, are also new features.—"The Dramatic and Musical Almanac for 1869," by J. W. Anson (of the Adolph), includes several amusing articles, and a large number of dated events connected with actors and the stage. Mr. Anson would make his Almanac more useful by adding the names of committee and officials of the various societies and funds connected with the Stage, Dramatic Authors' Society, Dramatic College, General Theatrical Fund, and so on, with particulars of their purposes and statements of accounts.—"The Art-Union of London Almanac for 1869" contains, like all its little predecessors, information on matters of art and art-societies not to be found elsewhere. The meeting days of all the societies are given, and room is afforded for noting engagements. For the current year every subscriber will receive a *fac-simile* of "Mulready's Wedding Gown."—"Young England's Almanac and Naturalist's Calendar" is well calculated to foster the study of Natural History, — and a valuable study that is.

VAMORUM.

Report of the Metropolitan Board of Works, 1867-8. The annual report of the Metropolitan Board of Works has just been published. It treats of numerous subjects, of much interest to the ratepayers of the metropolis, and shows them what they have had and are having for their money. Of the progress of the works we have already treated from time to time; but we may here summarise them from the conclusion of this annual report:—

"During the twelve years which have elapsed since the constitution of the Board, they have expended large sums in carrying out the objects contemplated by the Local Management Act of 1855, and various other statutes passed in subsequent years, under which largely extended duties have devolved upon them; and these sums have been uniformly raised by local taxation on the occupiers of property within the metropolitan area, the only exceptions being the coal and wine duties, the Government contribution of 10,000l. per annum, and the annual amount received from fire insurance companies in aid of the fire brigade. There is no doubt that, in return for this taxation, the inhabitants of London and its suburbs have received great benefits from the works of the Board, amongst which, as the most prominent, may be mentioned the system of main drains, the embankments of the river, the formation of new thoroughfares, the establishment of parks, and the preservation of open spaces. Beyond these there are many other improvements which the Board have from time to time aided the local authorities in carrying out by granting pecuniary contributions. But notwithstanding that much has been done during the past few years for improving the condition of the metropolis, it is clear that its growing requirements will be very far from met unless additional facilities for traffic are provided, commons and open spaces secured, and other works executed, which will necessarily involve a large expenditure. . . . The Board entertain a hope that the attention of the Legislature will shortly be directed to the important question of readjusting the taxation between the owners and occupiers of property in the metropolis, and that ultimately the requisite revenue will be placed at the disposal of the Board without the necessity for imposing additional burdens on those who are already so heavily taxed."

—"Sewage Irrigation," by Michael Scott, C.E., London. Maclehose, Glasgow. 1868. This is a second letter, addressed to the Lord Provost of Glasgow, on the city sewerage question. Mr. Scott here compares his own scheme, of which we have already spoken, with that of Mr. Bateman and Mr. Bazalgette, and shows in what respects he regards his own as preferable. The cost of the rival plan Mr. Scott states at 1,253,256l. and that of his own at 850,000l., thus effecting a saving by his plan of 403,256l. The annual charges on the Bateman and Bazalgette plan

would be 55,000l.; and on Mr. Scott's, 35,000l.; thus effecting a saving of 20,000l. a year; at least, Mr. Scott says so.—"Woman's Work in the Temperance Reformation, London," published for the National Temperance League, by W. Tweedie, Strand. However stale and unprofitable in the eyes of some, the temperance reformation movement is a most important one; and it is regarded as becoming every day of more and more importance on account of the sad fact that intemperate practices are privately spreading to a fearful extent amongst our women of every class. Mrs. S. C. Hall, in an able and womanly introduction, does not hesitate to state this as a fact, in her own knowledge; and in the papers, prepared for a ladies' conference, held in London, May 26, 1868, of which this little volume is made up, the abhorrent fact, of society being defiled with the prevalence of tipping and drunken women, is quite as plainly declared. This is a shocking state of matters; and a fearful look-out for the rising generation, many of whom, even while children, are absolutely taught to tipple and look for their daily wine or beer as eagerly as their elders. There are medical men, too, who obviously pander to the growing propensity in women for stimulants, and it is not seldom under the guise of medical "orders" that both women and children indulge the abominable habit. In these regards the little volume under notice is well adapted to arouse the public attention to the evil and to lead to its correction.—"The Agricultural Labourer" (No. 2). By J. Bailey Denton, C.E. This pamphlet contains a reprint of a series of letters, which first appeared in the *Daily News*, on the general condition of the agricultural labourer. They treat of village water-supply, drainage, earth-closets, and cottage-gardens; cottages; wages, hear, and cider; education and technical instruction.

Miscellanea.

Bedfordshire Architectural and Archaeological Society.—The general meeting of this society for the present year has been held, Lieut.-Colonel Stuart in the chair. Mr. Wynt read a paper entitled "Bedford and the Olden Time," which formed a continuation of the author's "Glance at Saxon Bedford" (read before this society and published in the volume for 1865), bringing down the sketch to the close of the last century. It was illustrated by some large drawings in water-colours of various objects of interest. Mr. Hurst next read a poetical version of the legend connected with the lady whose tomb and effigy are to be seen in the south wall of Oakley Church. Mr. Haddock then read the report for 1868, which was adopted.

Value of Property in Brighton.—An opportunity of forming an opinion upon the value of freehold property in the best part of Brighton was afforded last week, when Mr. George Attree submitted to public competition the block of freehold mansions facing the sea, numbered from 1 to 5, Junction-parade; together with the property known as No. 1, King's-road, forming the western end of Junction-parade. Lot 1 comprised No. 5, Junction-parade, let on a repairing lease at 200l. a year, determinable on the 1st of September, 1873. Taken at its present rental, Mr. Attree estimated its value at 4,000l.; but he put its value at 250l. a year, which might readily be obtained in five years' time. The first bidding offered was 3,000l., on which an advance of 500l. was immediately made. Another 100l. was offered, and from this point the biddings were increased by fifty till they reached 3,850l., at which price the lot was knocked down. Lot 2 adjoined lot 1 on the west, and was of similar elevation, but less extensive frontage and accommodation. It was let to the same tenant for 150l., and possession could be obtained at nearly about the same time as the last lot. The biddings for this property, which opened at 2,000l., were more spirited, and rose 50l. at a time till they reached 2,850l., for which sum the property was bought by the same party that had secured lot 1. Lot 3 adjoined lot 2, and was let to the same tenant for 170l. a year, but upon a yearly holding. The entire front, it was stated, had, within the last twelve months, been reconstructed, at a cost of 350l., to correspond with the two lots just sold. The biddings opened at 2,750l., at which price it was sold, to a Brighton gentleman; the others having fallen to strangers.

A New Masonic Hall for Durham. — The foundation-stone of a Freemasons' Hall has been laid with Masonic ceremonial, at the south end of Old Elvet, Durham. The architect is Mr. T. C. Ebdy.

Free List of Portraits in the National Portrait Gallery. — A list has been printed of the portraits in the Exhibition at 23, Great George-street, Westminster, and is presented gratis to those visiting the Exhibition, which is open to the public on Mondays, Wednesdays, and Saturdays, from ten to four o'clock; admission free.

The late Sir Richard Mayne. — It is to be hoped that the death of this valuable servant of the public was not expedited by the howl of ridicule and abuse directed at him for his endeavours to lessen the danger of unowned dogs and the nuisance of hoop-trundling in the streets, — excellent and much-needed steps. Some of our journalists, and so called, dramatists, ought to feel thoroughly ashamed of themselves.

King's College Chapel, Cambridge. — We understand that Mr. F. E. Stacey, of Llandough Castle, Glamorganshire, and formerly Fellow of the College, proposes to fill the great west window of the chapel with stained glass. The donor expressed his wish that the new work should harmonize with the magnificent windows now in the chapel, towards realizing which result it would be his endeavour to secure the services of the best artists and glass-stainers to be found either in England or upon the Continent. Here is a fine chance for fame or contempt for some one. We advise Mr. Stacey to treat the design and the execution of the glass as two separate events.

Working Men's Club and Institute Union. A meeting of representatives of workmen's clubs in London, took place on Tuesday evening, at the offices of this society, with a view of conferring with the council on the various questions which affect the success of those institutions. Among others the subject of connecting the clubs with all popular organizations, such as the co-operative, trade, benefit, and temperance societies, was carefully considered; also the question of rendering workmen more independent of public-houses in the matter of refreshments, and of making the clubs more attractive, under the heads both of recreation and of instruction. At the close of the meeting, a motion for a further conference, to be held shortly, was unanimously agreed to.

Luncheon on Australian Meat in the City. — About eighty guests assembled on Tuesday in the central depot of the Australian meat agency, Norton Folgate, London, at the invitation of Mr. Tallerman, the manager, in order to test the qualities of various forms of preserved meat from Australia. On this occasion the chief form presented was meat salted in Australia and prepared in various ways in this country. Mr. Warren, inspector of cookery for the army, superintended. It is reported that the result was sufficiently satisfactory to warrant the public in giving some encouragement to the undertaking. Preserved meats, hermetically sealed in tin vessels, are to form the chief ingredients of another banquet. The company were of opinion, as we are, that the successful introduction of meat into England from Australia was a matter of the highest importance.

The Great Bell for Worcester Cathedral. — The long-expected bell has arrived from Loughborough, conveyed upon one of the Midland Railway Company's wagons, drawn by three horses gaily decked with ribbons, to the cathedral. This bell, which is 6 ft. 4 in. in diameter, is not to form one of the peal in the cathedral tower; but is to be the clock bell, to strike the hours. The motto on it is "Surge qui dormis, et exurge a mortuis, et illuminabit te Christus!" — that is, as in the English version, — "Awake, thou that sleepest, and arise from the dead, and Christ shall give thee light." This motto appears round the crown of the bell. Round the waist there are coats of arms. Below there is the following inscription: — "In usum Ecclesie Cathedralis Christi et beate Marie Virginis in civitate comitatus Vigorniensis, Johannes Taylor, Loughboro'. Fudit A. D. 1868." which may be Englished thus: — "For the use of the Cathedral Church of Christ and the blessed Virgin Mary, in the city and county of Worcester. John Taylor, Loughborough. Founded A. D. 1868." There are round the bell four rows of Gothic ornamentation.

Monument at Alnwick. — A monument to the memory of the late Dr. Hedley, of Alnwick, in the form of a memorial cross, of Sicilian marble, upon three large stone bases, has just been erected in the cemetery, Alnwick. It is 11 ft. high, and was designed by Mr. Thomas Gibson, architect, Newcastle. The work was executed by Mr. D. McMillan, monumental sculptor, Alnwick.

Local Improvements in Glasgow. — The unwholesome and overcrowded closes are being cut into by the Improvement Committee, who are gradually destroying them, with some consideration as to the temporary want of dwellings which such operations necessarily produce. The death-rate of the districts which are being opened up have been appalling, — 40 to 45 per thousand. Clearances for a new street are being made across many of the closes, extending from Bell-street to Spirling-street, and also across others, stretching from St. Andrew's-street to Steel-street. The tall tenements thus disclosed present a most wretched aspect.

Destruction of Wick New Harbour Works. A hurricane of great violence has been experienced in the North, and has been attended with considerable destruction to property. The new harbour works at Wick were so completely destroyed that only a few upright sticks remained of several hundred yards of piling and staging, and the whole stonework of the past season disappeared, being thrown into the bay. All along the shore, on both sides of the bay, large quantities of timber were stowed, and the immediate vicinity of the works presented mixed masses of stone and debris, which had been thrown ashore during the night. The break-water staging, where not entirely demolished, was here and there twisted, broken, and otherwise injured, and 250 ft. of sea-wall which had been built this season were gone. The damage is variously estimated at from 10,000, to 30,000. At least twelve months' work has been destroyed, and it will take more than another twelve to bring the works to the state which they were in. The end of the sea-wall was closed up, as formerly, for the season, some time ago; the stones being firmly embedded, and secured by powerful iron clamps in a manner that justified the hope of the works being able to resist all inroads of the sea.

TENDERS.

Table with 2 columns: Item description and Price. Includes tenders for alterations at Whitelebury House, Highgate, for Mr. G. H. Brown, Messrs. W. G. Habershon & Pite, architects; and for alterations and repairs to No. 15, King-street, Chesham, for Mr. Gabriel.

Table with 2 columns: Item description and Price. Includes tenders for the erection of new buildings in the Iron Gate, Derby, for Mr. John Smith; and for alterations and repairs to No. 15, King-street, Chesham, for Mr. Gabriel.

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For the erection of a shop and dwelling, and alterations to the Ten Bells, Spitalfields, Mr. W. E. Williams, architect: —

Table with 2 columns: Name and Price. Includes tenders for the erection of a shop and dwelling, and alterations to the Ten Bells, Spitalfields.

For alterations, Nos. 49 and 50, Hooplanditch, Messrs. John Young & Son, architects: —

Table with 2 columns: Name and Price. Includes tenders for alterations, Nos. 49 and 50, Hooplanditch.

For Loughborough village roads and sewers. Mr. A. R. Pite, architect: —

Table with 2 columns: Name and Price. Includes tenders for Loughborough village roads and sewers.

TO CORRESPONDENTS.

Terms Cited — Several manufacturers, who were not present at the recent discussion on this subject at the Institute of Architects, write saying their names consequently do not appear, and they wish us to rectify the omission. We are unable to comply.

We are compelled to decline pointing out books and giving addresses. All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Non-Responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

IMPROVED MACHINERY, combined with STEAM POWER, is employed by J. W. BENSON in the Manufacture of Church, Tower, Stable, and Tell-tale Clocks, Sun and Wind Dials, Perpetual Calendars, and every description of Clock and Watch Work. Architects, Builders, Committees, &c. can be promptly supplied with estimates. A descriptive Pamphlet on Church and other Clocks, post-free, 2d. J. W. BENSON, by special appointment, Watch and Clock Maker to His Royal Highness the Prince of Wales. Steam Factory for Clocks and Watches, 65 and 60, Ludgate-hill; Showrooms, 25, Old Bond-street, London.

ARCHITECTURAL ASSOCIATION, 9, COVENTRY, W. The ASSOCIATION, JANUARY 29, 1869. The ASSOCIATION for which the Prizes of the Association were awarded will be held by the respective authors.

IN THE UPPER SCHOOL, PECKHAM, S.E. every boy well grounded in English, made to write a treatise on his favourite subject, according to a plan of his own, and on terms as spoken daily. The admission fee for drawing and for Natural Science are nominal. — Adm. Five Years, 15 D. The School RE-OPENS JANUARY 19, 1869.

ORARY'S INN ROAD. — To Builders, Cabinet Makers, and Others. MR. LERREW will SELL BY AUCTION, on the PREMISES, between 10 and 11, MONDAY, JANUARY 4th, 1869, at TWELVE for ONE, a quantity of iron, steel, and brass, prepared for building, machinery and other work, dry cut stuff, wide plank, mouldings, and boards, of all kinds, poles, ladders, old materials, &c. — Auction Office, 2, Cannon-street, Strand, near Euston Station.

NOW READY, price 6s. by post 4s. 4d. LANTON'S BUILDERS PRICE BOOK, for ARCHITECTS, ENGINEERS, BUILDERS, CONTRACTORS, SURVEYORS, and all the BUILDING TRADES. For Fifty Years this Book has held the position with the Building Trade. The present issue has been very carefully revised and improved, and will be found a valuable as a guide as ever.

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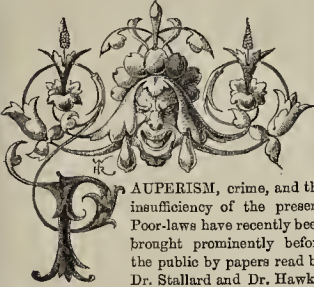
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GWILT'S ARCHITECTURE, illustrated with more than 1,100 Wood Engravings. Revised, with Alterations and considerable Additions. By WYATT PATWORTH, Fellow of the Royal Institute of British Architects. Additionally Illustrated with nearly 100 Wood Engravings by H. J. Swait; and more than 100 other Woodcuts. London: LONGMANS, GREEN, & CO. Paternoster-row.

The Builder.

VOL. XXVII.—No. 1353.

Pauperism and Crime.—The Boys' Refuge at Bisley, near Woking.



PAUPERISM, crime, and the insufficiency of the present Poor-laws have recently been brought prominently before the public by papers read by Dr. Stallard and Dr. Hawksley, in the one case at a meeting of a department of the Social Science Association, and in the other in the rooms of the Society of Arts, under the auspices of the London Association for the Prevention of Pauperism and Crime, Lord Shaftesbury presiding. At the Social Science meeting, Mr. J. Morley, M.P., was in the chair; and on both occasions the subject was discussed at considerable length by a number of gentlemen who have long given attention to it. Startling facts, affording evidence of the rapid growth of pauperism, were adduced, and the public seem to be aroused to the importance of the matter. Let us hope that some real advantages will follow. Dr. Stallard's paper and the reports of the discussion upon it have been referred to the Council of the Social Science Association, with the request that they will "take such steps as they may deem best to promote reform in the administration of the Poor-laws." They must go

farther than this, and obtain legislation on other points if the advancing evils are really to be stopped and remedied. With the deepest interest in the object at heart, we must express regret that a fresh society has been formed to effect what the Social Science Association has long more or less actively urged, and is at this moment specially engaged upon. It would surely be better if the efforts of all interested in it were concentrated, and a more speedy result might then be expected. No trifling efforts will be needed to stop the spread of pauperism. Individuals are getting richer, masses poorer; and many causes are in operation tending to bring this about. Besides some that have been dwelt on, we must regard the present enormous amount of Imperial taxation and the inequality of local rating as powerful agents. Whole parishes are being pauperised by these causes alone.

In the exceptionally taxed parishes the small shop-keeper finds it impossible to pay his way, falls out of the rate-paying class into the aid-receiving body, and thus increases the fatal pressure on those who are still struggling. What sound reason can be given for forcing a man who lives on one side of a street to pay 4s. or 5s. in the pound for the relief of the poor, while his neighbour on the other side of it, perhaps even his rival in trade, is not called on for more than 1s. or 1s. 6d. in the pound? The only argument that can be adduced is one of selfishness. It is to be hoped that efforts for a remedy of this evil will be persevered in. Such injustice cannot much longer endure. It is simply a question of time. Again, our system of building on short leases is gradually transferring all house property to a few persons,—handing over the accumulated savings of thousands to the comparatively few land-owners. This same system has given us miles of ill-built, ill-ventilated, insufficiently-drained, fever-producing piles of rubbish, which, at the expiration of the short lease on which they have been "run up," will have to be repaired and set in order by the unlucky then owner before delivering them up. If this system do not produce a convulsion one of these years the teaching of history is worth nothing. We hear

of one well-known nobleman who can tell the date of the year in which his descendant's income from property in the metropolis will be a million a year, and no one able to say what he will do with it. A promising young nobleman, with some 400,000*l.* a year *already*, has recently put himself under the guidance of an alien church; the coming men of a million a year each may prefer an alien king, or, at any rate, spend their wealth without any reference to the well-being of those who have placed it on their land for them.

One result of this system is that shelter gets dearer; houses grow worse and worse. Overcrowding destroys the stamina and self-respect of their occupants, and produces a population of sickly paupers and evil-doers. If we would prevent the spread of the evils we are deploring the children must be taken in hand. There are 100,000 children in the metropolis alone uncared for who may be made either a curse or a blessing to society, just as society chooses. An enormous responsibility this, surely. Education and industrial training must be afforded to all, and insisted on from all. Parents who will not give their children decent training must be made to do so. This should be one of the first works of the new parliament. The opposition to such legislation would be much less than some seem to fear. Notwithstanding the enormous sums we spend annually in alleviating poverty and punishing the criminal, we do comparatively nothing to prevent pauperism or crime. Calculations that we made some little time ago, and which have been confirmed by the statements of Dr. Hawksley and Dr. Stallard, show that the money expended on the poor through the agency of charitable societies, parochial bodies, and private donors must be at least eight millions *per annum*: the punishment of crime, according to official statistics, costs about four millions, and we estimate the cost of crime to the public, the extent to which the criminal class destroy instead of producing, at six millions, making, in the whole, an expenditure of *eighteen millions of pounds sterling annually*.

Against indiscriminate almsgiving we wage war. Indiscriminate medical relief is the first



The Boys' Refuge Farm School, Bisley, near Woking, Surrey.—Messrs. Habershon, Brock, & Webb, Architects.

mors towards destroying self-dependence and showing the recipient the way to the workhouse. Of discriminate charity we cannot have too much; the charity that knows, and aids at the right time; that prevents the break-up of the home; that inspires with fresh hope; that shows the field for profitable exertion. The able-bodied should be forced to work, if they would eat; and they should be made to do work that will pay. The work-in-vain system is wasteful, demoralizing, and abominable. We want the result of every man's labour. The payment should be by piece-work. The making and maintenance of roads, embanking rivers, draining, the manufacture of clothes for the poor, for the army, and for the navy, and above all the reclamation of waste lands, are works to which such labour might be fairly applied. There are millions of acres of uncultivated land in England and Ireland on which labour might be profitably employed. We shall want legislation to enable public bodies to employ the destitute. Aid might be given to those who would emigrate—not to the colonies or another country, but to these waste lands at home, there to bring up their children in habits of industry and self-dependence, and to make the desert smile. With less of indiscriminate almsgiving, as we said before, we want more real intelligent charity, personal help, and Christian sympathy;—sympathy—

"Which hath an operation more divine
Than breath or pen can give expression to."

Above all things let us take up the children. The strong feeling we have in that direction leads us to make this an opportunity to bring before our readers the last step taken by those who manage what are known as "The Refuges for Homeless and Destitute Children," whose head-quarters are in Great Queen-street, Holborn.

The house there was found too small to receive the crowds of orphans that came for succour. In 1866 the *Chichester* training-ship offered the means of training for a seafaring life some 200 boys, but the mission still grew, and it was determined to erect a house at Bileys, in Surrey, to which it is proposed to transfer the young and weakly boys from the London Refuge, so that they may be trained to look after cows and pigs, grow vegetables, till the land, and thus be fitted for service at home or in the colonies. To so good an enterprise we wish the best success. The new building consists of a centre and two wings, connected together by corridors. The centre contains the committee-room, store-rooms, living-room for the master, and separate infirmaries. The left-hand wing contains workshops for several departments, and a broad open dormitory over. The right-hand wing contains the dining-room, with a similar spacious dormitory above. In the rear the kitchen and proper offices are erected as separate buildings; and again in the rear of each of the wings are swimming-baths and lavatories. The total frontage of the building is about 160 ft., and the entire cost 5,775. The architects are Messrs. E. Hatherston, Brock, & Webb; and the builders, Messrs. Carter & Son, Horseferry-road, Westminster. The style, it will be seen, is a sort of Gothic, with bands and patterns of coloured bricks, and walling of red bricks. The dormitories have open timber roofs, and accommodation is made for 150 boys. The farm consists of 88 acres. Mr. W. Williams, the hard-working secretary of this association, said, at the opening of the new building last month, that in the previous year there were gathered from the streets into the refuge no less than 246 boys, and up to the end of November 310 had been received, and for the twenty-one days of this month 50 more had been received, and still they came heaving to be received. We need not enlarge on the advantages accruing to the public as well as to the boys themselves in so large a number being rescued from misery and vice, instead of being allowed to drift into the criminal and dangerous class. The advantages are apparent to any one who will give the subject a moment's thought. At the present time there are 160 boys on board the *Chichester*, being educated and trained for the Royal Navy and Merchant service, 166 boys in another refuge, and 50 at the country home, and upwards of 100 inmates in the two refuges for girls. With a view of further converting the "waste" going on in the human material and turning it into useful labour, the committee have raised the building we now illustrate, and to which they purpose transferring the young and weakly boys from the London Refuge, so

that they may be fitted for service at home or in the colonies.

While urging this immediate necessity for larger and more comprehensive measures to stem the advancing tide of pauperism and crime, we point with admiration to what is being done by this particular association.

THE HISTORY OF ITALIAN SCULPTURE.*

In the fourteenth century Marcus Romanus was the one sculptor, of whom Rome can show any proof, and this is only in one work, a statue of Saint Simon, the prophesier, behind the high altar of the church dedicated to him at Venice. Some writers have attempted to divide this century between Marcus Romano and Pietro Cavallini, the scholar of Giotto. Vasari, for instance, names Cavallini as the sculptor of the crucifix at St. Paul's, which is said to have spoken to St. Bridget; and Horace Walpole says, that it was he who made the shrine of Edward the Confessor, and designed the crosses which marked the resting-place of Queen Eleanor's body. Mr. Perkins, in the book we are now noticing,† denies both these statements. There were, however, two sculptors in the fifteenth century, Paolo Romano and Gian Cristoforo. They were both goldsmiths as well as sculptors. Antonio Filarete mentions that Paolo helped to make the silver statues of the twelve apostles for the altar of St. Peter's, that were destroyed in the sack of 1527. His principal works are the statue of St. Paul on the Ponte Sant' Angelo, the tomb of Fra Bartolomeo Cavallini in the church of the Knights of Malta, and the monument of Cardinal Stefaneseh at Santa Maria, in Trastevere. The sarcophagus of Fra Bartolomeo is divided into panels by twisted columns, containing his arms and a mortuary inscription in Gothic letters; and on the top of it lies the knight dressed in armour and grasping the handle of his sword. The cardinal's tomb consists also of an effigy on a sarcophagus, but it has the addition of a marble canopy, with a frieze of coloured mosaics. Gian Cristoforo was the scholar of Paolo, and like his master was a goldsmith, as, with the assistance of two more scholars of his master, Niccolò della Guardia and Pietro Paolo da Todi, he made the twelve silver statues of the apostles for the Papal chapel at St. Peter's. He is also mentioned as the sculptor of figures and busts at Sta. Maria, in Trastevere, and as one of the artists employed upon the tomb of Gian Galeazzo Visconti, at the Certosa, at Pavia. Mr. Perkins gives two Roman sculptors to the sixteenth century, Giovanni Battista and Andrea Romano, the first of whom accompanied Giulio Romano and Primaticcio to Mantua, the last being also employed in the same city. In connexion with this paucity of local sculptors our author makes the following remark:—

"When we remember that Rome in the early part of this century was the home of some of the greatest foreign artists, it seems incredible that their example and teachings should not have developed native talent. From Niccolò Pisano down to Benvenuto Cellini all the great Tuscan sculptors went to Rome; some, like Donatello, Ghiberti, and Brunelleschi, to study ancient remains; others, like Simon Donatello, Filarete, Rosellino, Mino, and Michelangelo, to reside and work there. All were received, honoured, and employed by the Pope, the city became their chosen place of residence, being then, as she still is, the most sympathetic and the most attaching of all places to those whose lives are devoted to art in any form. Everywhere at Rome we find that the works of merit are by foreign artists. At St. Peter's and St. Pietro in Vincoli they are by Polignolo and Michelangelo; at Sta. Maria del Popolo and Sant' Agostino by Andrea and Jacopo Sansovino; and in the deserted cloister of the latter church by Mino and Mino's imitators; at Sta. Maria del Popolo and the Pantheon by Lorenzetto; at Sta. Maria dell' Anima by Tribolo and Michelangelo Senese. Indeed, with the exception of the pulpits, ciboriums, and tombs of the Cosmati, and the works of Paolo Romano, which hardly rise above respectable mediocrity, there are no Roman sculptures of interest in the many churches of the Eternal City."

The history of the Comacine architects forms an early feature in the account of sculpture in Lombardy. For twenty years an island in the Lake of Como held out against Alboino and his followers. It contained numbers of fugitives from all parts of Italy, some of whom were the skilled workmen known as the Maestri Comacini, and subsequently as "casari," builders of houses. There is evidence to show that the Lombard kings enfranchised the members of this guild, after the island submitted, and allowed them the privilege of making contracts. King Rotari, especially, in his code of laws, protected the

Maestri Comacini, whose free jurisdiction, explains Mr. Perkins, was recognised by the name of Free-masons. Although the miserable state of the country, owing to war and pestilence, prevented any considerable structural operations, for some time after the conquest, Queen Theodinda soon appears upon the scene, employing the Magistri Comacini to build the duomo at Monza, and recording the conversion of her husband Agilolph in a bas-relief over the portal representing the baptism of our Lord. A century after this other Comacine masters were still building in the same style, which is debased Roman with strong Byzantine tendencies. There is an octagon font in the duomo at Cividale, erected by St. Calixtus, bishop of Aquileja, which well illustrates its peculiarities. "Its roof is supported upon slender columns, with rude Corinthian capitals. Their intermediated spaces are spanned by round arches, whose spandrels are adorned with clumsily-represented Christian emblems. The bases of the columns rest upon a marble parapet sculptured with figures symbolical of the four evangelists, each holding a book, inscribed with verses by Sedulius, a Latin poet of the fifth century, and an ornate Greek cross, with candelabra and palm-trees executed in relief by lowering the surface of the stone around their clumsy outlines, within which the details are indicated by furrows dug out in the stone." Milan so heartily patronised the arts that the fourteenth century saw no fewer than 2,000 monuments in its churches, according to the statement of a chronicler of that period; but a decree of the Council of Trent led to many of them being taken down. About this time we first meet with the Campionesi, a company of architects and sculptors so called, from the district of Campione. Five sculptors, known as "da Campione," were engaged upon the duomo at Modena in the thirteenth century. Two others, Matteo and Bonino da Campione, were accorded the title of famous. Area di Sant' Agostino at Pavia, which took twelve years to complete, in this structure "the effigy of the saint, covered with a winding-sheet held up at its corners and sides by six angels, lies upon a mortuary couch seen through the open arches which support its second story. The statues of the apostles are placed, two by two, in compartments around the lower or basement story, separated from each other by pilasters faced by statues of the Virtues. Above them smaller statues of saints and prophets stand against the pilasters of the second story, upon which rest consoles supporting seated figures of saints and martyrs. A row of pointed gables, decorated with crockets and finials, runs round the uppermost story, upon which is a series of bas-reliefs, representing incidents in the life of St. Augustine, separated from each other by twenty statues." One of these artists was the sculptor of the monument that Bernardo Visconti erected to the memory of his wife, in which, curiously, there is no effigy of the lady, but an equestrian statue of himself, clad in armour and biton in hand. And the elder of the two was appointed architect, first of the duomo at Monza and then of that at Milan. At Monza there is a mortuary tablet, set into the outer wall, which says, "Here lies the great architect, the devout Master Mathews da Campione, who built the facade of this holy church as well as its pulpit and baptistery, and who died in the year of our Lord, 1396." The first architect of the cathedral at Milan was Marco Frisone da Campione, who with four Campionesi formed a body of architects and sculptors, attached from this beginning to the "Veneranda Fabbrica." The contemporary building, the Certosa, however, was placed in the hands of Bernardo da Venezia. This building Mr. Perkins, with others, considers surpasses the duomo in artistic interest, for it is a perfect museum of sculpture by the best artists of the Lombard school. He says of it,—

"Few Italian churches, indeed, can compete with the Certosa, whose stillness is broken only by the hushed tread of some white-robed monk, who passing on, leaves the visitor to an undisturbed enjoyment of the objects around him. After scanning every rich detail of the facade, he enters through the sculptured portals into the nave, examines the paintings and marbles in the chapels, the tombs that lie the transepts, the expensively sculptured doorways of the sacristies, the bas-reliefs and terra-cottas in the vast cloisters, the richly carved capitals and cornices, and carries away with him a sense of harmony and completeness only to be derived from a series of works which belong like these to one school and to one time."

Early in the fifteenth century we find Jacopino da Tradate working for the "Fabbrica del Duomo." He was called upon by the Duke Filippo Maria

* See p. 1, ante.

† Italian Sculptors. Longmans & Co.

to commemorate the entry of Pope Martin V. into Milan, by erecting a colossal statue of him in the duomo. This admirable figure, which is more than twice the size of life, is seated on a draped throne, in full pontifical, holding the keys in one hand and giving the benediction with the other. Jacopino was also the author of the half-figure of God the Father in bronze in the centre of the roof of the apse of the duomo, and the reputed author of the tomb of Pietro Torello at Sant' Eustorgio. Before his death he removed to Mantua, to work for the Duke Francesco Gonzaga. The school of the Campionesi characterized by "simplicity and extreme quietness of action in its round-surfaced, short-proportioned statuettes and bas-reliefs" was now supplanted by that which came in with the Renaissance, remarkable for its "violent action, intense facial expression, hording on grimace; clinging draperies, great length of limb, and very flat treatment of surfaces." A transitional style appears to have been used by the brothers Mantegazza, in the first part of their career. They did so much work at the Certosa for the Prior Filippo de' Ranacate, that their pay amounted to nearly the cost of a house at Milan, which he made over to them as a discharge of his debt, stipulating that its value over and above their account should be made up in future work. Some of their later work is marked by the exaggerated gestures and expression we have just quoted. Giovanni Antonio Amadeo, or Omodeo, who worked with them, on the Certosa, is considered the most remarkable of the Lombard sculptors. He was the son of a farmer, living near the Certosa. When he was nineteen we find him with his brother Protasio, at work upon sculptures for this building; and in 1490 we read he received the appointment of head architect to it, and designed and carried out the façade. He erected the monument to the daughter of Bartolomeo Coleoni, at Basella, near Bergamo, spoken of as one of the most charming works of the kind in Italy: delicate, simple, and beautiful. The slender figure of the deceased, in an embroidered robe, lies with her head upon an ornamented pillow, upon a sarcophagus, enriched with statuettes. There is a string of jewels upon her head, and a necklace round her throat. Her eyes are closed, and her arms folded upon her bosom in serene repose. Her father commissioned Omodeo to build a family chapel at Bergamo, immediately after its completion, which he designed in the richest Renaissance style. At Cremona he worked upon the shrine of the Egyptian martyrs; and in the family chapel of the Borromei on the Isola Bella he executed two monuments which show his delicate touch and artistic eye to considerable perfection. But when he undertook the crowning of the Milanese duomo with a cupola he resigned all other engagements and removed to Milan. Mr. Perkins considers Omodeo would have ranked with the Tuscan Quattro Centisti had his style been less mannered and more elevated. After him come his rival Cristoforo Solari, some time head architect of the Milanese duomo, with his scholars Giovanni Dentone, Giovan Giacomo della Porta, Girolamo da Novara, and Andrea da Fasina; the latter of whom figures in the records of the Fabbrica, poor unfortunate, as continually asking for money in advance. It is, perhaps, some clue to this inability to meet his current wants with his current industry to be told that his work was "tasteless and clumsy, though smoothly and skilfully executed." After this brief little is known beyond the names of the sculptors, who clustered "like bees" about the duomo in the last half of the fifteenth century, and stored up their work in it. The Fabbrica held out great advantages, which were appreciated to their fullest extent. The young were taught their art and the old were pensioned; which privileges were forfeited by seeking work elsewhere without permission. Mr. Perkins gives full accounts of the labours of other Milanese sculptors not employed on this great work; but who have materially enriched Lombardy with their works. We learn from them the lesson that we need not grieve because our work is not displayed in the high places of the world. They teach us "to labour and to wait." Recognition is sure to come, if our work be worthy of it.

We must give the pretty piece of word painting with which our author limns in Venice. He says the Venetians had more feeling for colour than for form, and accounts for this preference by their relations with the East, and the situation of their city between the formless sea and everchanging sky—

"When we look around us at Venice we see colour expressed in every object which meets the eye. St. Mark's, with its marbles and mosaics, is almost white; the Ducal Palace is toned like the inside of a sea shell; the façades of the stately buildings which line the Grand Canal are variegated with disks of serpentine and porphyry; and the sails of the fishing-boats vary in tint from a golden yellow to a deep amber; the water in the side canals, which as we emerge from them into the Giudecca or the Lagoon expands into the broad sea, is as pure as those long strips of sky between the black chimney-tops, which in like manner widen out into the measureless heavens. Seen from afar through the early morning haze Venice looks like some 'saporoso amellist,' and at sunset, when the flaming heavens above her are reflected in the smooth waters, her towers and palaces grow grey upon a pavement of fire, like ashes resting upon glowing embers. City and sky and sea are then all visionary, all indistinct in outline, and we feel why a great school of colourists rather than a great school of sculptors grew up at Venice. Venetian sculpture was always strictly decorative, and the artists who practised it were rather marble-workers than sculptors, men skilful in carving statuettes and arabesques, but incapable of raising their art out of its Medieval dependence upon architecture."

All the leading Venetian sculptors for three hundred years were architects. In this span of time three styles of architecture prevailed—Gothic, Renaissance, and Baroque, and the sculpture was adapted to each with like skill. The Gothic was practised by Filippo Calendario, the Massegne, and the Bons; Andrea Rizzo represents the Lombardi; Leopardi the Renaissance; and Alessandro Vittoria, with his followers, the Baroque. Up to the thirteenth century, Byzantine influences predominated, as many details on St. Mark's prove, especially the central bronze door, which hut for its Latin inscriptions and saints might be taken for Byzantine work. The first indication of less formalism is pointed out by our author as the beginning of a national style, is shown in the scriptural bas-reliefs upon the marble columns of the ciborium, and in the baptistery, and in the little figures at the base of the columns in the Piazzetta. The Niccolò di Barattieri who raised these columns and sculptured the figures, a Maestro Donato, and Johannes di Venetia are the only Venetian artists who are known to have flourished before the fourteenth century. After the new century came in, we find Bertuccio casting the external gates of St. Mark's, and two anonymous Venetian sculptors at work, the one making an ancona of wood for the altar of the duomo at Murano, and the other carving the Madonna della Misericordia above the Ponte del Paradiso at Venice. A third is heard of at Genoa. These, with the bas-reliefs of the second half of the century, are exceedingly rare compared with the contemporary sculpture of Tuscany. The Ducal Palace sculptures are so perfectly adapted for the places they occupy, are so complete as a series, and harmonize so well with the scheme of the building, that Mr. Perkins considers they must have been designed by the architect Filippo Calendario, and not, as some writers have endeavoured to show, by the Bons a hundred years afterwards. This Calendario was originally a sailor or shipbuilder at the fortress of Mirano, and by his talents and industry at last occupied the post of superintendent of public works. Mr. Perkins accounts for his acquiring the necessary skill to maintain such a position by suggesting that Andrea Pisano must have given him some instruction. He is, let us hope he may ever be, the solitary example of an architect being hanged. He was implicated in the conspiracy of Marino Faliero, or supposed to be so, and the Council of Ten sentenced him to death, gagged him, and hanged him from the red columns of the balcony of the ducal palace he had beautified. His work undergoes an appreciative criticism in the work before us. Instead of examining it minutely, we must proceed with a more general survey of the stores Mr. Perkins has collected. He describes the type of tomb common at Venice upon which so many of her sculptors spent their best thoughts, as the most perfect of any, because it is beautiful to the eye as well as solemn and appropriate. The sarcophagus is generally set high up against a chapel wall under an arched canopy. Its front is divided into two panels full of bas-reliefs, by a statuette of Christ, or a group of the Madonna and Child under a little baldacchino; and at each end there are figures of the Angel of the Annunciation and the Virgin. He says the recumbent figure of the deceased is placed upon the sarcophagus as though it was laid out in church before burial, and angels are placed to guard it, either holding back curtains that fall from the canopy above, or standing by with censers in their hands, or supporting the cushion on which the head is placed. The tombs of the doges afforded ample opportunity for the sculptor's chisel and fancy.

A Renaissance tomb, by Pietro Lombardo, consists of a sarcophagus resting on a projecting base, supported upon consoles, having several holding vases in their hands, rich leaf-work and an eagle with spread wings on its front, and has a frieze so exquisitely sculptured that a needle rather than a chisel seems to have been the implement used in its execution. It is, however, upon buildings that the chief works of the Venetian sculptors are to be sought. After Jacopo Sansovino's forty years' reign in Venice, during which period nothing was undertaken without his sanction, his defects were exaggerated by his successors into the style called Baroque. War was declared against the straight line, ornament was heaped on regardless of construction, limbs twisted into impossible attitudes, and draperies hollowed out, to look as though honeycombed from natural causes rather than by the chisel. This illogical, thoughtless, capricious sort of work is not to our author's mind, who, accordingly gives it no prominence in details, and closes his account of Venetian sculpture with a sketch of the life of Alessandro Vittoria, under whose auspices it commenced its eccentric rule.

In Verona we find Magister Uro and his scholars Gioventius and Giovanò, from the Isola Comacina, at work upon a ciborium, on the church of San Giorgio di Val Pufficella. Then comes a gap with only Maestro Pacifico, through which several centuries rolled away. In the twelfth century there was a little band of sculptors at work upon the church of San Zeno, making the bas-reliefs that cover the walls of the façade on either side of the great portal. One of them Adamans, carved his name upon a capital of a shaft at the entrance to the crypt; so we may conclude that it was he who sculptured the centaur hunting a stag, the dead fox hanging on a staff carried by two cocks, imaginary animals, and such droll conceits, upon the architrave above. The first great Veronese artist, our author asserts, was Victor Pisano; for before that period, if the lords of Verona wished to build a tomb they were obliged to send to other cities for artists. But it would be difficult, he continues, to find more delicate shades of modelling, greater truth to nature, and more exquisite taste in the use of costume and arrangement of drapery than are to be found in some of Il Pisanello's work, though he looks upon him as a medallist rather than as a sculptor. Among the cinque-cento sculptors our author mentions Girolamo Campagna, the author of the clever bas-relief, relating the story of a murdered man resuscitated by St. Anthony, that he might testify to the innocence of his father accused of his death, in the Cappella del Santo at Sant' Antonio. Neither of the sculptors of this period, however,—not Giulio di Girolamo della Torre, the ex-lawyer,—nor Giovan Battista, who made the crucifix for the duomo at Mantua Vasari praised so highly; nor Alessandro Bassi, who made the statue of San Bernardo Abate for the church of Sta. Maria at Carrara, made anything so exquisite as the marble candelabra in the duomo, ascribed to an unknown Paolo (detto delle Breze) from Rome.

Vicenza, the birthplace of Palladio, sent a sculptor to Padua in the first half of the fifteenth century, to carve an elaborate pilaster for the Cappella del Santo in the church of Sant' Antonio. A hundred years after this, another Girolamo da Vicenza was making the tomb of Pope Celestine V., in the church of Sta. Maria Collemaggio at Aquila, in the Abruzzi, and another Vicentine sculptor, Rocco, was executing marble works for the Collegiata of Sta. Maria Maggiore at Spello. Two other sculptors left Vicenza to work elsewhere, and left the field free for Palladio's fame.

Padua, associated with the work of many renowned Tuscan sculptors, has also produced a few artists of eminence. First among these was Fra Clarello, monk, sculptor, architect, and standard-bearer, in the army of the Pope, that marched to Padua to put down Ezzeolino, but his works have all perished. Bartolomeo Bollano is the next. He worked for Pope Paul II., at the Palazzo di San Marco, and was employed at Perugia in casting a bronze statue of him for the outside of the duomo. His pupil, Andrea Briosco, called Riccio or Crispo, from his curling hair, is more famous. He was the author of two clever bas-reliefs, in the choir of Sant' Antonio, which have been said to contain lessons enough to make a modern sculptor; and of the bronze candelabra, of which his patron Gian Battista Leon wrote, "Well may the city be proud of a work so admirable in every part, so beautiful in

form, and so perfect in execution," and of which Mr. Perkins gives an etching and full details. There were several other Padoan artists who did good work, but his fame eclipses them all.

Mantua dedicated herself to Virgil when the illustrious poet had made his birth-place famous. His name was upon her banners and on her coins, and when the magistrates wished to celebrate a victory they decreed that his statue should be erected in a niche above the Piazza that he might appear to be taking share in the events of the day, and the joys and cares of his compatriots. This statue proclaims the condition of art to have been but rude when it was erected. Twenty years afterwards a marble alto-relief was made of him, the execution of which is somewhat better. These and all the earliest sculptures at Mantua are anonymous. Three men, Mantegna the painter, Alberti the architect, and Sperandio the medalist, influenced much of the subsequent work at Mantua. Mr. Perkins says of the foremost of these three that he Christianized Paganism, and of Giulio Romano that he Paganized Christianity.

Most of the cities in Central Italy hold high places in the history of art as fields on which good work has been done, and great artists produced. Bologna stands foremost in virtue of Francia and the Caracci; then comes Parma, made famous by Correggio. Their sculptors are not quite so world-known. But Bologna boasts her beautiful and gifted sculptress and vixen, Propertio da Rossi; Ferrara can claim Alfani, Lombardi; Modena is proud of Guido Mazzoni and his scholar Antonio Begaroli; Reggio of her two Clementis; and Parma of Benedetto di Antelamo. Throughout his attractive volume Mr. Perkins gives illustrations of the chief works of the most celebrated artists. Thirty-nine etchings, some of them of great beauty, are given, and upwards of a dozen woodcuts. Opportunity has, of course, to a great extent, guided their selection; although there are none included that do not specially illustrate some peculiarity, there are necessarily many sculptors left unrepresented altogether. Of the works of the artists just enumerated, only one is illustrated, which is a group from a mortorio in the church of San Giovanni Decollato at Modena, by Guido Mazzoni. Those who would qualify themselves for looking at sculpture with some knowledge of its chief sculptors and their styles, those who would enlarge their sources of interest in their fellow-workers and their appreciation of their works, would do well to read every page of Mr. Perkins's book.

METROPOLITAN EXTENSIONS OF THE SOUTH-WESTERN RAILWAY.

In addition to the important extensions that have been recently completed and opened to the public, in connexion with the railway systems of the metropolis, others—the last, probably, for a considerable time to come, excepting the East London line only—have again to be announced, namely, the new line of the South-Western Company from Kensington to Richmond, and the new direct line of the same company between Wimbledon and Kingston. The new lines, the successive openings of which have been most recently noticed in the *Builder*, the Metropolitan extension from Paddington to Brompton, and, next, the Metropolitan District from Brompton to Westminster Bridge, are parts of the inner circle, the precise course of which was definitively settled by Parliament in 1864. The Kensington and Richmond line and the metropolitan system are intimately related in two distinct aspects. The principal of these is, that the Metropolitan has running powers at mileage rates over the new line, upon which the company may run trains by a working junction at Hammersmith, from Moorgate-street, or any other station on the inner circle, through to Kew, Brentford-road, or Richmond. For the present the Metropolitan Company will book passengers to any of the stations on the new line, but will not probably take advantage of the running powers till spring or summer, when the pleasure traffic sets in. The Metropolitan Company has just completed a greatly enlarged new station at Hammersmith, which will continue to be used as a terminal station for that locality. The station of the new line is close to that of the Metropolitan, but on a higher level; a covered stair and gallery communicates between the two stations. The course of the new line from its start at a point a little

to the north of the West Kensington Station, on the West London line, is by a bend of nearly a semicircle to the north and west, the springs of the arch being at the West Kensington station on the east, and the Hammersmith Station on the west. In its course the line passes under the Metropolitan line (Hammersmith and City), and bending round to the west, rises to the high level station, close to the Metropolitan station, the high level having been necessitated by the headway required for the Grove-road, which passes under the line close to the two Hammersmith stations. The junction between the Hammersmith and City line, and the Kensington and Richmond line, is effected between the point where the last-named crosses under the other and the station. The booking-offices and stations on the new line are all more compact and promising for the comfort of passengers than that at Hammersmith, which straggles, with a variety of angles and curves, over what seems to be, but possibly is not, an unnecessarily large aggregate area. Abundant platform accommodation has been provided at this as at all the other stations indeed, but it is to be regretted that the chief advantage of planked platforms—their being warmer than stone or asphalt—has been sacrificed here, from considerations of economy it may be presumed. The long platforms, about 15 feet above the ground level, and open to the bottom, are laid with undressed planks, and five-eighths or three-quarters of an inch open at the joints. The planks will, of course, last much longer with the air playing between the edges; and will discharge the rain that falls upon them more readily than a close surface, but stone or asphalt would have been preferable for comfort, during dry cold, in such a situation. The line is carried over the public road by a wrought-iron girder bridge of 90 feet span, very much askew. The floor of the bridge is of double planking, and wrought-iron buckle plates, packed between, to deaden the sound of passing trains, with Burnsted saw-dust. From this point the line curves round on a viaduct of about a mile in length, and pursues a course nearly straight, and almost due west, for about three miles, to Brentford-road. About midway there is a station for the service of Turrham-green. The course of the viaduct is nearly parallel with the London and Brentford rail; the average height of the work is about 20 feet to the rail level; the arches are of 20 feet span. There are ten wrought and cast-iron bridges in the viaduct of from 76 feet span downwards, all waterproof and packed to deaden sound. The line crosses Acton-green upon a falling gradient of 1 in 120, and at the west side of the Green enters a cutting of considerable length and depth, in which the line passes under the Brentford-road, which is carried across on a wide skew bridge. In this locality, also, the mains of the water and gas companies, which serve the district, are borne across the line between plate girders of wrought-iron.

At Brentford-road the line curves to the south, and reaches the station for Brentford in the course of the curve. The station here is large and commodious, with four lines of rails, and ample platform accommodation. The up platform is about 24 ft. wide, and covered the whole width. There is from this station a short branch connecting the line with the North London, by which trains may be run from any of the stations on the North London line to Kew Gardens and Richmond direct, instead of, as now, by the long detour by way of Barnes. There is also a junction here with the South-Western loop-line, giving communication with Brentford, Hounslow, and other stations to the south-west. At a short distance from the Brentford Station the new line crosses over the South-Western loop-line and immediately afterwards over the Thames by a bridge with cast-iron piers and lattice girders. The bridge has five spans of 108 ft. 6 in. each clear, with about 20 ft. of head-way at high water. The cylinders are square, with small three-quarter columns at the corners, the columns cast solid. The cylinders are let down deep in the London clay, the base of the foundation excavations being filled with concrete. The cavities of the cylinders are filled with brick-work and cement. The upper portions of the piers rise considerably above the upper edge of the girders, and show deeply-indented panels filled with alto-relievo ornamental work. They show semicircular heads on the faces, and are surmounted by globular lamps. The abutments are of red brick, and relieved with pilinths, columns, and caps, of Portland stone.

The most important work between the river

and Richmond is the station opposite the new entrance to Kew Gardens,—a station at which doubtless a large pleasure traffic will be done, for which provision has been made in platforms and sidings. In its onward course the line passes under the Richmond-road and Sandylane by a tunnel-bridge of 150 ft. long, and a little further on bends round and runs alongside of the Richmond and Windsor line to the new station, close to the old one at Richmond, which will be used in common by the South-Western, the Metropolitan, and the North London Companies. Passengers will here change for the Windsor, Reading, or Kingston trains. The line is about seven miles in length.

The extension from Malden to Kingston is important in itself, in passing through about 2½ miles of exceedingly pleasant new country, admirably adapted for residence, but is even more important in the connexion it opens with the London, Chatham, and Dover and Brighton systems. In addition to the new line between Malden and Kingston, and the new station thereon at Norbiton, near Kingston-hill, the South-Western line has been doubled between Malden and Wimbledon, and there is now a regular service between Ludgate-hill, Blackfriars, and Camberwell-road stations *via* Herne-hill, Tulse-hill, Streatham, Tooting, Wimbledon, Malden, and Norbiton, and Kingston. Numerous other advantages, in interchange of traffic between north and south, east and west, have been secured by the opening of these new lines, and the train arrangements that have been entered into between the various companies. The changes and enlargement of service consequent upon the opening of the lines, involved the addition of about 300 trains daily from New Year's day, when the new services were entered upon with the opening of the lines.

The works were designed and carried out under the superintendence of Mr. W. R. Galbraith, engineer to the South-Western Company. Messrs. Brassey & Ogilvie were contractors for the Kensington and Richmond line; and Mr. P. Mortimer, resident engineer. Messrs. Aird & Sons were contractors for the Kingston and Wimbledon line; and Mr. A. McDonald, resident engineer.

THE ANTIQUITIES OF PARIS.

THERE is sad work going on amongst the relics of old Paris. The Paris correspondent of the *Telegraph* relates a circumstance to illustrate this. M. Récapé, a well-known amateur and dealer in works of art and *ébrés*, having heard that a considerable quantity of carved wood had been sold as rubbish, hurried to the spot. One glance at the confused heap in a corner of the yard was enough for M. Récapé. The contractor asked 1,200 francs for the lot, and the amateur paid the money down. On examination, this huge pile of firewood turned out to be an inestimable treasure—no less than the whole of the woodwork which had decorated the old reading-room in the "Bibliothèque Impériale," a marvel of artistic workmanship, supposed to have been designed and carved for the great Colbert. When the woodwork had been cleansed of all impurities, even Récapé himself was astonished. The carvings were voted, by competent judges, to be among the finest productions of the reign of Louis XIV., and were purchased soon afterwards by M. Mailet du Boulay, a rich amateur, for the sum of 8,000. Another instance of like enormity happened three years ago. A wrought-iron balustrade was taken down from the grand staircase of the same "Bibliothèque," and was also sold by weight to some *Aucignat*. A goldsmith of Genesee saw it, and became a happy possessor for the sum of 1,200. On being told of the affair, the inevitable M. Récapé went immediately to Genesee to make himself, at any cost, master of the balustrade, which is said to be one of the most wonderful specimens of wrought-iron in existence.

Quiet "Practice on the Piano.—The Paris journal *Le Ménestrel* mentions a new invention which should earn for its author the gratitude of millions. It consists of an apparatus, which, applied to any piano, will deaden the sound emitted. There are few persons who have not been sometimes distracted by the "practising" of some too persevering player, and who would have paid any price for such a "mute" as that described. But will the players use it?

THE DEAD YEAR.

Among the duties which fall to be performed by the public journalist at this "festive season," is the mournful task of reviewing the losses which the world has sustained by death. He is once more called upon to chronicle a long roll of public characters, distinguished in the various walks of professional life, who have closed their earthly career during the past twelve months. Some had attained to greatness, others had but given promise of becoming great when the fell destroyer came; but of one and all it may truly be said that they died and left the world better than they found it. Many eminent names are inscribed in the general obituary of the year; the church, the senate, the army and the navy, literature, the law, and the medical profession, each has lost a number of notable representatives both at home and abroad. It falls more within our province, however, to record the losses that science and art have sustained. Here we have to mourn many bright ornaments in our own and in other countries. The year 1868 will be chiefly memorable as that in which died two of the most renowned men of any age or country. The great natural philosopher—the discoverer of the law of polarization of light by reflection—the inventor of the kaleidoscope—the founder of the British Association for the Advancement of Science.—Sir David Brewster breathed his last at his seat near Melrose on the 10th of February, at the patriarchal age of 87. His illustrious friend and countryman, Lord Brougham, followed on the 7th of May, at the still more advanced age of 90. In the deaths of Brougham and Brewster, Scotland lost two of her most illustrious sons, and the world two of its greatest benefactors. Science and art, as we have said, have suffered numerous and great losses. Baron Marochetti departed with the old year, having died in Paris on the 25th of December, 1867, aged 63. About his merits as a sculptor there is a diversity of opinion; while he lived he enjoyed a considerable reputation, and we are content to respect the old maxim *de mortuis nil nisi bonum*. With the dawn of the year—on the 2nd of January—passed away John Doyle, better known as "L. B.," the celebrated political caricaturist, whose works caused an extraordinary amount of public interest forty years ago. His likenesses of Sir Robert Peel, the Duke of Wellington, and other public men, have never been excelled. He was father of the artist who designed the inimitable and familiar frontispieces of *Punch*—the well-known "Dicky Doyle" of "Pips, his Diary," and "Brown, Jones, and Robinson," celebrity. Within a few days after died M. Claudet, the eminent photographer, of Regent-street, who first introduced into this country the old daguerreotype process, in the year 1839, and made various useful discoveries in connexion with his art. Also Theodore Rousseau, one of the most celebrated landscape painters in France. M. Rousseau died at his beautiful retreat at Barbizon, on the skirts of the forest of Fontainebleau, whence he drew his inspiration. He was 55 years of age. On the 24th of this month the death was recorded of Dr. John Davy (born 1790), an able chemist, geologist, and physiologist, and brother and biographer of the celebrated Sir Humphrey Davy. In February, William Herapath, the well-known chemist and toxicologist, of Bristol, was taken from us in his 72nd year; and in the following week, singular to say, another member of the Herapath family, John, proprietor of *Herapath's Railway Journal*, and author of "Mathematical Papers," died at the age of 78. The death of Ball Hughes, the sculptor, took place at Boston on the 5th of March. Born in London in 1806, he was a pupil of Baily for seven years, during which time he gained several important prizes in competition. The Royal Academy gave him a silver medal for the best copy in bas-relief of Apollo, and the Society of Arts awarded him a gold medal for an original composition, "Pandora brought to Earth by Mercury." Mr. Hughes emigrated to America in 1829, and executed a large number of works in the States, some of them of great excellence. M. Charles Méryon, the famous French etcher, who died also in the beginning of March, was principally known by his admirable etchings of Parisian streets and buildings. Towards the close of this month was announced the demise of Bernard Mhlenin, a distinguished miniature-painter, of Dublin, and president of the Royal Hibernian Academy; as also of M. Poot, the veteran historical painter, of Paris, aged 82. He obtained the first prize of L'École des Beaux Arts with his "Mort de

Jacob," so long ago as 1813. Herr Vandernael, the eminent architect, of Vienna, died in April, and Mr. Carmichael, a well-known English landscape painter residing at Scarborough, in May. The end of this artist was painfully sudden. He had been out walking, and on his return to his studio was seized with a fit, which terminated fatally in a few minutes. Mr. Carmichael was 68 years of age. At the close of May we had to speak of the death of John Burnet, engraver, painter, and writer on art, the friend of Sir Walter Scott, and of Wilkie and Allan, the painters. A descendant of the famous Bishop Burnet, he was born in Edinburgh in 1785. His engravings of Wilkie's pictures are well known. Many of his engravings are from Burnet's own pictures, or illustrations of his own books. Among the former are "The Greenwich Pensioner," the original of which was purchased by the Duke of Wellington; "Feeding the Young Bird," "The Draught-players," and "The Mouse." His literary works include, "Hints on Painting," "Landscape Painting and Oil Painting," and lives of Rembrandt and Turner. Louis Royer, the celebrated Dutch sculptor, died at Amsterdam, on the 5th of June, aged 75. This day month (on the 5th of July) Italy lost Giovanni Bastianini, a young sculptor of undoubted genius. He produced busts in terra-cotta of marvellous truthfulness and grace: of one of which at the South Kensington Museum we have recently spoken. Unfortunately for his reputation, his price being high, his line of labour was confined to the pseudo "antique;" that is, presenting as ancient works the productions of his own hands, washing the marble of his busts and statues with tobacco water until they became so discoloured, that even the most suspicious could not pronounce with any degree of positiveness, by merely looking on them. Bastianini was the son of a poor stonemason, of Fiesole, and began life as a worker in the quarries. Through the patronage of the Chevalier Inghirami, he learned the rudiments of the art of sculpture, and afterwards was employed at a small remuneration by Freppa, a well-known dealer in curiosities, to execute for him those works in terra-cotta which have since found their way into great national collections as the recovered masterpieces of Early Italian art. One of them, the celebrated bust in terra-cotta of Benivieni, which was bought for a trifling sum by the Florence dealer, and afterwards sold for 13,000 francs, at a public auction in Paris, is now deposited in the Louvre. This promising genius fell a victim to typhus fever, in Florence, at the early age of thirty-eight. America had to lament one of her most widely known painters, Emanuel Lentze, who died of congestion of the brain, at Washington, on the 20th, aged fifty-two. He was of German extraction, and became a pupil of the famous painter Lessing, of Dusseldorf. Lentze produced a series of pictures from English and American history, which are remarkable for their character, spirit, and fidelity. Among the best of his earlier works may be mentioned "The Court of Queen Elizabeth;" "Henry VIII. and Anne Boloy;" "Cromwell and his Daughter;" and the "Tea-noclast." Of his paintings representing subjects taken from American history, the most important and popular are "Washington at Monmouth," "Washington crossing the Delaware," "Sergeant Jasper," "Washington at Princeton." All these works are widely circulated throughout the United States; and though the last named may be said to be the most popular among art critics, engravings of "Washington crossing the Delaware" can be seen in almost every cottage in that country. At the time of his death Lentze was engaged on a large cartoon representing "Civilization," to be painted in one of the panels of the Senate Chamber at Washington. Our own country lost an unusually large number of distinguished professional men this month. The versatile and accomplished artist, George Honsman Thomas, was snatched away suddenly at the age of 44; and George Cattermole, in his 68th year. In the death of Richard Hassall, South Kensington lost one of its chief designers and sculptors, a man of great promise. Another designer and modeller at Kensington, Mr. Gibbons, was accidentally drowned. James Thomas Hixon, the water-colour artist, died of consumption, at the island of Capri, in the Bay of Naples. He had recently been elected an associate of the Institute of Painters in Water-colours, and exhibited four drawings at its last exhibition. Mr. Hixon was only 32. In August Cicéri, the great French scene-painter, passed away full of years and honours. His career was curious.

Having begun life as a musician, he used, at fourteen, to play his part on the violin in the "Séraphin" orchestra. Subsequently he took to painting, under one of the architects to the king, and ended in being the most eminent artist in his line. As far back as 1810 Cicéri, by order of King Jerome, restored the great theatre at Cassel, and in 1825 he superintended the coronation festivities of Charles X. The decease, on the 25th of this month, of Charles Elliott, deprived America of her most distinguished portrait-painter. He was the son of an architect, and was born in Scipio, New York, in 1812, where he studied art under the well-known American painter, Trumbull. Also in August died Professor John Millington, an English chemist of reputation, in the United States, aged 89. He was a practical miner, and in early life was associated with Macadam, the celebrated road-maker. George Maccallum, a young Edinburgh sculptor of much promise, pupil of Brodie, R.S.A., and afterwards assistant of Steel, her Majesty's sculptor for Scotland, was cut off suddenly in the beginning of September, in his 27th year. On the 15th, E. H. Wehnert, a clever and popular artist, several of whose works have been engraved, died at Kentish-town, aged 54. He was closely followed by Hippolyte d'Orschwiller, the French painter, about the same age. Next, Antonio Vechte, the *repousseur*, passed away, to the regret of all who are interested in art-workmanship. This accomplished craftsman and able designer was born in France in 1799, and lived in this country for a number of years. His works now enjoy a European reputation; but few men have made a nobler struggle for recognition than Vechte. On the 27th of October, the death was announced of Herr Edward Hildebrandt, a distinguished landscape-painter of Berlin.

Other names besides those we have enumerated deserve record—of individuals who have departed during the year, less distinguished or less known, perhaps, than the above, but whose useful labours in the cause of science, art, and architecture are nevertheless not without interest to our readers. Among architects we have lost George Guillaume, of Southampton, who died on the 15th of February. He enjoyed a high provincial reputation for nearly thirty years, and, in addition to numerous works in ecclesiastical and domestic architecture which he designed and executed, Mr. Guillaume was an able writer on architectural subjects, and a man of no mean powers as a mechanical inventor. On the 23rd of May Mr. Pritchett, architect, York, closed a useful life at the venerable age of fourscore years, having been in actual practice on his own account for the long period of 55 years. In the end of July William Clephane, architect, of Stockton, died; and about the same date, after a long and painful illness, as our readers know, George Rowden Brnell, in his 64th year. The other day we announced the death of John Burlinson, who for a quarter of a century was the confidential and valued assistant of Mr. G. Gilbert Scott. Several able engineers have also disappeared from our midst, including Thomas Duncan, the water engineer to the Liverpool Corporation. His death happened also last month. The Society of Arts has lost one of its oldest and most valued members in Harry Chester, who will be missed from the councils of that and various kindred associations. Nor ought we to omit the name of Channoy Hare Townsend, who departed at a good old age in February. He was an elegant poet, an accomplished musician, and a skilful painter. But he will be chiefly remembered as a collector of works of art, of rare judgment and exquisite taste, and for having with equally rare liberality bequeathed his venerable collection to the South Kensington Museum for the benefit of the public.

Since this notice was written Mr. George Lowe, the well-known gas engineer; Mr. Edward Goodall, engraver and father of painters; and Mr. Abraham Cooper have left this life. Abraham Cooper died at Greenwich on Christmas-eve, aged 81. This notable painter was born, we believe, in Red Lion-street, Holborn, and sprung from a very humble position. His first exhibited picture, "Tam O'Shanter," sent to the British Institution well nigh sixty years ago, was purchased by the Duke of Marlborough. Mr. Cooper has been ever since a constant exhibitor both at the Royal Academy and the British Institution. His works consequently are very numerous, and he painted too long for his fame. Among the principal are "Blincher at the Battle of Ligny," "Cromwell at Marston Moor," "The Death of Harold," "The Battle of

Assaye," "The Battle of Shrewsbury," "The Battle of Waterloo." He was elected an associate of the Academy in 1817, and R.A. in 1820.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE HOLY LAND.

The fortnightly general meeting of the above Institute took place on Monday evening, the 4th inst., Mr. James Edmeston in the chair. Mr. John Clarkson, of 36, Great Ormond-street, and Mr. Thomas C. Ebdy, of Darham, were balloted for and elected associates of the Institute. The decease, on the 16th of October, at Hong Kong, of Mr. John Clark (member), formerly of 2, Great James-street, Bedford-row, was announced by the chairman.

A communication from Professor Donaldson, giving a hasty sketch of that gentleman's visit to the Holy Land, with passing remarks upon the intermediate places visited; by the Professor and his party, was read. It was in the form of a letter addressed to Mr. C. C. Nelson, and was couched in the characteristic graphic style of the writer. Speaking of his visit to the Suez Canal, Professor Donaldson states—"The southern portion between Ishmaella and Snez is excavated to half its depth only, and one harbour at one mouth has to be completed. It is a marvellous realization of a prodigious project, and does justice to the daring of its projectors. As you steam along its channel 300 feet wide, with sufficient depth to receive the largest merchant vessel, you cannot but feel impressed with the extent of this great sea-channel. But its maintenance [continued the writer] will be the greatest difficulty of all: to preserve the depth from being choked up by the sands, whether along the canal itself or in the port, is even now a matter of anxiety and care. While we were upon the spot a French vessel of war was expected, and they were employing many gigantic dredgers to secure a channel. In the basin of the harbour there were several vessels of considerable size. The piers to enclose the harbour of Port Said are constructed of enormous blocks of concrete, a couple of metres or more in each direction thrown over and left to take their places *à la nature*; but it has been found that this will not do, for the waves force themselves between the crevices and interstices with such force as to move them, and they are now considering how to produce more cohesion between the blocks than by their mere weight; and if they are obliged to adopt the combination of the masses by regular construction, as in our Dover pier, it will cause an enormous expense, for the dykes or piers extend out miles into the Mediterranean." From Port Said the party proceeded to Jaffa, in an Egyptian coaster, the journey thence to Palestine being continued on horseback. Jerusalem was reached in a day and a half. "Jerusalem itself," writes Professor Donaldson, "caused me the greatest disappointment and pain. It is a vast store for religious traffic, occupied by religionists of every shade of Christian doctrine, each scrambling and fighting for the pre-eminence. . . . Each sect seeks to appropriate as specially its own this or that spot as the true site of each sad event in our Saviour's life. The Holy Sepulchre could never have been where its representation is now located; but Latin and Greek, Armenian and Copt, fight and scramble on the soil, and the Turk, as guardian of the sacred spot, as it is supposed to be, is obliged with bastinadoes to keep the furious superstitious antagonists in order." The sanitary condition of the city was described as the worst possible; for it is without sewers, and is supplied with water from cisterns which receive the surface waters, too often impregnated with cesspools and drains. The architectural features are few and difficult to trace. The structure most deserving of notice is the new dome to the Holy Sepulchre, nearly completed, the entrance being decorated with paintings which were described as being of too pale a tone to be effective.

The Holy Sepulchre itself was mentioned as a most dramatic assemblage of churches, chapels, oratories, and sanctuaries; some on the general level, others going up, several going down into the rocky caverns, and with the ceremonies of the various religionists carried on at the same time the mind became bewildered, "and one wondered whether this could be a true temple for the worship of the living God, or a very Bahel or Hense of Baal for the sacrifices of superstition."

Jericho, Bethlehem, and Samaria were in their turn visited. The main tour in the Holy Land occupying the party three weeks. Hardly any traces of Jewish buildings remain, but there are some noble ruins of the times of the Herods and the Romans. Two days' ride from Caesarea Philippi brought the party to Damascus, "one of the world's Paradieses of the Turk and Moslem." Thence a portion of the party visited Balbek, and after an examination of the stupendous ruins there, were joined by their friends, and proceeded thence to Athens. The Professor is now on his way home, and will, no doubt, on a future occasion communicate to the Institute an account of his subsequent trip.

Professor Kerr took occasion to call attention to the subject of the New Building Act about to be brought before Parliament, and expressed a hope that before any decided step was taken on behalf of the Institute on so important a measure, a general meeting would be convened by the council.

Mr. Seddon said the subject had been under the notice of the Professional Practices Committee, and a series of resolutions on the Bill had been drawn up by Mr. Digby Wyatt, which had been referred to a special committee. The last action taken in the matter had been to request Mr. Chas. Barry and Mr. Marrable to confer with Mr. Tite, the president of the Institute, who had charge of the Bill in Parliament with respect to several of its more important provisions.

The paper appointed for the evening was "A Descriptive Sketch of the New House at Innewood, county Wicklow," by Mr. White. Illustrations of this structure, with a description, having appeared in the last volume of the *Builder*, it is unnecessary to repeat the particulars which constituted the paper laid before the Institute.

A brief discussion followed the reading of the paper, in the course of which additional particulars were furnished by the author with regard to the construction of the flat of the roof, being in this instance of cement and tile, in contradistinction to lead—an experiment which the architect believed would be successful in all respects. The arrangement of the gutters, which was of a peculiar and novel character, was also the subject of conversation.

In reply to inquiries, Mr. White said he had omitted to give the details of the construction of the central flat between the two main roofs. This, he said, was effected by a course, first of all, of Staffordshire red tiles laid upon the joists, with a fall sufficient to carry off the water. Then followed a course of slates laid dry; upon these was a layer of cement, and upon that a course of plain tiles, likewise jointed in cement, so that there were three courses of tiles and one course of slate, with a body of cement between, which, in his opinion, formed an excellent and permanent flat, more durable than lead; the objection to the latter material being the frequent repairs required. The surface of the flat was of tiles, and he considered the cost of that mode of construction was not much beyond that of lead. The total cost of the building was 15,000*l.*, including the stables, &c. He added, that the joinery work was undertaken by an English contractor, who had sawing and planing mills in this country, and the work was sent out ready to be fitted together on the spot.

LEEDS.

Sanitary Progress.—An increasing death-rate has long given rise to a feeling of uneasiness respecting the sanitary condition of Leeds, and the arrangements for preserving the health of the town. Many improvements, involving a heavy expenditure, have been carried out, and others equally costly are projected with the view of removing the causes to which epidemic disease and premature death may be traced. Confined localities have been opened up, and stagnant atmospheres rendered comparatively harmless by admittance with purer air; foul privies and pestiferous cesspools have been swept away; unhealthy dwellings have been either closed or brought to a better condition; the habits of negligent and slovenly householders have been corrected as far as is possible; and the sanitary state of the town has been further improved by scavenging and a main drainage, so far as the latter has been carried out. But while much has been done to promote the public health, there are still many adverse influences at work. Not the least potent of these are the back-to-back houses which con-

stitute so marked a feature in the domestic architecture of Leeds; all with cellar kitchens, some so much below the level of the street as to render them as unfit for human habitation as diminished light, damp and steaming walls, and imperfectly-trapped sinks can make them; while the peculiar plan of such dwellings renders a thorough ventilation of the sleeping-apartments a problem which the opening of windows seldom succeeds in solving. The operations of speculative builders also have not been favourable to the hygienic condition of Leeds. Streets have been run up, and footpaths and roadways left in the state in which the carriage of building materials, the digging of foundations, and the laying of gas and water pipes have left them. Happily the disgusting aspect of the backs is being rapidly changed. The backs which have already been improved are Dow-heck and Hol-heck, the works connected with the former having been completed, while the greater portion of Hol-heck has been finished, and additional powers are sought by the corporation in the Improvement Act Amendment Bill, of which notice has been given, to enable the backs committee to undertake the remainder. All that has been done up to the present time in reference to Sheeps-crook has been the removal of a large quantity of the mud which had accumulated in its bed; but it is expected that its turn for improvement will come before long. The excellent effect which the works have had, so far as they have proceeded, fully justify the anxiety of the backs committee to push them forward; and, in what has been done, their views have been ably carried out by Mr. A. M. Fowler, the borough surveyor. The first improvement contract which the corporation intend to let in the spring, embraces that portion of Sheeps-crook or Lady-heck extending from Nether Mills, on the river Aire, to Broadhead's Mill, in Mabgate; the next contract will take in the part extending from the last-mentioned mill to Woodhouse Carr. It is not proposed to cover over the large streams, such as Sheeps-crook and Hol-heck. The watershed of Sheeps-crook is upwards of 12,000 acres.

The new Hotel.—The new Central Station Hotel, mentioned by us some time ago, has during the past eighteen months sprung up in one of the busiest thoroughfares of the town. It is being erected by the Great Northern Railway Company. The directors invited a limited competition, and the plans of Messrs. M. E. Hadfield & Son, of Sheffield, being chosen, the necessary drawings and contracts were prepared. It was at first intended to erect the hotel upon the precise spot of the old Wellington Inn, but the great disadvantage of having to cross Aire-street suggested the possibility of removing that street, and so placing the hotel in direct communication with the station. The result shows the change to have been most desirable, and the hotel, as it now stands, may be said to present four fronts, with ample streets for light and air on all sides, whilst the broad and spacious railway corridor will afford a passage in all weather from the carriages to the interior of the hotel. The style of architecture chosen may be described as "Romanesque," studied from the domestic buildings of Germany and Lombardy. The general outline of the exterior is well defined by four pavilion roofs of high pitch which spring from the general cornice, thus surmounting the formidable difficulty of the square block which the site imposes with reference to architectural effect. The building occupies a site of about 160 ft. by 90 ft., the principal, or entrance, front being towards Wellington-street, but the façade opposite the station, being of greater extent, presents a more striking elevation. The hotel is very nearly completed, ready to receive its decorations and furniture, which it is proposed shall accord with the style adopted for the architectural details of the building, colour being freely used wherever it can be made useful in heightening the effect of the interior. The contractors are Messrs. Shafoe & Barry, of York, and Mr. Daniel Falcher has acted as clerk of works. The stone carving of the exterior, with exceptions, is by Mr. Earp, of London, and has been executed from the architects' sketches and direction. The tile pavements are by Messrs. Maw, of Broseley. The marble chimney-pieces and stove-grates have been supplied by Messrs. Dennis Lee & Welsh, of Leeds; and the metal balconettes and staircase balustrade by Messrs. Longden, of Sheffield. The hot and cold water service, hoist, heating, bells, gas-fitting, kitchen range and cooking houses, &c.,

have been fitted up by Messrs. J. & C. May, of London; and the Vieille Montagne zincwork of the roofs has been executed by Mr. Fox, of Limehouse. Messrs. Garlick & Son, of Leeds, have executed the plastering.

WORKS OF UNKNOWN ARTISTS.

THE FAIRFORD GLASS.

In commenting on some similarities between the Dantzig picture and the Fairford west window in the *Standard* of October 8th, I remarked that the picture was by H. Van der Goes. In your journal, on the other hand, Mr. Weale's authority was quoted in favour of Dierich Stuerhonts. This led me to ask Mr. Weale if he had made any more recent discoveries than those with which I was acquainted, and he tells me that the story of his having discovered the Dantzig picture to be by "Boots" is a canard invented in Berlin about April 1st, and thence copied into some English papers. This will account for the error. The coats of arms on the back of the picture and other evidences (which, I believe, Mr. Fuller Russell is about to publish) make the testimony in favour of Van der Goes as the artist very strong. Enough, I think, has been said and written against the attribution to Dierich of the Fairford windows; and it is very palpable to any person conversant with the art of the fifteenth century, especially in glass, that he could neither have painted nor designed the whole of them, if he did any.

After some months of research in various ways for a clue to the artist, I was looking again over the Brussels gallery in company with Mr. Weale, and came across a picture which *prima facie* so resembled the Fairford work that I was arrested by it. On examination, I found much corroboration of the identity between the artist of the east windows of Fairford and the picture before me. The picture is numbered eighty-four in the catalogue, and is a representation of the Crucifixion; with other scenes in the background. I give some of the most evident points of similarity:—

First.—It has the A of the Fairford work, on a blue banner, on the dexter side (not the A of Albert Durer, or Aldegrever, as given in the article in the *Gentleman's Magazine* by Mr. Tom Taylor).

Secondly.—Our Lord on the Cross has the same style of floriated nimbus.

Thirdly.—It has the good and bad angels over the thieves.

Fourthly.—The plumed and rough wood crosses.

Fifthly.—Arrangement of hair on angels' heads, plain to the ears and then commencing to curl, and the manner of their draperies nearly identical.

Sixthly.—The face and figure of the Blessed Virgin with her costume very similar in character, &c.

Seventhly.— Armour and costume alike.

Eighthly.—The same sentiment, tone of colour, and style of composition mark both works.

The artist seems to be amongst the unknown, or rather as yet no name has been identified with the work, either by the connoisseurs of Germany or Belgium. At one time the picture was attributed to Aldegrever, on account of its signature. This every critic now acknowledges to be a mistake, and I have some sketches from glass designed by that artist, which bear no resemblance whatever to the picture. It was once also, I am told, attributed to Durer. This was found to be as untenable as his claim to the Fairford work, and affords a capital parallel; in fact, if Mr. Holt can identify the picture as Durer's, to my ideas he will have gone a great way to prove the glass also to be his, and *vice versa*. It was in the collection of M. Weyer, of Cologne, and sold at his sale to the Brussels Gallery at the same time as the beautiful *Mentling* was purchased for our own National Gallery. There is a long notice and description of it in the account of Mr. Weyer's collection, a work useful to every picture collector. I translate the following portion for the benefit of your readers:—

"This composition is very remarkable. The groups, especially the cavaliers to the right of the Cross, and the Holy Women, are disposed with great ability, and show the original genius of the author. If the drawing falls short in its anatomical proportions (the heads being large and the arms short), the draperies and details leave nothing to be desired. The colour has a marvellous brilliancy, dazzling in its splendour, and the deep sentiment that reigns throughout, makes this picture worthy to occupy a high rank amongst the productions of the school of the 'Bas Rhin.' At the commencement of the present century it ornamented the church of Richterich, near Aix la Chapelle, when from ignorance of its value it was sold to General Ruhl von Lillenstein, who left it to the Minister von Schleitens, from whom M. Weyer purchased it."

* Its title is, "Notice sur la Collection de Tableaux anciens faisant partie de la Galerie de M. J. P. Weyer," &c. &c. Par W. H. J. Weale. Bruges. Louvain: Barthes & Lowell.

Mr. Weale, at Mr. Weyer's sale, tried to persuade Sir Charles Eastlake to purchase it for our gallery. Sir Charles, however, did not think it the class of picture desirable. And it was sold to the Brussels Gallery for the trifling sum of 185*l*. In a letter received but a few days since from Mr. Weale, to whom I had shown some drawings of the Fairford work, occurs the following remark:—

"Since I saw you I have seen the carved retables of Verney now at Tongres; the canopies are of a similar design to those at Fairford. I have no doubt that the artists who executed the Fairford work [by some of it], belong to that part of the Netherlands. Richterich is between Aix la Chapelle and Hertzogenrath."

These contributions will be, I hope, useful to those who, like myself, take an interest in the works of unknown artists, and their name is legion, for the works identified with their authors bear a small proportion to those not recognized or of doubtful attribution.*

N. H. J. WESTLAKE.

THE STAIRCASE IN HAMILTON PALACE.

Sir,—Allow me to correct your correspondent "J. S. R." in some of his statements about the staircase in Hamilton Palace, "built entirely of black marble."† He says that this "is not the principal one in the palace, and that it was erected by the late duke." It was erected by the late duke's father, viz., Alexander, the 10th Duke of Hamilton, who made the latest additions to it, and it is the principal staircase in the palace; but to one not acquainted with, and getting perhaps a hurried look through, the house, such a mistake might easily arise.

The older portion of the palace forms three sides of a quadrangle, the entrance-hall being on the ground-floor, with the entrance-door in the centre of the inner face, facing the east. On this floor, also, were the principal rooms. The addition faces the west, and this became and is now the main front of the palace. In the centre of this front, and on the first-floor level, is the new entrance-hall, approached through a portico on the same level, and reached by a double flight of steps, somewhat like Blenheim. All the state-rooms are on this level, alongside the new entrance-hall to the north, and its use is this. Should visitors be set down at the western entrance, instead of ascending by exposed outside stairs leading to the portico, in wet weather, they go inside at once, to a lower hall, communicating with the old one on the same level; and if arriving by the old entrance, the black marble stair becomes the main approach to the principal floor, the steps being only carried up to this level.

The staircase, instead of being of black marble, is lined with a warm-tinted and beautifully veined freestone; so also is the new entrance-hall. The latter magnificent apartment, the floor of which is laid with coloured marbles, is the whole height of the principal and bed-room floors; while the staircase has the additional height of the ground-floor.

The masonry of these two apartments is of the most exquisite kind. Not only the faces of the stones, but the top and bottom beds and end-joints also were polished; and instead of this being done in the usual way by rubbing them with the polisher, the parts to be polished were laid on the polisher, and in this way rubbed until they were perfectly true.

The steps of this stair-landing, balustrade, and skirting, are of polished black marble, as also are the jambs of the doors at either end of the landing, the one leading into the new entrance-hall, the other into the state bed-rooms. The landing is supported by two Atlantes, I forget whether of bronze or marble. I think, speaking from recollection, that the steps at the centre flight are 8 ft. long, and the return ones 6 ft. The steps are moulded on the back and all polished. The balusters are carved, and stand on a moulded base, raking with the steps.

With regard to the cost of this staircase and stair, I think no one could possibly give a guess. The freestone was from one of the duke's own quarries. The workmen were in his own employ and paid by the day. The workmanship had to be of the best, and the men were allowed their own

* As respects the Fairford windows specially we have received a number of letters, including one from Mr. Martin Underwood (with various drawings, both from Fairford and Nuremberg), and a further communication from Mr. J. G. Waller. We must, however, wait for a fitting opportunity to bring the matter forward again with the prospect of a useful result.—Ed.
† Vol. xxvii, p. 948.

time. As the lower portion of the walls of the staircase is chamfered rustic work, and every arris had to be perfectly true, no idea can be formed of the cost of this part of the work. The steps, plats, and balusters were contract-work, and I think were executed in London. I cannot believe in a single baluster costing 27*l*. for the polishing; but the entire cost of one might reach that sum or even more.

To satisfy your correspondent "K. K." as to the date of erection, I may state that I was engaged at intervals at the drawings for this staircase and other parts of the house, while in the office of the late David Hamilton, of Glasgow, who was architect to the duke (see his obituary notice in the *Builder*, vol. i, p. 537) from 1837 till his death in the end of 1843, at which time it was not quite finished.

I suspect "J. S. R." has mistaken the stair known as the duchess's (also a very fine one), for the principal stair. It is so to the bed-room floor, but it is not the principal stair in the palace. JOHN BAIRD.

ST. PANCRAS INFIRMARY.

This Infirmary is now being erected at Highgate on a site containing about 3½ acres of land. On the highest or north side of the ground is placed the central or administrative block, extending from north to south. In the front portion are placed the porters' rooms, and immediately joining them are the male and female receiving-rooms, with water-closet and bath in each. Right and left of these are the dwellings of the resident surgeon and assistant surgeon, and matron, with bed-rooms, &c., in the floor above. On the other side are the Board and waiting rooms, with lavatory attached. The matron's linen-room, &c., are on this side also.

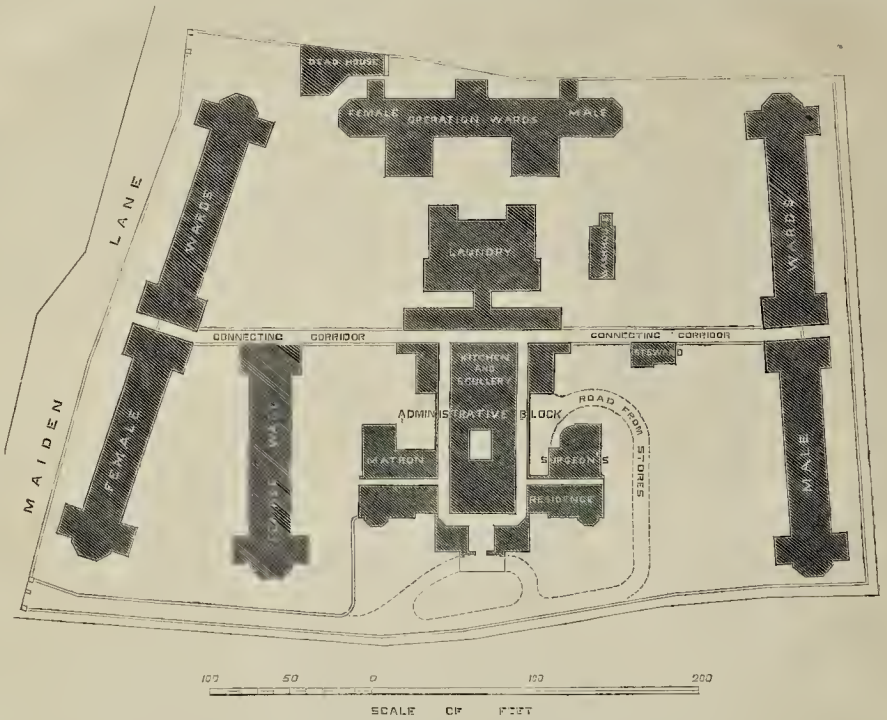
The centre is occupied, as will be seen from reference to the plan, by the store department, with steward's office overlooking. By the natural fall of the ground ample space is obtained for wine, beer, and other cellars beneath without excavation. The kitchen, scullery, and larders are adjoining, and occupy the centre of the entire range of buildings.

On either side of the corridors are the steward and male servants' mess-rooms, and the matron's and female servants' mess-rooms. The steward has a separate and a distinct house on the right of the main building, overlooking the entrance to the stores. The dispensary and operating-rooms are situated on the side of the intersecting corridor, between the male and female block; on the other side of the door dividing the cross corridor is the boiler-house, with stairs to coal-store below. A patients' clothes-store is close at hand here, entered from the covered way outside the building, which leads to foul wards.

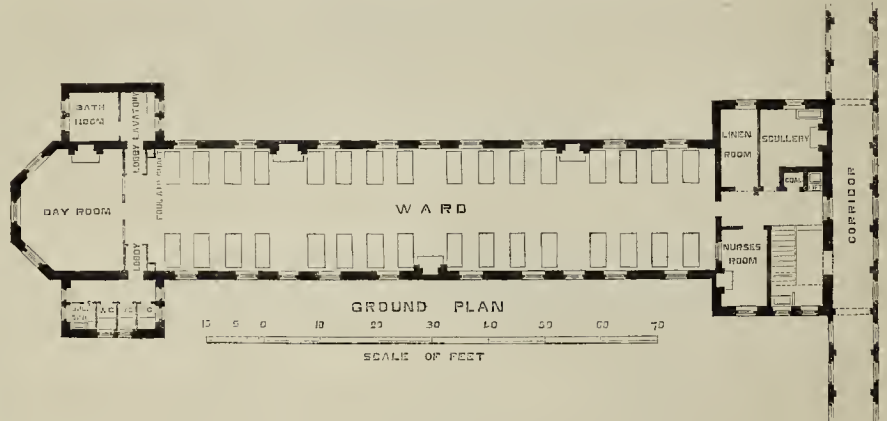
The laundry is approached by steps necessitated by the fall of the ground; these steps are divided in the middle from the male and female sides. Dry-houses for drying the clothes are provided for, and in addition a spacious drying-ground adjoins the laundry. All these buildings are lofty, and ventilated by top draughts. Beyond this laundry, and entirely detached from the rest, is a wash-house for foul linen, with fumigating-room, under which is a large tank for storage of rain water. W.C.s and urinals in convenient positions are placed throughout the buildings.

The patients' blocks are placed on either side of the main block—the three blocks for females on the left, the two for males on the right. Accommodation for 256 females is provided in two wards of three stories each and one of two only—32 beds in each ward. For male patients there is one block of three floors and one of two, providing for 160 patients. The wards are 22 ft. wide and 13 ft. 6 in. clear height, and are lighted by windows on either side, reaching within a foot of the ceiling; the upper part of the window is made to fall open for ventilation. Open fireplaces are used for warming, the air before passing into the wards being heated by circulation round the stoves. Each ward has a staircase, with nurses' room overlooking ward and ward scullery, sink, and lift from corridors below for linen, food, &c.; a linen-store and nurses' W.C. at the one end of it, and shtes and dust for foul linen. At the other, on one side are a bath-room and lavatory for patients, and W.C.s in the other, thoroughly ventilated by through draughts. At the extreme end is a day-room for the use of convalescent patients, with easy access from ward.

ST. PANCRAS INFIRMARY, HIGHGATE.



Block Plan of the whole Establishment.



Plan of One of the Wards.

The four wards are entirely isolated, and contain accommodation for 54 patients of each sex, or 108 in all. They have lavatories, W.C.s, nurses' rooms, and sculleries for each particular class.

The dead-house is at the south-east corner of the ground, with the necessary *post-mortem* rooms, &c., and removals can be made without the necessity of going near the main buildings.

The staff of nurses will, we understand, be provided by the Nightingale Training Institution.

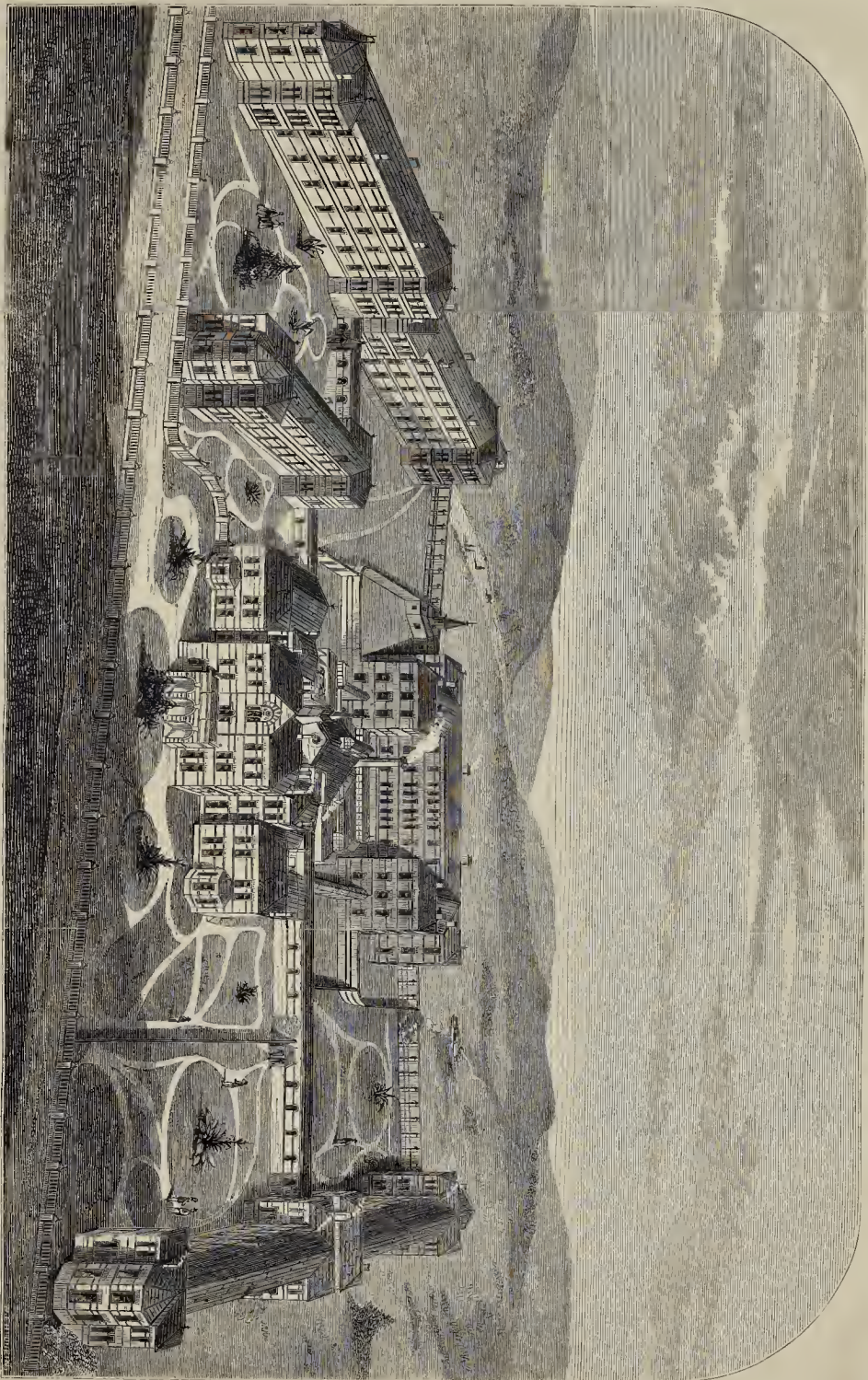
This infirmary is being erected for the St. Pancras Board of Guardians, of which Mr. W. H. Wyatt is the chairman, from the designs of Messrs. John Giles & Biven. The contractor is Mr. W. Henshaw, whose contract amounts to 36,000. The clerk of works is Mr. Culverhouse.

THE STREET SIGNALS IN WESTMINSTER.

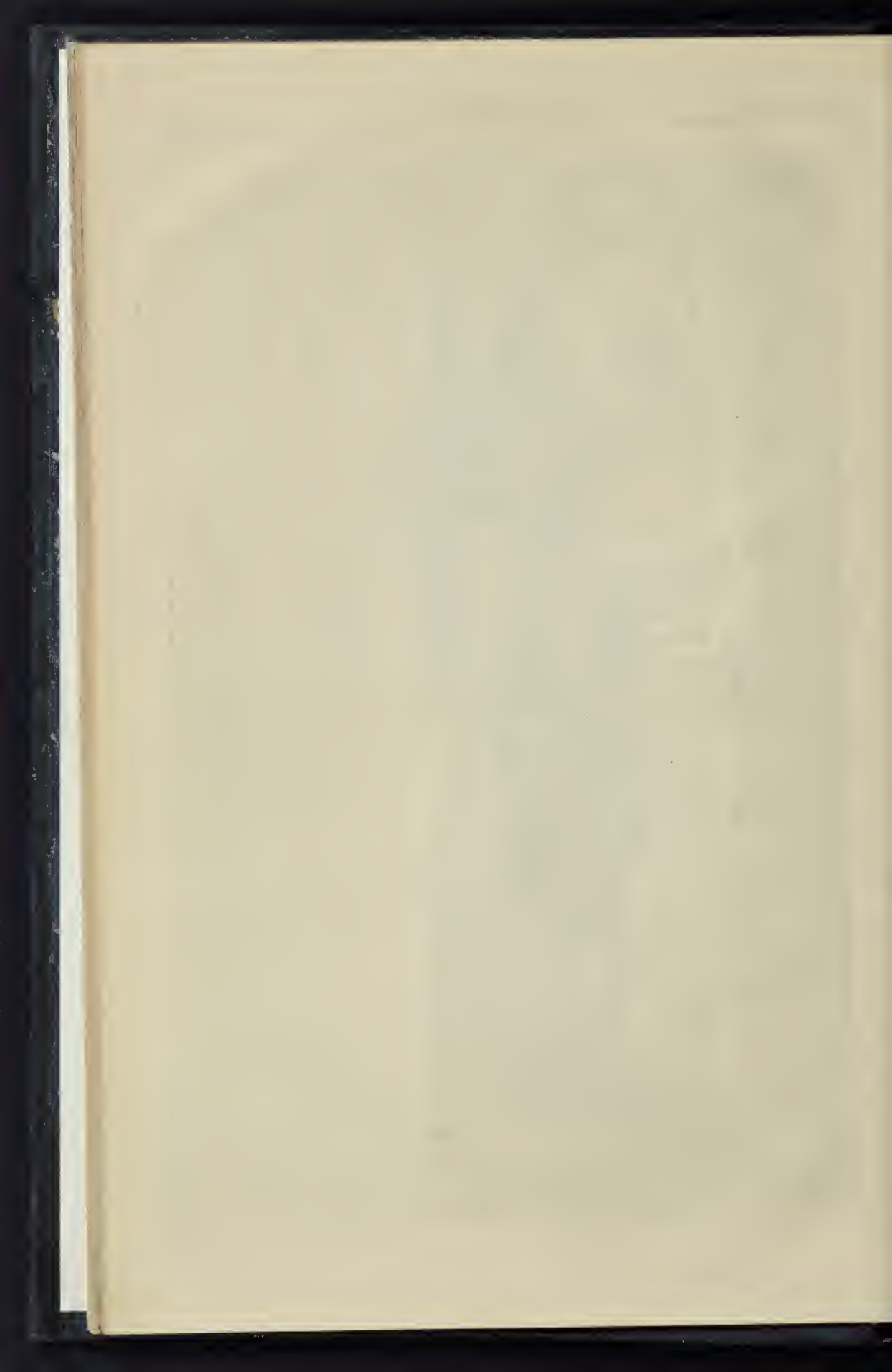
The police report favourably of the working of the Semaphors signal pillar, recently erected at the corner of New Palace-yard, Westminster. The pillar has had the misfortune to sustain two accidents from gas explosions, for which its designers, or makers, are in no way chargeable. It appears that some of the mains near the pillar are in such a state, that the gas escapes freely from them, to saturate the earth, or escape how it may. A quantity of this leaked gas found its way into the hollow signal pillar, and caused a violent explosion on Saturday night, when the constable opened the small door with the intention of turning off the gas from the signal lights. The policeman had not any light, but the gas

probably ignited on the admission of the air, the lights never being quite extinguished. Pending inspection and repair of the mains, an attempt is made to protect the signal pillar by loosening the road round its base, that the gas leakage may be discharged into the atmosphere, and not allowed to accumulate in the cast-iron signal pillar, which is nearly air-tight.

A Statue of Grattan.—A movement is about to be set on foot for the erection of a statue in College-green, Dublin, to the memory of the illustrious Henry Grattan. The site will be opposite the building which was the scene of the orator's triumphs, and in the immediate vicinity of Foley's statues of Burke and Goldsmith, in front of "Old Trinity."



ST. PANCRAS INFIRMARY, HIGHGATE.—MESSRS. JOHN GILES & BYER, ARCHITECTS.



ROAD MAKING.

Sir,—Notwithstanding the attempt at logic and argument of "Pro," I am still of opinion that a strong foundation of concrete, &c., (which he admits in places) is a *struqum non* in making or renovating a road; and I think instead of carrying out the plan as advocated, of sprinkling over the surface just a stone thick, it would be better, in most cases, and great economy, to completely renew the road-surface, put in a good foundation, and cover the surface with the best and strongest stone that can be procured, properly prepared, and carefully laid on, and we should hear little of bad roads.

I have known roads so constructed of a pitched foundation covered with a 6-in. coat of Hartsill stone, last for six years without applying fresh material, under the heaviest traffic of any road out of London, and the broken stone that was prepared for its renewal had become covered over with grass in the depôts. That shows the advantage of a well-made road in the first instance.

If "Pro" wishes to know the expense of repairing roads in the neighbourhood of London, that might be obtained from the Secretary of State, who receives the annual returns of expenditure, &c., on every trust, and these are fully and fairly made out, and are trustworthy data for those who are anxious to acquire information on the subject.

"Pro," who appears to be a new shining light, seems to think that all that has occurred before his advent is chaos and confusion worse confounded, but he labours under a slight mistake. Certainly we are not improving so much as we ought from the precepts and examples of our predecessors, simply because we are too prone to endeavour to establish a standard of our own.

For instance, "Pro" advocates the use of hot coal-tar, &c., as a panacea of all the ills applied to the loose coating of stone spread over the surface by means of an old water-cart, constructed on low wheels, and afterwards rolled.

The application of gas-tar and pitch to road surfaces "Pro" must understand is not new. In 1842 I used it at Nottingham, and it is used in many places; but it is not applied in the manner proposed: indeed, it would not be practicable. The stones are first properly broken, and the tar and pitch are spread over, and mixed amongst them in the heap, and the heap is turned over and over, so that every stone becomes more or less covered with the tar and pitch. The material is then applied to the road surfaces, and consolidated in the usual manner. But I have found in practice that, in the first place, it is not cheap, being more expensive than "binding;" it does not stand up to the durability of the roadway, because in all the summer months the heat sets injuriously upon it, softens it, and produces friction and abrasion amongst the metal of the roadway, and forms, in addition, a very soft, elastic, and yielding surface for the draught of carriages, and therefore adds seriously to the force of traction.

As to moisture or rain penetrating the crust of a well-constructed roadway, it is not the fact except when it is only a stone thick: with proper curvature the rain runs off. I have broken up old roadways in large blocks, thoroughly consolidated and cemented together, that were difficult to separate, and moisture could not penetrate, except slightly at the surface; so that the argument about moisture percolating through falls to the ground.

"Pro" condemns my 12 in. of material put in one coat, and yet in another place he recommends slag or cinder for a foundation, 6 in. or 8 in. thick (just as I applied the 12 in.); but this thickness is insufficient for heavy traffic, even if protected with the heavy coat of 2 in. as top covering!

If cinders are not to be had, he suggests 3-in. zones, 6 in. or 8 in. deep, covered with the fressad coat of 2 in. These will not act as proposed, as they would inevitably work up to the surface, and form a rough road, and would not require lifting to make a smooth surface. As to my remarks about lifting, "Pro" mistakes me. If an old roadway had rough stones, if many inches deep, I should just lift or clarify the surface, without disturbing the foundation, so as to improve the cross section, and kick out the large stones; then I should break and add to them additional metal, so as to strengthen the surface, and not lift and take

out the rough stones, break and apply them to another part, as is sometimes the practice.

I have lately had several opportunities of examining the street surfaces of some parts of the metropolis, and I must say I do not find much improvement in the mode of repairing them. The Poultry, in which so many experiments have been made, is still far from being a perfect street surface. The cross section is too flat and defective; it is sunk in holes in places where mud and water accumulate in wet weather. This, I believe, arises originally from a defective foundation, and the imperfect way the stones are set, and perhaps the quality of the stone may have something to do with it.

In extending my observations westward I found them most properly breaking up the Macadam road at Charing-cross, and substituting for it a pavement.

They were using a foundation prepared of concrete, and upon that they were laying sets of apparently good depth and suitable thickness; but I do not quite approve of the plan adopted, nor do I believe it is one calculated to make a strong and durable roadway.

The concrete did not appear of sufficient thickness for such a thoroughfare of heavy traffic, and the ballast of which it was composed was too fine, as coarser ballast would make a stronger and more durable concrete for such a purpose.

The sets are also placed in transverse rows, close together, and the joints filled in with fine concrete in the form of grout; and this I consider a defect in the mode of paving, as I believe an open transverse joint of 1 in. or 1½ in. wide, well and solidly crammed full of gravel or ballast, would form as good a surface, and at the same time afford a better foothold for horses.

I observed in many cases where the streets are paved with the narrow sets, that horses are continually slipping and falling, and I think this may be obviated to a considerable extent by the open joint suggested. I do not think it would at all deteriorate from the strength and durability of the roadway, while it would add much to the safety of the traffic.

B. BAYLIS.

SCHOOLS OF ART.

The Bath School.—The annual distribution of the prizes took place at the school premises, 33, Paragon. The mayor presided. He said he hoped the school would be self-supporting. During last year 102 pupils had attended the mechanics' and artisans' class, the average attendance for evenings being forty-five; 133 pupils had attended the morning classes, the average attendance being sixty-two. Dr. Puckett (the head-master, whom he eulogised) had also succeeded in establishing a sketching class, which numbered twenty-three pupils. Then, in addition, 2,000 of the pupils belonging to the poor schools of the city were taught the elements of drawing, and this they hoped to continue. It was an almost incredibly large number, and they could not expect them to be very elaborately taught; but the teaching was sufficient to enable them to obtain prizes from Government.

The Penance School.—The prizes awarded the pupils of this school by Government have been handed to them by the Mayor of Penance. Many of the visitors, who filled the school, saw for the first time the improvements which have recently been effected—the substitution of an arched way for the north wall, and the addition of a second room 18 ft. long. By this arrangement better light, as well as more space, has been secured. A large number of ladies were present. The head-master is Mr. Geoffroy, who has conducted the school since its commencement, sixteen years since, when it began with twenty artisans. There are now 900. The school is considered to be in a successful state, and it is now a school of science as well as art.

The Cork School.—The annual distribution of prizes to the students of this school took place in the Athenaeum. The mayor presided, and there was a fair attendance of spectators, but not at all what might have been expected to be present on such an occasion. Mr. Brennan, the master of the school, read the committee's report, which stated that, during the past year, the total number of persons receiving instruction in the Central School had been 187, being a slight increase over the number attending last year, in addition to which the children from the National Schools, St. Stephen's Bluecoat School, &c., continued to re-

ceive instruction either in their own schools or at the School of Art. The Department examinations in freehand drawing, geometry, modelling, &c., were held early in the month of March. About fifty-six persons presented themselves for examination, of whom twenty-nine were successful, being an increase of nine over the number last year. Two of the students passed in all the subjects of the "second grade," entitling them to receive their certificates. A considerable number of advanced and elementary works were sent up to the annual competition in London. The Department reported favourably on the character and rendering of the works sent, and the works of thirteen students were selected for national competition; two received "honourable mention," and three students received their grade prizes.

STAINED GLASS.

Batley Church.—To the east window of the chancel we have already alluded. In the principal part of the centre light is a life-size representation of our Lord as the "Good Shepherd," leading into the fold a stray sheep. In the upper part of the same compartment is a jewelled mosaic cross, within a vesica. In the two compartments on the dexter side of this is a large group, representing the Nativity of our Lord, and the visit of the Magi. In the two compartments on the sinister side, the group represented is that of little children brought to our Lord. Both these groups are surmounted by mosaic shrine work, founded upon ancient examples in Westminster Abbey. The tracery is filled with a treatment of our Lord in Glory, and St. Peter and St. Paul, and a host of angels, with musical instruments, and palm branches, &c. The window has been presented by Mr. Sheard, the architect of the church, in memory of his daughter; and the artists, as formerly noted, were Messrs. O'Conner, of London.

St. Mary's, Nottingham.—Two more stained windows have been placed in the south side of the chancel of this church. There is a similarity in the design of the windows. The subjects dealt with by the artist in the window erected by the Wright family are chiefly connected with the earlier events in the history of the Saviour, extending to St. Matthew iv. The window in memory of Sir C. Fellows is illustrative of the first six or seven chapters in Matthew and John, including the miracle of walking on the water, and the driving of the money-changers out of the temple. There is a representation of Christ praying in the wilderness.

Kibworth Church (Market Harborough).—A second memorial window has just been put in the church of Kibworth. The window is placed on the north side near the east end of the aisle. The window contains three openings, and the subject is Christ raising to life the son of the widow of Nain. In the centre light is our Saviour holding the hand of the young man; the widow is standing at the end of the bier, while the Saviour, commanding those who carried it to stand still, said "Young man, I say unto thee, arise." The other figures in the group are the Apostles and other attendants. The canopies and bases are formed of the lily foliage, and the figures of St. Wilfred, the patron saint, and Faith and Hope, are introduced on either side. In the tracery are angels bearing scrolls. The window was designed and executed by Messrs. W. Holland & Son, of Warwick.

St. Michael and All Angels, Braintree.—The east window of this church has just been filled with stained glass at the expense and in memory of the late Mr. Richard Lacy. The artists were Messrs. Clayton & Bell. The window consists of five lights, each divided into two parts; the upper containing a full-length figure surmounted by canopy work; the lower, on a smaller scale, the representation of some scene in the sacred life, in an especial way connected with the holy person represented above. In the first light is the Virgin Mary, holding in her arms the infant Jesus, and bearing the lily; beneath is the Nativity.—Mary, Joseph, and the Babe lying in a manger. Next in order, is St. John the Baptist in raiment of camel's hair, bearing the cross and pointing to a medallion Agnus Dei; beneath is the baptism of our Lord by the great forerunner. The centre light contains a figure of our Lord in the act of blessing; beneath which is the crucifixion, with St. Mary and St. John. The next division contains a representation of St. John, bearing the palm of victory, and a chalice,

whence issues a dragon, in reference to the legend which tells how the apostle was once warned of a poisoned draught by such an occurrence. Beneath is the last supper, our Lord seated with the twelve. St. Peter occupies the next light, bearing the golden key of heaven in his hand, and the scene beneath is that in which the risen Lord appears, bearing the print of the nails. The tracery in the upper part of the window is filled with coloured glass, an angel occupying the centre space.

SCHOOL-BUILDING NEWS.

Whissonsett.—A new school building in connexion with the Church of St. Mary the Virgin, Whissonsett, Norfolk, has just been completed, from the designs of Mr. C. J. Moxon, architect. The main building consists of a school room 51 ft. by 20 ft., a classroom, communicating with the former by open arches, and separate porches for boys and girls. The roofs are all open-timbered of a very substantial and ornamental character, and the material employed in the building is flint, with red brick dressings. The whole is warmed by a patent Garney stove, so placed as to serve for school and class-room. The builder was Mr. George Brown, of Whissonsett.

DISSENTING CHURCH-BUILDING NEWS.

Whissendine, Rutland.—A few days since a new Congregational chapel was opened in this village. The building, which is of Gothic character, is constructed of red and white bricks, arranged with stone. It occupies a prominent site in the heart of the village. Mr. J. Berridge is the architect, under whom the works have been carried out by Mr. John Fast, of Melton Mowbray.

Chard.—A new Congregational church has been erected in the High-street of this town. It is Early English, and of parallelogram form, divided, by iron shafts and the construction of the roof, into nave and aisles. There are a tower and lofty stone spire at the south-west angle. The principal entrance is in the centre, and having a tracery window over, filled in with stained glass. The apse at the east end is relieved by the diaper work and passages of Scripture. The architect was Mr. Stent, Warminster; and the builders were Messrs. Hawker & Harbour, Chard. The total cost is about 8,000l.—On Wednesday last a preparatory Congregational church was opened in the Kent-road. A limited competition resulted in the design of Mr. Stent, of Warminster, being accepted for church, school and class rooms, &c. The schoolroom has been erected and dedicated as a preparatory church during the erection of the other buildings. Mr. A. Smith, of Portsea, is the contractor.

North Shields.—A Scandinavian Lutheran church has been opened here. It is situated in the Borough-road. The edifice is built on an irregular shaped piece of ground a short distance from the New Quay. The congregation will be chiefly composed of sailors. Owing to the peculiarities and the smallness of the site, the west façade of the church is built at an obtuse angle with the adjoining quay. The length of the chancel, which occupies the ordinary ecclesiastical position, is much less than would otherwise have been the case; and it was necessary to build a gallery at the west end. The staircase to this gallery is enclosed in the circular turret at the south-west angle of the building, which forms a feature in the external appearance. Two lancet lights, with shafted jambs, and a large sexfoil window complete the west gable. The church is 47 ft. long by 26 ft. wide. The east window is of stained glass: it is of three lancet lights set in polished stonework. In the centre light is a representation of the Crucifixion, with St. John and the Virgin in the side lights. The artists were Messrs. Heaton, Butler, & Bayne, of London. This window is the gift (among other embellishments) of Mr. Borries, the Norwegian and Swedish Vice-Consul, at Newcastle-upon-Tyne. The chancel floor is laid with encaustic tiles. The pulpit is placed in the south-east corner of the nave; and open pews fill the rest of the church. There are all of deal, slightly stained and varnished, and will accommodate 230 persons. The church is heated by means of a Gill stove in the basement. The work has been executed under the direction of the architect, Mr. F. R. N. Haswell, of North Shields. The contractors, with the exception of the iron-

founder (Mr. W. H. Walker, of Newcastle), are all Shields men,—viz., Messrs. Campbell, mason; Conlon, joiner; Place, slater; Twizell & Sons, plumbers and gasfitters; and Frazier, painter and glazier.

Olney.—The Baptist chapel, having undergone considerable alteration and renovation, has been reopened. The pulpit, pews, ceiling, and galleries have all been removed, and the building is now fitted up with a platform. The new benches fall back about 4 in., and to each there is a door about 18 in. or 20 in. high to protect the occupants from draught. The renovation has cost about 345l. The contractor for the work was Mr. Cunnold, builder, of Ipswich; the plans being those of Mr. Barnes, of the same town, architect.

CHURCH-BUILDING NEWS.

Gamblesby.—The new church here has been opened for divine service. It has been built on a concrete foundation about a yard in depth, and is of red stone. The ground connected with it is enclosed by a wall of the same material. The exterior of the church measures 72 ft. by 22 ft., and the interior 66 ft. by 18 ft. It contains thirty-two pews, which represent 130 sittings. The pews are all open, and of stained wood. At the west end of the church is a slated spire. The roof of the church is ornamented by a stone ridge. The architect was Mr. Charles J. Ferguson, who, when his design was chosen in 1865, was a pupil of Mr. G. G. Scott, and is now of the firm of Cory & Ferguson, of Carlisle. The builders were Messrs. Watson & Son, of Kirkoswald. The contractors for the building were,—for the stonework, Messrs. A. Watson & Sons, Kirkoswald; joiner work, Mr. Pollock, Penrith; plumbing and glazing, Mr. Porter, Penrith. The stained-glass windows at the east end of the church were from Mr. John Scott, of Carlisle. The total cost of the church is estimated at about 1,900l.

Gatesgill (Carlisle).—The chief stone of a new church has been laid here. It will be dedicated to St. Jude, and will be built in the Early English style of architecture, and consist of a nave 45 ft. by 24 ft., with centre aisle, and a chancel 21 ft. by 14 ft., adjacent to which will be a side chapel, vestry, and organ-chamber. The principal entrance will be by a porch on the south elevation. The north and side elevations will be coupled lancet windows, with projecting buttresses, relieved with gables to vestry and organ-chamber. The west gable will be pierced with circular and lancet windows. The heafry will be erected at the south-west angle of the west gable, with gill terminal 42 ft. high. The roof will be of high-pitch, and covered with slates of varied tints and ornamented with ridge cresting. The total cost will be about 1,100l. The contractors for the building are Messrs. Bregg, Wilson, & Baty, of Gatesgill; for the carpenter and joinery work, Mr. Ward, of Raughtonhead; slating, Mr. Hanson, Carlisle; plumbing and glazing, Messrs. Thomson & Sons, Carlisle; plastering, Messrs. Johnston, Brothers; ironwork, Mr. Wm. Corbett, Carlisle. Mr. John Love, of Manchester, architect, has supplied the design for the building. The church will be built of stone from quarries in the neighbourhood.

Yoxford.—The church here has been reopened, after a renovation of the interior. The two galleries have been removed, and the dormer windows in the roof blocked up. The church has been rebenched with New Zealand Kawrie pine. The chancel floors are paved with tiles. The walls have been scraped and cleaned. An organ, built by Mr. Green, of Ipswich, has been presented by Mr. Green, of Ipswich, has been presented by Mr. J. W. Brooke, of Sibthorp, in charge. Mr. J. W. Brooke, of Sibthorp, has presented the new north door, curtain, &c. The door was built under the superintendence of Mr. R. M. Phipson, architect, of Ipswich and Norwich. The rest of the work has been carried out by Mr. Charles Nunn, of Friston, builder, the execution of the work having been performed by him, jointly with Messrs. Clayton & Cotton, carpenters, Yoxford. The whole cost of the restoration, exclusive of the organ, will be upwards of 600l.

Nevington.—The restoration of the chancel of the church here, with the exception of a little decoration, has been completed. The temporary window is of white, hordered with red. The reredos is not finished, as the wall is too damp for illuminating. The alabaster tomb of Sir John Brook has been restored by Messrs. Houghton & Co. The gallery has been removed.

Kendal.—The parish church restorations have been completed. The present restoration will

cost about 2,500l. This added to 6,400l. spent in 1850-2, and 2,200l. in 1863-4 amounts to more than 11,000l., the greater part of which was raised by voluntary contributions, and is exclusive of several presentations. The works have been carried out under the designs furnished by Mr. J. S. Cresswell, of Manchester, who has been the architect on all the several occasions. The contractors for the carpentry were Messrs. John Fisher & Samuel Compton; for the masonry, Mr. Robert Shaw; for the plumbing, Mr. Robert Winder; for the staining and varnishing, Mr. William Jackson; and for the plastering, Mr. Joseph Steel, all of Kendal.

Hertford.—A meeting of the committee for rebuilding St. Andrew's Church has been held to consider the steps to be taken with reference to the plans and estimates for the new church. The contracts sent in by different builders, it was stated, were all considerably in excess of the architect's estimate, and they were rejected. It was then referred to Mr. Johnson to find, within a specified time, a builder to carry out the works at the cost he stipulated. This he had done, and Messrs. Dove, of Ilkington, have offered to take the contract for 3,215l., omitting the heating apparatus. They at first offered to do the work for 3,450l.; and then omitting the heating-chamber (which would cost 60l.) for 3,390l. Since then they had sent in another estimate, offering to carry out the plans, building walls of 2 ft. thick, instead of the thickness figured on the plans (which was 1 ft. 3 in.) for 3,215l. The sub-committee recommended Messrs. Dove's estimate of 3,215l. to the general committee for their adoption, subject to the question of finance; and the general committee agreed to this.

Sawlingham.—The church here has been reopened. There is a new aisle, equal in area with the nave, and separated from it by an arcade springing from five pillars, and surmounted by a new roof. The windows (five in number) are similar to those in the churches of Shelton and Alburgh, which latter is supposed to have been built by the same architect as the church was restored by. The central one, of Birmingham, Messrs. Hardman, of Birmingham, illustrates the story of the "Good Samaritan." Parallel with the aisle has been erected a vestry, opening into the chancel by the north wall. The alterations in the nave consist of the windows and roof. The former have been enlarged perpendicularly; the latter, which of late was flat and almost resting upon the beams, has been replaced by one of greater elevation, with cornices and diversified spandrels. The narrow archway leading into the tower has given place to one extending to the full breadth of the tower, through which is seen a window erected over the new stone doorway, which leads from without into the ringing-chamber. The church is laid throughout with black and white tessellated pavements. The pewing is of oak, moulded and surmounted by poppy-heads. The contractors were Messrs. Rust, Devoreux, & Barrell, of Norwich; and Mr. Benest was the architect.

PROVINCIAL NEWS.

Newcastle-upon-Tyne.—The foundation stone of the new hospital in connexion with the Newcastle-upon-Tyne Poor Law Union Workhouses was laid on the 9th inst. The hospital is intended for the accommodation of 200 patients, being sick and infirm inmates of the workhouse; and the estimated cost of its erection is 14,000l. The building forms three sides of a quadrangle, the latter being open towards the south. The east and west wings will be two stories in height, each containing two sick wards, 94 ft. long, 24 ft. wide, and 14 ft. high. The range on the north side of the quadrangle will also be two stories in height, and contain two wards on either side of the centre building, 88 ft. long, 24 ft. wide, and 14 ft. high. The centre building will be three stories in height, and is appropriated to nurses' rooms, sculleries, surgery, committee-room, &c. The walls will be of stone, and the style may be called Domestic Gothic. Mr. Robert Robson, of Wideopen, is the contractor; the architect, Mr. S. Oswald; and the clerk of Works, Mr. George Nixon.

Havreboer, South Devon.—A cottage residence has been just erected for Mr. Wm. Eastlake. It is in the parish of Buckland Monachorum, and is surrounded by fine moorland scenery. The walls are of Lee Moor white brick. The more exposed dressings are of wrought granite, the rest of freestone. The lower portions of win-

dows are glazed with plate glass; the spaces above the transoms with stained glass in lead. The furniture of the cottage will be chiefly of oak. Mr. James Hine, Plymouth, is the architect.

Preston (Lancashire).—A new workhouse has been opened for the purposes of the Preston union. The building has cost between 40,000*l.* and 50,000*l.*, and has been designed by Mr. Leigh Hall, of Bolton. The site is at Enlwood, about a mile from Preston. Hitherto there have been five workhouses in the union, but the new establishment will do away with them all.

West Bromwich.—A meeting of the committee appointed to consider the various plans forwarded for the hospital about to be erected in West Bromwich, in place of the present inconvenient dispensary, has been held at the Infirmary Board-room, High-street. Designs for the building were received from Mr. Y. Thompson, of Bennett's-hill, Birmingham; Mr. G. B. Nichols, West Bromwich; and Messrs. Martin & Chamberlain, of Birmingham. The sub-committee ultimately decided to recommend the Infirmary Board to decide the plans of the last-named gentlemen. The plans provided for the erection of forty beds, but at present it is only intended to build so as to have room for twenty, though the administrative offices will, of course, be designed for the whole number of beds. The site of the proposed building will be on the Lodge Estate, West Bromwich, in Edward-street, at right angles to Lombard-street, and the ground contains 6,000 square yards. It is hoped the work of excavation will be commenced in March. The total sum at present raised is about 2,350*l.* This amount includes a subscription of 215*l.* from the workmen of Messrs. George Salter & Co., and from those of Messrs. P. D. Bennett & Co., 126*l.*, both of which are payable by small weekly instalments extending over three years. The building will cost between 5,000*l.* and 6,000*l.*

FROM IRELAND.

St. Mary's, Crumlin-road, Belfast.—This church is the first of five churches which were to be built to supply the great need of church accommodation in the suburbs and manufacturing districts of Belfast. It has been consecrated by the Primate of all Ireland. It is from the designs of Messrs. Slater & Carpenter, of London. It has a lofty wide nave, with side aisles nearly as wide and lofty as the nave, following in this respect the idea of the great church of Austin Friars, in London. The tower is central, with transepts and chancel. The nave arcades are simple in character, with alternate voussoirs of Carlisle and white Scraho stones, resting on shafts of red Scotch stone. The roofs are simple. The ornrod braces of the nave roof rest on the ends of the tie-beams of the aisle roof, which are brought through the wall, thus forming a continuous tie across the church. The windows are lancets in triplets and complets. The complets in the aisles have large crossed circles over them, under one great inclosing arch on the inside. The nave has a traeroised roof on the gable. The chancel is apsidal, with crossed lancet windows. The tower rests on four moulded arches of red and white stone, rising from stone piers, two of which are engaged in the chancel and transept walls. Above these is a lofty lantern stage open to the church, with four lancets on each side, richly arcaded outside, resting on shafts of red Carlisle stone, with carved capitals. Above is a similar and much more lofty stage, for the bell-chamber. The angles of the tower have pilaster buttresses, with shaped angles. The spire is of timber, slated, and has on each of its cardinal faces rich spire-lights of oak, with lofty pointed roofs. The whole height of the tower and spire is 120 ft. The church is built of hassat faced with white Scraho stone, red Scraho and Carlisle stone being introduced in the arches and bands. The paving is of Dungannon stone, and the chancel is tiled. The builder was Mr. Henry, of Belfast.

St. Patrick's, Ardagh, County Monaghan.—This church, or rather part of a church, has just been consecrated, and has been built by Mr. E. P. Shirley, from Messrs. Slater & Carpenter's designs. It is a simple oblong building, with an apsidal sanctuary opening out of it by an arch at the east end. The whole is to form the chancel of a much larger church, but for the present it will be used for the parishioners. It is four fays in length, and has lancets moulded on the inside. The chancel arch is built up in the west wall, and encloses a traeroised rose-window, with a

temporary door and porch under. The roof is of timber, with arched principals. The sanctuary is apsidal, with a moulded lancet in each side. The roof is of solid stone, arched on the inside, and weathered on the outside. The walls are lined with polished alabaster. The floors are of rich tiling. The sanctuary is raised seven steps, the Shirley vault being formed in the crypt below. The windows are all filled with stained glass, by Messrs. Clayton & Bell; the rose-window illustrating the life of St. Patrick; the sanctuary windows the Passion of Our Lord. The other windows are of simpler design. The marble work is by Sibthorp, of Dublin, and the builder was Mr. Parks, of Carrickmacross.

SANITARY PROGRESS.

Sanitary Inspection of Shipping.—The Sanitary Act of 1866, which the *Builder* had previously done its best to show the necessity for, especially as regarded the sanitary inspection of shipping, as well as in other respects, has been acted on by the City authorities in the supervision of the sanitary state of the shipping within its limits; and the report of Dr. Letehely, the medical officer of health for the City, on that important subject for the last two years, has just been issued, and we now give an abstract of its contents:—

"Small as the City district is, it affords ample proof of the necessity for proper inspection of all the shipping in the port of London; and it indicates, moreover, the kind of work which, and for during the last two years, there have been 3,223 inspections of the ships and vessels within your jurisdiction, and on 149 occasions it has been found necessary to amend their sanitary condition. This number includes nearly the craft which are under your control, and the chief improvements required have been the cleansing and better ventilating of the forecabin. As a rule, your officer makes about forty inspections a week, and he takes the opportunity of visiting the ships directly they arrive in port, in order that he may see their actual working condition.

From what I have seen of the state of the vessels in the river, and of the opinion that the appointment of a sanitary inspector of shipping has been productive of much good; and it is to be regretted that a like appointment has not been made by the other local authorities having jurisdiction over the shipping of the river; for it is manifestly an inconsistent thing that the whole port of London, only about a thousand yards of it, on each side of London-bridge, should be subject to sanitary supervision.

That there is great necessity for this is admitted by all who are acquainted with the sanitary condition of our mercantile marine; for over and over again it has been shown that fever and scurvy and epidemic diseases are not only very prevalent in the vessels which trade with this port, but that they are also directly referable to defective sanitary arrangements. This has frequently been a subject of remark by the medical officers of the Dreadnought hospital-ship, and of the customs. . . . Nearly all the cases of fever admitted into the hospital-ship are of the typhoid class, which indicates bad sanitary arrangements.

It is open to inquiry whether the inspection of vessels should not extend beyond the mere lodging of the crew, so as to reach the nature and quality of their diet; for if, as Dr. Barnes asserts in his report to the Medical Department of the Privy Council, half of the men received into the Sailors' Home at Poplar are, at the time of their admission, suffering from sea scurvy, and if, as he also states, it is not uncommon for from 20 to 70 per cent. of a ship's crew to be diseased at one time, it is highly necessary that inquiry should be instituted as to the cause of such mischief. It concerns the health and well-being of upwards of 170,000 British sailors. Laws have been made, and notably the Merchant Seaman's Act for 1835, for the purpose of obviating this, but they are practically inoperative.

Inspections of this nature might properly be made by the sanitary officers of the port, whose duties would then extend to the whole sanitary condition of the ship. At present, however, there is a lamentable failure of all such proceedings; and even in respect of the partial supervision of our mercantile marine, in so far as the provisions of the Sanitary Act of 1866 are concerned, there is an open disregard of the law. . . . It is expedient, as well as imperative and necessary, that the several nuisance authorities on the two sides of the River Thames should agree on some mode of co-operation, whereby a proper inspection of all the shipping in the port of London shall be regularly and systematically performed, in accordance with the provisions of the Act of Parliament."

Stamford.—The Marquis of Exeter has presided at a public meeting in the lecture-room of the Stamford Institution, for the purpose of considering the sanitary state of the town. There was a numerous attendance of the clergy, medical men, and chief inhabitants. After some discussion the following resolutions were carried unanimously:—"That it is desirable to take steps to adopt a more effective system of drainage in Stamford, with a view to improve its sanitary condition." "That a memorial from this meeting be presented to the town council, requesting them to adopt the Sanitary Acts in Stamford." In course of the discussion it was remarked by Mr. Phillips that the drainage of the town might be materially improved, and that the impurity of the water supplied from the public wells was the great cause of preventible disease amongst the inhabitants. Mr. Heward mentioned that diarrhoea of a very serious type was prevalent in the town during the past autumn, and that

many deaths occurred. Mr. Paradise said that the cost of draining Grantham had been "about 6,000*l.*"

UTILITY OF THE NORWEGIAN COOKING APPARATUS TO WORKMEN AND OTHERS.

A SUBSCRIBER, of Newcastle, Ballymahon, Ireland,—Mr. L. H. King Harman,—writes us on this subject. He gives the result of three successful trials made under his own superintendance. In one case, he states:—"Having a shooting party of seven gentlemen at this place, I had a proper quantity of Irish stew made in the usual manner, put down on the hot hearth in the largest of the tin vessels, when it came to a boil in thirty minutes; it was then kept boiling fifteen minutes longer, when it was rapidly taken from the hearth, and placed in the machine, with a quantity of extra potatoes, in the other two tins, which last tins came to the boil in about half the time of the larger one. The box was then locked up, and sent in a cart after the shooters, when in two hours and a half, after being opened and turned out, the gentlemen found all the contents most perfectly cooked, steaming hot, and most excellent. This afforded as much as the seven could eat, and was also sufficient for an excellent dinner for the head keeper and some of his assistants. This machine will cook anything which can be boiled, as meat, fowl, vegetables, dumplings, &c. I considered it a most complete success, and that it will prove a useful companion to all persons obliged to move about, and not able to be at home for comfortable, hot, and regular meals, as railway guards, land agents, on inspecting expeditions over the properties under their charge; shooting parties, commercial men, pic-nic excursionists, &c.; and last, not least, it would prove of the utmost value to our army, and when made on a large scale it would do well to accompany the new water-transport cart, and afford excellent refreshments to our soldiers after a heavy march, an exhausting field-day, and a well-fought battle, when a hot and comfortable meal would go far towards restoring the strength and maintaining the life in many a wounded man. The great utility of these machines will plead my excuse for trespassing on your columns. They only require to be known and properly tested, in order to be highly prized and valued. The smallest size would prove most useful to tradesmen, as carpenters, stone-cutters, &c., working on buildings, &c., far from their own homes, before leaving which, when at their morning meal, their wives or children could prepare their dinner, which they could find well cooked, hot, and comfortable when required."

Were the apparatus made cheaper and better than at present, it would come into general use among workmen and others. Its present price, 12*l.* 6*l.*, is too high, and the way in which it is put together far too slight. A first-rate tradesman informed Mr. Harman that they could be made properly at 5*l.* each in a large quantity, and leave a good profit to the maker.

RAILWAY CRUELTY.

Sir,—I have just been seeing my daughter off by the twelve o'clock train for Leeds. As the journey is expensive for poor folks, she took a second-class ticket; but nothing would induce the porters to let her have a hot-water tin,—not on payment or any way. They said they had strict orders only to put them gratis into first-class carriages. They might surely let poor second and still more, third-class passengers have had little comfort on a long cold journey at a small fixed price. It is most arbitrary and insulting, I call it, to those who cannot pay the high first-class charge: the second is high enough. Fancy nurses and children, or a delicate young governess, going all the way to the North in the depth of winter, and being refused such a thing, whilst they see them given away where they might be paid for. I hope you share my indignation.

AN ARTIST.

. We do share our correspondent's indignation. Independently of the cruelty of the thing, it is utterly stupid. Directors know well enough, now, that it is from the second and third classes that they derive the bulk of their revenue, and yet they have not the sense to see the desirability of rendering travelling as agreeable as possible to those classes. It is an utterly short-sighted policy.

BRICKMAKING IN SCOTLAND.

A WRITER in the *Weekly Scotsman*, on Manufacturers in Native Clays, says,—“The number of bricks made in Britain in the year 1802 was 714 millions; in 1840 it was 1,725 millions; and in 1850, the year in which the duty was abolished, it was 1,563½ millions. The number of bricks made in Scotland annually was 154 millions in 1802, and 47½ millions in 1840. If the great increase in railway and other works, the rapid enlargement of towns, and other recent causes leading to a more extensive use of bricks be considered, the number now made in Scotland cannot be less than 200 millions a year.

There are in Scotland 122 manufactories of bricks, tiles, and articles of a similar nature; and in connexion with these from 4,000 to 5,000 persons are employed. The manufactories are widely scattered over the country, the farthest north being at Banff, and the farthest south at Dalbeattie; but the greater number are in Lanarkshire and Fifehire, in which counties valuable beds of fire-clay exist. The most extensive manufactory is that of the Garnkirk Fire-clay Company, situated on the Caledonian Railway line, about six miles east from Glasgow. The company was originally formed to work coal, but, finding that extensive seams of fire-clay existed on their property, they took to manufacturing that material, which now almost exclusively engages their attention. The principal seam of clay is 7 ft. in thickness, and lies at an average depth of twenty-eight fathoms. Its quality is considered equal to that of the best Stourbridge clay. The manufactory covers upwards of six acres of ground, and is surrounded by thirty tall brick chimneys, which give it an extraordinary appearance. Raw material is brought in, and finished goods are sent out, by branch railways, the traffic on which never ceases from one week's end to the other. Two hundred tons of clay, and about an equal weight of coal, are used every day. Upwards of 300 men and boys are employed by the company, and these are aided by three steam engines with an aggregate of 150-horse power. This is exclusive of the power employed to bring the clay and coal out of the pits. The clay is of a dark colour, owing to the presence of a small proportion of bituminous matter; but when that is dispelled by the action of fire, only silica and alumina remain, and it is the presence of these substances in certain proportions that decide the value of the clay. As it comes from the pits, the clay is entirely devoid of cohesion or plasticity; and in order to bring it into working condition, it has to be ground very fine, and then mixed with water. Several powerful mills are used for this purpose. They consist of great iron rollers, which travel round a circular trough, and pass over the clay. Several hundred-weights of material are operated on at once, the time for which the grinding is continued depending on the quality of the articles to be produced.”

SNOW AND THE VESTRIES.

I VERY much wish to be permitted to ask whether our vestries, district boards of works, and like bodies, are at all thinking of what to do in case London should be visited with a snow-fall of anything like the greatness of that which came upon us in the first week of January, 1867? I have read a number of local papers in order to discover any indication of preparation or thought on the question, and I confess I have found no indication.

“We know not when the storm may come,
But 'tis coming in the air;
And this is the warning of the drum,
Prepare! Prepare! Prepare!”

I was perhaps wrong in saying that no local body had given any attention to the snow problem. The City of London, the localist of our local bodies, made some stir in the matter during the whole of the year 1867. Its Engineer, in a report dated January 17 of that year, that is, about a fortnight after the great fall, detailed “the measures taken for cleansing the streets of the City after the snow-storm on 1st January, 1867.” This report, with some additions, was subsequently issued in pamphlet form, and no doubt is still procurable at the office of the Engineer of Sewers, Guildhall.

On October 31, 1867, the City authorities offered, by advertisement in the public prints, premiums for “plans and suggestions as to the best mode of effecting the removal of snow from streets and places within the City.” This move of the magistrates (the premiums offered were beggarly in the extreme, 30 guineas for the best plan, and 20 guineas for the second best) resulted in the chief clerk, Mr. J. W. Law, receiving by the appointed day, November 26, 1867, 157 replies, some with drawings, and some few with models illustrative of the schemes. These were severally referred by the committee to the Surveyor, to arrange and classify. They were arranged in classes as follows:—1. Snow to be melted by furnaces, boilers, or steam jets, &c.; 2. Snow to be carried away to vacant places, River Thames, &c.; 3. Snow to be thrown into yards, railways, or to minor streets; 4. Snow to be thrown into sewers, down existing inlets, or by new inlets to be constructed; 5. Snow to be dissolved

by salt, salt and water, manganese, or other chemical agents; 6. Snow to be heaped into ridges in centre on sides of carriage-way to melt gradually; 7. Snow to be rolled by steam or horse power.”

On Thursday, December 19, 1867, the Streets Committee presented their report to the Court of Common Council, which met on that day. The committee had met on several occasions after the completion of the classification by the surveyor, and had carefully examined the schemes separately, and had selected several of them for further consideration. They proposed that sundry experiments should be made, with a view to test the practicability of some of them. They avoided, therefore, giving an opinion upon the merits of any until the result of such experiments had been ascertained. But considering that snow might fall before these experiments had been tried, they had carefully considered the best course to be adopted, and had given the superintendent such instructions as they believed would greatly assist in mitigating the inconvenience of a heavy fall of snow in the City.”

This report, as I have said, was presented on December 19th, 1867, now more than a year ago. We had scarcely any snow in London last winter, and so, of course, no “experiments” with the new modes were tried.

Thus, then, stands this grievous snow question.

On the 3rd of January, 1867, one of our great difficulties wrote:—
“London woke up yesterday morning to find the streets and pavements covered with three or four inches of snow. To all appearance we could not have been more surprised if we had all been asleep since the hottest day in last August. Nobody seemed to expect the snow, and nobody was prepared to meet it.”

Let us not deserve this stinging reproach again. Let our local boards at once form “snow committees”; let them estimate, and, if not met, make their forces in advance of the time. Let each local surveyor take a journey to Guildhall and ask permission of Mr. Hayward, Secretary to the Commissioners of the Metropolitan Board of Works, to inspect the numerous and a half of plans sent in by the very experienced engineer of the Commissioners, and by the extremely patient hundred and a half of planners; let the local surveyors meet together and compare their own experiences, and exchange views on the subject, as was said with strictest truth of the snowstorm of the 1st of January, 1867.—“Nobody was prepared to meet it.”

EXEMPTIONS: METROPOLITAN BUILDING ACTS.

§ 11.—I should feel greatly obliged if you could give me information on the following matter:—

Amongst the buildings exempt from the operation of the Metropolitan Building Act (vide Part I. Sec. VI.) are, “all buildings not exceeding in height thirty feet, as measured from the footings of the walls, and not exceeding in extent one hundred and twenty-five thousand cubic feet, and not being public buildings, wholly one occurrence street or alley, whether public or private, and at the least thirty feet from the nearest buildings, and from the ground of any adjoining owner.”

1. Does this clause justify any person in erecting two or more houses on his own ground less than 30 ft. apart, if more than 8 ft. from any other building, and at least 30 ft. distant from the ground of the adjoining owner, without the interference of the district surveyor?

2. If the district surveyor choose to inspect the premises to ascertain whether or not they are exempt from the Act, is he entitled to any fee?

A case raising the first question was before the magistrate at the Woolwich police-court some few weeks ago, but was not completed on the first day of hearing. It was adjourned to, I think, the 12th or 14th of November, but I have been unable to ascertain how the matter was settled. As, however, the question is of some importance to builders, and the public generally, some of your readers may be able to inform us of the magistrate's decision.

“* * We do not know how the case in question was settled, but are quite certain the clause quoted does not ‘justify any person in erecting two or more houses on his own ground less than 30 ft. apart, if more than 8 ft. distant from the ground of the adjoining owner, without the interference of the district surveyor.’ The clause requires for a building to be exempt, that it be at least 30 ft. from any building, no matter to whom it belong, and at least 30 ft. from the ground of any adjoining owner. If it did not do so, whole rows of houses belonging, as they often do in the first instance, to the same owner, might be built without the control of the act. In reply to question 2, no fee is allowed by the act to a district surveyor for ascertaining that a building is exempt.”

NORTH RIDING OF YORKSHIRE BRIDGE-MASTER.

Sir,—Some weeks ago exception was taken in your pages to an advertisement issued by the magistrates of this riding for a bridge-master. The effect of that advertisement was to bring not less than fifty applicants from engineers. This number was reduced to eleven by a committee, and the appointment will take place by vote at the Quarter Sessions held this week. A most active canvass is proceeding by the selected eleven from my own experience. I can safely say that a bridge-master who attends, not only to the building of new bridges, but the repair of present ones (in a Northern climate, where sudden and great rises of waters occur), the roads 100 yards on each side from the crown, the parapets and railings, the goal and police coats and cells, &c., will have plenty of work to attend to in winter practice. A NORTH RIDING MAGISTRATE.

RAILWAY COLLISIONS.

Sir,—Will you allow an old correspondent to mention a circumstance which may at least appear curious, if not startling? Some twenty-five years ago he really believed he possessed a “secret,” though a “civil engineer” (with mutual friend) must afterwards have had a very similar one, and expected vast advantages from it, to infallibly

neutralize, or “paralyze,” railway collisions, if at highest speed, and within a few feet of contact, by the shaft-wards encountered, or at least the writer did, an overlooked circumstance, which sadly damped their aspirations. The “shocks” of instantaneous stoppage, which perhaps they could not have achieved, covered by a lateral correspondent three or four years ago, to “fall from a height of 80 ft.,” might “half kill” nearly all the passengers in a train, near and far. The “other” contingency, still, with respect for after judgment, could not something more be done there by means of sounds? I do not mean “temporary” for signals, or even constant “shriek” of whistle; though that would be infinitely preferable to mutilation or death, of which we have had such terrible examples, and even social and religious warnings lately. But a regular announcement of approach at sufficient distance for safe measures. With sole drawback of some “noise” which safety to “life and limb” might not weigh so heavily as “shriek” struck by machinery once in three or four seconds, or otherwise, though capable of being stopped in “one.” If the “bell” were carefully tuned to a “high” or “altruistic” tone, the effect might not be so bad; perhaps in the country rather “lively.” And this, I expect, could be distinguished when prepared for in almost any weather at about or near the distance of a mile distant. J. D. PARAY.

COMPENSATION CASES.

HENRY ABRAHAM V. THE CORPORATION OF LONDON.

This case (Lord Mayor's Court), a compensation claim, arising out of the works of the Holborn Viaduct, came on for hearing, on the 4th inst., before the learned Plaintiff, Mr. Henry Abraham, is a glass-cutter, lead merchant, &c., and carries on a large business at No. 55, Snowhill and 1, Farringdon-road. The original claim sent in some time ago for 19,680*l.*, but was amended to the sum of 8,857*l.*

Mr. J. H. Lloyd and Mr. Litter (of the Common Law Bar), instructed by Messrs. J. & M. Pontiff, appeared for the claimant; and Mr. W. H. W. and the Hon. F. P. Thayer, instructed by the City Solicitor, appeared for the Corporation.

From the opening speech of the claimant's counsel it appeared that the business in the neighbourhood of the claimant's was daily increasing in value from the enormous pedestrian and vehicular traffic in Holborn, and more especially so the claimant's premises, in consequence of their fine central position; and evidence of the claimant and his surveyors (Mr. E. Fox, Mr. O. A. Young, and Mr. Samuel Green) showed that the sum claimed was not in any way exorbitant one.

After several other witnesses had been called on behalf of the claimant and severally cross-examined by the counsel for the Corporation, the jury was discharged in compensation for the sum of 4,636*l.*

MESSRS. THORN V. THE METROPOLITAN BOARD OF WORKS.

This claim, under the Lands Clauses Consolidation Act, for compensation for compulsory removal from offices which the claimant rented, and which were required for the Thames Embankment, &c., and the new street to the Mansion House, was heard on Tuesday at the Guildhall Police-court, before Mr. Alderman Finnis.

Mr. Murphy, instructed by Messrs. Braddon, appeared for the claimants; and Mr. Philbrick, instructed by Mr. Ward, for the Metropolitan Board of Works.

Mr. Murphy said that the claimants were the contractors for the construction of Blackfriars Bridge, and the compensation they sought was out of the ordinary course. In 1841 Messrs. Thorn took the contract for the bridge, and immediately took the second and third floors of the claimant's premises, in consequence of which they were required to close the new street to the side of Chatham-place, No. 4, where they were unable to have a view of their works or the men employed upon them. There was a great loss accruing to the claimants from the fact that they were unable to employ a sufficient supervision over them. That loss was difficult to arrive at, from the exceptional character of the case. Some had estimated so much a day, and the new street to the side of Chatham-place, No. 4, where they were unable to have a view of their works or the men employed upon them. They had put down their loss at the moderate sum of 5 per cent., but he was bound to say that that was only a speculative item, for they had no data upon which to arrive at any definite sum.

The claim put in was 1,500*l.* for the loss on the men's time by want of supervision, 40*l.* for increased rent, 20*l.* for fixtures, 20*l.* for reinstatement, 16*l.* for loss of clerks' wages during removal, and 5*l.* expenses of removal; making a total of 1,601*l.* Evidence having been given in support,

For the defence Mr. Philbrick called Mr. E. N. Clifton, architect, who said he had constructed building such as Greenhall House and East India-avenue, and paid about 3,000*l.* a fortnight for wages. Supervision at all, and the want of it could make no appreciable difference in the profits of a contract. There was no value in Mr. Thorn's interest in No. 13, for he paid a rack rent; but where a tenant was compelled to move, it was customary to give him a week's notice.

Mr. Trist, of the firm of Norton, Trist, & Watney, thought that 150*l.* would cover every expense and liability of the Board of Works, and be a full allowance. Mr. Clifton, Mr. Trist, and Mr. Martin, the chief clerk, to consult on the matter, and on returning into court awarded Messrs. Thorn 400*l.* compensation, and 30*l.* costs.

BOOKS FOR THE SCIENCE CLASSES.

Sir,—I think if each of the science schools was provided with an circulating library of first-class scientific works, it would greatly facilitate the spread of scientific knowledge. A committee should be appointed to collect the most valuable and practical works, and place them at the disposal of the students, for the payment of, say 1*l.* per week. Surely the Government could accomplish this; and I think it would be highly creditable to the working classes of England, who wish to improve

themselves. It would render the technical phrases and terms familiar to the ear of the student, and save a considerable amount of the teachers' time. For I am certain there are many that join the sciences classes that do not understand a single term of geometry; and they commence drawing without really understanding what they are doing. They do not succeed because success is impossible, and the teachers very rarely give them any encouragement, and they become discouraged, and ultimately leave the school. And I also think there is room for amendment in the appointment of teachers, for I have actually seen a teacher in one of the London schools puzzled by a simple problem in descriptive geometry, and also very inattentive to the students; such as spending thirty or forty minutes in a friendly chat. I think every teacher should be thoroughly conversant with the science that he is paid to impart to his pupils. Moreover, he should pledge himself to execute his duties, and take a kindly interest in his vocation, and his attendance should be regular and punctual, which, I am sorry to say, it is not in the school mentioned above. After considering the above facts, can we wonder that so few pass the examination? I hope the Authorities at South Kensington will take this into consideration.

A. WORKING MAN.

HOLLOW WALLS.

SIR,—Can any of your correspondents inform me whether, in the case of a dwelling-house built with hollow walls, any openings (as air-bricks, &c.) are necessary from the external air into the chamber between the two thicknesses of the wall, and, if so, what number in proportion to wall length, and in what position they should be placed?

A. B. C.

FLOWER POTS.

SIR,—Is it not possible, in this age of window gardening amongst all classes, to manufacture a better sort of earthenware flower pot than is usually sold,—say a section of a column, with two ribs on the upper part and two ribs on the lower, with two lip side handles such as are commonly seen on the old red earthenware pan. We should then have a flower pot with a solid base, not so top-heavy. I cannot afford china pots, marble squares, or decorative tery. I want a good, besides not being so well adapted for the growth of plants as earthenware. I think if gullion and peck pots were so made they would have great sale.

CIVIS LONDINENSIS.

BOSTON CHIMES.

SIR,—Writing in a strictly independent yet temperate spirit, I gave a descriptive account of the bells and chimers at Boston in the *Builder* of the 19th ult. How far "G. L." in your last impression has fairly represented the scope and tenour of my remarks, let your readers decide.

I might reply at some length touching the suggestion and proposal of your correspondent. I will, however, merely say on the present occasion that if he will refer your readers—I do not myself require such information—to any set of large bells on which the capabilities of a machine constructed upon the principle which he advocates have been, or will be, fairly tested, much time and trouble will be saved.

THOMAS WALSLEY.

NEW METROPOLITAN MARKETS.

SIR,—The ultimate erection of new markets for the accommodation of the more crowded districts of London is no doubt certain, either under central or local authority, but in the mean time much may be done to make the existing centres of retail business more convenient on the working man's great marketing night, Saturday.

My suggestion is that such streets as have by custom become regular markets, and are in consequence practically impassable for horse traffic on Saturday evenings, should be closed at each end from say six till twelve o'clock, the district scavenger ordered to cleanse the street thoroughly from end to end, and the stall-keepers placed back to back in the centre of the road.

In many streets like East-lane; The Brill, Somers-town; New-cut; Westminster-broadway; Narrow-street, Limehouse, even this arrangement would leave little enough room; but the two comparatively wide paths on either side of the street, and the stoppage of vehicles, would be preferable and more convenient to both seller and buyer than the present disorganized condition of these necessary resorts. The parish surveyors and the police might easily initiate the system, and, working in harmony, could not fail to add to the comfort of all concerned.

A. M.

NEWS FROM MELBOURNE.

The warehouse of Messrs. Warne & Webster, Flinders-lane, Melbourne, is a five-story building, recently erected in this lane of large warehouses. It is being erected for a firm of importers and clothing manufacturers. The space occupied is 27 ft. frontage by a depth of 90 ft., and 52 ft. in height from footpath to the top of blocking. The half-ank basement is of bluestone ashlar to the level of the ground-floor, and thence, to the top of the building, of brick, each floor being lighted by windows on both sides. The floors are 12 ft. high, with the ex-

ception of the basement, which is 10 ft., and the attic, which is 9 ft. to underside of tie-beam of roof. Goods are raised by a hydraulic lift to the several floors. Each floor is supported on wrought-iron girders stretching across the whole width from wall to wall. The front towards Flinders-lane, from the footpath to the level of the ground-floor, is fine sized rusticated hne stone, with plinth and capping, angles rounded, and segmental-arched window-heads. The superstructure is cemented, the ground-floor having a cornice and semicircular-headed entrance-door, and windows springing from the impost, the vousoir of arches being vermiculated with moulded archivolt between the vousoir, the jambs rusticated, and the rounded angles rusticated and broched to receive the square quoins above. The object of rounding the angles is to prevent drays from injuring the building. The two ranges of windows above the ground-floor cornice and below the main cornice have, in each floor, three windows with regular entablatures, moulded jambs, sills, &c., and rusticated quoins on the angles, the whole surmounted with a very plain adaptation of Vignola's grand hock cornice. Over the cornice is an attic having rusticated pilasters with vertical raised panels and rusticated quoins; and the three windows are finished with architraves; and over all an attic cornice and cincture blocking.

Books Received.

Art of Constructing and Repairing Common Roads. Weale's Rudimentary Series. London: Virtue & Co., Ivy Lane. 1868.

A fourth edition of this volume of Weale's Rudimentary Series, with additions, has been published. It includes a "Survey of the Metropolitan Roads," by S. Hughes (which might be left out without much loss); the "Art of Constructing Common Roads," by Henry Law; "Remarks on the Maintenance of Macadamised Roads," by Sir John Burgoyne; and a note by Mr. Robert Mallet on the causes of the apparent failure of macadamised roads in certain localities. Mr. Mallet regards asphaltic macadamising as the very best material for the street surfaces of populous cities. A large amount of valuable instruction is given.

A Descriptive Treatise on Mathematical Drawing Instruments. By WILLIAM FORD STANLEY. Second Edition. London. 1868.

In the second edition of this Treatise, already as originally published favourably reviewed in these pages, Mr. Stanley has given some additional matter, including illustrated accounts of a tray for holding wood blocks on which drawings are to be made; a copying-table; a set square for section lines; a full description of planimeter for computing areas; a gauge for cutting off drawings, and some few smaller matters. The book will be found useful in every office.

An Elementary Course of Plane Geometry. By R. WORMELL, M.A. London: Thos. Murby.

Mr. WORMELL feels, with others, that sticking to Euclid, pure and simple, is not the way to teach properly the practical bearings of geometry; and he has, therefore, compiled this text-book for beginners, with reference to utility. The advantages that have resulted from the introduction of the system in the City middle-class schools, enable him to speak with some confidence of its value. Many of the illustrations are drawn from architectural subjects, which leads us to say, by the way, that the view of a cottage, on page 67, is in faulty perspective. Nevertheless it is a good little book.

The Art-Journal.

The *Art-Journal* begins the year with the first of a series of illustrated papers, headed "The Stately Homes of England (occasionally open to the people)," by the indefatigable editor, Mr. S. C. Hall; Mr. Llewellynn Jewitt contributing the antiquarian notes and details. Alton Towers is the first "stately home" treated of. The number is altogether a very good one, and includes a view, and some engraved details of the Paris Opera House. Mr. Jas. Dalmore again takes up his valuable series of papers on "British Artists," and illustrates well the works of Sir Joseph Noel Paton.

Miscellaneous.

House Blown Down near Huddersfield.—The ravages of the recent hurricanes are everywhere perceptible in some of the villages in Yorkshire. A house belonging to a farmer at Thurstonland, a wild, romantic district, was blown down, and is now a mass of wreck and ruin. The farmer's wife was completely buried among the debris, and when extricated, a task which occupied over half an hour in its accomplishment, it was found that she had sustained very severe injuries and bruises, caused by the descent of bricks and rafters. A cradle in which the child lay was overturned, but the occupant was not hurt. Babies always escape, somehow. One hears, now and then, of them tumbling out of railway-carriages running at high speed; but who ever heard of one of them being killed? They are scarcely ever even injured.

Proposed Rural Hospital at Ashford.—A scheme is under consideration for the establishment in the neighbourhood of Ashford of one of those excellent institutions which have been found so valuable at Cranleigh, Tewkesbury, and elsewhere. Sir Edward Hoare, bart., Mr. C. Pemberton Carter, and Mr. John Furley are prepared to undertake the establishment of a hospital of this kind at Ashford, and it is to be hoped that their benevolent exertions will be crowned with complete success. The last report of the trustees of the Cranleigh Village Hospital contains the following statement:—"The simplicity of the domestic arrangements and the comfort of being within easy reach of relations and friends, as well as the quiet of a private room, and the home feeling which prevails throughout the hospital, add materially to the popularity of the institution in its own immediate district; and, combined with a certain amount of liberty, more than can be accorded to the inmates of larger hospitals, has an influence which certainly aids in the recovery of many of the patients."

Mr. Holman Hunt a Sculptor.—Mr. Holman Hunt is in Florence. He finds so much difficulty in getting his design for his wife's mausoleum executed that he has taken lessons in sculpture, and is himself carrying out the work.

Mdlle. Nilsson a Sculptor.—According to the *Vigaro*, Mdlle. Nilsson is exceedingly clever as a sculptor. The next Exhibition (it adds) will probably contain a statuette executed by her.

Manufacture of Building Material.—Among the trades lately introduced on the Tyne, the manufacture of concrete for building purposes is mentioned.

Gloucester Cathedral.—The nave of this cathedral was lighted with gas for the first time on Christmas-eve. The effect, it is said, was good. The lighting is effected by about 500 jets, projecting from the string course above the Norman arches, the main pipes being concealed from view. It has been ascertained that the cost of lighting is about a guinea each service.

Master Builders and Trade-Unions, Manchester.—A circular calling attention to the relative position of builders, brickmakers, and bricklayers has been issued. The persons and firms by whom it is signed include some of the most influential in the city. Their complaint is:—"The arbitrary laws of the unionists unwisely shorten the hours of labour; limit the quantity of work to be performed in a given time; advance the rate of wages; increase the cost of all building without improving the workmanship; keep down the skill and condition of the workman; augment the difficulty of his becoming a master; and injure most the very class supposed to be benefited. To remedy this evil they suggest the employment of non-unionist workpeople and members of the Free Labour Registration Society; and that they themselves be encouraged to take apprentices from the non-employed youth of our large towns; by which means they would have an opportunity of adding considerably to their weekly wages, and thus a constant and well-regulated supply of labour would always be available, and contribute much to the general good of the public as well as to all parties connected with the building trade.

Charge against the Accountant of the Metropolitan Board of Works.—Mr. Hughes, the accountant of the Metropolitan Board, has been taken into custody and brought before a police magistrate on a charge of defalcations to the extent of about 2,000.

More Alpine Railways.—Mr. Fell, the English engineer, has offered to the Swiss Federal Council to undertake the construction of three railroads, over the Alps for a guarantee of interest of 600,000*fr.* annually. He estimates the cost of that over the Simplon at from 11 to 13 millions; of the St. Gothard, at from 13 to 14 millions; and at 15 to 18 millions for the Luckmanier.

Intensification of Gas-light.—Mr. James Allison Hogg, gas engineer, Edinburgh, practises a method of producing intense light with coal gas. A mixture of gas with atmospheric air is lighted after passing through a tiasse of iridio-platinum wires at a determinate pressure. In a few seconds the metal becomes heated up to a white heat, the flame disappears, and an intense white light is the result. An enlarged picture has been taken by its aid on prepared photographic paper. The light will burn in a gale of wind, it is said, without any protection round it, and a downpour of rain will not affect it. The use of platinum to increase the intensity of gas-light has been long known; but this seems to be an improvement.

The Cheap Railway Fare Scheme.—A paper was recently read at the Inventors' Institute, London, by Mr. R. Brandon, on his scheme for the "Consolidation of Management of Railways, and Uniformity of Fares for all Distances." At present, he said, the fares average 1*s.* for each person; but by his plan the fares would be 1*s.* first-class, 6*d.* second, and 3*d.* third; and he calculated that the number of passengers would be increased sixfold. He would propose, however, that all luggage should be paid for. By this plan, taken as a whole, he expected the following results:—Single tickets, 17 millions sterling; annual, 18 millions; express trains, 11 millions; 3*d.* fares, half a million; luggage charge, four millions; saving in management by amalgamation, 3½ millions; total contemplated revenue, 55 millions, being an excess over the present gross revenue of 38 millions sterling. He had not entered into any calculations as to goods trains, as he did not think they would be much affected by the proposed change. He preferred that Government should take the whole of the railway capital at a value based on a seven years' average of quotations, and that the interest should be 4½ per cent. Deferred shares and bondholders would be paid out of the surplus revenue after the payment of the above charges. The chairman (Mr. H. Williams) whilst inviting discussion, demurred to Mr. Brandon's calculations. He denied the analogy between the carriage of letters and of passengers altogether. A discussion followed, in which Mr. Varley, Mr. F. W. Campion, and others took part; and the proceedings terminated with a vote of thanks to Mr. Brandon.

The French Atlantic Cable.—For the past four months the manufacture of this line has been actively going on down at Greenwich. The cable is nearly similar to those laid down in 1865 and 1866, with the exception of the core in the present being larger, and weighing 100 lb. of copper more per mile. The object of this enlarged core is to attain a greater speed of transmission. The cable is very strong, its actual strain being 7½ tons. Sir James Anderson, who superintends the whole work on the part of the company, has recorded his opinion that by keeping up the Milne Bank, and around the southern edge of the Grand Bank, there can be no possibility of injury to the cable from icebergs. It is a well-known fact that the icebergs never "bottom" in over 90 fathoms of water; and, by acting upon Sir James Anderson's advice, the line would never be out of 500 fathoms of water. The *Great Eastern*, now lying off Sheerness, by next March will once again have resumed her telegraphic attire.

Progress of Montreal.—Upwards of 1,000,000 dollars have been spent in building in Montreal in the year 1868. In 1856 the value of assessed property was but little over 25,000,000 *dols.*, and the revenue of the city from all sources 285,000 *dols.* Now the value of assessed property is computed at nearly 100,000,000 *dols.*, and the city's revenue has increased to upwards of 700,000 *dols.*

Alarming Accidents at Churches in Liverpool.—Those assembled in St. John the Baptist's Church, Toxteth Park, on the Sunday before last, were alarmed by a noise produced by the top stone of one of the turrets falling on the roof over the south side of the nave of the building.

A gale of wind was the cause. Happily the stone, though making a hole in the ceiling, rested on it. One of the churchwardens (a builder) shortly afterwards advised the clergyman to suspend the service as the wind was blowing very hard, and a similar downfall of some of the other minarets might occur. The service, therefore, was prematurely closed. A precisely similar accident occurred about the same time in St. Paul's Church. In this case the broken piece of the spire fell through the roof and landed on the organ, but without doing more injury.

The Thames Embankment.—The planting of trees on the Thames Embankment (north), as recommended some few weeks since at a meeting of the Metropolitan Board of Works, has been commenced, nearly fifty trees being now in the ground. The trees are placed at intervals of about twenty feet from each other, and already nearly half the line of ground between Westminster-bridge and Hangerford is ornamented. The three new piers now in course of construction on the river—at Hangerford and Waterloo-bridges and the Temple—are fast approaching completion.

Hydraulic Cements: The French Academy.—Paris, December 21st.—M. E. Fremy presented his second memoir, "On Hydraulic Cements." These cements, he said, were produced, as Vicat established, by the calcination of argillaceous limestones. It is generally admitted that the result from the action of lime on clay is three salts—silicate of lime, silicate of alumina and lime, and aluminate of lime, which become hydrated on addition of water, and so form cements. M. Fremy's researches have been made with a view to putting these theories of hydraulicity to the test. In his first memoir, he demonstrates that the theory of hydraulicity founded on hydration does not apply to all the bodies formed during the action of lime on clay. By producing silicates of lime and silicates of alumina and lime under the most different conditions, he proved that these salts never hydrate nor solidify in contact with water unless they contain some free lime. Following up the five experiments of M. M. Rivot and Chaptou, he has demonstrated that of all the bodies which result from the calcination of an argillaceous limestone, aluminate of lime is the only one which has the power of solidifying and forming a hydrate under the influence of water. In the memoir now before the Academy he expresses the following opinion:—"The 'setting' of an hydraulic cement is always due to a pouzolanic phenomenon; consequently an hydraulic cement should always be formed of two different parts, the pouzola and the lime bases."—*Scientific Opinion.*

Explosion of Gas in a Concert-room.—An explosion, causing some damage to property, but, fortunately, unattended with injury to life or limb, recently occurred at the Co-operative Hall, Darwen. The large room of the hall, lately used as a theatre, was set apart for an entertainment to be given by Miss Emma Stanley, the veteran actress, as we might call her, were it not unallant to speak of a lady as a veteran. About six o'clock on that evening she went to the hall along with her manager, Mr. Harrison, for the purpose of seeing that all things were in proper order. A strong smell of gas at once arrested their attention. The hall-keeper sent for a gas-workman, who went underneath the platform foolishly with an open light in his hand. The consequence was, that the gas immediately exploded with a loud report. The platform was shattered, and one of the pillars was entirely blown to pieces. The workman, almost miraculously, escaped unhurt; but the concussion had such an effect on Miss Stanley's nerves that she was incapacitated from performing that evening, for which loss, it is said, she intends to claim damages.

TENDERS.

For a villa residence at Putney. Mr. G. H. Page, architect. Quantities supplied:—
Eaton Brothers £1,257 0 0
Lathey Brothers 1,230 0 0
Aries 1,264 0 0
Merret & Ashby 1,291 0 0
Bass 1,190 0 0

For the erection of a villa residence on the Bromham-road, Bedford, for Mr. James Edward De Gruchy. Mr. John Usher, architect. Quantities supplied:—
Edey & Waldman £1,165 0 0
Smith 1,153 13 0
Moore 1,145 0 0
Dey 1,138 10 0
Dickens 1,124 0 0
Carvin 1,115 0 0

For pipe sewers, &c., at Springfield Park, Lewisham:—
Hilton £992 0 0
Hutchings 711 0 0
Trevorson 669 0 0
Jones 688 0 0
Phillips 569 0 0
Reed 510 0 0
Blackburn 500 0 0
Crockett 495 0 0
Cherdwell 484 0 0
Major 484 0 0
Hartley 453 0 0
Thomson 442 15 10
Kent 415 0 0
Wigmore 393 0 0
Lusk 376 10 0
Turner & Cole 370 0 0
Ossenton & Carter 363 0 0
Rose 340 0 0
Smithson 330 0 0
Johnson 310 0 0
Young 295 0 0
Parke 295 0 0
Blomfield 249 0 0
Gardner 235 0 0
Bard 200 0 0!

For five houses and shops in Sloane-square, Chelsea, for Mr. Oakshott. Mr. J. W. Pentold, architect. Quantities not supplied:—
Baker £10,289 0 0
Piper 9,534 0 0
Belham 9,267 0 0
Turrell 8,611 0 0
Richardson 7,995 0 0
Wilson 7,300 0 0
Wilson 6,574 0 0
* Submitted an amended tender for the same sent in and accepted.

For houses at Putney, for Mr. J. Clipson. Mr. R. Niblett, architect. Quantities supplied:—
Aries £419 0 0
Adamson & Sons 449 0 0
Aries 434 0 0

For the erection of a model lodging-house, &c., in Catherine-wheel-street, Bishopsgate-street, for Mr. G. Barker. Messrs. Tolley & Dale, architects. Quantities supplied by Messrs. Birdseye & Stoner:—
Henshaw £3,451 0 0
Smith 3,430 0 0
Johnson 3,252 0 0
Tally 3,210 0 0
Rivett 3,193 0 0
Farrer 3,173 0 0
Newman & Mann 3,165 0 0
Heale 3,054 0 0
Langford 2,987 0 0
Ramsay 2,973 0 0
Manly & Rogers 2,967 0 0
Wells 2,967 0 0
Ashby & Sons 2,937 0 0
Howard 2,937 0 0
Ennor (accepted) 2,898 0 0
Piper & Co. 2,850 0 0

TO CORRESPONDENTS.

R. D. (not that we know of)—W. J. E. (not uses the MS. W. W. A. (we are forced to decline furnishing prices of materials).—Aqua (we know of no "public Landings" other than at "baths and washhouses"—R. R.—H. B.—W. F. G.—M. L.—Carp.—Rev. E. L.—G.—J. E.—G. M.—J. U.—Mr. E.—A. A.—H. H. W.—T. L. P.—D. L.—Col. G.—E. J. D.—E. S.—J.—Anti-Slavery—W. C.—W. R.—W. W. A.—E. J. P.—F. & G.—E. B.—Dr. J. S.—W. W.—J. L.—W. A.—D. R.)
We are compelled to decline printing out books and giving addresses.
All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.
Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

TO SUBSCRIBERS.

We give with our present Number, as a supplement, an INDEX and Title-page to the Volume of last year. A COLOURED TITLE-PAGE can be had, gratis, on personal application.
THE TWENTY-SIXTH VOLUME of "THE BUILDER" (bound), for the year 1868, will shortly be published, price One Guinea.
CLOTH CASES for binding the Numbers are NOW READY, price Two Shillings and Nine-pence each.
SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of Three Shillings and Sixpence each.

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The Builder.

VOL. XXVII.—No. 1354.

The Church of St. Mark, Venice.



UNITE alone in architecture stands the Church of St. Mark in Venice; it belongs to no style, it is a style in itself; it is without antecedents, it has remained without imitations,—perhaps, we may say, it is incapable of being imitated, for the scale is part of the style, and the richness of the decoration no less so; in its completeness it is an architectural resultant of the long history of Venice, and the history of Venice is too peculiar to have had parallels, or to be likely to be repeated.

It is usual to ascribe much of the peculiarity of the building in plan, construction, and decoration to Byzantine influence, and to consider that in this way its riddle is explained,—its evolution accounted for,—but little, indeed, is to be made out in this way on accurate comparison; we may recognize Byzantine details, features, processes, ornaments, but at last the renunciations, and the protests against any Eastern prototypes we know, are more important than the adoptions and adaptations.

We shall do better justice to the subject by leaving aside at the present time the attempt to affiliate the structure by inconclusive or insignificant family resemblances,—a view of the subject sure to be well taken care of elsewhere,—and by taking well to heart the manifest fact that whencesoever the designer of St. Mark's may have collected hints, as whencesoever he may have gathered his materials or his workmen, it was due to his own energy of organization, to the vivacity of his own fusing and remodelling imagination, that their ultimate form and arrangement, their harmonized unity and truly original effect, are to be ascribed. This is one of the cases where the enjoyment of art supercedes, or, at least, subordinates the interest of archaeology. *Materia superavit opus*; the idea of the architect dominates the materials he works with and works upon, even when sometimes he seems to adapt them in their very crudest form. The name of the architect of St. Mark's is unknown,—his very age is uncertain within a century; but whatever may have been the date at which he commenced his work, or put on sufficient record the leading lines of his conception, his spirit seems to have been continued to many of those who went on with his work, whether they may have been merely putting into execution his own intentions, or were moved to apply enhancements that almost invariably harmonized in effect.

The church, if we would describe its leading characteristics most summarily, is in plan—apart from some interior modifications—a Greek cross, with aisles on either side of both nave and transept, the nave and its aisles terminating eastward, in semicircular apses, with niches at their ends and sides. Over each arm of the cross, and over the intersection, is a hemispherical dome; five, therefore, in all. The western

arm of the cross is enveloped by a portico northward and westward, which is returned on the south side as a series of external chapels, including a baptistery. The interior of the church has its walls encrusted up to a certain height with slabs of veined marble, and where they cease, the decoration is taken up by a covering of mosaics of Scripture subjects with inscriptions, in colours on a ground of gold mosaic. These cover the whole surfaces of the vaults, the domes, the archivolts; below, the pavement is composed of elaborate patterns, in tessellations of most variously coloured stones, and the columns that are introduced are massive monoliths, often of the rarest and most costly marble.

At present a great deal of the pavement is in a state of ruin, and even some large surfaces of the mosaics of the vaults are stripped for reparation. The marble walls are discoloured, whether by mere dirt, or whether their brownish hue may be the more inveterate result of time and exposure. Tarnished are the silver lamps, and dulled the glitter of the heavy compound crosses that hang suspended from the roof, but still the effect of the interior is gorgeous in the extreme, with a gorgeousness that is majestic even at a disadvantage, and in its earliest freshness could have been by no means tawdry. All the minor fittings are of like magnificence. The smaller shafts that support the two pulpits are most beautiful, and so varied as to exhaust the vocabulary of the lapidary; rich slabs form the sides; the screen and all the furniture of the choir, and apse, and altar, has the same character, whatever their ages, of elaborateness, costliness, splendour. We should wish to convey this liveliest conception of this accumulation of costly elements of splendour, that a due impression should be prepared for of the value of the true artistic management by which they are brought under control, and made to subserve a gradual culmination of a larger effect.

The same principles of decoration and the same lavishness are continued in the portico with some new variations, and thence again to the exterior. Walls, vaults, and niches are again encrusted with marbles and historical mosaics, and the pavement with tessellations; the porches also and the intervals on the western wall are now still further clothed by double superposed orders of small columns of various marble, and with capitals as varied; this style of enrichment is still further extended on the western exterior and its recessed porches. These clothing colonnades reach up to the springing of the archivolts, and then are succeeded by covering slabs of marble, with sculptured or more brightly-coloured slabs inlaid, the enclosed semicircles above the portals being occupied by brilliant mosaics, and repeated by others with the same costly embellishments above.

On the gallery above the central porch stand the four bronze horses, so called, of Lysippus—but Greek in any case—transferred originally from Chios to Constantinople; and behind them rises again the range of five archivolts, with intermediate pinnacles, and crested by a richly but elaboration of foliated crocketing, rising to its highest apex to enclose the emblazoned lion of St. Mark's.

The foundations of the present church of St. Mark's at Venice date from A.D. 977; but they occupy the site, and very probably follow the lines of the earlier ducal chapel destroyed by fire, which is dated A.D. 826,—a century and a half earlier. Thirteen years previously the Venetians had acquired—an ancient inscription in a side chapel says frankly that they stole (*Marcum furantur Kanairii vociferantur*)—the relics of St. Mark from Alexandria. The interest of Venice in Cyprus quite explains her peculiar attachment to the evangelist whose history connects him with the island, and the readiness with which the patronage of the city was transferred to him from San Teodoro.

The main building was completed in 1071, and repaired, after injury by fire, again in 1106. The incrustation, with marble within and without, came later. The bronze horses which now stand above the portico, were brought from Constantinople in 1205, but probably found their present places later, for it was not until quite the end of the fourteenth century—that is, after 1380—that some of the window openings received traceries, and the upper archivolts and pinnacles were added and decorated. The high domes are also work of the late Middle Ages; while the foliated crockets, with intermingled and cresting statuettes that enhance so remarkably the grace and glory of the façade, are as manifestly works of the Renaissance as any of the dated mosaics of the seventeenth century.

The unity of effect which nevertheless results is certainly very remarkable; it is so far successful that the combination of styles is very constantly overlooked here as completely as in the Dog's palace, and thus are betrayed some who, lavish of praises without qualification for mediocrity in its purity, have no words hard enough for that revival which, whatever it revived, was very largely a revulsion from abuses of a style that was effete. Whatever is most peculiar in the building is at the same time most beautiful and most predominant, and whatever is less original seems by very force of its association to have put on so much of special character as to harmonize by producing agreeable relief rather than to shock by an incongruity.

The five external cupolas have a bizarre effect that adds no little to that peculiar richness of fanciful variation that is often styled Orientalism; but their value tells rather in remoter views than as contributing to the composition as it presents itself from Piazza and Piazzetta. The plainness of their surfaces would conflict with the general enrichment of other parts if they were more obtrusive; to the extent to which they appear their numbers and fantastic outline at least give evidence of the extent of the building behind and intimate sympathy with the multiplied variety of the façade.

This façade is not perpendicular to the main axis of the piazza, nor is this large square indeed even nearly a regular oblong, while still the sides are not so far divergent as to attract ordinary attention. The variety thus given to the presentation of the structure is an immense advantage, whether the result of design or not; the sacred temple seems to assert independence, and, at the same time, escapes an air of contemptuous disregard; it is neither the slave of its position nor forgetful of its responsibilities.

The exterior of the building carries more marks of alterations than the interior; perhaps instead of alterations, we should say of successive additions and completion at intervals; and yet this comparatively few changes and additions that have been made within derogates much more from the general value of its effort. To this point, however, I shall return.

The effect of the façade has been made the subject of glowing and picturesque descriptions which it would be vain to emulate and a little ungracious and unwelcome to criticise; indeed, they involve so much of truth that we may accept the exuberance of ornament like the extravagances of some of Turner's Venetian scenes, as in this sense faithful—they express the effects of the original on enthusiastic imaginations, and may surely therefore be credited to the excellences of the original.

The fundamental plan of the church of St. Mark may assuredly be described as the Greek cross, and it would seem to have been by a slip of the pen that Mr. Fergusson substitutes so distinctly the Latin cross. The full outer breadth across the transepts, including the walls, is as nearly as possible equal to the length from the first step by which we enter the church slush with its front wall, to the outside of the eastern

wall beyond the apse. The numerous recurrences of the Greek cross among the mosaics and upon the sculptured capitals of most archaic style of any in the church vindicate the claim of the form to primary consideration by the designers, who, whatever the freedom with which they treated it, returned to it in distribution of horizontal spaces, as we shall see, over and over again.

The front wall is of double thickness, to admit the introduction of staircases to the upper plan, the entrances to which are on either side of a covered porch, open towards the narthex or covered portico.

We take as the basis of observations the plan of St. Mark's given in the Atlas of Giogonara. It verifies so many logical adjustments that the author was in no way cognizant of, that its general accuracy seems to us to be sufficiently approved. It agrees also very exactly with the later outline by Kreutz.

The thickness of the internal incrustations is given, on what authority for exactness we know not, by a lighter shade or hatching. Whether this enrichment was contemplated from the first or not, the distribution of the interior neglects it and follows proportionate dimensions taken up to the unclotted wall.

The church proper, as we have shown, may be enclosed in a square.

The centre of the central dome on horizontal plan is midway between the back of the extreme niche of the apse and the internal line of wall by the entrance; a transverse line, therefore, through this point gives us the axial line of the transepts.

A central circle equal in diameter to one-fifth of full breadth of inclosing square, includes the horizontally-projected plan of the dome.

The nave dome is of the same diameter as the central dome, and its centre is fixed midway between the interior line of west doorway and the margin of central circle; the interval between dome and dome is thus equal to that between western dome and entrance wall.

The projection of the western dome is flanked on either side by a triplet of columns; the distance from axial line of these columns to centre of nave equals the distance given in the other direction to the flank wall; thus is decided the width of the aisles and the complete internal width of the body of the church.

These lines are ruled through across the transepts with the result of giving a broader interval on either side of plan of central dome than divides it from the nave dome.

The limit north and south of the domes over the arms of the transepts, is now obtained by the dimension from centre of plan to western margin of nave dome; in other words, a circle struck from centre of building will just touch on their remote margins and thus include, the horizontal projections of the nave and of the transept domes.

The breadth of the transept has already become deducible, and consequently the plan upon which its aisles and dome are to be distributed.

A transverse line tangential to eastern margin of nave dome projection, cuts the line of the wall of nave aisle; a column is placed in the aisle upon the line in front of this intersection, and the interior line of transept wall is made to range with the eastern margin of this column on plan.

The semi-breadth of the transept is thus diminished, and becomes less than the semi-breadth of central dome taken with interval between it and nave dome.

The semi-breadth of the transept thus obtained, is now to be halved, and this will give the axial line of an intermediate colonnade, here of two columns only, and by deduction of the semi-diameters of the columns, the diameter of the transept dome.

This diameter appears to have been brought by design exactly to 28 Venetian feet against 36 of the central dome, showing a loss of 4 ft. on each side by the contraction ensuing on the inserted colonnade.

The result—anticipated and aimed at—is most important in subordinating the transepts to the central nave; this is still further pursued by the reduction of the full spread of the transept on plan, by the occupation for closed chambers of so much of the space of full breadth of building as extends beyond the external margins of the transept domes to the north and south. These chambers, however, are not permitted to curtail the breadth of the church absolutely, for they have only the height of a ground story, and support a continuation of a gallery open to the

church; and on one side the light of the southern sun is admitted through a large rose window—of later design—above them. This peculiar feature is still more remarkably treated at the western extremity of the church, where the gallery in question is not only extended over the double wall of the entrance, and the inclosed staircases, but this open upper story is extended even over the west porch or atrium, and light is thus admitted into the body of the church through the great window immediately above the advanced west portico. It is this arrangement which gives a certain appearance of increased length to the church, and vitiates so far the primary proportion of the Greek cross.

The lines of the transept ruled through on the eastern side touch the margin of the projected plan of the choir dome. The diameter of this is apparently about 30 Venetian feet, as against the 36 of the centre—the span being contracted as in the transepts, by beavings for an archivolt within the lines of the piers of the centre; the eastern semi-circular cove is struck immediately beyond the projection of eastern dome upon a diameter again reduced on the same principle.

When we glance over the general appearance of the plan thus brought out, we see that it starts from a single principle of arrangement, then develops by repeated applications of the same principle to successive extensions, and lastly, sets a limit to this process of development, and gives coherence and unity to all comprised within those limits, by subordinating all members to one chief dominant position of interest, by modifying each subordinated member in accordance with speciality of function, and by marshalling all in appropriate sequence and order.

Nothing can well be more alien from the system on which this—systematically enough—is effected, than that rule of planning, on equal squares—*pari-quadrato*—that has sometimes been vanned as a royal road, at least it were an easy one, to the mastery of noble effects. Assuredly it is no easy problem for the balance to be held between irregular fancy and mechanical coldness in design. Regularity is the very soul of that rigid law of discipline that architecture can never relinquish with impunity; by which alone it can retain mastery over the manifold and immense assemblages of members and materials it contends with. But strictest discipline must needs be administered with that discretion of which the equivalent in design is quick apprehensiveness of safely admissible—of absolutely indispensable, adaptation; with that lightness of hand, that treatment with feeling, that can venture from time to time—nay, even constantly as the work proceeds,—to desert the dry perceptive lines of the broad and hard general rule; that can revert to qualifications which, although only admitted at first instinctively, deserve welcome as inspirations; these will constantly be found, on further study, to be themselves amenable to laws as eternal as the one rule that they appear at first to contravene, whereas they in effect cooperate with it.

The general plan of the church, then, as we have seen, is the Greek cross, with arms of equal spread from the centre; but the east and west arms are allowed a more liberal width than the transepts north and south, and thus the dignity of a nave is asserted in this direction. Moreover, while the lengths of the transepts are curtailed on the floor level by assignment of their extreme portions to closed chambers, the eastern arm receives a distinction that shows it as noble above all its fellows,—by an exceptional apsidal termination.

The cross of the general plan has a very marked expression in the void space of nave and transept, which remains after the reduction of the plan by the cross lines that partition off the lateral and transverse aisles. The hemispherical dome over the grand crossing rests on the keystones or rims of the extrados of four great arches that are continued as barrel vaults in the four directions as far, generally speaking, as the edges of the great quadrangle which mark the breadths of body of the church and of the transepts. The transition from the square central plan to the covering circular dome, is effected by coved spandrels or pendentives. This central dome has thus the effect of being the centre of a Greek cross of its own, of which the short and almost equal arms are the pairs of oblongs, north and south, and east and west, that are roofed by the barrel vaults.

The north and south arms of this cross are now appalled severally as arms of, again, a northern and southern Greek cross dependent on a domed centre in either transept.

The transept domes, like that of the centre, rest on the rims of four barrel vaults, of which three extend as far in each case as the outer wall of the church, and the fourth as far as the grand crossing. The eastern arms of the crosses thus formed on either side, are appropriated as chapels with altars, out of regard to which, as it appears, the opposite arms of the cross are left clear; the north and south arms, as we have seen, are closed below, but are open above to a late Gothic wheel-window on the south, and on the north to the extramural wall, which is clothed with a rich mosaic. Galleries extend over the closed portions, of which that on the south is divided by a passage giving an entrance to the church from the piazzetta.

The western arm of the central cross becomes in like manner the eastern arm of another majestic cross of which the nave dome covers the centre,—the north and south arms extending to outside walls of the church proper, and the western as far in the first instance as the wall pierced by the entrance door.

Above this western limb, which is not like the corresponding member in the transepts curtailed below, receives the farther extension already noticed, and includes under its prolongation of vaulting a gallery over the portico or vestibulum, as far as the line of the large west window and the wall behind the projecting outer porches, and their external gallery.

The piers which present an angle at each corner of the square of the central dome, and bear at right angles the barrel vaults across the transepts, and across nave and presbytery, are pierced by arches north and south, and east and west, to give passage to the direct and the transverse aisles, and become thus on plan divided, in fact, into four piers; here again the projected plan gives a small secondary Greek cross; with arms included in each case between the three massive quadrangular piers, and the pier attached to angle of nave and transept wall; the perforation is in two stories,—a loftier opening is below a smaller of more window-like proportions above. The analogy to the large central arrangement is supported by each of these small squares, having again its domical ceiling or cupoletta resting on extra dos and coved spandrels.

The barrel vault of the western arm of the nave cross descends on parallel walls that are pierced with arches again like those that bear the eastern; only the north and south walls of the church, instead of being perforated, are merely clothed with shallow arches; but the square voids in the angles still assert their analogy, and receive each its proper domical vault.

The eastern arm of the central cross becomes the western of another domed at the crossing and above the high altar, in like manner, but in place of a rectangular eastern arm, it recedes in this direction a semi-circular apse of full span; its semi-domical head of this is wall visible throughout the full length of the church, and is occupied by a colossal mosaic of the seated Saviour on a blazing ground of gold. Below are three smaller niches with semi-domical heads,—that to the left is fitted at the back with the bronze doors of Sansovino that give entrance to the sacristy. It is at this point that the differentiation of the primary type of arrangement is most declared. These eastern domes rest, as in other cases, on grand arches of its full span, but below, to the right and left, the eastern halves are walled up, affording towards the choir backs and seats for stalls, and serving to enclose small chapels at the ends of the north and south aisles; these have apsidal ends eastward and three smaller niches in the thickness of the wall below, reductions, therefore, of the main termination of the church. Above the dividing wall runs the gallery that accommodates organs and orchestra.

The main effect of a grand crucial plan might easily have been distinguished by the importance of the large secondary cross vaults; that it is sufficiently salient on first entrance into the church, is due to the skill with which the differences of the upper and lower plans are blended, to the well-regulated gradation in dignity of enrichment of the several arms of the cross, and the vigour with which certain well-accentuated lines of decorated detail are carried round the interior throughout at identical elevation, binding all together in unity.

The line of nave, east and west, is well-decided and kept distinct from the north and south arms of the cross under its special dome by the insertion of three columns in the interval, which

carry a connecting gallery only, and for the rest declare themselves simply as standards of a line of demarcation. The moderation of their intervals is moreover most useful in bringing down a scale for comparison of magnitudes; and the space under the central dome gains in magnitude by contrast with the oblongs of the aisles that are so cut off from it.

By a like arrangement in the transepts, the eastern and western arms of the domed crosses are divided from the main transept, running north and south by pairs of columns in opposite sets, bearing a continuation of the galleries which wind round the interior of the small squares of pier-crosses, and so round the church, connecting the covered extremities of both transepts and nave. This passage has thus much analogy to some forms of the so-called triforium, but that it was ever extended, or intended to be across the aisles, I do not believe.

The capitals of these columns are gilt, and very varied in design, but even when not exactly paired, are usually treated with a distinct intention to match in general effect. Some are pretty literally Corinthian, and some Composite, never exactly executed; others belong fundamentally to either one or other of these forms, but betray a definite attempt to work out a novel combination, and usually under a predominant Byzantine feeling. We seem to be provided here with examples of two forms of innovation in style. Innovation is sometimes little better than innovation of malice aforethought, when it is prompted by no welling up of new imaginations, but is a mere assertion of brute independence, a resolution to be different in any case, different for the sake of difference, right or wrong.

It is impossible not to perceive in other cases that it was through the degradation of an originally pure if not perfect form, that novelty has been evolved more honestly at least, and of better promise. A type that might have been fixed and immutable for ever, by the conserving energy of its very beauty, had it never been unworthily executed, has been superseded at last by designs of most contrasted character, that still took their origin from its own dehailed exemplars. When refined beauty lapses, it may easily be into something worse than primitive crudity; ill executed specimens then become incitements to regeneration, to remodelling that does not retrace the steps of the ages to a departed purity of which the traditions may be absolutely lost, or that otherwise may be too elaborate for resources, for patience, or for skill. Many Byzantine capitals have much the air of being cheap or random completions, one how or another, of capitals that had been found blocked out to receive Corinthian foliage. The attempts of indifferent workmen in this way at last suggested motives that were developed by livelier imaginations, abler hands, but equally exempt by education from reverence for correct classification. This, however, is subject to the transformation of species architectural, that deserves to be worked out independently, and invites abundant illustration; parallel phenomena are to be found in those changes of language by which degraded provincial Latin became the Italian of Dante, the French of Montaigne, while dialects less divergent from their original, remained less Medieval Latin, or became obsolete.

The columns of the interior of the church, of porphyry, verd-antique, Oriental and African marbles, have invariably monolith shafts, and in their enrichments, as in their ordination, there are but exceptional traces of that irregularity that is so striking in the vestibule and the external porches. In the interior there is scarcely a trace of admission of incongruous associations for the sake of finding a place at any risk for fragments of value in themselves, but with no pretensions to match; here every column and capital has the appearance of having been made for its place, and designed with regard to its associates and its surroundings. The six in the nave proper are of marble, as indeed are most of the rest; but these, in deference to the dignity of their position, are cut in the expensive direction—transversely to the veining of the stone. The central capitals of the triplets on either side are tolerably accurate Corinthian, and contrast by heightened decoration with their companions on either side, which again match their opposites, but are of style of plainer finish.

Every abacus above the gilded capitals is enriched with an elegant inlaid pattern in black and white; this is continued at the same level round the plain massive piers; it is repeated

with extra and very beautiful elaboration above the capitals of the granite monoliths, that are in pairs against the walls and at the angles of the transepts to receive the broad archivolts of the pier-crosses; from these capitals the simpler pattern of the nave abacuses is continued as a string-course along the walls, and it thus makes the circuit of the entire church,—nave, transepts, presbytery, choir, with a value in effect that is far beyond its immediate conspicuousness.

The positions of other parallel string-courses above are governed by the distribution of the design, as it is shown by a longitudinal section.

It is futile to attempt to follow out the process of distribution of a truly artistic design through one single line of deductions. The very principle of harmonious combinations implies the ultimate concurrence of several motives of arrangement—the equilibration of various concurrent momenta. But the concurrence at last is only brought about by independent examination and pursuit of the tendencies of each; by the discovery of agreements arrived at from different points; by the concession of compromises recognised as unavoidable after scrutiny from most varied aspects. The height of the crown of the central dome from the pavement is as nearly as possible equal to one-half the interior length of the choir as already taken; this, however, does not give us the height of the dome itself—the level of the springing of the hemisphere. This is necessarily one-half of the diameter of the dome, of that circle which, as we have seen, is given by one-fifth of the full length or breadth of the church. This agreement, however, may be but an undesigned coincidence, or it may have been considered, and even rendered exact, in consequence of its observed approximation to a dimension brought out by another process. Thus, let us say that the architect decided first, that his greatest interior height should equal half his extreme interior length; by halving this height again we find that our section of the church is again divided into a lower portion, comprising the vertical walls of rectangular outline, and an upper which contains only the vaults, domes, and semicircular heads of walls under the vaults. This line well marked runs through from end to end of the church, interrupted only by the later wheel window of the transept: it is confluent with the abacus of small column of upper story immediately below the spring of vaults and archivolts, and is returned at the eastern end to mark the base of the semi-dome of the grand apse.

The upper division or half is now divided between two semicircles of equal span,—that of the large central dome and that of the barrel vault of the nave below it. That the diameter of these semicircles is not equal to half the height of this upper division is due to the circumstance that a certain space is occupied by thickness of construction between the base of the dome and the intrados of the barrel vault. By making this deduction, on whatever principle, it is clear that we should bring out the diameter of the central dome by reference to the continued bisection of interior length, and irrespective of its division into fifths. The lines of height of barrel vault and dome springing again, run through from end to end of the church, to finish upon the crown of the grand eastern apse.

Thus we have, first, the level giving the base of the domes throughout; then that of the barrel vaults and semicircular archivolts; the joint height of these divisions being equal to one-half the full height of the church, or one-fourth of its full interior length. By halving the height from the base of the dome to the floor, we obtain the line of bases of paired columns that in an upper story carry the archivolts of the transepts of the choir and apse; it is returned round the transepts as the moulding of the halustrated gallery over the arcades, round the tribunes, houses within the great piers, and so passes entirely round the church. At one end it accentuates the elevation of the gallery over the entrance, and at the other crowns the lower division of the grand apse above the secondary niches. The proportionate height is continued to the choir, where the raising of the floor below is counterbalanced exactly above by the thickness of the sub-archivolt.

Apart from the noticed deduction for constructional thickness, it is clear that the height of this division and of the colonnettes it includes would be exactly one-eighth of the full height of the main dome; as it is, they are somewhat

in excess of one-sixth of the height of vault of nave, the reduced dimension.

The smaller paired columns upon this level already adverted to, have great merits in themselves, and the highest value in effect. Here again is exemplified most strongly the distinction that must be admitted between the treatment and design of San Marco in the interior and on the exterior. All these columns are alike in design, adjusted originally to the dimensions of their position and of well-studied elegance. Their shafts of dark marble are octagonal prisms, with graceful diminution upwards, and they blend below into an accurately moulded base of elegant profile with an ease that may well put to shame mediaevals who never learnt to spare the jar of a harsh transition from abruptly broken shaft to base-moulding.

The abacus is rectilinear in profile, and the intermediate capital, of uniform type in every case, and of very decided Byzantine character, is accommodated to the outline of the shaft by cutting off the angles of a cubical block from the corners of the abacus above to a line matching the inclined side of shaft below.

The more numerous and closer introduction of the colonnettes in apse and presbytery assists very greatly that effect of gradual focalization of interest that is favoured by general increased enrichment ensuing upon contraction of the general spacings and rise of level upwards to the eastern extremity.

This line, then, coincident with their capitals, and at exact midheight between pavement and springing of cupolas, marks the lower point of the pendentives under all the domes, and the limit of the vertical piers and sidewalls throughout the church; and its importance is acknowledged accordingly by a white marble moulding, richly carved, but still of no such projection that it may not consistently be returned as an abacus moulding above the capitals of smaller paired columns that, on the upper story bear the advanced archivolts.

The line of the bases of these small columns gives another continuous division marked by a light plain moulding of small projection; it is continued below the vertical windows of the apse in one direction, and in the other it is returned round the transepts as the moulding of the halustrated gallery over the arcades, and so it reaches ultimately the like position above the arcades of the nave, and the tribunes housed within the great piers.

This is the leading line that determines the distribution of the gorgeous internal enrichments of the church. The soffits of the arches of the arcades are indeed enriched with mosaics of figures, compositions, and patterns; but except for these, and a few figures on walls of the nave aisles, the enrichment up to this level throughout the church in nave and transepts, depends entirely on incrustation with long vertical slabs of veined marble returned symmetrically upon their sections. The general character and tone of colour of these is pretty uniform, and has a certain warmth that is not inharmonious; besmirched, however, as the entire surface appears high and low wherever not brightened here and there by attrition of heads or shoulders of worshippers, the original tint may easily be misinterpreted through adventitious dinginess. The comparatively plain yet not neglected walls, only broken and relieved by the attached and intermediate shafts, are thus interposed between the elaborate mosaic pavement of the floor, and the gleaming and storied walls of the upper story above the level of the galleries, and then of the vaults and archivolts, the pendentives, and the domes. We must reserve the remainder of our observations for another article.

MEMORIAL OF THE LATE HENRY KIRKE WHITE.

THROUGH the earnest efforts of the Rev. E. Davies, rector of Wilford, near Nottingham, which place was the favourite resort of Henry Kirke White, a memorial of the youthful poet has, at length, been placed, by public subscription, in the chancel of Wilford Church. The memorial consists of a painted window, illustrating Kirke White's ode, "The Star of Bethlehem," which has been produced by the Messrs. O'Connor; and also of a medallion portrait of Kirke White, sculptured in white marble by Mr. W. T. Hale, of London, and which has received approval for its truthful resemblance to the existing portraits of the poet.

THE BIRMINGHAM AND MIDLAND BANK.

We publish a view and plan, in our present number, of the Birmingham and Midland Bank, which is now in course of completion. The commercial needs of the great midland metropolis have induced the proprietors of the chief banking establishments to rebuild or extend their premises, and amongst the foremost in taking that step were Messrs of the Birmingham and Midland Bank, whose offices in Union-street have been enlarged from time to time till, more accommodation still being required, the directors wisely determined to build on a more extensive site more convenient premises fitted with recent improvements.

The building is from the designs of Mr. Edward Holmes, of Birmingham and London, and stands at the junction of New-street and Stephenson-place, opposite the Exchange Buildings, which were erected from the designs of the same architect, and illustrated in our pages a few years back.

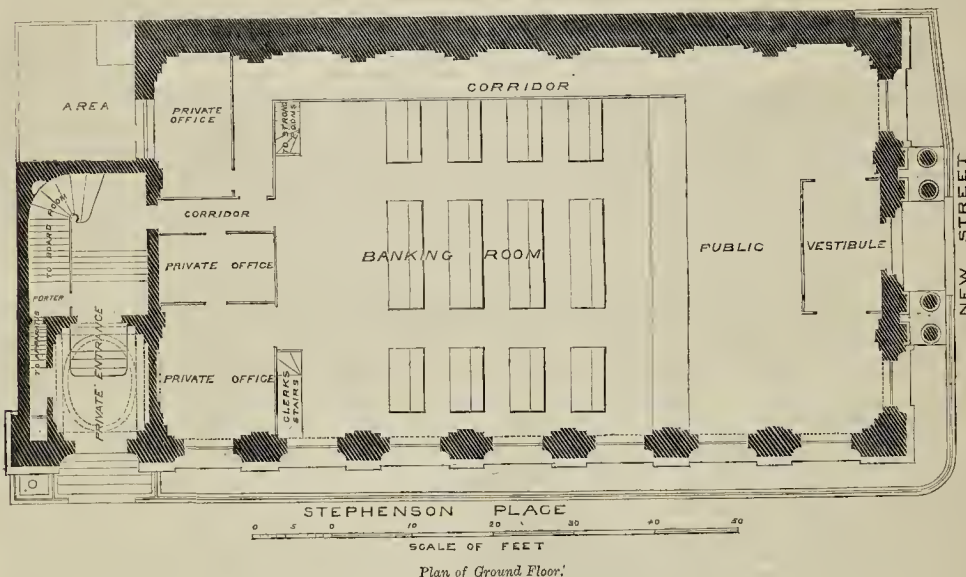
* See p. 47.

As will be seen on reference to the plan, the whole of the site, with the exception of the private entrance and stairs to Board offices, is occupied by the banking room, a fine apartment 92 ft. long, 49 ft. broad, and 30 ft. high, the private offices being shut off by screens of polished mahogany and embossed plate-glass. In addition to nine lofty windows, a central lantern gives light to the bank. This lantern is 37 ft. by 18 ft. 6 in., and is filled with ornamental glass by Messrs. Chance, Brothers. The strong-rooms, with the dining and coat rooms for clerks, occupy the whole of the basement, which is well lighted. On the first floor are placed a board-room, 48 ft. long, 26 ft. 3 in. wide, and 25 ft. high, with windows in both fronts, and ante-rooms, dining-room, sitting-room, and bed-room for resident clerks, lavatory, &c. There is a private room for the manager on the Mezzanine floor over the private entrance, and a gallery which may be used for clerks over the private rooms at end of bank. The second floor, lighted from the roof and from area for central lantern, is occupied by the kitchen, offices, and bed-

rooms: a light from coal-cellars communicates with the former. The upper stories are carried by wrought-iron large box-shaped transverse and longitudinal girders, each of the transverse girders weighing about 18 tons.

The style of the building speaks for itself: it is somewhat severe in character, the architect being instructed to avoid all unnecessary ornamentation, but the result is an edifice at once dignified and bank-like. The two fronts are executed in Portland stone, the four columns of the portico being of Cornish grey granite polished, each a monolith. The walls internally are finished with Martin's cement. The ceiling is divided into nine compartments, round each of which there are cornice and cove: each division is cofered. The bank fittings are of polished Spanish mahogany. The private rooms and board-room are being warmed with hot air by Mr. W. W. Phipson, C.E.; the massive iron railings are in the hands of Messrs. Hart & Son; and the other works have been carried out under the direction of the architect by the contractors, Messrs. J. Cresswell & Sons, of Birmingham.

THE BIRMINGHAM AND MIDLAND BANK.



Plan of Ground Floor.

A PLEA FOR STONE.

Among the theories set up by sundry architectural prophets, upon which to ground the formation of a new style, and indicate with precise and irrefutable logic the form which such style must take, the most prominent is that which takes for its basis the comparatively recent introduction of iron as an important constructive element in building. We have had this view of the matter, in fact, dimmed into us *ad nauseam*. All young lecturers and readers of "papers," who wish to appear very philological, tell us that this is the "iron age," a metaphor which seems inexhaustibly attractive. "A pound of wire will do as much as a ton of stone;" we are to have no more such wasteful and clumsy expedients as arches and abutments. Tension, tension is the thing. According to a well-known and very clever writer, the lintel and the arch styles, representing cross-strain and compression, have had their day, and the *tensile* style is the style of the future. We have no intention here of "setting the battle in

array" upon the question of our future style. Heaven forbid that we should add a line to the reams of theorising which have been written on the subject. To us, indeed, one building carried out with thorough honesty and straightforwardness as to material and design is worth more than a whole shelf of books of prophecy. But one can understand how comforting it must be to the minds of a certain class of designers to have a neat concentrated theory upon an apparently practical basis; and how exhilarating must be the visions conjured up of all the new and elegant forms which building design is to take after we have become naturalised with the new material, and have made it as important an element in architectural history as stone was made by our forefathers. And even if we decline to contemplate the possibility of a purely iron style, still, if we are to accept Mr. Garbett's tensile style of arches without abutments, it is clear that iron must play the most important part in the practical construction thereof, and a millennium for the ironfounders be the inevitable result.

Our ironical anticipations on this head, however, were rudely interfered with the other day by the contemplation of a small piece of iron 2 ft. long, which some years back had been inserted in the masonry of a spire when under "restoration," to tie one of the angles at a weak point; that is to say, the material was stated to be iron by those who were bound to know—a statement which, in the face of the unsightly ragged mass of oxidation presented to us, had to be accepted in faith only. Of course, it has been a currently admitted fact for some time past that iron is very unsafe material to use in conjunction with stone, and that under such circumstances it is always liable to go; in fact, that in admitting iron into masonry you are introducing an element of decay, or even of destruction. Yet this knowledge is very often set aside and practically ignored. We are acquainted with one church built by an eminent architect, and deservedly an object of admiration in its neighbourhood, the "crossing" of which professes to be covered by a solid stone dome springing from four main piers. It was originally

intended to be so, but (being in the confidence of the contractor) we obtained the information that the pendentives were in fact supported by iron girders across the angles, concealed in the masonry. We represented that this was, in fact, tying the edifice up, not building it, but were met by the assurance that the girders in question would last "till the millennium;" which, not knowing the date of that era, we could not dispute. But, waiving the question whether such proceedings are really in accordance with the art of architecture properly so called—whether it is not a very lame and mean sort of expedient to represent a building as constructed of masonry when, in fact, it is supported by concealed bands of a tensile material—what we wish specially to call attention to is the fact that iron, even when used in the most favorable positions, and with the greatest care to exclude from it the action of weather, has not yet had the test of time to determine its capabilities of endurance as an architectural material. It is very well to talk of an iron style, and to declaim against the prejudices of those old-fashioned people who look cautiously askance at the idea; but it must be remembered that it has heretofore been one of the chief glories of architecture as an art, one of the qualities which render it in its highest forms most attractive to the best minds that have been engaged upon it, that its productions have been more or less monumental in their character, and have claimed both by their magnitude and stability a kind of dignity and importance on the earth beyond that which attaches to smaller and more perishable works of art. Now, even setting aside the question of artistic appearance, we have no proof as yet that structures principally or wholly of iron will last in this way as monuments to future generations, since time is the only test in such matters; but, from what we know of the material, we have every presumption that it will not so last. Knowing as we do the rate at which iron gives off its substance in the form of rust, a source of decay which becomes more felt in proportion to the increase of external area; knowing the extent to which it alters its conditions under change of temperature, and the difference of the conditions of wrought and cast iron in this respect, which yet must often be used in conjunction; remembering also the thousand and one weak points which are liable to make themselves felt in a structure all the parts of which have to be joined by bolts, screws, and such-like contrivances; under all these circumstances, it is impossible not to feel that the claim for iron as a leading material in the architecture of the future is even practically a very doubtful one, and that buildings dependent in any way on such a material, though invaluable for temporary purposes, must lose nearly all that enduring character once supposed to belong peculiarly to architectural designs, and have small chance of carrying down the memory of their designers to posterity.

Nor is the case for stone, as against iron, less strong in an æsthetic than in a practical point of view. Consider for a moment the remarkable distinction between the *rationale* of the two materials. They do not stand by any means on the same footing. In using iron, we are using a material which is to some extent artificial. It does not show itself above ground; and when it has been laboriously dug up and brought to light, it is not in a state for use, or even recognisable at once by those who only know it in its artificial state; nor is it till after much mystery of smelting, puddling, and other treatment known to the initiated, that it comes forth "purified and meet for the master's use." But in using stone, we are using a natural material in its unaltered state, so far as texture and quality are concerned,—a material concerning which we have had previous experience, before we used it, in its powers of resistance. We see it before us in the quarry, coherent in vast masses, and resisting a compression of many tons, and we take it as it is, merely cutting it to the required sizes, and set it, as it lay before, "on its quarry bed" (if our object of the works attends to his duty properly). We expose a great amount of its surface to the weather; but otherwise, if our building is properly constructed, we do not alter the condition under which the material existed in its natural state, and consequently are saved much of the doubtful and experimental proceedings which are forced on us in dealing with artificial materials. A more important consideration, in an æsthetic point of view is, that we are here using the material which we see visibly around us, which forms part of the ground we tread;

we are causing the "great globe itself," visibly and ostensibly, to furnish the means whereby we may erect those "cloud-capped towers, gorgeous palaces, and solemn temples" which have formed some of its noblest adornments. It is this which has given much of their impressiveness and effect to the great monuments of the architecture of the past; that they have appeared not so much as independent erections or constructions upon the earth's surface, as actual growths from it, homogeneous with it, in substance and texture, and thus appearing to form part of the landscape amid which they stand. Sir Charles Barry, indeed, is known to have made this latter effect a special object whenever circumstances permitted, his delight having been to "connect the house with the landscape," by happily-contrived terraces and gardens, diminishing in artificiality as they receded from the edifice and mingled with the open country. Nor can we ignore the immense value of the mass and weight of material necessary to a stone building, and necessarily precluded in an iron one, when architectural effect is to be considered. After deducting all the effects of previous habit and prejudice, after showing that a nation long habituated to seeing its principal structures of iron would come to look on that material with far more respect than we now do, and become used to its rigid lines and thin forms, it is nevertheless impossible for a moment to admit that structures resting upon thin metallic shafts and roofed with a web of spider-like framing, can ever have that effect on the mind which has been produced upon all beholders by the temples of Karnac and Philæ, the Parthenon, and the great cathedrals of the middle ages. In the "iron age" all that has constituted the majesty of architecture would disappear. That aspect of enduring immobility, which seemed to connect the structure with the ground it stood upon, the broad play of light upon the piers, the depth of shadow in recesses and roofs, the aspect of mystery which pervades a grand interior on a large scale—all this would go, and leave us instead a barren framework of thin lines, standing nakedly out, devoid of all the magic of chiaroscuro, and suggesting nothing save economy of space and material. Unless architecture is to be a lost art, stone must still be the main material for the architect to work with.

Brickwork has indeed been putting forward great pretensions of late, and, in buildings where economy has to be considered, must always take precedence of stone; but we have instances, not a few, of late years, in which brick has been, and is being, voluntarily preferred for large and expensive churches, and buildings of a similar class. We take this to be a foolish piece of fashion; a change for the sake of change, or in the vain hope of thereby achieving originality. All our church architecture having for so long, more than any other branch, run into copyism, the original models have been exhausted, and the copyists were at a dead lock, when the lucky discovery was made that the Mediceval builders of the North of Italy had produced admirable structures, after their manner, of brick and marble, to the adequate illustration whereof one of the most talented English architects lent himself with a will. Here was a new field, the marble, indeed, might be difficult to obtain, but the brick was feasible; whence a springing up of brick churches, as aforesaid, with square jambs in lieu of splay or mouldings, and traversed by divers bands of black. This may be all very well for a change, but as to appearance there is no comparison, except in the eyes of prejudiced persons. It is very difficult to get brick of a decent colour at all for a large building, and when the best is obtained, it is far inferior to the natural tint of fresh stonework; and being an artificial tint, moreover, does not harmonize with the landscape around it: while the forced and strongly pronounced polychromy obtained by different tints of brickwork is far inferior in effect to the natural play of colour and tone in stone walling. Then carved ornament cannot be introduced, except by the insertion of stone in which to carve it; though the enthusiasm of some of these modern "bricks" has led to the resuscitation of moulded ornament in brick,—a device which costs nearly as much as stone carving, without having one-fourth the effect, and which was originally used in localities where no stone easily carved was procurable, but which is now voluntarily substituted for freestone, where the latter is plentiful, merely for the sake of fashion. Of course, good brick is a very fine material where expenditure must be limited; what we protest against is the pretence

of preferring it to stone on artistic grounds. And there is one very strong reason for using stone, when building in the country, even for small houses, viz., that it can be made to harmonize with the landscape of the district in which the house is erected. In introducing brick into a landscape, we are in almost all cases introducing a discordant element of colour. But in using (as should always, if possible, be done) the stone of the neighbourhood, not only are we using, as before said, a natural instead of an artificial material, but we are using that which is the basis of the landscape around, and from which the latter takes its prevailing tone and character; whether it be a limestone or a sandstone district, or whatever formation it may be, we are thus carrying the tint and character of the landscape into the walls of our house, which seems to become part and parcel thereof. This is not sufficiently attended to; and sometimes stone is brought at additional expense from a distant quarry, to satisfy some whim of the architect, when the stone of the neighbourhood would have had a far more satisfactory effect in comparison with the surroundings of the building.

In making this plea for the use of stone as *par excellence* the architectural material, we may be met by the objection that the order of things, and consequently the tenure of building property, is no longer characterised by the same stability which belonged to ancient periods, when the current of life moved at a slower rate, and when the uses and requirements and value of a building did not change for centuries after its erection. It may be said that we have no longer occasion, in our towns especially, for those monumental structures which were seen built to last for ages, seeing that we know not when the demands of a shifting and increasing population and a changing polity may render such edifices, after a comparatively brief time, no longer suitable or useful. But the idea arises from a too partial view of the course of human affairs. As Mr. Froude observes in the opening of his "History of England," the history of nations has always presented an alternation of epochs of change with long periods of settled and established ideas. We are now in a period of change; steam has revolutionised our domestic polity, and some time may elapse before we settle down into the new form of life and manners towards which we are, however, rapidly moving. It may be wise, therefore, not to stereotype any of our present wants or partialities in the form of expensive buildings of a monumental and enduring character. We are now in the condition of the man described by the Roman satirist:—

"Diruit, ædificat, mutat quadrata rotundas."

We are changing our forms of building and our forms of life, and the iron architecture does well enough for the temporary needs of such a period of change, and will last about as long as it is likely to be wanted. When we shall have settled alike our great lines of railroad and our great lines of life, and grouped our habitations accordingly, we shall once more find stone the fittest and best exponent of an architecture which we may trust will not be inferior to that of the great periods which we have left behind us.

A FRENCH BOOK ON HEATING AND VENTILATING.

THE author of a treatise upon heating and ventilating French private houses and supplying them with water, recently published in Paris, cries out bitterly against the prevailing system of false luxury in French houses, which provides appearance before comfort.* Every sanitary arrangement, he declares, is sacrificed to secure handsome reception-rooms, which give to their occupant a semblance of being something more than he really is; and if the architect entertains any other consideration, it is how to impart an air of luxury to the façade. Where an English landlord advertises, "Well-aired beds," a French one announces "*Appartements ornés de glaces.*" M. Joly, the writer in question, has made a long residence in foreign parts; "where taste is sometimes at fault, but where domestic comfort is studied better than in France," which we presume he is too polite to name more particularly. But it is easy to see that it is with

* *Traité Pratique du Chauffage, de la Ventilation et de la Distribution des Eaux dans les Habitations particulières: à l'Usage des Architectes, des Entrepreneurs, et des Propriétaires.* Par V. C. Joly. Paris: J. Baudry, 16, Rue des Saints-Pères. 1869.

the widely-spreading adoption of sanitary appliances in English houses that he contrasts the almost utter absence of water and ventilation in French habitations. In his enumeration of what he calls the vice of French domestic buildings, he speaks of low ceilings, of water-closets badly lighted, badly ventilated, and placed close to the kitchen; of the absence of ventilation, baths, and water; of nurseries looking upon the unwholesome courts into which the spots carrying away the foul waters of the house discharge themselves; and of chimneys which waste the heat they should economise, as evils the French tolerate with complacency, if not with approval; and after dwelling at some length upon the discomfort and misery of these shortcomings, he strenuously urges the adoption of the habits of "propriety" common to the English, Dutch, and Americans. Posterity, he continues, will be scarcely able to believe, that in Paris, the eighth wonder of the world, men and women can be seen at the present day *attels à des tonneaux*, and carrying water upon their shoulders to the upper stories of houses. Cold water within the last few years has found its way into French kitchens, but hot water is still unprovided there, and both are entirely absent in the upper stories, as is the health-giving bath. A French bed-chamber, he deplures, let it be ever so richly decorated, contains only a bed, a secretaire, and a few chairs: no convenience for the performance of ablutions is in sight. He would have a bath at the side of the bed, a choice of site we cannot endorse, however much we approve of the general use of this source of cleanliness and health. A bath in a bedroom is a mistake, because the steam from the hot water is a source of damp to the bedding. It is much more advantageously placed in a room opening out of the sleeping apartment, when, by the simple plan of closing the door between them, the steam is confined to the bath-room. Having shown the great desirability of more attention to sanitary matters, especially the need of a proper water-supply in French private houses, he first points out the best methods of carrying the last-mentioned reform into execution, after owning that learned engineers have spent much time in disentangling the difficulties of providing water, ventilation, and heating for barracks and prisons, and adding, "Thanks be to Heaven, every one does not live in these," as a reason why private dwellings should also be considered. He next turns his attention to the best modes of heating and ventilating, illustrating his subject with upwards of a hundred and fifty diagrams, and supplementing it with a list of the principal works relating to it, dating from the year 1400. Each division of these important measures is minutely treated; for instance, water supply is discussed in its various stages of collection, filtration, distribution, heating, purification, and utilization; and its application to baths is shown in views and sections embracing the modes in use in ancient Rome and Pompeii, as well as in England and America at the present day. He terminates his description of the different systems of heating baths with an account of that which he calls French, because he has not seen it in use elsewhere, and, he says, it seems to him admirably adapted to the many-storied French houses. This is merely the plan which utilises the surplus heat of kitchen or other stoves instead of wasting it. The reservoir of water is furnished with a number of pipes, through which the waste heat from the stove, generally the kitchen stove, circulates, and these heated pipes raise the temperature of water in which they stand to their own. In summer, when large fires are not so certain to be in constant use, gas can be applied with equal facility to the same apparatus.

M. Joly's chapter on the heating of apartments is agreeable reading, for it treats the subject cosmographically, if we may say so, and is rich in illustrations of the stoves of the world. Chinese, Persian, ancient Roman, and Mediaeval heating contrivances are well represented, as are the more modern Continental stoves. He names as the best kinds in use in France those known by the names of their inventors, as "l'Appareil Foudet" and "l'Appareil Mouserson," both of which are furnished with hot-air chambers. A third management of the means at disposal may be described as an ordinary wood fire upon the hearth, the smoke from which ascends an iron pipe in the chimney-flue, leaving the extra space in the chimney as a chamber in which external air is heated by the pipe, and made to distribute itself into the same room in which the fire is placed, near the

ceiling, by orifices provided for the purpose. Heating by water is only used in France in greenhouses and hospitals.

Ventilation is treated by M. Joly as the twin-sister of heating. He gives the preference to natural ventilation, but enters fully into the various artificial means, as well as into the history of *l'aération*. The ventilation of mines first occupies his care, thence he passes to that of hospitals, and thence to that of churches, theatres, salons, concert-halls, schools, and buildings of many stages in height, successively, the various systems being clearly illustrated. We pick out for especial mention a plan for warming and ventilating a building of the last-mentioned class, which resembles in its most essential features one recently illustrated in these pages. M. Joly shows a four-storied house with a basement, in the centre of which is placed the heating apparatus. There are three ventilating shafts in communication with the *calorifère*, one ascending straight up from it through the entire height of the house to the outside of the roof, the other two being placed on either side of it, at some little distance, so that they pass through the rooms to the right and left of those in the centre of the house before passing likewise out of the roof. At every ceiling there is an opening into one of the shafts to carry off the vitiated air, and in each room near the floor there is another opening, through which hot air, conveyed by pipes from the central apparatus below, is introduced into it. Like others, M. Joly urges that the most simple, economical, and effective way of ventilating a private house, both in summer and winter, is to imitate the method used by Nature for the circulation of the blood in the human frame; that is to say, to place the moving power and principal arteries in the centre, with branches directed towards the extremities. In a house the principal artery should be a shaft in some useless angle of the staircase, as near as possible in the centre of the building. This would be the seat of the circulation of the air of the interior. Hot-water pipes ascending from the basement for the service of the rooms above could be also placed in it. If the waste heat of the kitchen fires was not available for the displacement of air in it, a stove could be placed at its base for the purpose, which could be further utilized by making it heat a circulation of water that could mount to the top-most floor, and serve the baths and lavatories upon every story on its way up. In a section devoted to a consideration of the ventilation of the rooms occupied by working men, the author asks whether their cases should not be thought more of than that of criminals, for whom so much trouble is taken in the ventilation of prisons. After picturing the upright workman coming home to his modest habitation, which is probably without water, ventilation, warmth, and salubrity, he suggests that in those instances where his house forms one of a row adjoining a factory, there should be a vast horizontal conduit running through it and the rest, carrying into each chamber fresh air in summer, and hot air in winter. This plan has been pursued by some manufacturers, who have been recompensed by the vigour and activity of their workpeople, as well as by the decrease of cases requiring pecuniary assistance. When the house is not so situated he recommends another cheap plan of securing fresh air and heat, which appears to be an exceedingly ingenious one. Taking it for granted that the workman will have a stove and not an open fire, he says this stove should have suspended over it a small iron-plated and lined reservoir or cistern, which is to be heated by the smoke, and by a circulating boiler. The flue of the stove on its arrival at the ceiling ought to find there an enlargement or opening, in the middle of which the smoke-tube is to pass out, the remaining space being filled with a moveable register, shut when the fire is afloat, but open throughout the night. The disadvantage of turning flues into ventilating shafts with us is the descent of soot. With wood fires this might not be so insurmountable; moreover, the pipe for the smoke, made perhaps of glazed earthenware, might be carried up the full height of the flue, where there could be no deposit of any kind in the latter. This is not the only ingenious conclusion urged upon French landlords. In conclusion, M. Joly observes progress is slow, especially in a country like France, full of routine; but it is sure; and what is a luxury for the few to-day will be, in twenty years perhaps, a necessity for every one. We commend his work; it is comprehensive as well as foreseeing.

THE LATE MR. GEORGE SMITH, OF MERCERS' HALL.

We mention with regret the death of a much-respected member of the old school of surveyors, Mr. George Smith, which took place on the 5th inst. Mr. Smith was born at Aldenham, in Hertfordshire, on the 28th September, 1783; came to London in early life, and was afterwards articulated to Mr. Brettingham. We have heard him remark as a curious fact, that he and another pupil were the only students there who afterwards followed the profession, the rest having joined the army. He afterwards went as clerk to Mr. Alexander, and was largely connected with the dock business; subsequently he was with Mr. Beazley, a relative of the late Samuel Beazley. Mr. Smith eventually settled in London, living in the neighbourhood of St. Paul's, and quickly came into a large practice.

He was appointed district surveyor of the southern division of the city of London, in the year 1810, an appointment he held until the time of his death; being, we have heard, the second surveyor who had held the appointment since the passing of the Building Act. In 1814 he was elected surveyor to the Mercers' Company, and held this appointment also to the time of his death.* He formerly held the appointment of surveyor to the Coopers' Company; this he resigned to take his place on the court, and he served the office of master twice. Mr. Smith was a very early member of the Royal Institute of British Architects; became a member of the council; and was the appointed chairman of the committee who drew up the report on dilapidations.

During his time he was much engaged in the heaviest references, in connexion with his old contemporaries Roper, the elder l'Anson, Montague, Higgins, and some more, who have all passed away, as well as with Mr. Lockyer, Mr. Hoil, and others, still pursuing an active career. Among his works as an architect, may be mentioned St. Paul's School, the New Corn Exchange, the tower and entrance of the old Royal Exchange; the Whittington's Almshouses, at Highgate, for the Mercers' Company; the church in Blackheath Park; Hornsey Church, except the tower; Gresham College; Mercers' School; and numerous private residences. He also made designs for Sellers' Hall, where he took but with right consideration declined to carry them out, and insisted upon the company's own architect being employed. He was a member of the Surveyors' Club from the year 1807, and a trustee of their charitable fund. He was also a Fellow of the Society of Antiquaries, and connected with some other public bodies. A few years ago he married a young wife, who, however, died before him, and he had recently built for himself a house, "Newlands," at Cophthorne, in Sussex.

THE EDINBURGH MEDICAL HOSPITAL.

EDINBURGH is at this moment in a sort of fever about the rebuilding of a medical hospital. It appears that the ancient institution which has flourished now under the name of the Royal Infirmary for a period of nearly two hundred years, has survived its usefulness, and has become antiquated. What is more, it turns out to be positively injurious to the health of the unfortunate patients who are forced to seek admission within its portals. Notwithstanding the most strenuous efforts to improve it and add to it, the original defects of its construction appear to be incurable; it has been tried in the balance of hospital statistics, and found wanting; and during the course of last year it was formally condemned by the proper authorities, and ordered to be razed to the foundation. Of course, as a necessary consequence, a new hospital has to be built; and on this question we may say a few words.

It is hardly necessary to tell our readers that Edinburgh is the seat of a most ancient and celebrated medical school. Genoa is not more distinguished for its velvets, nor Lyons for its silk manufacture, than Edinburgh is for the profession of medicine. It may be said that in a city from which all political and even literary glory has gradually departed, the profession of

* His very active partner, Mr. George Barnes Williams, who, first as clerk and then as partner, has been connected with the subject of our notice for the last thirty years, and for some time past has done all the work of the company in consequence of Mr. Smith's failing health, is a candidate for the appointment, and would seem to have strong claims to support in his application.

such a school of medicine is not to be disregarded. To do them justice, the citizens of Edinburgh are in no wise guilty of neglecting this circumstance; and accordingly they have entered heart and soul into a movement to provide the necessary funds for erecting a building worthy of the city and the profession. Upon the Medical Hospital, of course, the wide reputation of the Edinburgh Medical School is based, has been reared, and will, no doubt, be extended; it is in fact, if we may venture to use an old metaphor, the corner stone of the building.

The doctors, as far as we can discover, were the first to complain of the present building. This was, indeed, no more than their duty; but the most important initiative steps in the work were taken by the citizens themselves.

During the month of April last year a great public meeting was held in Edinburgh. The Lord Provost took the chair. Lord Dalhousie, Lord Hamilton, Lord Polwarth, the Lord Advocate *in esse* (Gordon), the Lord Advocate *in posse* (Moncrieff), the President of the College of Physicians, and the President of the College of Surgeons, together with an eminent publisher, Mr. Boyd, and a famous paper-maker, Mr. Charles Cowan, addressed the meeting. It was announced that 100,000*l.* was the sum needed; and of this sum the managers could supply 40,000*l.* from their own funds, chiefly derived, it would appear, from former legacies. The response was hearty and immediate: 25,000*l.* were subscribed on the spot. An influential committee of citizens was appointed to conduct the public subscription. A benevolent widow lady, Mrs. Buchanan, of Moray-place, first of all contributed 1,000*l.*, and then soon afterwards amended her donation to 5,000*l.* The Earl of Moray gave 1,000*l.*, the Earl of Wemyss also gave 1,000*l.* There were in all ten names followed by the same magical complement of one numeral and three cyphers. The high constables undertook a domiciliary visitation of the working-classes, who, to say of them what is only fair, have always been faithful supporters of the institution. Collections were made at the same time in those curious brass plates which stand on tripods at the doors of the city churches, and the result of this and more was, that towards the end of July the sum of 67,000*l.* had been raised, which sum, added to the 40,000*l.* we have mentioned of Infirmary stock, make up 7,000*l.* more than the stipulated capital required for the rebuilding of the new hospital. We cannot tell as yet how far this continued appeal has met with success, for the subscription is still in progress.

Hitherto "the movement" had been one of uniform success, peace, concord, and good-will. But we must now turn over another leaf in the history; and this, we are sorry to say, is by no means so full of sunshine, or rather of azure and gold. The best of "movements" somehow or other never will run smooth; the apple of discord is sure to fall to the surface sooner or later; and in the present case the split has arisen on the question of *site*. This is a vital question, and its importance cannot be over-estimated, but the considerations which should determine it are so simple, the condition so elementary, and the necessities so easily understood, that we are totally puzzled to discover the reasons for such a stormy and protracted warfare as it has caused in the newspapers and public meetings of Edinburgh.

It may be desirable to explain here that the Infirmary of Edinburgh consists of two hospitals, the medical and the surgical. The medical hospital is the ancient institution we have referred to above, and the *bens* of the surgical consists partly of the old High School of Edinburgh and partly of a comparatively new suite of buildings which were erected in the year 1852. The old High School contains the wards and class-rooms of Professor Syme; the new buildings those of Professor Syme. Further, it may be added that this noble charity is under the management or supervision of a board of directors, partly elected annually from the body of contributors and partly composed of the Lord Provost and magistrates, who are managers by virtue of their office. The duties of the managers seem to be rather indefinite. But to proceed: the gentleman who played the part of the Goddess of Discord on this occasion was Professor Syme, a surgeon of long practice and high standing, who honourably fills the chair of chemical surgery to the university of Edinburgh. On the 16th day of November last year he addressed a circular letter to each of the subscribers; and in this letter he asserts, and shrewdly supports, the six following propositions:—

"1. That the managers had resolved to spend nearly the whole of the money in the purchase of property adjacent to their own, 69,000*l.*

2. That they had also resolved to rebuild the medical hospital partly on its present site and partly on the site so acquired, which consists of the shops and houses in South Bridge, facing the College gates.

3. That a larger, healthier, more salubrious, and cheaper site could be got in the grounds of Watson's Hospital.

4. That the managers only proposed a new medical hospital.

5. That there was as much need, if not more, for a new surgical hospital.

6. That if the new infirmary he erected on the present site, all the existing buildings must be removed before the foundation-stone could be laid. In that case, Edinburgh would be without a hospital for at least three years."

We will only quote two sentences from Professor Syme's argument under his fifth proposition, in order to illustrate their character:—

"Although the ordinary surgical wards are not so bad as they were, still that terrible pyæmia—the scourge of unhealthy hospitals—is distressingly frequent, together with other indications of imperfect ventilation, It is therefore with no pleasant feeling that I receive the visits to our hospital so frequently paid by members of the profession from all parts of the world, who must necessarily make injurious comparisons of the spacious, convenient, and well-ventilated wards seen elsewhere, with the narrow, rank, and altogether incoherent arrangements of our surgical department."

It is hardly necessary to say that this letter made at once a powerful impression on the contributors and the public. We do not see how it could operate otherwise; for the facts seem to us indisputable and the arguments unanswerable. But it is an unfortunate characteristic of our medical schools, that their doctors differ in their opinions, and still more in their practice. Edinburgh, we are sorry to say, is no exception to the rule. Indeed, if we are to credit all we hear, we believe that diseases of the antagonistic and pugnacious type break out there with uncommon virulence and intensity. Since the days when Dr. Sangrado pulled his opponent's ears there has been no such scene witnessed as one professor of the same college publicly burning the pamphlets of another professor in his class-room. Our readers, therefore, will not be astonished to learn that within a week another doctor of the same school, Professor Spence, professor of surgery proper, also published a letter in reply to that of Professor Syme, in which, if not with equal skill, at least with more command of statistics, he urged the following counter-propositions:—

"1. That Professor Syme's letter contains statements regarding the sanitary condition of the surgical hospital which, if allowed to pass unchallenged, must prove injurious to the reputation of the institution, and of the medical school of Edinburgh.

2. That he (Spence) knows these statements to be incorrect as regards the department under his charge.

3. That he, as the senior acting surgeon of the infirmary, had never made or joined in such complaints; neither had the acting surgeons as a body.

4. That he had had actual experience in every ward of the surgical hospital. Professor Syme never had charge of any one of them. He might, therefore, feel justified in calling in question his (Syme's) competence to pronounce an opinion.

5. That the statistics of amputations for disease during a long period, as given in the published reports will compare favourably with those of any great city hospital.

6. That he holds strong opinions as to the advantages of the present site."

We have no room, even if we had the inclination, to wade through the terrible mass of newspaper controversy which followed on these rival letters,—

"Strew'd were the streets with milk-white reams,
Flow'd it all the Canongate with inky streams!"

All the great Edinburgh writers—medical, legal, ecclesiastical, mercantile, economical, municipal, and architectural—seem to have exhausted their wit and invention in fetching arguments and digging up sites. One writer recommended that the hospital should be put beyond the boundaries of the city, after the fashion of the ancient Jews,—and very wisely too. Another suggested the city poor-house; a third, the cattle-market; a fourth, George Heriot's Hospital; a fifth, the Queen's Park. One doctor, obviously half-eccentric, proposed an iron bridge over the Cowgate to a site among the lowest slums of the High-street; and another doctor of equal eminence proposed that there should be no hospital built at all, only a provision of movable pavilions constructed with cast-iron plates. The medical profession, as far as we can judge, are about equally divided in their opinions; and, in fine, the question as between the two professors is substantially unaltered. But when doctors venture, who shall decide? We need not disguise to answer the question. With regard to public "movements" of this sort, the proverb is something musty. The science of public health, for example, is perhaps more indebted in our generation to the engineer than the physician; but,

at all events, no man in his senses will be governed in his opinions by the statistics of one department of a hospital. Professor Spence's statistics may be, and are, doubtless, correct, so far as they go. But no statistics in the world will make a plain man believe that the site of Christ Church Hospital, in Newgate-street, is as salubrious as the site of St. George's Hospital at Hyde Park Corner. And such—or nearly so, we believe—is the analogy between the present site of the Royal Infirmary at Edinburgh, and the site which Professor Syme recommends at George Watson's Hospital, which lies with a southern exposure, on the northern slope of the Edinburgh meadows. We cannot choose but support the view which gives the suffering inmates of a hospital the chances of more sunlight, better ventilation, and purer atmosphere.

We hear that Mr. Ryce, the architect to the Royal Infirmary, has been requested to report on the comparative merits of the two sites. This ought to have been a preliminary step. It is unfortunate that the managers have lodged their bill, and scheduled the property on the old ground, without the least reference to another and, it may be, improved site. However, better late than never.

COLOGNE CATHEDRAL.

It was not until the spring of last year that the works and restorations upon other parts of this venerable pile were thought sufficiently advanced to allow of some progress being made with the two western towers; and this being at length determined upon, much had to be undone in consequence of decay, and other reasons, before the work could be satisfactorily proceeded with. Mechanical appliances were for the most part as uncouth and imperfect in the middle ages as they probably were in the time of the Egyptian Pharaohs. In those days it was the work of an entire day to raise a block of stone weighing some 40 or 50 cwt. from the ground to a height of 100 ft., and this was mostly done by soldering a powerful ring into the stone and raising it by means of a huge crane to the top. Some twenty stones have this been found upon the northern tower, of the "Dom," each still provided with its lifting-ring, which it was not thought worth while to remove at the time when the works were stopped. Last spring the task of completing the towers was put in hand, the first thing to be done being to remove the time-honoured ponderous old crane we all know so well, if not from an actual visit, at any rate from all the Eau de Cologne bottles we have ever seen. All joints, mortises, and joggles, were found utterly rotten, and a special scaffolding was necessary to take down the huge timbers that once had formed the crane. A careful examination into the condition of the masonry was then made, when it was found that much had utterly decayed, and would have to be taken down before continuing the new work; for in the upper parts of the towers, at least, much of the local soft sandstone appears to have been used, and this was in parts so weathered away, that in one instance the root of a creeper was followed down to a depth of 20 ft. before it could be extracted. As the annual tourist this year approaches what Mr. Spurgeon calls (like Coleridge before him) the City of a Thousand Smells, and the fine old tower gradually looms into view, he will find that his old friend has disappeared, and the puff of white steam will tell him that here as everywhere the steam-engine has superseded manual lifting-power. A stationary engine of 8-horse power will be at work, lifting in four minutes what in days gone by would have taken two days. Both towers are in hand at the same time, the progress of both being the same; and being connected by means of a light iron bridge fitted with rails, the stones can be moved, when up, to any required spot. The pecuniary means whereby these works are carried on are twofold,—namely, first, by voluntary aid (his Majesty the King of Prussia heading the list with a handsome annual contribution), and, secondly, by the questionable proceeds of a lottery, which produces to the Dom Committee an annual income of about 37,000*l.* It is thus hoped that the second story of both towers will be completed in two years and a half, the octagonal part in two years and a half more, and the whole work by the year 1877. After perusing the above paragraph, the reader will be amused to learn that Bishop Bertholet, of Air-la-Chapelle, in a report on the cathedral at

the beginning of the present century, actually advised Napoleon I. to have the whole structure raised to the ground, as it was "positively unsafe to walk under it!"

MICHAEL FARADAY.

The last number issued of the "Proceedings of the Royal Society" (No. 106, vol. xvii.) contains amongst the Obituary Notices of Deceased Fellows an interesting and important narrative of the chief events of his personal history, "with such indications of his character and opinions as may be read in his written correspondence and private memorials." It has been put together by Dr. Benze Jones, F.R.S., occupies 68 pages, and is full of delightful teaching. The way in which Faraday acknowledged, on many occasions, his obligations to Mrs. Marcet's well-known "Conversations" will interest on several grounds. He thus wrote to M. De la Rive on the occasion of that lady's death:—

"Your subject interested me deeply every way, for Mrs. Marcet was a good friend to me, as she must have been to many of the human race. I entered the shop of a bookseller and bookbinder, at the age of thirteen, in the year 1804, remained there eight years, and during the chief part of the time bound books. Now it was in those books, in the hours after work, that I found the beginning of my philosophy. There were two especially helpful me, the 'Encyclopedia Britannica,' from which I gained my first notions of electricity, and Mrs. Marcet's 'Conversations on Chemistry,' which gave me my foundation in that science.

Do not suppose that I was a very deep thinker, or was marked as a precocious person. I was a very lively, imaginative person, and could believe in the "dark night" lights as early as in the 'Encyclopedia'; but facts were important to me and served me. I could trust a fact, and always cross-examined an assertion. So when I questioned Mrs. Marcet's book by such little experiments as I could find means to perform, and found it true to the facts as I could understand them, I felt that I had got hold of an anchor in chemical knowledge, and clung fast to it. Thence my deep veneration for Mrs. Marcet; first, as one who had conferred great personal good and pleasure on me, and then as one able to convey the truth and principle of those boundless fields of knowledge which concern natural things to the young, untaught, and inquiring mind.

You may imagine my delight when I came to know Mrs. Marcet personally; how often I cast my thoughts backwards, delighting to connect the past and the present; how often, when sending a paper to her as a thank-offering, I thought of my first instructress; and such-like thoughts will remain with me."

A life of continuous unselfish work was that of this "blacksmith's son from Jacob's-Well-mews, full of inborn religion, and gentleness, and genius, and energy, [who] searched for truth and trusted to facts in his experimental researches, and thus left to science a monument of himself that may be compared even to that of Newton."

A VOICE FROM THE CRYPT OF ST. PAUL'S.

Sir,—Will you allow me to appeal to you, as one of the recognised guardians of our public buildings, to prevent the desecration and the great injury which the annual assembly of the charity children within St. Paul's Cathedral does to the sacred edifice itself, and to the various national monuments it contains? This assembly of the children has hitherto taken place in June, so that if the subject were brought forward now, there would be ample time to investigate the matter and to make other arrangements.

For some time before the day of meeting, load upon load of heavy timber is carried into the cathedral, and a host of workmen sent in to erect the staging necessary for the accommodation of many hundreds of children and of spectators. To say nothing of the interruption to the ordinary services of the cathedral, and violation of the tranquillity which should reign in this national mausoleum, just think of the danger and the actual damage done to the monuments of those whom the nation delights to honour, and which have cost, individually and collectively, vast sums of public money. The sculptured effigies of our great countrymen are out of reach of ordinary visitors, which clearly shows that the injuries they have sustained must have been caused by careless workmen, and be the result of these heavy timber erections. And after these huge halks of timber and immense loads of planking have been crowded in, so as to occupy the whole area of the noble dome, what then? All this expense, labour, risk of fire, fuss, and trouble, are incurred for the mighty grand purpose of allowing some hundreds of educated people to listen to the performance of an enormous number of ill-instructed charity children, singing psalms and hymns in a way to illustrate the

lamentable deficiency of musical tuition in this country. And then come several more days of hammering and wrenching apart; the staging is taken down, and the loads of planking and timber are huddled out of the cathedral.

Now, I ask you, Mr. Editor, *est homo*? If it be desirable the charity children should have an annual gathering, why not let it be held in Exeter Hall, or the Crystal Palace? Both of these places are already prepared for such exhibitions; but the latter especially recommends itself as a means of sparing the poor children much suffering and inconvenience; and after the performance is concluded, they could enjoy some recreation and amusement.

With the meeting at St. Paul's as now arranged, the access to the children's seats being very limited and exceedingly inconvenient, the poor little creatures are obliged to be in their places some hours before the time of performance, and there they must sit, hungry and weary, for many of them have walked long distances to the cathedral; and when, as is frequently the case, a girl faints from the heat and from sheer exhaustion, she has to be lifted out over the heads of her companions.

A third point is, what becomes of the money collected at this festival? On the day of rehearsal it may be small in amount, but on the "grand day" it must be considerable. The whole affair is in the hands of "The Society of Patrons," who are supposed to help the parochial schools from the funds so collected. Who has ever seen an account of the receipts and disbursements? The writer, some twenty years ago, filled a public office, and was then told it was right for him to go to this celebration. At the cathedral and at the dinner afterwards, to which he was invited, he gave about 25*l.* The following year he was invited to the sumptuous dinner at the London Tavern, the few gentlemen constituting the "Society of Patrons," being in all their glory. Since then he has heard nothing of them or their doings, nor of their society, saving the notice in the public newspapers of the meeting of the charity children in St. Paul's.

Who constitute the Society of Patrons? Why are not the accounts sent to subscribers? Where are the said accounts to be seen? Who are the auditors? And what good has the whole thing done? A SHADE.

SANITARY MATTERS.

Kidderminster.—In compliance with a request by the local board of guardians, Dr. Roden, medical officer for the No. 2 district, Kidderminster, has presented a report embodying his views on the sanitary state of the town. Mr. Stretton, medical officer for No. 1 district, had already presented a report on the same subject. Dr. Roden remarks at the outset, that he quite agrees with Mr. Stretton that, although the town would never be placed in a secure state till proper drainage and water works were carried out, there were, nevertheless, many local causes of disease not connected with such works which required prompt removal or amelioration. He could safely say that scarcely a death from fever or other zymotic disease had occurred in his medical district, that he could not almost immediately trace to some cause capable of amendment or entire removal. Pigstyes were scattered in all directions at the rear of rows of houses, and in crowded streets and alleys throughout the densely populated parts of the town, and generally so near the houses as to be a constant source of disease. Privies and open ashpits were generally still nearer to the houses, and so constructed that the roof shuts the rain-water into the ashpit, thus giving rise to pestilential vapours, and dealing out death and disease to the entire neighbourhood. Doubtless, [he said] the proper remedy for this state of matters would be the adoption of earth closets; but, as he imagined it would be next to impossible to carry out such a system in large towns, some plan of amelioration should be attempted. Besides scarlet fever, which has latterly been the cause of the increased mortality, the population had been visited by almost every form of exanthematous and zymotic disease, including measles, erysipelas, gastric and typhus fevers, whooping cough, croup, diphtheria, diarrhoea, &c., and under such conditions it was easy to understand that bronchitis, consumption, rheumatism, and other blood diseases were not only engendered, but their victims were, in many cases, rapidly hurried to a premature grave; while, as regarded scarlet fever, the disease has assumed

the most malignant type—it was, in fact, nothing less than the putrid sore throat of hygone times. Dr. Roden suggested various remedies which should be adopted without further unnecessary delay. First and foremost, he would advise the early adoption of the Public Health and Local Government Acts. The application of these Acts he thought ought to be compulsory on towns of a population of 10,000 and upwards, as should the appointment of medical officer of health in all cases where the Act is applied. A complete system of sewerage and waterworks could no longer be delayed, or the town might lose the opportunity of controlling the expenditure. The council should adopt Mr. Torrens's Bill for providing better dwellings for artisans and labourers, which, he remarked, would be of incalculable benefit to the town.

Sheerness.—The town of Sheerness, once reputed to be a most unhealthy place, appears now to be one of the healthiest towns in England. The number of deaths registered in the year 1868 for the sub-district of Minster, in Sheppy, including Sheerness and Queenborough, was 304. The population of this sub-district was 17,000 in 1861, and is now at least 20,000. Hence the death-rate of Sheerness is only fifteen in the thousand—seven less than the death-rate of England and Wales, ten less than that of London, and lower than that of any watering-place in England except Eastbourne. This surprising improvement in the health of Sheerness is not exceptional, the death-rate of 1867 being nearly as low. The great improvements effected during the last ten years in the sanitary regulations of the town, with the natural salubrity of the fresh sea-air to which Sheerness is exposed, have tended to produce this favourable result. The want of additional and better class houses is much felt, and extensive building operations are contemplated during the coming summer. A large public hall, with reading-rooms, &c., is in course of erection. The Government has been induced to dispose of a quantity of land for building purposes to meet the local want of houses.

THE TEMPLE OF HEROD.

LIEUT. WARREN has recently addressed some speculations on this subject to the Palestine Exploration Committee. He says:—"From our present knowledge of the Haram area, we may draw the inference that the southern wall is that spoken of by Josephus as the south wall of Herod's enclosure; for we have the Ophel wall joining in at the south-east angle, at what would have been the eastern cloisters, and we have the arches of Robinson and Wilson on the west; and the great difficulty now is the dilemma about the dimensions given by Josephus; for, while on the one hand, he leads us to suppose that the Temple enclosure of King Solomon was in compass four furlongs, and that the area was doubled by Herod, yet, on the other hand, he gives us six furlongs as the compass of Herod's enclosure, including Antonia: so that it is an open question as to what the exact measurements were.

We have, however, in the present walls, certain conditions given to us in Josephus's account of Herod's Temple, and it may be interesting to apply to these Haram walls a plan of that ancient enclosure. For this purpose I have taken the plan of the Temple, constructed by the Rev. John Lightfoot, D.D., in 1684, because it was made (by his own account) entirely from the ancient writings, his mind being unbiassed by any knowledge of the present Haram enclosure. I have taken his southern wall, and applied it to the south wall of the Haram area, lengthening it until they coincide, and at the same time increasing all the parts to scale. We have then a plan of Herod's enclosure occupying the southern part of the Haram area, and being a square of about 900 ft. a side, its compass being six furlongs."

The writer then goes on to note the results, pointing out relations and discrepancies, and showing that there are between Dr. Lightfoot's plan and the present Haram area a number of points of resemblance, which are sufficient to draw serious attention to the matter; but out of them there are two or three points which tell almost equally in favour of those plans in which the altar is placed near to the *sakhra*.

His remarks may be useful to those who are interested in locating the Temple enclosure; but we seem to be a long way yet from fixing the position with any degree of certainty.

HOUSE BUILDING.

In the course of the discussion at the Institute of Architects last week, on the description given of Humewood,* in the county of Wicklow, Ireland, Mr. T. B. Smith said it was natural that some differences of opinion should arise on the subject of building. One was as to the treatment of granite. There appeared to him to be great advantage to the architect in the use of granite, inasmuch as it was a material of that refractory character which would not allow him to be run away with by all sorts of fancies; and much of the effect of the recent works in Dublin, he thought, was mainly due to their having been executed in a material which would only bear a treatment of great breadth and simplicity. Any description of fine moulding in granite was out of place, unless it was polished, and then they got into great expense. He would be glad to hear the criticism of the meeting with regard to the arrangement, as in the instance before them, of placing the kitchens and other servants' offices in the basement, beneath the principal floor of the house. They had been led to believe that in country residences, where there was more space at command than in towns, there was advantage in having the offices on the same level as the house, and that the drawback of a long corridor was compensated by the freedom from noise and odours arising from the basement. At the same time, in the present case, no doubt there was great economy in the arrangement of the servants' offices beneath the principal floors.

Professor Kerr said the question of placing the domestic offices in the basement, or on the same level as the house, was one very much to be decided by the tastes and habits of the family occupying it. In the case before them it was obvious that the garden front of the mansion was overlooked from the servants' offices. This would be an objection with some people; but such an arrangement of the offices as had been carried out at Humewood was, no doubt, highly economical. With regard to general convenience much, no doubt, was to be said on both sides. To some people the carrying of dinners up a staircase was objectionable, and principally affected the servants themselves. The question of the casements of the windows instead of sashes was one on which they might rest a little. He thought they might take it that in this climate the sash window was the only known contrivance which would keep out the weather. No casement he had ever heard of was effective against a thorough wet wind in England; and it must be still less effective in Ireland. In his own practice he ventured to introduce sash windows in every case, even in millioned windows, and the suggestion which occurred to one's mind that the sash had an unpleasant external appearance was not borne out in fact if they got a sufficiently deep reveal. He would like to receive a little more explanation with regard to the gutters. The construction of the tile and slate flat described was, he thought, rather a novel thing, but he did not think there would be persuaded to adopt it in preference to a lead flat. The gutters were, perhaps, as remarkable in their way as the flats, and he would like to ask Mr. White how the down-pipe acted which was inside the wall. He (Professor Kerr) said he believed most people made it an invariable rule to have the down-pipe outside the wall; and in his younger days he received a lesson with regard to inside down-pipes which led him to avoid them thereafter. His apprehension in the present case was, that when the pipes stood full of water, the water would find its way through some unexpected place in the wall.

Mr. C. F. Hayward thought the question of basement offices and the arrangement of the same accommodation on the ground-level could only be practically answered by saying it was entirely a matter of taste on the part of the proprietor interested in the subject of the roof flat, because he had a belief in the tile flat in opposition to the lead flat, and he saw no reason why it should not answer in the present case. There were certain disadvantages in lead slate—one of which was the frequency with which they required to be repaired, and the little parloinings which went on during those repairs, and the frequent shovelling off of snow was liable to damage the lead. In this respect he felt Mr. White had done good service in having entered upon this particular experiment, and it was one which was deserving of consideration; and on this point he would be

glad to have some information as to the comparative cost of the two modes of construction. He thought there were very good grounds for adopting such a plan as this in opposition to the lead flat, and he hoped the experiment in this instance would be successful. The question of casement versus sash was one of importance, inasmuch as upon the determination of it depended the arrangement of the curtain and other decorations of the room.

Mr. Brooke suggested that the objection to basement offices on the score of their overlooking the garden front could be obviated by the use of roughed plate glass in the windows.

Mr. White, in concluding the discussion, said, with regard to the arrangement of the domestic offices in the basement, beneath the principal living-rooms, he should be better able to give an opinion in two or three years time, and he should then be happy to communicate to them what the experience in this particular residence was. But the question here was that, inasmuch as there must of necessity be a basement of 8 ft. or 10 ft.—in the first place, for the sake of getting out of the cold and damp, and secondly, for the sake of the prospect, it would have been an enormous waste of space if it had not been utilised for the servants' offices. As arranged in this instance, he thought there was the minimum of inconvenience from the adoption of that plan. He conceived that all these offices being brought into such very available communication with the living part of the house was a great advantage. In a residence on a smaller scale he might hesitate to place the kitchens, &c., on the basement. With regard to the overlooking of the garden front from the offices, it was to be remarked that it was at a point of the ground which would never be much used by the family or visitors, as it was the way to the stables and other parts of the out-premises, and the windows were glazed to the height of six feet with roughed glass. With regard to dinner-lifts he believed they were only lifts that smells all over the house, from what he had heard of places in which they had been adopted. With regard to the question of sashes and casements, he could say he had seen as much wet come through the former as the latter, and he had seen casements which were impervious to rain and wind in the most exposed situations; and he had also seen sashes which did let in a vast quantity of both. Casements, on the other hand, he regarded as best adapted for the display of fine scenery and prospect. With regard to down-pipes within the walls, he thought Professor Kerr, in the case he referred to, must have used pipes which were insufficient for the overflows. The pipes at Humewood, he said, were 6 in. diameter, and were placed between the outer and inner casing of brick-work which lined the house. With regard to the true curves of mouldings, of course it was impossible to explain or define why one curve was better than another, and why one point which was simply artistic should have a more pleasant effect than another. All they could aim at was the result to be derived from them as a whole.

NEW CONGREGATIONAL CHURCHES.

"THE Congregational Year Book for 1869" * shows, as our own pages have already done, great activity on the part of the body it represents in building churches, chapels, and schools. It shows that there have been fourteen new churches formed in England, three in Wales, and two in Queensland. The foundations have been laid of thirty chapels in England, of four in Wales, one in Canada, and one in Madagascar. Fifty new chapels have been opened in England, eleven in Wales, three in Scotland, seven in the colonies, and one in Paris. The foundations of four schools have been laid, and twenty new schools have been opened. The Year Book contains descriptions and views of a number of the buildings erected, and of these we give two:—

Trinity Congregational Church, Huntingdon.

This church is a large structure of the early decorated style of Gothic architecture, with tower and spire at the south-west angle of the front; the total height of the latter being 190 ft. The church stands 45 ft. back from the High-street, the open space being inclosed. The plan of the church is cruciform, having a total length of 114 ft., 49 ft. wide across the nave and aisles,

* The Congregational Year Book, 1869. Containing the proceedings of the Congregational Union for 1868, and general statistics of the denomination. London: Hodder & Stoughton.

and 60 ft. across transept. The height of the church, from floor to ceiling, is 48 ft.; and the average height of the aisles is 24 ft.

The arches, separating the aisles and transeps from the nave, are of moulded Bath stone, and support a clearstory, having double-light windows, with tracaried heads. The columns are of cast-iron, bronzed. The ceiling of the nave is continued the full height, over the apse, and terminates in an octagonal form. The trusses of the roof rest on dwarf stone columns, having sculptured oaks and corbels; the wall space, beneath the windows of the apse, is covered with arcading, unornamented by a corbel table—the whole forming a reredos. The panels are fitted with Irish marble, having Scripture texts. This decoration has been erected to the memory of the Rev. W. Wright, the first pastor of the church, by his son, Mr. Samuel Wright.

The floor of the apse is raised about 18 in. above that of the church, and choir-seats are placed on each side. The organ-chamber is on the left of the apse, and opens into it and the aisles by stone arches and columns. On the right side of the apse is a corresponding arch fitted with a wood screen. The tower entrance has a stone-vaunted ceiling, with moulded ribs and sculptured corbels. Beneath the church is a large school-room, 60 ft. by 31 ft.; infant school-room, and seven good class-rooms, beside a library, warming-chamber, large lavatory, and other conveniences. The height of the basement is 12 ft. The warming apparatus consists of hot-water pipes, which run up the centre, and round the sides of the church. The church is at present arranged for about 720 sittings on the ground-floor. Mr. John Tarring is the architect.

Congregational Church, Ancoats, Manchester.

Amongst the illustrations in the Year Book of 1866, was one of a new church at Pin Mill Brow, in Ancoats, Manchester. Very shortly after that building was opened, the Midland Railway Company obtained powers for a line to a new goods depot, which necessitated its purchase. It still stands, but has not been used for worship since then. With the proceeds of the sale of the property, the trustees purchased the only available plot of land in the township, viz., the site of the old gas-works. The accompanying engraving shows the structure, as now in progress. The river is about 25 ft. below the road; and, after allowing for floods, the depth at that end admits of a large room below the church floor, 47 ft. by 30 ft., and 15 ft. high. This will be temporarily divided, and used for infant and elementary class-rooms. The interior of the building is 88 ft. long, by a mean clear width of 50 ft. Galleries are provided on three sides, and two spacious staircases thereto. Underneath the galleries will be class-rooms, ten in number; temporarily separated from the central portion of the body of the church by lath-and-plaster partitions.

It is intended to fit up the galleries with pews, for appropriate sittings for the congregation, and to use the ground floor for school purposes at present. The entrances are so arranged that access to the galleries is exclusively confined to the congregation.

The body of the ground floor will contain movable forms, capable of seating 300 adults, which, added to the sittings in the galleries, will give accommodation for a congregation of 650 persons.

The roof is supported by wood pillars, in a line with the side-gallery fronts, connected by framed spandrels above. All the timbers will be exposed to view, and stained and varnished. The walls are of brick, with stone dressings. The roofing will be covered with Knaethell slates.

Provision is made in a cellar-basement for Haden's heating-apparatus. The cost of the building proper is 4,710*l.*, which is the amount of the builder's contract. This includes 500*l.*, at least, for extra foundations, the whole of the walls having to be taken down to the level of the bed of the river, between 20 ft. and 30 ft. below the ground surface. The lighting, heating, and movable furniture, boundary fences, and architects' commission, will swell the total outlay to about 5,800*l.* The architecte are Messrs. Paull & Robinson, Manchester.

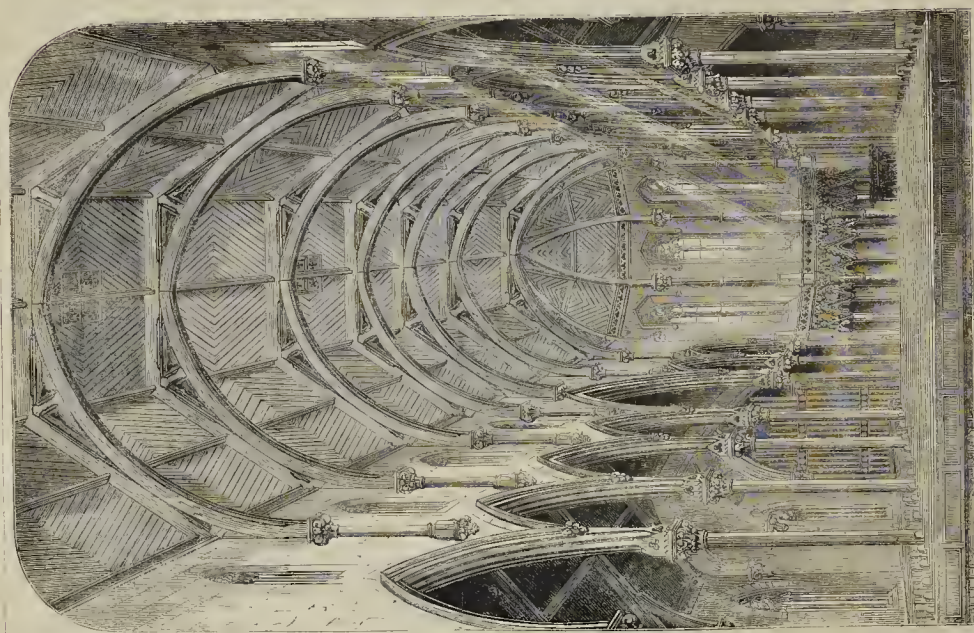
Society of Engineers.—At the meeting of this society, to be held on the 13th inst., the president will present the premiums awarded for papers read during the year 1868, and the president for 1869 will deliver his inaugural address.

* See p. 26, ante. View, plan, and description of this mansion will be found in our Vol. xxvi., pp. 657, 658, 659.

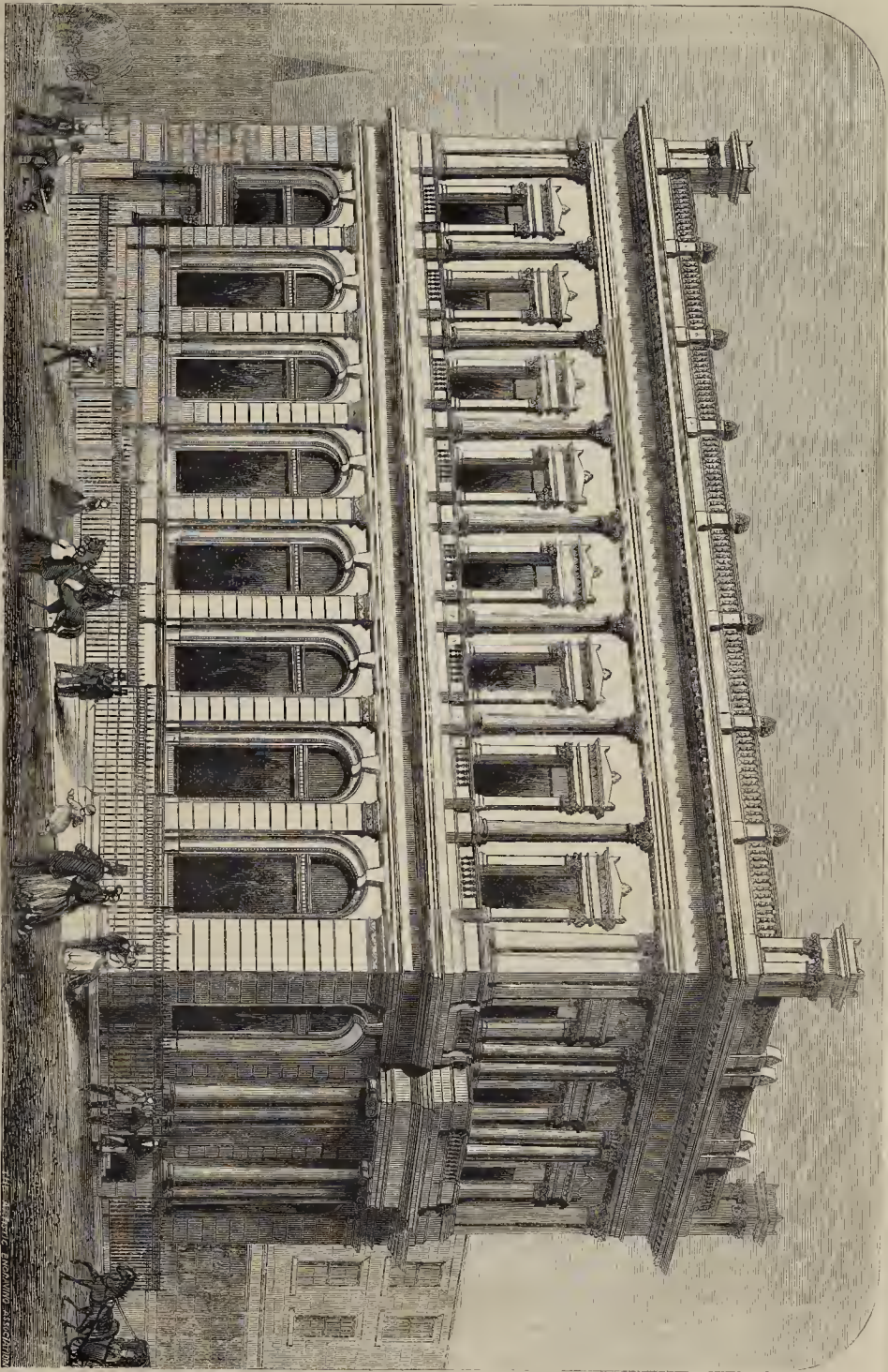


CONGREGATIONAL CHURCH AND SCHOOLS
 LONDON
 ARCHT. BY J. W. LITTLE
 CONTRACTORS: MANNING & ARCHER

ONE HALF

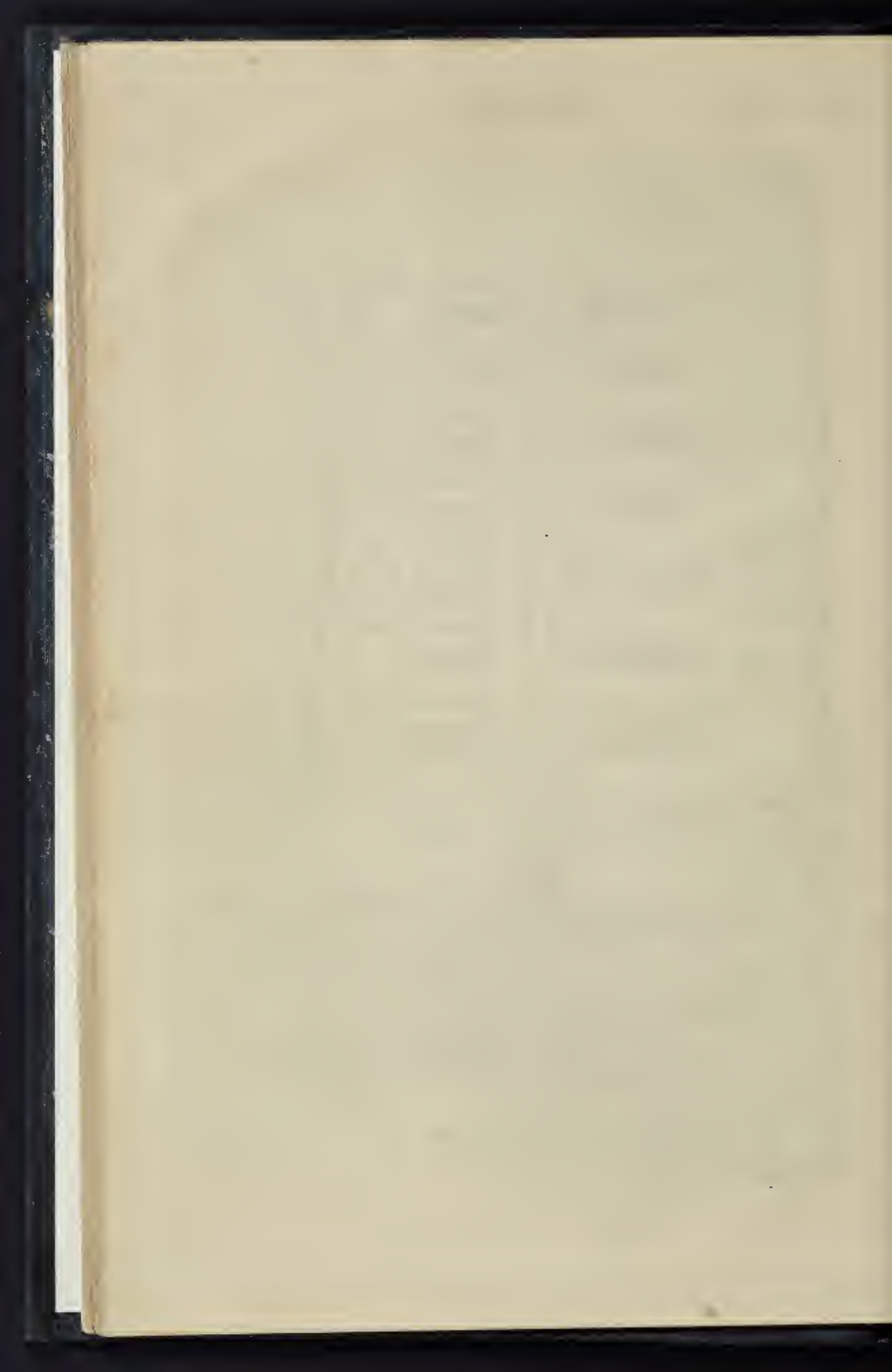


INTERIOR OF TRINITY CONGREGATIONAL CHURCH, HUNTINGDON.
 ARCHT. BY MR. JOHN TUBBING.



THE BIRMINGHAM AND MIDLAND BANK, NEW STREET, BIRMINGHAM.—Mr. Edward Holmes, Architect.

[See page 11.]



ARTERIAL AND AGRICULTURAL DISTRICT DRAINAGE, AND THE LAWS CONNECTED THEREWITH.*

The term "arterial" has been applied to the rivers and streams of a country in consequence of their similarity to the arteries for conveying the blood through the body, and the appearance of a map and of a drawing of the arteries of the body are precisely the same.

In this paper it is proposed to advocate the principles of arterial drainage by pointing out the great benefits that would ensue from a more extensive adoption of the system, and by giving an account of the results in those cases where some combined systems or district drainages have been carried out.

Before an institution consisting, as this does, of persons practically acquainted with the management of land, and who are fully alive to the improvement of which it is often capable, by the application of engineering works, it would seem unnecessary to occupy time in discussing questions so familiar to them. Nevertheless, as an inspector under "The Land Drainage Act, 1861," having had a better opportunity of forming an acquaintance with the subject, perhaps, than most persons, I have found that the advantages of such works, particularly in some parts of England, are not appreciated as they ought to be, and I hope that the influence and intelligent spirit of the members will be exerted to recommend the adoption of the facilities offered by this Act. As an illustration of the works that have been carried out in training and forming the courses of rivers through marsh lands, we need only refer to the fens in the counties of Lincoln, Cambridge, and Norfolk, to understand what can be done by combined systems of drainage in reclaiming land, and in preparing it for cultivation.

The necessity for district systems of arterial drainage has, it is well known, arisen from the great increase of pipe drainage, and the better clearing and opening of ditches and drains of late years, thereby causing a more rapid and an increasing discharge of water from the uplands into the valleys, and overloading the rivers and streams, so flooding them more frequently, and to a larger extent, than was experienced in former times; besides which, those valley lands being subject to floods, or the water constantly lying within a few inches of the surface, have their crops frequently destroyed, and are available as pastures for a much shorter period in each year than they really ought to be.

The difficulties that formerly arose, from the state of the law, in constituting any combined action to remove obstructions in rivers, to deepen, straighten, and improve them, and to form proper outfalls through the lands of hostile owners, or of those who were indifferent to the improvement of their own land, or unwilling to give facilities to others, have been, to some extent, removed by an alteration and extension of the powers of the old sewers laws.

I read a paper on "Arterial Drainage and Outfalls," at the Institution of Civil Engineers, in 1859-60, after which Sir George Cornewall Lewis, then at the Home Office, prepared a Bill extending the powers of the laws relating to the Commissions of Sewers. In 1861, the Act called "The Land Drainage Act" was passed. The main features of that Act are that it enables commissions of sewers or district drainage Boards, as the promoters may elect, to be formed in river valleys, or in marsh and low lands, by those who may be interested in them, by combining under either of the above forms to carry out works in making new watercourses and improving rivers, with the necessary outfalls, and to take the lands benefited by these means within a properly defined jurisdiction, sanctioned by the Inclosure Commissioners, but extending into valleys in the interior, and not limited to the areas marked out by the level of the tides, as the old commissions are. The Act also provides for the reclamation of land from the sea, irrigation, &c.

Mr. Theodore Thring has published a manual of the Act, which I beg to recommend to any one who wishes to be informed of its various powers.

The number of cases under the Act, amount to twenty-two, of which I have inspected twenty-one, and these districts comprise, in all, about 770,600 acres.

* From a paper by Mr. R. Bovall Grantham, C.E., read at the Ordinary General Meeting of the Institution of Surveyors, January 11th, 1869. The President in the chair.

The following is a list of the districts which have been formed:—

District	Acres
Morden Carrs, Durham	4,000
Wormbrook, Hereford	1,974
Wissey, Norfolk	8,240½
Ladden Brook, Gloucester	957
Longdon and Eldersfield, Worcester	3,835
Langorse, Brecon	1,985½
Masey, Northampton	7,918
King's Sottingham, Norfolk	891½
River Idis, Nottingham	6,000
Stamoor, Somerset	876½
Currymoor, Somerset	1,820
Dysynay, Merioneth	2,554
Staunton Common, Hereford	1,454
Winterton, Norfolk	1,055
Chedzoy, Somerset	2,412½
Alter Moor, Somerset	2,154
Frodsham, Cheshire	4,217
Northmoor, Oxford	2,384
North Moor, Somerset	3,235
Alter Moor, Somerset	2,154
Haddiscoe, Norfolk	1,628
Muckfleet, Norfolk	1,404

Some of these have been carried out most successfully, and others are in progress, and some have not been commenced. The areas of each district vary, as will be seen, from 591 to 11,259 acres.

The cost of putting the powers of the Act into operation has been on an average 50l. in each case.

I do not know that I can illustrate the subject better than by describing the practical results of different methods of carrying out a combined system of arterial drainage. For this purpose I have selected a district drained by gravitation; another by means of pumping; and a private drainage, also by pumping.

The first is that of the Leaden, which is a river rising in Herefordshire and Worcestershire, with a watershed of about 120 square miles. The district was formed under a Commission of Sewers in 1861, and the works, which are confined to the jurisdiction, were completed, as far as they could be then executed, in 1867.

The commissioners, in order to inform those who are interested in the improvement, lately published a statement of their proceedings, with an account of the expenditure. The account shows the total expenditure; but it should be remarked that the purchase of the water rights and compensations absorbed more than half of it.

The Leaden flows into the western branch of the river Severn, about 1½ mile from Gloucester. There were formerly two mills upon it—one, the Over Mill at the Severn; and the other, Radford Mill, about 2½ miles above it—by which the water was penned back for upwards of 5 miles. The water-power of both mills was purchased by the commissioners, who were thus enabled to deepen, widen, and straighten the river where requisite; and the effect has been to lower the water towards the outfall 5 ft., and at the upper end 4 ft. The jurisdiction of the commissioners, which includes a branch river in the parish of Tibberton, extends over about 1,400 acres.

From the Severn to the archway under the Hereford and Gloucester Canal, which is 4½ miles, the work consisted for the greater part of a new cut, and the remainder in deepening and taking off bends only. Both sides of the new river, for a mile and a half in length up from the Severn, as well as along the bank parallel to the Severn, were embanked, to keep out the tides and its flood-waters, and also to confine the floods of the Leaden itself, which flow down from the upper country about two days before those of the Severn arrive at the same point. From the Hereford and Gloucester Canal through Tibberton parish, being about 1½ mile, the brook was deepened and widened in places, and in others the banks were dressed off and the bushes cleared. From about the fourth mile on the main river it was deepened, cleared of bushes and weeds, and the banks dressed off for about 2 miles, making altogether nearly 7 miles,—the cost of which amounted to about 3,070l., including superintendence. The remainder of the outlay was for obtaining the commission, raising money, office and legal expenses, &c. The money has been borrowed, and will be paid off in twenty-five years. The rate for the repayment of this and interest, together with the annual expense of clerk, varies from 9s. to 11s. per acre, assessed upon the land according to the benefit conferred. For the first two years after completion of the main cuts for the river, the repairs and clearing the bottom and sides cost only 10l. The practical result has been that the floods caused by the river Leaden itself have not overflowed its new channel, and the floods and tides of the Severn itself have been so confined within its own banks as to prevent them overflowing the adjoining land, and their duration is very much reduced.

The floods have never since injured the growing grass, nor carried it away when out, as was formerly the case in about one year out of four. The quality of the grass is very much improved, and cattle and sheep can remain on the pastures nearly all the year. The under-drainage can be better carried out, and the river is as nearly as possible under the control of those who are interested in its proper action. To conclude the description of this work, I cannot do better than quote a letter written to me by Mr. William P. Price, the member for Gloucester, and chairman of the Leaden Commission, who lives in the neighbourhood, and has a large area of land within the jurisdiction:—

"November 29th, 1868. The result of our Leaden drainage may be stated in a very few words.

We can now drain effectually all the lower level, which we could not have done before; and the floods are much fewer in number, and when they come do not hurt us, because they are off again directly.

The drainage has done all I ever expected of it. It is difficult to speak of the commercial value. The rates may be taken to be about 7s. 6d. per acre, putting the rest for redemption of capital outlay. Is the improvement worth this 7s. 6d. to the tenant?

In the first place, I don't think any one of them denies it. But if they did, I should not believe them.

In the second place, one may crop saved in every four years would pay it for them; and summer floods destroyed the crops at least once in four years.

But, apart from this, we can now keep cattle in the leas always, except during the very short duration of a flood, which we rarely experience now, except when the cattle are all in the folds. W. P. PRICE.

Note.—The average cost per acre which Mr. Price refers to is that which is chargeable to the tenant, being the interest, the landlord generally paying the difference, which is the redemption of capital outlay.

The next case which I propose to describe is that of a district in Norfolk, in the parishes of Winterton and Somerton, about 10 miles north of Yarmouth, and which is drained by pumping. This district, containing about 1,100 acres, is comprised within a watershed of about 2,500 acres, and lies in a basin, formed by high land on the south side, and bounded on the west and north sides by Martham Broad, or Lake, and the Hundred Stream, the levels of which are from 3 ft. to 4 ft. above the area: on the east side are sand hills on the sea shore.

The soil at the eastern side consists of sand, yielding much water from the sand hills; it then, as we proceed westward, becomes peat of some depth in places below the bottoms of the drains; farther west still, the clay locally called ooze, or houlder clay, underlies the peat, and appears on the surface; and then, at the extreme west, there is peat again to a small extent.

The land, previous to the formation of the Commission, was drained by a windmill, driving a scoop wheel, which was destroyed in a gale of wind; and also by a small steam engine, driving another scoop wheel, which was too small by itself to drain the lands.

The area was, in fact, a marsh; for, although the wheels lifted the water out, floods occurred, and the drains were seldom free from water, the level of which was within about 2 ft. of the surface of the land, which produced little more than rushes and water weeds, and cattle could remain on the lands a few months only, even if the weather was fine. The marsh lands are generally let with the uplands in proportion to their extent, and, therefore, no definite rental is charged upon them exclusively; but I have always considered that an average of 10s. per acre was as much as they were worth. In 1864, a commission of sewers, under the "Land Drainage Act," was issued, called the "Winterton and Somerton Commission of Sewers."

The object of the work was to collect the water by a main leading drain at one point, from which it could be pumped into the Martham Broad, or lake, a lift of 5 ft. to 7 ft.; and, in 1865, an Appold pump, worked by steam, was erected for this purpose.

It should be mentioned that the natural fall of the country was towards the sea, and that the hundred stream formerly discharged itself into the sea, through what are now high hills of sand, so that the drainage of the eastern portion has been diverted westerly against its natural direction; and it was therefore necessary to cut the drains through a summit in the district to make the water flow to the pump, which caused deeper cutting for the drains than would otherwise have been required. The different parts of the work were done by contract, completed in July, 1866, and the following is a summary of the cost:—

Earthworks	£1,422
Pump and engines	1,301
Bridges and culverts	512
Engine-house	625
Engineering and other costs	423

£4,183

There are other items of expense, the amounts of which I am not acquainted with, but I consider that the whole cost has not much exceeded 4,500*l.*, or about 4*l.* per acre. At first, owing to the land having been for all time full of water, and several springs existing, which came from the northern high land and sand hills, frequent pumping was necessary to keep the water in the drains low; but the subsidence of the peat lands, and the draining kept up by the pump, have very considerably reduced the necessity for its use. The rate, including the repayment of the borrowed money, is about 8*s.* per acre. In this case the rate is levied equally on the acreage, and not in proportion to the benefit conferred.

A great part of the area has been ploughed up, and the remainder has become firm pasture, which, in the course of time, will be improved by the disappearance of rushes, flags, and water-weeds. The nearest value that I can arrive at is, that the parts which have been wholly reclaimed are worth, to rent, 30*s.* per acre, and the remainder, 2*l.* per acre at the present time; and this value will doubtless increase. . . .

The "Land Drainage Act, 1861," has hitherto not been applied so extensively as might have been expected, considering the great scope of its powers, and the advantages which result from them if properly called into action. It is, doubtless, well known to you that the old sewers laws could not be made available for the improving and advancing the interests of agriculture in the present times. They certainly impose but light burthens upon lands by way of rates; but the powers are so restricted, the jurisdictions are so undefined, and the governing bodies so varying and irresponsible, and, generally, unconcerned, that they are almost useless for the exercise of extended operations.

But the "Land Drainage Act, 1861," requires amendment in some particulars, with the addition of provisions to make it more applicable to the purposes of agriculture, and that only. The old sewers laws are applicable, as far as they go, both to the drainage of towns and of agricultural districts; for it was not contemplated when they were framed that any distinction between the two would have been necessary; but, of late years, towns and populous districts have well-defined laws of their own, applied under the sanction of a department of the Government, by which the mode of proceeding and method of rating are regulated, and other useful provisions are exercised; but the legislation for agricultural drainage purposes is surrounded by great difficulties and uncertainty; in fact, well-defined provisions are required for many purposes, and

the chief of these is the mode of rating, in which there exists much doubt and difficulty. In my experience of this question of rating I have met with a great variety in the practice and opinions of the several valuers with whom I have come in contact; one has adopted the poor-rate as the basis of the rate; another, an equal acreage rate; and one or two, a rate according to the benefit conferred. Cases of appeal to Quarter Sessions have been referred to me; but I think there ought to be a special rule for this kind of rating. The only Act which in any way refers to this question is the 4 & 5 Vict., cap. 45 (which was merely an amendment Act of 3 & 4 Wm. IV., cap. 22), but in so indefinite a manner as to throw doubt upon it. The correct principle, in my opinion, is that it should be in proportion to the benefit conferred on the various lands by the works; and in Ireland, where the question of drainage and rating is unlogged by sewers laws, the matter is better understood; and at the time of the famine, in 1847, when large arterial works were carried out, they adopted such a system, which is illustrated in the table below.

There is another important question, and that is the power and the means of taking land for new works, or removing mills and obstructions in rivers; but the regulations laid down in the law are most cumbersome and uncertain. There are many other matters, which it would be tedious to enumerate, each requiring amendment; and I am in hopes that in the next Session of Parliament, an inquiry will be instituted into all the laws relating to drainage, and that we shall have a well-defined and simple system of law established expressly for agricultural, arterial, and outfall drainage.

It would be very desirable to include, in any new Act, provisions for irrigation and storage of water, so that they might be either conjoined with or separated from drainage districts; and powers to charge either water rates or rents according to the systems adopted. The system of irrigation is extensively carried out in France, in the districts of Alpes-Maritimes, Haute-Garonne, and Basses-Pyrénées; in Spain, in those of the Canal de Esla, Canal de Henares, and Canal de Logrono; and in Italy, at Milan, &c.

A discussion ensued, in which Messrs. Ryde, T. Marr Johnson, and others took part.

The next meeting will be held on Monday, the 25th inst., when the discussion on Mr. Grant-ham's paper will be resumed; and a paper will be read, entitled "Parochial Assessment," by Mr. Edward Ryde.

found, on the contrary, that it was capable of consuming more smoke than in fact it did; but it was urged in defence that to use the means provided for that purpose would render it impossible to carry on the trade with the furnace in question. The defendant was convicted, but the Court of Exchequer quashed the conviction on the ground that (assuming the furnace to be properly constructed) the words in the local Act "as far as possible" meant as far as possible consistently with carrying on the trade in which the furnace was employed.—*Cooper v. Woolley.*

Liability respecting Footways.—By the Ryde Improvement Act (which incorporated the Towns Improvement Act) commissioners were appointed to carry the Act into execution and were empowered to levy rates and to apply them to specified purposes. By the Towns Improvement Act the management of streets is vested in the commissioners, who are thereby made surveyors of highways. They are by the same Act guilty of a misdemeanour for neglecting to repair any public footway within the limits of a special Act, and are liable to be indicted in the same manner as the inhabitants of a parish. In a case where a person met with an injury caused by a footway within the limits of the local Act being out of repair, the commissioners were held liable to an action, and it was decided that it was not necessary to aver in the pleadings that they had funds applicable to the care of the footway.—*Hartnall v. The Ryde Commissioners.*

Construction of the Words "Tenement" and "Inhabitant."—A manufacturer of edge-tools in Birmingham resided out of the town, but occasionally took his meals during the day at the factory, where his servant-man resided. He applied, under the Improvement Acts, to the town commissioners of Birmingham to remove the ashes, dust, and rubbish arising from the manufactory, but they refused to do so. It was decided by the Court of Exchequer that they were obliged to remove ashes, &c., made from the manufactory. The manufactory was held not to be a "tenement," and the owner was held not to be an "inhabitant" within the meaning of the Improvement Acts.—*Lyndon v. Stanbridge.*

THE CABINETMAKERS OF LONDON.

SIR,—In your issue of the 26th ult. you gave a selection from the speech delivered by the Marquis of Bute before the members of the Cardiff School of Science and Art, in which he makes an indelicate charge of incompetency against the cabinetmakers of London. I allowed another number of your invaluable journal to appear hoping to find some one more competent than myself had replied to the charge therein made, but was disappointed; herein is my excuse for troubling you.

Now, notwithstanding the general excellence of the noble marquis's speech, I must enter my protest against the above statement. I have an intimate knowledge of the London cabinet-makers, and have had years of experience amongst them; and, instead of the above charge being correct, I can testify to numbers of them possessing practical knowledge of detail to carry out any job entrusted to them. I have often found the designs given to the workmen are not practical, and they have to be altered to the requirements of the job,—I do not mean sketches, but as working drawings. I have as workman had the honour and extreme pleasure of carrying out designs in different styles, wholly solid and others richly inlaid, principally Gothic, by Mr. Welby Pugin, Mr. Burges, and others, yet I have never had a single complaint of the jobs whilst in execution or when finished, and for years I have seen art works executed with the same result. Yet, withal, I am perfectly satisfied there is room for great improvements, to produce satisfactory results. It is necessary there should be improved relations between employer and employed—a reciprocity of feeling; but if the employer requires a foreman he advertises,—he selects one from the number of applicants. Cupidity too often prompts him to select the man possessed of effrontery, and the men feel that he is placed over them to extract all that is possible from them. He is generally ignorant of the speciality of the business. He is invested with full power, and he carries it out to the letter. I have seen the best men in a shop discharged without one moment's notice, and no reason assigned to them for the act, yet each and every one of those men mentally and morally were his superiors, and he knew it, never regard-

Name of Drainage District.	Area of Land Drained or Improved.			Total Cost.	Original Annual Value of Land Drained or Improved.			Increase in the Value of Land Drained or Improved.	Cost of Works per Acre.	Annual Charge per Acre of Principal and Interest.								
	A.	R.	P.		£	s.	d.				£	s.	d.	£	s.	d.		
District of the Blackwater in the Counties of Meath and Kildare	3,827	2	13	12,115	18	6	2,119	1	8	1,634	7	9	3	3	3	0	4	0
District of Lough Neagh, in the Counties of Antrim, Armagh, Down, Londonderry, & Tyrone	29,625	1	24	156,277	14	10	25,652	2	5	9,953	17	7	5	5	6	0	6	0
District of Oranhill, in the County of Galway	674	0	16	3,571	16	2	260	12	5	315	10	1	3	19	6	0	5	9

THE "BUILDERS'" LAW NOTES.

Execution of Public Works.—A certain local Act of Parliament authorises a local corporation when any street not being a highway is not sufficiently sewered, levelled, paved, flagged, and channelled, to give notice to the respective owners of the premises fronting such street, to sewer, level, pave, flag, or channel; and if the requirements of the notice were not complied with, the corporation might execute the works referred to in such notice, and recover the expenses from such owners. In a certain case the corporation gave notice to owners of premises in a street not a highway to "repair, form, and pave the same." It was held by the Court of Queen's Bench, on appeal, that the notice was bad as it did not sufficiently specify the works required to be done, and the order of justices for the payment of expenses was accordingly quashed.—*Parkinson v. The Corporation of Blackburn.*

Ratable Value of a Railway Goods Station.—A certain borough Improvement Act authorising a rate to be levied enacted that the occupiers of any land used only as a canal or a towing-path for the same, or as a railway constructed under the powers of any Act of Parliament, should be rated at one-fourth only of the net annual

value. Certain sidings and turntables, occupying about ten acres of land, were used for loading trucks or carriages with goods, and also as a standing-place for laden and unladen carriages, and were found in a special case to be necessary for conducting the traffic of the railway. It was decided that this land might be virtually considered as part of the railway, and it was accordingly only rated at one-fourth of the net annual value.—*Midland Railway Company v. The Corporation of Birmingham.*

Consumption of Smoke.—Under the provisions of the Towns Improvement Clauses Act, a penalty was imposed on persons so negligently using a furnace as not to consume the smoke arising from it. The Birmingham Improvement Act incorporated this provision, but with the reservation that the words, "consume the smoke," should not in all cases mean "consume all the smoke;" and that the penalty might be remitted if the person summoned had so constructed or altered his furnace as to consume, as far as possible, its smoke, and had carefully attended to the same, and had, in fact, consumed the smoke as far as possible. An information was laid against a manufacturer for so negligently using his furnace as not to consume its smoke. It was not shown that the furnace was improperly constructed; it was

ing his employer's interest. By such treatment men get demoralized, which often causes them to take any advantage that arises. He not being conversant with the details of the style of work necessary to be carried out, is continually thwarting the workman in his attempts to carry out what is so necessary, and plays so important a part in good work. Now, what could he more simple than to select the best man in the shop to fill the office who understands all the requirements of the business? By so doing, there is a stimulus given to men to perfect themselves, and act as a member of the firm, in hope of promotion. Your journal has often insisted upon the necessity that all art-workmanship should bear the names of the producers; but for the full development of art-principles and art-workmanship it is necessary the workman should have a share in the profits, and feel himself a *bona fide* member of the firm, partaking of the honours and emoluments, or losses and disgrace, which his own actions would create or destroy. In your volume of 1865, pages 365, 386, and 514, you treat upon the relations of capital and labour, which would be to the advantage of all to study seriously. Mr. Hughes states, at page 366, "The old relations of master and men have passed away; they will never be satisfied without a share in the profits, and some voice in the internal management of the workshops. But it is to M. Leclair that I should like attention to be drawn, page 514, wherein your readers will find how completely the interests of art are interwoven with amicable relations existing between employer and employed.

WM. WARREN.

CHURCH-BUILDING NEWS.

Birmingham.—The new church of St. Gabriel, situated in Barn-street, in the parish of St. Bartholomew, has been consecrated. The cost of the edifice, including fittings and lands, has been 4,200l. Of that sum 3,000l. were contributed by the Ryland Fund, and the remainder has been defrayed by voluntary donation. The architect was Mr. J. H. Chatwin; and the builders were Messrs. Wilson & Son, of Soho, Birmingham. The whole of the gas-fittings, the church bell, and the communion-table were manufactured by Messrs. Blews & Sons, who were at the same time donors of a brass lectern, a metal reading-desk, and the chairs used in the church.
St. Paul's (Cornwall).—The parish church of St. Paul has been consecrated. The whole fabric was put in repair more than twenty years ago. Some portion of it was then rebuilt, and the same process, as the *Cornish Telegraph* points out, might very well now be applied to the south-west angle, especially after the improvements which have just been effected in the church. In the spring of the year the vicar had a new reredos erected by Mr. Earp, of Lambeth; the style is Perpendicular, in accordance with that of the church. The design comprises a central gable canopy over the holy table, flanked on each side by an arcade of sunken panels in Caen stone, separated by buttresses of two stages. The canopy is cusped and crocketed, and surmounted by a finial. The material is alabaster, the veining being sufficiently light to admit of contrast with the red Plymouth marble of the supporting columns and super-altar. Within is a panel of Salvati's mosaic, having, on a gold ground, the sacred monogram in a vesica, and passion-flowers with their tendrils and leaves on either side.

Warkworth.—The church here has been renovated by the liberality of Miss Horton, the Lady of the Manor, at whose sole expense the restoration has been effected. Mr. Franklin, of Deddington, was the builder employed in the work, under the superintendance of Mr. Charles Driver, Messrs. Heaton supplied the stained-glass window.

Bristol.—The body of Emmanuel Church was built and licensed for divine worship about two years ago; the congregation has continually increased, and so additional accommodation was rendered necessary. Funds (for want of which the designs were curtailed) being provided, the church has been so far completed as to justify its consecration, and the ceremony has now taken place. The additions, says the local *Times*, consist of a chancel and two transepts. The foundations are laid for a tower, 130 ft. high, with bellry story; a west porch and south chapel are also contemplated. Five months ago Mr. Diment, the contractor, commenced the new portion, and now it is completed. Accommodation has been provided for about 230 people more than could previously find room in the

church. Of 614 sittings 100 are free and unappropriated. The fabric, which was designed by Mr. Norton, of London, now consists of a chancel, with an apse, 39 ft. by 28 ft.; two side chapels, 22 ft. by 13 ft.; transepts, 21 ft. by 14 ft.; nave, 84 ft. by 28 ft.; and north and south aisles, 63 ft. by 14 ft. each. It is constructed of local stone, with Bath stone dressings, relieved by bands of red sandstone; and the walls are strengthened with buttresses. The walls are surmounted by a parapet, with a carved cornice. Above the apse is an iron cross and finial, and on the transept gables are stone crosses. Mr. Alderman Proctor gives a tenth of the cost of the additions. The north chapel has been built mainly through the instrumentality of Mr. James Poole.

South Weald.—The parish church has been reopened for divine service. The nave, south aisle, and upper portion of the tower were taken down. The tower was originally built with Kentish rag, and has been restored with the same material, keeping the old lines and details. The body of the church consists of nave and chancel, south aisle, and lay rector's chancel. The additions to the church are the new chancel, organ-chamber, and vestry. The length of nave and chancel, 105 ft.; height to apex of roof, 40 ft.; south aisle, length, 90 ft.; height, 37 ft.; organ-chamber, 14 ft. by 8 ft.; vestry, 15 ft. by 14 ft. The walls throughout are built of flint rubble, with Ancaster stone dressings. The windows are all of the same material. The roofs are of Dantzic fir, quite open. The nave and chancel roofs are of ornamental character. The south aisle roof has been so arranged as to open out the tower arch. The seats are of English oak, plain, and are all open seats. The carving of pulpit, prayer-desk, and stall ends has been executed for the contractor by Mr. Polley, of Coggeshall. Of the stone carvings, which consist of a choir of twelve angels, in white Mansfield stone, several bases and heads were executed by Mr. Earp, of Lambeth, for the contractor. Mr. Earp has also prepared a new reredos, consisting of a series of nine arches, filled in with texts of Scripture. The arches are of alabaster. A new oak porch is erected at the main entrance. The church is heated with hot water by Messrs. Goddard & Massey, of Nottingham. The bells have been re-hung on new oak frames, &c., by Messrs. Mears & Stainsbank, of Whitechapel, London, who have also supplied a new chiming apparatus, to enable one man to chime the whole of the bells. The building is of the Decorated period, and Mr. T. S. Fenton, of London, is the architect; Mr. James Brown of Braintree, the contractor; Mr. Thomas Cressy, the clerk of the works. The works have cost about 7,000l., and have been defrayed by the vicar, lay-rector, &c.

ARCHITECTS' LIABILITIES.

SIR.—Will you kindly favour me with your opinion in your next issue on the following points?

Upon a church restoration there is an architect's clerk of works employed, with the usual powers as to construction of the building, quality of the materials, &c., &c. In the course of the work it is found that a beam would be placed in what the contractor's foreman considers dangerous proximity to a flue, and he called the attention of the clerk of works to it, who gives instructions for the casting of the beam to be delayed until he can see it done. He (the clerk of works) is present on the scaffold, when the beam was cased under his personal supervision, and the work is left (as is supposed) perfectly safe. In a short time after, the church is burnt down from the defective casing of this very beam.

1. Upon whom does the responsibility rest?—the architect, the clerk of works, or the contractor?
2. If an architect, in giving a final certificate for balance of contract and extras, is or is not bound to give an account showing how the balance is made, if it should be demanded from him by the contractor?

FAIRPLAY.

* * * If this statement be correct, the contractor is clearly not to blame, but the clerk of the works, for whose acts, if he were appointed by the architect, the architect would probably in law be deemed responsible. This responsibility, however, is a very serious matter, and should have the consideration of architects as a body.

The reply to question No. 2 would depend on the conditions of the contract. Such an account is usually given.

THE NEW MEAT MARKET, SMITHFIELD.

How praise great Jones's work, where men Have coolly swept away each pen? But that this sarco-phagus may endure, From the first butcher's stall I seize a skewer, To tell how Jones, the genius, waved his wand, While Browne and Robinson * obeyed command Like bricks—with bricks. The butchers' palaco
rose
Where once unsavoury odours smote the nose; And for a structure grand, and no Aladdin-myth,
Browne, Jones, and Robinson, nurlped the field of Smith!

ACCIDENTS.

Fire at Messrs. Chance's Glass Works.—A fire recently broke out in the glass-works belonging to Messrs. Chance, at Spon-lane, Birmingham. Efforts were at once made to prevent the fire spreading from the box-room to the store-room, next to which is another pile of buildings, said to contain goods worth 20,000l. The place where the fire began was entirely gutted, and the roof of the goods warehouse completely destroyed. The damage is roughly estimated at about 3,000l. The works of Messrs. Chance cover about thirty acres, employ 1,700 people, use nearly 1,800 tons a week, make their own gas, have their own saw-mills, pot-rooms, and clay-mills.

Fall of a Warehouse Floor at Ipswich.—A serious accident has occurred at a new seed warehouse, at the corner of Bridge-street and St. Peter's Dock. The warehouse has not been long completed, and is used for the storage of linseed. It is three stories in height, and consists of a centre and two wings, and it was to the first floor of the centre that the accident occurred. The space below the floor is that into which wagons with loads of seed are drawn, and where they are unloaded, and the main supports to the floor were two wooden beams, each strengthened by an iron girder down its centre: the ends of these rested on four piers of brickwork, two on either side of this part of the building, and the load it was calculated that each beam would support was 200 tons. Several cargoes of seed had arrived, but the quantity placed upon the floor in question did not much exceed half the weight calculated as its full load. Without any warning the iron girders of both beams gave way, the beam furthest from the entrance-gates snapped in two, and that half of the floor with its load of seed fell in, carrying with it the upper part of the two piers, and a small portion of the brickwork of the end wall, but the seed slipping off the other portion of the floor it remained in its place. The accident is supposed to have arisen from defects in the iron girders.

Fall of Two Houses in Liverpool.—In Jamaica-street, Toxteth Park, the Corporation have in course of demolition a block of buildings the removal of which is requisite for certain improvements to be carried out. While the men were at the work of piecemeal destruction, the outer wall of one of the houses suddenly came down wholesale. The remainder of the block fell immediately afterwards, and in the general wreck one of the workmen was buried and severely bruised.

Fall of a Railway Embankment.—On the London and South-Western line, at the western end of the Exeter tunnel, several tons of earth and rock recently fell upon the up-line, which was blocked up during the night. The disaster had been expected for some days previously. Some men were then working at the Honiton tunnel, where a similar catastrophe occurred some weeks ago.

Fall of a Chimney.—On Sunday last two men, named respectively James Fields, brick-layer, and John Flynn, labourer, were killed in Glasgow, by the falling of a chimney-stalk, between 90 ft. and 100 ft. high, connected with the works of Messrs. Robert Fields & Co., Parliamentary-road. The stalk had been deemed insecure, and the men who have been killed were employed, with two others, in lightening the structure by taking 20 ft. from the top. For this purpose cross-stays were erected inside the stalk, by means of which Fields and Flynn ascended to the top, where they removed the bricks, and dropped them down the inside, whence they were removed by the other two men through an aperture which had been formed

* The builders.

of about 5 ft. high and 3 ft. wide. While they were so engaged on Sunday last the stalk suddenly gave way at the bottom.

"CHOOSING THE WEDDING-GOWN."

ART-UNION OF LONDON.

THAN this picture, by Mulready, it would be difficult to find, in the entire range of modern art, and so work more pre-eminently combining skilful composition and drawing with thorough knowledge and masterly exposition of the theory of colour, whether exemplified in harmonious gradation or bold contrast. Though coloured on the warmest scale, the reds are so skilfully toned and so counterpoised by cooler tints, that the whole produces a rich mellow effect on the eye, analogous to that of a judiciously-planted flower-bed of bloom and foliage combined.

The sentiment and composition are no less excellent than the colouring. The exquisitely easy pose of the bride's figure, the *bonhomie* of the old mercer, and the interest with which the young parson watches his betrothed, are all admirably given. The work is full of valuable instruction, both for the draughtsman and the colourist.

When this picture was exhibited in 1846, it was felt that Mulready had given new interest to an old story. That the popularity of the subject has not waned is proved by the number of copies constantly being made of the original in the South Kensington Museum, and the crowd of visitors always attracted to it. Though the "Vicar" says he chose his wife not "for fine glossy surfaces," but "such qualities as would wear well," we must allow him to have been exceptionally fortunate in getting thrown into the bargain the graceful form and sweet face of the damsel before us.

This picture the Council of the Art-Union of London has had reproduced in chromolithography for the subscribers of the current year, and, looking at the extreme difficulty which necessarily attends the production by mechanical means of such a work, we must allow that great success has been achieved by Mr. Vincent Brooks and his assistants. No little artistic knowledge and able management of colour are required to produce, by printing from stone, a similar effect to that of colour laid on by the brush, and when it is known that no less than thirty-four tones have been used for as many different gradations of colour, and that every printing must coincide to a hair's-breadth with all that have preceded, the difficulty of the work can scarcely be over-rated. We may certainly congratulate the members of the society on the opportunity thus afforded them of getting for the amount of the subscription so faithful a transcript of this masterpiece of England's great colourist, besides the chance of prizes.

It is announced that the impressions will be ready for the subscribers on the 1st of February.

DECORATION OF THE GREEK CHURCH IN LIVERPOOL.

At the Liverpool Court of Passage an action has been tried, in which Lazarus Syreloff, a Greek artist, sued Mr. George M. Papsayanni, of the well-known firm of Papsayanni Brothers, of Liverpool, merchants and steamship owners. The declaration in the pleading alleged that the plaintiff was induced by the defendant to come to Liverpool, at great expense, upon the promise that on his arrival there he would be employed to execute paintings for the Orthodox Greek Church now in course of completion in Parliament-street, but that the defendant had refused to perform his promise. There was also a claim for work done. The defendant pleaded, amongst other things, that he had not agreed as alleged, and that the agreement was subject to a condition which had not been fulfilled by the plaintiff. The defendant is one of the committee of subscribers by whom the erection of the church is being superintended. It was thought desirable by these gentlemen to secure the services of a Greek artist for the decoration of the church, and the defendant accordingly communicated with a gentleman residing in the Levant, who recommended the engagement of the plaintiff, then living at Chios. The defendant then wrote to the plaintiff, offering him a free passage to Liverpool, and agreeing, according to the plaintiff's case, to engage him on his arrival here to paint ten large paintings and some smaller ones for the embellishment of the church, and to find him a passage home again at the conclusion of his work, which was to be accomplished by the 1st of July, 1867. The plaintiff came to Liverpool in 1868, in one of the defendant's steamers. On his arrival there he painted a picture for the approval of the defendant and the other subscribers, which the plaintiff asserted was approved by them, but the church not being ready for the reception of the pictures, the plaintiff was not employed. The defence was that Mr. Papsayanni acted only as one of the committee, and not on his own responsibility. It was said that the plaintiff entirely failed to please the artistic taste of the committee. Mr. Basilio Papsayanni, the defendant's brother, then offered him a free passage home, and promised to obtain subscriptions for him. He also

entertained the plaintiff at his own house for six months.—The jury returned a verdict for the defendant, but expressed their opinion that Mr. Papsayanni should give the plaintiff a free passage home. A passage, it was stated, would be at the plaintiff's service any time when he chose to avail himself of it.

THE CHIMES AT BOSTON.

Sir,—I am sorry to notice in your valuable periodical the publication of letters which have for their object an attempt to depreciate the carillons of chimes lately set up at Boston by Messrs. Gillet & Blaud, of Croydon. Being a most disinterested party, I may perhaps be allowed to express my view of such hostile conduct.

As an amateur, I went to Boston last June purposely to see and examine these pebbles. Unfortunately the work was not finished; but I saw quite enough to warrant me in saying that I fully concur with Mr. Denison in what he says as to "the magnificent machinery which has been constructed for producing the chimes—infinitely superior to everything else of the sort for promptitude, certainty, and regularity of action." Indeed, I will go further, though a country parson, from circumstances which need not repeat here, I happen to know the difference between good workmanship and bad—and I question whether it is possible for any parties to turn out a more masterly production. I had no opportunity of seeing the barrels at work, nor of hearing the bells sounded in concert, but I examined the details of the machinery, and tested the tones of the bells individually, and they appeared to me to be of admirable quality and of very sweet tone. If, as it is stated, the big bells and the little ones do not blend together in perfect harmony, the fault may be with the founder, if he has cast the whole set from the same alloy, instead of graduating the proportions of metal according to the size. Be that as it may, and whatever may be said by any hostile critics, I have not the slightest doubt but that eventually the Boston chimes or carillons will not only be the first, but the finest in the kingdom.

It was a saying of my friend, the late Sir Mark Lambard Brunel, whose inventive powers were perhaps never surpassed. "Ah! it is very easy to invent a thing, but very difficult to make it do; and when you have, after much labour and anxiety, succeeded, some ill-natured, jealous person will be found ready enough in endeavouring to run it all down; but, never mind—what is good will prevail, and that's enough for me."

H. T. ELLACOMBE, M.A.

* * * We have from "G. L." a reply to Mr. Walsley's note, but do not think it necessary to print it.

AIR TO HOLLOW WALLS.

Sir,—In last week's *Builder*, I observe a letter from "A. B. C." (page 35), inquiring the best mode to supply air to hollow walls. If we prepare a large quantity of our Patent Damp Proof Course for this very purpose, by connecting holes on the upper side of the slab (beneath the hollow in the wall) with the longitudinal hole running throughout the entire length of slab. The vitrified course thus answers three purposes,—1. Prevents the damp rising; 2. Admits air to hollow walls; 3. Prevents dry rot in the floor timbers. CHASLES LUGGER.

Sir,—In reply to your correspondent "A. B. C.," who asks "if air bricks are necessary to the construction of hollow walls?" I beg to say they are not. A house should not only be dry, but warm in winter, and cool in summer. To insure this the internal temperature should be beyond the influence of external change. An air space hermetically sealed is an effective non-conductor of heat or cold. The introduction of air bricks would promote circulation within the air space, and thus destroy that uniformity of temperature which is so much to be desired. GEORGE JENNINGS.

THE FEVER HOSPITAL AT HAMPSHIRE.

Sir,—With reference to your notice, in the *Builder*, of the hospital about to be erected at Hampstead from our plans, we wish to say that the original estimate was "£15,000, exclusive of engines, boilers, and machinery," the cost of which, together with providing for six additional patients, for which we received the instructions of the committee, has raised the total estimated outlay to 17,400, and not to 19,000, as stated. Moreover, no "alterations" have been made in the plans, except those necessitated by this increase in the accommodation, and they are now before the Poor Law Board. The cost will not exceed "172, per bed," but for the purpose of comparing this hospital with other projected buildings of the same class, it must be borne in mind that the "cost per bed" will always have reference to the number of patients under the same "administration," and that as the latter increase in number the cost will be in a diminishing ratio; also that four of our pavilions are "one-story buildings," which, we need scarcely remark, adds to the cost, as does the very considerable fall in the levels of the land. PENNINGTON & BINGHAM.

PROPOSED RESTORATION OF CHRIST CHURCH CATHEDRAL, DUBLIN.

The Dean and Chapter, at last taking steps to put this very interesting building into a decent state, applied to Mr. G. E. Street to advise them as to what should be done, and that gentleman has accordingly made a report on the subject, and illustrated it with plan, section, and elevation of part of the north side of nave. Examining the crypt, he is led to believe that its age is uniform throughout; or, at any rate, there is very little difference. The pointed arch occurs in its construction throughout; and the square piers which support the vaults are almost all chamfered, and the chamfers have an ornamental stopping which is certainly not earlier than the end of the twelfth century.

It follows from this, in Mr. Street's opinion, that no part of the old Irish Cathedral built by Bishop Donat, now remains; and that the Church which we have contains nothing earlier than the work of the English artists who followed the invasion of Stronghow, and who left so many marks of their presence in the beautiful works which they erected throughout the Pale.

"At first sight the planning of this crypt looks so much more like that of a Norman work than of a Pointed building, that it is important to insist upon the fact that, in point of date there is very little difference between the completion of the crypt and the erection of the Church above, and that whatever Church existed on the site before the time of the English Invasion, was entirely removed in order to provide the necessary foundations for one on a large scale. I see no reason whatever to doubt that the whole of the Choir was erected on the same plan as the Crypt, and that from the beginning of the thirteenth century to the middle of the fourteenth it stood unaltered."

The unsatisfactory choir being sound, he proposes to confine the new works to the nave, which is very bad; to build up large buttresses opposite each of the principal columns of the nave to support the clearestory; and to rebuild the south aisle. The estimate of these and other works necessary stands thus:—

"1. I estimate the cost of the south aisle and south arcade and clearestory complete, as shown in my plans, at a sum of.....	£7,000 0 0
2. The cost of the alterations in the west end, the new door, window, coping, gables, &c., &c., estimate at.....	1,265 0 0
3. The whole of the works in the north aisle and north side of nave.....	1,500 0 0
4. The groining, &c., of nave (in wood).....	585 0 0
5. The cleaning and repairing interior of transepts.....	500 0 0
6. The paving of nave and aisles.....	253 0 0
7. The paving of transepts.....	200 0 0
Total cost.....	£15,835 0 0"

Mr. Street's proposition to finish the walls of both aisles and clearestory "with the characteristic Irish battlements" seems to us worth reconsideration: this rude sort of finish scarcely agrees with the fine thirteenth-century work of the fabric.

COMPETITIONS.

Eaton Suburban Church, Norwich.—In reply to invitation seventeen sets of drawings from architects residing in various parts of the kingdom, were received. From this number the committee selected four sets,—two from London, one from Edinburgh, and one from Norwich; and at a meeting of the committee, held on the 7th inst., it was determined to adopt the design of Messrs. Brown & Pearce, of Norwich.

Lincoln County Prison.—The magistrates received twenty designs in reply to their advertisement, and after several meetings reduced that number to three, and then referred the selected plans to Mr. Barnard Hartley, the county surveyor of the West Riding of Yorkshire. Ultimately the design of Mr. Frederick Peck, architect, London, was selected. The committee recommended that a grant of 1000, be made to Messrs. Jones & Lee, architects, London, whose plan appeared second in merit, and 500, to Mr. Moffat, architect, Edinburgh. The prison is to be built at Lincoln, and will be commenced as early as possible.

Wesleyan Chapel and Schools, Pill, near Bristol. In a limited competition for this work, the designs by Mr. E. A. Lansdowne, architect, were chosen.

DIAPER BRICKWORK.

We have inspected with great pleasure a number of bricks with diapered surfaces, also string courses, and columns, produced under Peter's Patent. Ancient examples of diaper work in brick are well known, but hitherto the few attempts to approach the object have failed, from the great expense of ordinary moulding, and the very prohibitory exorbitant duty formerly imposed on such work. By machinery patented by Mr. H. Pether, bricks with elaborate designs, either in delicate hold relief, can be produced at a moderate cost (6s. a thousand), either from patterns now prepared by him or from designs furnished by architects. Many of these will admit of the introduction of ceramic colour, or the insertion of gilt or other glass. Mr. Pether obtains a small joint, by the contrivance of a recess or kick on all other sides of the brick to receive the bulk of the cement, thus forming a strong union and key.—The Barkham material is particularly sound, and most of the designs already prepared are very artistic. We are disposed to think good use may be made of this invention.

RAILWAY INTELLIGENCE.

Progress of the Railway in the Thames Embankment.—At the meeting of the Metropolitan Board of Works last week, in answer to a complaint by Mr. Shaw, the engineer stated that he had no hesitation in saying that the works of the railway company on the Thames Embankment, if carried on at the present rate, would not be completed in six years. The works in the new street from Blackfriars to Cannon-street had not even been commenced. The interest on the money due had not been paid. Mr. Newton said it was quite time pressure was put on the railway officials to force them to carry on their works. The subject was referred to the works committee for report.

A Dangerous Railway Platform.—At the *Secondaries' Court*, before Mr. Secondary Potter and a special jury, the case of Walker v. The Great Eastern Railway Company has been heard. This was an action in the Common Pleas to recover compensation for personal injuries at the Lea Bridge Railway Station, through, as alleged, a "rotten platform." The damages were laid at 2,000l. The plea was withdrawn and judgment suffered by default. Plaintiff was walking along the platform from a train when he fell into a hole in the platform. He was much hurt, and had since been, and still was, unable to work. The jury assessed the damages at 250l.

PROGRESS IN BELFAST, IRELAND.

ACCORDING to a report made to the Town Council at their last meeting, it appears that since the Belfast and County Antrim Borough Act was put in force the 1st July, 1866, there had been 302 private streets formed and completed—paved and paved—under the Borough Surveyor's superintendence. Since 1861, when the last census was taken, 10,078 houses had been erected, and of these 1,602 had been built during the year which had just expired. The valuation of property had increased in the borough. In 1861, the valuation of the borough was 278,807l., while at the end of the year which has just closed it was 417,329l., showing an increase during the last seven years of 138,522l. The surveyor has been able to accomplish a great many improvements in the other streets of the town. During the year 1,487 new houses had been erected on the County Antrim side, and 135 on the County Down side, making a total of 1,622.

PROVINCIAL NEWS.

Bristol.—The new white Lion Hotel, in Broad-street, has been opened for business. The building was erected from designs by Messrs. Foster and Wood, of Bristol, architects; and the structure above the principal floor occupies three sides of a square, so that the rooms enjoy as much natural light as possible, Christ Church, at the top of the street, forming the fourth side. The principal entrance is in Broad-street, where a flight of steps leads to a vestibule and hall, 70 ft. by 20 ft., covered by a glazed roof supported on bays of arches, with pillars and carved capitals. The panels below the roof have been decorated by Mr. Lang, of London, with designs representing the seasons. On the right of the entrance are the coffee-room, 42 ft. by 28 ft.; clnh-room, 47 ft. by 21 ft.; bar, still-room, offices for the manager, &c. On the left is provided a capital commercial-room, 50 ft. by 28 ft., with writing-room and lavatory attached; a restaurant, 48 ft. by 26 ft., approached from a side entrance, with bar and service-room adjoining, fitted up by Messrs. Llewellyn & James. The coffee and commercial rooms abut on the terraces in front of the hotel. Behind the hall, and separated from it by a secondary entrance and passage, is the billiard-room, which can also be reached from Wine-street; the apartment measures 42 ft. by 24 ft., and is fitted up with two of Thrston's best club tables; the scoring apparatus is of the most perfect kind. Adjoining the billiard-room are a smoking-room, lavatory, &c. All the principal rooms on this floor are 16 ft. high. The principal staircase, which is of stone throughout, commences behind the commercial-room. On the first floor are a ladies' coffee-room, 25 ft. by 10 ft., numerous suites of sitting-rooms, and some few bedrooms. The second floor, and also the third, are devoted to bedrooms. The floors are all fireproofed by Dennett's patent construction. At the top of the building, on the lower corner, is an immense tank, filled with

water, which will be available in case of emergency. There is a luggage lift from the bottom to the top of the house, and another for the conveyance of provisions from the kitchen to the bar. An apparatus for supplying hot water all over the house is provided. There are over 200 rooms and about 560 windows in the hotel. The contractors were Messrs. Warburton, of Manchester; Mr. Boulton has done the carving.

Cannock.—The covered market, which has been erected by a joint-stock company, and has been built, at a cost of about 1,300l., by Mr. M. B. Anderson, of Cannock, from designs by Mr. T. Lloyd, of Wolverhampton, has been thrown open to the inspection of the public.

DISSENTING CHURCH-BUILDING NEWS.

Dovenby.—A new Congregational chapel, which has been erected at Dovenby, near Cocker-mouth, has been opened for divine service. The chapel has been built from the design of Mr. T. L. Banks, of Cocker-mouth, architect, and is in the Gothic style of architecture, with a high-pitched roof and a semi-octagonal ceiling. The building of the edifice was commenced in the course of last summer, the masonry being let to Mr. Henry Grave, of Aspatia, and the joiner's work to Mr. P. Robinson, of Cocker-mouth. The chapel has cost about 200l., and is capable of accommodating between eighty and ninety persons.

STAINED GLASS.

Holy Trinity Church, Worcester.—The centre window of the five in the apse of this church has just been filled with a design in stained glass by one who, having had a legacy left him as one of the executors to a gentleman lately deceased, has devoted it to this purpose. The window is by Mr. Wailes, of Newcastle. It is in the Decorated style, and includes three principal lights, each between 9 ft. and 10 ft. high, and stone tracery under the arch. The entire window has been filled with stained glass, the subject being that of the Ascension of our Lord. The figure of the Saviour occupies the upper portion of the central compartment; in those on each side are represented choirs of jubilant angels; while the eleven Apostles and the holy women are variously grouped below. Each light is terminated by a canopy, worked with foliage upon a ruby background. The tracery under the arch is filled with a running wreath of foliage glass in various tints, upon background of ruby and purple.

Miscellanea.

Proposed Margate Pier and Harbour Company.—A Bill for the incorporation of the Margate Pier and Tranway Company has been published. The proposed capital is 12,000l. in 12,000 shares, of 10l. each. The Bill applies for the carrying out of many improvements and the use of certain new powers of various kinds, including power to make specific charges for persons and goods passing along the pier. The Corporation are neutral in the matter. The Commercial Union have resolved that a requisition be sent to the mayor, signed by the burgeses, asking him to convene a public meeting for the consideration of the project.

Lead-poisoning on the Tyne.—The *Lancet* says,—"A valued correspondent reminds us of a fact of which we were not altogether ignorant—that there is a great amount of lead-poisoning involved in the various works on the Tyne. He says 'it is pitiful to see the number of young girls suffering from lead.' It is not improbable that this subject of lead-poisoning will be brought before Parliament. It is of sufficient importance to be a matter of inquiry, whether we consider the suffering involved in lead-poisoning, or the frequently early disablement of the sufferer in various ways."

Gas.—The Staines Gas Company have declared a dividend of 7½ per cent., free of income-tax, for the past year. They are extending their works.—The Bewdley gas consumers complain both of the price and the quantity of their gas, or its quality. The price is 6s. 8d., and they have nothing for that but darkness made visible. This they cannot understand considering the position of Bewdley with reference to coal.

The Liverpool Free Public Libraries Report.—This document has been issued in printed form. It states that there is nothing of special interest to report during the year just expired. The Institution has pursued its career of usefulness, increasing as its treasures increase, and is at present in a thorough condition of efficiency. The Committee regret they cannot report much further progress towards the erection of the permanent Gallery of Art. The Council have sanctioned the outlay of 10,000l., provided the interest and redemption fund can be met out of the penny rate levied under the special act. During the past year the average number of books issued from and returned to the Reference Library has been 1,982 per day, the yearly circulation numbering 565,344 volumes, against 573,774 during the previous year. During the year, 1,973 volumes of books have been added to the Library, viz., 1,686 by purchase, 119 from the Commissioners of Patents, and 68 volumes by donation. From the Lending Libraries, 423,547 volumes have been lent. The total number of volumes in these libraries is 39,035. The circulation has been equivalent to lending each volume ten times in the year; and each reader has had 50 volumes, or nearly one a week. The works of music issued, viz., Operas, Oratorios, Masses, &c., number 3,492 volumes. As regards the Museum, compared with the average of five years, the total number of visitors in 1867-8 is very nearly 10,000 in excess, as shown by the following figures:—Total number of visitors in 1867-8, 463,851; average of the five years preceding 1867-8, 453,914; excess in 1867-8, 9,937.

Manchester Academy of Fine Arts.—The ninth annual general meeting of the members, associates, and students of this Academy has been held in the council-room of the Royal Manchester Institution; the president, Mr. W. K. Keeling, presiding. There was a numerous attendance. The hon. secretary (Mr. Selim Rothwell) read the annual report. The council remarked that they had again the satisfaction of stating an increased success, and a considerable addition of associates and students during the past year. There were twenty-eight members, eight associates, and ten students. The report having been adopted, the president and secretary were again re-elected; Mr. Crozier as treasurer, and Mr. Hadfield literary secretary.

The Law Courts and Thames Embankment.—Mr. Tite, M.P., at the Metropolitan Board of Works, has given the following notice of motion:—

"Whereas it appears by certain public documents emanating from the Commissioners for building the New Courts of Justice that the actual cost of the site purchased in the Strand will amount to 785,000l., and that the additional land now proposed to be purchased, according to Mr. Pownall's estimate, is 668,000l., so that the total cost of the ground will be 1,453,000l., and the expenditure on land and buildings together, as appears from a same document, will be 34 millions, of which 1,385,100l. are proposed to be advanced by Government at 4 per cent. on the security of a redeemable annuity; and whereas the Equity, Common Law, and other Courts could be accommodated on the site already purchased by the Commissioners, that the Probate Court, Masters' and Registrar's offices could be placed on the site afforded by the Thames Embankment, with such supplementary acquisitions as the nature of the proposed building may require, by which means a considerable reduction would be effected in the cost of the land to be taken, and a position would be obtained superior to any in regard to free circulation of air, unimpeded light, and in the facility of access by road, river, or rail,—that it be referred to the Works Committee to consider the extent required for the suggested buildings, the area at present at the Board's disposal, and what additional property would require to be taken adequately to provide for the several offices enumerated; and that the committee be authorized to confer with her Majesty's Government as to their willingness to negotiate for the acquisition of such a site for the purposes above indicated."

Ahley-mills Pumping Station.—The Metropolitan Board of Works has appointed Mr. Usher, who has been engaged in superintending, under the direction of the engineer and assistant engineer, the erection of the machinery, to the office of superintendent of the station, at a salary of 250l. per annum, with house-rent, coals, and gas, and he is to remain on the premises. The Board also determined that the staff at the station and weekly wages to be paid to each shall be as follows:—Four engineers, 36s.; two firemen, 24s.; two coal trimmers, 21s.; four cleaners, 21s.; two oilers (yonths), 15s.; two fishers, 24s.; one smith, 36s.; one hammerman, 24s.; one clerk, 30s.; one lodge-keeper, gardener, and messenger, 24s.; one night watchman, 21s.

Destruction of the Prince of Wales Theatre, Glasgow.—This theatre died the natural death of theatres on Wednesday night last.

Masons Insisting on the Help of Stone-dressing Machinery.—About two months ago a strike was the result of Messrs. Beauland, of Bradford, attempting to use stone steps dressed by machinery at the Idle quarries, near Bradford, and the men returned to work on their employers allowing the men to re-dress, by hand, work already dressed at the quarry by machinery. Messrs. Beauland ultimately insisted on their men dressing the stone for the steps entirely by hand; but his men now insisted that the stones should be partially prepared by machinery at the quarries, and finished by hand-labour at the new buildings. The stone from Idle had, in fact, been found too hard for the labour, in dressing by hand, to be remunerative. The result is a strike on the part of the masons against the use of stone wholly dressed from the quarry.

Presentation of Bells to St. Julian's, Shrewsbury.—Mr. J. J. Peele, town clerk of Shrewsbury and a churchwarden of St. Julian's, has just presented a peal of six fine bells to the parish. The bells were cast by Messrs. Mears & Stainback, and have been hung in the tower of the church, in lieu of a like number of bells anciently placed there and requiring renewal. The mottoes inscribed on the several bells are,—

- No. 1.
"Peace on earth," &c.—Luke, chap. ii.
"My gentle note shall lead the cheerful sound;
Peace to this parish, may goodwill abound!"
- No. 2.
"Our voices tell when joy and grief betide:
Mourn with the mourner, welcome home the bride."
- No. 3.
"May all in truth and harmony rejoice!
To honour Church and Queen with heart and voice."
- No. 4.
"Prosperity attend old England's shore;
Let Shrewsbury flourish, now and evermore."
- No. 5.
"For mercies undeserved this peal is raised;
So may Thy name, O God, through Christ be praised."
- No. 6.
"With deepest tone I call to church and prayer;
And bid the living for the grave prepare."

The New Magdalen Hospital at Strat-ham.—The extensive range of buildings for the new Magdalen Asylum recently erected at the rear of the railway asylum at Strat-ham is now nearly completed, and the inmates at present located in the old hospital in the Blackfriars-road will be forthwith removed to the new institution. The new hospital extends over eight acres of land. A church has been built within the grounds, for the public in common with the inmates.

"The Architecturesque."—At the next meeting of the Institute of Architects on Monday evening, the 18th inst., Professor Kerr is to treat the subject of "The Architecturesque," in continuation, we are reminded, of a preliminary lecture to the Architectural Association fully reported in the *Builder* of March 7th and 14th last.

Schools for St. Luke's District, Gloucester. It is proposed to erect these schools in, and facing, the Stroud-road. The buildings will consist, on the ground-floor, of boys' schoolroom (70 ft. by 20 ft.); girls' schoolroom (50 ft. by 20 ft.); and infants' schoolroom (65 ft. by 20 ft.); with class-rooms attached to each, and with separate entrances; accommodation is afforded for over 450 children. A house for the master is attached to the schools, with offices and yard. The house will contain parlour and kitchen on the ground-floor, and three bedrooms on the first-floor. This portion of the buildings (though entirely separate from the schools as far as communication is concerned) has been made to form a feature in the group. Open and spacious playgrounds are provided. The schools and class-rooms will be 12 ft. high to the wall-plate from the floor, and the timbers of the roof, which are to be exposed to view, will be stained and varnished. The building is intended to be of red brick, with bands of ornamental coloured bricks. The design was prepared by Mr. Alfred William Maberly, architect, Gloucester, under whose superintendance the works are to be carried out; and the estimated cost is 2,000l.

The Slade Bequest to University College. A meeting of the Graphic Society was held at University College, on the 11th inst., the president, Mr. Foley, R.A., in the chair, when several resolutions were passed acknowledging the value of the Slade bequest, and the meeting adjourned with a view to further action. We had intended to refer to the subject of this bequest at greater length, but are forced by press of matter to defer doing so.

The late Dr. Robert Hooke.—We are told that the vicar and some influential inhabitants of St. Helen's, Bishopsgate, have formed a committee for the purpose of obtaining subscriptions for the erection of a stained-glass window in their church, as a memorial of Dr. Robert Hooke, a brief account of whose inventions and discoveries appeared in our columns a few weeks ago.

Viaduct across the Solway.—The Solway Junction Railway is now near completion. The permanent rails between Kirtlebridge and the Solway viaduct are laid, and the station-houses are being erected. The viaduct, which is a fine specimen of engineering, is now finished. The river Wampool is crossed on a viaduct of seven bays. The viaduct is similar to the one over the Solway.

The Institution of Civil Engineers.—At the meeting of this Society on Tuesday evening, the 12th instant, fourteen candidates were elected, including two members, and twelve associates.

Rotherhithe Drainage Contract.—At last week's meeting of the Metropolitan Board of Works, tenders were received for the construction of new sewers in Plough-road, Swing Bridge-road, and Trinity-street, Rotherhithe, and the diversion from the river of the sewage from the Durand's wharf outlets, which varied from 25,450l. to 14,750l., and the lowest, that of Mr. Nicholson, was accepted.

The Builders' Benevolent Institution.—The annual ball for this excellent charity will be held at Willis's Rooms, St. James's, on Tuesday, the 26th of January, under the immediate patronage of the Lord Mayor and the Lady Mayoress. Mr. G. F. Trollope is the President, and Mr. G. Plucknett the Treasurer. Mr. Joseph Bird takes the ball, as usual, under his special care, and will receive applications for tickets up to the 22nd. Such of our readers as like an evening of the sort promised will enjoy it the more, knowing that the profits of the entertainment will go towards rendering easy the last days of distressed age.

Science Classes.—On Friday, the 8th inst., a public lecture was given at the South-west London Science School, Arthur-street, Chelsea, on the "Physical and Chemical Properties of Water," by Mr. Bickerton, head master of the science classes held there; Mr. H. J. Coles in the chair. The lecture (admission to which was 1d. to non-members) was given as the preliminary lesson for the present year to the chemistry class, the object being to show the interesting nature of scientific study and the pleasure and advantages to be derived from it.

A Covering for Staircases.—The wear of staircases is often a serious matter. Whether of wood or stone, with much usage, they soon go. M. Cazean says he has found a durable covering in thin plates of aluminium bronze. It is for the column of the Place Vendôme that M. Cazean proposes his covering. He says the experiment has been made in a factory, where plates of common bronze on the stairs 1 1/2 in. thick were worn out in six weeks, while plates of aluminium bronze 1/2 in. thick remain just the same as when new, after 11 months of service. Aluminium bronze, it would seem, is not so expensive if it will bear this amount of usage. It is merely copper, with from 8 to 10 per cent. of aluminium.

TENDERS.

For pulling down and rebuilding house, for Mr. J. S. Gower, City Horse and Carriage Repository, Barbican. Mr. R. Walker, architect. Quantities by Mr. W. E. Stoner:—

Lark	£1,765 0 0
Brass	1,615 0 0
Hurdley	1,650 0 0
Sewell & Son	1,650 0 0
Prince	1,470 0 0
Kilby	1,350 0 0
Turner & Sons	1,330 0 0

For house, at Upper Norwood, for the Rev. R. Birch, Mr. Sextus Dyball, architect:—

Perry (accepted)	£2,500 0 0
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Accepted for four houses, offices, &c., at Bulrush Mills, Bately, for Messrs. Talbot, Senior, & Talbot. Messrs. Sheard & Hanstock, architects:—

Mason's Work	
Farrar	£613 14 0
Joiner's Work	
Iberson	236 12 0
Plumber's, &c., Work	
Senior	18 0 0
Plasterer's Work	
Hey	31 0 0

For a cottage, for Mr. Thomas Brown. Mr. John Usher, architect. No quantities:—

Dickens	£270 0 0
Lawson	230 18 6
Richards	208 18 6

For new infirmary, &c., Stratford-upon-Avon Union Workhouse, for the Board of Guardians. Mr. Thos. T. Allen, architect:—

Bennett	£2,370 0 0
Dixon	2,105 0 0
Naden & Sons	2,160 0 0
Bayly	2,068 16 0
Hilton	2,065 0 0
Clark & Smallwood	2,000 0 0
Green	1,883 0 0
J. & G. Callaway	1,868 17 9
Holtom & Price (accepted)	1,865 11 6

For new waterclosets, lavatories, drainage, &c., Stratford-upon-Avon Union Workhouse, for the Board of Guardians. Mr. Thos. T. Allen, architect:—

Denner	£285 10 0
Porter & Co. Callaway	340 0 0
Ham, Martin, & Edwards	385 0 0
Holtom & Price	330 0 0
Horseman & Martin	321 0 0
White (accepted)	286 0 0

For the Acton Main Drainage, Contract No. 6. Mr. E. Monson, C.E., Surveyor to the Acton Local Board. Quantities supplied by Mr. Young:—

Porter & Co. Callaway	£1,020 0 0
Smith	779 0 0
Brunsdon	765 0 0
Williams	760 0 0
Robson	755 0 0
Bloomfield	729 0 0
Robinson	696 0 0
Robinson	690 0 0
Crockett	650 0 0
Young	613 0 0
Parker (accepted)	603 0 0
Reed (too late)	573 0 0

For proposed villa residence, for Mr. Wm. H. Withall, in the Fortincales-road, Wandsworth. Messrs. Lee, Brothers, & Pain, architects. Quantities supplied:—

Nicholson	£4,040 0 0
Nicholson	4,025 0 0
Van Vliet	3,569 0 0
Edbs & Sons	3,777 0 0
Alastair & Sons	3,669 0 0
Avis	3,669 0 0
Thompson	3,260 0 0

For villa residence, at Calne, Wiltshire, for Mr. G. Harris. Mr. John Watson, architect:—

Bladwell	£9,128 0 0
Pinnegar	8,268 0 0
Call & Fethick	6,518 0 0
Light & Smith	6,484 0 0

Tenders for Bridge at Moerdijk.—According to the Bulletin for pipe tenders sent in for the construction and erection of the metallic part of a great bridge over the Hollandsche Diep, at Moerdijk, on the Dutch State lines, was that of Messrs. Vriesingen & Van Heel, of Amsterdam, 1,947,471. Among the English tenders sent in for this work may be mentioned the Newcastle-on-Tyne Iron and Coal Company, 241,000l.; the Butcherly Company, 224,000l.; Messrs. T. Brassey & Co., Birmingham, 165,322l.; Messrs. Viguoles, of London, 168,750l., &c.

Radnorshire Gaols.—Messrs. B. & A. Hamer, builders, Kingston, obtained the contract for enlarging and altering the Radnorshire county gaols at Freestige, for 1,853l.

Springfield Park Estate.—Mr. James Bloomfield says his tenders for pipe sewers was 343l. 2s. 2d., as printed. The rightful discrepancy in the tenders for this work (see p. 36, ante) calls for some explanation. The highest was 932l., the lowest 200l.

TO CORRESPONDENTS.

Deacy of Blue (next week)—R. P. D. C. (next week)—O. W. B. (next week)—Inquirer (next week)—Pro (next week)—J. N. (next week)—H. W. B. (next week)—R. G. B. (next week)—F. O. (the Society for Improving the Dwellings of the Poor, at Exeter Hall)—A Subscriber (the prestis vales, inquires of the inventor of pavements in the districts where it is required to induce lights)—Langham (should consult a surveyor on the spot)—Anti-Sham (the process has been described in our pages on several occasions)—T. W. C. W. L.—W. B.—J. W. P.—Capt. P.—S. & H.—J. W. F.—R. & J.—H. K.—J. W.—W. T. H.—G. L.—J. B.—R. M.—Rev. G. S.—W. J. L.—F. P. Q.—L. W.—T. A.—R.—S. W. R.—R. E.—R. P.—R. A. L.—Rev. H. P.—W. I.—K.—F. R. G.—J. O. F.—J. G.—Mr. R.—A. M.—S. A.—W. F. P.—J. P.—J. J. M.—Q.—W. J.—F. J. H.—H. T. R.—S. W.—C. R.—C. H.—G. R.—W. A. L.—St. J. B.—C. H. D.—H. J. C.

We are compelled to decline putting out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests of course, with the author.

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Advertisements cannot be received for the current week's issue later than THREE o'clock p.m. on THURSDAY.

The Builder.

VOL. XXVII.—No. 1355.

Underground Life.*



VISIT to a coal mine is always extremely interesting, and even exciting, to a novice. The underground workings are reached by the shaft; in a bucket suspended from a rope in some collieries, but on a well-arranged platform with a cage and shield overhead, the whole travelling in guides, in others. An unpleasant feeling is experienced at starting, in the sensation of vacancy which the going down a shaft always produces. The bucket rubs against the walls; the space is narrow, and appears still more so than it really is, on account of the darkness. It is but dimly lighted by the lamps. Water filters through the rock drop by drop, in a fine rain, and now and then the thought occurs that a stone might fall from the wall and smash your head; that the rope, stretched by the weight it supports, and whose oscillations are perceptible, may also break, or the bottom of the bucket come out. In the middle of the shaft the thought occurs of a collision, or of a possible entanglement; but when the obstacle is escaped you breathe more freely, and soon reach your journey's end, happy to have escaped with so little trouble. Visitors sometimes decline to go down the mine in this way, while others cover down at the bottom of the bucket, where they remain motionless through fear, and on reaching the bottom it is actually necessary to turn the bucket over to get them out, and they only recover their senses with difficulty. The miners, on the contrary, make this journey twice every day without a thought of danger; and they laugh and talk in going down, just as an old soldier goes under fire without shrinking, and gallily faces the shower of grape-shot.

Two or three times every four-and-twenty hours, but usually twice, morning and evening, the fresh turn of hands enters the mine. The sight is a curious one; the men press forward in a hody; then, at the sound of the bell, they disappear in crowded groups in the tubs and cages, or down the ladders. They are heard talking on first leaving; but the sound of their voices is soon lost in the shafts, until it becomes merely a hoarse murmur, and only the pale glimmer of their lights is distinguishable.

Prayers are offered up in some Continental mines by the miners before going down; in most mines, however, this is neglected. When they arrive at the bottom of the shaft they separate, and every one goes to his place of work.

In the stalls and working-places where the noise is heard, and where the smell of gunpowder is perceptible, the miners are getting the coal; in the levels the rolly-boys and horses are crowded together, and trains go and come; at the bottom of the shaft it is the noise made in hooking on or unhooking tubs which is heard, and the shouts of the hookers on to the landers

at the pit-mouth. The lamps only shine at certain points, lighting up the faces of the men, the shape of the wagons, and the coal which glistens here and there; the rest is cast in shadow, and yet the whole effect is animated and startling.

The galleries cross each other in all directions, like the streets of a town with many turnings. There are cross-roads and squares; each road has its name and destination, but as there are no sign-posts, a stranger loses his way at first, soon finding it, however, by practice. Some of the galleries, which are long, wide, and well ventilated, form the principal thoroughfares and great streets, constituting the fine quarter of the mine. The others, which are sometimes low, narrow, tortuous, ill supplied with air, kept in bad repair, and liable besides to be only in temporary use, are like the old quarters, which will soon have to disappear. This underground town is inhabited night and day; it is lighted, but with lamps. It has railways, traversed by horses and locomotives. It has streams, canals, and fountains—strong springs of water which, in truth, could be very well dispensed with. There are even certain plants and living creatures which are peculiar to it; and life, as has been said, seems to assume special forms in it. It is the black and deep city, the city of coal, and the lively centre of labour. The inhabitants only live in it part of the day or night to do their work; and the crews or shifts relieve each other two or three times in the course of the four-and-twenty hours. There are not, as might be supposed, either promenades, shops, or houses, and still less resident miners who never see day. Light again when they have once entered the works. The horses only, in some districts, never leave the mine.

Some authors have spoken of men who spend all their lives underground, who are horn and die there, painfully subjected to the labours of the Troglodytes. There are two mines in particular on which the imagination delights to brood—those of Wieliczka and Bochnia, in Austrian Galicia, where they do not work coal, but a rich mass of rock-salt. At the intersection of the galleries the miners have carved out of the solid rock obelisks, columns, statues, and even a chapel. There was no need to pretend that there were in these salt-mines houses several stories high, bazaars, theatres, coffee-houses, hotels, springs and streams of fresh water, and even a windmill! It has been stated that the miners never left these dismal abodes, that they were born and died there. All that is pure fiction. It is not the less true that a large mine in active work resembles in some respects in appearance, and by the animation which prevails in the working-places and the levels, an actual town.

The dangers to life in coal mines are varied and numerous, as every Briton well knows. One of the most fatal is fire-damp; but on this we need not here enlarge. In some collieries it used to be the custom, before the safety-lamp was invented, to light the fire-damp every night. The time is still remembered at Rive-de-Gier, in France, when a man came every evening to set fire to the gas in the mine—to provoke the explosion, in order that the working stalls should be accessible again the next day. Wrapped in a covering of wool or leather, the face protected by a mask, and the head enveloped in a hood like a monk's cowl, he crawled on the ground before firing the explosive mixture, to keep himself as much as possible in the layer of respirable air; for the fire-damp, being lighter than the atmosphere, always ascends to the upper parts of the levels. In one hand he held a long stick, with a lighted candle fixed at the end of it, and he went alone, lost in this poisoned maze, causing explosions by advancing his lamp, and thus decomposing the noxious gas. Having fired any mixture of fire-

damp, he naturally changed his position and walked upright, since the carbonic acid produced by the explosion rapidly formed the lowest layer of air. He was called the *pentitent*, on account of the resemblance of his dress to that of certain religious orders in the Roman Catholic Church. In other mines this brave collier was called the *canonier*. When the fire-damp killed him on the spot, it was said that the canonier died at his post on the field of honour, and that was all his funeral oration. The same person in English mines bore the expressive name of *fire-man*.

Coal mines are liable to take fire and burn even for years. The ignition of the coal, especially in Staffordshire, where, from the peculiar nature of the coal, combustion is not uncommon, has produced surprising effects of alteration in the measures containing the coal. The sandstones have become vitrified, baked, and dilated by the fire, the banks of plastic clay hardened, and changed nearly into porcelain.

In the environs of Dudley there was formerly a coal-mine on fire. The snow melted in the gardens as soon as it touched the ground. They gathered these crops in a year; even tropical plants were cultivated; and, as in the Isle of Calypso, an eternal spring prevailed. It is by somewhat similar means that early fruit and vegetables are grown in the depth of winter in some of the gardens round Paris, where the temperature of the soil and the surrounding air is artificially raised by means of currents of hot water made to circulate in pipes underground.

In another Staffordshire colliery, the firing of which dates many years back, and which is called by the inhabitants *Burning Hill*, it was noticed, as at Dudley, that the snow melted on reaching the ground, and that the grass in the meadows was always green. The people of the country conceived the idea of establishing a school of horticulture on the spot. They imported colonial plants at a heavy expense, and cultivated them in this kind of open-air conservatory. One fine day the fire went out, the soil gradually resumed its usual temperature, the tropical plants died, and the school of horticulture was under the necessity of transferring their gardens elsewhere.

Subterranean ignitions generally only trouble the miner by the mephitic vapours which they give out, and the high temperature which they cause in the stalls.

Falls of ground may be ranked amongst the greatest perils which the miner has to guard against. If the shock be direct, the man is crushed on the spot; or if he escape, it is at the cost of a limb. Masses of rock from the roof, bell-moulds, as lumps of ironstone are called in the figurative language of the colliers, sometimes become suddenly detached without the least warning, from the shales or friable coal forming the roof. These lumps, frequently of great size, falling on the head of the miner, often kill him outright.

In other cases, the wallings and timberings give way under the enormous pressure of the ground.

The danger of underground inundations is as formidable as that of falls of ground. The water accumulates in the mine, in a body, in basins, in actual lakes. The miner keeps it there by dams made of cement or clay—by wooden framework, the different pieces of which are geometrically put together like the stones of a wall or a vault. Equally cleverly devised masonry has been built up in the shafts; and yet the pressure of the water is sometimes so great as to overcome all these obstacles. An old English collier, who believed the earth was alive, compared the veins of water met with in mines to the veins and arteries of the human body.

The proportion of accidents and lives lost to

* *Underground Life; or, Mines and Miners.* By L. Simonin, translated, adapted to the present state of British mining, and edited, by H. W. Brastow, F.R.S., of the Geological Survey. Illustrated with many plates, including chromolithographs. London: Chapman & Hall, 1863.

the number of persons employed, and the tons of coal raised, in 1868, according to our author, was as under:—

The number of accidents involving loss of life in the collieries of the United Kingdom was	837
The number of lives lost by those accidents was	1,484
The number of collieries in the United Kingdom was	3,192
The present quantity of coal raised	1,011,654,544 tons.
A life was lost for, of coal raised	69,484 tons.
Tons of coal raised per separate fatal accident	117,837
Persons employed per separate fatal accident	374
Persons employed per life lost	216
The number of coal-miners in Great Britain	329,663

The accidents, when analyzed, are annually as follows:—

By explosion of fire-damp	149.6
By falls of roof	449.8
By falls, &c., in shafts	147.9
By sundry causes	190.1
	1099.3

It is remarkable that in the confined and sunless atmosphere in which the coal-miner lives half his time, he contracts few special maladies; nevertheless, in the course of time the bad air impoverishes the blood and causes anæmia, while the dust arising from the coal produces dangerous affections of the chest and lungs. On the other hand, the miner is sheltered from the inclemency of the weather, from cold, wind, and rain, and is more favoured in that respect than the out-door labourer. He has, nevertheless, to be careful not to take cold on leaving the mine, and to observe certain precautions when he has to work in water. Now that the long ladders have been nearly all done away with in coal-mines—though not so in metallic mines—and with them the serious lung-diseases which they induced, it may be said that, accidents excepted, the most formidable enemy of the miner is rheumatism. It is accidents only which expose the miner to a thousand perils, and which cause death, as it were, to marob incessantly by his side.

The managers of collieries generally watch over the safety of their men with a paternal solicitude. Sick-funds are everywhere established, and supported by subscriptions, and by the produce of fines, which are imposed at every mine whenever any of the standing rules are broken.

The sick-clubs, which are now generally being introduced into the collieries of this country, are under the management of the miners themselves.

The coal production of the globe in 1866, according to M. Simonin, was as under:—

United Kingdom (England, Ireland, and Scotland)	101,630,544 Tons.
Other countries of Europe	17,000,000
Prussia	11,200,000
France	12,000,000
Austria	4,000,000
Saxony	4,500,000
Hesse, Bavaria, Hanover, Russia, Spain, Italy, &c.	4,000,000
North America	50,800,000
Other countries of the globe—India, China, Japan, Australia, &c.	15,000,000
	68,800,000
Total	170,430,544

See England (2) (continues M. Simonin). "Coal does not merely furnish the indispensable aliment of the factories; it serves beside to freight ships. Should coal fall elsewhere, England alone could supply the world. She exports at this time more than nine million tons, the eleventh part of her entire produce. It is by means of their coal depots that the modern representatives of the old Phœnicians mark their maritime hitting places on the globe; and it is partly for the supply of their steamers that they transport coal from one hemisphere to the other. In the Mediterranean they are everywhere, especially at Gibraltar, Malta, and Alexandria; in the Red Sea, at Suze; in the Indian Ocean, at Aden, the Mascarets, Natal, Mozambique, and Zanzibar; then at Muscat, Bombay, Madras, Ceylon, Calcutta, Rangoon, Singapore, and the stations in the China and Japanese waters; in the Atlantic Buenos Ayres, Monte Video, Rio Janeiro, Bahia, Pernambuco; and at the Azores, Madeira, the Canary Islands, Ascension, Saint Helena, the Cape of Good Hope, on the coasts of Guinea and Congo. All these stations, all these anchorage, have stores of English coal; so has the entire archipelago of the Antilles, especially Cuba, Jamaica, Saint Thomas, and Colon-Aspinwall. Along the coasts of North America—at Quebec, Halifax, Boston, and New York—the British Colonies and the energetic Yankees compete with each other in supplying coal. In the Pacific it is Panama, Guayaquil, Callao, Arica, and Valparaiso which the coal-ships visit; and on the opposite parallel in the northern hemisphere, San Francisco, the Queen of the Great Ocean, Antity, between the Indian Ocean and the Pacific it is the great island Australia, which of itself forms a section of the globe. The globe now belongs to those who can supply her with coal; and, as a celebrated statesman said in the House of Commons, all the nations which are without combustible minerals are the vassals of England.

Europe, even, cannot dispense with the services of the United Kingdom. If nature in the formation of coal-fields has favoured England at the expense of the other countries of the Old World, the greater number of the latter are, notwithstanding, possessed of Carboniferous deposits, which they work with greater ardour; still, what is required to make the production equal to the consumption is derived from England. Here, again, we see the British coal-ships make their appearance, not in the Mediterranean only, where we have already followed in their wake, but along the coasts of the Atlantic, of the English Channel, of the North Sea, and the Baltic. France herself is in this respect the tributary of Great Britain."

The excellent work of M. Simonin treats chiefly of coal-mines, but also to a considerable extent of metallic mines and surface works; and the volume is concluded with a briefer account of mines and other works which yield precious stones.

In speaking of metallic miners, he says:—

"The miner in metal, like the coal-bearer, occupies a distinct place, and is marked by peculiar characters in the great family of workers. He constitutes the true type of miner, a sort of subterranean pioneer, a type more varied, and of yet greater originality than that of the collier. In coal-mines a certain sort of family likeness prevails, the same discipline distinguishes the works, the strictness of the regulations in force in each district is the same, and these deprive the workman of a portion of his local habits and customs. In metal-mines, on the contrary, the depôts are dissimilar, and each of them has a special mode of occurrence, necessitating different systems of working; and the discipline also is less exact. Lastly, while the ordinary way of mining for coal is scarcely a hundred years old, some of the metal-mines have been worked for ages as they are now worked. In each of them the workman has retained, as it were, the stamp of the ground—peculiar manners and customs."

It may be useful to quote the following passage from remarks on the purity of gold:—

"Analyses of some Specimens of Gold from Mines."

	Composition in a thousand parts.		
	Gold.	Silver.	Iron, copper, &c.
Siberia ... {Altai,	980	20	—
Ural,	950	50	—
Australia	940	60	—
Northern mines	900	100	—
California {Central mines	800	198	2

This table shows how the character of the gold varies with the country which produces it, and how it often differs from that of the gold which is coined or worked. The standard gold coin in England, by an Order in Council issued in the reign of her present Majesty in 1855, is made of an alloy consisting of twenty-two parts of pure gold and two parts of alloy, the alloy being an indelible proportion of silver and copper. The standard for gold used by jewellers and goldsmiths (hence called jewellers' gold) is 18 parts of pure gold in 24 parts of alloyed metal (called gold of 18 carats fine); but articles of plate and jewellery may also be wrought of 9, 12, or 15 carate pure. In France the proportion is 9 parts of pure gold to 1 of copper for gold coinage, and 7½ of pure gold to 2½ of copper for the gold employed for jewelry and goldsmiths' work. It need scarcely be added that the object of alloying the gold with copper is to make the precious metal harder and less liable to wear.

Like most metalliferous substances, precious stones are generally met with in veins or simple fissures, and even in cavities, which either traverse or occur near eruptive rocks. Sometimes they are found disseminated through the rock itself. Most gems are considered to have been produced, like metallic ores, from aqueous solutions and hot vapours. Time, repose, and the means being favourable, sparkling crystallizations are the result, and the gem slowly appears, crystallizing itself out from the surrounding rock in which it originated. Volcanic lavas have given birth to some gems.

The British public are in no small degree indebted to the translator of this instructive and valuable work for adapting it to the present state of British mining; and also for reducing the somewhat high-flown and romantic style of the original, which nevertheless gives a minute and practical account of mining throughout the world by an experienced miner.

The work is well printed, on excellent paper, and contains 10 fine chromo-lithographs of metallic and other minerals, precious stones, &c., with 100 uncoloured engravings on wood, and 20 valuable geological maps.

THE RAILWAY PROSPECTS OF 1869.

The railway returns of the Board of Trade afford to any one who is at the same time practically familiar with the subject of railways, and apt at analysis, the means of arriving at very important results. To a very great extent inductions and analyses have been already brought

before the public in the pages of the daily press. There is one mode, however, of investigating the subject which no publicist, so far as we are aware, has attempted. It is one that leads to very important conclusions. We are happy to add that they are little less encouraging than they are important.

Eighteen years of railway history are summarily compared in the analyses of the report. In the year 1849, when the comparison commences, the sum, in round numbers, of 230,000,000 sterling had been expended upon 6,000 miles of railway, which had then been constructed at a cost exceeding 38,000l. per mile. The gross receipts for that year were hard upon 12,000,000l. sterling, or 1,957l. per mile, and the number of passengers carried was nearly 69,000,000.

At the expiration of nine years—that is to say, in 1853—the capital had been increased 41 per cent. The length of line open had been increased 53 per cent. The gross receipts had doubled. The receipts per mile had increased 35 per cent. The passengers had rather more than doubled.

At the close of the second period of nine years, or in December, 1867, the capital had increased 54 per cent. on that of 1853, or 111 per cent. on that of 1849. The length of line open had increased nearly 60 per cent. on that open in 1853, and 136 per cent. on that open in 1849. The gross receipts had increased 64 per cent. on those in 1853, and had more than trebled (333 per 100) those of 1849. The earnings per mile had increased 91 per cent. on those in 1853, or 45 per cent. on those of 1849. The passengers had increased 106 per cent. over those of 1853, or 315 per cent. on those of 1849.

The great difference in the rate of increase, in every item, between the first and the second of these two periods, is much more striking when we compare the cost at which the additional mileage was constructed in either case. The 3,500 miles constructed in the first nine years averaged 27,400l. per mile, and reduced the cost of the entire net of railways to 34,300l. per mile. The 4,700 miles constructed between 1853 and 1867, cost 37,100l., almost exactly 10,000l. per mile, or 36 per cent. more than those of the former period; thus increasing the total cost of the entire system to 35,300l. per mile.

It is thus plainly evident that the railways of this second period were at once more expensive and less remunerative than those of the first. They cost within 1,000l. per mile as much as did the railway prior to 1849, by the construction of which we had to obtain our knowledge of an entirely new system of engineering, and in the cost of which the price of that experience was included. It is true that the heavy cost of the expensive metropolitan termini, and internal links, is included in the latter term. But while this will do much to account for the increased outlay, it may, on the other hand, be expected to have contributed in equal proportion to the increase in the sum total of receipts, and in the numbers of passengers.

During the second period, therefore, from 1858 to 1867, the 4,700 miles of railway, constructed at the price of 37,400l. per mile, while increasing the running length of some by 60 per cent., only increased the gross receipts by little more than the same proportion. A closely similar proportionate increase of length (53 per cent.) during the former period, at the cost of a third less per mile, had allowed the receipts earned at the commencement of the time to be doubled. How much this difference was attributable to circumstances beyond the direct control of the projectors of the various lines, it is not now our purpose to inquire. The facts themselves are sufficiently striking.

Had we been destitute of the experience due to a more sober period of constructive industry, the fact that in eighteen years, by increasing our railway net to the extent of 136 per cent., we trebled the receipts, and more than trebled the number of passengers carried at the commencement of that period, would be enough to lead us to form no contemptible idea of the energetic growth of the great industrial interest identified with the new system of transit. The facts are of extreme significance; and the deduction that, if wasteful extravagance is avoided, a gradual improvement in the returns and dividends of the railway property of the country will take place, is hardly to be avoided.

There is another aspect of the question, of even more immediate practical interest, as to which the returns now before us do not afford the means of so complete an analysis; but to which it is not easy to attach too much impor-

We have seen that the present mileage returns of railway traffic results in an average loss, regard being had to the interest proper to be paid on capital. We see further that the traffic now actually carried on may be grouped into four classes, namely, the three classes of passengers, and the goods, minerals, and cattle; and that, in approximate numbers, these groups earn the respective rates of 30s., 15s., 8s. 8d., and 3s. 6d. per ton. It is true that to obtain the full value of the experience of 1867, we should take into account the mileage both of passengers and goods, as well as the total numbers of the former, and the tons weight of the latter. But without going into this nicety of detail (which the anxious manager will, no doubt, do for himself), it is palpable that there is a very remarkable connexion between the character of the traffic and the net earnings of the railway.

Taking the cost of 6s. per train mile as normal, we have given reason for estimating the mileage of the express trains at 6s. 1d. per mile for the speed of 40 miles per hour, and 10s. 3d. per mile for a speed of 50 miles per hour; these prices to cover deterioration of property and 5 per cent. dividend. Allowing for the extra quantity of tare per ton of first-class passengers, it is pretty evident that there could be no loss in conveying them at express speed, if trains were especially devoted to their service—a point which it is clear that some of the companies have endeavoured to establish. The disproportion between the fares and the accommodation of the first and second class passengers is one of the greatest anomalies in our present system. The difference in the cost of conveying the two classes, at the same speed, is, on some lines, inappreciable. Again, on other lines, the distinction between the second and the third classes is little more than nominal, except in fare. That the public are arriving at a similar conclusion is indicated by the fact that the second-class traffic has diminished $\frac{3}{4}$ per cent. during the year 1867, while the first-class traffic has increased $1\frac{1}{2}$ per cent., and the third class has increased 5 per cent.

If, then, we cannot regard the first or second class traffic as conducted on such disproportionate terms as to cause loss to the shareholders, the question lies between the third-class traffic and that in goods, minerals, and the like. It is only necessary to compare the earnings per ton of each class of traffic in order to see where the really weak point in our system lies. The conveyance of a ton of third-class passengers, on the gross average, produces for the carrying company 244 per cent. more than the conveyance of a ton of goods. The tare on the conveyance of the former is more than on that of the latter, but all other elements of expenditure are less in the former case. Yet it is this important traffic which it is the general object of railway management to discourage as far as possible, with the futile hope of driving passengers to pay higher fares; while the exertions of the traffic agents in obtaining goods to transport have been so successful as to cumber our railway lines with 54 per cent. of entirely unremunerative traffic.

The subject presses for the attention of every railway shareholder, more especially from the fact (to which we have before alluded as imminent) that not a few of the main trunk lines must shortly be doubled, if they are to continue to increase both their passenger and their goods traffic. It is difficult to come to any other conclusion, from the facts before us, than that the bulk of the mineral and goods traffic is carried on at a loss. Canals in some parts of the country are falling into ruin, which might resume their former activity, to the great profit of the proprietors of the railways, who are, in many cases, also proprietors of the neglected canals.

Without attempting to dilate upon individual instances, without saying more than that the figures of the Board of Trade returns indicate certain points as demanding very careful and very honest investigations, we invite our readers to draw their own conclusions from our analysis. The entire railway traffic of the country is now worked at a loss, considering the fair rate of interest on the money expended. More than half of that traffic, measured by its money returns, involves the transport of five times the net weight of the traffic that earns the other 46 per cent. Making an allowance for the tare, and considering that the extra price, which now, in a somewhat invidious manner, is charged for a cushion or an arm-chair, may be fairly and properly proportioned to the speed at which the traveller chooses to be conveyed, the

disproportion is startling. To reverse the system of the late period of railway decline; to cease to strangle the legitimate canal traffic with the dishonest result of ruining the canals and impoverishing the railways; to regard the third-class passenger as the staple customer of the latter, when conveyed at a moderate speed, are the points which seem, as it were, of their own accord, to emerge from the sea of figures presented by the report of the Board of Trade.

The increase of traffic receipts in 1867 over those of 1868, is 1,315,000l. This is accompanied by an increase of mileage. But, as we have before seen that, in eighteen years, an increase of 136 per cent. in mileage was accompanied by an increase of 333 per cent. in receipts, we are justified in calculating on an average increase of 3 per cent. per annum, independently of any augmentation of mileage. This is equal to an annual increase of 1,200,000l., of which, according to the experience of 1867, 600,000l. would go to dividend. But all the ordinary railway stock existing at the end of 1867, amounted only to 233 millions sterling; 269 millions of capital existing in the form of preference stock and debentures. It is not, indeed, the case that the whole of this preference stock now receives its guaranteed dividend, and the profits of several years may be swallowed up before the condition is fulfilled. Still, it is to be noted that a steady increase of earnings, applicable as dividend, at the rate of 600,000l. per annum must exert a very transforming influence on the value of railway property and lower the rate of interest on all terminable loans. Apart from any increase of profit which may be anticipated as likely to result from a revision of the traffic system, such as above suggested, the natural growth of income will, in little more than three years, add nearly one-half per cent. to the gross amount of dividend. In nine years that average dividend promises to amount to fully 5 per cent. That the net income applicable to the existing railway capital of 502 millions will amount to 5 per cent. by the close of the year 1876, is one of those anticipations on which we are as fully justified in relying, if we experience no return to our past insanity, as on any inference to be drawn from the analysis of carefully-collected statistics.

SPECIAL INSTRUCTION IN ART.

FELIX SLADE'S LEGACY.

The late Mr. Slade, of Lambeth, has left to trustees and executors 45,000l., in trust, that with so much of that sum as may be sufficient for the purpose, not exceeding altogether the sum of 35,000l., they may fund and endow, within two years after his decease, three or more professorships for promoting the study of the fine arts, to be termed the Slade Professorships of Fine Arts; one of such professorships being founded and endowed in the University of Oxford, another in the University of Cambridge, and one or more in the University College of London, the amount of the sum to be expended in founding and endowing each of such professorships being in each case at the discretion of the trustees; it being also at their discretion whether the sums shall be equal or unequal in amount. They are also, out of the same sum of 45,000l., to fund and endow, within two years after his decease, six exhibitions or scholarships of fine art, to be called the Slade Exhibitions or Scholarships, each to be of 50l. per annum in amount, and to be in connexion with University College, London, and to be given to students in the fine arts, under nineteen years of age, for proficiency in drawing, painting, or sculpture; and to be held by each student to whom an exhibition or scholarship shall be so given, for not more than three years. Any surplus of the sum of 45,000l. bequeathed, the trustees, within five years after his decease, are to apply in such manner as they shall think fit for the encouragement, benefit, and advancement of the fine arts in England; and every part of such surplus which shall not be so applied within the same period of five years, is to fall into his residuary personal estate.

The University College committee having referred, the trustees were informed of the considerations which pressed upon the committee, as thus:—

"1. Our Committee considered that the acceptance of Mr. Slade's bequest, and particularly of that part founding scholarships for students in drawing, painting, and sculpture, would impose on the College the duty of affording such instruction as ought to be given to students who are following the fine arts as a profession.

2. We thought that the academical education in Uni-

versity College of professional artists would require the establishment of a separate faculty or department. We have now two faculties, those of literature and of medicine; we should then require a third, a faculty of fine arts, with its separate classes and teachers.

As we now find to some extent, with reference to our present two faculties, we should certainly then find to a much greater extent, with reference to a new fine-arts faculty, that many of our existing chairs (or professorships) would be eminently fitted for giving instruction to fine-art students on subjects important to such students, and yet at present not taught to them at all, or very insufficiently taught. Indeed, it seemed to our Committee, as far as we at present understand the matter, that a faculty, or college, or school, for the education of professional artists, could scarcely be well carried on unless in connexion with complete schools of literature and medicine, such as University College aims at maintaining."

Mr. Edwin Field, on the part of the committee, set forth various points that presented themselves for consideration, and asked as an immediate question:—Will the executors be disposed to found a "Felix Slade Faculty of Fine Arts" in the College for the education of professional artists, the schools of this faculty to have their own appropriate buildings, such buildings hearing of course Mr. Slade's name?

"Such a faculty in connexion with complete schools of literature and medicine does not, I believe," says Mr. Field, "exist in Europe. In the eyes of artists it would be a most noble and useful institution." The difficulty seems to the committee to be this, that while the single professorships to which each of these Universities is confined, would certainly be each a professorship, not for the instruction of artists, but one aimed at inducing the general students of those Universities to take a greater interest in art; the provision pointing at an indefinite number of professorships at University College, and at an unequal division of the funds, and also at the scholarships to be established at University College, points at the institution of a complete system of fine-art education at the college. Mr. Field thinks it necessary to point out (though probably it is not material where the executors have such large discretion as Mr. Slade's have) that architecture may seem to have been omitted by Mr. Slade from the benefits of his bequest:—

"Our Professor of Architecture (Mr. Hayter Lewis) rightly suggests, however, that it should be pointed out that drawing (one of Mr. Slade's three objects) is as necessary for the architect as for the painter. He tells me that there is a great desire on the part of many eminent in their interest for promoting architectural education, that students in architecture should study drawing from the living models, and receive a more artistic education generally; for which purpose a committee has recently been appointed by the Royal Institute of Architects."

Some of the artistic bodies of the metropolis have already passed resolutions, as our readers have been informed, recognising the importance of the bequest and the desirability of securing it. At the meeting of the Graphic Society Mr. Cave Thomas spoke on the broad question. Some of his observations we may usefully reproduce. He said: "It appears to me that if the Royal Academy could have in any way joined issue with the great objects of the Slade bequest, it would have been one of the greatest events of modern times, no less than that of initiating a great educational reform. For it is not only in its important special educational hearing that I regard the Slade bequest, but as offering the means of introducing the training of the most important of the senses into the curriculum of a general education. Consider for a moment the vast amount of impressions received through the sense of sight, and yet that our established system of general education takes no cognizance of the importance of training the eye to observe, to see correctly. True education is not to ' cram ' all kinds of information into a student, but to educe, to develop the true human nature, the whole manhood. This, therefore, appears to be our very strongest ground of appeal to the executors. For although we may all feel the great novelty and importance of the boon which the Slade bequest offers specially to the Fine Arts, we must also acknowledge the equal or greater boon which it offers to the cause of general education. And my own opinion with reference to the policy which University College should adopt with reference to the bequest is, that the educational motive should be its starting point; for in effecting a reform it behoves us to be political economists,—to effect the change we desire gradually, so that the inconveniences of change be reduced to a minimum—not, however, for a moment losing sight or grasp of the ultimate purpose. The sudden establishment of a great school of art solely for the education of painters, sculptors, and architects, notwithstanding it should offer greater advan-

tages than other schools, might have the effect of raising more artists than the State requires, and he the source of great disappointment; for where, at present, is the work demanding this highest education of the artist? You will, perhaps, agree with me, that as yet it does not exist. But why does it not exist? I answer, for this simple reason, that æsthetic training has no standing in our accepted educational system. Make art an element of education by utilizing the Slade bequest at Oxford, Cambridge, and University College, and the foundations of our appreciative feeling for art will be laid, which will create the demand for that monumental art which requires the highest education of the painter, sculptor, and architect. Meanwhile, the art student would gradually learn the advantages of pursuing his special and general studies *parsi passu* under one dome. Thus, by a system of gradual development and growth, facilities of the fine arts would by-and-by be established without exciting that animosity and opposition for which great pretensions, no matter how reasonable or well founded, are often, unfortunately, the mark in this too jealous country."

The first point is for the University to secure the bequest. Mr. Field's remarks seem to suggest the probability of a delay that might endanger it. An opportunity to advance the artistic education of the country now offers itself that ought on no account to be missed.

PROFESSOR KERR ON THE ARCHITECTURESQUE.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The adjourned meeting of this Institute took place on Monday evening last, Mr. Charles Barry, vice-president, in the chair.

The chairman announced in terms of deep regret the decease of Mr. Arthur Ashpitel, past vice-president and member of the council, the intelligence of which, he said, had only reached the council during their sitting that evening; also of Mr. Geo. Smith (follow), of Frederick's-place, Old Jewry, who was personally well known to many members of the Institute. Among the donations announced was that of Mr. James Fergusson's folio work "On Tree and Serpent Worship," illustrative of mythology and art in India, presented by the author, a sumptuous book, embellished with numerous photographs. A letter from Mr. Fergusson was read, announcing his resignation as member of the council of the Institute, the retention of which office he considered incompatible with the appointment he had recently accepted of secretary to the Board of Works. The chairman took occasion to remark, that the appointment of Mr. Fergusson to that office could not but be most satisfactory to the public, and was an event of peculiar interest and gratification to the architectural profession at large.

Mr. Abel G. Clifton, of Great George-street, Plymouth; Mr. James Joy, of 112, St. George's-road, Southwark; and Mr. George Vials, of 15, Great James-street, Bedford-row, were elected associates of the Institute.

A conversation took place (introduced by Mr. Chas. Fowler) relative to the steps proposed to be taken by the council in connexion with the amended Building Act, to be introduced in the next session of Parliament. It appeared that a report had been made to the council by a special committee, to whom the provisions of the Bill had been referred for consideration, upon which a draft report had been prepared by the council, with a view to its being submitted to the Metropolitan Board of Works, in accordance with a communication from that body. Mr. Fowler, Mr. David Brandon, and other members, thought it desirable, that before any formal step was taken on the subject in their corporate capacity, the Institute should be made acquainted with the views of the council as embodied in their draft report, and that an opportunity should be afforded them of discussing the provisions of the Bill at a special meeting to be held for that purpose. After some talk it was agreed by resolution of the meeting that the draft report of the council, together with a report adopted by a committee of district surveyors, should be printed and circulated to the members, and that the subject should be discussed at the next meeting of the Institute.

Professor Kerr then proceeded to deliver a discourse entitled "A Development of the Theory of the Architecturesque," in continuation of a preliminary lecture to the Architectural Associa-

tion (*vide Builder*, March 7th and 14th, 1868). The Professor commenced his address by remarking that during the last twenty-five or thirty years, as was well known, one speculation after another had been submitted to the public and the architectural profession with the view of determining the proper principles of architectural art, and of supplanting certain other principles which were supposed to prevail. Those speculations at first were grounded upon the supposition that we previously possessed the material with which to deal in design; that is to say, that the rules of the examples of antiquity, and the precedents of former practice, were to be regarded as the data. Later in the day they had a different idea set up: they were called on to look to nature and set aside mere precedent. They were called on to repudiate copyism, and to design for themselves. They had even been invited off-hand to devise any number of new styles to suit any number of occasions. Little came of all this: and more lately still they had had an entirely new character of speculation set up, which he might call the poetic sentiment; and they were now invited to discard gross and every-day notions, and to rise to sublimated and refined ideals, while those who called upon them to do so were not always able properly to explain. On this point he contrasted the dicta of two celebrated advocates of a new state of things in order to start the subject he had to lay before them. He found in the edition lately published by their friend, Mr. Wyatt, of the old *Gwilt* of early days, an apparently excellent dissertation on Medieval architecture, and what he wished to lay before them was what appeared introductory to the principles of Pugin on one page, and those of Ruskin on the other. Having quoted these passages, Professor Kerr went on to remark that they had here the views of two muscular writers, both thoughtful men, well versed in strong language, and hard hitters. In one they had the views of the practical architect, in the other those of the speculative enthusiast. The contrast was singular, and would serve to illustrate with effect the argument he had to use.

Some present might be reminded that not much more than half a century ago a somewhat similar bewilderment existed in the sister art of painting, and it was a singular fact that that bewilderment was very much dismissed by the apparently simple proceeding of the introduction of a new phrase. It often happened that a word which it promotes an idea and becomes accepted, served to bring disputed points to a distinct and definite issue; and he thought in the present condition of architectural philosophy they were in a position to introduce a corresponding phrase to that which was introduced on the former occasion in the art of painting, and by the using of the word "architecturesque," if they could understand and agree upon its meaning, to simplify the position as regarded the art as much as the word "picturesque" had served to simplify matters in the art of painting in this country.

The question he had to propound this evening was this. Is there in the art of architecture a certain artistic essence which is peculiarly its own? They would look at a building—suppose it a perfect work—the structure all that could be devised for propriety, and in accordance with the advancement of the age; and yet, when looked at by the artist, that building should happen to be simply dead, devoid of everything like vitality, and dumb with regard to anything like speech. But the artist should put his pencil over it, and, like an enchanter's wand, it should produce in every touch a manifest vitality, until at the last that which was dead was instinct with perceptible life, and that which was dumb spoke a positive and fascinating language.

Now what was this that was added? That upon which this process had been performed was building, the result architecture. Between the two lay something, and that he called the architecturesque. They might call it "dress." Not that he desired to suppose that architecture was clothing. It was an immaterial dress—call it embellishment. A few months ago he had occasion to deliver a lecture before a kindred society, and he chose this subject, and he then contented himself with endeavoring to establish the necessity for the recognition of this special artistic quality and the propriety of defining it by his phrase for the sake of formula. He did this, he said, in order to introduce it to the architectural reading public, to see if it was contradicted before he presumed to introduce his theory in a more advanced state. He had hitherto not been contradicted, and therefore he considered he

was so far entitled to their indulgence if he considered he was permitted, in the absence of contradiction, to use the word "architecturesque" without further definition or explanation.

His next step was to point to a few examples of the introduction of the architecturesque, or the expenditure upon building of that desire which was implanted in the human intelligence for ornamentation—that desire which of itself more than any other separated man from the lower animals. Professor Kerr proceeded, by illustrations exhibited, to point out the gradual stages of the introduction of the architecturesque as shown in the development of the column from the rude trunk of a tree up to the Greek Doric order, which, he said, might be regarded as almost the simplest of all architectural contrivances, yet so refined that it still retained its hold upon them as one of the most perfect. He next proceeded to point out the development of the architecturesque in the arch. The origin of the arch, he said, was not generally properly understood. Most people supposed that the curve of the circle was the form that originated the structure of the arch. Nothing was a greater mistake. The origin of the arch was simply in timber strutting. The same principle was exhibited in stone struts, and he was of opinion that the pointed arch as a principle was older than the semi-circular arch; he did not mean as an ornamental detail, but as a principle of construction. The development of the cornice and the stylobate was also followed out.

Before proceeding next to trace the development of architectural design, or the architecturesque historically, he would say a word on what he called spurious architecturesque. This, he said, was emphatically their present fault as architects, and it was this which was bringing down upon them one new broom after another, proposing to make a clean sweep of all of them, and set up something else. The reason for this was that they had been educated in the superficial rather than the substantial; and this was a state of things which would take a longer time to remedy than many supposed. Dealing historically with the question, he would now point out that there were three great schools of architecture,—the ancient, the mediæval, and the modern. The ancient world in origin be Oriental; the mediæval, Boreal—if he might be allowed the old-fashioned term;—and the modern, Occidental. The ancient having the elegance of the Eastern nations; the mediæval having the force of the North; and the modern the many-sidedness of the Western intellect. Again, the first was of large stones, the second of small stones, and the third of any stones or no stones at all,—sometimes, perhaps, "compo"! The first was trabecation (structural), the second arcuation (still structural), the third superficialization (post-structural, and too often counterfeit);—the first peculiarly architecturesque, the second intentionally picturesque, the third merely æsthetic. And if we were ever to recover the life and spirit of design it must be by superficialism giving place to substantialism.

After some critical remarks upon the historical development of the Greek orders, also upon that of arcuation as the sole basis of the system of Gothic architecture, Professor Kerr proceeded to remark that, after all he had said on the subject, those whom he had addressed would expect some kind of indication of a scheme or system for the architecturesque, and he had prepared the following in a tentative way only. First, the subject was building, with its adjuncts; secondly, the purpose was embellishment (beauty, ornament, decoration)—embellishment in pursuance of that natural law which was an essential element in the constitution of the human mind—the desire for "dress," the desire for ornament, the desire for producing art; and, thirdly, the purpose being embellishment, what was the limit of that purpose? Nothing short of infinite novelty. That was a principle involved; from which there was no escape; for that which forced the human mind to ornament everything which it produced, forced it, also, to perpetual effort for novelty. The next point was the means by which architecturesque effects could be produced, which were traceable under four heads. Then came the sources of suggestion,—structure, proportion, and imitation. Another point was the influences by which these suggestions should be governed, amounting to little more than the reaction of the same principles upon each other. Lastly, the conclusive effects would be three—viz., grace, style, and character; the multifarious results of

which one could scarcely instance, except by a few haphazard selections.

Coming, then, to the special application of the architectesque principle, he would, in the first instance, take the case of the steam-engine. Some present might remember the time when it was a serious subject of consideration how to combine the steam-engine architecturally—how to apply any of the five orders to it. The question was, which of them was most suitable, and it was generally decided in favour of the Greek Doric. But the steam-engine was a thing it was impossible to architecturalize. It was a mechanical matter, and not a thing to which the architectesque could be applied. Then take the case of a bridge; which was now considered to be the work of the engineer. How seldom did we see a bridge artistically treated. There were some approaches to ornament; but the spirit in which ornament should be applied to such structures was the architectesque, and was not understood. Looking at the Thames Embankment, what a noble opportunity it afforded for treatment by the architectesque; but the opportunity had been lost. Again he looked for a moment at the Crystal Palace. It was not in itself an ornamental structure. It was no doubt well built, but the question of ornamentation was avoided for sufficient reasons; but it served to raise the whole question of the application of the architectesque to iron work. When they heard declamations about new styles they ought to remember that at least a new material required a new style, and if there was one circumstance which attached more discredit than another to them as architects—and they would excuse him stating his opinions very boldly, even when they were against themselves—it was this—that architects had been so long in possession of the new material of iron, and had yet to take the first step towards the treatment of it in an artistic manner: and this showed the slow growth of any new style; for educated as they had been, he had no doubt it would take ages to effect the introduction of a new style, even with all the advantages of new materials. Having spoken at some length on architectesque sculpture, the learned Professor concluded by remarking that he had taken upon himself to confess a great deal—perhaps too much—on their behalf, but it was well not to be stingy in confessions. But if they, as architects, were guilty of so much that was spurious, was there not here and there in other matters besides architecture a good deal of what might be called spurious sentiment? Did we not live in an age of spurious sentiment? Our history, our philosophy, our law, our politics, our poetry,—was there not a good deal that was spurious in every one of these? If we came to our faith, our hope, our charity, was there not too much that was unconventional at the very core? And if they as architects had the custody of an art, whose essence depended upon its reflecting the character of the times, if they reflected that character all too faithfully what less could they do?

On the motion of Sir Digby Wyatt, seconded by Mr. J. P. Seddon, a unanimous vote of thanks was accorded to Professor Kerr for his paper. The lateness of the hour at which it was concluded prevented any discussion upon it on this occasion.

"THE ARCHITECTESQUE."

SOCIETY is singularly capricious in its reception or non-reception of a new word. It occasionally happens that an expression, happily hit upon by a popular writer, will receive sudden and almost immediate currency, and be recognised at once as a convenient shorthand expression (so to speak) for some class of ideas which formerly floated indistinctly through complicated ramifications of speech, with no set term whereby to define it. At other times a word equally happy and equally needed will, nevertheless, fall dead upon the public ear, or only force its way into recognition through a system of repeated manifestoes in its favour by those who have originated it. Probably the explanation may be found in the fact that in the one case the subject with which the new word is connected is one widely understood, or at any rate sympathized with; and that in the other case it may be one which, though perhaps equally important, has not laid hold of the sympathies of people at large. This is not a pleasant conclusion for those interested in the art of architecture, for there can be no question that the contrast hinted

at above is illustrated by the two words "picturesque" and "architectesque," which were placed side by side by Professor Kerr in his recent elucidation of the latter term at the Institute meeting. The first-mentioned expression appealed at once to a large circle of more or less educated persons; for though the highest qualities of the art of painting have been, and perhaps always will be (like all high things) "caviare to the general" yet at the time the word "picturesque" came into use there was undoubtedly, as there is now, a wide-spread interest in the productions of this branch of art, fostered to a great degree, no doubt, by the dicta of fashion, which impelled both gentlemen and ladies periodically to congregate where

"The Exhibition stares with annual pictures."

No such public interest attaches, so far as we are aware, to the introduction of the word "architectesque," hit upon by Professor Kerr; and as the word is similar in its etymology to its progenitor "picturesque," and as it certainly expresses, very aptly, a quality for which there was no concentrated expression before, we can only regard the indifference with which it has been treated as one more indication of the want of public interest in architecture as an art, and the ignorance of what really constitutes it as a separate branch of art.

It is really, however, a very important thing that we should define, more clearly than has hitherto been done, wherein architecture as an art really consists, seeing that in the eyes of one class of critics it is coming to be largely identified with engineering, and with another class it has for some time back been looked upon only as the framework for the exhibition of sculpture and ornamental design. We owe a good deal, therefore, to one who has introduced an expression, the recognition of which (should it come to be recognized) will be in itself a tacit acknowledgement of the fact that architectural design does actually exist as an independent art. We shall owe still more to any one who will define clearly for us wherein the "architectesque" consists. It was on this head that some of those present must have felt, as we did, that the lecture which has given rise to these remarks was, as it was, perhaps, intended to be, rather suggestive than exhaustive. The grouping of all previous and present architecture into three schools, the 'architectesque, picturesque, and conventional,' characterised respectively by aruation, trabecation, and *superficialisation* (another new word) was very comprehensive; though we should doubt whether the architecture of the present (represented by the third term of the triad), can rightly be called a "school" at all, its predominant characteristic being the absence of all distinguishing characteristics. And, to our thinking, Professor Kerr gives a more important place to what he somewhat vaguely calls "the desire for the beautiful" in originating architectural features than we should be inclined to concede. Observe, we say, in *originating* them; the decoration of them afterwards is another matter. For instance, we cannot accept the idea of the origin of the plinth from a desire to carry off the abrupt angle formed by the wall with the level ground. We imagine the plinth, like the cornice, to be purely constructive in its origin (which, indeed, the Professor in the latter part of his lecture by implication admitted), and to have arisen simply from the perception of the advantage of a broad and heavy base line of masonry in distributing the pressure of the wall, or the line of piers or columns, which it supported. Nor do we feel the nature of the architectesque to be much more clearly defined by referring it to "proportion," or its decorative part to "the imitation of the beauty of Nature." It may be that it is scarcely possible to define further; still we think the gist of the matter lies in the question, *how* are we to imitate Nature? At the risk of being, in our turn, found fault with for vague speculation, we would suggest that the essence of the architectesque consists in its being a generalising of those principles of beauty of which the plastic arts of sculpture and painting are more definite but less general expressions. A picture tells us a definite story, gives us a definite idea, but it also pleases us as much, sometimes much more, by its general effect of chiaroscuro, just as a group of sculpture pleases us by the balance of mass and form, independently of the subject. In architecture we have all the definite expression eliminated, and the attention wholly directed to the general broad effect of light, shade, and balance of form. Again, in nature we admire certain flowers for their special beauty, but in truly architectesque

ornament we do not directly copy any special vegetable form, however beautiful in itself; but we observe what common qualities they are which originate more or less the beauty of all these forms,—we recognise the principle of growth, of the springing of smaller parts from a central stem, and upon this we base such ornamental features as the Classic anthemion and the Gothic fleur-de-lis. We throw this out as a hint of the direction in which we suspect the truth to lie, as to what constitutes the essence of the architectesque. To the consideration of the difference between the really architectesque and the picturesque schools in architecture, and their relative value, we may return hereafter. In the meantime it is to be hoped that the introduction of the subject may give rise to some valuable hints in future discussion.

LIFE AND DEATH MAPS.

It would be difficult to confer a greater benefit upon sanitary science than that which is rendered by the preparation of clear topographical delineations of the path, or of the home, of disease. We urged this in past years, and the seed bore fruit in a few places. In Keith Johnstone's "Physical Atlas," a sheet is devoted to the subject of the distribution of health and disease over the surface of the globe, and much credit is due to Dr. Bryson for what that gentleman did in this direction when he held the post of Deputy Inspector-General of Navy Hospitals.

The general idea of the importance of graphical illustration of facts statistically collected, is one of which it is not easy to exaggerate the importance. The value of any single fact, be it more or less when isolated, is incalculably increased by co-ordination with other and similar facts. In all forms of study or of teaching this is admittedly the case. But when graphic illustration is appealed to, information which is entirely unexpected, will sometimes make its appearance on the chart. Not only does the process of plotting make what is already known more clear to the mind of the describer, and thus to that of the reader or observer, but it not unfrequently indicates the existence of some unsuspected law, or some previously unknown relation.

Take, for instance, the case of the elaborately drawn map of the cholera districts of London, which is to be found in the ninth report of the medical officer of the Privy Council. The actual rate of mortality during the cholera outbreak of 1866, is represented on this map, the greater or smaller number of cases in each district being represented by a greater or less intensity of dark shading. It is impossible for any person who has the slightest acquaintance with charts or plans, to look at this map without acquiring an amount of information for which he would have to toil through many columns of letterpress, or to consult an unwieldy table. Time is thus saved to no small extent. But this is not all. Those who will study reports, or consult tables, are the persons who already take an interest in the subject discussed. But a clear plan has the result of *creating* that interest. It brings the matter home to those who would otherwise care or know little or nothing about it. And to grasp the attention of the non-professional reader on any point regarding the operation of the great laws of health, is to render more prevalent the exercise of enlightened sanitary precaution.

The distribution of the darkly-shaded spaces which indicate the most fatal activity of the choleric poison, so markedly and persistently coincides with a certain river valley, and with the district supplied with water from certain clearly ascertainable sources, that the lesson is unmistakable. No surveyor, no architect or engineer, no physician, could look at the map for a moment without having his attention drawn to the probable exciting cause of the disease. No educated person could look at it without becoming aware that a means of warding off one of the most dreaded scourges of the time was, at all events, indicated to him, and so indicated, as to be to some extent within his reach. Thus, that which is only an elegant and convenient memorandum for the officers of health, becomes a striking medium of information and of instruction, for those who have neither the time nor the habit of thought that would lead them to the perusal of reports. A man looks at the map from curiosity. He draws from it wisdom unawares.

Genuine admiration, without question, is due to this careful method of graphical illustration

We have pleasure in calling attention to the further progress of this study evinced by a description of the map communicated by Dr. Haviland to the Medical Society on the 30th November last. It is one of an entirely new series of charts, which cannot fail to contribute to that which is one of the first objects of the architect and of the engineer, human health. In the old maps of the last century dangerous localities were indicated often by the lineaments of some grotesque monster. Somewhat in the same way the series of charts which Dr. Haviland is now preparing will tell all those who may be conscious of a liability to any specific form of disease, what districts they should shun. Rheumatism and heart disease, and the terrible scourge of cancer, are the maladies which have been just selected as the topics of graphical display.

To a certain extent the medical map will correspond with a physical sketch of country. Elevation is a prime element in the distribution of disease. Mountain slopes and summits, table lands and elevated plains, mountain valleys, which are the cradles of streams and torrents, fertile river valleys and basins, and districts swept by the sea breeze, each have their distinct value in the map of health. In fact, each element has a specific relation to each distinct type of disease; so that a genuine medical map, when complete, will be almost too complicated for distinct plotting. It is an atlas rather than a map, which we expect from the new delineators of the new medical survey.

We are familiar with the use of cartography as a means of presenting the results of statistical inquiry to the eye at a single glance. Many interesting plates of this nature are to be found in every physical atlas. The rain map is one of the most striking of this series, the greater or smaller depth of annual rain-fall being represented by a corresponding depth of shade. Some time ago some very clear diagrams were published to illustrate the operations of the Post Office, in which, instead of shade, proportionately drawn lines were employed, to indicate the density of population. Charts of tidal phenomena, of winds and cyclones, of isothermal and isochimical limits, of the paths of eclipses, of the districts ravaged by earthquakes and volcano, are familiar to every student of physical geography.

Dr. Haviland, drawing experience from the labours of his predecessors, is not content with showing the actual presence, or plus-indications, of the subject of his inquiry, and leaving the plain blank paper to represent the absence of disease. He uses two colours, instead of a simple shade, and represents in blue and in red the positive and the negative value of a district. We are not sure that this method is theoretically correct. If we consider health to be normal, we may take the tinted paper as its best exponent. Still there are advantages to be secured by another mode of treatment, and the balance of those advantages is a fair subject for discussion.

As far as cancer is concerned, the lesson to be derived from Dr. Haviland's map is simple. Damp seems to be the predetermining cause; damp, connected with alluvial soil and depressed level. The pressure of the barometric column appears to enter into the list of predisposing causes. Many persons are aware of the depression of feeling caused by residence in river valleys, or even by passing a short time on low levels, not excepting the sea-shore itself. In this depression of spirits may be detected the indication of at least one of the disturbing causes that tend to generate cancer.

Rheumatism and heart-disease are, topographically speaking, close neighbours of cancer. But there is a difference between these two forms of ill health which becomes very apparent in the map. In cold, upland valleys rheumatism prevails. The barometric elevation, or some other cause, is unfavourable to the development of cancer. On the other hand, the sea air appears to have a directly preventive influence as to the progress of heart-disease. This sanative power does not extend to cancerous affections.

One of the most striking results that springs from the chartological investigation of disease is the positive direction which we are thus led to see that Nature herself affords as to the location of hospitals. A hospital for cancer, it would seem, for example, should be erected in the very spot which would be most unfavourable for the position of a hospital for phthisis, or lung disease. The insular position which would be the most favourable for a hospital for patients affected with

disease of the heart, would be most fatal for the patients suffering from cancer. By the wise selection of the appropriate locality of hospitals for each specific form of disease the *vis medicatrix nature* will be brought most directly to the aid of the physician.

It is this view of the subject which is naturally the most important to the architect. The question of site, indeed, is not always within the competence of the professional adviser. Too often all that the architect can hope to do is to make the best structural use of a given spot for a fixed purpose. This is frequently all that lies within the limits of his duty. Such is the case, for the most part, in city or suburban buildings, or in cases of reconstruction. But when a wider range is allowed to the professional adviser, he may obtain the most valuable aid from charts such as those to which we refer. If it be the mark of a man of genius to select a site for a great building, which shall be the best for picturesque and structural reasons, no less will it enhance the future fame of the builder of a great hospital, that he has been guided by sound sanitary knowledge. The success or failure of the treatment of the majority of cases of any specific disease, which are brought to a hospital, skill and care being alike, will depend entirely on the fact how far the site of the building is suitable to the recovery of that particular class of patients.

To draw an illustration from a case under our immediate notice. A noble building is rising opposite to the Palace of the Legislature at Westminster, to receive the patients of the former St. Thomas's Hospital, — a building to be known by that long respected name. Now, with whatever detail the architect may have been expected to enter into the distribution of the several wards, he may draw one lesson from the map of Dr. Haviland. He need make no provision for cancerous patients. The river-side hospital is no place for them. Highgate, or Hampstead, or Sydenham, would, according to this view, be the proper locality for the successful treatment of that formidable malady. An indication of this nature is of no little value, both to the architect and to the physician. On the other hand, no general idea of the advantages of a fine healthy situation should be allowed to influence the selection of an elevated site for a hospital intended to receive patients suffering from pulmonary complaints. In the same way we are taught how most surely to exorcise the familiar household demon known to our country population as the "rheumatiz," and how a sea-side sojourn may be favourable to evils affecting the heart, without resorting to the heroic remedies of the Lesbian poetess.

One other important question will be illustrated by the completion of a good series of medical maps. It is that of the influence, whether chemical or electric, of the actual elements of the soil. Hitherto it has been difficult to distinguish between the physical and the chemical elements of climate. Those persons who have been able to give much practical attention to this subject, are the most aware of its importance. Thus, a volcanic soil, composed of ash, produces an amount of fatigue to those who walk over the surface, which, under the same latitude, and at the same elevation, and the same time of year, is unfeelt by those who walk over limestone. Something of this electric depression and volcanic fatigue may be realised in Paris or in London by persons who walk on an asphaltic pavement. In London itself a sensible difference of elasticity and buoyancy of spirit is experienced by some persons when they pass from a clay soil to a gravel, or the reverse. We have known instances of an almost entire loss of sleep during a residence on the alluvium of Bordeaux, in spite of the comparative cleanliness of the city and the careful structure of the houses. In South Wales, over the wide district that consists of what is called "rab" (a sort of indurated clay), a sense of fatigue and depression is normal to some strangers, which is entirely lost when they pass on to the red sandstone of the neighbourhood. These are a few out of, no doubt, very numerous instances of a climatological effect which is not dependent either on elevation, on temperature, or on the presence or absence of fadings from sea breezes, in the air. Medical men will do a great service to the profession, and to the health of their countrymen, by aiding in the investigation of this obscure part of the science of therapeutics.

The ample field that yet remains for the illustration of statistics by well-designed maps, is

worthy of the best attention of the profession of the civil engineer.

The cholera map to which we have before referred, as issued in the report of the medical officer of the Privy Council, is an example of clear, intelligible, shading, which may safely be taken for a pattern. In any attempt to combine the charts of the various diseases, it is evident that the adoption of two colours to express the *plus* and the *minus* state of affection would be impossible. On the other hand, it would be quite practicable to give a large amount of definite information as to the natural distribution of distinct forms of disease on the same plan, by the use of a single tint to denote each malady. For this reason we are inclined to the opinion that the introduction of two colours to indicate the prevalence or the reverse of the same disease is less advantageous than the adoption of a single colour, with a deepening intensity of tint. For the purpose of a public lecture indeed, where the greatest amount of distinctness has to be studied for a large audience, and where a separate chart can be produced for each separate branch of inquiry, the plan adopted by Dr. Haviland has great convenience. But whatever may ultimately prove to be the best mode of working out the details, there can be no doubt in the mind of any educated man of the great advantages to human health which may be expected to follow from the development of the comparatively novel study of medical cartography.

While speaking on this subject, we must not omit to call attention to the valuable report of Dr. Buchanan, on the distribution of phthisis as affected by dampness of soil, appended to the tenth report of the medical officer of the Privy Council. The annexed geological map of the South-east of England, reduced from the Geological Survey, is as clear as can be expected from so small a scale as 10 in. to the mile. The map showing the registration districts is less to be commended. Perhaps a certain indistinctness may be thought to give more force to the sensible remarks of Dr. Buchanan as to the scientific utility of the parochial boundaries, and as to the necessity for following the physical geography of a country, rather than its civil geography, in medical maps. We hope that Dr. Buchanan's researches will not slacken until he presents us with a phthisis map of England, shaded like the cholera map to which we have referred. In the mean time, too much attention cannot be given to the ultimate conclusion of Dr. Buchanan's report, "That wetness of soil is a cause of phthisis to the population living upon it."

THE VENTILATION OF SEWERS.

Sir,—I very gratefully acknowledge that, for many years past, I have derived a good deal of information from the pages of the *Builder* on different branches connected with the drainage of towns. Amongst all the other matters that have been discussed, that of ventilating sewers has come in for its share of attention since its importance has been felt. In order to accomplish this purpose, various modes have been adopted, none of which, however, seem fully to answer the purpose intended, and, may I be permitted to say, that in my opinion, for this simple reason—that they have not been in accordance with the teachings of nature. I may venture to state that engineers have failed to reason out this matter in any satisfactory way, almost uniformly adopting the method which includes charcoal as a deodorizer. In the report of the engineer respecting the drainage of Canterbury, however, he stated that this mode had been found to be a hindrance to ventilation and a motive of escape into houses through shallow and imperfect traps; and open pipes above the roof were chosen as the only safe way. And for this purpose, many engineers have adopted the rain-water pipes of high houses; but the fallacy of trusting to this arrangement has been ably exposed by Dr. Carpenter, of Croydon, in his pamphlet on "Housé Drainage."

That a considerable amount of good has been effected even by these means, that are now acknowledged to be imperfect, there can be no doubt. Indeed, the present President of the Society of Engineers, in his opening address before that society, gives two instances of *ascertained* saving of life as far as statistics can show it; one at Croydon, and the other at Liverpool. I think, however, that a much more certain and effective mode of ventilating sewers would be, to consider the difference in the temperature of the sewers and of the external air, and to con-

struct ventilators accordingly. To expect rain-water pipes or any kind of shaft exposed to the night air to be effectual, is not to found our expectations on the operations of Nature's laws. For do not the laws which produce atmospheric movement teach us a lesson in this respect? If the principal cause of those currents of air called winds is the disturbance of the equilibrium of the atmosphere by the unequal distribution of heat, if when one part of the earth's surface is more heated than another, so that the air becomes lighter, and rises up, from being expanded, does not the cold air rush in and take its place? But we need not appeal to Nature in her grander movements when we may be made sensible of this fact any day. Stand, for instance, just inside of a lecture-hall or other assembly-room when there is neither fire, nor gas, nor audience, and there is no rush of air into the room; but let the gas be burning freely and the room well packed with people; and then take up a similar position, when the heated air is rushing up through the ventilated ceiling, and there will be a convincing proof that the cold air is rushing in to take its place.

Assuming, then, that it is a settled point in the operations of nature, that a great cause of all atmospheric motion is the unequal distribution of heat, I conclude that when the external air is colder than the air in the sewers, neither the charcoal ventilators, nor the rain-water pipes, nor the ventilating shafts recommended in the ninth clause of the report of the Royal Engineers, as to the drainage of Oxford, Eaton, Windsor, and Abingdon, will fully answer the purpose intended; but may sometimes, and especially at night, occasion a downward draught, and thus force the foul gases through the sink and close traps into the warmer atmosphere of living and sleeping rooms. Now, sir, I am well aware that the *Builder* has on many occasions pointed out the importance and necessity of heat in some form or other for the effectual ventilation of sewers; but what seems surprising to me is, that drainage engineers appear to ignore it altogether. In the early part of last year I had nearly a dozen schemes of drainage to examine and report on, and in all of which I found the proposed ventilation to be unsatisfactory, being either by means of the charcoal container or the rain-water pipes.

About two years ago I prepared and submitted to a local Board a method of ventilating, which I described in the following words:—"The other set of ventilators I propose for night only, to be formed by passing an iron tube up a lamp column, which is to be fitted up with a spreading reflector forming a cone, and the gas to be in four jets, causing a greater warmth over the aperture of the ventilating-pipe than exists in rooms or closets at night-time, when doors and windows are closed, and when the ordinary out-of-door ventilators are not sufficient to prevent the gases passing through water-traps into the warmer temperature of cooking and sleeping rooms. A lamp so fitted up I propose to be placed as near as convenient to the highest part to which the different public drains extend."

I have fitted up such a ventilator myself, in connexion with a large cesspool, on premises in the occupation of some of my own family, and am satisfied that it acts beneficially. Mine is simply a cooking gas-burner placed on the upper part of a gas-column, with the addition of a spreading cone, with the ventilating-pipe protruding through and upwards, so that by the series of small blue jets of gas the whole atmosphere above has a glow of heat; and as it is so placed as to be available for the purposes of light, it is sometimes turned on sufficiently strong for that purpose, and which, of course, causes the ventilator to be much more heated.

I was glad to read the very sensible remarks on the subject of sewer ventilation, signed "V," which appeared in the *Builder* of November 21st, 1868, and am quite of his opinion that any system which is likely to meet with acceptance must be self-acting, or, at any rate, not attended with much trouble, and such I consider the plan which I suggest to be.

I proposed that a charcoal doozeriser should be placed in the pedestal of the lamp-column, so as to use the one by day and the other by night, if desirable.

SURVEYOR.

Poets' Readings.—Mr. Robert Buchanan is to give the first public reading from his own works in the Hanover-square rooms on Monday, the 25th inst. The programme naturally includes some of his best pieces.

FROM AUSTRALIA.

Melbourne.—An immense structure is in course of erection in Flinders-lane, upon the site of the old Prince of Wales Hotel, and towering in a most conspicuous manner above all the surrounding buildings. It is to be a warehouse, although the ornate nature of the architecture renders it dissimilar to the generality of such places in Melbourne. The style of architecture is the Romanesque, which has been employed in embellishing a vast oblong shell, constructed with the main object of providing an amplitude of room, none of which can be sacrificed to considerations of beauty. Messrs. Reed & Barnes are the architects. The building measures 156 ft. long by 48 ft. wide, and its height to the top of the parapet which surmounts the walls is 76 ft. It is divided into a basement, a ground-floor, and four upper stories, the basement walls being of stone, and the superstructure of bricks cemented. The most conspicuous ornamentation in the Flinders-lane front is bestowed upon the centre first-floor window, which is of Venetian form, with a projecting balcony and pediment. The remaining front windows on the different floors, and those along the sides, are arranged in clusters and groups, the grouped openings being separated by small capped columns. Communication between the various levels, for the transit of goods and persons, will be afforded by lifts and ample staircases from floor to floor. As a rule, the workers employed in the warehouse will ascend and descend by the lift. The contractor for the building is Mr. John Wood, and the clerk of the works Mr. Wallace, while the plastering has been done under the supervision of Mr. Parry. The item of plastering is a pretty considerable one in the contract, since the walls of the building are plastered inside throughout, and are to be finished off with architraves and other ornamentations. Between eighty and ninety men have been employed upon the work, including the bricklayers, plasterers, masons, carpenters, and laborers. The entire cost of the building will be about 15,000l.

An addition to the Sailors' Home is now in progress, and nearly completed. The new dining-hall, now being erected, is 56 ft. long by 22 ft. wide. When completed, the Home will accommodate 125 men. The total cost of the institution, including both the old and the new portions, will be about 10,000l.; that of the new being 4,300l., although the present contract only amounts to 3,050l. Messrs. Martin & Peacock are the contractors for the additions, and Messrs. Smith & Watts are the architects. The foreman of the works is Mr. Greig.

Additions have been made to the Wesleyan Church at Emerald Hill. Messrs. Crouch & Wilson are the architects. The additions comprise a transept 70 ft. by 40 ft. internally, orchestra and small class-room, with two large vestries underneath, and two porch entrances. The new walls are built for a tower. The church will now accommodate 1,000 persons. The fittings have been supplied by Messrs. Bell & Butt, of Richmond, who also prepared those in the old portion. Messrs. Danks & Dempster also again attended to the gasfitting. The nave measures 73 ft. 6 in. by 40 ft.; the transept, 70 ft. by 40 ft.; the walls are 23 ft. high, and the mid-ceiling 35 ft. 6 in.; the height to ridge is 53 ft. All the passages and lobbies are laid in cement, the flooring being raised some 5 in. or 6 in. higher. The pulpit, &c., are of cedar, French-polished.

Fitzroy Gardens, Melbourne.—Melbourne is abundantly provided with public parks and gardens. The Fitzroy Gardens are second only to the Botanical in extent, beauty, and general attractiveness, while they are nearer to the city. The public are indebted to Mr. Hodgkinson, Assistant Commissioner of Lands and Survey, for the conversion of what was not long ago a waste blank into a delightful retreat. The ground is tastefully laid out, stocked with all sorts of ornamental trees, reticulated with running water, which keeps the grass ever green and the shrubs umbrageous, and is intersected in all directions with broad and well-kept avenues.

Ballarat.—A large bell, cast here for the Free Church of England, attracted to Mr. Higgins's foundry a large number of ladies and gentlemen to witness the process. The St. David bell, as it is called, is the largest ever cast in Ballarat for church purposes, its weight being a little over 2 cwt., and its dimensions 26½ in. at bottom, with a height of 23 in. A smaller bell, cast at the same time, weighed about ½ cwt. The next largest bell cast here for church use is that of St. Peter's, in Sturt-street, which weighs about

120 lb., and was cast nearly two years ago at the Victoria Foundry, by Messrs. Hunt & Opie. The same firm cast the largest bell yet made here—namely, the bell cast six or seven years ago for the Ballarat Fire Brigade, which weighed between 5 and 6 cwt. Mr. Higgins, the caster of the St. David bell, is also the donor of the bell to the church.

MONUMENTAL.

The statue of Lord Palmerston, by Mr. Woolner, which is to be erected in Palace-yard, Westminster, is now so nearly completed that the model is in the hands of the bronze casters. The figure is somewhat larger than life.

The municipality of Missolonghi are taking measures to raise a monument there to Lord Byron, who contributed so much to Hellenic independence before he died in their town in April, 1824. A statue is to be erected to the poet on the spot where he breathed his last.

The total sum subscribed by the metropolitan police for the erection of a monument to the late Sir Richard Mayne, K.C.B., chief commissioner of police, is 574. 18s. 9d.

The young sculptor Dantan has received the commands of the Emperor to execute a marble bust of Rossini for the library of the Institute.

THE JOINT COUNTIES ASYLUM AT CARMARTHEN.

ARCHITECTS' RESPONSIBILITIES.

SOME few months since we gave a short article upon "False Economy in Building," in which we had occasion to refer to the large structure at Carmarthen known as the Joint Counties Asylum. We now learn that at the Quarter Sessions lately held the subject was brought before the three courts of Carmarthen, Cardigan, and Pembroke, when a report was presented from the Committee of Visitors to the Asylum. In this report the committee regretted to state, that "in consequence of defective workmanship and materials used in building the asylum," it had been "found necessary to renew a considerable portion of the work, and extensive repairs had become indispensable." The committee stated that they had been compelled in September last to call upon the treasurers of the three counties to pay 400l., so as to enable them to proceed with such repairs, but the committee found that they were now "compelled to make a similar order for the sum of 1,200l." The committee express the hope that this sum—1,600l. in all—will be sufficient to place the buildings in thorough repair. They also state that a "case" had been submitted to counsel to advise whether or not they had a remedy against any person, and whom, for such defective workmanship and bad materials used in the erection of the asylum; and in pursuance of the "opinion" given they had resolved, subject to the approval of the Courts of Quarter Sessions for the three counties in union, to take proceedings against their late architect for the damages they have suffered, and were sure of being subjected to, by his having given his certificates, from time to time, to the contractor, and thereby passed defective workmanship and materials used in building the asylum. The matter was discussed at the Quarter Sessions in the three counties, and at the Carmarthenshire Court, the Earl of Cawdor explained the position of affairs. He said the committee had not been properly treated. They put their trust in their architect, and he had certified that the work was properly executed, but they now discovered many defects. The committee had submitted a "case" to an eminent counsel,—Mr. Field,—and they had just received that gentleman's "opinion," which was to the effect that the committee could proceed against the architect, to recover damages for the defects. Earl Cawdor's individual opinion was in favour of this view. It was stated in the discussion that followed, that a precedent for proceeding against the architect was furnished in the case of an action which arose with respect to the large structure at Colney Hatch. However, the Quarter Sessions of the three counties,—Carmarthen, Cardigan, and Pembroke,—have all decided upon confirming the proposal of the Asylum Committee to take legal proceedings against the architect. The case will be anxiously looked forward to. It is far from clear whether the action should be taken against the contractor for not fulfilling the terms of his contract, or against the architect, for signing certificates when the work was not properly executed.

THE LATE MR. GEORGE SMITH,
ARCHITECT, F.S.A.

To the brief but comprehensive sketch, in the last number of the *Builder*, of the professional life of the late Mr. George Smith, architect, permit an old pupil to add a few unprofessional details, if only to show how well his success was deserved by the means he took to secure it, and by the generous use he made of its fruits.

Mr. Smith had always been sincerely attached to his profession, and perseveringly followed it. In all that he did he was extremely careful and painstaking, and wisely thought that whatever was worth doing at all was worth doing well. The specifications which, as a student, he wrote out were admirable examples of neat and elegant penmanship.

His drawings were done with great care and attention. The early habit thus formed never deserted him. In advanced age I have seen him, at his country house, occupy himself in drawing out a humble plan and elevation with as much carefulness and exactness as if the world were still all before him, and he had his fortune to make in it. His writing, like his drawing, was always his best. The slow and careful way in which he invariably signed his name was something remarkable, and showed the importance he attached to doing it well. His measuring-hooks were models of neatness and even elegance; so also were his calculations for estimates; there was nothing of a hurried or hasty character about even the most insignificant of his papers and notes. His heart was in his business, and thus business became his chief pleasure.

In the most solemn act of his life, his first marriage, business came second to the ceremony itself. I have heard his eldest son, George, long since deceased, say, that after the wedding in the morning, his father went down to Windsor to measure some work. Windsor was then a much longer distance in time from London than it is now. The lady he married was a Miss Howel, a daughter of a City functionary, the water bailiff, who on going once to consult the eccentric Abornethy, and stating who he was, the latter replied,—"Water bailiff! sir, water bailiff! you mean the brandy-and-water bailiff!"

Mrs. Smith had a cultivated literary taste, but did not indulge her inclination for writing to the detriment of maternal duties. They had a numerous family—five sons, two of whom are in the church, and two daughters, the eldest of whom died early. The present oldest son is the Rev. Sydney Smith, M.A., perpetual curate of Werth, in Kent. Mr. Smith lived to a good old age, and retained to the last much of that constant cheerfulness and gaiety of mind for which he had all through life been distinguished. Those who have had the pleasure of meeting him only on business, and those who have been privileged to witness the expansion of his heart and his sportiveness in the bosom of his more serious family, will never forget either that genial courtesy and pleasantry which made him a constant favorite, especially with the gentler sex, nor that unchilled juvenility which often led his loving wife laughingly to exclaim, "Now, is he not the youngest of them all?"

Mr. Smith had a natural turn for humour, and a talent for selecting the comic points of a story and representing them with dramatic effect. An ordinary narrative would thus in his hands become transformed into a humorous description that made the gravest hearers laugh heartily, though he himself rarely joined in such noisy demonstrations.

As Mr. Smith rose in his profession he became the benefactor of his family, and though he may not have left the world a wealthy man, in the common acceptance of the word, yet he died rich in good deeds, and of him it may be truly said, in the words of holy writ, he rests from his labours, and his works do follow him.

The writer of this short tribute to the memory of his once honoured master, entered Mr. Smith's offices as an artiled pupil in 1822; they were then in Bread-street Hill, and a Mr. Thomas Nichols was the head-clerk. Nichols was a good draughtsman and mathematician, and perfectly well understood construction: he made the drawings for St. Paul's School, and for the tower of the late Royal Exchange.

His successor in that situation was Mr. A. B. Clayton, who had taught painting in the family. Clayton came from Mr. Roper's offices, and was a person of a very different stamp to the pleasant Tommy Nichols, as his predecessor used familiarly to be called. Clayton had de-

signed the new Church of St. Mark, at Kennington, and the tall monumental shot-tower by the side of Waterloo Bridge. He was an artist, and introduced a new style. It was shortly after this that the offices were removed to Mercer's Hall, where they now are.

Of the several pupils his contemporaries, the most distinguished was William Grellier, of Wormwood-street, Bishopsgate; he subsequently obtained the prize awarded by the Gresham Committee for the best design for a new Royal Exchange. He was a most exemplary and persevering student; received in 1829 the gold medal in Architecture of the Royal Academy, and in 1831 was one of the most efficient members of the Architectural Society of London, and for four years was honorary secretary. When, in 1842, that society was merged in the Royal Institute of British Architects, William Grellier received a piece of plate and a memorial, in testimony of his valuable services. A premature death deprived the profession of one of its rising brightest ornaments. The principal edifice with which William Grellier's name is associated is that handsome structure in Liverpool, "the Royal Insurance buildings." Another fellow-pupil was James Barr, recently deceased, the author of "Anglican Church Architecture." To give, however, even a brief account of the pupils of the late Mr. Smith, both before and since the writer's own time, would fill a volume. How several entered the Church, how others entered the army, how some followed one calling, some another, and some no calling at all, would serve to show what a good practical foundation this study affords for a variety of subsequent professions, and that in the intermediate and undecided stage of life which succeeds to boyhood, there is nothing better for a young man to do than to court *La bella Architettura*, who says to all her suitors, "Love me, love my sisters also."

H. C. BARLOW, M.D., F.G.S.

SANATORIUM FOR HARROW SCHOOL.

In the year 1861, the Sanatorium for Harrow School, of which we give illustrations in our present number, was commenced. Previously to this each boarding-house had a set of sick-rooms, where illness of every sort was attended to, and where every precaution was always taken to prevent the spread of infection, though by such means alone it was not always possible to provide against the communication of disease. Even now the same series of sick-rooms exist at each house, and the same care and attention are given personally to all ordinary forms of illness, but all cases of infectious diseases are removed to the Sanatorium.

It is difficult to imagine how such a large school as Harrow, with 500 scholars, was able at all satisfactorily to get on without such a safeguard against extraordinary, and it is indeed greatly to the credit of the masters, and a strong proof of their care and attention, that the school was able so long to exist wanting an asylum of this kind against those insidious and fearful visitations which, spite of care and attention, seem to come to all communities alike, but which are peculiarly obnoxious to such large numbers of young people as are gathered together at a public school.

It was principally owing to the indefatigable exertions of the present—then the new—head master, Dr. Butler, that all the unavoidable difficulties of the new arrangements were overcome, and the means provided for the prosecution of the work.

We quote from the architect's report on the subject in 1863, to show the original intention, before we speak of how it has been carried out:—

"I may remark first as to the building itself (for it deserves somewhat upon the character which it is to assume what will be the best site) that it would probably not be desirable to make it a very conspicuous object, nor too prominent amongst the other school buildings at Harrow, either by its position or its architecture. Yet at the same time I presume it must be conveniently situated, and large enough to contain the accommodation mentioned to me the other day. As to the rooms or wards themselves, they need not partake too much of the character of a hospital, though obviously they should have all the conveniences of one, and possess sufficient cubical capacity and ample means of ventilation.

Attention should be paid not only to the aspect of the rooms, with a view to obtain sunlight and air, and shelter from cold winds, but also to secure a cheerful prospect, and one associated with the everyday enjoyments of school life.

Bearing all this in mind, I have made a small (though imperfect) sketch, in order to show how the various require-

ments could be satisfied and the several rooms grouped into a block, which could be erected in a simple style of architecture and in an economical manner.

The ground-floor might contain the beds for miscellaneous disorders—the matron's room, kitchen, &c.; while, supposing the building were placed on the side of a hill sloping considerably towards the south and east, the various outbuildings might economically form a basement under the central wing.

The upper floor might be appropriated solely to the class of disease prevailing at one particular time, and some of the rooms be reserved for more desperate cases, with nurses' rooms attached, while two or three extra rooms might be obtained in the roofs of some part of the building as extra sleeping-rooms for servants, or store and lumber-rooms, if required.

The architectural appearance of the building would be simple, very little stone being used; but the character of the school building; generally kept up, in the use of red bricks, with a few black bricks introduced, and tiled roofs. The interior might be finished partially with stained and varnished deal.

Most of the sick-rooms would contain 1,000 cubic feet for each patient, and each room an open fireplace as one of the best possible ventilators. All the windows should be made to open, if required, and placed in such a way that by opening the door and the windows of the passage a thorough draught could be secured to purify the rooms. At the same time everything like a draught should be generally preventible by a system of warming and ventilating the passages as well as the rooms. For this purpose a system of what may be called "artificial" ventilation should be adopted to assist what may be termed the "natural" ventilation of doors, windows, fireplaces, &c.

The site itself was costly, and the building, owing to its position and special requirements, could not be a cheap one; yet, a great deal of accommodation has been obtained on an appropriate site, and, as will be seen, at a moderate outlay, viz., about 3,500*l.*, exclusive of site, fencing, and a few items not necessarily belonging to the building. It is, however, only right to add that the fitting up of the laundry, &c. (which we shall describe), with the hot-water coils in the hall, was executed by Messrs. Bonham and others at a cost additional to the above. The whole works have been carried out under the superintendence of the architect, Mr. Charles Forster Hayward, F.S.A., in a style consistent with other works by that gentleman at Harrow, and somewhat also in accordance with the local traditions of the spot, viz., in red brick, with a sparing introduction of stone dressings, ornamental pateras of black headers, and with tiled roofs.

It should be stated that the building is smaller than was at first intended, and the site larger than was actually required for the present; and the roadway had to be made as well as considerable special works for drainage. The advantages, however, are commensurate; for perfect isolation at the end of a long private road, yet with a cheerful view of habitations not too near, a magnificent prospect extending to Windsor Castle in one direction, and, at the same time, openness to all health-bearing breezes, with shelter from the coldest quarter, have been secured,—at a distance not too far from the business of the school.

Advantage has been taken of the steepness of the ground to obtain a good basement,—the living-rooms in which look upon a terrace high above the remainder of the site, which is laid out as a garden; while the chief entrance is on what would be called the ground floor.

The accommodation afforded by the basement is as follows:—Kitchen, scullery, servants' room, larder, cellar, knives and boots, and coal places; and there is an entrance on the terrace level. In communication with these rooms, but with a chief entrance on the exterior and on the opposite side, are a laundry, purifying-room, and the heating apparatus, which serves both these, as well as the warming of the hall by hot-water coils. The purifying-room, which is a most important adjunct, is vaulted and capable of being heated to a very high temperature, and therein is placed all linen, &c., to be thoroughly cleansed,—and, if not reused, consumed. All the steam and smell are, of course, carried off by the great draught of the furnace flues, and the articles are got rid of in the shortest possible time, and with the least amount of handling—by no means an important matter. On the basement level, also, is the carriage-house, containing the special vehicle, which alone is allowed to be used for the conveyance of the infected.

The entrance-porch, doorway, and hall, are made sufficiently wide for the entry of this carriage into the building; and the staircase is made unusually wide, and easy of tread, to allow of patients being carried up in their beds when necessary, though, of course, it would seldom occur that a patient arrived in such a state of prostration. It must be remembered no accidents or surgical cases are brought to the Sanatorium; its use is strictly confined to the treatment of infectious diseases.

Once in the hall, the general arrangements are clear: a short, wide corridor gives access, on the right, to a convalescent room, a surgeon's room and dispensary, a bath-room, and at the end a "double ward;" while adjoining, on the other hand, are the W.C., &c.; the back staircases, down and up, and the lift, which is fitted with noiseless gear, and is built in a solid brick shaft, with only the actual necessary openings to it. The short passage-way, lighted from the side (at one's back on entering), conducts to the matron's rooms, and the stores immediately under her care; and for her use there is a private access to the back staircase and the rest of the building.

Ascending the staircase, which is of oak and pitch pine,—unenclosed in any part, the underside of the stairs being as visible as the upper, and all finished to show the woodwork,—we find the upper floor a counterpart of the arrangement thus described, except that the two rooms below used for the doctor and for convalescents, form the largest ward for three patients, or more if necessary. The bath-room on this floor is also fitted as a nurse's kitchen, with small range, &c., and the rooms over the matron's rooms are quiet wards. Advantage is taken of the position of the hot-water cistern on this floor, to form an airing-room for linen.

The larger wards we have spoken of were designed for one or two beds each, generally only one, but with a door of communication between them, for the sake of taking advantage of the feeling of companionship in youth generally, and making cheerfulness an assistance to convalescence, as it would be in the many cases of the mildest character, to be treated in the building, while isolation or at least separation was adopted for the more seriously affected patients.

The wards are separately ventilated from the ceiling by Watson's double tubes running up to, and enclosed in, a turret on the roof; at the same time open fireplaces are used, and open windows are available if required. By closing the passage-way, these rooms can be made a complete set for the treatment of a different disease from that attended to in the remainder of the building.

At Eton, the wards are a series of small rooms for single patients—a system corresponding with that of the school generally; but in the building of which we are speaking there is only one room unable to accommodate more than one patient; if occasion should require, but provision is made for enlargement at any time, so that desirable rooms could be added if it were found desirable. The total number of beds now provided for is fourteen, or eighteen when the house is quite full. The sick-house at Rugby is used, we believe, as a sort of general hospital for all kinds of illness, and is very popular amongst the boys; and the same can be said of the Harrow sanatorium, as, indeed, the cessation from lessons and ordinary school discipline, with the substitution of special care and attention, with often no great feeling of debility, is likely to make it.

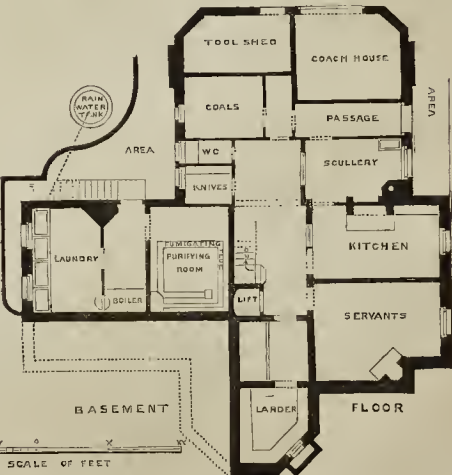
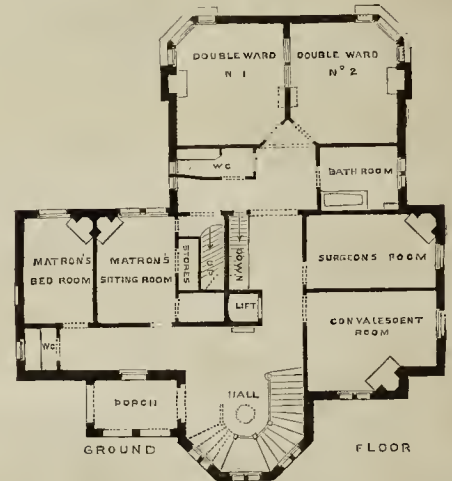
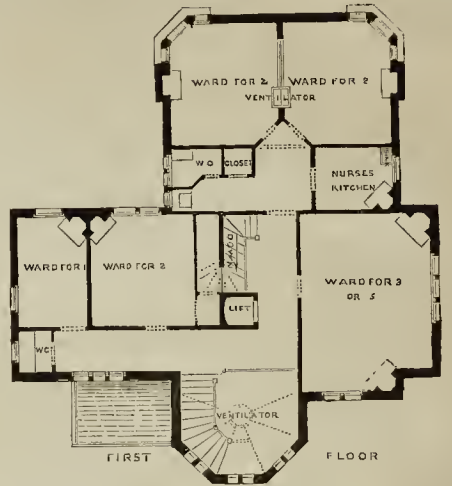
The ventilation of the rest of the building is carried out by a large Watson ventilator in the turret over the principal staircase. Over each doorway is a set of louvre openings, which, communicating with the upper part of passage-ways, carry the foul air that passes in this direction at once to this exit; while open fire-lump stoves and sash windows afford additional assistance. The part of windows above the transom is hinged also, and works by cords and pulleys, so that the upper part of the room can easily be filled with fresh air. The rooms are 12 ft. high, and each ward allows 1,200 cubic feet of space to each patient when the rooms are full—otherwise, about double this quantity. Of course, the haseiment is cut off from the rest of the building for ventilation.

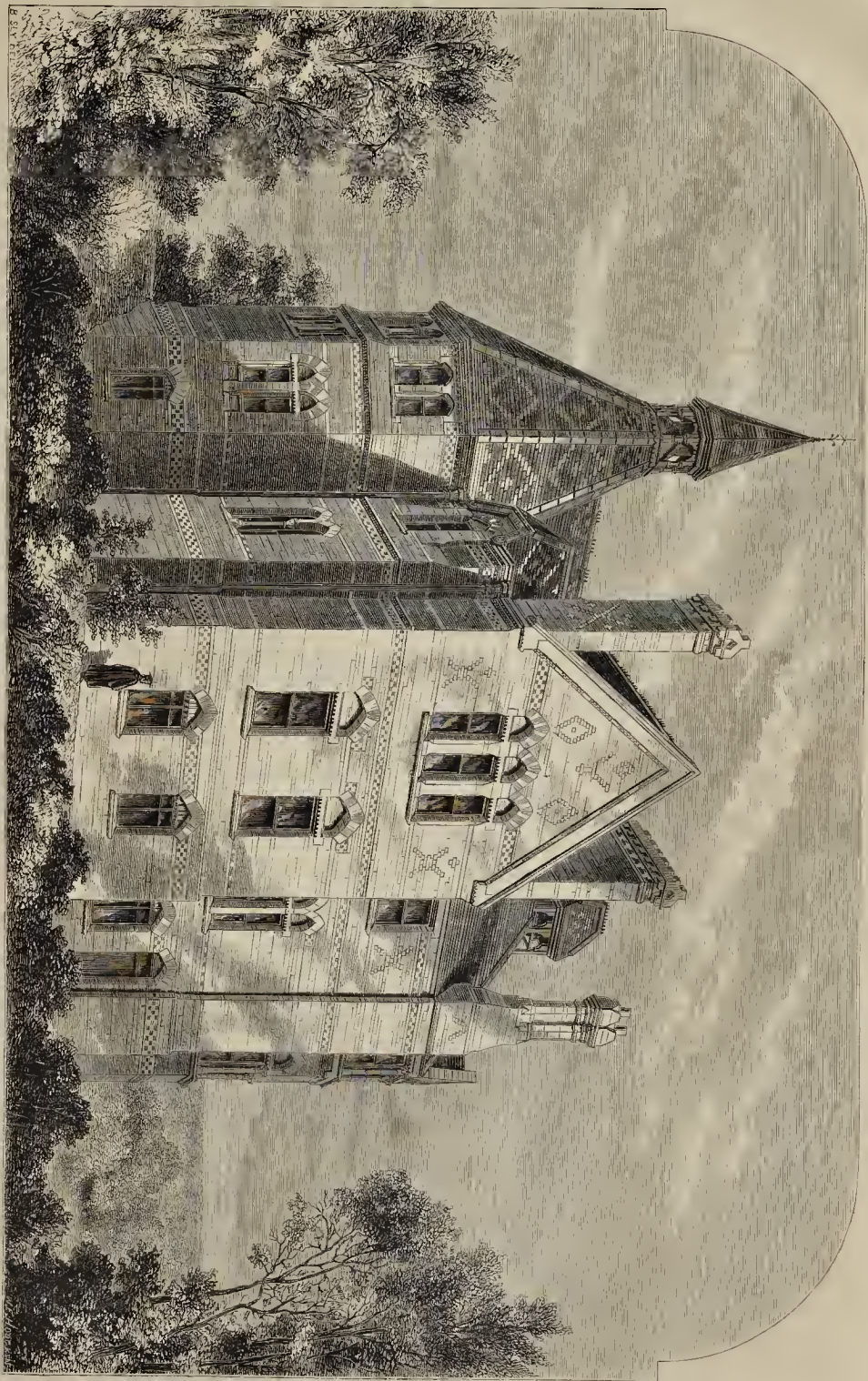
The furnishing of the interior has been carefully attended to, and carpets and curtains avoided as much as possible. The walls are all painted. The hall is paved with tiles partly, and the floors are stained and varnished. The works were carried out by a local builder; and its usefulness has already been put to the test, and its importance proved as one of the institutions of the flourishing school founded by old John Lyon at Harrow-on-the-Hill.

We have only to add that the Sanatorium is under the care of Dr. Hewlett and Dr. Bridgewater; a lady presiding over the establishment.

St. Mary's, Newington.—Mr. Charles Hardy, Assistant-Surveyor of the borough of Leicester, has been appointed Surveyor of Sewers to the parish of St. Mary, Newington.

THE HARROW SCHOOL SANATORIUM.





SANATORIUM FOR HARROW SCHOOL.—MR. CHARLES FORSTER HAYWARD, ARCHITECT.

THE SEWERAGE OF BIRKDALE.

Those who know anything of Southport will hardly have failed to notice the rapid increase of the neighbouring township Birkdale. Some few years since what is now occupied by a considerable population was then merely rabbit warren. Numerous residences have been erected, and the care and expense the proprietors have been at in forming gardens upon the barren sand, in most cases the whole, show the sea-side to be brought from a distance, and the sea-side is appreciated by the inland manufacturing population, from whom, among the substantial classes, both Southport and it are mainly fed. Southport and Birkdale have attained considerable reputation for mildness of climate, which has not failed to influence their prosperity; and five years ago Birkdale adopted the Local Government Act, and in consequence of the formation of new roads, and the rapid extension of property within that time, after considerable discussion, the Board have finally decided to give their district the benefit of a comprehensive system of sewerage, in lieu of the absorbent cesspool system now in vogue. The question of a suitable outlet formed one of the main difficulties to be dealt with; as the objection to bringing outlet pipes on to the shore being insuperable, an arrangement for a disposal of the sewage inland became of prime consequence. These preliminaries having been settled, the Board have entrusted the preparation and carrying out of a sewerage scheme to Messrs. Keade & Goodson, civil engineers, of Liverpool.

Among other things, Birkdale will possess suitable gardens when the new portion of the Birkdale Park Estate (the property of Mr. T. W. Mandell) is completed.

COLUMNS IN PUBLIC BUILDINGS.

It has often occurred to me that in churches & other public buildings they might now substitute for those heavy, massive stone pillars now used, which are so expensive, tedious in erecting, and so much obstruct both the seeing & hearing, strong iron pillars, and then encase them in thick coloured glass, by which means they could give them the most beautiful polish, either plain or fluted, of the most varied and attractive colours. No two of them need be alike, if it was considered advisable. I think the manufacture of glass has been brought to such perfection in this our day, that you would experience little if any difficulty in getting what I propose and suggest, in the most perfect and satisfactory manner, and, by so doing, secure six most desirable things in this go-ahead age of ours,—namely, beauty, lightness, roomy, space, efficiency, and time.

St. JOHN S. BRODERICK.

NEW WING OF COUNTY GAOL, CHESTER.

This work is now near completion. The old buildings having been removed, says the local *Chronicle*, the foundations were found to be defective, and this unexpected obstacle had to be overcome by excavating the entire surface to a depth of 14 ft., the foundation walls being raised from a bed of concrete 4 ft. 6 in. deep, which involved an outlay of £1,375. On the 10th of November, 1867, the first stone was laid, and from that time the building progressed satisfactorily to the present. The form it takes is a section of an octagon, the front presenting two oblique angles, corresponding to the projecting angles of the chapel at the south-west end of the goal. The entire length of the building is 140 ft., the width 46 ft., and height at the ridge 43 ft. The front is of stone, double-faced, and taken from the old buildings, at the exception of the plinth course. The entrance is by a porch beneath a tower, or projection shaft, which is 61 ft. from the ground, and which is attached a lightning conductor, half-inch copper wire, with glass insulators. The entrance, under the tower, is secured by a iron-plated on the inside and at the edges, and beyond this are ordinary sliding-doors opening into the main corridor. The width of the arch is 12 ft. 6 in., and the height to the ornamental cornice at the springing of the arch, 12 ft. On either side of the corridor are the cells for the prisoners, 84 in number, in three rows of 14 on each side. Each cell is 12 ft. by 8 ft. 6 in., and 9 ft. 6 in. high, and is furnished with a table on ornamental brackets, a stool, wash-tub, and water-closet, while at one side

of the table is a roller to which the hammock is strapped, the other end being secured by hooks to the wall. The different tiers of cells are reached by an ornamental iron winding staircase in front of the main entrance, with perforated treads and risers, there being four flights and two landings, and is lighted by six windows, 5 ft. 6 in. by 3 ft. 6 in. From these landings there are balconies with ornamental iron fronts, resting on scroll brackets, which extend the length of the corridors on both sides and give access to the two upper tiers of cells. In the tower, and easy of access from this second landing, is the officer's day-room, and above that his sleeping-room, and from his position he can see down to the angles on either side of the corridor. In each cell there is a handle which, when turned, strikes a gong near the officers' rooms, and throws out an indicator at the cell which requires attention. There is a jet to give a certain amount of light to each cell, while the corridor is lighted by jets from the scroll brackets supporting the railings. The heating is by means of hot air, to obtain which there is a saddle boiler under the corridor. A main is carried the entire length of this, and from it a pipe is carried to each cell, the prisoner being able to regulate the temperature by letting in cold air if he chooses. Besides this, the hot blast can be regulated by the admission of cold air, and for close and sultry weather there is a stove in the extraction shaft for increasing the current of cold air. The water for the use of the prisoners is supplied from two large cisterns fixed above the corridor arch in the roof: each prisoner obtains what he requires from a tap in his cell. The architect is Mr. R. Griffiths, of Stafford; the clerk of the works, Mr. C. Smith; and the builder, Mr. H. Lovatt, of Wolverhampton, who has the contract for the new county asylum at Macclesfield, and has been engaged in prison alterations at Stafford, Coldhath-fields, and elsewhere. The total cost of the work, less 688*l.* 4*s.* 6*d.* for old materials, was 3,956*l.* 1*s.* 11*d.*, and the personal superintendence of it is, for the most part, due to Mr. F. F. Foxall and Mr. Elsdon, the foremen of Mr. Lovatt.

THE DESTRUCTION OF A GLASGOW THEATRE BY FIRE.

We last week announced a telegram notifying the total destruction by fire of the Prince of Wales's Theatre, Glasgow. It was situated at the junction of Main-street, Cowcaddens, and Stewart-street, the front entrance facing the Established Normal Seminary. At a quarter past eleven o'clock on the Wednesday night, at the conclusion of the performance of the pantomime of "Valentine and Orson," the audience was dismissed. About five minutes after twelve persons in the street gave the alarm that the theatre was on fire, flames coming from the roof above the gallery and that part of the stage nearest to Stewart-street. Ere the engines reached the scene of the fire the flames had got complete mastery over the building, and were bursting forth from the back of the stage onwards to the rear of the gallery. The fire brigade had then to direct their efforts in the way of preventing the flames from spreading to the contiguous buildings, and particularly to a tenement, part of which forms the corridor which led to the stalls and boxes. These efforts were successful, but it was not till near three o'clock that the flames had subsided. In fact, the fire did not cease raging till it had burned up everything that was combustible. The building was insured by the proprietor, Mr. Hannay. Mr. Davis, the tenant, is insured for 2,000*l.*; but the value of his scenery and other properties is estimated at 8,000*l.*; so that his loss is 6,000*l.* The actors, carpenters, and some musicians have lost their all—their dresses, tools, and instruments,—and may be a considerable time out of employment.

This is the fifth theatre in Glasgow which has been destroyed by fire. The first—a stone building—was the Queen-street Theatre; the second, the theatre—a brick erection, built by Anderson, the Wizard of the North, in the Jail-square; the third, the Adelphi, also in the Jail-square, built of wood, and tenanted by Mr. Miller; the fourth, the Theatre Royal, in Dunlop-street, a fine stone building, which belonged to Mr. Alexander, who also managed the theatre for himself; and the last, the Prince of Wales's. Mr. Cook's Circus, in the Jail-square, also met with the same fate.

The Prince of Wales's Theatre, which was opened on the 3rd of August, 1867, was built on

the site of the Old Colosseum, in Stewart and Cowcaddens streets. It had a neat but unpretending appearance. There were two tiers of galleries, one of which was set apart as boxes, and the other for the accommodation of the "gods." The gallery was seated for 1,000, pit and stalls for 1,600, while in the boxes sitting-room was provided for 700. The stage was 40 ft. in length with 33 ft. of proscenium. The theatre was lighted with a large crystal sunlight gaselier, situated in the centre of the roof.

THE PHYSICAL

COMMOTIONS THROUGHOUT THE GLOBE.

THERE is something really alarming in the persistency with which "earthquakes in divers places" have for some time been manifesting themselves. In Iceland last month, numerous shocks were felt, not a few of them more or less violent. At Tauras, in Rungia, a violent earthquake was felt on the 3rd of the present month: its direction, as in so many other cases, was north and south. Distinct shocks have been felt at Weston-super-Mare, and in the east of England itself: there, too, the direction was north and south. A clergyman complains that he was sadly maltreated by what he calls a typhoon, while walking between Winscombe and Axbridge: he was struck on the back all of a sudden by a whirlwind, and dashed along "like a stone from a catapult" for 100 yards, and even rolled over and over after being dashed to the ground. Intelligence from Mexico announces that an earthquake took place on December 20th, in the cities of Colima and Manzanillo. Several persons were killed, many houses were destroyed, and nearly all the buildings in both places were more or less damaged. On November 12th, too, an earthquake destroyed several houses in the state of Coshula, and continued for two days with recurring shocks, fifty-eight in number. The country had previously been deluged by floods in the river Nazas, causing great distress: many people were drowned, houses were swept away, and vast quantities of provisions destroyed. A private letter received from Taranaki, in New Zealand, states that during the recent earthquake there the earth seemed convulsed by a perpetual pulsation for six hours, and for forty-eight hours afterwards sleep was hardly possible, as the constantly-recurring shocks were very violent. There were no less than forty shocks. To other earthquakes which have occurred in India and elsewhere, even since this article was prepared, we have no room at present to refer.

In a recent discussion at Melbourne, Australia, before the Royal Society there, relating to the South American earthquake, it was stated that the great wave which rolled on the coasts of New Zealand and all the eastern and southern shores of Australia, on August 15th, must have rolled over the Pacific Ocean in eighteen hours, or at the rate of 383 miles an hour. We are no disciples of Dr. Cumming; but when a matter-of-fact practical paper like the *London Times*, under present circumstances, quotes Scripture as to "earthquakes in divers places," one need not much fear making a little more particular allusion to predictions which may relate to cosmical and social laws of progress, which we as yet know little about, as we certainly do about the cause of these earthquakes, and which were, no doubt, seen clearly and appreciated by the inspired predictor. In the first place he alludes, as do Old Testament seers, to "the latter days" as the opening of a great summer, though attended by notable cosmical and other disturbances. Thus, in the Book of Amos, the seer, speaking of a vision he had, says,—"*I see a basket of summer fruit.*" Then, said the Lord, *the End is come upon my people;*" and in accordance with this we find the following passage in Matthew. "Now learn a parable of the fig-tree. When his branch is yet tender and putteth forth leaves, ye know that summer is nigh; so likewise ye, when ye shall see all these things, know that it is near, even at the doors." "These things" related not only to "earthquakes in divers places," and "the sea and waves roaring" but to "stars falling from heaven," the sun being darkened and the moon not giving light and becoming "as blood," or, in other words, to a total eclipse of the sun, after the "triumulation of those days" with "wars and rumours of wars," "perplexity of nations," and yet "knowledge increased," and great "running to and fro," &c. Was there ever a time in the memory of man when "all these things" were so concentrated in any one year as in last year, when there

were "earthquakes in divers places," when the falling meteoric showers excited great interest; when there was an eclipse almost unprecedented for its totality; and when the blood-coloured prominences which surrounded the disk of the moon while it darkened the sun, might well be regarded as the true meaning of the passage in Revelations relating to the sun becoming black and the moon as blood? What all these earthquakes, at least, betoken, is a very grave problem for men of science to solve. No sneering can extinguish this fact.

THE DECAY OF STONE IN PUBLIC BUILDINGS.

SIR,—For many years I have looked with grief upon the decay of stone in several of our large buildings, especially in such noble buildings as the Houses of Parliament, and many others which are ornaments to our metropolis. It seems a pity that after so much pains, anxiety, and expense has been bestowed upon these, they should in so short a space of time crumble to decay.

Now, as this decay must result from some cause, it is necessary that the exact cause be arrived at. It has been said on good authority, and by some of the cleverest men of the present day, that it is the smoke of London acting on the stone causes it to decay.

The principal object of this paper, then, will be to show that the decay of stone does not result from this cause, and in order to substantiate this I will mention a few plain facts which will tend to show that the smoke does not act upon the stone in sufficient force to decay it.

I have been to a great many quarries in various parts of Great Britain, and therefore have had the opportunity of noticing the stone on the spot from whence it is obtained, and I find there is a certain portion of stone that will perish in its own native air, and on its own soil, away from all smoke and soot; for instance, I have seen the Cheshire, Yorkshire, Lancashire, and Derbyshire stone, also the Glasgow white stone, and granites at various quarries, all perish in their own native air, and at most of these places there has been no smoke or soot to act upon them.

Again, there was a large building erected in the west of London, and one of the late eminent judges of stone was appointed to examine the quality of the stone. Now after this gentleman had passed the stone for the West-end building, a great quantity of it perished before the roof was on. This must at once prove to our minds, and not only to us but to architects and engineers, that it is not the soot that causes the stone to decay in our public buildings, but the inferior quality of the stone that was used. If the above proofs are not sufficiently convincing, allow me to mention one or two still more so. If we will but take the pains to look at some of our buildings, we find in many instances a sound stone adjoining a decayed one. How can this be accounted for? If the smoke had such an effect upon these stones that are decayed, why did it not act in the same manner upon the adjoining ones that are sound? Thus we again see that an inferior quality has been mixed with a good.

I have myself removed the accumulated soot from the face of stone, and on examining, found it to be quite sound and perfect. These simple facts ought to convince any practical man, and also our geologists, that the smoke is not the cause of the stone decaying.

The largest quantity of stone used in London is of the Portland. I have walked through these quarries and examined the stone at this place and found it to perish in large quantities (remember this stone has not been subjected to the smoke). The stone then is brought to London, and used in the construction of buildings, and, as may be expected, before the roof is fixed will be found to be in an advanced state of decay, and not only before the roof is fixed, but even after the stone has been used only two or three months; then our scientific men say it is the smoke acting upon the stone causes the decay, whereas if proper judgment had been used, and the stone of the right quality, the smoke would have had little or no effect upon it.

A great quantity of the Portland stone that is used in London perishes far sooner than the Bath. As a proof of this I will refer to the entrance gateways to the park at Hyde Park Corner. These are of Portland stone; nearly all this stone has perished, and is still perishing as fast as time will permit. Now the adjoining building

to these gateways is Apsley House, which is of Bath stone, and the stone of this building stands far better than the so-called Portland at the gateways. The exterior of the Grosvenor Hotel is mostly of Bath stone, and has been erected some seven or eight years, and not a single piece of this stone is decayed. And why? Because it was carefully selected. If it had been of a bad quality it would have perished before now, and thus, while this Bath stone building stands, some Portland ones have perished in less time than that above mentioned.

This stone, then, that decays, is simply an inferior quality, which, if placed in any buildings, whether in town or country, will decay; and not only will decay, but has already done so. For instance, many large buildings in the city of Oxford were erected out of stone obtained in the neighbourhood, without any regard being paid to the quality of that stone, and the result was as may be expected, in a few years these buildings went to decay. Had this stone been of a good quality, it would have remained sound and perfect, because some of the good quality obtained from the same neighbourhood was used at the same time as the above, and is as perfect now as when used.

The above example must not be confined to Oxford only, for it is the same with our noble Houses of Parliament. It appears to me that two qualities of stone have also been used in this building, namely, a good and bad. The fault is not so much in the stone decaying as want of judgment in selecting the same; because if stone be carefully selected, I am confident there will not be that decay there now is.

When we take into consideration the various kinds of stone that are sent to London, and all different in quality, we will see that careful judgment ought to be exercised in the selection of the same. I will here mention a few of the many sorts of stone. There are six distinct sorts obtained from Portland, five from Bath, and fifteen from Yorkshire and Derbyshire. In the neighbourhood of Penryn, there are about sixty or seventy granite quarries, the granite differing in a great many of them both in colour and quality.

We also obtain eight different sorts of granite from Aberdeen and its neighbourhood, viz.,—three sorts from Peterhead, two from Mull, five from Dalhousie, and three from the north of Ireland. We thus see that great care and judgment ought to be exercised in the selection of the proper quality, but that judgment has not always been correct; for instance, the before-mentioned judge of stone condemned two large loads of Portland stone at some works for which Mr. Kelk was the contractor. I said at the time this stone was good and would stand the weather. As a proof of this we afterwards used the whole of these two large-loads at the same works, and up to the present time not a single stone has perished. And here I cannot help remarking that some of our great men have a name which sways all before them, but have not the correct judgment which is absolutely necessary in respect to the quality of stone; for we here see judgment had been passed upon this stone and it proved the reverse.

It has also been mentioned that the granite at Waterloo Bridge is passing under the same process of decay as our stone, caused by the smoke: this is not the cause, for it is well known that the granite which was brought to London at the time Waterloo Bridge was being built was of an inferior quality compared to the granite used at the present day. I have seen granite almost as soft as grit stone, and possessing all the elements of decay. I have also seen granite in the neighbourhood of Aberdeen decayed in the inside of a new building, where it has been screened from smoke and the weather.

Thus, I have endeavoured, in the first place, to show it is not the soot that decays our stone; and, secondly, that this stone that decays is of an inferior quality.

It must not be supposed from the above that there are no good stone buildings in London, as several are now passing before my mind, but time will not permit me to offer any comment on these.

WILLIAM CROSS.

Manager of the Prince Consort Memorial.

** We willingly allow Mr. Cross, as a practical man of good experience, to express his opinion. What he says is to a great extent correct, but it is not wholly so. The decay of the stone of the Houses of Parliament (and which, by the way, is usually described as more extensive than it is), is not a case of selected and

unselected blocks. This is proved conclusively by the circumstances that the decay is most apparent in particular positions all round the building; for example, under the base moulding throughout, and under the first string. The stone in these long lengths would necessarily present a fair average of the quarry. The gentleman to whom our correspondent refers is obviously the late Mr. C. H. Smith. We have no right to doubt the assertion that his judgment failed on the occasion stated; but knowing well the experience he had had, and the extent to which he had studied the subject, we may confidently ask, who knew more about stone than he did? and if he failed, in whose judgment can we even now place faith?

ACCIDENTS.

A PORTION of the embankment of the Bridgewater Canal, at Trafford Moss, has given way, flooding a large extent of land in the neighbourhood. It happened on the left or north-east side, near Barton-on-Irwell, opposite the Trafford Moss Farm. In a few hours the Irwell had received nearly the whole of the escaped water. It was found that the bank had given way at a place where a culvert has recently been constructed, which passes beneath the canal and drains the moss.

At Petersfield the floors of a malthouse belonging to Mr. Crafts, in the Dragou-street, fell to the ground-floor below, containing a quantity of malt and barley. Fortunately no one at the time was on the premises. The cause of the accident appears to have been from the beams resting in the walls having withdrawn from their bearings. The old building was burnt down in March last. The new malthouse was erected in the summer.

A fire has occurred at the Town-hall, Crewe. A workman who was about to do some repairs, on opening the door of the news-room, was met by a volume of smoke. The fire brigade and engine of the London and North-western Railway Company attended without delay. The flames had by this time made their way into the large hall above. Some little delay occurred in getting a good supply of water; but upon securing it, the exertions of the fire brigade were speedily rewarded by the abatement of the fire. The damage, fortunately, was not very extensive. A large space of the flooring of the hall is burnt out, a couple of doors or so downstairs are destroyed, and some of the flooring there also and the smoke-room papering and paint are damaged, as, indeed, is the paint in the hall as well. The fire would appear to have originated in the passage leading from the news-room to the smoke-room, in which passage the firewood, &c., is kept. The origin of the fire is unascertained.

A singular accident has happened in Flat-street, Sheffield, by which two men were seriously injured. Messrs. Rodgers & Sons, the well-known cutlers, have lately added further workshops to their large large chimney, 33 yards high, has been erected. The whole of the works and the chimney were completed without an accident, but, the chimney being finished, it became an object of curiosity to go up it, and on Saturday afternoon many persons ascended. The apparatus used in the ascent was the same as was used in the course of building the chimney—namely, a wooden box, drawn up inside by a rope extended from "legs" at the top of the chimney to a crab in the yard. A mason and a bricklayer, among others, went up, three other men being at the crab, two of whom were accustomed to work, but the third was lending a hand, and it is supposed that he rested his left hand on a bar at the top, and by so doing disengaged the "catch" which locked the spindle of the crab into its place. At all events, the catch did become disengaged, and the effect of this was that the spindle got out of its place, a small cog-wheel at the end of it, which worked into the big cog-wheel of the drum, coming away from the larger wheel altogether. There was then no check on the drum round which the rope was coiled, and of course the weight at the other end caused the rope to unwind with great velocity, the two men in the chimney coming down like stones. The crab being thrown out of gear, the men at the handles had no control over it, as the revolution of the drum did not affect the handles in any way. When the accident happened the two men were within two or three yards of the top, so that their fall was about 30 yards. One had a leg broken, and the

other a serious scalp-wound, but neither was killed outright. The contractor for the chimney and works was Mr. John Wilson, of Sheffield.

A terrible accident occurred at Delhi on December 5th. Some masons were employed plastering an arch of the new bridge across the branch of the river between the fort of Delhi and Salimgruh parallel with the railway-bridge, when the arch fell in, burying the men beneath its ruins. Out of ten men extricated from the mass of masonry, only one was found to be breathing, and he died soon after.

THE METROPOLITAN BOARD OF WORKS.

MONEY MATTERS, LEICESTER-SQUARE, OXFORD-STREET UNDERGROUND, &c.

The usual meeting of the Metropolitan Board of Works was held on Friday in last week. The financial statement presented showed the total cash balance in the hands of the treasurer on the 11th of January to be 234,929l. 17s. 11d. Dividends were ordered to the amount of 9,396l. 18s. 3d. The sinking fund now amounts to 110,882l. 2s. 5d. New Three per Cent. Annuities.

The Chairman said he had received a communication from Mr. O'Beirne, M.P., stating that a proposal had been set on foot to build on the vacant piece of ground in the centre of Leicester-square. The amount proposed to be raised for building purposes was about 80,000l. It was resolved that a communication should be sent to Mr. O'Beirne, to the effect that the Board would do all in their power to prevent the open space from being built upon.

A deputation from the vestry of St. Marylebone and residents in the locality of Park-road, Regent's Park, attended the Board to present a memorial with reference to the application of Messrs. White & Sons for erecting buildings in front of the present line of frontage in Park-road, as laid down by the superintending architect. The memorial was referred to the Works Committee for consideration and report.

A memorial was presented from the Board of Works for the Strand district against the proposed Oxford-street underground railway. This memorial was also referred to the Works and Improvement Committee for report, but it is said the bill has been withdrawn.

The clerk to the Board presented a report from the Finance Committee, which recommended certain payments to be made, and amongst the items were the following:—

Mr. Wilkinson, J.—Counsel's Fees, May and June, 1868.—	
1 Woolwich and Silverdown Drainage	245 3 0
2 Cattle Market	150 13 6
3 Subways	150 13 6
4 Thames Embankment Approaches	195 16 6
5 Chelsea Embankment	150 13 6
6 Metropolitan District Railway Company	50 8 0
	4743 8 0

Mr. H. L. Taylor drew the attention of the Board to the enormous charges for counsel's fees paid to Mr. Josiah Wilkinson for two months only. Mr. Dalton (chairman of the Finance Committee) said Mr. Smith, the solicitor to the Board, used his discretion as to the counsel he employed, and for his part he could see no reason because Mr. Wilkinson had been a member of the Board he should not be employed. He believed that the House of Commons had laid down the charges to be made by counsel. The report of the Finance Committee was ultimately approved, and the money will be paid.

A report was presented from the Finance Committee stating the result of a negotiation for a loan of 150,000l. for the purpose of completing the Whitechapel, Holborn, and Kensington improvements, and the formation of Finsbury and Southwark Parks, and recommending that the offer of Mr. Pepper to obtain the advance of that sum for a period of five years at 4½ per cent. be accepted. This recommendation led to a long discussion, Mr. Roche expressing his great dissatisfaction at the way in which this money was proposed to be raised. He saw no reason why they should not go to the fountain-head in the money-market; and by issuing bonds for small amounts, they would be readily taken up when it was known that those who advanced the money had the entire rates of the metropolis as security for the payment, and they would be content to receive a very much lower rate of interest than has then been proposed to be accepted by the committee in their negotiations with Mr. Pepper. He moved an amendment, which was negatived by a majority of 21 to 14, and the original recommendation of the committee was put and carried to.

WIDFORD CHURCH, HERTS.

The parish church of Widford, like many others of the Hertfordshire churches, had fallen into a bad condition. A year or so ago, however, the vicar and some of the leading inhabitants, took the matter up, funds were raised, and the church having been restored, was reopened for service on the 14th inst. The bishop of the diocese, Rochester, preached on the occasion, and the village kept holiday. It deserves mention that one of the lady residents assisted in raising the fund by sketching and lithographing views of a number of the churches in the country, and which found sale in the neighbourhood. Readers of Charles Lamb will remember that Widford is the scene of his tale "Rosamund Gray;" and from the churchyard, looking across the valley of the Asbe, is seen the Wilderness, formerly a *pleasance* of the old mansion at Blakesware, where a relative of Charles Lamb was housekeeper, and which he often mentions in his writings. The works at the church have been done under the direction of Mr. G. E. Pritchett, architect, by Messrs. Bell & Son, of Cambridge. The tower has been thrown open by the removal of a gallery and modern boarded inclosure. The whole church has been reset and paved with encaustic tiles. The roofs have been restored and panelled. All the masonry and buttresses have been repaired, leaving the original stonework untouched as far as possible. A vestry has been added on the north side, and the church has been warmed with hot-water pipes supplied by Mr. Waller, of London.

Three ancient wall paintings in the chancel have been preserved. One of these, on the north side of the chancel, is particularly interesting, as it represents the Saviour seated in judgment on a rainbow; swords proceeding out of his mouth; his feet and hands pierced; there are figures around him (probably of angels) blowing trumpets. Another of them is on the eastern wall, probably representing St. Peter in Eucharistic vestments; and a third shows an ecclesiastic mitred pronouncing a benediction. Dandruff makes mention of these paintings. The chairs in the chancel are the gift of Miss Hamond. The altar-cloth was presented and worked by the Misses Palmer; and Mr. Spencer Lewin presented a new flagon and alms-dish, and restored the ancient chalice. The piscina and sedilia were both blocked up, but were found when the works were going on; also a Norman capital, which was embedded in an old buttress. The heltry is in course of renovation; there are five bells, one of which being cracked, has been sent away to be recast.

THE ABBEY OF AFFLIGHEM.

The ancient Abbey of Afflighem, near Alost, which has been in ruins for sixty years and more, is, we understand, about to be restored to its original uses, and has again passed into the hands of the Benedictine Order.

At the period of the dissolution of the religious houses in Belgium, which took place at the commencement of this century, the Abbey of Afflighem was one of the most magnificent establishments belonging to the Order of St. Benedict, in the "Low Countries." Originally founded in the year 1063, it had been several times rebuilt. The earliest portion of the buildings then in existence was the nave of the church, which was erected between the years 1122 and 1144. The church was of great size, and consisted of a long nave and aisles, with two towers at the west end, transepts with an eastern aisle, and a very spacious choir, without gables. The nave was Romanesque, the transepts Transitional, and the choir, which was erected in 1204, was fine Early point. Unfortunately, the interior of the church was entirely modernized in the year 1762, under an architect of the name of Dewez, who covered the grand old Romanesque arches and pillars with wretched "Rococo" ornaments in stucco. Most of the abbey buildings were also re-erected by Dewez, and although very magnificent in their way, were quite out of keeping with the church and other ancient portions of the monastery. A very interesting little "bird's-eye view" of this abbey as it appeared at the end of the seventeenth century is to be seen in the "Brabantia Sacra." This engraving is by Harewijn, and represents the church crowned with curious "inlions" spires. The cloisters appear to have been very extensive, and to the west of them was a large building with Gothic windows, and a large porch on the

upper story, which was approached by an external flight of steps. The west front of the church had evidently been modernized, even at that period, and most of the gables had been deformed by scrollwork.

The remains of these buildings are not very extensive, as they have been destroyed at various times, and the materials sold. However, a considerable portion of one of the nave arcades exists, with several of the monastic offices.

We have not been informed what portions are rebuilt, or whether a thorough restoration of the whole building is contemplated.

FALL OF WALL, LIVERPOOL.

SIR.—Human life is cheap, that is, under certain circumstances. Another bricklayer has succumbed to the injuries he received when he fell with his fellows at Fairfield, and is dead. An enlightened British jury, under the direction of the borough coroner, have sat upon him, and have delivered a verdict similar to those already given by juries on the two others who died from the same cause previously, viz.—"Accidental death, caused by the rains," a verdict equivalent to the old one of "Died by the visitation of God," and one which I utterly repudiate as being false, for if ever there was an accident which might have been predicted and prevented this was one.

I have visited the fatal spot again, and see nothing to alter in the account which I gave you at the time of the accident, an account which I shall leave your readers to compare with the verdict, and I have no doubt many will concur with me in my opening remark, that "Human life is cheap."

But, sir, I fear that this accident, of which I have told you, is not the only one on the same spot of which I shall have to make report. Not only are the remaining internal walls so bulged and shaken that they will have to be taken down, but the front of the house has collapsed, and the party-wall, which contains the chimneys of that side of the house, and of the other which is to be built against it, has formed itself into a fine curve outwards, of some 6 in. or 8 in. rise, and is also likely to fall. But the builder is sanguine, and hopes yet to save his carcass, and so he is getting in the foundations of this new house, which is to form a prop and support to the disabled one. Workmen meanwhile working in and about the building, the district surveyor also calling occasionally, and looking on.

This seems to me a very wrong state of things, and one calling for immediate alteration. Does the district surveyor do his duty, or is the law which he executes insufficient? Houses here are usually run up with 9-in. outside and party walls of inferior bricks and mortar, and very inferior workmanship, and without bond or wall-plates, and yet they are expected to stand. That they do not stand when any great strain is put upon them is well instanced by the fall of three houses on this same estate on Sunday, 27th of December last. These three carcasses were built in a row and adjoining, with good sized plan and four stories high, and were ready to receive the roof. A gust of wind came and levelled them with the ground, leaving only a small part of the back of the last house standing.

It is high time that some protection should be given to tenants, who are often compelled to inhabit the houses they occupy, but who are now liable to plague, pestilence, and sudden death from the want of previous supervision.

E. G.

ST. MARY'S, WARKWORTH.

The Church of St. Mary, Warkworth, Northamptonshire, was reopened on Tuesday, the 5th inst., by the Bishop of Peterborough, after renovation. It is of the late Decorated period, and was probably built on the site of the chapel of the Old Castle of Warkworth (the ruins of which were removed within the last few years). It has suffered much from alterations made at the end of the seventeenth century, and also from a "restoration" carried out about thirty years ago, when the greater part of the beautiful carved oak fittings for which this church was noted were either removed or destroyed.

At the commencement of last year, Miss Horton, of The Holt, Middleton Cheney, the lady of the manor, determined to restore the church as far as possible to its original beauty,

and generously provided the whole of the necessary funds for that purpose. The works are now completed, at a cost of about 2,500*l.* and have been carried out from the designs and under the superintendence of Mr. C. H. Driver, of Westminster. Messrs. Franklin & Sons, of Deddington, were contractors for the work generally; Messrs. Heaton, Butler, & Bayne supplied the stained glass; Messrs. Minton & Hollis the ornamental tiles; and the altar-cloth has been worked by Miss Draper, of Banbury.

The principal works executed have been:—Rebuilding the chancel on the old foundations (in place of the barn-like structure of the seventeenth century); building south arcade to nave; re-roofing the whole of the church and reseating it with oak seats, using the fine old ends that remained in the chancel; lowering the floor to its former level, and resetting in stone slabs the two fine brasses found under the floor of the Lady Chapel; cleaning the beautiful thirteenth-century altar tomb to Sir John de Lion from the whitewash which disfigured it; and restoring the porch to its original form. A vestry has been also built, the oratory warmed, and the churchyard properly drained.

COMPETITIONS.

Hull: St. Silas Church Competition.—This church, according to the conditions issued by the committee, is to hold 650 adults; the cost, including foundations for the tower, is not to exceed 3,500*l.* The premium for the selected design is 25*l.* and for the second best design 10*l.*; the competition was confined to local architects, and from whom the committee received eight designs. The design bearing the motto "Argus" has been selected for the first premium, and "Why not?" for the second. The church is to be built of red brick, with stone dressings; the arrangement of plan shows a nave of four bays, with north and south aisles, and a chancel with south aisle, the latter to be used for vestries and organ. The tower will be at the south-west corner of the nave, the first stage forming the porch and south doorway. The seating, of red wood, varnished, will accommodate 676 adults in the nave and aisles, also 40 seats in the chancel for choir. The author of the design selected for the first premium is Mr. R. G. Smith, of Guildhall Chambers, Hull.

Everton Hospital for Infectious Diseases.—The committee of this hospital having advertised for plans and specification for the erection of a new building upon the present site, received designs from sixteen competing architects. With the aid of a committee appointed by the members of the Liverpool Medical Institution, two plans have been selected—the first by Mr. Thomas Cook, of South Castle-street; the second by Mr. Joseph Ivimey, of Bunston-square, London; to whom the first and second premiums of 50*l.* and 25*l.* respectively will be awarded on the committee being satisfied that the building can be completed for the sum specified. The committee do not bind themselves to carry out either of the selected plans.

Dover Priory Competition.—The design marked No. 1, London, which gained the first premium (52*l.* 10*s.*) was sent by Mr. F. A. Klein, of Cannon-street, London. The design marked L. S. D., which gained the second premium (21*l.*), by Mr. A. G. Hennell, Southampton-buildings, Chancery-lane. There were seventy-five designs sent in.

PATENTS CONNECTED WITH BUILDING.

APPARATUS FOR INCREASING, REGULATING, AND CONTROLLING THE HEAT AND DRAUGHT IN STOVES, &c.—A. Middlemist. Dated 27th January, 1868. This invention consists in the adaptation to the back part of the range, stove, or fireplace of a rectangular or other formed box or case, provided with a damper or valve to be employed in connexion with the grate, stove, or hearth, so as to regulate the passage of the air, heat, and smoke within the chimney, and accelerate or diminish the draught to or from the fire by means of a mouth or opening. The apparatus whereby this is effected may be formed of wrought or cast iron or other material, and fitted or adapted to any or all of the various descriptions of grates or stoves at present in use; or new grates or stoves may be so constructed as to have the invention combined therewith.

WINDOW SUN BLINDS.—W. E. Newton. A communication, Dated 30th January, 1868.—This invention is not described apart from the drawings.

ORNAMENTAL TILES, &c.—J. Walker. Dated 17th February, 1868.—According to this invention the patentee perforates the absorbent mould in the parts where it is recessed, in order to form the pattern with small holes, which serve to supply the air more freely between the die or mould and the moulded tile, and cause the two to separate more readily. Also, in place of filling the mould as usual, he forces it upon a hat or slab of clay or clay by means of a press or otherwise, and the requisite impression is thus formed on the hat or slab of clay or clays, the holes giving free escape to the air and allowing the clay to penetrate into all the recesses of the mould afterwards in the usual way. The hollows in the moulded slab or hat of clay or clays are filled in with clay of another colour or colours, and the tile is finished as heretofore. The same process of manufacture is applicable to slabs, bricks, and other articles.

PORTABLE STOVES.—J. & J. Hinks. Dated 18th February, 1868.—Stoves made according to this invention are especially suitable for burning petroleum oil or petroleum spirit, but other liquid combustibles may be employed. The patentees construct a portable stove in the following manner:—the body of the stove consists of a hollow perforated cylinder of metal, the bottom of which has an opening sufficiently large to permit of the cone of the burner being passed through it. The said body is supported above the lamp at the required distance by means of arms or brackets on the lamp-stand. The lamp is supported on a stand provided with handles, by means of which the stove may be carried about. A short distance above the flame of the burner a sheet metal, up which the current of heated air and products of combustion from the lamp pass, and on the top of the perforated cylinder a hot-water reservoir or boiler fits. The hot-water reservoir has a conical tube passing through it, up which the current of hot air from the lamp rises and passes into the room. The cover of the hot-water reservoir and conical tube is so formed that the heated air in passing into the room carries with it a portion of steam rising from the water, and this keeps the air of the room sufficiently supplied with moisture. By means of a tap hot or boiling water may be drawn from the boiler. The lower part of the body may be made of glass, so that the lamp serves as a source of light as well as heat. When the body of the stove is of metal, the patentee inserts near the bottom a piece or pieces of talc, through which the state of the flame can be observed.

MANUFACTURE OF COMPRESSED BRICKS.—H. Chamberlain. Dated 18th February, 1868.—This invention consists essentially in pressing the brick two or more times, and each time in a fresh mould, so that the second pressure which is exerted upon a brick delivered from the first mould in the more or less defective state usual in dry brick moulding, perfects the article by completing the expulsion of the confined air and equalising the density of the brick, which, according to this invention, is turned over or reversed whilst passing from one mould to another, and, consequently, becomes equally pressed on the top and bottom surfaces.

MACHINERY FOR EXHAUSTING AIR, SUITABLE TO BE USED FOR VENTILATING MINES, &c.—J. G. Jones. Dated 19th February, 1868.—Here the patentee constructs a casing which is mounted on a central axis, and around the axis, on one or on both sides, are apertures for the passage into the casing of the air from the mine or other place to be exhausted. The casing has two or more hollow arms formed upon it, which spring from the central portion of the casing approximately in a radial direction opposite to that in which the casing is driven. The end of the arm is open, and forms the exit for the exhaust air from the mine or other place. On the leading or convex side of each arm there is formed a hood to take in air. It has a wide opening at its mouth, which receives the air standing in its course, as the hood is carried round with the other parts of the casing. From the mouth the air-passage in the hood gradually diminishes in area in passing outward along the arm until at some distance from the center end of the arm the hood opens into the air standing in the arm, and the air taken in by the hood consequently enters this passage and acts as a blast to force forward the current of air issuing from the mine or other place through the arm. When the apparatus is required to work under varying conditions it is desirable that the plate which separates the exhaust-air passage in the arm

from the blast passage in the hood should be made adjustable.

PULLEYS FOR SUSPENDING WINDOW FRAMES.—F. Ryland. Dated 12th March, 1868.—The patentee claims making on the inner sides of the frames or boxes of the said pulleys bushes or annular projections, and forming the shoulders of the axes of the bowls or wheels, or the central bosses of the howls or wheels of the said pulleys, in the same planes as the sides of the bowls or wheels for the purpose and substantially in the manner described.

ORNAMENTING SLATE, &c.—J. S. Gee. Dated 16th March, 1868.—Here the patentee first prepares the design correctly in accordance with the effect desired to be produced upon a sheet of prepared or lithographed transfer paper, or paper cloth, or other suitable material, prepared on one side or face thereof for the purpose of receiving the colours which are afterwards intended to be removed therefrom in a body. The surface of the slate or other material to be ornamented having been cleaned and prepared to receive the coloured ornamentation, the sheet of prepared paper, cloth, or other fabric or material, having the surface of the design first coated with a thin layer of cement or adhesive liquid, is then applied to the surface to which the ornamentation is to be transferred, and upon the application of friction and pressure to the back of the sheet, with the aid of water or other liquid to discharge the coloured design or ornamentation from the sheet, the coloured design is readily transferred. The slate, marble, or other material treated is then stoved or baked, and the colour or colours having been thoroughly dried and hardened, the surface is afterwards coated with varnish, and again subjected to heat during a sufficient period. When prepared it may be repeatedly varnished and stoved alternately, and finally polished in the manner at present practised in producing enamelled slate.

ARBITRATION CASES.

WHO IS WRONG?

The Liverpool corporation some time ago obtained the sanction of Parliament to appropriate the water, known as the Riddleworth Compensation Water, amounting to 8 cubic feet per second, during twelve hours per day. The claims of thirteen out of the fifteen millowners and riparian proprietors had been satisfied some time ago, but it was found impossible to arrange amicably with the remaining two, Mr. John Park and Mr. Rodgett, and these cases had therefore to be referred to arbitration. Mr. C. E. Cayley, M.P., acted as arbitrator on behalf of the corporation; Mr. J. Bancroft, on behalf of claimants; and Mr. George Pownall, as umpire in both cases.

In the first case claimant produced eleven valuers, whose estimates varied from 21,800*l.* to 35,000*l.*, the average of the whole being 27,420*l.* The corporation brought forward four valuers, the average of whose estimates was 3,211*l.*, and the umpire awarded 5,882*l.*

In the second case, namely, Rodgett's, the average value as ascertained by the array of witnesses called by claimant, was 13,470*l.*; the average of the four corporation witnesses was 3,169*l.*, and the award of the umpire, 3,936*l.*!

ARCHITECTS' RESPONSIBILITIES.

SIR,—On the subject of the responsibilities of architects for defects of workmanship, which the most careful supervision will not always adequately provide against, I send you herewith a copy of a clause which I have for some year past uniformly introduced into my contracts to meet this particular contingency; it is as follows:—

"Provided, nevertheless, that no final or other certificate shall, under any circumstances, cover or relieve the contractor from his liability for any fraud, default, or wilful deviation from his contract or works described in specification; but he shall always remain responsible for any such fraud, default, or wilful deviation, and for the consequences thereof, whether the same be discovered or noted previously to the granting of such final or other certificate or not."

This should, of course, be introduced after the clause specifying the payments and certificate. It is perfectly equitable and most admirably adapted to the cases against which it is particularly aimed. It has, moreover, this special advantage; that retaining the responsibility the contractor after the certificates are given, does away with one of the main inducements to bad work.

H. B. G.

ARCHITECTS AND "QUANTITIES."

SIR,—As there was a long discussion in your columns some few months back, relative to the desirability of the architect supplying his own quantities for new workhouse at Hereford, or in fact of any architect supplying his own quantities, perhaps it may interest your readers to know the result, and to warn architects against adopting a similar course of procedure.

From the *Hereford Mercury*.

NEW WORKHOUSE.

A report, dated January 1st, was put in from the building committee, who met at the new house on New Year's Day; present, Mr. Abel Smith, Mr. Mortlock, Mr. Cooks, Mr. Squires, Mr. Baker, Mr. Robinson, and Mr. Brandram.

It stated that the committee had inspected the new workhouse. Mr. Peck had made a statement respecting the extra brickwork, and had expressed himself satisfied with the construction of the tank to which Mr. Cousins had objected.

Mr. Peck attended, and said, with regard to an alleged error in taking out the quantities of the brickwork, that he did not wish to get rid of his responsibility, but that there was an error of 84 rods 17 ft., and the amount of extra brick was equal to 1,018.

The Chairman asked if it was necessary to take action on it.

Mr. Brandram said he thought not; the Board had nothing to do with it. Mr. Peck had guaranteed the accuracy of the quantities, and the error was stated to have been caused by an omission of a clerk in Mr. Peck's office.

Mr. James asked whether Mr. Peck had received any money on account.

Mr. Sworder said, No. A SEAFYTOR.

NEW MODE OF TOLLING GREAT BELLS: WORCESTER.

THE 44-ton bell lately cast by Messrs. Taylor, Loughborough, for Worcester Cathedral, has been hung on a new plan, which, with the bells clock on the model of the Westminster one, designed by Mr. Denison, Q.C. and gives a very efficient mode of tolling, which is too heavy to be swung in full swing. The gudgeons or pivots are wedge-shaped, like those of a scale-balan, and are on hand-brasses very slightly hollowed: the friction is thereby so little that the bell can be moved by one man with one hand, and was so used after afternoon service last Sunday (Jan. 17), by the Rev. H. T. Eilacombe, of Devonshire; it is a small man, and nearly 80, as well as by Mr. Denison himself, and the Rev. R. Cattley, the author of the scheme for the peal of 12 bells and the clock. It is actually much easier in pulling the clapper by a rope, besides being unlikely to crack the bell; and the tone of the bell came out much more grandly than with the old plan. There is no doubt that the heaviest bells in England might be made tollable in this way at a very small expense, some of which are never heard now, except very inadequately struck by a clock hammer, or by hand. No bell is required, only a long lever fixed to the bell.

The gudgeons must not be lower than the top of the bell. The bell is half a tone below the half-quarter bell of the Westminster clock. The diameter of the mouth is 76 in. The inscriptions are set in ornamented medallions, copied from some ancient bells in Wiltshire. Round the shoulders:—*Surgit, dormit, et exurgit martiris et illuminabit te Christus*; with a flourish between each word. At the waist:—*Johannes Taylor, de Loughborough, fudit. In usum ecclesie cathedralis Martiri et beate Mariae Virginis in civitate et castro Wigorniensis.* MDCCCLXVII. Besides the founders' trade-mark, within a circular medallion, there are on shields the Royal arms, and those of the City, and the seal of Worcester, and the Dean and Chapter, besides the names of the donors which encircle the bell.

RECENT NOTICES OF FREEMASONS.

Worcester Cathedral Roll, A.D. 1396-97.—William Gidding and William Gerys, Freemasons. Gidding had a salary of 1l. 6s. 8d.—In 1427, John Wolston and John Harry, Freemasons, were sent from Exeter to Beer to measure stone.

Guilford of Freemasons were in existence in London A.D. 1375, Edward III. A list drawn up in French of the numbers of persons chosen to several mysteries of the Common Council in the next year, 1376, show two Freemasons among others elected.

Whitby Abbey Chapel, A.D. 1434.—William Gidding, Freemason, made a contract with the lord of York for the construction of the same.—*Monasticon*, vol. iii, p. 162.

St. George's Chapel, Windsor, A.D. 1507.—William Vertue, Freemason, executed the groined ceiling at St. George's Chapel, Windsor.

Eton College, A.D. 1441, December.—There were thirty-five Freemasons employed.

Tower of London.—The Freemasons' work between the 4th of June "laste paste," into September 7th, 24th year of Henry VIII., is described by a document now in the Chapter-house, Westminster.

Louth Steeple, A.D. 1627-8.—The spire was repaired by "Thomas Englefield, Freemason and steeple mender." E. W. S.

MATTERS THEATRICAL.

Haymarket Theatre.—"Home," a new, if not wholly original, comedy, by Mr. T. Robertson, the author of "Caste" and other excellent dramatic pieces, has been produced here with complete success,—that sort of success which must force all who are interested in stage productions to go and see it. The story, though slight, is compact and "washable." Some of the situations are novel; the language throughout is pointed and good, and it is thoroughly well acted by Mr. Sothorn, Mr. Compton, and Miss Ada Cavendish (the original Venus of "Ixion"). Miss Jane Burke and Miss Caroline Hill fill smaller parts efficiently. A young actor, brother of a gentleman already acting in this theatre, made an agreeable impression. He was wrong to take a name, Astley, so little different from that of an actor beginning to become known at the Adelphi. Mr. Buckstone, in announcing the new piece for repetition until further notice, said to his audience,—"I know you all like home, and I hope you will find it here for many nights to come." In "The Frightful Hair," which is very funny, Mr. Kendal, an actor fast rising in his profession, makes a decided hit. His travestied imitation of the principal actor in Lord Lytton's play, in voice, manner, and appearance, is strikingly good, and is sustained throughout the entire piece. Some of the parodies are exceedingly well sung, and Mr. O'Connor has painted for the piece two or three bright scenes.

"The Princess's"—"After Dark" continues to fill the house nightly; nor need any be surprised at this who consider the matter. It is not alone the story, which is sufficiently interesting, the well-contrived and painted scenery, or the strikingly sensational passage of the express train (one of the cleverest mechanical effects, be the inventor who he may, that the stage has shown); but the acting, too, that has assured this success. As in nearly all Mr. Bonicault's pieces, each part is rightly filled. Mr. George Vining has made of the role of a first drunken vagrant Tom a finished study, elaborating it throughout with the greatest care and efficiency. The resulting picture is calculated to teach as well as interest. The varnished bushranger of Mr. W. Lacy and the Jew gambling-house keeper of Mr. Dominick Murray are equally excellent in their way.

Lighting Theatres.—A correspondent, "M.A.B.," writes thus:—"Perhaps you will allow me to offer a suggestion on lighting theatres and concert-rooms. The excessive quantity of gas in these places of entertainment very much interferes with the comfort of many persons, and in cases in which the great amount of light is not distressing to the sight, the deleterious atmosphere so occasioned is most injurious to the health. I know several ladies who suffer severely from headache whenever they spend two or three hours in these over-lighted places. The effect of subdued light is most agreeable to the majority of persons. There are people who can not only bear a strong light, but like it; they are exceptional, however, and should be better instructed on the subject. There are two London theatres which I need not name where a good example is set in the matter of moderate lighting: the stage effects are very much heightened by this means, for the glare upon the eyes from the chandelier and surrounding lights renders it difficult and painful to see and appreciate all that is passing upon the stage."

Montreal.—A showy theatre, to seat 1,600 persons, has been completed here.

Creusot.—A new theatre, designed by M. Morisot, of Creusot, has been opened at the great ironworks there.

Mr. Henry Leslie's Concerts.—Mr. Leslie has sent out an attractive prospectus of his fourteenth season, which will comprise concerts of unaccompanied music, by Mr. Leslie's choir, and orchestral and choral performances. The first concert will be given on Thursday, February 4th.

PROVINCIAL NEWS.

Nottingham.—The new Mechanics' Hall, replacing the one that was burnt in 1867 upon the same site, is nearly completed, and was opened on the 19th instant. What remained of the old building has been restored and incorporated with the new. The lofty portico fronting Milton-street remains, but the entrances are parallel with the street, constituting an improvement on the old steep flight of steps. Another improvement is the porch at the Burton-street entrance to the hall, which is situated almost on the site of the old entrance to the library. The lecture-hall at the corner of North Church-street is a prominent addition to the institution. The present edifice has improved ingress and egress as compared with the late one, having three spacious entrances from Milton-street and two from Burton-street, in addition to several entrances from the corridors, dividing the hall and the institution leading to the orchestra, green-room, retiring-room, &c., with several additional exits available in case of emergency, while the stairs throughout are fireproof. The old grand hall within was 95 ft. long, 45 ft. wide, and 30 ft. high; the present hall is 110 ft. long, 59 ft. wide, and 40 ft. high, and has a gallery in addition. The superficial floor-space of the old hall was about 4,275 ft., while that of the present hall is 8,100 ft. The cubical quantity of the old hall was about 128,250 ft., while the new hall contains about 258,600 ft., which shows the new hall is more than cent. per cent. larger than the old one. The orchestra is semicircular, and less precipitous than the old one, and able to furnish space for about eighty more performers, with four convenient approaches. The grand hall is oblong in form, with semicircular ends and returns. The building has two tiers of windows to the sides, side and end galleries, with a horse-shoe well-hole. The hall is surmounted by a coffered ceiling, with a coved and enriched cornice. The outer tier of eaves are encompassed by guilloche ventilators, communicating with draught chambers through the roof, having pendants at their junctions, lighted by five 81-jet sun-lights, by Messrs. Verity & Sons, of London. The lecture-hall, abutting upon North Church-street and Burton-street, is 59 ft. long, 43 ft. wide, and 28 ft. high. This room is in one story, and lighted by an 85-jet sun-light. The library is 58 ft. 6 in. long, 31 ft. 9 in. wide, and 16 ft. high, lighted from each end by skylights and three pendant corner gas chandeliers. The reading-room, which occupies the north-western boundary, is 58 ft. 6 in. long, 25 ft. 3 in. wide, and 16 ft. high, having an enriched cornice and empanelled ceiling, lighted by a tier of six semicircular sashes from the west, and furnished at the end of the room with pendant ventilating shade-lights, which, together with the sun-lights, were all provided by Messrs. Verity & Sons. The lecture-hall and grand hall are warmed by hot water on the circulating principle, supplied by Messrs. Goddard & Massey, of Nottingham. The principal contractor is Mr. William Slinn, builder, Nottingham. The carpenter and joiner's work has been executed by Mr. George Wheatcroft; the plastering by Mr. Thomas Murdy; and the slating and stonework by Messrs. Marriott & Co., all of Nottingham. Mr. T. Simpson, of Nottingham, is the architect.

Cavendish.—A new lecture-hall has been opened at Cavendish. The building, which has been erected at the sole expense of Mr. J. S. SALTER, Garrett, stands at that gentleman's estate. Mr. Sudbury, was the architect, and the building was erected by some workmen of Mr. Garrett's.

Canwick.—The new market-hall of Canwick has been opened for the inspection of the public. The site and building cost about 1,200l., raised by 1l. shares, which were quickly taken up, in the main by the middle and poorer classes—the landed and money interest giving scarcely any encouragement to the undertaking. The shape of the hall is nearly oblong, with an open roof, supported by eight horizontal rafters, these being connected with a network of tie-beams. Light is admitted from a clearstory, and from a large window over the entrance door. The hall is 100 ft. long, 47 ft. wide, and 42 ft. high, lighted with circular gas-burners of 21 jets each.

Kidderminster.—At a meeting of the building committee of the new market-hall to consider the tenders for the hall, it was found that there were eight tenders sent in, varying from 1,919l. up to 2,650l. That of Messrs. Goodman & Wilks, for 1,949l., was accepted. The vegetable market is to be completed in two months, and the whole of the work is to be finished by May 6.

Books Received.

History of the Fens of South Lincolnshire. By W. H. WHEELER, C.E. London: Simpkin, Marshall, & Co.

THE chief purpose of this volume is to draw attention to the large expanse of fertile land which might be redeemed by home colonization in the fen district, and about the confluence of the Witham, the Willand, the Nene, and the Ouse. The scheme brought forward by Sir John Rennie for enclosing the whole of the Wash, and thus reclaiming 150,000 acres of waste space, Mr. Wheeler considers as one well worthy the attention of Government. The example set here by the Romans of old, who employed their soldiers, aided by convict labour, in forming the embankments by which the Fens are protected, might well be imitated in the present day, even were neither soldiers nor convicts to be employed. And it is not in the fen districts alone that thousands of acres of English land might be utilized, and employment thereby found for our unemployed working classes, but in various parts of the country. Mr. Wheeler gives an interesting account of what has already been done in the fen district, whereby 250,000 acres of land, a space larger than some of the English counties, have been converted from mere morass into one of the richest tracts of agricultural land in the country; so that what he proposes would be no blind speculation, about the profitable results of which there could be much doubt. The volume is accompanied with a plan of the district treated of, reduced from the ordnance map, and specially adapted by the author for his book.

VARIORUM.

THE "Spirit of Education." By Mikado. Wynman & Sons, Great Queen-street, London. Without entering into any of those subjects which the author of this brochure gives simply by way of exemplification of the relationship of the teacher to the pupil, such as the theory of "the three elementary or primitive colours" in light, we must admit that the tone is excellent and worthy of all acceptance, as is the motto which indicates it, namely,—"Though I speak with the tongues of men and angels, and have not charity, I am become as sounding brass or a tinkling cymbal." The author impresses on his readers that teachers should be trained to feel "that it is their duty to regard all who differ with them in religious belief with feelings of charity; to respect the convictions of others, as they would have their own respected; and to feel that each one of the numerous sectarian bodies composing the Christian church might, with equal right, act upon the assumption that all the others were in error, as they that all those were who differed from them in opinion."

"Report of the Sanitary Committee of the Borough of Nottingham, for the year ending September 30th, 1868." The reporters here state that an intimation of the outbreak of the Typhoid epidemic was made to them in September; and that—

"An inspection of the parts of St. Ann's Ward, especially affected by it, was at once made, when it was found that a considerable number of pigs were kept in close proximity to dwelling-houses, without proper drainage, and which were in such a state generally as to induce your Committee to take active steps for the abatement and removal of the nuisance. It was also found that many of the sepulchres in the same neighbourhood, in consequence of defects in the plan of construction, were in a foul state, caused by the accumulation of water. Your Committee caused all the districts affected with fever to be liberally supplied with disinfectants."

The Committee state that four of the twenty three public water-closets "have been converted into dry-earth closets with satisfactory results, and the contents are utilized instead of running into the sewers." Storing-tanks in some of the thirty-nine urinals have also been provided. The means requisite for the utilization of the sewage, and the purification of the river Trent and its tributaries, are exciting attention in the district.

—The *Register and Magazine of Biography*, January, 1869. Nichols & Sons, Parliament-street, Westminster. No. 1. This new shilling magazine is intended as an enlarged record of births, marriages, and deaths, with notes of genealogical and personal occurrences. The present number contains biographical notices of Henry Constable, the poet, Sir Edmund Andros, and members of eminent persons more recently deceased, including Rossetti, with relative matter of a miscellaneous description. It is an enlargement of the idea carried out for many years in the *Gentleman's Magazine*, with which the Messrs.

Nichols were long and honorably connected.—The *Publisher's Circular* (Sampson Low) for January 16, is specially devoted to the educational books of the year. In its advertising pages there are copious lists of school, college, and class books of every kind, aim, and variety, adapted for almost every college or school, as well as for private tuition and self-instruction. Amongst them will be found Mr. John Murray's standard school books, consisting of advanced dictionaries, school dictionaries of Dr. William Smith, Greek and Latin classics by the same author, and others, and even reproductions, King Edward VI.'s First Latin Book and Latin Grammar: another admirable variety is the Student's Manual series, from the same publisher. Messrs. Longman's list includes a great variety: Gleig's School Series; Colenso's Mathematical, Classical, and most valuable Elementary Works; Alexander Bain on Grammar and Composition; the Civil Service Arithmetic; White's Capital Dictionaries; Valpy's Delicacies; and, last and sweetest, educational and elementary works on Music, which has now fully taken its place as an item of a generous education: we must not omit to mention a very useful little series of works, the "Stepping-Stones" to knowledge—instruction in various sciences, wherein music is simply explained and easily retained. In the lists of the Messrs. Virtue will be found the important handbooks of instruction, brought down to the latest discoveries, the *Wendle Series*.—"Troveville by the Sea." Edited by W. Blanchard Jerrold. Bradbury & Evans, Bonverie-street. In the preface the editor says: "The loveliest watering place on the northern shore of France is all but unknown among us; and it is to make a beginning towards rooting out this ignorance that I have watched the following unpretending and light chapters through the press." It is well calculated to send additional visitors in the season to this already much and fashionably-frequented sea-side resort.

Miscellaneous.

The Central Station Hotel, Leeds.—In our necessarily brief account last week of this handsome structure it was stated that the carving, with some exceptions, had been executed by a certain carver. We are now invited to add a line as to these exceptions, and willingly comply. At the corners of the building, which the town authorities required to be rounded off, a corbel figure is carved, representing an athlete supporting, as it were, the angle above, and bearing the railway company's armorial badge; thus surmounting well a somewhat formidable difficulty. These were executed by Mr. Theodore Pnyfers, and deserve to be commended. Mr. Pnyfers, it will be remembered, is executing the figures for the south porch of Canterbury Cathedral.

Sheep-shearing by Steam.—The Melbourne correspondent of the *Alexandra Courier* says:—"I saw a machine at work the other day which is likely to cause a great change in the sheep farming interest; it is no less than to shear sheep by steam; and from what I saw of it, it is likely to be a complete success. The machine is made of brass, something in the shape of a small trowel; the motion is got up by a turbine wheel about three inches in diameter; and this is geared into another wheel on which is fixed a cutter; in front is a comb, which serves as a guide, and against cutting the skin of the sheep. The steam is conveyed from the boiler by a tube of india-rubber; this tube or pipe is double, having one inside the other; the inner one is the injection, and the space between the two is the ejection. The machine can be handled quite easily, and will be used just in the same fashion as the shears, but will cut much quicker and far cleaner, without the least danger of injuring the fleece or the sheep."

Liverpool Architectural Society.—The seventh meeting of the twenty-first session of the Liverpool Architectural and Archeological Society was held on Wednesday, the 13th, in the Royal Institution, Colquhoun-street. Mr. F. Horner presided. Mr. Boulton exhibited a plan of some tunnelling discovered in excavating the foundations of the New Exchange; and the paper of the evening was read by Mr. H. P. Horner, "On Characteristic Design in Architecture." A sub-committee, consisting of the president, Mr. Boulton, Mr. Wm. Picton, and the secretary, was appointed to consider and report upon the subject of architectural education in Liverpool.

Death of Sir Henry Ellis.—On the 13th inst., Sir Henry Ellis, late principal Librarian of the British Museum, died in his 92nd year. He was appointed to that post in 1827, and was for many years Secretary of the Society of Antiquaries. In middle life he was indefatigable as an author. Among the most valuable of his publications are his "Original Letters and Illustrations," mainly from the autograph originals in the British Museum, the State Paper Office, and other sources. Sir Henry Ellis was also the responsible editor of an enlarged edition of Dugdale's "Monasticon Anglicanum," in several volumes folio. He also was the author of the "General Introduction to 'Domesday Book.'" Only a few weeks ago we found him assiduously examining the accounts of the Literary Fund, and heard from his lips many stories of long long ago. Directly after this, the fall of a stack of chimneys into the room where he was sitting gave a shock to his system, and there is reason to fear expedited the event we deplore.

Exhibition to further Domestic Economy in Utrecht.—Meetings are being held in London to further the proposed exhibition in Utrecht to be held in the months of August and September, 1869. The principal object of this exhibition is to bring to the knowledge of the workman such articles of household use, furniture, dress, food, work, and instruction of different countries, as at a low price, combine usefulness and solidity, so that he may be enabled, by judicious economy, to improve his condition. Articles of luxury as well as of elegance, strictly so called, are excluded. The exhibition will include house &c. (a) Plans of dwellings for married and single men; (b) Plans of lodging-houses, eating-houses, boarding-houses, baths, rooms for reading and recreation; (c) Details of construction; (d) Materials for such buildings. Household necessities, &c.: Furniture, clothing, food, workmen's and gardeners' tools, means of moral, intellectual, and bodily development, and reports, statutes, regulations of different associations for promoting the well-being of the working classes. All the articles to be sent in between the 15th and 30th July.

Society for the Encouragement of the Fine Arts.—On Thursday, the 14th inst., the annual general meeting of this society took place in 9, Conduit-street.—Mr. James Edmondson in the chair.—upon the annual report was read by the hon. secretary. The report stated that the session of 1868 had been a successful one, evidenced by the increase in the number of members, the warm interest taken in the proceedings of kindred societies, and by the continued support it had received from those professionally connected with the fine arts. The revival of art exhibitions, at which the merits of such men as Dore, Barry, and Constable had been discussed, had given general satisfaction; and these, with the *conversations*, musical, and of lectures, had formed a centre of artistic social enjoyment.

Saw-hardening Furnaces.—Mr. John Rogers, builder, Hereford-street, Sheffield, patented an improvement in the building and constructing of saw-hardening furnaces; it is said to be applicable to steam boilers and brick-pans, and will consume its own smoke. It is estimated that the invention will save 30 cent. in fuel.

Exhibition at Bath School of Art.—Lately noticed the distribution of Government prizes by the Mayor, at the Central School of Bath. We may now add that there is an exhibition of the works executed by the pupils during past year, in chalk, colour, and monochrome. There are in it original sketches by the members of the Sketching Club, a club formed up through the suggestion of Dr. Puckett, I. master of the school, for the purpose of encouraging pupils in original compositions.

Encroachment of the Sea.—A special meeting of the corporation of Hythe has been held to consider the present dangerous condition of the sea wall, caused by the recent gales, was resolved that the clerk should request Courtenay Honeywood, the Lords Commissioner of Romney-marsh and the War Department, to co-operate with the corporation in some effective measures for mutual protection. It was resolved that the mayor should procure such quantity of rough rock and other material as was necessary for the temporary protection of the sea wall at the Parade.

The Licensed Victuallers' Asylum.—This Asylum, founded for the benefit of licensed victuallers who have been reduced to distress, an institution which is regarded with peculiar interest by the body to the wants of whose necessitous members it is intended to minister. Of late years its sphere of usefulness has been gradually extended, until it now comprises 170 bays, accommodating 211 people. This work is maintained at an expense of about 6,000*l.* per year. The annual hall was held on the 14th inst. at St. James's Hall, and was attended by about 600 people.

Australian Meat.—On Wednesday a dinner was given by the manager of the Australian Meat Agency to a large number of working men and their wives, selected from the principal establishments in which the various working people of the metropolis are employed, for the purpose of making those most interested in the adoption of cheap meat thoroughly acquainted with what is sought to be accomplished by the promoters of the movement. The dinner was served at the central depot of the agency, 31, Trower Folgate, and was partaken of by some 100 persons, who were said to represent as many as 70,000 working people of London. Dr. W. Richardson presided. The question taken up and put to a practical test by the Australian Meat Agency is certainly worthy of the best attention of the public. What is sought to be done is simply to utilise the surplus food of our colonies for the purpose of reducing the price of it in the mother country.

Mr. Arthur Ashpitel, Architect, F.S.A.—I mention with extreme pain and regret the death of Mr. Ashpitel, which took place on Monday last. We shall make an early opportunity to speak of him more at length. He was highly cultivated and estimable man.

Sanitary Board of Health.—Great complaints have been made as to the demand by the Board of one set from each competitor, for the "finished sketches, &c." The amount should be returned to all who send in a *bona fide* production.

Ready Raft.—I beg to suggest a plan for saving life at sea from foundering ships in violent storms. A portion of the deck to be reserved to the ship's frame (two thick bands of lumber to be laid between to prevent vibration) by three stout bolts on each side. In an hour of danger the nuts to be partially screwed, and at the critical moment the bolts knocked out. It would then float off and sink with its livin'; freight; the hullwarks at each end would afford some protection to the crew thereon, and it would not upset.

Gas-light on Shipboard.—The lighting of steam carriages with gas is about to be followed up by gas-light in ships. The *Monarch*, a turret ship, preparing for sea in Chatham Harbour, is ordered to be fitted up with a gas apparatus, every portion of the hull between decks being intended to be lit up by gas, which will be manufactured on board. The estimated expense of fitting up the ship's apparatus is about 300*l.*

Chapel-house, St. Pancras.—The guardians of the parish of St. Pancras have erected a chapel-house, with *post-mortem* room, in the ground adjoining the workhouse. The structure has been built under the superintendence of Mr. Dent, architect, by Mr. Turner, with Horsely.

TENDERS.

For building two houses, Herolds Park-terrace, &c., for Mr. G. Harpell, Mr. J. H. Smith, &c.—
 J. Smith 21,337 0 0
 J. Smith 4,320 0 0
 J. Smith 1,200 0 0
 J. Smith 452 0 0

For erecting new brick and Sunday Schools, Allington-street, Mr. Gordon Stanham, architects:—
 Brown, Brothers 41,445 0 0
 Stanham 4,320 0 0
 Stanham 4,320 0 0
 Ford & Whittier 4,189 0 0
 Newman & Mann 4,126 0 0
 Stanham 4,023 0 0
 Stanham & Sons 3,963 0 0
 Scrivenner & White 3,619 0 0

For the rebuilding of shops on Mr. Coxeter's Estate, Easton and Hampstead roads. Messrs. Richardson & Waghorn, surveyors to the estate:—

The John and Bee Tavern.

Lawrence & Baugh	23,707 0 0
Adamson & Son	3,480 0 0
Henshaw	3,429 0 0
Eaton & Chapman	3,400 0 0
Scrivenner & White	3,419 0 0

No. 3, Hampstead-road.

Gammou & Sons	1,259 0 0
Tarrant	1,158 0 0
Macey	1,149 0 0
Mitchell	1,129 0 0
Kelly Brothers	1,083 0 0
Scrivenner & White	1,027 0 0
Eaton & Chapman	1,020 0 0

No. 5, Hampstead-road.

Tarrant	921 0 0
Gammou & Sons	911 0 0
Macey	893 0 0
Mitchell	870 0 0
Eaton & Chapman	845 0 0
Scrivenner & White	825 0 0
Kelly Brothers	823 0 0

No. 7 and 9, Hampstead-road.

Kelly Brothers	1,473 0 0
Eaton & Chapman	1,555 0 0
Foster	1,510 0 0
Mitchell	1,449 0 0
Thompson	1,424 0 0
Scrivenner & White	1,394 0 0

For factory, &c., at Robin Hood-street, Nottingham, for Mr. William Windley. Messrs. Thomas C. Hine & Son, architects:—

Hall	5,890 0 0
Baker	5,430 0 0
Dennett & Co.	5,398 0 0
Fell	5,142 0 0
Stevenson & Weston	5,265 0 0
Wright & Johnson	5,200 0 0
Bell & Son	5,150 0 0
Rest	5,099 0 0
Wood & Slight	5,093 0 0
Wood & Son	4,998 0 0

For building a viaduct to Stanley Bridge, for Vestry of Chelsea, and erecting a boundary-wall by Stamford Bridge. Mr. Joseph Pattison, surveyor:—

Dickson & Olliver	2,941 0 0
Crockett	2,900 0 0
Wignmore	775 0 0
Whitlock	730 0 0
Neave (accepted)	673 0 0

For residences on Lime Grove, Putney, for Miss Blackley:—

Sutton (accepted)	21,000 0 0
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For the road and drainage works to be completed on Regate Estate (Red Hill), belonging to the United Land Company (Limited):—

Hooper	21,523 0 0
Wignmore	1,340 10 0
Blackmore	1,345 0 0
Nesley	1,290 0 0
Cook	1,290 0 0
Moxon	1,130 0 0
Pizzoy	1,090 0 0
Coker	1,027 3 0
Symonds	853 0 0

For new sewers, Trafalgar-road Estate, Old Kent-road. Mr. William Smith, architect:—

Levis & Smith	2,350 0 0
Hanilton	280 0 0
Wignmore	278 0 0
Carter & Phillips	265 0 0
Phillips & Johnson	256 0 0
Hilcox	238 0 0
The Blackrah	230 0 0
Baxter	223 0 0
Howe & Pressney	199 10 0
King	187 10 0
Leas & Turner	184 4 0
Harris	184 0 0
Smart	184 15 0
Blackmore & Morley	176 0 0
Young	171 0 0
Hoare & Son	165 0 0

For the enlargement of the passenger station at Kensington, for the West London Railway Company. Quantities supplied:—

Middleton	27,821 0 0
Jackson & Shaw	6,800 0 0
Brown & Son	6,723 0 0
Baker & Constable	6,700 0 0
Dann & Son	6,598 0 0
Dunkley	6,556 0 0
Wicks, Bangs, & Co.	6,540 0 0
Bird	6,465 0 0
Axford	6,350 0 0
Myra	6,349 0 0
Sherrwood	6,171 0 0
Palmer	6,112 0 0
Jay	5,981 0 0

For the erection of two houses, Marine-parade, Folkestone, for Mr. E. T. Witing, Mr. H. H. Strickland, architect. Quantities supplied by Mr. Edward W. Fry, surveyor:—

Dunk	23,335 0 0
Bowley	3,150 0 0
Potts	2,950 0 0
Hollim (accepted)	2,875 0 0
Frebble	2,800 0 0
Webster	2,858 0 0

For the Radnor County Gaol, Mr. Williams, county surveyor. Quantities supplied by Mr. Joseph Summons:—

Roberts, Kingston	42,319 0 0
Roberts, London	2,151 0 0
Homer (accepted)	1,883 0 0
Jones	1,850 0 0
Morgan	1,730 0 0

For erecting new coach-builder's premises, &c., at Young-street, Kensington, for Mr. W. Cole, Mr. Gordon Stanham, architect:—

Waterstone	22,052 0 0
Cook & Co.	1,883 0 0
Newman & Mann	1,836 0 0
Wignmore	1,792 0 0
Hockly	1,791 0 0
Salter	1,763 0 0
Edbs & Sons	1,737 0 0
Blackmore & Co.	1,709 0 0
Brown & Sons	1,675 0 0
Till	1,670 0 0
Temple & Forster	1,645 0 0
Wimship	1,638 0 0
Davis	1,623 0 0
Simpson	1,600 0 0
Scrivenner & White	1,598 0 0
Turner	1,578 0 0
G. Bennett	1,440 0 0
Foale	1,437 0 0
Kendall	1,270 0 0

For erection of house at Luton, for Mr. Richard Brown:—

L. & W. D. Patman	23,699 0 0
Kimberley	3,675 0 0
Patman & Co.	3,585 0 0
Spencer	3,581 0 0
Smart, Brothers	3,335 11 8
Nixon	3,342 0 0
Dennett & Co.	3,309 10 0
Parbell & Son	3,170 0 0
Osborne, Brothers	3,100 0 0
Brown	2,961 0 0
Neale & Sons	2,964 0 0

For carpenters, joiners, painters, and plumbers' work of two houses on the Kilkenny estate, for the County Investment Company. Mr. J. H. Smith, architect:—

Aplin	2,905 0 0
Giles	608 0 0
Consius	596 0 0
W. Smith	590 0 0
Fusch (accepted)	520 0 0

For new Institution Building, 105, Jernyn-street, for the Royal Society for the Prevention of Cruelty to Animals. Quantities by Messrs. Pain & Clark:—

	Estimate A.	Estimate B.
Belham	24,375 0 0	24,375 0 0
Crockett	3,500 0 0	3,540 0 0
Nightingale	3,430 0 0	3,485 0 0
Temple & Forster	3,383 0 0	3,430 0 0
Merritt & Ashby	3,303 0 0	3,300 0 0
Bracher & Sons	3,387 0 0	3,398 0 0
Edbs & Sons	3,320 0 0	3,381 0 0
Cook & Green	3,369 0 0	3,365 0 0
Thompson	3,330 0 0	3,345 0 0
Till	3,300 0 0	3,343 0 0
Fully	3,293 0 0	3,322 0 0
Carter & Sons	3,250 0 0	3,205 0 0
McLachlan	3,195 0 0	3,215 0 0
Howard	3,185 0 0	3,215 0 0
Thomas & Son	3,176 0 0	3,119 0 0
Turner	3,168 0 0	3,094 0 0
Baker & Constable	3,173 0 0	3,001 0 0
Mansley & Rogers	3,170 0 0	3,078 0 0
Deards	2,989 0 0	3,012 0 0
Wicks, Bangs, & Co.	2,990 0 0	2,990 0 0
Baird & Russell	2,985 0 0	2,999 0 0
Foale	2,774 0 0	2,789 0 0
Blackmore & Morley	2,721 0 0	2,745 0 0

For three houses in Luna-street, Chelsea, for the West Brompton and Chelsea Labouring Classes Dwelling-house Company (Limited):—

Vickers & Harding	21,285 0 0
Co-operative Building Society (Limited)	1,200 0 0
Archer (accepted)	1,150 0 0

St. Pancras Board, Middlesex.—The contractor for the iron house to be erected at Richmond House, Plaiestow, for the above board, is Mr. S. Dyer, Easton-road. Last year he built two iron rooms at Plaiestow for the same board.

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The Builder.

VOL. XXVII.—No. 1356.

St. Mark's, Venice.



RETURN we once more to this remarkable shrine.* The enrichment of the division that we have called the upper story—the interval of vertical surface between the level of the gallery and the springing of the vaults—is comparatively moderated: it thus forms in a manner a frieze to the plain wall below, and constitutes a term of transition. Above this frieze-like band all the surfaces are covered with a general ground of gold mosaics, which follows every curve, and is folded level over every angle of band or archivolt. No interruption to it is allowed by interfering projections of mouldings. Indeed, except for the few string-courses below already noticed, and a somewhat more decided cornice round the base of the cupolas,

there is a negation throughout of such ordinary architectural features; in the general effect of solid piers and unbroken continuities of masses, there is nothing to intimate that the whole structure might not be monolithic,—that it might not be cut out of single solid rock with merely such well-adjusted allowance of thickness relatively to weight and cohesion, that the material is free from danger of being self-crushed and easily supports itself.

The glory of the gold ground tells, of course, with peculiar effect upon the curved, still more upon the coved, surfaces, and throws up in brilliant distinctness the subjects and borders of patterns many-lined with which it is charged.

This is not the place to dissert upon the system with which various subjects from sacred, legendary, and even historical lore were distributed. The designs are of various dates and various excellence,—from the archaic, which are sometimes grand and sometimes grotesque in their quaint proportions, to the modern, which comprise contrasts as vital, between refinement and sophistication. The Academical style is, no doubt, as remote from purity in taste as the grimly barbarous; but they who would exalt the merely quaint into the only truly reverential, do small honour to the architecture that is far indeed removed from artificial quaintness. To criticism, however, with such proclivities, it may be recommended as matter of consistency to assert the right of the associated rhyming legends to give little norm of poetry;—

* Sic actus Christi describunt quatuor isti, Marcum firmiter, —Kantaris vociferantur, &c.

The subjects are for the most part left to be divided by the free unoccupied space of gold left between them. This much may be said as justification of the principle underlying the scheme of their distribution: the centre of the first cupola as we enter is occupied by the dove as symbol of the Holy Spirit, from which rays descend to fiery, or, rather, scarlet tongues, upon the heads of the twelve Apostles, who alternate

with the twelve lights that pierce the cupola. The four evangelists occupy the four spandrels of the centre, and in the points below them are the four rivers of Paradise; the cupola above is assigned to God the Father; and the third, with its apse, is given in completion of the Trinity, to the glorification of the Son. Throughout the whole series, both in vestibule and church, we observe the intention to comprise a complete cycle of the sacred scheme as understood by the designers, and to distribute its various divisions to appropriate positions in the sequence in which they would be architecturally arrived at,—in order of conspicuousness and dignity, and in relative connexion or parallelisms,—while leading up at last to the great culmination of all interests, human and divine, in the eastern apse.

The presbytery is raised above the level of the church, at the line of the eastern margin of the central square of the crossing, and there can be no doubt, from the plan and section of the crypt below which are given by Cicognara, that the rise was originally fixed at this point; the row of small arches in front may once have been always open, affording a view into the crypt, and have extended clear across. The entrance would then have been to the right and left by the continuations of the aisles. At present the small arcade is covered in the centre by semi-circular steps, giving admission through a surrounding barrier or parapet that is the base of a highly-enriched screen. Four polished columns upon this on either side of the entrance bear an entablature that runs through from side to side, and on the entablature are seven statues over columns and intervals, on either side of an elaborate archaic cross that rises in the centre. The style of these columns, and their capitals, and the colours of the inlaid and encrusting marbles of the whole, are quite in harmony—beautifully so, indeed, with the chrook at large; but nevertheless it is a most unfortunate and damaging innovation. The wall of separation, the screen, is so effectively a screen that it interferes seriously with that completion of the cross on the lower plan by visible dependence on the eastern arms upon the centre, that was certainly counted on in the original design for bringing the more complicated upper plan together. Still more unbaptly it secludes the entire eastern division of the church from the main body to an extent that is at variance as much with architectural effect as with the certain traditions of local ritual. Even at the present time the separation marked by so absolute a line is habitually disregarded, and the ordinary congregation enters, and on occasion crowds without let or distinction beyond the barrier, and takes their seat and station. By other certain signs there can be no doubt that the portion originally secluded was marked off by the western line of the dome of the choir. Only when the screen is at least moved back in imagination to this point, if not—still better—beautiful as it is, obliterated entirely, can we stand in Saint Mark's and recognise with full satisfaction how noble and self-coherent is the plan and distribution of the temple that has received through a succession of ages enrichments so ever unstinted, and with scarcely another exception so uniformly in harmony. At present the long entablature of varied marbles bolts abruptly at either end against the plain marble incrustations of the piers, which exhibit no modifications announcing that it is expected, no lines nor mouldings responsive to its attachment.

The pair of eastern piers, on the other hand, receive an enhancement that marks their line as specially terminal. Their interval is reduced by the diameter of coupled columns placed in advance of them; above these the marble-encrusted pier is advanced, and bears like a podium the still smaller coupled columns of the upper story, upon which descends the

architrave of a transverse arch, presenting below the barrel vault, an enriched face to the westward. This is a repetition of the same treatment that is applied in the arms of the transepts, of which the span is contracted by the like arrangement that subserves enhanced enrichment by secondary columns and presentation of architrave fascias. The levels of the horizontal divisions are also preserved throughout, but with the difference that the elevation of the floor of presbytery and choir reduces the height of the lower range of columns to the great advantage of concentration of effect; the greater richness of their materials harmonizes with the preciousness and minuter elaborations of the fittings of the sanctuary, as their size with the reduction of its spacings generally. A gradual approximation in scale was thus introduced to the stature of the celebrants, on whom attention is most concentrated, and from whose position the eye is led by easier transitions through a series of magnitudes expanding at last most impressively to the largest dimensions of the structure.

The lower half of the height, intermediate between dome-base to pavement, remains to be distributed. One more most important horizontal line is given here by the heights of the nave columns, to which we have already adverted. Detailed measurements only would make it worth while to dissert on the principle observed in the proportions and spacings of these. It must be enough to notice that they seem so far to adhere to classical precedent as to show a commensurableness of height with divisions of plan.

There is nothing more thoroughly artistic in the composition than the easy and accurate articulation of the eastern termination of the church with the design of the flanks, consistently at the same time with the introduction of novel enhancements and enrichments to give appropriate distinction to the focus of the entire work. It is here that we too often have to regret,—if we do not weakly permit ourselves to slur over,—shortcomings on the part of Mediæval architects, in whose favour patriotic associations plead in conjunction with many others. In many an abbey church,—let it suffice to specify Whitchy,—and even in cathedrals, the transverse walls both of transepts and even of east ends are too frequently simply built across,—either with no acknowledgment of allegiance to,—no assertion of control over the horizontal divisions and string-courses of the sides, or at best with vain and to be commiserated endeavours to tie the two compositions,—each admirable in itself,—together by some straggling, incompetent, and misdirected moulding.

The relative heights of the upper and lower arcades—that is, of the nave lateral arcades and the lower perforations of the piers, as compared with the upper, are most effectively, and we have no right to presume otherwise than deliberately and artistically, decided. Here, again, was put in practice at an early date a principle that the Western architects were long in appreciating, but never lost sight of when once they had grasped it. One of the greatest advances in Gothic was achieved when the architects learned to correct the proportions of their predecessors in this respect—to give lightness, loftiness, and dignity no less, to their compositions by throwing a predominance of height in favour of the pier arches, and yet not entirely to sacrifice the importance of the arcades above them. The architect of St. Mark's might seem to have been in danger of forfeiting the grandest effect of the magnitudes he commands in consequence of the comparative fewness of his points of main support, and the unbroken largeness of the spaces he spanned; but even in this respect he is not so far behind his competitors as we find the later builders of Italian Gothic, and he recovered his effect by an adaptation that is all his own—the free interposed arcades.

* See p. 37, ante.

No one who is familiar with the interior of St. Mark's, to whom its ever-varying effects, and its ever-abiding and unchanging effect, have been daily delight, will easily wish that it were other than it is; the liberal spaciousness appropriate to the public worship of a collected population of a great city, is made compatible with the requirements of secluded devotion, and the self-communing of the contemplative; massive grandeur and minutest finish, simplicity and magnificence, meet and are reconciled, and the wealthiest resources seem for once not to have corrupted taste, or distorted judgment, which still can hold the balance even between admiration of rarer materials and gorgeous processes, and the better attractiveness of refined design. When we review the design, however, at a distance and in memory, regret will arise that no worthy attempt was ever made in the ages of vital Gothic architecture, to reproduce and rival its characteristics as a domical structure in union with the perfected details of the Gothic style. Apart from marble incrustations and mosaic covering, the plain unrelieved surfaces of the structure must be oppressive to a degree, which only painting of the very highest character could relieve. But all the lines of the construction would lend themselves most happily to expression and enrichment by Gothic profiles and mouldings; the cupola by its constructive nature would seem to proffer its capabilities of elegance and grandeur to the pointed style, as spontaneously as the elongated hollow pyramid of the spire. The very dome of St. Paul's gives us, in section, a pointed arch; and the concealed cone which is its core, and that having no affinity to the semicircular arcuation, is now advantageously withdrawn from visible association with it, might have been honestly patent in the rival style.

One translation of St. Mark's into the Pointed style took place early, and had considerable influence on a provincial school of architecture; this was the well-known example of St. Front, at Périgueux, in Aquitaine; but here, no less than in the Italian modification in St. Anthony's, at Padua,—

The builder was with want of genius cursed—
The second temple was not like the first.

How different it could be with so many points of accurate agreement is indeed a warning to those who copy badly where the one problem worthy of study is how to recast with mastery independence. Of the intention to copy there can be no doubt; even the slight difference in dimension has been ingeniously traced to the Venetian foot having been read off in the somewhat shorter French dimension, but the workmanship is too much at variance for us to admit the assistance of Greek or Venetian workmen.

The pendentives by which in St. Mark's the square plan of a crossing is reduced to the circular of the dome, are known to be formed by a succession of discharging brick arches bearing on the archivolts of the great arches; at Saint Front it has been found that the courses of the pendentives have horizontal beds; and this may induce us to believe that it was mistrust of construction that caused the transverse perforations of the great piers to be so contracted that they cease to be continuations of the aisles, and become mere disproportioned passages. The aisle colonnades are omitted, the gradation in diameter or area of domes is neglected,—blankness, barrenness, sameness rule throughout, and so the germ that should have taken new developments in a new climate degenerated hopelessly in process of transplanting.

The tessellated pavement of St. Mark's is of marvellous unevenness; in the open space under the chief dome it has been replaced by large slabs,—which, however, are broken,—they are rejoined curiously so as to seem almost bent,—to follow the undulations of the more perfect portions adjacent. One writer has been soberly quoted as authorising the opinion that the inequality was intended to symbolize the power of Venice over the sea; elsewhere the wavy footing, dangerous enough at times, has been interpreted as a refined type of the tempests that trouble the church or the world. It is certainly curious that the floor of the church should have been so ill-founded, while the lines of piers and walls remain so wonderfully accurate; a very small proportion of the subsidence beneath our feet would have started the mosaics and cracked the incrustations in all directions. The case of subsidence is clear by the proof, if any were wanted, of the sinking of the plinth of the left-hand pulpit since its erection, and the consequent

readjustments of the heights of some of its supports; that the crypt when first reopened was full of water to mid-height of its pillars, would explain more serious infiltration.

Before we pass on to remark on the architecture of the vestibule and façade, let us look once more round the interior. The span of the transepts, and consequently the diameter of their domes, is contracted by the insertion of coupled granite columns set against the outer piers on either side, and carrying an archivolt turned below the barrel vault of the main crossing; this vault therefore, which in the nave is carried forward unbroken westward, is superseded over the arms of the transept by one of lower level; the pairs of free columns also, and their arched epistylia, are also set in and range north and south with the granite pair, while the triplets of the nave east and west lie back behind the piers, and do not encroach in any way on the nave spacing.

Again, the barrel vault beyond the transept domes, and above the inclosed chambers at the north and south walls of the church, are still further lowered and contracted by an advance of the line of wall and springing, and exposes the plane of another vertical fascia with an inscription on its mosaic ground.

Even in the nave, where the full grandeur of the vault is otherwise uncontracted, a sub-vault is introduced and shows a plain fascia, at the line where its extension begins over porch and vestibule. In the upper order or story of the transepts the small paired octagonal columns over the granite pair below, bear the contracting archivolts east and west; over the inclosed chambers on the south the second still more contracted archivolt descends again upon another pair parallel to the others, but somewhat in advance; on the north these second pairs are omitted,—their place and function being taken by an advance of the pier.

In the division under the eastern cupola the same treatment is repeated, but with enhancement above the transepts, as those received differentiating details in respect of the more simply ordered nave. Here the eastern and western archivolts of the choir-dome descend upon coupled columns parallel to the axis of the church,—four pairs in all, therefore, instead of two pairs only, as in the transepts. Four single columns, again, of like design and adjacent, each upon a plan at right angles to the coupled pair, receive the transverse archivolts, and make up rich angular groups; the fronts and soffits of these archivolts are enriched with especially-elaborate and resplendent mosaic patterns—the westernmost with an impressive inscription; albeit, in a rhyming Latin verse.

It is with excellent feeling that these upper paired columns throughout the church—the only columns on this line—are exceedingly, indeed, for anything that appears to a not very close scrutiny, are absolutely alike. They emphasise the principal turning-points of the design, and by their prominent correspondences lead the eye easily round the building by a simplified series of stages that might be otherwise confused in the general union of metallic surfaces and un-moulded projections. By their response, again, to larger paired columns below them they provide a link that unites the lower plain marble surfaces with the upper system of exuberant ornament and more complicated construction.

We have already adverted to the fact so important for appreciating the true artistic style and finish of the interior of St. Mark's, that the columns employed have, for the most part, every appearance of having been designed for their positions, of being matched absolutely, or at least with parallel divergence, from a common type. The chief exceptions are the larger and ruler shafts that are attached in pairs to the walls of the western arm of the church and receive archivolts that cross the aisles from the great angular piers; in these we may with probability recognise the columns that are stated to have been left standing from the old church founded in 831.

At the angles of the wall at returns of nave and transept there are groups of three, giving a paired presentation either way. The column at the angle, of deep red granite—like all other columns in the church, the shafts are monolith—stands free; the other two, which are of lighter colour, are partly engaged in the wall, possibly only from encroachment of the later incrustation: the bases are particularly rude in profile and coarsely executed, and the capitals, except for the line of black and white inlaid pattern, scarcely less so. The shafts in the right hand

aisle are so much taller as to dispense with the architrave that on the opposite side is interposed between shafts and spring of the archivolt. The pairs of columns that flank the western door are of nobler materials; they have capitals to a certain point similar to those of their granite fellows, but range with them by a special adaptation; the member which is architrave in one aisle and omitted in the other, is here modified to become an integral part of the capital, below the mouldings that it has in common with the other two. The exceptional irregularity thus managed and modified, kept in the background as far as maybe, and broken in any case into a certain consistency, becomes the highest expression of the resolution of the artist, so fully carried out elsewhere, to give no licence to mere brute magnificence of material to the detriment of orderly refinement.

"Such, then, is Rome!" so concludes Strabo, in his endeavour to give a succinct description of the magnificence of the capital of the world under the first Caesars. "Such, then, is St. Mark's," we hesitate to say, when indeed it is hopeless to say more; it is for poetic faculty, and not for critical or simple artistic appreciation to attempt to convey to those who have not stood below its domes the impression that this glorious temple makes,—deeper than logical thought, more lively than excited imagination, but satisfying both at the same time, as exciting a fund of sentiment that has its headspring beneath them and beyond them. Passing from it, but not forgetting it, we contemplate with a communicated interest its less perfect adjuncts and completions. The western arm of the Greek cross of the church is invested externally on the north and west with a covered portico, vestibule, ambulatory, and on the south side to almost equal width, that is, to more than half the spread of the transept, with chambers that accommodate a baptistery, and at the south-west angle the mortuary chapel of a cardinal: this, however, is a comparatively modern intrusion. Data are not accessible at present to enable us to discuss with any hope of an accurate result the several dates of these external compartments. Considered on their own merits as they are before us, they announce themselves equivocally—on the one hand, as exhibiting archaisms in their mosaic decorations as crude as any that we meet within the church; on the other hand, such ingenuity in general artistic and decorative principles as apparently to preclude the idea that they, or the general façade they are attached to, can be due to the same architect or the same period.

As regards construction, the leading principle is indeed the same. Issuing from the church through the central door and its recessed porch, we find a square opening overhead in the roof of the portico, giving a view through to the continued barrel vault of the nave, as already described, and admitting light from the west window which terminates it, over the advanced wall of portico. To the right and left of this opening, barrel vaults extend to squares opposite the doors to the aisles, and these are roofed by small domes upon pendentives.

Along the north flank there are four such domes, including one at the angle, which is common to the front,—but so near each other that the intermediate vaulting is reduced to a handed archivolt; and opposed to each in the outer wall is an external coved recess. It is observable that the arcuation of the portico north and west is slightly, let us say obtusely, pointed; all above the line of spring is clothed, as within the church, with a gold mosaic ground, bearing Scripture stories; the walls are marble-coated; the pavement is a mosaic tessellation. The most eastern hemicycle is pierced for an entrance door from the northern piazza dei Leoni, and is in immediate communication with an entrance into the north transept, coved, and with pair of niches on either side, marble pillared, marble lined. Along the exterior of the church wall runs a marble seat, between the paired pillars, which receive the rectangular transverse archivolts. In the front portico external are suppressed; recesses that take their place are occupied by tombs of antique dates,—and there is greater luxury of columns and capitals, which in double tier quiche clothe the face of the west walls and inner portions. This is the first appearance by the route we have taken, of a system of enrichment that is extended to extravagance on the fronts; a crowd of shafts, or pillars of confused marbles, convey at first a feeling of confusion after the staid orderliness of the interior,—nor does this feeling wholly vanish even when we

have had time to observe that the multifarious, not to say motley, collection is in truth not left unmarshalled. Pair, we then find, answers with considerable accuracy to pair,—the assemblage is no mere utilization of fragments at any cost of uniformity; but still the symmetrical principle does not only announce itself,—it requires time for being observed,—not to say attention for detecting it, and there is a hard fight at last with the disturbing differences in details.

Again, when we glance over the plan there seems a marked contrast in some points of construction that are in favour of the church rather than the portico. On the exterior of the north porch advanced piers answer to the boms of the hemicycles of the interior, and compose with them such immense masses of solid masonry that they have been constantly referred to as abutments in favour of the stability of the domes. A glance at plan and section shows that they can subserve no such purpose, and improves, moreover, our appreciation of the economy of solid support by which this stability was really effected. On the whole, we are disposed to pronounce in favour of the probability that the investing porticoes are much later than the church, and that neither in leading lines nor in detail do they belong to the original design. The more artificial treatment of the coved recesses of the portico seems to us alien to the taste and spirit of the artist, who only advanced by gradations of enhancement to the still dignified enrichment of the western apse. As regards the naïvely archaic mosaics, we doubt, must be posterior to the erection of the portico; but so they may be also to the church itself, and even to the decorations within it, that seem to assert themselves as contemporaneous. The style of hieratic decorations is, of all others, most difficult to date. We shall find at this day, it is said, on Mount Athos, a monk painting a wall with a saint of a characteristic grimness that should be thought a resurrection from under the whitewash of Santa Sophia.

But "it is too tangled a knot for us to untie;" keep we more steadily to the point of view of simple architectural propriety and beautiful effect.

The western arm of the church is invested not merely below, but by an upper story on all three sides; the result is, that the proper crucial form of the church is entirely masked and the domes rarely can be caught sight of in such a combination as to recover the expression of the plan,—in any case, it would only be to declare an incongruity with the distinct enunciation of the façade.

The façade, as seen from the grand piazza, exhibits a line of five recessed porches, with segmental heads; the piers closely clothed with pilasters in double tiers; a free single column is added at the north-west angle, to extend the front as far as the line of the northern projecting piers; the small open square that it completes at the angle has a low mosaic covered vault; and here alone throughout the structure, and in an addition at the southern angle, given for uniformity, have we found even a faint indication of groin vaulting.

The wider central porch answering to the nave is semicircular in plan; the next on either side opposite to the aisles are narrower, rectangular on plan, and with less important doorways, and these three in themselves would complete an agreeable composition; but on either side again the front is extended by recessed arches and doors on the same line, answering to the flanking porticoes; by the greater span which is assigned to these, the law of sequence is reversed; and still once again our sense of order is destined to receive a further shock by the sharp contrast of the small and narrow stilted open arches at either extremity.

The archivolts of the aisle-porches, like that of the centre, are true semicircles; but those of the flank porticoes have a flattened appearance, a greater width of segment being obtained with equal height by striking them from a centre below the level of springing. Placed as they are, between two narrower openings, they become in a manner secondary centres, to the disparagement of the true centre, and with no proportionate advantage to themselves, unable, as they declare themselves to be, to assert control over their irregular—their unequally narrower, flanking supporters.

Close above the archivolts of the side porches runs the pillared balustrade of a gallery, which has a width extending over the porches and their advanced piers. The balustrade is broken

in the centre by the loftier sculptured archivolts of the central porch. The result again is most unfortunate to the composition taken with reference to the main expression. The aisle porches are still further dissociated from the central porch, which they would most harmoniously support, and attached more intimately to those of the flank porticoes that are only pushed to the front obtrusively and interferingly. In the upper story the composition goes far to recover itself, and its merits have sufficed for centuries to mask the ill-impressions of the disorderly series below. The line of this upper front is only set back behind the gallery so far as to the line of outer wall of the investing porticoes. It follows the same line on the return along the north wall, and the gallery which returns also along this wall is carried by the advanced piers of the exedra.

Five large archivolts above answer to those of the porches of the façade; but here the proportionate sequence is happily corrected. The central arch occupied by the great west window retains its full predominance, and the adjacent arches answering to the lines of the aisles, are now consistently wider than the outer which correspond to the flank porticoes.

Here we become entangled again in another chronological *nodus*. The elaborate finishings of this upper story are due to the Renaissance artists. In fact, the style is so exactly that of the gateway which connects the church with the Doge's Palace that it is probably the work of the same Bartolommeo Buono (obt. 1529), whose name appears there inscribed on the architrave as its architect. Was it due to his taste that the design is recovered here to sequent coherence, or did he but reduce a well-prepared design of earlier date, which had become confused at a lower stage by the inaptitude of an intermediate artist? However this may be, we cannot but be thankful that the disarray of the lower story, in which the outer arches make an unseemly straddle to compass justly the axis of the side portico, was not allowed to propagate its norm abnormal to the upper. The upper and lower designs are thus, no doubt, in discord; but it is well and better, indeed, that all should not be out of joint.

The height of the upper story has a happy subordination to that of the lower,—its enrichment is as happily as appropriately enhanced. This is due to Renaissance artists, who created each archivolts with a low hood of a curve returned to an elevated apex; the edges are brilliant with white marble crocketing of exuberant foliations supporting worshipping figures; the more elevated central apex is surmounted by the blessing Saviour in place of final above the embazoned lion of St. Mark, and the four lower on either side by triumphant saints. Over the four piers intermediate between the five arches are high canopied tabernacles; the conical canopies are doubtless incongruous here, but it were in vain to try to pause to quarrel with them. Statues of the four evangelists are housed in the pointed arch shades, and below each is an elegant figure with pitcher on shoulder perforated for storm waters from the roof,—personifications again, but here by no means grotesquely archaic, of the rivers of Paradise that are below the evangelists of the dome. A somewhat larger tabernacle is over either angle of the front: in that corner left kneels between twisted colonnettes the Virgin of the Annunciation; in the other the announcing Angel. The distance of separation is not unusual in representations of this subject; so on the bridge of the Rialto the Virgin kneels in bas-relief on one spandrel of the bridge, and the hastening Gabriel appears in like position on the other side.

The upper design, thus, it must be admitted, no less than the lower by loading the plain expression of the nave and aisles of the church with co-ordinate expressions of the outer corridors that are mere external adjuncts; sins, indeed, more seriously, for moderation in this respect in the upper design would have gone far to contravert any trespass in the lower—if not to establish it as justifiable. The architects, however, seem at last to have a little left aside their regard for the church itself, in anxiety to spread out the front to an extent that would make it a proportionate occlusion to one full end of the grand piazza.

Some observations yet remain to be made on the treatment of the lower portico. While we should ascribe the ground plan of the façade to an architect other than the designer of the church, we feel inclined to recognize again an interfering and inferior hand at a certain point of

the elevation; a change of taste, and a change for the worse, seems to supervene at the spring of the archivolts. The boldly advanced piers are clothed in front, and on the recessed sides, with closely set shafts of most varied material and colour, and irregular in diameters, finish,—in almost every respect. Still they are disposed by no means at random, clumsily, or independently of a system deliberately thought out. On the lower range especially, dark and light shafts alternate, and are opposed with marked symmetrical purpose. These larger shafts have a podium of good solidity, and support an architrave, that in its turn serves as a podium to the upper order. These smaller shafts are so closely set, that their capitals and bases are in contact, and so that six above are included in the dimension that takes only four below. At this point ensues the transition that is made so awkwardly. The merest ledge scarcely thicker than an abacus appropriate for a shaftlet, is interposed between the capitals and the springing of the great archivolts. These are too large to respond directly to individual capitals, and the intermediate course is far too slender to even seem to bind several solidly together. The decorative character of the shafts is abruptly superseded by a constructional demand upon them, for which no adequate support is afforded. In the smaller porches there is more appearance that the outer arches were intended to fall as truly on the capitals at the angles of the piers, as is the case, but still not universally, with the recessed architraves that descend on nook-shafts on either side of the grand entrance. But the aim is missed, and sometimes a capital is only half covered, and in other instances they stand free. There is a general unluckiness prevalent through the entire series, the more glaring from occasional examples of the happiest agreement. Barbarian here is self-betrayed and obtusive. Have we before us, we inquire, a work of better intention, that has been carried forward by bunglers? Surely so, rather than rudimentary developments of tentative genius.

We spare to enter in detail into the treatment of the exterior on the north and south. Here, as decidedly as on the façade or still more decidedly, the church itself is masked by the investing chapels and porticoes below, and by a story above them, of which the interior is discovered neither from church nor porticoes, and has no correspondence whatever with the grand interior.

In itself the investing portico appears to be a happy and appropriate addition to a church of importance; it replaces the ancient narthex; it softens with more bappy gradation than the atrium of St. Ambrogio at Milan, the transition from the worldly to the sacred atmosphere, and supplies for the general congregation an invitation to the same tone of feeling that the cloisters may be supposed to have generated in reflective denizens of an abbey. Such an extension of it, however, to façade and upper story as we have commented on at St. Mark's, is in every sense no less than artistically, an encroachment and an abuse.

The four horses of gilded bronze from Constantinople stand on free pedestals in the centre of the gallery, and disadvantageously low over the main porch. Behind them are four loftier pedestals; we could almost believe that these marked their original position, and that space was found for them lower by abolishing a super-archivolts of the main porch, which seems so much missed by the heavily-sculptured arch, and for which there is foot-space blankly forlorn over the middle colonnettes of the piers. Otherwise these four higher pedestals might seem intended to accommodate upon the usual scheme, the three feet and foot-supported bow of a colossal lion of St. Mark.

Of the richness and quality of the various marbles employed enough has been said by others and elsewhere; others also have noticed the insertion as exterior ornament of a slab on the north side with a pagan subject,—Ceres in dragon car, with torques, in search of her daughter. But a still stranger subject is that has-relief on a slab set in the north angle of the façade, which shows Hercules returned to Argos with the captured Erymanthian boar, and Eurystheus as we see him on the ancient vases, retreating in alarm into a huge vessel as a hiding-place. It is not easy of conjecture, to confusion with what incident in sacred lore such group can have owed its position.

Thus much, then, we have said in qualification of the enthusiasm that not inexcusably is excited

by the first—nay, sustained and fed by long familiarity with St. Mark's; thus much we have said in vindication of the genius of some earlier architect, perhaps architects, whose work, from the very admiration it excited, attracted some sedulous extensions, that though sometimes apparently inspired by very contact with the original work, in other cases unfortunately defaced, overloaded, or overlaid it.

After all discriminations have been weighed and accounted for, the final impression which we would report from the whole, taken even as it stands, is far more in sympathy with that of its uncritical worshippers, to whom whatever there is in it is right, than with strictures we meet with from a writer more sober, but whose consistent endeavour is above impeachment. The late Joseph Woods, writing in 1816 (see "Letters of an Architect," published 1828), says truly enough of the Orologio or clock tower to the left of the church:—"It is not good in itself, and contributes nothing to the whole effect." He proceeds—"I do not say this of the campanile, though it is merely a great square tower, above 300 ft. high, terminated by a pyramid, and having no intrinsic beauty; its power of pleasing is owing to the strong contrast it affords, running up so high upon a narrow base, to the long-continued horizontal lines of the piazza, and to the lumpy forms of the cathedral." Be it observed in passing, that the admitted merit of enhancing a large general effect—a merit which extends far beyond the limits of the piazza, is of noble nature and more worth than any such beauty as might be styled intrinsic, but which should only be beautiful while looked at by itself, and helping to disgrace and discredit everything around. "The exterior of this church," the criticism proceeds, "surprises you by its extreme ugliness more than by anything else. It is of two perfectly distinct styles. The lower belongs to that degraded Roman which we call Norman, adorned with numerous little columns, and abounding in ornament; but the ornaments are merely such, neither forming nor interrupting the lines of the architecture, but entirely subordinate to them," &c. Presently we read again of these columns that they "are mostly good and ill-made; some are of their original length, others have been shortened; the capitals are almost all different—all in bad taste, and disproportioned to the columns, being not so much in height as in diameter, some being too large, and others as much too little."

It is hard to say that these things, and there are more such imputations in reserve, are not so; it may seem a bad task after such admission to have to justify to ourselves and others our admiration, our enthusiasm; it is to the behoof of a truly hardy and healthy criticism that it should be endured to recognising fairly whatever of truth however unwelcome, and so confront it fairly. Whether we badage our own eyes or cover up our facts out of sight,—whether we are silent upon a fair half of our subject or involve it by our utterance merely in a haze of metaphors and nebulous wordy extravagance, we do equal injustice and expose the most ingenious exposition to deserved disaster. "The Duca palace," says Woods, "in the next page, is even more ugly than anything I have previously mentioned." This was not in 1816 so bold a paradoxical speech as it might be held now; but precisely because such judgments on the great architectural combinations of Venice would now be unpopular it is desirable to revert to them as they were enunciated before present influences came into play. The result, we believe, will be that after the most candid recognition of blots and blunders we shall revert to our original impression—that in architectural design, as in heroic natures, there may be a value in the larger scope of character that will atone for very grave accumulative errors in detail. "Has your master no virtues then," said Henri Quatre to the Spanish nobleman who wanted his king's exemption from some kindly weaknesses, "has your master no virtues that he must take his stand upon superiority to peccadillo?"

In justice to Woods, it must be said that he has a true feeling for the prime virtue of this great architectural centre, though misled by too technical hesitations, to depreciate its primacy. This grand and decisive excellence is found in a successful union of a display of power and riches with a certain justness of proportion in the masses and in the distribution, so that a moral grandeur dominates at least the mere material magnificence; and minor inaccuracies and carelessness are superseded by the dignity of the whole,

THE PRINCE CONSORT MEMORIAL, HYDE PARK.

We have from time to time mentioned the progress of this monument, and given particulars of its details in the order in which they have been erected. We are now about to add a short account of the designs of the mosaics which are to fill the spandrels of the arches forming one of the principal stages of the memorial, and of the figures, also to be executed in mosaics by Signor Salviati, that are to fill the gables over them. It will be remembered that these figures, four in number, are to represent Architecture, Sculpture, Painting, and Poetry, and that the two spandrels of the arch beneath each figure are to be occupied with a design carrying out a delineation of the subject over which it presides. Thus, under the figure representing Architecture, the two spandrels will contain mosaics giving an idealised presentment of the details of the practice of architecture; under that of Sculpture are to be placed illustrations of sculptural manipulations; and so on.

We must further premise that this series of designs is from the pencil of Mr. J. R. Clayton. He has treated his subjects with poetical as well as pictorial feeling. His figures, Greek in their proportions, in their small well-poised heads, in their regularity and general similarity of feature—low brows, straight noses, full eyes, prominent chins—are Mediaeval in their handling. He seems to have treated them with the privacy and severity of the ancient Greek models, yet clothed them with the warmth and life of Mediaeval associations. Looking first at the spandrels representing Architecture, we see two draughtsmen seated at a table at work, with compass and pencil. Their heads and limbs are Greek, youthful and graceful; especially the hands are well formed, the fingers long and slender; their drapery fitting, yet sufficiently flowing to fall in folds conformably to the movements of their limbs. Not a line or a fold could be spared from the reticent purity of the composition so far. Then we note the spirit of the Mediaevalist making its mark. The foremost figure is shown, full length, seated with one leg bent under the opposite thigh on an open wooden stool, resting his elbow upon the table, his head upon his hand, drawing, abstractedly. The second figure, owing to the exigencies of the spandrel form, is not shown below the waist. He is represented as intent upon a measurement of a drawing spread upon the table before him. In the opposite spandrel we see the stalwart workmen of the Middle Ages; they who dexterously placed the mighty stones in their appointed places, and they who lifted the heavy burdens and carried them to and fro. A mason, with upturned sleeves and close-fitting cap, standing on scaffolding over an arch, the centering of which is not withdrawn, trowel in hand, is preparing a bed of mortar for a stone ready before him, to be put into position. His brawny arm, his wide thick hand, are in marked contrast with the slenderness and delicacy of those of the draughtsmen, as are his broad shoulders and air of docile strength. Behind him, close to a ladder, stands a labourer older, more worn, with uncovered head and close-cropped scanty hair, tightening a rope about the point of junction of two poles; older, as we said, and hollow-eyed and hollow-cheeked, but still able to twine the great cordage about his arm, and with a good grip make it fast and safe beyond chance of slip.

The youthful female figure that represents Poetry is seated on a cushioned throne, the canopy of which rises over her head in the apex of the space filled by the composition. In her right hand she holds a lute, the lower part of which is resting on her knee; with her left hand she is unrolling a scroll, the end of which falls over her arm in bold curves. Her robe is drawn about her neck by a band which crosses her breast in a straight line, and rises over her shoulders at right angles, and thence descends below her waist, till it is hidden by a second mantle thrown lightly over her knees, and which falls, in its turn, about her feet upon the steps of the throne. Part of one foot only protrudes from this last-mentioned vestment. The head, slightly turned towards the left shoulder, is crowned with a garland of flowers and spiked leaves, fastened with a knot of ribbons. The features are small, clear, and refined; the expression mild, dreamy, and longing. In the spandrel on the right of this beautiful impersonation are two youths, the one entrancing, the

other entranced with the subject and sound of a lyric. The first figure, or that occupying the perpendicular space of the spandrel, is seated, and with extended hand striking the strings of his instrument, which is resting upon a portion of balustrade; the second faces him in a leaning posture with a clever arrangement of attitude that follows the curved line. An expression of soft rapture beams from both faces. In the left compartment a third figure is seated beneath a tree, in the act of composition; a scroll lies spread before him, and a quill is in his hand. At the moment of representation he has rested his head upon his disengaged hand, and is looking wistfully into the realms of thought. A fourth figure, full of years in an attitude of meditation, as of one who has seen into the orbic of experience, with drooping eyelids and folded hands, fills in the horizontal portion of the spandrel.

Painting is seated, palette and brushes in her left hand, her right firmly upholding a panel, or canvas, standing on edge at her side. Her hair is bound closely to her head by a band; besides this ornament, a second circlet encompasses it, from which leaves spread themselves out in a ready coronet. Her robe is ample, covering her neck and arms, drawn in at the waist by a double cincture, and falling in massy folds over her knees and upon the ground. The expression upon her features is that of resolve. No suggestion of languor, tenderness, or wistfulness in her lineaments mars the impression of high ability and stern determination to act. We feel, as we gaze upon her bright, resolute face, that the most sluggish of painters would acquire vigour under her banner. There is more fire, too, or more earnestness, in the countenances of the painters filling the spandrels, of which this energetic figure is the central crown. In that on the right a youth holds a panel, upon which an artist, seated with his back to the spectator, his heart and soul in his occupation, is sketching in an outline. Purpose, genius, and skill are apparent in this last figure, and well contrasted with the hand, vague, scarcely awakened curiosity of his less-gifted assistant.

Sculpture, grave and thoughtful, uncrowned, bare-armed, with an implement of her art in her left hand, and a product of it, in the shape of a small draped figure, in her right, is seated with her arms resting upon the low sides of her chair. Her air and attitude are alike indicative of well-earned repose. Her mien is that of a contemplative worker intent upon creations of power and beauty. The folds of her drapery are, like her purpose, bold, well-defined, grand, and certain; neither light nor petty, not profuse nor overcrowded. In the spandrels are more delineations of industry and allusions to creative will. On the right a sculptor is seated between a female figure holding a tazza, upon which he is at work, and his model. His back is turned to us, his mallet uplifted, his chisel placed in the fold of the drapery he would deepen; vigor and determination are apparent in the tension of his arm, in the position of his head, in his concentration of thought. In the spandrel on the left a second sculptor is giving the last touches to the drapery of a model. A third figure, probably that of the chief of the studio to which this last belongs, reverent and bearded, yet in the prime of manhood, overlooks his progress from the background, resting as he does so an arm upon the base of a colonnade and clasping his pendant wrist with his otherwise unoccupied hand.

Those whose sympathies are with the revived art of the mosaicist will enjoy this portion of the details of the gradually growing monument.

THE HOUSES OF PARLIAMENT.

SINCE last session, several works at the New Palace at Westminster have advanced towards completion, under the direction of the architect, Mr. Edward M. Barry, A.R.A., and workmen are at present busily engaged in making some new arrangements in the House of Commons, with a view to provide additional sittings for Members and others. Below the bar there have hitherto been three rows of seats on each side of the House appropriated to Peers and other distinguished strangers. In consideration of the inconvenience often experienced by members from a want of room, the two front rows of these seats have been thrown into the House, which gains

by this means thirty-six additional seats for members. The strangers disposed of by the change will be accommodated in the gallery behind the clock, facing the Speaker. This gallery, known as the Diplomatic Gallery, has hitherto contained seats for twenty persons; but, by the addition of an extra seat, it will now accommodate forty-six strangers; and, as the number removed from below is twenty-eight, there is only a loss by the new arrangement of two seats for strangers, and a total gain of thirty-four seats within the present walls of the House.

In St. Stephen's crypt the baptistery has been finished and decorated. The floor is paved with Minton's tiles, mixed with marble of different colours, and squares of white marble incised with outline heads of the evangelists and other saints. A font occupies the middle of the baptistery. It is of alabaster, with marble columns supporting it, and is placed on two steps. The sides of the baptistery, which is octagonal, are lined to about 5 ft. from the ground, with alabaster incised with grotesque patterns; and above this dado there is a holdy carved cornice of alabaster. The groined roof and upper part of the walls have been decorated by Messrs. Clayton & Bell, a figure of the Saviour in a vesica facing the door, and a nearly full-length figure of St. John the Baptist facing eastwards. The window opposite the latter is filled with grisaille glass by Hardman. The baptistery is placed at the south-west angle of the crypt, and is entered from it. It will reward a visit.

Mr. Grace is at work in the Royal Gallery completing the decoration, which had been left unfinished by Sir Charles Barry. The stonework is elaborately painted and gilt, and four out of the eight statues, for which niches are provided, are finished, and are now being fixed in their places. The statues are in stone, by Mr. J. Birnie Philip, of the following monarchs:—Alfred, William I, Richard I, Edward III, Henry V, Elizabeth, William III, and Anne, who have been selected as representing the great wars of English history, according to the principle indicated by the choice of the subjects of Waterloo and Trafalgar for the pictures by Maclean painted on the side walls. The statues are to be gilt with dead gold, varied in shades, and toned down by picking out with dark colour parts of the dress and ornaments. In the adjoining apartment, the Queen's Robing-room, Mr. Dyce's frescoes have been repaired by Mr. C. H. Cope, R.A., and the decoration of the room has been completed. The ceiling, which is panelled, has been painted and gilt, statuettes of English princesses have been placed in the niches, and a panel behind the throne has been filled with embroidery representing the royal arms, with the cyphers V. R., on crimson velvet. The upper panels in the wall framing were left unfinished at the time of Sir C. Barry's death, and they are now about to be filled with bas-reliefs in oak by Mr. H. H. Armsted. The bas-reliefs are about 2 ft. high, and of various lengths. They represent scenes from the "Morte d'Arthur," in accordance with the subjects of Mr. Dyce's frescoes of the exploits of the Knights of the Round Table. Nothing has yet been done to carry out the recommendations of the select committees of last year on the House of Lords or the enlargement of the House of Commons.

In new Palace Yard the iron entrance-gates, made by Hardman, are being fixed, and a drinking fountain of plain polished grey granite has been placed near the cabstand, for the use of the cabdrivers and others. The statue of Sir R. Peel has been removed from the angle opposite Parliament-street. The turf border on the side next Bridge-street is being laid out with beds for flowers and overgreens. In Parliament-square, where Canning's statue formerly stood, the two turfed spaces are being laid out in a dissimilar way, and trees and shrubs are about to be planted in the inclosure opposite, behind the present site of Canning's statue. The iron railing round this inclosure is being set back to widen the footpaths, and the corner next George-street is cut off, so as to have Mr. Burton's octagonal drinking-fountain isolated, and approachable from all sides. The plots in Parliament-square are being inclosed with a wrought-iron railing about 3 ft. 6 in. high, made from the architect's design by Messrs. Skidmore. All the works above described are being rapidly pressed forward, that they may be completed as far as possible before the meeting of Parliament next month.

THE LATE MR. ARTHUR ASHPITEL, ARCHITECT.

LAST week we briefly recorded the death of a valuable and universally esteemed member of our profession. Mr. Arthur Ashpitel died on the 18th inst., at his residence, 2, Poets'-corner, Westminster Abbey, at the age of sixty-two years. He was never married.

Mr. Ashpitel was born in Hackney, and educated at Dr. Burnett's celebrated school. When about twelve years old he met with a serious fall, and dislocated his hip, which crippled him for life, and laid the foundation of serious illness.

He was a man endowed with vigorous intellectual power, and, probably in consequence of the fall which debarred him in a great measure from very active bodily exertion, he was from an early period and through life a careful and laborious student of ancient and modern literature.

He received his professional training in the office of his father, who was a pupil of Mr. Daniel Alexander, and had a considerable practice in partnership with Mr. Savage. Mr. Arthur Ashpitel commenced work on his own account about the year 1842 in Crown-court, Old Broad-street, where he conducted a considerable practice as an architect and a large business in compensation and reference cases. Among his architectural works are the churches of St. Barnabas, Homerton; St. John's, Blackheath; of Ripple, Ilford, Verham Dean, Aldborough, and others, as well as some schools at Hoxton. Illustrations of the church at Homerton, and of a tomb more recently designed by him, will be found in our pages.

In the year 1850 he entered into partnership with Mr. Whichcord at Carlton Chambers, and subsequently at Poets'-corner, Westminster; and for several years was engaged in large general practice. Amongst his works at this period may be enumerated several private mansions in Surrey and South Wales; the clock tower, London Bridge; establishments of public baths and washhouses at Lameth, Maidstone, Bilston, Kidderminster, Llanelly, &c., one or two blocks of dwellings for artisans, and the Kent Ophthalmic Hospital.

His health failing, he left England for Italy in the year 1854; travelled for a considerable period with the late Mr. David Roberts, R.A.; and resided some time at Rome, where he made the intimate acquaintance of the late Cav. Canina, and entered upon a course of study that resulted in his "Restoration of Ancient Rome," which he exhibited as a drawing at the exhibition of the Royal Academy. He also made a drawing, "Rome as it is," and the two were reproduced in chromolithography by the Messrs. Kell.

Of late years Mr. Ashpitel had retired very much from the active exercise of his profession, and devoted himself to literary pursuits. His pen was constantly employed, and his studies were directed to the elucidation of archæology; his contributions have been frequent and valuable to the Society of Antiquaries; the Archæological Association; and to the Dictionary of the Architectural Publication Society. In connection with the British Archæological Association he contributed papers on the Cathedrals of Worcester, Chester, Lincoln, Rochester, and others. He also edited an edition of Nicholson's "Carpentry," and quite lately edited, under the title "A Treatise on Architecture," papers on Architecture and the Arts of Construction, originally published in the "Encyclopædia Britannica." These papers, as we mentioned in our notice of the book when it appeared, he supplemented in various parts.

In more general literature Mr. Ashpitel, who was a Tory of the old school, wrote early in life several political pamphlets and satirical poems, which at the time attracted considerable notice. Some of the *vers de société* and translations from the Greek Anthology, which, published in the *Obit*, gained attention, were from his pen. He was a frequent contributor, also, to *Notes and Queries*.

Mr. Ashpitel took a very active interest in the affairs of the Royal Institute of Architects, and when he was in sufficient health he was a frequent attendant at the meetings. He was elected a vice-president of that body in 1862, and on the resolution to initiate a voluntary Examination for proficiency was appointed one of the examiners, in which position his matured learning was found of great value.

His death will be felt in many quarters as that of an amiable and accomplished scholar,

and the profession will regret the loss of a disinterested and kindly colleague.

His remains were interred on Monday last in the family vault, at St. John's, Hackney. In the first coach were (his only brother) the Rev. F. Ashpitel and his son; the next was occupied by the Rev. W. Denton, and Messrs F. and O. Denton; and the third by Messrs. B. B. Woodward, A. White, J. Whichcord, and Olding. In the last coach were Messrs. James Edmeston (who began professional life with the object of our notice some twenty-five years ago), Wyatt Papworth, W. Gritten, and T. H. Porter.

We are able to add to our notice the announcement that Mr. Ashpitel has bequeathed the greater part of his rare and valuable books, and his collection of antique and Etruscan vases, brought by him from Italy, to the Society of Antiquaries; that the two drawings of Rome are left to the National Collection, South Kensington; and that provision is made for founding a prize at the Institute of Architects.

ON PRINTING AND GRAINING FROM THE NATURAL SURFACES OF STONES.

At a meeting of the Society of Arts, held on the 27th, Mr. George Godwin, in the chair,

Mr. W. Dean described his patented process for taking impressions from the grain of wood, and transferring those impressions on to other surfaces, and which he has called "Xylography."

Before entering on a description of this process, he made a few remarks of a personal character. He said,—I think it was about the year 1833 when the late Mr. Minton added to his other large operations that of making encaustic tiles. From the first it was felt that pattern sheets of the tiles—which in those days were all of one size, 6 in. square,—would have to be printed, to send to architects and others, for the purpose of illustration. These were printed from wood blocks, the size of the tiles, and were engraved, I believe, by Mr. Barr, of Birmingham. They were printed on huff paper, which represented the groundwork of the tiles, in red and black, which represented the ornament, these being the only colours then in use. The practical inconvenience of patterns of this size will be obvious, and so it was felt at the manufactory, and Mr. Minton decided to reduce the size of the patterns, and to have them printed from stone, under his own superintendence. But at that point he met with this difficulty, there was not a lithographer in the county. With his accustomed energy and promptness, he determined that he would have a lithographic press in his own town; and, in the arrangements which were made to carry out that decision, it so happened that I was selected to go to London to learn the lithographic printing, and, early in 1835, I entered the establishment of Mr. Hullmandel, of Great Marlborough-street, as a pupil. After a residence of some months in London, I returned to Staffordshire and commenced operations. In working on these pattern sheets for Mr. Minton, I received valuable aid from Mr. Hullmandel, and I remember well, when Mr. Minton introduced the deep blue on buff ground on the tiles, the difficulties I had to contend with in printing blue on huff paper; for as you are all aware, no doubt, that the result was huff and green, and not huff and blue. Trials almost without end were made. I was greatly perplexed, and Mr. Minton became very impatient, for it so happened that he was engaged in getting up a design for the floor of a church for the Marchioness of Lodiham, in which tiles with a blue ornament on a buff ground were introduced, and we were within three days of the date when the design had to be forwarded. In a state almost of desperation, and while casting about for help, in a happy moment I thought of Mr. Hullmandel, and decided to write to him by that night's post, in the hope that he might possibly help me through the difficulty. The return post from London was due on the day the design had to be forwarded; the morning came, and with it a letter from Mr. Hullmandel. It was very brief, but very characteristic of the man, and was as follows:—

"DEAR SIR,—Print in varnish, and dust with dry colour.
Yours truly,
C. HULLMANDEL."

I need scarcely add that the design was forwarded in time, greatly to the delight of Mr. Minton. To some present this may seem strange enough; but it must be borne in mind that, at

the time I am speaking of, chromolithography was not introduced.

I proceed to remark that in showing my own patented process in different places, I have often heard it observed, "How very remarkable it is that this has never before been discovered;" and indeed in that light I myself regard it, especially when I reflect on the fact that pieces of oak, such as I now hold in my hand, called by letter-press printers "reglets," have been in use by them for, I should say, at least a century, and probably for a much longer period, and that there never occurred to the thousands of masters and workmen who, during that period, must have seen imprinted the veining of those reglets, the idea of turning the fact to practised account, and giving to it a commercial value. Yet such appears to be the fact.

Before I enter on a detailed description of the process, I will glance at the range of the patent, and point out those branches of industry to which it is specially applicable. These are as follows:—for transferring impressions from wood to plain deal, or to painted surfaces, either flat or moulded, in buildings of all descriptions, where an accurate transcript of the more costly woods is desired, and for bonse and bedroom furniture generally; for japanned goods, made in metal or papier mâché; for enamelled parquerie tiles, and for articles in earthenware, such as garden seats, oyster and flower tubs, spirit cases, flower-pots, tea-urn stands, &c.; for enamelled slate, for paperhangings, and for oil cloths.

Having thus briefly indicated the nature of the patent, and the range of its application, I proceed to state the methods by which these results are arrived at. Select a piece of wood of fine quality about 5 ft. long, 12 in. wide, and a ¼ in. thick; it is, to use the technical phrase, cleaned up by the cabinetmaker on both sides, and is well sand-papered down. By having both sides of the board cleaned up, two patterns are obtained from the same board. A chemical preparation is then applied to it, which has the effect of opening the pores of the wood, and, at the same time, of hardening the surface, and, when the board is thoroughly dry, it is ready for use; and is, in fact, a wood-plate, "not graven by art or man's device," but by the Great Designer and Architect of the Universe, whose works, the most stupendous as well as the most minute, are all perfect. The material used for taking the impression is prepared in oil, and is specially adapted for the purposes of transferring. The paper, too, is manufactured for the purpose, is very thin but tough, so that it can be successfully applied to any irregular or moulded surface, and is sized to prevent the colour from becoming incorporated with the body of the paper. A small wooden roller is used for spreading the colour on the board, and a large, broad, flexible palette-knife is used for taking the superfluous colour off. That being done, the sized paper is placed on the board, and both are passed through a small machine having turned iron cylinders, the upper one being covered with double-milled flannel; the paper is then taken off the board, its printed surface is applied to the article to be decorated, the back of the impression is lightly rubbed with a piece of soft flannel, the paper is removed, and an exact *fac-simile* of the board from which the impression is taken is given. But that is not all, for a second and a third transfer is frequently obtained from the same piece of paper, and sometimes a fourth, a fifth, and a sixth. This is one of the remarkable features of the process; and, as you will not fail to perceive, must have a very marked influence on the rapidity of its application, and, consequently, on its cheapness. The thought may occur to the minds of some present, "but in taking off the impressions do not the boards get foul, and the pores of the wood clogged up?" The thought is a natural one. My answer is, that with the colour properly prepared and adapted for its purpose, they do not, no more than does the plate of the copper and steel plate printer; but such a result would occur in both cases if the material used was not suitable for its purpose. When a board has been used it is treated as all other plates are,—a cheap material is used for dissolving the printing colour, a handful of fine sawdust is then rubbed over it, which most effectually draws out of the pores of the wood the dissolved colour, and leaves the board clean and ready for further use when required. Another question may arise in some minds,—"But what about the durability of the boards?" The answer to that question at

first sight may appear startling, but I am satisfied it is correct, notwithstanding, that under the same conditions, provided no accident happen to it, the board will be far more durable than either the copper or steel plate. I have arrived at that conclusion, not only from close observation, but from actual experience; for it is a fact that there are boards at Messrs. Thomas Simmonds & Sons', Manchester; at Messrs. Minton & Co.'s, Stoke-upon-Trent; and at the carriage works of the North Staffordshire Railway Company, which have been in something like regular use for nearly three years, and my conviction is, that they are in as good a working state at the present time as they were the day they were first used. Nay, more,—I believe that some boards, with careful and constant use, improve rather than deteriorate. This is one other point I will allude to before passing to the other important branch of the subject, and that is with respect to variety of pattern. That question has sometimes met me in a very hurtful form. I have been told that there would be either great sameness in the work, or I must take a timber-yard with me. My answer to this is, not necessarily either the one or the other. For example, I take a board of the size already named (5 ft. long and 12 in. wide); this I use on both sides, and from one such board I obtain 10 ft. superficial variety of pattern, and in applying the impressions I do not follow that they should all be applied precisely in the same way; so that half a dozen boards of the sizes named would give 60 ft. superficial of variety of pattern, and that variety would be trebled by judicious application, and would give ample variety for the largest room in a nobleman's mansion. But there is no necessity to limit the number, if greater variety is desired, the boards being cheap enough, only costing about half-a-crown each.

The second division of the subject, and the one to which I shall now direct my attention, is the important one of quality and cost. In dealing with them, instead of giving my own opinion, I shall give that of others—persons of refinement and taste, and of large practical experience.

I have taken considerable pains to bring my specimens and process under the notice of architects, both in London and in the provinces; in some cases an audience has been denied me; by some I have been told plainly enough that they hate all imitations; but by others I have met with a very courteous and, sometimes, a flattering reception.

Messrs. Thomas Simmonds & Sons, of Manchester, were among the first to adopt my patent, and, after three years' experience of its practical value, have had the spirit to arrange with me for an exclusive licence for the city of Manchester and Salford. Shortly after they introduced it they were employed to erect a mansion for a gentleman who had seen my specimens, and who wished to have the graining done by this process. The architect objected to it, but the proprietor persisted, and carried the point. When the mansion was completed, the architect, the proprietor, the builder, and the patentee met to look over the work. After the inspection, I took the architect to the entrance-hall, to a point where the imitation was worked up to the solid oak, and where we had a good view of both; and, while looking at the work from that point, I asked the architect whether he thought there was more than one person in a hundred who would be able to say where the solid ended and the imitation commenced. He replied very frankly that he thought there was not. I replied, that being so, I thought my patent process ought to have fair play, and it ought not summarily to be put out of court. He said he quite agreed with me, that it had worked out much better than he thought it would do, and if I would call on him at his office, he would give me an hour to talk over its application elsewhere. You will readily imagine that I was perfectly satisfied with the result. I had fought the battle of imitation and won. The next illustration I shall cite took place in one of our largest provincial towns. The architect has attained to considerable eminence in his profession, and the case afforded me some amusement. After a careful examination of my specimens, and listening to what I had to say in their favour, he called his chief assistant, and, pointing to the specimens, asked him what he thought those were. He replied, very promptly and emphatically, "I suppose, sir, you will call them shams." The reply was, "No, I shall not; these are not shams, they are a transcript from the wood itself, and, therefore, must be both true and natural."

The building firm whose opinion of the quality of my specimens I shall now have the pleasure to quote, are the builders of the new Foreign Offices, Messrs. George Smith & Co., of South-street. Judging from the solid oak-work inside that building, I may safely say, that if any persons in the kingdom are competent judges of quality of work, they are; and I esteem the opinion expressed by Mr. Taylor, of that firm, of the utmost value to me. While Mr. Taylor was examining my specimens, Mr. Smith, jun., of that firm, came into his office. Mr. Taylor, after directing his attention to them, remarked, "This is what we are got to now; we cannot tell the solid from the imitation of it. I think I know as much about wainscoting as most men, and I defy any man to tell these specimens from solid wood."

As to the question of cost, I may remark here that there are plenty of painters, in London and the country, who say that they can get graining done at 5d. and 6d. per yard. I do not deny the statement, for I heard one gentleman say that the men who did his graining got through a great deal of work, for they did it with white-wash brushes, and, for aught he knew (or perhaps cared), it answered as well as if it were more costly. There are others, however, who are candid enough to admit that, for good oak-graining, they have often to pay 2s. or 2s. 6d. per yard. Among the latter I have pleasure in mentioning Mr. Foxley, of London. I have it on the authority of Mr. Crossley, of Newark, that he paid to a London grainer 50s. for graining fifty doors for him, in a house he was decorating in the metropolis, for, I believe, a Nottinghamshire gentleman; but Mr. Crossley declined to affirm that the hand-graining he paid so high a price for was equal in quality to my specimens.

A painter in Burslem was anxious to see some work done by the process in his own house; a man and boy were sent over to do some, and they grained two six-panelled doors in twenty minutes by the clock. The wife of the painter told me she watched the clock with the special object of ascertaining how long it took to do them. The same man and boy grained an octagon pulpit for another painter, about three miles from Burslem, in an hour and twenty minutes. Both these painters purchased licences. When Messrs. Simmonds & Sons, of Manchester, purchased a second machine, I gave one of their men instructions in working the process, and, after three days' practice, I asked him about the quantity of work he could do as compared with hand-graining, and he informed me that he was quite sure he could do one-third more than by hand, and much more easily and pleasantly to himself.

The question of durability has been raised, and properly so, as that is a point of great importance to the public. To enable you to judge, I may say that the hand-grainer works in distemper, I in oil-colours, and it resolves itself into the old question, which is the more durable—water-colours or oil-colours? After all, the test of experience is the most conclusive and satisfactory; and here again I must refer to my specimens, as the large one has been done more than three years, and has had a good deal of knocking about at exhibitions, and travelling through the country. If a good sound varnish is used, such as is manufactured by Mr. Williamson, of Lancaster, I have no hesitation in saying that the work will be very durable, and more so than work done by hand.

The letter-press printer reproduces old and scarce books, and the chromolithographer reproduces rare and costly pictures, and they do so at a price that places them within the reach and means of the general public. So this process is designed to make accessible to the community in general copies of the more than artistic beauties of a part, though it be but a small part, of the glorious works of God. I flatter myself that I can, even at this early stage of the process, produce as fine a copy of a choice piece of Baltic hillek oak as the chromolithographer can produce of Stanfield's "Venice," Turner's "Polyphemus," or any other fine work of art.

At the conclusion of the paper a discussion ensued, to which we may refer on another occasion.

Discovery of a Crypt in Hungary.—A fine crypt of the twelfth century has just been discovered at Gran, near the cathedral. Eight granite columns support the roof, and each has a different capital. The monument is to be thoroughly restored.

INDIAN PUBLIC WORKS DEPARTMENT.

The Indian Public Works Department is attracting some attention at present, and it may be of interest to afford a description of how works are carried out by it; and what advantages it offers as a career. Before 1853, military roads and buildings were almost the only undertakings of the East India Company, of an engineering kind. Expensive wars were waged continually, absorbing the surplus revenue. Such things as loans for productive enterprises were not thought of; but a considerable debt was gradually incurred for warlike purposes, and with great readiness. Millions are at once forthcoming for a war, but to irrigate the country, for instance, where similar sums are wanted, there has been the greatest disinclination to borrow.

The public works were managed by the military boards, as they were termed, in the different Presidencies, constituted of the commandant of artillery, the commandant of engineers, the Commissary-General, a paid member, and a secretary. The Military Board had the regulation of the commissariat, clothing, and stud departments, as well as the Public Works Department. One of its main objects was, to check, not to encourage, expenditure; and while it is often obviously beneficial to reduce military charges to a minimum, it is utter destruction to a country to draw as much revenue from it as possible, and give it nothing in the shape of roads, canals, and other useful works in return; only fortifications and barracks, constructed in the cheapest way practicable. It was found out that a board to check expenditure was not the best for the Public Works Department to be under, and the Department was rendered independent of it. But the profession of engineering had no weight in India. Men like Sir Arthur Cotton spoke in vain. The influential service in India is the Covenanted Civil Service. By it the revenue is collected and justice administered, and the legal and general councils are formed chiefly. In its eye it is sufficient if the revenue from land-rents and salt and customs is high and increasing, and if the courts of law work smoothly. The improvement of the country is a secondary consideration. Indeed, the civil servants living on large salaries in considerable estate do not see that so much is wanted. Most of the year they are in spacious houses, well furnished, attended by numerous servants, with an excellent table every day, and their attention taken up with work that is, in its way, really important, and far from uninteresting. Much of it is of absorbing interest. They have pleasant society in the stations, a church, and often a band; and the only differences, perhaps, between their being at home and in India is the heat, which is most disagreeable and debilitating, and the monotony only relieved by the daily round of work.

In the cold season, after the rains have subsided the rigour of which aspect the country wears at most other times, they go into camp, making a round of their districts. They then have ample sets of tents, a troop of servants, abundant carriage, the best provisions that are to be got, supplemented by preserved articles, and the best wines and liquors; so that the period of their tour passes with great pleasantness, and India is voted not such a bad country, after all. In the same manner, there is no part of the world, even the driest, that could not be gone through to leave a favourable impression behind it. The civil servants therefore go back to their stations with the idea that the neighbourhood is prospering. They got about quite easily, consequently the roads must have been good enough. They did not feel any scarcity of provisions, for everything was plentiful and of average quality. It cannot be expected they should be very urgent advocates for public works; and, occupying the most commanding places, it is about the last thing they think of, their thoughts being occupied with the moral rather than the material interests of the country.

Next to the Civil Service, the most influential body are the representatives of the army. The Indian army is in no way situated to sympathize with the condition of the masses of the population. The heads of it live in much the same fashion as, and associate with, the civilians. The social staff of the army reside in cantonments, in the midst of a class essentially European in their mode of thought. They have little or nothing to do with the country at large, and see very little of it, except in marching from one station to another. It so happens that from old days have

come down tolerably good communications between the principal stations for troops; and, except in high prices, the state of the country does not present itself to their notice. Of late the placing the European force in India under the Horse Guards, and having the native troops a separate branch of the service, has tended further to disconnect the army interests from those of the empire itself. Queen's officers have no stake in it at all; pay does not go so far as it used to do; all having independent means exchange out of India as soon as possible, and each as have not wait patiently for relief. The mode of life is exactly similar to that of any other colony, Indian allowances compensating for the discomfort of the climate. The old East India Company's Officers used to take a much more hearty interest in the country, because they were engaged to spend their whole service in it, were sent to garrison many of the out-of-the-way posts which were never tenanted by European troops, and had opportunities of getting away from their regiments to civil appointments, where they got nearly as good salaries as regular civilians. Indeed, young officers of ambition never looked upon military duty as their sphere, but set to work to study the native language, and quitted their regiments as soon as ever they could. The company's native regiments had always more officers on the list than were required, except in actual war; as is proved by, in these days, the number being a third what it used to be. When engaged in it is a moot point still whether the revised scale is sufficient. India being under a government conducted by a few officials in every way alien to the population they govern, must be held by a vast army of Europeans.

In this way the bulk of the European society in the interior is military, and the sentiments are not the same as those of a commercial community would be. To an army inaction is perfect misery. There is nothing in drill and filling up returns to relieve the dullness of living among barracks. Consequently in India the main, though perhaps not reiterated, wish is for a rumpus,—some war by which medals, and brevets, and prize money may be won. Discussion takes this shape far more readily than bettering the country. Much of this feeling is reflected by the higher officers, who administer the army, to the Government. The cause of which they are the exponents is powerfully advocated, and this advocacy, though beneficial to the army, is virtually antagonistic to the other claims upon the attention of Government.

Military operations in India are of a very simple character. Success depends upon the mettle of the troops, and the infusion, if not of as large a body as possible, at least of their spirit, among the native soldiers. It also hinges upon the enemy being neither so well armed nor provided as the imperial force. Scientific expedients, therefore, are not often called for, and military engineers are not the necessity they are in civilized countries. Good European infantry and artillery, with a mere sprinkling of sappers, and a small engineer staff, will win any battle in the East Indies. But as a precaution, and in the event of a contest being not altogether with Oriental strategy, the East India Company maintained the full complement of engineer officers in a fixed proportion to the rest of their army. But they only retained a few companies of sapper rank and file in each Presidency, to man which a title of the engineer officers on the list would have answered. The remainder had no express military duty to attend to, except to build and repair the barracks, and make and repair the roads, from one principal station to another. As things stood, then, we had the Civil Service in no way particularly disposed to promote public works, having their other and more engrossing duties of collection of the revenue and enforcement of the law, and seldom opportunity of forming a due conception of the backwardness of the country; and the army, by position desirous of turmoil, and exerting its influence for anything but works of peace; the mercantile community confined to the presidency towns, and with very partial knowledge of the wants of the vast interior; and the only class left to represent the need for all kinds of public works was that portion of the corps of military engineers not required in garrison, they being by qualification and habit almost the only officials in India capable of talking with authority on the subject and dealing with such questions. Practically control of the public

works fell to them. During the continuance of the East India Company they were in each Presidency the Public Works Department. The rule was they had the prior claim to all other candidates, and though other officers were admitted to the Public Works Department, it was solely because the engineers could not numerically undertake more than a certain amount of work. Indeed, just as the civilians trained at Haileybury were presumed to have the monopoly of all the revenue, judicial, and political appointments under the Indian Government, the Bengal, Madras, and Bombay engineers were considered to have the Public Works and Survey Departments as their exclusive sphere. With this privilege in a fashion secured, the engineers ranked next to the civil service in popular estimation, as offering either a military or civil career of a very attractive kind. The source of supply was the military seminary of the Company at Addiscombe. About forty cadetships were given away by nomination half-yearly, and the nominee at the end of two years could present themselves for examination for the three branches of engineers, artillery, and infantry. The number of appointments given away to each branch depended upon, first, the vacancies in the engineer and artillery lists; and, secondly, the proficiency of the candidates. The education imparted at Addiscombe was excellent. The mathematical standard was high for engineers, and about half the hours of study were allowed to it daily, the others being taken up with Hindustani, drawing, fortification, and a few other things of minor importance. But classics and history were almost excluded from the curriculum. No candidate could get into the Engineers who had not read advanced mathematics, and if one failing to do so stood well in the final examination, he not only did not get into the Engineers himself, but prevented those below him who had from entering. By this every one did his utmost to acquire a competent knowledge of the test subject. The Artillery ranks before the Engineers in the army, but the latter service was the prize of the cadetship.

The competition for the junior service was very severe, and the severity is a measure of its popularity over the artillery. There were many reasons for this preference, and they are worth adducing. In the first place, it was always thought the engineers had exclusive right to places in the Public Works Department. This, of course, was a fallacy, as in India officers from the line were admitted almost for the mere asking. Then there was the public esteem in which a corps, formed entirely of men who had gained a high college proficiency, must of necessity be held in. There was also the prospect of obtaining civil employment at once, without going through the drudgery of military duty, which to a mind fond of study and hooks is very repellant and unprofitable. In short, the notion was abroad that, next to the covenanted civil service, the engineers was the best thing going. So parents and guardians kept their sons and wards for years beforehand at schools which taught mathematics in preference to classics; and inculcated upon them the putting out all their strength to become engineers. It was an immense thing for the East India Company having obtained such a good reputation for its engineer service, one greatly in excess of its deserts as compared with the civil service, the emolument being in the ratio of say 3 to 1. But there would never have been such competition excited by the intrinsic merits of the service alone. It is well known that those who entered the Company's military service as cadets, were not men of fortunes generally; and that whichever line was best paid was the one for them to try for. Even as cadets they were aware that as engineers they would have advantages they could not look for, at the commencement at any rate, in the other branches. The engineers could spend two years nearly longer in India than the artillery and infantry, who had to go out to India at once. They would also come into receipt of a staff salary on landing, whereas if posted to the artillery they would not only have no chance of more than the pay of a lieutenant, for ten or fifteen years, but have to buy expensive horses and equipment into the bargain, and be for years, perhaps, a pull on their relatives; so that it was an immediate object to avoid falling into no hopeless predicament, to all who could read high enough, and had no private resources. The semi-civil nature of the service also commended itself to many who did not care to accept the subordinate position of a regimental officer for a long term of years. This

A PLEA FOR IRON.

SIR,—Your recent article entitled "A Plea for Stone" bears so strongly against the use of iron as a material for building purposes, that you will doubtless permit some protest to be made by one of those who would give to iron an important place in modern architecture. Your severest strictures are directed against those who are endeavouring to give to iron a precedence over stone in situations where the latter has hitherto been used alone; and in much of what you say on this innovation you will have the concurrence of those who are the warmest advocates of iron when legitimately used. But it is the misfortune of every new project, and of any suggested improvement, that they are judged more by the mistakes made with them by the unskilful than by the real services they are intended to perform, and which they succeed in performing when properly applied. There is, no doubt, a tendency at present to take an extreme advantage of the great tensile power of wrought iron, and to produce the "spider-like framing" to which you refer; but this is generally in purely utilitarian cases, where the architect has no discretion given him, economy being the sole consideration, and in those cases also where the distance to be spanned is impossible for any other material.

But it is with the hidden use of iron that you find the greatest fault; and every man of taste will join with you in decrying the shams which profess to be stone, but which are secretly held together by iron ties. These false pretences, however, are not peculiar to iron, and the architect, in adopting them, merely follows a too common practice of his art. In a theatre, or any large hall, he considers it necessary to show a ceiling with elaborate cornices and brackets, on which apparently rest the beams of his roof. Really there exists out of sight an entirely independent trussed principal, on which the ceiling hangs. But assuming the existence of the sham roof, why should it not be of iron, which will allow a large span with moderate weight?

For the new Central Hall at Kensington an iron roof is being constructed, below which will hang a ceiling having a different outline. The iron roof over the courtyard of the new India Office shows an attempt after fitness which is praiseworthy, but which might have been improved. That the roofs of this kind are sham at all is the fault of the architect, not of his material; and iron roofs, with no detail of their construction hidden, could be constructed which need shock no true canon of taste. Iron is peculiarly adapted as a substitute for timber in roofs, and will allow large spans otherwise unattainable.

The aesthetic taste which would despise iron as a material for architecture is a false sentiment, which will disappear as we become more skilful in giving the appropriate form to iron-work, and in those countries and situations where stone and brick are scarce and expensive the new material is studied more than is yet the case in this country. Important buildings, with imposing elevations, entirely of iron, have been erected in America and in the cities of the Continent, which would alone prove the truth of the present assertion. The feeble attempts to imitate in cast-iron the traditional moldings and ornaments of stone deserve fully the reprobation they obtain; but if iron is heated properly it will allow a fineness and delicacy of ornament which, perhaps, may be possible in marble or alabaster, but which are quite impossible in stone.

The remarks in your article as to the endurance of iron raise a most important issue. The mistakes continually made in the application of iron arise very greatly from the confusion of ideas which often exists with regard to the difference between cast and wrought iron. During the last fifty years great mistakes have been made with the use of the cast metal, and accidents and failures, occurring partly through the use of inferior iron, and still more from its unskilful disposal, strong prejudices are felt against its use by many architects; and it is a common boast by many that they will never introduce it except where strictly in compression, as in the case of columns and stanchions. Without entering further into this question, I will merely remark that cast iron possesses many qualities which render it often preferable to wrought iron, and it is therefore for certain situations used by those who are better informed. In the matter of endurance against weather it is far superior to wrought iron. Rust does not scale from it; and the oxidation, when formed, is of a much

less dangerous kind than in wrought iron. Iron-work should either be accessible for painting, or should be entirely protected from the air. Box girders of wrought iron are often inaccessible inside for painting, and where ironwork is thus neglected the period of its existence may be calculated pretty surely. Iron hedded in lime will last for centuries; and some bars lately taken out of the walls of the Chapter-house at Westminster are perfectly sound and strong. Who knows how long the bars which help to hold the aisles of the Abbey together have existed? Mr. George Gilbert Scott, who is now engaged in restoring the Chapter-house, is having a pointed roof of cast-iron (as most likely to endure) constructed above the groined stone ceiling. In bridges I presume iron holds an undoubted preference, or else I would point out that the early cast-iron structures show no signs of decay. The Coalbrookdale bridge over the Severn, erected nearly a hundred years ago, first showed what could be done with iron; Southwark bridge, which has been standing so many years, exhibits no symptom of failure, and will in all probability long survive its more modern and elegant rival at Westminster, which is constructed mainly of very light wrought-iron. The engineer of the city of London is most wisely constructing the large bridge for carrying the Holborn Viaduct over Farringdon-road entirely of cast-iron.

I am content if I have shown that those of us who believe in the capabilities of iron, at any rate, have a case, and will leave able champions to dispute the strong position which we maintain for it, whether the question be one of taste or mere utility,—two qualities which should go hand in hand together.

EWING MATHESON.

THE LIVERPOOL ARCHITECTURAL SOCIETY.

At the last meeting of this Society, on the 27th ult., Mr. J. A. Picton alluded to the loss the architectural profession had sustained in the death of the late Mr. Arthur Aspland, whom he characterised as not only an accomplished architect and writer on architecture, but a man of very varied literary acquirements and of most amiable character. He also drew attention to some old specifications for the building of the old Liverpool Exchange (then the *new* one), and some other buildings, which had come into his hands, and which were remarkable for their brevity and concentration in comparison with more recent documents of the same kind, as it appeared that in those days the specification for a large building often occupied only one page of manuscript. It appeared that, for the old Exchange, the arrangement with regard to the architect's Commission was that Mr. Foster, the architect, was to receive 5 per cent. on the work if it did not exceed 80,000*l.* in cost; but if it did exceed that amount, the per-centage was to be paid on that amount only; and if the cost should be less than 80,000*l.*, per-centage was to be on actual amount expended. At the building of St. George's Hall a similar arrangement had been made, with a result most disastrous to Mr. Elmes, as the expenditure in that case vastly exceeded the amount on which the commission was calculated.

Mr. W. H. Picton then read a paper, entitled "Gleanings from the Architectural Field of 1868," chiefly suggested by the views of new edifices which had appeared in the *Builder* during the past year, a number of the illustrations from which were exhibited in further elucidation of the subject. Among these were the mansions of Possingworth, Sussex, and Hunewood, county Wicklow; St. James's Church, Kidbrooke (Messrs. Newman & Billing); the Town-hall, Melbourne (Messrs. Reed & Barnes); St. Patrick's Cathedral, Melbourne (Messrs. Wardell & Co.); the London University (Mr. Pennothorne); and also photographs of various new buildings in Australia. Mr. Picton referred specially to Possingworth, Sussex, built by Sir Digby Wyatt, which he considered a plan well worthy of study, especially as to the manner in which the various classes of rooms were grouped together, and the admirable planning of the offices; though the intrusion of a flight of steps into the large hall would, he thought, materially interfere with its use as a hall-room, if that should be desired. He highly commended the style of the external design as suitable for an English gentleman's house; and referred, as a contrast, to Hunewood, Wicklow, by Mr. White,

as an example of what might be called the "Romantic" style of house-building, and which, whatever the undeniable merits of the design, was far too archaic in its expression for a modern dwelling-house. Mr. Picton commented also on the design for the London University, by Mr. Pennothorne, as a very well-considered elevation, and a timely protest against the eccentricity of design which characterized so many modern buildings.

LOUTH GRAMMAR SCHOOL AND BEDI-HOUSES.

The Grammar School of King Edward VI., in Louth, Lincolnshire, was founded in 1552, being one of the earliest foundations of that reign. The management of the school was vested in the Corporation of the town, which was founded by the same charter, with the style of "The Warden and Six Assistants of the Town of Louth, and Free School of King Edward VI., in Louth." This body escaped total extinction on the passing of the Municipal Corporations Act, through the favour of the late Lord Lyndhurst, who paid a debt of gratitude to some of the inhabitants of Louth by procuring the insertion of a clause in the Bill containing the existence of the warden and six assistants as governors of the school only. Before the time of railways, and the establishment of the large proprietary schools, when a scholar was thought to travel far if he passed the confines of his native county, Louth school enjoyed a high and well-merited reputation. It not only ranked as the Eton of Lincolnshire, but successfully competed with similar foundations in the neighbouring counties. The seal of the old corporation is a curious piece of antiquity. It bears the legend "*Qui parit virgo odit filium*," and represents the interior of a school-room, with one of the scholars receiving bodily chastisement at the hands of the pedagogue, who wields a formidable sprig of betula over the form of his erring disciple. The estates of the school are considerable, and at present under the control of the Charity Commission.

Attached to the school are Bede-houses for the accommodation of twelve poor persons.

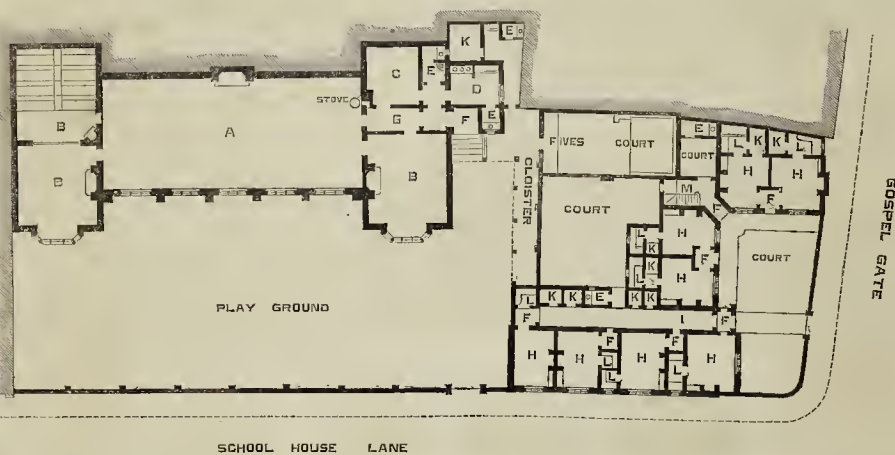
The fund for the erection of the new buildings has been provided partly from the estate itself, and partly from a subscription raised by old *alumni* of the school, among whom are found the names of Alfred Kempton, the poet-laureate, and his brothers; Sir John Franklin, Dr. Hentley (Canon of Christ Church, Oxford), Governor Eyre, and other persons of distinction. The school is at present in a flourishing state, numbering about seventy boys. Together with the rise of Mr. Fowler's handsome and spacious building, the hopes of the numerous friends of the school have revived. In the new race about to be run by the old grammar-schools of England, they think that Louth will have, all things considered, an excellent start; and that its ample funds, its old glories, and its present popularity entitle it to take its place as one of the great county schools foreshadowed by the recent Royal Commission. It is expected that the new building, the foundation-stone of which was laid in August last, by the visitor, the bishop of the diocese, will be opened by his successor in the course of the ensuing summer.

The principal school-room is 57 ft. long, 23 ft. wide, and 30 ft. high to the ridge. It has an open-timbered roof with arched principals, and is lighted by a range of traiered windows on the side. At the north end of the school is a room 40 ft. long by 16 ft. wide, with a gallery at one end to be used as a lecture-room, and by means of a folding partition it forms two good class-rooms. At the south, or entrance end, is the library, 19 ft. by 16 ft., with a large bay window in addition, and there is a similar window at the other end. These rooms are 13 ft. high. Near the entrance on the east side are cloak-room, lavatories, &c. The ventilation of the school-room is effected by means of fresh-air channels near the wall-plate and behind the cornice, 15 ft. from the floor, with foul-air flues at each end of the room in connexion with the heating arrangements. The entrance to the school is sheltered by a lean-to roof, which is continued along the south side of the playground, forming a kind of cloister, and from this access is gained to the Fives-court.

The Bede-houses, as before referred to, adjoin the school on the south. The land available for them required considerable care in their arrangement. Eight are on the ground-floor and four



KING EDWARD VI'S GRAMMAR SCHOOL AND BEDE-HOUSES, LOUTH, LINCOLNSHIRE.
MR. JAMES FOWLER, ARCHITECT.

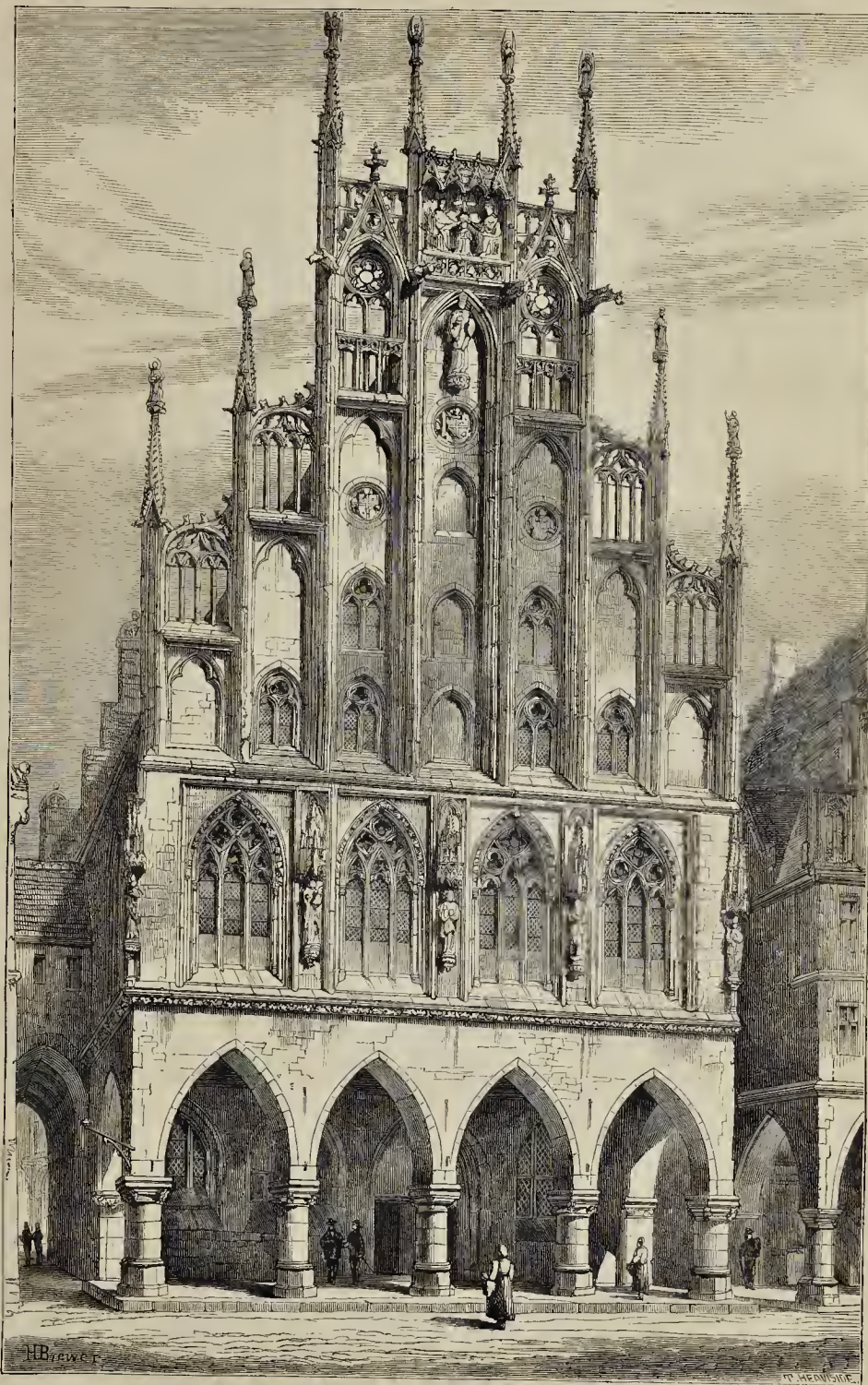


above; the latter are approached by a stone staircase, and by a balcony in front. Each room is about 12 ft. by 10 ft., and 10 ft. high, and has a separate pantry, coal-store, cupboards, and so on. The buildings are of red brick in narrow courses, the windows being of Ancaster stone, and when completed they will form an agreeable addition

to the attractions of the town, seen as they will be in connexion with the noble and well-known spire of the parish church. Mr. Fowler, of Louth, is the architect employed by the trustees; and his designs have so far been well carried out by Mr. Thomas Morey, a local builder.

REFERENCES.

- A. School-room.
- B. Class-rooms.
- C. Cloak-room.
- D. Lavatory, &c.
- E. W.-Cs.
- F. Entrances.
- G. Passage.
- H. Bede-houses.
- I. Covered Way.
- K. Coals.
- L. Pantries.
- M. Staircase to Upper Story.



THE RATHHAUS, MÜNSTER, NORTH GERMANY.

RATHHAUS, MÜNSTER.

WHETHER looked at from a historical or archaeological point of view, Münster is certainly one of the most interesting towns in Northern Germany. It was originally the capital city of a very powerful prince-bishopric, and to this fact it probably owes the number and beauty of its churches, and the solidity and picturesque quality of its houses.

The situation of Münster cannot be called beautiful, as the town occupies the centre of an immense flat plain; but it is, nevertheless, pleasing from the richness of the cultivation and the number of trees seen in all directions. The beautiful towers of the churches group well over this foreground of rich and varied foliage. The entrances to the town are not prepossessing, as it is surrounded by a *stinking ditch*, which is a disgrace to any civilized community, and the river into which this abominable drain empties itself is little better than another ditch. The ancient walls and ramparts were destroyed at the commencement of this century, and their place is now occupied by a fine avenue of trees, which entirely surrounds the town, and would form an agreeable promenade were it not for the before-mentioned ditch.

Many of the streets are not uninteresting; but the high-street, or, as it is here called, the "Prinzipal Markt," is one of the most picturesque in Europe. The houses on both sides are built over arcades of acutely-pointed arches, supported upon octagonal and circular columns; some of these arcades are as early as the commencement of the fourteenth century, and the details of the capitals and bases are often highly original and ornamental. Each house has a gable towards the street, some of which are ornamented with pierced Gothic tracery pinnacles, panelling work, and other enrichments. The house which originally belonged to John of Leyden is a singularly beautiful specimen, and in a very perfect condition. At one end of this noble street stands the Church of St. Lambert, a highly ornamental Gothic building, upon the tower of which are seen the cages in which the bodies of John of Leyden and his companions were exposed after their execution.

Near to the opposite end of the street, and on the east side, stands the Rathhaus, of which we give a view, engraved from a drawing made on the spot for us by Mr. H. W. Brewer. Its gable forms a striking object from whatever point it may be seen; it is of great size, and built entirely of stone; it is 104 ft. high to the top of the upper pinnacles, and 51 ft. broad. The date of this portion of the building is late in the fourteenth century. It is difficult, however, to decide whether it is all of the same date, as the open flying buttresses pierced with flamboyant tracery certainly appear to be of a later date than the simple "geometrical" windows. However, in Germany the two kinds of tracery were often used in the same building to an extent which is not to be met with in either England or France; and in Westphalia this appears to have been particularly common, for in the before-mentioned church of St. Lambert, the side windows are filled with the widest kind of curvilinear tracery, and the windows of the tower, which are of the same date, have very simple geometrical tracery.

The four large windows on the first story give light to a large hall, which has been renovated; and although it is a fine apartment, the old arrangements have been entirely disregarded, and the details are hardly removed from "Carpenters' Gothic." The "Freidensaal," in which the "peace of Westphalia" was signed in the year 1648, is a much more interesting room; it was fitted up in the year 1575, and all the panelling, ceiling, and other ornamental portions are of that date. Perhaps a more beautiful example of a Mediaeval chamber of large size does not exist in Europe. The gable to the rear of the Rathhaus is of the same date as the "Freidensaal" hut, although highly picturesque, is not remarkable for its architecture.

RIGHT-HAND AND LEFT-HAND LOCKS.

A CORRESPONDENT writes:—"May I beg you to favour me with a definition of the terms 'right-handed' and 'left-handed' as applied to locks on doors? I find a difference of opinion among professional men upon the subject."

A lock which, when the hevel of the spring-catch is in front of the observer, shoots towards the right, is a "right-hand lock;" if it shoot towards the left, a "left-hand lock."

STRENGTH OF WAREHOUSE FLOORS.

At a recent meeting of the Liverpool Architectural Society a report was received from Mr. Newlands on the cause of the accident in Bighy-street, Liverpool. The writer says,—"I have carefully investigated the failure of the fifth story floor of the warehouse, No. 25, Bighy-street, which involved the partial destruction of the next three floors under it, and now report the result. The building was erected originally as a lard-refining establishment, and was not intended to be used as a warehouse in the usual acceptance of the term.

The warehouse consists of seven stories, the floors of which, with the exception of the first, which is of brick, are constructed with girders and bridging joists of timber. There are four rows of girders, each 15 in. by 7½ in. in section, supported on two rows of cast-iron columns, placed so as to make the clear bearing of each section of the girder 14 ft. long. The area of the bay of the floor, supported by each of these sections of the girders, is 122½ ft. superficial.

A girder of the size and bearing above mentioned should, if perfectly sound, break with a load of 40 tons uniformly distributed over it. It is a rule of practice, however, to limit the actual weight to one-fourth of the breaking weight, and this is called the safe load, which, in the case stated, would be 10 tons.

The timber of the girder of the warehouse is of a wonderfully small specific gravity; a cubic foot weighs only 25 lb. The girder is, moreover, reduced in strength by the mortises out for the joists, and by knots, and its breaking weight is reduced to 33½ tons, and its safe load to 8 tons 7½ cwt.

In order to ascertain whether the usual formula could be safely applied in calculating the strength of the girders in question, I had three pieces, of 7 ft. long, 6 in. deep, and 3 in. wide, out from the broken girders; these I loaded until they broke, which they did on the average with a load of 6,714 lb., which is somewhat less than the average of the formula. I used the results thus obtained in calculating the breaking and safe load already given.

The weight of a cubic foot of line-seed was next ascertained for me by Mr. Johnstone, of the Weights and Measures Office, by repeated experiments. The result was, that when the line-seed was compacted together by being well shaken in the box, a cubic foot weighed 46 lb. 11 oz. 10 dwt., but when it was allowed to flow in through a hopper it weighed only 41 lb. 7 oz. 6 dwt.

I am indebted to Mr. James Samselton, however, for the means of ascertaining, with great accuracy, the weight of the line-seed per cubic foot when distributed over a floor to the depth of 4 ft. 3 in., when it may be supposed to be nearly as densely compacted as by shaking.

In the case addressed by him 7,429 cubic feet weighed 150 tons, which gives as the weight of a cubic foot 45½ lb. nearly; I have assumed 45 lb.

It was stated, in evidence, that there were 60 tons, or thereabouts, of line-seed on the floor that gave way, and that it was spread uniformly to a depth of 3 ft. 6 in. Now this must be a mistake for the net area of the floor, deducting 114 ft. 1½ in. for the areas of the left, the stairs, the chimney, and the shoot is 1,788 ft., and the weight upon it would be 126½ tons.

It is, however, sufficient for the present inquiry that we find the quantity that may be presumed to have been sustained by one bay of the flooring, that is, by one section of the girder which gave way.

Now the area of a bay of the floor supported by one span of the girder is, as has been stated, 122½ superficial feet; and if line-seed were spread over this to a uniform depth of 3½ ft., its weight would be 8 tons 13 cwt., or 6 cwt. more than the limit of safety.

But the hay might be loaded by heaping up the material to a height of 7 ft., with a weight of 17 tons, which is more than half the breaking weight of a sound girder of the dimensions of the one in question.

There are now no means, unfortunately, of discovering the extent of the load; all we know is that, unhappily, the girder broke, and broke under a load far less than its assumed breaking weight.

I had therefore to look for some special cause of failure, and my first supposition was that some settlement of the building might have taken place, and that a greater load might have been thrown on some part of the girder than it

was calculated to sustain. The fact that the point of rupture was only 4 ft. from one of the supports, and not in the middle of the span, appeared to justify this supposition. A careful levelling of the building showed that no settlement had taken place, and the conclusion was forced upon me that the condition of the girder at the point of rupture must have been the cause of the accident.

At this point there is found a large knot, extending diagonally across the section. The fibres are much twisted from their normal direction, and the timber is very much shaken and otherwise injured. It is impossible, of course, to say now how this condition of things was brought about; but it is to this condition, in my mind, that we must look for the cause of the accident.

Had the timber of the girder been all of the same strength as the scantlings which were sawn from it, and broken as a test, there should have been no immediate failure, even if the room had been loaded with line-seed from floor to ceiling; but in such a case there would have been a gradual deterioration of the timber, ending doubtless in its eventual rupture, and this shows the necessity for never exceeding the safe load. There does not, however, appear to have been time for this deterioration, and the accident must be attributed, as I have said, to the existence of an unseen evil, which unfortunately betrayed its presence by causing injury to life and property."

THE PROPOSED BUILDING ACT AND THE INSTITUTE OF ARCHITECTS.

A SPECIAL meeting of the Institute will be held on Monday evening next, to consider a report of the committee on the Metropolitan Buildings and Management Bill, adopted by the council, 22nd June, 1868. We have the report before us, together with one drawn up on the same subject by the District Surveyors' Association.

The committee of the Institute say,—

"We, the committee, appointed by the Royal Institute of British Architects, to examine and report on the draught of a proposed New Metropolitan Buildings and Management Bill, having duly examined the same, and considered the provisions therein contained, both in their relation to those set forth in previous Acts of the same nature, and in relation to the necessities of current practice in the metropolis, beg to report as follows:—

Having reference to the present state of the Bill, and the probability of its being extensively altered, we have only dealt with it at the present time in general terms, leaving the minute details to a future time.

We observed that its scope differs from that of the existing Building Act in the extended powers given to the Metropolitan Board of Works. Not only has that body, by the proposed Bill, power of authorizing any deviation from the conditions of structure laid down in the Act, but it remains the sole and absolute court of appeal in all matters or questions arising out of the Act, having at the same time such despotic rule over the position of the district surveyors, as to render them entirely powerless, if the Board sees fit to exercise its authority. Our chief objections to the Metropolitan Board of Works, as holding this great power, are not of any personal nature, but rest on the following considerations.

Questions arising out of this Act are generally on matters of detail of an altogether technical nature; that is, technical either from an architectural or a legal point of view. While the variety and importance of other duties already devolving upon that Board, are not likely to leave them time to properly investigate complicated questions of construction, and the numerous other matters which must necessarily arise out of the working of the Bill; and the number of members of which the Board is composed, must neutralize to a great extent the sense of personal responsibility which is essential for the due administration by it of such matters of detail. Your committee would have preferred to have seen the authority conferred by the draft Bill upon the Metropolitan Board of Works, vested in a smaller tribunal, appointed, it may be, by the Board, and adequately remunerated, especially selected for possessing the necessary legal and constructional knowledge, and directly responsible for their judgment of all questions upon which any power of discretion is

left by the Act. Such tribunal should, we think, consist of one or more architects or surveyors of repute, and of one or more magistrates or barristers.

We would further observe, that the draft Bill, as compared with the existing Metropolitan Building Acts, contains various provisions, founded in the main on the Building Act in operation at Liverpool, with respect to fire-resisting buildings, more particularly of the warehouse class; and the conditions under which goods of greater or less combustibility may be stored therein. The introduction of these clauses (subject to some remarks, we shall hereafter offer in detail) will, we consider, confer a benefit both upon the public, and upon those especially connected with the use or erection of such structures.

The Bill comprises various clauses, more particularly affecting metropolitan local management, which we consider tend to complicate unnecessarily an Act for the special regulation of buildings—a kind of Bill which, from its very nature, must always be somewhat complicated. We consider, therefore, that any such clauses would, with great propriety, be included in a Bill for the Revision of Metropolitan Local Management.

We find so many clauses and provisions relating to the prevention of fire, that we think more general prominence should be given to the subject in the preamble of the Bill.

We think, also, that the attention of the Metropolitan Board might with advantage be recalled to the suggestion already made by this Institute, that the introduction of a part (similar to Part VI. for party walls), having reference to questions of light and air in the metropolis, would be a great public boon, as tending to diminish and prevent litigation on that difficult subject, and to simplify procedure, when damage is caused by the erection or alteration of buildings.

We proceed now to refer to certain details of the draft Bill, which, we think, call for special remark, desiring to observe at the same time, that we leave many other points without comment at present, but which will require more or less revision, before the draft Bill can become law with any prospect of public usefulness. Some such points have already been noticed in the 'Remarks and Suggestions' submitted for the consideration of the Metropolitan Board of Works, in November last, by the District Surveyors' Association.*

The remarks and suggestions on the Metropolitan Buildings and Management Bill, already submitted by the District Surveyors' Association, for the consideration of the Metropolitan Board of Works, commence with these general remarks:—

"They do not consider that there exists any sufficient reason for such sweeping changes as are proposed by the Bill, or that they are demanded by the public. They believe that it would have been more convenient to correct the known imperfections of the present Act, leaving unaltered all the parts to which no objections had been discovered.

They consider that the general character of the Bill is one of too much minute detail, which they believe will be found inoperative from the impossibility of providing for all the various circumstances which arise in practice; also in many clauses the detailed regulations are technically and practically obscure. This is a defect which, in the present Act, has been found frequently to defeat the object of some of the provisions. By laying down minute regulations as to details, not universally applicable, and which must necessarily be framed with reference to presupposed cases, the officers who are charged with the execution of the Act will be prevented, in cases where the circumstances are different, from exercising that practical knowledge which they may be supposed to possess.

Important alterations have been made in the Bill since the former remarks of the District Surveyors' Association were submitted, in consequence of the report of Captain Shaw, the Superintendent of the Fire Brigade. These alterations require further careful consideration; some of the provisions as they stand at present are quite at variance with the results of practical experience. Captain Shaw's remarks refer chiefly to the case of a building actually on fire, but one of the great objects of the regulations of a Building Act should be the construction of buildings in such a manner as to reduce the liability to catch fire; and with this object,

materials which are incombustible, though not 'fire resisting,' may be used with advantage. With reference to fire, it is also important to distinguish between the construction of ordinary dwelling-houses and buildings of the warehouse class, which has not been hitherto sufficiently the case.

Some modifications are required in the rules for the thickness of walls, but they could only be pointed out by means of detailed diagrams, and it may be sufficient here merely to direct attention to the subject.

The district surveyors feel compelled again respectfully to urge that the clauses relating to the duties and emoluments of those officers would, if they became law, be unjust to the existing officers, and inexpedient even with reference to those who may be appointed in future.

They believe that the interests of the public will be best considered by so framing the Act as to insure the appointment of men of ascertained practical knowledge and experience, and of such professional position and standing as to give weight to their opinion."

NEW NATIONAL SCHOOLS, TWEEDMOUTH.

The new national schools at Tweedmouth were opened on the 11th inst., when 167 children presented themselves to the vicar, the Rev. Thos. Procter, for admission in the course of the morning; additional applications eventually swelling the number to a still more considerable one. The new schools have been built upon the site of a small group of buildings formerly used as a vicarage and school. They consist of two school-rooms placed one above the other, each 52 ft. long by 20 ft. wide, and both furnished with class-rooms 20 ft. long, and lobbies, besides separate residences for the master and mistress. The lower school is 14 ft. high; and the walls of the upper one are 20 ft. high, spanning which is an open timber roof. This last is apportioned to girls. They are both well warmed, lighted, ventilated, and furnished with all necessary appliances in the way of Siddehottam's reversible desks, &c. The class-rooms have galleries. In each school 180 children can be accommodated. A central feature of the exterior of the schools is a belfry surmounted by a cross. On a panel in the front of the lower school is inscribed:—"Tweedmouth National Schools: rebuilt, 1868. Bring them up in the nurture and admonition of the Lord." There are two gateways inscribed Boys' School and Girls' School respectively. The expenditure upon the new schools has been 1,150*l.*, to which sum must be added the value of the vicarage-house incorporated with them, and of the materials on the site, which have been re-used wherever practicable, and which bring up the value of the new buildings to 1,650*l.* The vicar, under whose auspices the work has been inaugurated, carried on, and completed, has been assisted by a grant from the Privy Council of 407*l.* 14*s.* 10*d.* Grants have been also made by the Dean and Chapter of Durham, the Diocesan Society, and the National Society. The architect was Mr. F. R. Wilson, Alnwick.

THE PROPOSED LAW COURTS AND THE THAMES EMBANKMENT.

At a meeting of the Board of Works, on the 22nd inst., Mr. W. Tite, M.P., brought forward the motion, the words of which we have already printed.*

In moving it, he said it was a great mistake to suppose that the Metropolitan Board of Works had any great amount of vacant land on the Thames Embankment, the principal part of it had already been disposed of. At Blackfriars-bridge the land taken from the river had been given to the gasworks. The next piece was of very little value, but that following it, 800 ft. long, had been given to the Temple for the actual or imaginary damage done to them by taking their water frontage. They then came to a piece of land of 120 ft. in length, which was given to Waterloo-bridge, and was at their disposal. This was to be appropriated to a station for the Metropolitan District Railway, for there would be no use in having a station at Blackfriars-bridge. He then got to Somerset-house, where there was nothing to deal with; but between Somerset-house and Hungerford-bridge there was a piece which was given to the Crown in exchange for the foreshore of the river. He then came back to the embankment, where he made it in the House of Commons, that, as he had been assured by a very competent authority that the land already obtained for the New Courts of Justice would be insufficient, and not equal to their wants, they should go again to Parliament for additional land, marked red on the plan, unless they were to put some portion of the offices in connection with the Law Courts on the Thames Embankment. He would state a few facts on the plan

which was then on the table. The land already purchased would cost 750,000*l.*, and the additional land proposed to be acquired would cost about 668,000*l.*, so that altogether the site according to the estimate, which was a very liberal thing from the actual cost, would be about 1,418,000*l.* and a half sterling. Then they were to take the buildings, architect's fees, furnishing, &c., which would bring up the total cost to 24 millions, of which sum 8,000,000*l.* was to be advanced by Government at 4 per cent. on the security of a redeemable annuity. About three-quarters of an acre on the Thames Embankment might be appropriated to some of the offices, for it would be advantageous that they should be divided from the general business of the law courts. For instance, persons who came to examine wills in cases before the Probate Court would be in the way, although it was necessary that the courts should be so situated that access should easily be had to barristers attending to them. Having alluded to the plan of Sir Charles Trevelyan, who had brought to bear a great amount of intelligence and talent, which had made a great impression on the public mind, he had proposed that the site should be changed, and that it would be a great mistake to put the buildings on the site selected in the Strand. His plan was that they should put the buildings on a site near the Thames Embankment, but that would not take a single foot of the land that the Metropolitan Board of Works might have to sell, as it kept all the buildings beyond the Thames Embankment line, although it would have a frontage towards the Thames.

Mr. Le Beau, the gentleman who presented a little too far, and objected to the proposal to have the Probate Court separated from the other courts. He moved, as an amendment, that he be referred to the Works and General Purposes Committee to confer with the Government or the Law Courts Commissioners, as to the acquisition by them of any land that can be obtained on or adjacent to the embankment for the purpose of affording additional space for any law offices it may be deemed expedient to erect thereon.

Mr. Tite consented to accept the amendment, which was accordingly adopted, notwithstanding an argument strenuously urged by Messrs. Roche, Cooke, and Eit, that they should not interfere with the open space near the embankment by disposing of it for building.

OPENING OF LUTON PLAIT HALLS AND CORN EXCHANGE.

These new buildings were formally opened on Monday in last week, by Lord Cowper, in the presence of the American Minister and a large assemblage. The opening was followed by a dinner and the usual speechifying, in which Mr. Johnson, of course, took a lion's share. The day was kept as a holiday in Luton.

The Plait Halls are in Cheapside and Waller-street. They open into each other, but have separate external entrances. These buildings are of simple construction. The dimensions of the Plait Hall in Cheapside are 100 ft. by 90 ft., and of that in Waller-street 130 ft. by 60 ft. The roofs are supported by iron columns, and covered with galvanized iron; the windows are filled with plate-glass; the walls are panelled; and the floors are boarded. In the Cheapside Hall there are forty centre stalls, and there are to be nineteen "shops" 12 ft. square and 12 ft. high. In the Waller-street Hall there are forty plait-stalls fitted round the sides, and there are to be thirty-two stalls or stands in the centre. The buildings are lofty and well ventilated. The cost of erection, including the purchase of the ground, is about 8,000*l.* The building was designed by Mr. R. W. Ordish, of London, architect, and erected by Messrs. Smart, Brothers, of Luton.

The Corn Exchange, which stands on the top of the Market-hill, is in the Venetian-Gothic style, with a tall clock-turret. The building is of red brick, with hands of other coloured bricks, and Bath-stone dressings. In the basement is the huteburs' market. The Corn Exchange proper is about 60 ft. by 30 ft., and is reached by a flight of steps from the Market-hill. There is a gallery at one end of the building. The light is chiefly obtained through a bay window. The Corn Exchange was erected by Messrs. Smart, Brothers, from the designs of Messrs. Grundy & Messenger, of London; and has cost about 8,000*l.*, which, we suppose, includes the demolition of old buildings.

HOT-WATER PIPES AND THE BUILDING ACT.

Sir,—Can you afford any information as to what in the eye of the law is to be considered a hot-water pipe, viz., at what temperature? For surely nothing can be more absurd than to consider those warm cast-iron pipes, now so much used in heating, as the hot-water pipe named in the Building Act, the water seldom or never boiling in the boiler that warms the water.

There is certainly an oversight somewhere; and, as I perceive by the *Builder* that the clauses of the Building Act are to be revised, I should be glad to have some practical information as to what a district surveyor can designate a

* See p. 53, ante.

(dangerous) hot-water pipe requiring to be kept clear of woodwork. Has there been any law-suit which can give a precedent as to what is a hot-water pipe or a warm pipe?

It seems to me that all restrictions about heating apparatus constructed with cast-iron pipe should be solely regulated by the height of the open supply cistern above the level of the boiler, as it is absolutely impossible (drive the boiler as much as you will), where there is an open supply cistern or air vents, to raise the water in such apparatus above the boiling point for such pressure as the number of feet taken vertically between the highest and lowest levels would give, viz., in church work, about 225" in the boiler, and, of course, much less in the pipes.

A SURVEYOR AND ENGINEER.

*** The Metropolitan Building Act (sec. xxi.) says nothing about "dangerous" hot-water pipes. It provides that "no pipe for conveying hot-water shall be placed nearer than 3 in. to any combustible materials," and extends to all water-pipes that are used for heating buildings, whether the boiler be a close one or not. Magistrates on more than one occasion have confirmed the district surveyors in their view, and rightly enforced adherence to the rule with penalties for previous non-attention to it.

The matter may deserve the consideration of the framers of the amended Act; but we are by no means prepared to say that pipes from an open boiler should be exempt. By any accidental stoppage of the pipes their temperature might be raised sufficiently to set fire to wood-work resting against them and already dried by the contiguity, should such be permitted. We are informed of some "hot-water engineers" who systematically withhold notice from the district surveyor whom employed to set up hot-water pipes. We need scarcely say that by such a course they incur a very serious responsibility, independently of the special penalty provided by the Building Act.

DIMENSIONS OF ST. PAUL'S.

SIR,—Respecting the height of St. Paul's great deception is constantly set before the public, as the height given is usually 404 ft., or twice the height of the Monument. Now, I cannot think why such a height should be stated, for in examining the sections given under A. Pugin's measurement in "Public Buildings of London," published in 1825 by J. Taylor, High Holborn, and under A. Pugin's directions, from the vaults or crypt to the top of the cross is 381 ft.; the crypt being 21 ft., leaving 360 ft. from the pavement of the nave; from the western steps to the east end, 550 ft.; from the top of the steps to the pine-apple of the western turret, 210 ft.; diameter of the walls supporting the outer dome, 107 ft.; length of north and south transept across the area of the dome, 240 ft.; from the inner doors north and south; height to the top of the ridge of the roof from the pavement, 112 ft.; from the base of the steps of the north and south transept, 313 ft.; from the springing of the outer dome to the top of the cone supporting the cross, ball, and lantern, 53 ft.; inner measurement of the nave and side aisles, 93 ft. 8 in. Now, if any accuracy may be placed in A. Pugin's measurement, I think it is high time such blunders were corrected; and that the publication of this through your columns would set at rest many inquiries which from time to time appear in almost every paper.

J. W. F.

*** Our correspondent is much too sanguine. Errors are very long-lived. The correct height of St. Paul's has been given even in our own pages many times, and will be asked many more.

THE NEGLECTED CHILDREN OF EXETER.

It is very gratifying to us to observe that this subject, which, as our readers know, we have much at heart, is making way in the provinces. A largely and influentially attended public meeting has been held in the council chamber, at the Guildhall, Exeter, convened by the mayor, by circular, "to consider the best means of employing the poor and destitute children of the city during the winter evenings."

The good attendance of clergy and citizens shows that the mayor of Exeter has taken up a subject which the public generally will feel a warm interest in, and be willing to help forward by pecuniary support and personal effort. Let a judicious scheme be devised for rescuing neglected children from the contamination of the

streets, and for providing instruction and employment for boys and girls whose parents either cannot or will not care for them aright, and it will not lack assistance. Police reports afford sufficient proof of the existence of a shocking amount of juvenile criminality; the large number of young people who infest the thoroughfares at night, supplies evidence of the fact that hundreds are lapsing into evil courses for want of proper direction and restraint. With these the mayor and those who are acting with him wish to deal, and so to deal that many who would otherwise acquire vicious habits may be made honest and virtuous, and many who are left to the bad training of the streets may be brought under influences calculated to render the idle industrious and the rude and immoral well-behaved and respectable.

On the motion of the Doan, it was resolved,— "That in the opinion of this meeting it is most desirable that measures should be adopted immediately for the purpose of providing additional instruction and well-devised amusement for the juvenile population of the city during the winter evenings."

Many gentlemen spoke, and it was resolved afterwards,— "That a committee be appointed to report to an adjourned meeting what steps it may be in their opinion desirable to take to give effect to the foregoing resolution."

The committee was then named and appointed. It included the mayor (Mr. Ellis), the dean, the ex-mayor, and several other influential men.

INSTITUTION OF SURVEYORS.

At the ordinary general meeting, held on Monday, January 25th, Mr. John Clutton, the president, in the chair, the adjourned discussion on Mr. Grantham's paper on "Arterial Drainage" was continued. Messrs. E. J. Smith, F. J. Clark, F. Vigers, J. W. Barry, F. Fuller, and others, took part; and the question chiefly discussed was that of the mode of rating the improved properties. The president summed up, and Mr. Edward Ryde then read a paper on "Parochial Assessments." A vote of thanks was passed, and any discussion adjourned to the next meeting on February 8th, when a paper will be read by Mr. J. Bailey Denton, on "The Extension of the Railway System, with special reference to its influence on Landed Property and Agriculture."

CHURCH-BUILDING NEWS.

Waddeton, Torquay, Devon.—The new church in the grounds of Waddeton Court House, the seat of Mr. Henry Studdy, was used for the first time on the first Sunday in the new year. It comprises nave, chancel (with apse), vestry, and porch, and will seat about eighty persons, being intended for the hamlet of Waddeton only; and rebuilt in memoriam of the Rev. E. Holdsworth, late vicar of Brixham. The works were designed and carried out under the superintendence of Mr. Thomas Lidstone, of Dartmouth, by whom the Mansion House was constructed some few years ago. The former chapel was consecrated in the twelfth century.

Hexham.—A vestry meeting was recently held in the vestry, Abbey Church, Hexham, for the purpose of adopting such measures as may appear necessary for enabling the rector and churchwardens to make application to the proper Ecclesiastical Court for a faculty to empower them to make certain alterations necessary in the restoration of the transepts. The meeting was of a formal character. The chairman having submitted plans prepared by Mr. Johnstone, architect, Newcastle, it was unanimously resolved that the meeting approve of such plans, and that the rector and churchwardens adopt such measures as may be necessary. The alterations, additions, and reparations will be made by voluntary contributions. It is intended to lower the floor of the transepts and their aisles to the original level; to repair the stonework of the piers, arches, clearstory, triforium, arcades, and other parts of the transept and their aisles; to close up the present north door of the transept, with a view to the restoration of the arcade to its original state, and to adapt, as may be considered necessary, the south door for the entrance to the church; to open out any windows that are blocked up; to build a new vestry on the part of the site of the old nave between the hut-tresses to the west of the tower; to take down the wall at present filling up the western arch of

the tower, and rebuild it within or without the intended vestry; and to do other minor works connected with the church.

Coventry.—The two new churches—All Saints' and St. Mark's—which have been erected respectively in Far Gosford-street and Stoney Stanton-road, have been consecrated by the Bishop of the diocese. These churches have been built for new parochial districts taken out of the parishes of St. Michael's and Holy Trinity, the funds having been contributed by societies connected with the church and by subscriptions in the county and city. About 7,700l. have been subscribed, and there is still a deficiency of about 700l. Both churches are as near as possible alike, and have been built by Mr. Lovatt, of Wolverhampton, from the plans of Messrs. Paull & Robinson, of Manchester, the diocesan architects. The buildings are in the Early English and Gothic style, and the exterior wallings and dressings are of local sandstone. Each church consists of nave, aisles, chancel, vestry, organ-chamber, and porch. The inside dimensions are, aisles and nave, 79 ft. 6 in. by 12 ft. 6 in. and 23 ft. respectively; chancel, 32 ft. by 20 ft.; making a total internal length of 111 ft. 6 in. The pews are all open, and are made of stained wood. In St. Mark's Church a stained-glass window amounts to the communion-table, the gift of Mrs. Darlington, of Meriden Hall.

Bristol.—A meeting of members of the congregation meeting in the iron church, Tyndall's Park, has been held to consider the desirability of taking steps for laying the foundation of the permanent structure. Plans for the building (prepared by Mr. St. Anby, of London) were submitted, and the architect's opinion was that when 1,000l. were forthcoming they would be justified in making a beginning.

South Walsh, Essex.—We are requested to state that the architect of the restorations of St. Peter's Church was Mr. Tenlon, not Fenton, as misprinted.

Lowestoft.—An adjourned vestry meeting has been held, the rector presiding, to receive a further report of the committee, and plans and specifications for the repair of St. Margaret's Church. There appeared to be three plans for consideration—the original plan, that now proposed by the architect, and the removal of the church into the town. The bishop had suggested to the churchwardens and committee that they should obtain from their architect a plan for the thorough restoration of the Church, with all that was requisite in the way of fittings, &c., and then make an appeal to the public for aid by donations either towards a particular object or a general fund; to be given at once, or distributed over a term of three or more years. The committee recommended that a work of so much urgency should be at once proceeded with. The report was adopted. The estimate for the additional work is 650l.

ART-WORKMANSHIP COMPETITION.

The works sent in competition for the handsome rewards offered this session by the Society of Arts are now on view in the Society's room, Adelphi. The number is but sixty, fewer than might have been anticipated. The adjudication of prizes will be made next week.

ARCHITECTURESQUE AND PICTURESQUE.

SIR,—It appears to me that Professor Kerr does not precisely set the painter's value on the word "picturesque." If he did, and the term "architecturesque" were proposed to be used in a parallel sense, it would, I think, be readily understood and accepted by them as well as by architects. The painter would not apply the word "picturesque" to the antiques, or the finest works of Michelangelo, Raffaele, Giotto, &c., which correspond with the classical examples of architecture; but to the works of the Venetian, Spanish, and Flemish schools. "Picturesque" by painters is applied to that kind of art which deals with the more florid, varied, and intricate in effect, in contradistinction to that which is more temperate, balanced, and simple. The word "architecturesque" to be parallel with "picturesque" should stand thus:—

Painting.	Architecture.
The Grand Style	The Classical
The Picturesque	The Architecturesque
The Unartistic	The Unarchitectural.

A PAINTER.

COMPETITIONS.

Walsall.—It is proposed to erect a new church at Galdmore to seat about 500 persons. A design by Mr. Veall, architect, Wolverhampton, was selected in a limited competition.

Harly Winney Church.—For this competition the committee received more than forty designs. They have chosen those marked "Fides," by Mr. E. A. Lansdowne, architect, and have given him instructions to carry on the work.

Elton.—A short time since designs were received by the committee in a limited competition for St. Stephen's schools, Elton, near Bury, Lancashire. After examination of the drawings, the committee selected those sent in by Messrs. Farrar & Syan, and also designs sent in by Messrs. J. M. & H. Taylor, for consideration. Ultimately the designs of Messrs. Farrar & Syan were adopted, and the works will be carried out under their direction.

SCHOOLS OF ART.

The Nottingham School.—Mr. W. F. Webb, of Newstead Abbey, distributed the prizes gained by the students of this school during the past year, in the large room of the Institution. Mr. Alderman Birkin presided. We have already given an account of the distinguished success of this school during the past year. The meeting was addressed by the chairman and by Mr. Webb, Mr. Rawle, the head master, Mr. Muddella, M.P., and other gentlemen.

A School for Swansea.—The public of Swansea and its vicinity are about to have the advantage of a School of Art. An advertisement appears in the *Cambrian* that a School of Art, in connexion with the South Kensington Museum, is about to be opened in the large rooms above the Post-office, Mr. Hooford being the head master. The school is warmly supported by a large number of the principal gentry, who are the managing committee, whilst the situation is central and convenient, the rooms being well lighted and furnished with classical figures and all necessary adjuncts.

METROPOLITAN BUILDING ACT.

CAUTION TO BUILDERS.

ON Tuesday last Messrs. Tonson & Williams were summoned to Clerkenwell Police-court by the district surveyor of South Islington for neglecting to give notice previously to cutting away a chimney breast and flue, also forming front window into doorway, at their premises, No. 336, Goswell-road, Islington.

Mr. Cooke, the sitting magistrate, fined them 3l. (afterwards reduced to 2l.), and expenses, 12s.

SANITARY TRACTS.

Sir,—I see that you decline to point out books, yet I venture to avail myself of a woman's privilege to ask if you could point out to me where I could procure some sanitary tracts. I have the task of arranging a quarterly packet of tracts for our Ladies' Sanitary Association in Manchester; and having exhausted every available source here, I am compelled to try elsewhere for something new. As I am writing contrary to the notice in the *Builder*, I shall not of course expect an answer, but shall be glad if you give me one, as I am really in difficulties about my packets of information for our meetings.

M. D. Manchester.
* * * Apply to the Ladies' Sanitary Association, 8, Pont-street, Belgrave-square, S.W.

THE TESTIMONIALS OF CANDIDATES.

Sir,—There is a matter connected with public competitions for surveyorships, assistants, and other offices relating to municipal affairs, to which, with your permission, I will draw the attention of those who are concerned. It is that of testimonials.

It has come to my certain knowledge that in one or two public appointments of late applicants have been thrown out and rendered ineligible because they had sent copies and not original testimonials.

That this is scarcely a consistent course for authorities to follow, I will endeavour to show. The persons so rendered ineligible may be the best qualified for that particular appointment. Original testimonials, in addition to the risk of being lost, soon become worn out from frequent handling; and this is no small risk, for although some authorities courteously return papers to unsuccessful candidates, I regret it is not constantly the case. As these cannot always, in fact very seldom can, be renewed, it is of serious consequence to the unfortunate individual so losing them.

It will sometimes occur that at the same time more than one appointment is made, and in different parts of the country; in this case it becomes impossible to transmit "originals" for several appointments, and perforce copies only can be sent, and so the applicant becomes ineligible, and his time is wasted.

When copies have been forwarded, it would be an easy matter for notice to produce "originals" to be given to those most likely to be appointed.

Whilst drawing attention to this subject, let me add, how much better it would be in the interests of all for municipal authorities to select, in the first instance, some half-dozen from among 50 or 100 applicants—being considered the most competent—to appear for personal examination, instead of having the whole batch coming forward at great expense and loss of time. The appointment of Surveyor of Pavements to the vestry of Rochester is a case in point. The matter just ventilated, I trust, will be taken up by some able pen in the interests of many of our subscribers. COMPETITOR.

THE LATE MR. GEORGE SMITH.

Sir,—I have received a letter from the Rev. Sydney Smith, who informs me that his mother was not the daughter of the water-bailiff. Will you have the goodness, therefore, to notice this error in your next number? I felt as certain of the supposed fact as I did of the anecdote touching Abernethy; the latter I was in the office some forty years ago by George Smith, Mr. Smith's eldest son, and felt sure that he had coupled the statement with his mother's name. H. C. BALLOW.

A CAUTION.

Sir,—About six o'clock on Saturday evening last, a Mr. "Roberts" was shown into my room. On my going into the room a few minutes later, he mentioned my father's name, and that his object was to obtain some assistance from the Architects' Benevolent Society, referred him to my father, who was not then at the office, and he left, carrying with him a valuable illuminated work that, with excellent taste, he had selected from my book-shelf. To put architects on their guard against such people, I beg you will be good enough to insert a note of this in your next issue. T. H. W.

CHARGES FOR QUANTITIES.

Sir,—Will you favour me with space in the *Builder* for the following statement of a surveyor's claim for quantities? And if you will add to the favour by stating your own opinion whether or not the claim is a proper one and in accordance with the practice of the profession, you will confer a benefit on all connected with building operations.

A house near this town (Perith) having to be enlarged, an architect from another town was employed, who advertised for tenders, and deposited his plans, &c., in a convenient place for inspection; but neither in his advertisement, specification, nor otherwise did he refer to any bills of quantities. About the same time, however, placards on the walls informed me that bills of quantities might be obtained at 2s. 6d. for each of my departments of the work, on application to a surveyor, at D— (the same town where the architect resides).

I rendered 7s. 6d. and received three schedules; but as these quantities had not been authorized or alluded to by the architect, I had no guarantee that other competitors would use or even obtain them. I therefore thought it desirable to check the quantities, and finding some important items too much, I set the whole aside and took out my own. My tender, amounting to 100l., was accepted, and I have since received a bill, making the claim of which I now complain. It is as follows:—

To Commission £2 8 0
To Lithographing 2 0 0

£4 8 0 making, with the previous payment, 4l. 10s. 6d. per cent. on the amount of my contract. The placard advertising the quantities it was stated that they "could be guaranteed on certain conditions;" but no mention was made of any further payment than that which I rendered; but when I got the schedules I found appended to each an intimation to add 2l. per cent. for quantities and other items for lithographing; but this I did not do, not seeing, under the circumstances, the justice of such an addition to my tender.

I enclose my address and other particulars for your own information. J. S.

* * * If the facts be precisely as stated, our correspondent is not bound to pay the charge made, which, moreover, is excessive.

MASONIC BUILDINGS.

Sir,—Will some of your correspondents point out a publication or anything which would lead me in the way of acquiring the "ritual of building adopted by the order of Freemasons for the extent and peculiarities of accommodation required for the working of the higher degrees of Masonry," as I am engaged in constructing a hall connected with the Masonic body. H.

THE BOSTON CHIMES.

Sir,—In the correspondence that has taken place in your paper, we have the late epistle of the Rev. H. T. Ellacombe, who went to Boston as an amateur, to examine and see novelties. He confesses the work was unfinished, but at so magnificent was the machinery, he felt convinced such beautiful work must produce the sweetest music. He did not see the barrels work, neither heard the bells together, consequently he can know but little of the question in dispute. He speaks heartily, and says the fault may be with the founder; acknowledges that he knows not where it is. The issue, after all, is very simple. The chimes are not satisfactory, and all mortals that make them so have failed. I confess I am mortified that my invention of raling and discharging hell-hammers should suffer from the incompetence of others. I repeat that the bells can be made to act perfectly; the whole thing is simple and practicable; and when my detractors confess they are beaten, I am ready to carry on their failure to success. D. LINDOP.

* * * We allow Mr. Imhof to speak, being personally interested; but we must decline printing two or three other letters on the subject since received. Additional work is being done, we are informed; and until that is finished and the chimes reopened judgment may be suspended.

Books Received.

Quantities Made Easy: a quick and accurate Method of taking out Quantities in Buildings.

By H. A. CREASEY. F. Shaw, Dockhead. THESE pages consist of lists of the items in an ordinary dwelling-house, so that an estimator may not forget or overlook any in taking out his quantities. Instead, however, of keeping all the trades separate, the writer puts each room separately, so that the same headings would have to be written over and over again, and the resulting sum would be very much higher than the same estimator would bring it to if he pursued the more customary, expeditious, and common-sense method.

Practical Remarks on the Principles of Rating, as applied to the proper and uniform Assessment of Railways, Gas-works, Water-works, &c. By H. JAS. CASTLE, assisted by EDWARD JAS. CASTLE, Barrister-at-Law. London: Maxwell & Son, 1869.

THIS work was originally published in 1863, and we have simply to announce the appearance of a new edition, in which additional judgments are quoted. A chapter is given on the rating of mines, brickfields, and cemeteries. The subject is better understood now than it was when Mr. Castle first wrote.

Atchley's Price Book for Architects, Builders, &c. 1869. By P. THOMPSON, Builder.

THE new issue of this price-book includes some sensible observations on "Building Materials," by Mr. F. J. Rogers; a short paper on "Concrete," and "Observations on the Law of Strikes and Combinations," by Mr. J. P. Godfrey, solicitor. The correctness of the prices we do not pretend to check; but we may ask on what grounds builders are to be allowed to charge 9d. an hour for a bricklayer (7s. 11d. a day), and 5d. an hour for a bricklayer's labourer, when they are told they must only charge 9d. an hour for a mason and 5d. an hour for his labourer?

VARIORUM.

THE "Journal of the Historical and Archaeological Association" of Ireland (late the Kilkeny Archaeological Society), for the July quarter of last year, has been issued (McGlashan & Gill, Dublin). It is a remarkably interesting number, and contains various papers and proceedings of special interest on the antiquities of Ireland, including those of the islands of Aran, the Suckinan Ogham inscriptions in the county of Waterford; the Cyclopean churches at Loughs Corrh, Mask, and Carra, and at Gill-Sleibh-Caillian; incised rock markings at Ballybann, county Cork, &c. The rock symbols referred to are identical with some of those on the rocks of England and Scotland, and include concentric circles, with a break in each circle, just as in some of the Northumbrian, but without the central cup, which, however, is repeatedly inscribed by itself, as is also the case on the English rocks. It is a remarkable and interesting fact, mentioned in "Fiji and the Fijians" (2nd ed., vol. i, p. 220), that on a sacred monolithic pillar, emblematic of a Fiji God, or his resting-place, where offerings are made, there are incised three separate series of ring and cup markings, consisting, in each case, of two concentric circles with the central point or cup. This fact may bear on the suggestions made by Mr. J. E. Dove, in his letters on "Rock Symbols" in the *Builder*, that these symbols referred to the relationship between the divine and the human, or the radiative and concentrative principles of life, to which he suggested a key in his letters on Geometrical and other Symbols, also in the *Builder*. The occurrence of the selfsame system of ancient symbols in parts of the world almost wide as the poles asunder, is very remarkable, but not unprecedented.—"Transactions of the Institution of Engineers in Scotland: twelfth session, 1868-9." This part of these Transactions is occupied with a lengthened discussion on the important subject of water distribution and the regulation of the supply, with especial relation to Glasgow.—"Report on Projects before Parliament affecting the City of London." By William Haywood, Engineer and Surveyor to the City Sewers Commission. Printed by Lowndes, Fenchurch-street. This report relates to the Eastern Metropolitan Underground, the Islington, the London, Chatham, and Dover, the Hyde Park and City, or Oxford-street Underground, Railways; and to the Courts of Justice Concen-

tion and the City of London Subways. Mr. Haywood recommends that the Commission dissent from the whole of the projects, so as to obtain its *locus standi* before the committees of the Houses of Parliament, to which the Bills probably will be referred.—Bates, Hendy, & Co.'s "Mercantile Handbook for India, China, and the Colonies." 1869. Old Jewry, London. This Handbook contains a good deal of matter useful in India, China, and the colonies to all who wish to transact business with this country. It comprises a Diary and Directory of British Manufacturers, said to be specially adapted for the use of merchants abroad; but upon what principle the names are selected, as those of the leading manufacturers, we do not know. Writing, as we happen to do, with a Perryan steel pen, we looked up the list of leading steel-pen manufacturers, but we do not find Perry amongst them, although the list contains several of whom we never heard before. So of other manufacturers. However, the book is a very useful one in its way.—Mr. H. H. Vale has printed in a separate form his paper, "The Antiquities of Iona," read at Liverpool Architectural Society (Watts & Co., printers, Liverpool).—"Sprague's Pocket Diary and Architects' and Surveyors' Memorandum Book for 1869" is a neat ordinary little pocket-book, with tables and memoranda, compiled for the use of architects and surveyors. It is not intended to compete with the diaries with which every one is familiar, the special feature rendering it of use to the profession exclusively.

Miscellaneous.

Manchester Art Society.—A numerous attended *conversations* of the members and friends of the Manchester Art Society was held on the 19th inst. in the large room of the Masonic Hall, Cooper-street. In the unavoidable absence of the Mayor of Manchester (who, however, wrote at some length, expressing his sympathy with the objects of the society), the chair was taken by the Mayor of Salford, who briefly addressed the meeting. Mr. J. A. Deane gave an account of the society since its organization in 1836. Its chief object was to supply a demand felt by a large number of artists in Manchester and the district for a greater scope for independent action in bringing their works before the public than had been hitherto obtainable either in connexion with any of the established institutions for public exhibitions in Manchester, or through the agency of the dealers. It was also thought desirable to assist artists generally to exhibit their productions when they might otherwise be unable to do so by reason of the overcrowding of contributions to the Royal Institution's exhibitions.

Cheap Cottages for the Poor.—Attention has lately been directed to an attempt towards solving the problem of building satisfactory residences for the poor on terms to offer a fair remuneration for capital. The cottages in question are at New Hampton, near Twickenham, and have been built by Mr. Benjamin Nicol, and his mode of proceeding by an invention he had made for giving increased power to the ordinary sewing-machine. Slabs are used composed of several layers, forming a thickness of 3 in., "the centre of which consists of a fabric of straw sewn together by a large sewing-machine, compressed at the same time by rollers to 1 in. in thickness, and steeped in a silicate to render it incombustible, while for the external part iron, gravel, Seyssel asphalt, and Portland cement are employed in certain proportions." In the report of the Commissioners on the Employment of Children, Young Persons, and Women in Agriculture, a full description is given. Plans have been submitted showing that by this mode of construction a cottage with living-room and three bedrooms "of ample size, and fulfilling all the requirements of health, decency, and comfort," can be constructed for £85, and which the Commissioners consider "likely to be of great service to all persons connected with agriculture."

Nonconformist Church, Huntingdon.—You will confer a favour if you find room to state what Messrs. Maile, Richardson, & Wrighton, of Huntingdon and Godmanchester, were the contractors for the Nonconformist Church at Huntingdon, which appeared in your pages recently.—C.

Statistical Society.—The usual monthly meeting of this society has been held, Colonel Sykes, M.P., in the chair. Amongst those present were Mr. Lowe, Chancellor of the Exchequer; Mr. Childers, First Lord of the Admiralty; Mr. V. Harcourt, M.P.; Dr. Farre; and others. A letter was read from Mr. W. E. Gladstone, the president of the society, regretting his inability to be present. Mr. K. Dudley Baxter read a paper on the taxation and capital of the United Kingdom. He first considered the resources and territories of the United Kingdom. The lecturer contended that direct taxation by one tax was impracticable, and that a system of taxes was necessary. He examined the various methods of taxation, giving a slight sketch of their history, and proposed the following classification:—1. Taxes on income and capital; 2. Licences on taxes or trades and professions; 3. Taxes on consumption of food and stimulants; 4. Rates on occupation and tolls.

Woolwich and Deptford Dockyards.—Woolwich Dockyard will be finally closed on the 1st of October next, and banded over to another department of the State. The yard at Deptford is to be cleared by April 1, but it is understood must be kept useless. The greater part of this yard is held on a peppercorn rent, under the will of the well-known John Evelyn. In the time of Evelyn, land at Deptford was of but little value; and being anxious to encourage ship-building, he gave land to Government at an annual rent of a peppercorn, on condition that there should always be a ship on the stocks; and during the twenty-six years it was closed up to 1833, the letter, if not the spirit, of Evelyn's will was carried out by the keel of a vessel being laid down and left in No. 1 building-ship. Here, as in educational legacies, we see how injuriously the stipulations of donors often act.

Gift to the Parishioners of Bromborough.—The inhabitants of Bromborough have had formally handed over to them a new building, which has cost upwards of 2,000*l.*, and which has been erected at the sole expense of Mr. Robert Rankin, of Bromborough Hall, and is intended for national schools in connexion with the parish church. The new building will contain accommodation for at least 250 children. It consists of three large rooms—one intended for boys, another for girls, and the third for the infants' school. There is also a class-room, and a playground a full acre in extent. Attached to the schools is also a residence for the master and mistress. The building is of red sandstone. The architect was Mr. John Douglas, of Chester. The land upon which this school is erected was given by Mr. Mainwaring, of Oteley Park.

Bell-founding in Birmingham.—The "opening," a few days ago, of the new peal of eight bells which have been placed in Bishop Ryder's Church, has drawn attention to an interesting business which once flourished, then died out, and has recently been revived in Birmingham. The merit of restoring one of its lost industries to the Midland capital belongs to Mr. W. H. M. Blews, New Bartholomew-street, who has placed in the tower of Bishop Ryder's Church a peal of bells, which has elicited praise from competent judges.

Sheffield Architectural & Archaeological Society.—A meeting of the members of this society was held on the 20th, in the School of Art, when a paper "On Architecture and Archaeology," was read by the president, the Rev. J. Stacey, governor and chaplain of the Shrewsbury Hospital. At the outset, the rev. gentleman thanked the members of the society for the honour they had recently conferred upon him, in electing him as their president. He then spoke of the necessity of architecture and archaeology being studied together, and concluded his paper by alluding to the fact that a great improvement had taken place in their street architecture, several creditable and handsome buildings having recently been erected, which were not unworthy of the wealth and importance of Sheffield.

The Ornamental Windows in the Parish Church and St. James's Church, Doncaster.—The stained glass memorial windows in these churches have been broken by mischievous youths with the catapult. In the Parish church the window erected by Sir Isaac Morley to the memory of his father and family, and the one erected by Messrs. Cooke & Co., bankers, to the late Mr. James Dunhill, have both suffered.

Irish Railways.—The second report of the Irish Railway Commission has been issued. The Commissioners state that they have carefully examined the effect which the reductions in railway fares in Belgium have had on the traffic in that country, but they do not consider the circumstances of that country and of Ireland to be analogous. They propose that the fares on the Irish Railways should be reduced to 1-25*d.* per mile first class, 75*d.* per mile second class, and 50*d.* third class; and they also recommend a considerable reduction in the charges for goods. These reductions, they are of opinion, would create such a large increase of traffic as would confer a great boon on the public, and largely develop the general industry of the country. The Commissioners also express an opinion that a saving of 32,000*l.* a year would be effected by the concentration of management under one administrative department.

City District Surveyor.—According to the *City Press*, the Metropolitan Board of Works has appointed Mr. G. W. Williams, of Frederick's-place, the District Surveyor of Pimmsstead and Eltham, to be Interim Surveyor of the southern division of the City, the appointment being vacant through the death of Mr. G. Smith. The income of the office for the last year amounted to 143*l.* 18*s.* 9*d.*, and the Building Act Committee have now under consideration the subject of the proposed re-arrangement of the several districts in the City, the income of the whole of them being below the average of other metropolitan districts.

Machines for Dovetailing.—Machines for mortises and tenons have long been in use among carpenters and joiners; and now a "dovetailer" has been constructed, which does its work so thoroughly that more than 2,000 of the machines have been sold and are in use in the United States. It performs the operation, it is said, with remarkable rapidity, leaving nothing to be effected by hand, and the saw is so contrived with a flange that the entire dovetail hole is cut out as easily as the pin which is to fill it. Its construction and mode of operation are described and illustrated by plates in the last number of "Proceedings" of the Institution of Mechanical Engineers.

Transparent Colourless Lacquer.—Under this name, says *Scientific Opinion*, Messrs. Brodie & Middleton, of Longacre, offer for sale a preparation which promises to find its way very generally into domestic use. Every one knows that the lustre and polish of ordinary brasswork are due to the thin coating of ordinary lacquer with which it is covered, and which, by excluding the air, prevents the process of oxidation. But frequent cleansing removes this lacquer from microscopes, door-plates, Medieval chandeliers, and so forth; and the re-coating with the lacquer is both a troublesome and expensive process. The new preparation obviates these difficulties. It can be laid on by any one with a common camel-hair brush, the object need not be heated, and the action of the air is effectually prevented. This new substance is quite liquid, dries with some rapidity, and is readily removed by turpentine.

Death-rate of Swansea.—According to the report of the medical officer of health of the borough (Mr. Ebenzer Davies), taken over the three months of the past quarter, the annual death-rate was only 15-8 per 1,000 of the population; while the death-rate for the past month of December was as low as 12-6 per 1,000. Seventeen persons died above 70 years of age, of whom five were above 80 years, and one woman died at the age of 101 years. The lately-constructed system of sewerage and the abundant supply of water, both carried out by the local board of health, may have contributed to this satisfactory state of things.

Rediscovery of the Dungeons of Guildford Castle.—After a great deal of excavation an entrance to the subterranean vaults and dungeons of Guildford Castle has been made. The largest room is open, and measures 60 ft. by 57 ft.; height, 9 ft. to 15 ft. Six others have yet to be found. In these dungeons, upon one occasion no fewer than 600 persons were tortured, and killed in a day or two.

Education of Workmen in Belgium.—The Municipal Council of Brussels, aided by a vote of the Belgian Chamber, has reorganized its industrial museum, and opened a school for the artistic education of workmen.

The Sanitary Condition of Chesterfield. The number of deaths in and around Chesterfield, which have resulted from scarlatina is creating much alarm amongst the inhabitants. It is not an uncommon circumstance to hear of five or six children being affected in one house, or of two or three in one family dying of the malady in a few hours. It is hoped these circumstances will stir up the authorities. The corporation have horrified 3,000l. for the purpose of completing the deep drainage, and also for erecting slaughter-houses outside the town.

Funny.—Amongst other American "factions" deadly and industrial (says the *Levant Herald*), which have been recently offered to the Porte by General Mott, the enterprising brother-in-law of Blaque Boy, and ex-officer of volunteers, who is still here, is a steam brick-making machine, which, it is said, not merely dispenses with "straw," but throws out clinkers burned, builds, furnishes, and all hut peoples, houses of any size or style of architecture the Minister of Public Works may desire.

The French Atlantic Cable.—The first instalment of this cable—125 miles in length—which will be stowed in the fore tank of the *Great Eastern*, arrived at Sheerness, in the hulk *Iris*, a day or two since, and the process of shipping it commenced.

Proposed Tramway on Thames Embankment.—The stoppage of the works necessary to the completion of the roadway arising from the delay of the District Railway Company, has given rise to a proposal to proceed at once with the roadway, laying a tramway along it for the public convenience.

Bath Stone.—Messrs. Randall & Sanders write—Referring to Mr. Cross's letter on "The Decay of Stone," which appeared in your last number, we beg to say that all the Bath stone used in the Grosvenor Hotel was supplied from our Corsham Down quarries. Will you do us the favour to notice this in your next publication?

TENDERS.

For additions to Messrs. Gainsford & Co's premises, High-street, Southwark. Messrs. Henry Jarvis & Son, architects:—

Richardson	23,750 0 0
Thompson	3,615 0 0
Tarrant	3,496 0 0
Macey	3,430 0 0
Hemshaw	3,299 0 0
Kidder & Son	3,250 0 0
Downs	3,193 0 0
Fitchard	3,183 0 0
Turner & Sons	3,067 0 0

For rebuilding No. 43, Strand. Mr. J. Nicholls, architect. Quantities supplied by Mr. Manning:—

Banders	1,640 0 0
Laurence & Baugh	1,617 0 0
Macey	1,540 0 0
Abrahams	1,429 0 0
Richards	1,399 0 0

For sewers, roads, and kerbing, Walford Estate, Stoke Newington. Messrs. Hannam & Lambert, surveyors:—

Nicholson	23,030 0 0
Wood	2,935 0 0
Found	2,797 0 0

For finishing house at Stamford-hill. Mr. Chester Cheston, jun., architect:—

Webb & Sons	21,693 0 0
Lewis	1,900 0 0
Rivett	1,833 0 0
Ennor (accepted)	1,421 0 0

For the erection of one detached and two semi-detached houses at Clapton, for Mr. Charles Jacob. Mr. Chester Cheston, jun., architect. Quantities by Mr. William Oakley:—

Ennor	23,420 0 0
Rivett	3,333 0 0
Asby & Sons	3,143 0 0
Lewis	3,120 0 0
Wood, Brothers	3,083 0 0
Newman & Mann	3,036 0 0
Myers & Sons	2,953 0 0
Morter	2,741 0 0
Brisley	2,650 0 0

For the erection of Clapton Paragon for the Rev. G. P. Irby. Mr. Chester Cheston, jun., architect. Quantities by Mr. William Oakley:—

Ennor	23,420 0 0
Rivett	3,333 0 0
Asby & Sons	3,143 0 0
Lewis	3,120 0 0
Wood, Brothers	3,083 0 0
Newman & Mann	3,036 0 0
Myers & Sons	2,953 0 0
Morter	2,741 0 0
Brisley	2,650 0 0

For dwelling-house and warehouse, Northgate, Chichester, for Mr. John Coffin. Mr. George Elkington, architect:—

Gambling & Sons (accepted)	21,195 10 0
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For the erection of detached house and stabling at Stamford-hill, for Mr. J. Bennett. Mr. Chester Cheston, jun., architect. Quantities by Mr. Oakley:—

Coleman	23,404 0 0
Myers & Sons	22,355 0 0
Lewis	2,223 0 0
Rivett	2,223 0 0
Chestum	2,120 0 0
Ennor	2,049 0 0
Brisley (accepted)	1,790 0 0

For workshops, boiler-house, chimney shaft, and alterations, Grange-road, Bermondsey, for Mr. Thomas S. Norton. Mr. George Elkington, architect:—

Coleman	23,404 0 0
Staines & Sons	2,354 0 0
Little	2,263 0 0
Kenl	2,223 0 0
Fosler	2,134 0 0
Burchell	2,110 0 0
Wells (accepted)	2,068 0 0

For rebuilding No. 124, Wood-street, Chesapeake, including fittings throughout, for Mr. M. Meyer. Mr. Herbert Ford, architect. Quantities supplied by Messrs. Hovenden & Heath:—

Scrivener & White	22,033 10 0
Myers & Son	6,843 0 0
Henshaw	6,823 0 0
Webb & Sons	6,763 0 0
Fritchard	6,693 0 0
Brown & Robinson	6,540 0 0
Conder (accepted)	6,435 0 0
Kilby	6,305 0 0
Crabb & Vaughan (error of £363)	6,197 0 0

For two semi-detached residences, Half Moon Lane, Dalwitz. Mr. H. H. Sims, Architect:—

Spencer	22,639 0 0
Pitebar	2,498 0 0
Waterson	2,357 0 0
Wile	2,373 0 0
Finch & Martin	2,225 0 0
Merritt & Ashby	2,173 0 0
Blackmore	1,975 0 0
George	1,945 0 0
Staines & Son	1,883 0 0
Laver	1,830 0 0
Sawyer	1,753 0 0
Hobers	1,747 0 0
Pellick	1,700 0 0

For the sewerage and completing Whitecross-street, in the borough of Derby. Mr. George Thompson, Borough Surveyor:—

Parrot	2324 0 0
Lee	620 0 0
Tomlinson	630 0 0
Thompson (accepted)	627 0 0

For shops and warehouses, Tabernacle-row, Finsbury, for Mr. Heard. Mr. Robert Walker, architect. Quantities by Mr. W. E. Stoner:—

Deveraux	41,816 0 0
Doell	1,620 0 0
Headley & Reed	1,534 0 0
Turner & Sons	1,491 0 0
Blackmore & Morley	1,360 0 0
Rogers	1,291 0 0
Stoner	1,240 0 0
Browne & Sons	1,252 0 0
Kilby	1,245 0 0

For the erection of a residence, coach-house, and stables, at Heathwood House, Kent, for Mr. John Webster. Mr. John Farring, architect:—

Stimpson	23,717 0 0
Perry & Co.	22,920 0 0
Henshaw	3,394 0 0
Patman & Fotheringham	3,385 0 0
Hill & Sons	3,340 0 0
Kaye & Head	3,199 0 0
Robinson	2,842 0 0

For the buildings of the London Orphan Asylum to be erected at Watford, Herts. Mr. Henry Dawson, architect. Quantities by Mr. Roberts and Messrs. Hovenden & Heath:—

Bromwich	273,554 2 0
Hill & Keddel	71,390 0 0
Perry & Co.	72,920 0 0
Asby & Son	70,347 0 0
Smith & Co.	70,280 0 0
Trotter & Sons	65,770 0 0
Patrick & Son	50,770 0 0
Colls	69,400 0 0
Mansfield, Price, & Co.	69,230 0 0
Dob	69,230 0 0
Brown & Robinson	68,680 0 0
Patman & Fotheringham	68,595 0 0
Conder	67,935 0 0
Jackson & Shaw	66,810 0 0
Gusman	65,967 0 0
Webb	65,490 0 0
Higgs	65,058 0 0

For erecting bath-rooms and lavatory-fittings to Probationary Rooms, Southall Schools, for the Guardians of the Poor of St. Marilebone. Mr. H. S. Sull, architect:—

Gibson, Brothers	275 0 0
Hanson	220 0 0
Manley & Rogers	245 0 0
W. Brown	210 0 0
Howard	238 0 0
E. Brown (accepted)	227 0 0

For constructing 710 ft. of sewer, 4 ft. by 2 ft. 6 in., and underpinning sewer, St. John's-wood-terrace:—

Wilkinson & Co.	24,700 0 0
Tackery	2,310 0 0
Crochel	1,890 0 0
Young	1,823 0 0
Dickson & Oliver	1,790 0 0
Phillips	1,774 0 0
Thwait	1,673 0 0
Cooper & Savage	1,670 0 0

Re House at Luton for Mr. Richard Brown.—Sir: The list of tenders for the above house was accidentally sent to you without my name as the architect appearing thereon, or stating that the quantities were taken out by Mr. John Scott. Thanking you to cause this error to be rectified,—I remain, &c.,—FRANCIS CHARLES SORBY.

TO CORRESPONDENTS.

Institute of British Architects.—In our report of proceedings at week, Mr. A. Clifton is mentioned as amongst those elected Associates. We are informed this is premature, as that gentleman was not balloted for that position.

J. W. Green would have to be read according to circumstances. We cannot speak personally of its efficacy.—J. C. (the delirious and despatches of letters in the various London districts vary in number according to the distance from the head office in St. Martin's-le-Grand).—Free Air (the obvious first step is to have the top-lashes made to open).—G. L. A. J. R. (Walsingham Bridge).—J. E. J. W. L.—A. H. P.—C. M. J.—H. H.—A. M.—W. C. P.—A. H.—J. R. P.—S. S.—H. H.—D.—Col. C.—T. N. D.—R. L.—F. & S.—K. L.—J. D. P.—R. W.—O.—C.—E.—R.—F.—Mr. B.—R.—L.—G.—Martin.—T. H.—W.—R.—H.—H.—G.—J.—S.—Son.—F.—A.—H.—F.—C.—L.—O.—E.—C.—F.—P.—J. H.

We are compelled to decline pointing out books and giving addresses.

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VOL. XXVII.—No. 1357.

"Père La Chaise."



N the year 1347 a wealthy grocer of Paris, it is recorded, as most readers know, one Regnault, built for himself a magnificent private residence, which he named La Folie Regnault. When this grocer died, his heirs sold the place to a devout lady who presented it to a convent of Jesuits. Louis XIV., in 1705 appointed as superior of the convent Père La Chaise, his confessor, to whom the monarch was much attached. The Père was a subtle and powerful man, and Mont Louis, as the convent was now called, became the favourite haunt of courtiers,—the focus of ambition, luxury, and intrigue,—the centre of Jesuitical power in France. On the suppression of the order, about sixty years afterwards, the mansion and grounds were sold to pay debts, and in 1800 they were purchased for 160,000 francs by the municipality of Paris to afford a site upon which to form their first cemetery. Such was the origin of the renowned Père La Chaise, which, as every visitor to Paris knows, occupies the slope of a hill on the north-east of the capital, beyond the Boulevard de la Bastille. Originally the grounds extended to forty acres, and the work of laying them out was entrusted to M. Brogniart, who now sleeps at the foot of one of the cypress trees which he planted. The cemetery was consecrated in 1804, and, on the 21st of May the same year, the first grave was opened. But, not long after, Père La Chaise was turned into a fortress. This was in 1814, while the armies of the allies were approaching Paris. Formidable barriers were erected in the cemetery, which, from its elevated position, commands the plain extending to Vincennes. The walls were pierced with loopholes, and the pupils of the Veterinary School of Alfort occupied it on the 30th of March, and successfully resisted two attacks of the Russian troops detached by General Barclay de Tolly. On the third day, however, the Russians succeeded, and made themselves masters of the cemetery. Paris capitulated the same evening, and here the Russians bivouacked. The worst use which they seem to have made of the place was to cut down a great many of the trees for fuel. Next year, on the second visit of the allies, the interments were again temporarily suspended. The work was once more resumed. To render access easy to different points, winding paths were formed, a wide paved road was opened to the ancient mansion of Père La Chaise, and the grounds were planted with shrubs, cypresses, and weeping willows. The mansion itself was demolished in 1822, and it was intended to erect on its site a colossal pyramid, the base of which was to serve as a chapel for the performance of the burial service. But this part of the

design was abandoned. The neat chapel, which stands in the middle of the cemetery, was erected instead. The present extent of the cemetery is 212 acres, and nearly 5,000,000. have been expended on it. Since the first grave was made, it is estimated that the remains of more than 200,000 persons have been interred here. The number of tombs amounts to about 16,000, of these upwards of 3,000 have monuments. There are three descriptions of graves. Those for the poor (*fosses communes*) are situated in the northern part of the ground. They are 4½ ft. deep. The dead are gratuitously hurried in coffins placed close to each other, without any intervening space, but not upon each other. These trenches are reopened every five years, that term being sufficient for the decomposition of the bodies in this soil, which is very clayey. Then there are the temporary graves. These are held for ten years upon the payment of a certain sum, but are revertible at the end of that period, notwithstanding that monuments may have been erected over them. The remainder of the graves are perpetual; that is to say, they are acquired by the purchase of the ground, and families have the right to sink vaults and to raise monuments at pleasure. At the extreme end of Père La Chaise stands a Moorish mosque, designed by Vely Pasha, Turkish ambassador, for the use of Mussulmans. The Queen and a prince of Oude are interred here. On the right, near the entrance of the cemetery, is situated the Jews' burying-ground. There lies Rachel, the celebrated *tragedienne*. The rest of the extensive tract of ground is devoted to the interment of persons without distinction of rank or religion. The monuments in this great necropolis are of every architectural character and design. Here we see elegant temples and chapels, solemn vaults, and massive pyramids; there tall obelisks, graceful columns, and altars, and urns of diversified forms. No other public cemetery contains the dust of so many celebrated men and distinguished women as Père La Chaise. Bunhill Fields, the "Campo Santo" of Dissenters, is interesting, since in it rest glorious John Bunyan, and Daniel De Foe, John Owen, George Fox, and Isaac Watts. The Edinburgh cemeteries are famous. In the Dean lie Francis Jeffrey, with David Scott, the greatest Scottish painter of his time, and "Christopher North." Dr. Chalmers and Hugh Miller sleep in that pleasant garden the Grange, and Greyfriars Kirkyard is the resting-place of George Buchanan and Allan Ramsay, and all that brave army of martyrs—the old Scottish Covenanters. In Montmartre, Paris, are the graves of Henri Heine, the German poet; of Pigalle, the sculptor; and of General Cavaignac. The remains of the patriot Manin were recently removed hence and conveyed home by his loving countrymen. In the Cimetièrre du Nord lie Paul Delaroche, and his wife, the daughter of Horace Vernet; but Père la Chaise can show a longer glory roll than any of these; it possesses an interest greater even than Kensal Green,—last home though it be of Thackeray, Thomas Hood, Leigh Hunt, Sydney Smith, Allan Cunningham, Mackworth Praed, Douglas Jerrold, John Leech, and other bright spirits who have gone, leaving the world better than they found it.

Let us glance at a few of the great ones whose names are recorded and whose praises are sung in the favourite and most famous of French burial-places. In point of general interest the names of Abelard and Heloise must head the list. The story of the unfortunate lovers, as told by Pope, is a fascinating piece of biography, and it is hardly any wonder that their tomb should be the first to attract the visitor to Père La Chaise. A brief description of their remarkable memorial may be not uninteresting. It consists of a rectangular chapel, in the thirteenth century Gothic style, formed by M. Lenoir out of

the ruins of the celebrated abbey of the Paraclete, founded by Abelard, and of which Heloise was the first abbess. It is 1½ ft. in length, 11 ft. in breadth, and 24 ft. high. An open-work crocketed pinnacle, 12 ft. high, rose out of the cruciform roof, and four smaller pinnacles terminated the gables, but owing to their ruinous state these were some time ago removed. Fourteen columns, each 6 ft. in height, with foliated capitals, support trifoliate arches with open spandrels unmounted by cornices wrought in flowers. The four pediments are pierced with trifoliate windows, and decorated with bas-reliefs, roses, and medallions of Abelard and Heloise. The principal one presents two busts, and a bas-relief in three compartments. In the centre is Mount Calvary; on the left Abelard, in his monastic habit; and on the right an angel holds in his arms the soul of the lover. The opposite one is adorned with two roses, and a bas-relief representing Abelard's funeral. The two lateral pediments are ornamented with roses of beautiful workmanship. Inside the chapel is the tomb built for Abelard by Pierre le Vénéralle, at the Priory of St. Marcel. He is represented in a recumbent posture, the head slightly inclined and the hands joined. By his side is the statue of Heloise. The bas-reliefs round this sarcophagus represent the fathers of the church. An inscription on one side of the tomb runs as follows:—

"Hic
Sub eodem marmore jacent
Hujus monasterii
Conditor Petrus Abelardus,
Et Abbatissa Heloïssa,
Olim studiis, ingenio, amore, infansatis nuptiis
Et penitentia,
Nunc aeternâ, quod speramus, felicitate
conjuncti.
Petrus Abelardus obiit x. primâ Aprilis, M.C.XLIII.
Heloïssa xvij. Maii, M.C.XLIII.
Cursu Carolus de Roney Paracleti Abbatissa
M.D.CC.LXXIX."

A second inscription refers to the retraction of errors regarding the doctrine of the Trinity, attributed to Abelard. At the angles of the monument are four short inscriptions, stating its origin, its removal, and erection in the Musée des Monuments Français, whence it was transported to Père La Chaise. The complete restoration of this interesting relic is now being effected. A plain tomb of large dimensions, surrounded by palisades, bears the name of him who has been called the French Virgil,—Jacques Delille. Near to it is an altar to the memory of the eminent composer, Grétry. Not far off lies Marie-Antoinette-Josephine Raucourt, who died on the 15th day of January, 1815. The opposition of the priests to the interment of this celebrated actress in consecrated ground was carried to such a pitch that it had well-nigh created a popular tumult. In a plain tomb sleeps Madame Cottin, the author of the ever-popular narrative, "Elizabeth, or the Exiles of Siberia." A lofty pyramid, on one side of which is a bas-relief bearing his portrait and name, and the date of his death, commemorates Marshal Massena; and close by are deposited the remains of his friend and companion in arms, Marshal Lefebvre, under a sarcophagus of white marble, with his bust. A large number of French soldiers of distinction rest here. We find the names of Marshals Kellerman, Grouchy, Berthier, and Suchet; Generals Gohert, St. Cyr, and Foy, the idol of the French people. Foy's monument consists of a splendid sepulchre surmounted by a temple containing a marble statue of the general in Roman costume. It is the work of David, and was erected by national subscription. Here also is the grave of the unfortunate Marshal Ney, who, upon Bonaparte's return from Elba, swerved from his allegiance to the king, was condemned to death on the 6th of December, 1815, and shot at nine o'clock on the following morning. This monument was removed soon after its erection, in consequence of the numerous pencil inscriptions written upon it, which were renewed as soon as effaced. The

spot is now laid out as a small garden, enclosed by an iron railing. Among the most imposing memorials is a statue erected by public subscription to Casimir Périer, the Prime Minister, who died of cholera, 1832. A still more costly mausoleum has been raised to Countess Demidoff. Ten Doric columns of white marble support an entablature, under which is a sarcophagus, accessible by a double-branched flight of stairs, the whole resting on a vast basement of sculptured masonry. The tomb of Count Lavalette is ornamented with a bas-relief, representing his escape from prison. There is a neat cenotaph to David the painter, and a massive tomb of bronze is the "In Memoriam" of Balzac. Near to the distinguished novelist rest Delavigne the poet, and Judith Pére, the original of Beranger's Lisette. The grave of the great song-writer himself, he who has been called the Burns of France, is some little distance to the right. His dust mingles with that of Manuel, the patriotic statesman of 1832. One monument serves to commemorate both. Molière and La Fontaine also lie side by side within one enclosure. Their remains were transferred to Père La Chaise in 1804. Racine, another genius, and the friend of these friends, sleeps not far off. Pradier and Dantan, the sculptors, are here, with David d'Angers, whose chisel supplied so many of the finest memorials in the cemetery, is himself commemorated by a tomb of the simplest kind. A little way beyond the gate, and to the left of it, we come upon the name of Alfred de Musset. In obedience to his wish, a weeping willow droops over the head of this lamented poet. Next to him lies Visconti, the architect of the new Louvre. A reclining statue, in white marble, finely executed, forms his tomb. Interesting also is the grave of the Marquis de Clermont-Calleraude who, on the memorable 10th of August, 1792, placed himself between Louis XVI. and the mob to defend his sovereign. But a record of all the famous personages gathered to their fathers in Père La Chaise, would fill many pages. Besides those we have mentioned, the visitor will find scores of others, some of them the greatest ornaments of their age. Among mathematicians and philosophers, be will find Arago, Curvier, Poinso, Delambre, Geoffroy St. Hilaire, and Larmouillière; Laplace the astronomer; Lavoisier, Fourcroy, and Gay-Lussac, chemists; and Dupuytren and Baron Larrey, surgeons (the latter esteemed by Napoleon as the honestest man he ever knew); Bnat, and the Duke Decrès, naval commanders; Bellini, Rubini, and Weber, the composers; Beaumarchais and Scribe, dramatic writers, with Martain, the Spanish dramatist; Duchesnois, the tragic actress and Talma; Lebrun the poet, Dacier the critic, Madame de Genlis, Angold the financier, Lafitte the banker, and Fourier the Socialist, in the company of Volney of "Ruins of Empires" notoriety. Garrier-Pages is here, with Benjamin Constant, the benevolent Abbé Sicard, Lalande, Souvestre, Janet, Davonal, Thérault, Winsor (who introduced gas-lighting into London and Paris), and the Duke de Morny, the faithful friend and servant of the present ruler of France. Of the more recently erected tombs Morny's is by far the most conspicuous and elegant. In Père La Chaise repose the ashes of a few English notables. Here are the names of Sir Sydney Smith, the admiral; General Macdonald; Mr. Ricardo, the writer on finance; the Earl of Stair; Lord Cochrane; Patrick Keene, who was assassinated on the Boulevard des Italiens in 1815; Philip Astley, of the Amphitheatre; also those of Mrs. Fitzherbert, and Mrs. Jordan. Strange, by the way, that the favourites of two English kings, brothers and immediate successors, should find a grave in the same spot, and in a foreign country!

In some respects Père La Chaise is unlike every other public cemetery. It bears but a slight resemblance to the humble and retired Scottish kirkyard, with its narrow footpaths leading to the "place of worship" in the centre, and the plain, modest headstones, with their matter-of-fact inscriptions scattered over its green sward. Of much greater extent, Père La Chaise is not so tastefully laid out or so carefully kept as the Highgate or Kensal Green, as the Dean Cemetery of Edinburgh, or the Clagow Necropolis. These are beautiful gardens, where you scarce can see the graves for flowers. In the Parisian cemetery you see very few

"Marigolds on death-beds blowing."

Looking at the reputation of the French in matters of taste and design, the place does not fulfil the expectations formed of it. There is

little uniformity or regularity in the plan of the cemetery. Thickly-planted trees overhang the principal pathways, making them very gloomy and nearly always damp. In autumn, the walks are literally covered with dead leaves, which it takes much time and labour to clear away. Then the poor quarter of the cemetery detracts greatly from its picturesque appearance. The graves here cover a large space; they are placed close together, each grave being partitioned off by a tiny railing of wood, painted black. Hundreds of small black wooden crosses, with wreaths of flowers and *immortelles*, themselves fast crumbling into dust, are deposited on these graves, and the whole of this valley of dry bones is overrun and choked with ferns and long grass. Altogether this place is dismal and the sight sad. The custom the French have, in common with all Roman Catholic populations, of decorating the graves of departed friends with stucco statues of the Virgin, painted portraits of saints, wax candles, crosses, rosaries, and glass cases of artificial flowers, and other mementoes of affection, is here indulged in to excess. The custom, it need hardly be said, little accords with English notions. But what spoils the beauty, as it disturbs the solitude of Père La Chaise, more than anything else, is the manufacture of monuments continually being carried on within its gates. At the time of our last visit bricklayers were everywhere busy building vaults, and stone-cutters hewing cenotaphs. One-half of the cemetery presented the appearance of an extensive stonemasonry establishment in full operation. These workmen were erecting the perpetual class of tombs already alluded to, and the work will go on from year to year until the ground is completely occupied with graves. Owing to this great extent, the number of interments that takes place in Père La Chaise is very large—from two to three thousand a year, we believe. But of course the number varies. You may see at the same moment half a dozen funeral processions winding their dolorous way up the wooded slopes of this "golgatha." And these mournful errands continue to be made all day long. All day long, too, you meet a tide of mourners and visitors entering and leaving this city of the dead. Yes, Père La Chaise is a city—a vast, ever-increasing city—the metropolis of departed Parisians, whose present population numbers upwards of 200,000, men, women, and children, who have quitted the busy world outside, and, in the significant language of the old Roman, have "gone over to the majority."

LIVERPOOL LABOURERS' DWELLINGS.

More than a year ago the Corporation of Liverpool offered a premium for the best plans for a block of dwellings which they proposed to erect on a site, purchased by them for the purpose, adjoining Vauxhall-road, one of the main thoroughfares to the north end of the town, parallel to the line of docks, and which traverses, perhaps, the most thickly populated of the poorer districts of Liverpool. The premium was to be awarded to the plan which should afford "at the lowest cost (having regard both to expense of building and quantity of land occupied) the greatest number of healthy and convenient dwellings, substantially built, and suitable to the wants of the labouring classes." As usual in such cases, a number of designs were sent in having no reference to the conditions to be attained; designs accompanied by alarming perspective views giving to the proposed block of humble dwellings the aspect of a lordly mansion, or a group of substantial dwelling-houses for the comfortable middle-classes; and further recommended by imaginary balance-sheets, fearfully and wonderfully made out, giving promise of returns of 7, 8, and even 10 per cent.; computed at available rentals being matters easily manipulated—on paper. The council, shunting their eyes to these golden prospects, gave the first premium to a modest and carefully-planned set of drawings by Mr. J. E. Reeve, which appeared best to fulfil the joint conditions of salubrity and moderate cost; but having reserved the power of employing any other competitor, they ultimately entrusted the work to Messrs. Redman & Beakthorpe, whose plans, on further investigation, appeared likely to yield larger accommodation and consequent return for the sum to be expended. These buildings, which are now nearly ready for occupation, are arranged in three rows longitudinally on the site which is an oblong parallelogram of about

two to one; the whole being again divided transversely by an asphalted road, 30 ft. wide, which runs across the centre of the site and opens into the two streets, Sylvester-street and Ashfield-street, which bound the site on the south and north sides respectively. The two longitudinal roads, between the centre and side blocks of dwellings, are 25 ft. wide, and the entire aggregation of dwellings is thus partitioned into six blocks, four outer ones of five stories, and two inner ones of three stories in height. The only objection to the general plan is that, as the ends of the site are bounded by existing buildings, each of the longitudinal courts of course forms a *cul-de-sac*, closed by a high wall at one end, which must materially interfere with light and thorough ventilation, besides possibly lowering the rental value of the houses near the upper ends. Among the plans originally exhibited in competition, several other ways of arranging the buildings were shown; and there can be little doubt that the plan which found favour with several competitors, of placing the blocks of dwellings transversely across the site from Sylvester-street to Ashfield-street, so as to have a succession of clear openings from side to side, would have been preferable in a sanitary point of view. The present arrangement was selected as affording space for a greater number of dwellings than any other; and as the number of applications for tenancy is said to have been already more than double the number of houses (which are 146 in all), we must refrain from quarrelling with a plan which provides what there is evidently such a very great demand for, especially remembering that this is to be looked upon only as an experiment before entering upon future undertakings of the same nature. In detail, there is much to commend in the planning, which is very compact, and loses as little as possible of available space. The houses are in three classes; with three, two, and one bedroom respectively, in addition to kitchen and scullery. Access is given to the different stories, at the requisite intervals, by staircases of Yorkshire stone, with landings of the same carried on iron beams; the landings at one side of the building being open to the air, and the alternate landings at the other side affording space for two water-closets on each, with Guest & Chrimes's apparatus. From the outer landings a door opens on each side, giving access to a set of rooms complete in itself, so that each tenant has its own outer door opening on to the staircase, and each has its own water-closet, a few steps up on the next landing. Between the two water-closets an ash-shaft descends, with an iron door on each floor, for discharging the ashes into the ashpit in the basement. Each room is fitted with gas, and a meter is placed in the basement for each staircase. We should have liked to see the water-closet a little less prominently and publicly placed; the seat is opposite the door, which opens directly opposite the street entrance on the lower floors. Of course it may be said that the class for whom such houses are built have not the same fastidiousness about such matters as is found among what are called the "upper classes;" but as one of the ends of improved dwellings is to raise their occupants, the more the latter are encouraged towards that refinement of habits which forms so large an element in civilization, the better for them. Another slight defect in the plan is the darkness at the bottom of the stairs leading to the basement dwellings, which might have been lessened by a glass riser in one or two of the steps above. The work in general has been very well executed by the contractor, Mr. Hugh Yates, of Liverpool.

The rental of the houses will be from 6s. to 3s. per week, the latter amount being only for the smaller houses in the interior blocks. These are about the current rents of house property of the same class in the neighbourhood, and upon this scale it is expected that nearly 54 per cent. will be realized. This will not be considered a very paying speculation, yet even this has not been attained save by rejecting what would probably have been a better sanitary plan, and by putting more houses on the site than it will well bear, considering the proportion of open ground to ground built on. The interior streets or courts will be little less close and crowded than some of those in the neighbourhood; and as no special provision could be made for a washhouse or drying ground, these courts will, at weekly periods, doubtless be crowded with clothes hung out to dry, than which there is surely not a more comfortable sight to be seen between two rows of dwellings. Is not "washing-da"

proverbial among the lower classes as a day of discomfort? And if anything like pleasantness and attractiveness is to be given to the aspect of our town homes of this class, we opine that a separate place set apart for washing and drying will be a *sine qua non* towards that end. In some houses of this kind built a good many years ago towards the south of Liverpool, drying-rooms were provided in the roof, as an attic, but it was found that the tenants would not take the trouble of carrying a large bundle of clothes so far upstairs. These same houses did not pay 5 per cent., if we remember rightly, nor anything like it; and possibly the addition of such a room, even in a more accessible position and with a slight charge for the use of it, would suffice to reduce the return below that moderate per-centage. But the result of this Labourers' Dwellings Competition in Liverpool goes far to convince us that those who undertake to provide for the labouring population in our towns, dwellings where life may be in some degree an enjoyment, and not a mere fact of existence, must be content for the present to mix a little philanthropy with their per-centage calculations. Political economy is a great science, but it does not abrogate the claims of humanity. When we consider the great amount of so-called wealth which is at present turned over amongst the richest classes, in a perfectly unproductive manner, on the one hand, and when we contemplate, on the other hand, the masses of population who, in such districts as that between Scotland-road and Vauxhall-road in Liverpool, are living crowded together in ill-ventilated and ill-drained houses looking out upon dirty alleys which are the receptacles of perennial filth and refuse—districts in which even such a large block of new building as it has been alluding to seems like a drop in a bucket—it becomes evident that to make any tangible improvement in this state of things we must not wait too warily for large per-centages. Money laid out, even with but a small per-centage return, upon such an object as this, will in the end repay the community, inasmuch as it will give a chance to the lower classes to live like men and not like animals, and to be more helpful to the general good. It is to be hoped that the Corporation of Liverpool, having made on the whole a fair first experiment, will not stop in so desirable a work.

fish's success by not making his "Foul Wards" a detached building, as requested, capable of supervision by one nurse. The ward which is divided into three seems to want Nurses' rooms. The mode of getting over the difference in levels needs explanation. As a means of escape from fire, the author gives his corridors terrace-tops. The design of "Experientia," which seems very complete and well considered, has an advantage over the latter in setting the administrative block forward, before the wards; and over "What is worth doing," &c., in the position of the foul wards building, which could by the plan of *Experientia* be served by the same administration. This could scarcely be the case in "What is worth doing." In this latter, too, the wards come very close to the railway, and the administration block to the proposed new street. The value of a double corridor to the administration, which renders supervision difficult, seems questionable; and we are not certain, looking from the same point of view, if a staircase at the end of the wards is desirable. However, all we wish to show by these observations, in the interest of the competitors generally, is the necessity for the most careful examination and comparison of relative advantages and demerits.

A NEW EXPERIMENT FOR THE POOR.

DURING the course of last year, while writing on the nature of the risks to which human life is subjected, we promised to discuss on a future occasion the principles of a new society which had then but recently started in Edinburgh for the purpose of improving the condition of the poorer classes. We have not been able to overtake the subject sooner; and indeed it is always well to postpone treating of any institution in the northern capital as a thing accomplished. For even in the present case an unquestionably benevolent and disinterested movement seems likely to turn out a failure, owing, as it would seem, to the strong and determined opposition of the local authorities. They may or may not be right. Our readers, however, may judge for themselves. There are circumstances connected with this experiment, as we must still term it, which are, at all events, worthy of the consideration of those who are interested in the progress of society.

In that valuable part of the "De Argumentis," where Bacon touches upon moral science, he lays particular stress upon that principle which he calls the *bonum communis*, or social good, considered as a source of happiness to the state or to the individual who pursues it; and he shows by a reference to various systems of antiquity that in this neglect lay their radical deficiency. For those systems placed happiness in the *bonum suavitatis* alone, or in that principle of which self is the only direct and ultimate object. We need not illustrate Bacon's philosophy by a reference to the celebrated Poor Laws of Elizabeth. But it is clear that Bacon considered that the "social good" could only be ameliorated, and, if possible, improved, under the direct and positive control of the state. In our day greater scope has been allowed to individual benevolence; and to such an extent has this idea prevailed, that some people begin to hold the opinion that all existing charities may be as well and impartially administered by private individuals or associations as by local authorities or even by the State itself.

The "Edinburgh Association for Improving the Condition of the Poor" belongs to this category of private benevolent associations. In fact, it is one of those modern experiments in "sociology," of which the success will exclusively depend upon the manner in which it is carried out. As we have already characterized it, it appears to be an attempt to eradicate poverty and extinguish crime on the principle of voluntary association. But, although the Scotch are unquestionably the best volunteers under the sun, the idea does not seem to have germinated in the northern capital. Either Paris or New York is entitled to the honour of being regarded as the birth-place of the present highly popular theory of amalgamating existing charities, or at least of opposing a united and articulated organization to the inroads of poverty, disease, and crime. Since, however, Edinburgh has been all along abreast of the movement, and more particularly has supplied us with the most voluminous reports on every phase of the subject, we cannot do better than give some account of its progress as developed and at present exhibited in that ancient city.

It is first of all necessary to explain that for some years past much attention has been directed to the deplorable condition of the industrious poor of Edinburgh. The late Dr. Chalmers made strenuous efforts to arouse the attention of his backsliding congregation to the utterly abandoned state of the Cowgate and West-port; Dr. Guthrie's eloquent denunciations of the sins and sorrows of the city fell upon the astonished ears of his fashionable congregation like a thunder-bolt; and Dr. Begg's able and more practical efforts at amelioration are well known to our readers. At the same time the ecclesiastical reformers were ably seconded in their efforts by the more scientific and better regulated researches of the medical men. The late Professor Alison's discoveries on the origin and causes of contagious diseases were chiefly made in the dismal cellars of the Cowgate and Cannongate; and these discoveries were tolerably well applied some years later, by one of his quondam pupils, Dr. W. T. Gairdner. Dr. Foulis, a philanthropic physician, actually purchased an old close, and after repairing it, renovating it, and supplying it with water and other necessities, succeeded in demonstrating that the existing evils, had as they were, could be diminished, if not entirely prevented. This school of medical reformers at length brought to light Dr. Littlejohn's admirable report on the sanitary condition of Edinburgh, from which report we believe have sprung the subsequent city improvements inaugurated so ably under the auspices of the Lord Provost (Mr. Wm. Chambers). Of course, it is unnecessary to state that all this time the press was not idle. The *Scotsman*, the *Edinburgh News*, the *Scottish Press*, the *Evening Courant*, and even the poor old and now defunct *Calonian Mercury*, made important special inquiries, and published long articles on the condition of the poor. Many private citizens, such as Mr. Charles Cowan and Mr. Thomas Knox, published pamphlets, and otherwise threw themselves with great earnestness and zeal into the practical questions of reform.

At length about three or four years ago the *Scotsman* undertook to expound at great length and, as we remember, with much ability the subject of the constitution and operation of the "Charities of Edinburgh," which had long been in an unsatisfactory condition. Irrespective altogether of the Poor Law Boards, it was found there were no less than thirty-six different charitable associations in Edinburgh, all engaged in the same common cause, and mostly supported by the same class of benevolent individuals. The sensible conclusion to which the writer came was this: that those various charities, from their isolated character, lost much of their usefulness; that their cost of management and administration was wasteful and extravagant; that, after all, they failed to meet their intended purpose; and that some method of combining them and organising them was urgently needed.

It happened very opportunely, about the same time, that public attention and curiosity were excited by an American gentleman, who was at that time residing in Edinburgh, and who pointed to certain well-organized charitable measures which had been employed with remarkable success in different Continental and American cities. By means of several private lectures which he gave, and by the publication of a pamphlet on the subject (in which he was ably assisted by a lady who is interested in the scheme), public interest was deepened and extended. Upwards of one hundred influential citizens of Edinburgh, ministers and laymen, together with all the leading newspapers, cordially concurred in lending their names and commending the charitable measures and intentions displayed in the pamphlet.*

To sum up the author's conclusions, the plan is based on three great principles:—

1. Thorough systematic investigation of the actual conditions and wants of all the poor in a city.

2. Suitable relief given in every case of need, in ways which tend least to abase, or to degrade and pauperize the receiver.

3. Relief given as far as possible by methods which enable the poor to help themselves, the great object being to prevent cases of temporary destitution from becoming cases of permanent pauperism.

The author proceeds to support this scheme by

* "How to Relieve the Poor of Edinburgh, and other great Cities, without increasing Pauperism; a Tried, Economical, and Successful Plan." Edinburgh: Edmondson & Douglas, 1867.

THE PROPOSED SICK ASYLUM FOR NEWINGTON.

The architects who have submitted designs for this asylum are Messrs. Berriman & Son, Messrs. Giles & Biven, Messrs. Jarvis & Son, Mr. Knightley, and Mr. Leppard. Mr. Burton was also invited, we believe, but did not send in drawings.

In the previous competitions of this kind, the names of the architects were affixed to their drawings; but in the present case they are not so, the drawings being simply identified by mottoes,—a delusion and a snare! We cannot applaud the change. The estimates of cost, as this list shows, differ enormously:—

"Junius"	£33,500
"What is worth doing at all is worth doing well"	33,600
"Experientia"	34,500
"L'Esperance"	51,000
"Expectans"	68,000

The competitors have all set forth their designs very creditably, one of them sending no fewer than a dozen drawings, to show alternative designs. The last on the list, "Expectans," has made the mistake of "well" lighting and ventilating his administrative block, which means ill lighting and ventilating; building round an internal area. This, and the general crowding of the buildings, will make his chance small. The plan by "L'Esperance," too, clever as it is in some respects, will not compare satisfactorily with the first three on our list, and from these we have little doubt the selection must be made. In general arrangement of the blocks these resemble each other very much at first sight, but this resemblance is lessened on looking at the appropriation of the several portions, and comparing distances. Stock bricks, with a few red hands, are the materials chiefly adopted, and all have three stories in height. We had made a list of objections to each, with the view of comparing; but we prefer to use them as simply showing how carefully the designs should be examined before the decision be arrived at. "Junius," with a capital plan in many respects,

references to the methods of systematic benevolent distribution in Paris and New York; to Liverpool; to Elberfeld, on the Rhine; to Calcutta, and to Bombay, as conducted under the auspices and supervision of Dr. Duff. The French and American systems, however, are those upon which he chiefly builds, and which, he tells us, "are totally independent of all church or congregational organization." It is easier, he adds, to form a visiting society quite independent of all churches rather than one dependent on their co-operation with each other, and a good deal more to this effect. Our readers will, of course, recognize at once the principle of absolute secularization in this American scheme of benevolence. The churchman to the cure of souls; the layman to the cure of bodies. We will not stay to notice it at present, further than to point out the fact that the visitors, to whatever church they happened to belong, would necessarily require to be sincere and benevolent Christians! In the city of George Combe and his disciples the principle seems to have met with general approbation, more particularly with that of the Lord Provost, who, we are informed, had long meditated some kind of similar organization on the subject.

The preliminary proceedings were conducted with great administrative skill. As a first step the Lord Provost issued numerous invitations to take part in a meeting to consider the "practicability and expediency of adopting measures to simplify, economize, and concentrate the action of the public charities of Edinburgh, as well as to improve the condition of the really deserving poor." The invitations were cordially responded to in every quarter; and a large number of ministers and doctors, as well as men of all parties and denominations, assembled in the council chambers. The Lord Provost presided; and in explaining the object of the meeting, drew attention, in very emphatic terms, to the unsatisfactory organization and results of the present charitable institutions. Without for a moment inferring that those charities were badly or recklessly administered, and while giving their managers all honour and credit for their efforts to succour want and infirmity, he deplored the absence of all systematic action. He also pointed out how it was possible that, by insufficient and unsystematic arrangements, they might be absolutely nourishing the diseases which it was their intention to assuage; and that in consequence of the present desultory system it was to be feared that they encouraged imposture on the one hand, while, on the other, many of the really deserving and modest poor were left in obscure holes and corners to suffer the pangs of misery and neglect. He further illustrated the need of more united action and of well-organized and systematic measures, by explaining what serious evils result, not only to the poor, but to all classes of the community, from the deficiencies of our existing charitable arrangements; and he finally declared that the whole system now pursued was fraught with consequences alike painful and reproachful; and that it could not possibly fail, if its operation were continued, to damage the best interests of the city. The proceedings were brought to a conclusion by the appointment of a large committee, consisting of upwards of seventy clergymen and laymen, representing every shade of theological and political opinions.

This meeting in the Council Chambers was held on the 15th April, 1867, and the first practical result of the meeting was the production, ten months afterwards (28th February, 1868), of a voluminous report on the whole cognate subjects, written by Dr. Alexander Wood.* This gentleman, it appears is one of the medical school of reformers which we have already indicated.

We will not criticise a report which is written gratuitously and for benevolent purposes. To those who have not studied too minutely the various phenomena and the innumerable circumstances of which it professes to treat, this report may be justly considered valuable. Certainly it contains a large store of facts, and a perfect labyrinth of statistics such as they are. Its practical conclusion may be expressed in three lines: "The only one of these schemes which the committee would recommend to take up at present is the thorough and systematic house-to-house visitations of the poor" (Introduction, p. 15) and also to this end, "that a central office must be established in connexion with it."

And accordingly a central office was established

* Report on the Condition of the Poorer Classes of Edinburgh, and of their Dwellings, Neighbourhoods, and Families. Edinburgh: Edmonstone & Douglas, 1868.

at 25, York-place; active operations immediately commenced; district visitors volunteered; a manager was appointed, at a salary of £200 a year; and the Edinburgh Association for Improving the Condition of the Poor is at this moment in full working order. But, as the national poet Burns has it, the best laid schemes of mice and men often "gang agley." The apothegm would also appear to include the most benevolent schemes. For only last week, on applying to the town council for their reasonable share of the preliminary expenses—guaranteed as they had thought by the Lord Provost and magistrates—the association were bluntly told that they were doing more harm than good; that they were teaching the whole poor of Edinburgh to seek alms; that before they began expending money at such a wholesale rate, they should have paid their printer's bill; and, finally, that the members ought to be aware of the old proverb, that charity begins at home! Well may the association retort on the town council in the memorable lines of Tom Hood:—

"Oh, for the early
Of Christian charity
Under the sun!"

GLEANINGS FROM THE ARCHITECTURAL FIELD OF 1868.*

ONE great advantage which the architectural practitioner of the present day enjoys over his predecessors in the art, is that of having brought constantly under his notice the works of his own time, as they are going on around him throughout the world. One hundred years ago it was absolutely necessary for the architectural student, if he would gain any competent knowledge of the state of his art prevailing even in this country, to travel extensively to the various cities and centres of industry. It is true, nevertheless, that the present easy acquirement of current architectural knowledge has had some evils connected with it, and these of a serious kind. The active and enterprising spirit of the age which has developed the cheap illustrated architectural periodical has brought along with it more weighty demands than ever upon the skill of the architect, and has given him shorter time for his tasks. Time for thought being denied him, and having treasures gathered round him from all quarters, his works have become rather adaptations than original productions; and, drawn hither and thither by the rival attractions of various styles, he has often attempted them all, and thoroughly worked out none. With his accumulated knowledge he has been like the man who was said to have so many books on his head that his brains could not work. This drawback is, however, one which may, and should be, overcome by the man who wishes to become a true architectural thinker. Let him select what style he chooses, in the first instance,—one in which he can labour with delight, *con amore*,—and, bringing all his knowledge of that style, and all his artistic feeling, to bear upon the work, he will gradually, without fail, expand and develop his adopted style in a natural manner, and with a success which will be of the highest value to the cause of art. I think that I am fairly borne out by the facts, when I assert that this has been the case in the career of the greatest architects. Brunelleschi, Palladio, Wren, Chambers, and, indeed, Sir Charles Barry (as his best works were Italian), were men who spent their lives developing one adopted style; and such are Pugin, Scott, and Street. No style monopolizes every beauty any more than any type of scenery in nature; and where we detect a beauty lurking in the features of any other style than our own, we are perfectly free to follow and adopt it so long as the new beauty will not agree with the old. But rival beauties are proverbially dangerous in art as well as in social life, and it is therefore necessary to do our spiriting gently. For instance, you see a beautiful picture in the artist's studio, deep-toned and subdued in colour; everything, indeed, about it being made subservient to the forcible telling of the story, say one of the late C. R. Leslie's, and you admire it exceedingly. A few months after you visit an exhibition, and seeing the name in the catalogue, look out at once for your favourite. "Alas, how different, yet how like the same!" The glory has departed! How? By the presence of a rival beauty beside it in the shape of a richly-coloured glowing landscape by Turner & Linnell. The one picture has killed

the other. Two notes in music may be beautiful when each is sounded alone, but when brought into rivalry how great the discord.

Notwithstanding the above remarks, the advantages of a constant view of the architectural field around aro, I repeat, great. Example is better than precept. As we view the works of others from week to week, we are thereby incited to emulation and strenuous endeavours; and by the manner in which difficulties have been worked out and overcome, we are encouraged to grapple manfully with our constructive necessities in order that we may ensue them in a form of consistent and truthful comeliness. From the abundant harvest of our art during the past year, 1868, as chronicled in the pages of the *Builder*, I have gleaned for my paper this evening a few illustrations of buildings on which to comment, trusting that the subjects thus brought under our view may afford us food for discussion. As distance is said to lend enchantment to the view, we will commence, if you please, at the Antipodes, with—

St. Patrick's Roman Catholic Cathedral, Melbourne.*

This important edifice was begun in the year 1855. The plan comprises nave, transepts, and choir, with aisles to each on both sides. The choir has an apsidal end, and five chapels open out from the aisle which surrounds it. There are two towers with spires, each 220 ft. in height, at the south-west end of the nave, and a lantern tower and spire, 330 ft. high, at the intersection of the nave and transepts. The extreme length of the church interior is 315 ft. The width inside the nave and aisles is 76 ft. The interior length of the transepts is 160 ft., and the height to the ridge of the roof is 92 ft. At the time the *Builder* writes, the nave and aisles, and two western towers, had been commenced; the nave and one aisle had been roofed in, and nearly completed, and the stone vaulting of the second aisle was making rapid progress; one of the towers was up ready to receive the spire, the other being complete to the floor of the upper belfry, and a portion of the helix had been hung in the western tower. The architects are Messrs. Wardell & Co.

The brief account of the building which I have extracted, will show that it is a church of a class which is rarely built in these days, although there are not wanting signs just now of a return to the old enterprise for building cathedrals, displayed so nobly in the Middle Ages. The new Roman Catholic cathedral at Westminster is likely to be of first-rate proportions. Here, in Liverpool, we have had a good deal of talk and correspondence in the papers about a Protestant cathedral, which I trust will not be allowed to rest till it result in the matter being accomplished. But to return to our subject.

The general external effect of the church is pleasing, reminding one much of Lichfield, with its three spires. The disproportion between the western and central towers is, I submit, too great. The same fault is observable, I think, in York Minster, where I always feel that the end towers look dwarfish when compared with the great central tower. In the body of the building the architects have lavished the most work upon the north transept elevation, which has three large doorways, in the Continental manner, with a magnificent rose-window above, the gable being occupied by three windows. In contrast with this front, the west end is kept too plain, and is scarcely, I think, worthy of the rest of the building. In justice, however, to the designers, I think it is evident that the transept doors have been made for some reason or other the main entrances to the building, a reason which would justify the designers to a great extent in devoting so much attention to them. The flying buttresses in their design are scarcely characteristic enough of stone. They resemble too much roof timbers, and one is reminded by them of a series of ornamented props, stuck up against the building. The top of the central tower appears somewhat crowded, in consequence of the canopies over the belfry windows running into the battlement above. The un-crocketed spire above this tower is not in harmony with the richly crocketed pinnacles around it, and the contrast between the two gives a baldness to the spire which otherwise it would not have. In the case of the west towers, the crockets are omitted with much better effect. There is a feature about these towers to which I wish to draw attention. The angles formed by the buttresses at the

* Read at meeting of the Liverpool Architectural Society, Jan. 27.

* See *Builder*, vol. xxvii. p. 594.

three corners are filled up with a splay, the wall being built out from the level of the belfry windows. This is a good idea. The towers are not large enough to allow of broad faces to the buttresses, and the architects by this means are enabled to project them out boldly without their having a meagre appearance, the great disparity between the faces and the sides being concealed by these projecting splays. Another good feature about the church is the way in which the line of the parapet surmounting the clearstory is carried round the western towers and across the west front, where the ornamental pierced work of the flank elevations might have been again introduced with good effect. However, even as it is, this feature gives much unity to the design. Taking the church as a whole, I consider that it displays a good deal of "character," the element so ally insisted upon by Mr. H. P. Horner. There is a dignity and repose about the design well fitted for the sacred purpose to which it is to be devoted. By all that we can gather from the description and the illustration, it fulfils very fairly Sir Henry Wotton's three requisites—"Stability, Firmness, and Delight."

My next illustration is the interior of St. James's Church, Kidbrooke, near Blackheath: Messrs. Newman & Billing, architects. This church, we are informed, was consecrated by the Bishop of Rochester, in July, 1867. It contains accommodation for 1,000 persons, and cost, exclusive of the organ, reredos, pulpit, fencings, lighting, &c., about 7,000*l*. The tower and spire, 160 ft. high, are at the east end of the north aisle, and a vestry at the opposite side. The organ-chamber is formed on the ground-floor of the tower. The reredos, pulpit, reading-desk, and font are wrought in Caen stone, with alabaster and marble columns introduced. The church is built of brick, with Kentish ragstone facing, and Bath stone dressings. The pewing and stalls are of deal, stained and varnished. The chancel is laid with encaustic tiles. The whole of the windows are filled with geometric tracery. The interior is chiefly noteworthy for its carving, and the novel mode of lighting by means of coronas surrounding the piers above the caps. The carving was executed from designs furnished by the architects. It is very elaborate, but not, I think, sufficiently conventionalized. In the large-sized view of one of the pier capitals it will be seen that the small sprigs introduced just above the necking look stuck on, like sprigs of holly in Christmas decorations. This opens up a nice question as to how far the use of natural foliage may be indulged in in architectural decoration. For my own part, I am of opinion that it may be laid down as a sound principle that all carving ought to be conventionalized to some extent before being used in connexion with architecture. This extent must depend very much upon the character of the buildings in which it is employed. In the Greek edifices, which were as far removed from any connexion with Nature as any buildings have ever been, we find the carving severely conventionalized, only still retaining the beauty of form and plan of structure derived from the natural model. In the Norman we find much of the same severity; but in the Gothic Pointed architecture we come upon a much closer imitation of nature, yet still conventionalized. This relaxing of the severity of the earlier style was only consistent with the architecture, which became itself much more closely allied to nature:—

"The pillars with clustered shafts so trim,
With base and with capital flourish'd around,
Seem'd bundles of lances which garlands had bound."

But in all this change the workman was much more than a mere clever copyist. He took, it is true, the plans and details of his leaves and flowers from the band of Nature, but nothing more, following her only in those elements of general form and contour which were common to both. The brackets under the shafts supporting tiers of timbers in this church are, I think, taken in their general form from the well-known examples at Lincoln. The east window is of good design. The filling-in of the arch over the organ with open tracery is an idea worth noting in the present day, when there is scarcely anything in the shape of an organ-case provided. The tracery will help to hide the tops of the large wood pipes, the swell, and other excrescences.

With regard to this method of lighting, I can testify that it has a most beautiful effect. About two years ago I stayed at York over the Sunday, and attended evening service at the cathedral,

which is now lighted in this manner, and a more striking sight I have seldom seen than the long nave, with the line of brilliant rings of gas jets illuminating the soffits of the immense arches. By this method the piers cannot cast any shadow over the pews, and the light is equally diffused through aisles and nave.

Again leaving England, I must ask you to return with me to Melbourne,* where the new town-hall is now being erected. The foundation stone of this structure was laid by his Royal Highness the Duke of Edinburgh, on the 29th of November, 1867.† This building is another evidence of the magnificent way in which they build in the new colony. There is a good deal about the general treatment of the whole which resembles our Liverpool municipal offices. In both buildings a large Corinthian order is employed, with attached columns and pilasters, and a lofty attic above. In both we have pavilion roofs at the corners. The position of the tower, however, in both is different,—in the municipal offices being in the centre of the front, while in this example it is at one angle. As far as the tower itself is concerned, this may be perhaps the best place for it; but, taken in connexion with the rest of the building, it appears misplaced, as it destroys the balance of the whole composition, which is one of the leading charms of the Classical style. The towers of both buildings are composed of much the same elements—viz., a columnar order—a clock-face story and a terminating story, which in the Melbourne structure consists of a slated dome and lantern. The clock-face here forms a base for the columnar order; in the municipal offices it is above. Here, although the clock story is somewhat bald in design, it still forms a pleasing contrast to the lighter and richer story above. Here the architects have taken considerable liberties with classical traditions in making the pedestals of the columns and the breaks in the entablature above circular in plan. This is certainly a mistake in the case of the pedestals, as they have lost thereby the effect of contrast presented between the square pedestal and the circular shaft above. The circle in the entablature gets over the difficulty of having a square break at the angle, and is therefore much less objectionable. The attic between the pavilions is too much broken up, and is scarcely severe enough in character to harmonise with the Classic order beneath. The large Venetian windows lighting the upper story appear to be of good design, and will have a fine and bold effect with their deeply-recessed arches. The composition of the two heights of windows beneath the tower is very happily managed. The architects here have wisely substituted a pedimented head over the upper window in place of the round arch, which would have looked weak and unsatisfactory. As it is, the large pilasters at the angles of the tower, with the deep entablature and the smaller pilasters and entablatures of the windows, are in accord one with the other, as they are both doing precisely the same kind of work in a precisely similar way. The harmony would have been complete had the large angle pilasters been coupled like those of the upper window.

*Passingworth Manor, Sussex, the Seat of
Mr. Louis Huth.‡*

This house is situated on ground rapidly falling to the south, commanding extensive views, and is screened at the back by a belt of fir trees. The materials used in the construction of the house are red brick with Bath stone dressings and slated roofs. The principal rooms on the ground-floor are the hall, dining-room, morning-room, drawing-room, picture-gallery, and conservatory. In the centre of the building is a quadrangle, entered under a gate-house, by which access is gained to the porch, forming the principal entrance.

The hall, which forms the south side of the quadrangle, is 50 ft. by 20 ft. in the clear, and 40 ft. to the underside of the ridge-piece, with an open timber roof. In the hall are the principal staircase, entirely of oak, with carved panels, an ornamental chimney-piece, 15 ft. high by 9 ft. wide, and several stained-glass windows, the one at end of the hall having representations of the Seasons, the bay window on the north side the Months, and the other windows various subjects. At the end of the hall is a gallery for musicians, or for lookers on. The dining-room is 38 ft. long by 22 ft. 6 in. wide by 15 ft. high

and is entered directly from the hall. In this room are a large bay window, 17 ft. by 8 ft. inside; a recess, opposite the bay, in which is a carved oak sideboard, specially designed by the architect; a chimney-piece carved in stone; and an elaborate ceiling. From this room leads the southern turret, forming a recess on the ground-floor, and from the top of which a fine view of the country is obtained.

To the west of the dining-room and south of the hall, from which it leads directly, is the morning-room, 25 ft. by 22 ft. On the south side are steps into the garden. The drawing-room is 43 ft. by 30 ft., exclusive of two bays, each 17 ft. wide by 7 ft. 6 in. deep. The walls are all panelled in oak, and the ceiling is elaborate. Between this room and the picture-gallery is a fine flight of steps leading into the garden, the balustrading to which is of pierced stonework. On the west of the quadrangle is a corridor; next which is the picture-gallery, 60 ft. long by 23 ft. wide by 22 ft. high. The ceiling is trabeated, the panels being of open ironwork between carved and moulded oak beams, supporting the glass, forming the inner ceiling of the gallery, which is lighted from above; the beams rest on ornamental brackets, which are supported on corbelled heads, carved. The gallery leads from a triple-arched doorway on the west side into the conservatory, which is composed solely of glass and iron. The roofing of glass is supported on iron columns, with ornamental capitals, and is crowned by a light glass and iron dome. To the north of the picture-gallery and conservatory is Mr. Huth's room, 43 ft. by 20 ft., with a bay at the west end, and a polygonal bay on the north.

The whole of the east wing of the building, about 100 ft. by 70 ft., is occupied by the kitchen and its offices. The kitchen itself is 36 ft. by 18 ft., by 24 ft. high, with an open roof crowned by a lofty turret. It is fitted up with cooking apparatus, plate-warmers, ovens, &c. Round it are placed the larder, scullery, dairy, yard, servants' hall, and so on. There are four water-closets on the ground-floor.

The first floor is devoted entirely to bed and dressing rooms, with a bath-room over the porch, and various domestic offices. The principal bedroom, with its two dressing-rooms adjoining, is about 50 ft. by 30 ft. by 12 ft. 6 in. high, the other rooms in like proportion. The second or attic floor is also used for bedrooms; the rooms are 10 ft. high, and of various superficial areas. In the basement are extensive coal, wine, and beer cellars. At some distance to the east of the house are the stables, containing coach-houses, stalls for four horses, six loose boxes, harness-room, open sheds, carpenter's shop, &c., forming a complete block, and a stable-yard 80 ft. by 70 ft. At the different entrances to the estate are three lodges. The cost of the building, including the stables, was slightly in excess of 60,000*l*, and the whole was erected from the designs and under the superintendence of Sir Digby Wyatt, F.S.A.

On the arrangements of this house, which are well worthy of study, I have a few criticisms to offer. In the large hall the Mediaeval idea has been followed out, with the bay window at one end; but a good portion of its length is occupied by the first flight of the stairs. This militates very considerably against its use as a ball-room or entertaining apartment, and I cannot help thinking that when so much space was sacrificed for the sake of carrying out the idea of the heronial hall, it would have been better to have had it thoroughly detached. Though nothing is said about it in the description, I should judge that it is very likely used as a billiard-room, as no other is provided in the plan, and the space left clear of the stairs is just about the area required for the purpose.

One great merit of the plan is the manner in which each department of the house is compacted together, and is complete in itself. The principal rooms, which face the south and west, are very admirably placed. First, we have the dining-room nearest to the domestic offices, so as to be conveniently served from the kitchen. Then the morning-room, with a door near the foot of the stairs, having a ready communication with the garden by means of an outer door, and flight of steps; and then the drawing-room, facing south and west, thus having the sun throughout the day. All the space that could be spared on the south side of the room is given to large mullioned windows, the best out-look being in that direction. A feature worth notice is the screen around the door, an arrangement to be seen in many of the Elizabethan mansions, and of great value in rendering the room free

* See *Builder*, vol. xxvi., page 765.

† The architects are Messrs. Reid & Barnes.

‡ See *Builder*, vol. xxvi., pp. 712, 713.

* See *Builder*, vol. xxvi., pp. 869, 861.

from draught—a desideratum where ladies in evening dress are assembled. The picture-gallery leading from the drawing-room, together with it and Mr. Luth's room at the other end, form a noble suite of entertaining-rooms, 120 ft. long from north to south. The arrangement of Mr. Luth's rooms is very complete, having gun-room, strong-room, water-closet, &c., with a separate entrance, so as to be readily accessible.

The domestic offices are an excellent example of thoughtful planning. Notice, for instance, the position of the housekeeper's apartments. Situated at the angle of the block, she has complete control over the exit and entrance of the servants; on one side is the china-store, on the other the kitchen; and a little further off the butler's pantry and servants' hall. The passage from the kitchen to the dining-room is a little circuitous, though as a compensation it gives ready access to both of the dining-room doors. On the upper floor, we find the principal bedroom, with its dressing-rooms, forms a complete suite by itself, having a private passage. The other bedrooms are gained by means of a passage lighted from the upper portion of the entrance-hall; while another passage over the cloisters communicates with the north wing of the house, where the space is divided into three rooms for men-servants attendant upon visitors. The upper plan of the servants' portion of the house is equally good with the lower. The housekeeper's bedroom is at the corner, over her sitting-room, having the linen-store close at hand. The butler has a bedroom above his pantry, with a flight of stairs up to it from the pantry. Above the lutey is a lift for dishes. It will be noticed, on looking closely at the plan, that there is a double wall, with a cavity between the W.C. and the housekeeper's room, to prevent the noise caused by the closet from being heard. Externally, judging from the view given, the house presents a highly pleasing appearance and has no affectation of antiquity. It looks what it is, the mansion of an English gentleman, not "of the olden time," but of modern days, degenerate though some may deem them. The long lines of balustrading and formal terracing help gradually to mite the work of the architect with the works of Nature around. One satisfactory thing about the elevation is that it is honest. There is no studied irregularity here; all the breaks and excrescences are accounted for naturally in the requirements of the plan; and, despite these breaks, which are many, there is a general symmetry and balance which gives much dignity to the whole. What pleases me more than anything else about the whole exterior is the very clever arrangement of the picture-gallery and conservatory. When you think of it you will allow that a picture-gallery, 60 ft. long by 23 ft. wide and 22 ft. high, in which there are to be no windows, is an awkward feature to have to deal with externally. And now observe how well it is done here. One side is made to serve for the back wall of the conservatory. (Some may think the architect should have had the conservatory on the other front, and which is decidedly a better aspect; but, considering the fine view on that side, I do not think that the space for it could well have been spared.) But to return. The conservatory, with its raised centre, breaks up the long line of the gallery, just leaving sufficient of it in view to show the connexion between the two sections of the house. But then on the other side was the other long wall, 22 ft. high, to deal with. This, again, has been overcome by the introduction of a corridor, one story in height, with an open arcade, which is useful as connecting the two wings of the mansion. Above there is a similar passage, but narrower, which is lighted with three windows, and so the whole difficulty is mastered. The doorway opening on to the flats above the large bay windows is a novel idea which I do not remember to have seen before.

Humestown, County Wicklow, Ireland.*

The view of this house appeared in the *Builder* of August 8th, in which we are informed that it was then in course of erection for Mr. W. W. Fitzwilliam Dick, M.P. for the county of Wicklow. It stands in a commanding position, well surrounded with rich woods and mountain scenery. The walls are entirely of granite, and the roofs covered with tiles. The kitchen offices are in the basement a few feet below the ground-level, giving considerable elevation to the ground-floor, which is approached by a stone staircase from a vaulted hall about 40 ft.

in height. This hall forms the base of the tower.

The fittings of the interior are being constructed of various coloured woods, the staircase being in oak. Provision is made in various ways for defensive purposes, if necessary.

The house being intended chiefly for a short summer residence, provision has been made for a system of warming and ventilation throughout during the time that it will be unoccupied. The whole of the basement is vaulted in brick. The ceilings and floors over the dining-room, drawing-room, &c., are supported by massive oak beams, and finished with cornices of wood. The kitchen is open to the roof, and well separated from the habitable part of the house. There is a lift for coals and luggage from the bottom to the top of the house, and dinner is to be served by a traversing wagon passing up the stairs to the serving-room. The windows of the hall and staircase and upper portions of those of the living-rooms will be filled with stained glass, containing armorial bearings. Mr. William White, F.S.A., is the architect.

The exterior of this mansion is eminently picturesque, the architect rightly considering that the romantic scenery in the midst of which the house is situated demanded the use of what may fairly be called the Romantic style. The sentiment of affection for "the good old times," as they are very wrongly called, has inspired the conception of the whole; but this feeling is kept well in check, and is not allowed to interfere seriously with the comfort or convenience of the dwelling. Yet after allowing that much ability is shown in the design, it is after all an acted style, and in this respect contrasts badly with the truthful expression of modern wants and requirements, shown in Possingworth Manor, which I last noticed. Such a building as this is a piece of architectural scene-making, which does not advance except in a very limited degree, the true interests of the art. The clever way in which the whole mass of building is grouped together shows the hand of a capable architect as well as an antiquary. The manner in which the lines of the tower are gradually brought with an easy flow to the ground is well managed, and the carriage porch, with its massive buttresses and deeply-shadowed portal, is in perfect keeping with the pseudo-donjon keep behind.

And now let us turn to an edifice of a very different nature to the above, viz.,

The New University of London.*

by Mr. James Pennethorne. The *Builder* observes, "After long endeavours a building is being provided for the London University at the public expense. It occupies the northern portion of the ground in which stands Burlington House, and fronts in Burlington-gardens. Of this elevation we give a view, together with a plan of the ground-floor. The design at first selected was objected to after the works had been carried on to a certain extent, and a fresh design, that now illustrated, and which is being proceeded with, was made. The plan shows the arrangements of the building and the principal apartments. The accommodation provided will be as follows:—

Upon the Ground-floor.		f.	ft.
Entrance-hall or corridor	.....	33	by 33
Public staircase	.....	72	by 56
Hall for conferring degrees	.....	72	by 56
Ditto for public examination	.....	61	by 32
Small hall ditto	.....	61	by 32
Waiting-room for candidates	.....	22	by 16
Two examiners' rooms, each	.....	18	by 14
General waiting-room	.....	23	by 18
Clerk's room	.....	18	by 14
Room for specimens and apparatus	.....	23	by 18
Messenger's room	.....	18	by 14

Upon the first floor are senate-room, committee-room, registrar's official room and private room, room for clerk of convocation, library, laboratory, anatomical room, and two professors' rooms. Upon the second floor will be apartments for the housekeeper, &c., and on the basement-floor rooms for the lithographer, for muniments, for stores, for the housekeeper, and so on. The principal front of the building is, as we have said, towards Burlington-gardens, and will be faced with Portland stone and red Mansfield stone intermixed, the enriched string-courses being of Hopton Wood stone. The estimate submitted to Parliament for the building was 65,000*l.*, exclusive of fittings, and this amount, it was stated to the House of Commons, will be considerably increased by the change of style."

The facade given in our illustration is a good specimen of Mr. Pennethorne's ability in the

Classic style. The raised centre of five bays flanked by the two clock-towers, is advanced out from the line of the front, and attains thereby a distinct completeness of its own independently of the rest. The arrangement of the columnar order at each end of the centre, where it abuts on the tower, is worthy of note. Many an architect would have been content to have had here merely a half-column in the angle; but Mr. Pennethorne, with excellent judgment, has finished the arcade with a full column at each end, the pilasters at the angles of the towers, giving the required finish to the order which is thus arranged like a temple in antis. Having a long front to deal with, and of no great altitude, the architect has endeavoured by every means possible to give height to the facade by breaking up the front and introducing perpendicular lines in the shape of pilasters, long and narrow windows, and statues on the summit. By these means the effect of too great horizontality is avoided very successfully. The treatment of the wings is particularly happy. The solid masonry of the lower portion, sufficiently relieved from heaviness by the stuated niches, affords a pleasing contrast to the open colonnade above, a pleasing variety very similar in idea to that of the wings on the east front of St. George's Hall, only that here the effect is obtained without such a serious sacrifice. In this upper portion of the facade the round shafts dividing the windows, contrast with the flat pilaster very pleasingly. Indeed, throughout the whole elevation there is a delightful play of contrast which fully occupies the eye without distracting it. There is no apparent striving for effect, so frequently a fault in our modern buildings, no crude half-conceived novelty impertinently thrust in; but, taking the old classical elements, a harmonious, dignified, and highly-effective composition has been wrought out of a slightly monumental character very appropriate to the purpose of the institution. There is only one feature in the building which does not thoroughly satisfy me, and that is the attic terminating the towers, which is treated in a similar way to the story below it, and the angular and heavy when contrasted with those beneath. A broad face of masonry was quite necessary here, no doubt, to carry up the line of the towers, but it might have been done with better effect, either with coins or simple unbroken projections. The dwarfish character of these pilasters is made still more apparent by the line of the balustrade being carried across the towers beneath the clock.

In concluding this paper I gladly express my belief in a glorious future, which is before our art. In spite of much weakness and numerous failings in the architectural works of our countrymen at home and abroad, no one can deny that great progress has been made in the last twenty years. That progress I attribute in a large measure to the greater liberality and breadth of thought begotten by the extensive circulation of the architectural newspaper, and the keen discussion of art subjects which has taken place in the numerous architectural associations throughout the land. The public mind is more interested in the subject year by year. A proof of this is afforded in the interest taken during the last few years by the public journals in the fierce "Battle of the Styles." But perhaps the greatest evidence of the rapid changes which our art is making is given by the extraordinary transformation in the revived Gothic style since the period of its resuscitation by Rickman and his followers. Compare some of the ultra-Medieval edifices of the present day which occasionally startle us with one of the early revived Gothic designs, and you hardly recognise the relationship. Abroad, in France, on the other hand, great advance has been made in the development of a Classical Renaissance style, which in the elegance of its details and severity of its mouldings has emulated the ancient Greek. The fact that eccentricity and fanaticism accompany this forward movement only shows that the rapid stream is swollen and so deeply agitated as even to tear up the natural channel through which it speeds in its onward course to the distant ocean.

"Not in vain the distance beacons. Forward, forward, let us range.
Let the great world spin for ever down the ringing grooves of change.
Yet I doubt not through the ages one increasing purpose runs,
And the thoughts of men are widen'd with the process of the suns."

W. H. PICTON.

* See *Builder*, vol. xvi, pp. 588, 589.

* See *Builder*, vol. xvi, pp. 851, 855.

PUBLIC WORKS DEPARTMENT, INDIA.*

The course pursued is as follows:—The chief engineer lives at the seat of Government, and being secretary for public works as well, takes the general direction of works on behalf of the civil administration. He is assisted by superintending engineers, who reside at some central station, and regulate all works in a certain area, which is usually very large, some circles being the size of Scotland, and others the size of Wales. The superintending engineers disburse no money, and keep no accounts. They do not even draw up designs or estimates unless they like;—simply receive schemes for check, and exercise a supervision more or less loose over those who are engaged in carrying out works. They have it very much in their power to settle down into a steady-going routine, varied by what is called their cold-weather inspection. At the same time, superintending engineers are seldom, in the efforts they make, behind other Indian officials; and that they are not as useful as they might often be, is owing to the system, and to circumstances. The superintending engineers, who are few in number, there being only sixteen for the Bombay and Madras Presidencies put together, and about thirty for Bengal, have under them from four to eight executive engineers apiece, by whom, and their assistants, the work of the Department is virtually done. That is to say, if the superintending engineers were eliminated there would be little change perceptible in the progress of public works. The executive engineers and their assistants prepare as a rule all the designs and estimates, and spend and account for all the money. There are some 400 or 500 executive engineers in India, and through them the entire grant for public works may be said to pass. Their present salaries for civil engineers range from 6,000 to 11,000 rupees a year, the equivalent of 300*l.* to 540*l.* a year in England, or even less. Executive engineers have, if their division is big enough, one or more assistants on say half their own pay, and several European and native subordinates. They are also furnished with an office establishment, and draughtsmen as required. Now supposing these agents were really zealous and efficient, as they are presumed to be by Government, the Public Works machine would go tolerably smoothly; but as it is, the only person really able to conduct very plain-sailing work at reasonable rates in so peculiarly constituted a situation as an Indian district, is not seldom the executive engineer himself, who gets the blame if anything goes wrong. Executive engineers are placed in charge of what are called divisions, which may be only a large military station; or a military station, with a hundred or two miles of road tacked on to it; or so many miles of road; or of all works military and civil in a particular district. If the latter, which is most common, there is generally a principal town at which the European community, the troops, the magistrate, doctor, clergyman, &c., reside, and which the executive engineer makes his head quarters. The works are very much scattered about over the district, and the assistant engineers and subordinates are pushed out to superintend them. They get plans and instructions furnished them, and are occasionally visited by the executive engineers. As a rule, contractors on any scale do not undertake work for the Indian Public Works Department. In the words of the Department itself, "they are not to be got," yet it is strange that almost every railway work is done, and well done by contractors and sub-contractors. The fact is, that the Public Works estimates are framed upon the results given by daily labour or job work, executed under favourable departmental supervision; that is, by careful superintendents, whose pay has been separately provided for. So that as no contractor can hope to work so cheaply, and obtain a profit, none of any standing will come forward to tender; and such as may, look to securing one by getting bad work passed, and when found out discredit the system. If an executive engineer cannot obtain contractors, he has to employ daily labour. The additional anxiety and attention this requires is enormous. The subordinates in the district may be careless or unpractised, and either the executive engineer has to be constantly moving about, or else has to hear the brunt of the excess expenditure they incur. But if they are diligent, the daily labour principle takes up an undue amount of their time. Indeed, to get good results from labour hired by

the day, and outasked, and to get money's value in the purchase of materials for a large work in small quantities, demands a great deal of experience and knowledge of what prices are in a locality, that it must take some considerable time for either assistant engineers or overseers to acquire; yet they are set to this difficult duty of managing daily labour without much personal control from the executive and superintending engineers, who are, perhaps, alone experienced enough to work the system economically, and catch it if they break down. If the Department is taken from the point of view of an assistant engineer, newly set to conduct works in India, it will show its weakest side; and that is the one which, if amendment is to take place, should have public opinion turned upon it. A newly appointed engineer lands at one of the presidency towns, where he finds civilized English society, and a mode of life not so very dissimilar to that of home, except that the extreme heat confines people all day to the house unless they go about in a close carriage. There are all the evidences of great wealth, and the bustle of an immense trade. All the professions are represented, and exercised in much the same way as in European towns. On the whole, the appearance of the presidency towns is such as to give a favourable impression of India to the new comer. An assistant engineer is posted somewhere in the interior very soon; it may be to a large military station, where he will still have European society; or to a wild district, in which Europeans are to be counted by the half-dozen, and are miles and miles sunder. He is paid the same in both situations; but in the one he can live in a respectable manner, while in the other, if not ravenously fond of sport, the style of life that has to be adopted on small allowances is little short of disgusting, ordinarily good food being hardly obtainable. The greater part of the interior of India is poverty-stricken to a degree. The people have few or none of the appliances of civilization. They inhabit hovels of mud and thatch most of them of the size of an English cottager's pigsty, and an agglomeration of these forms a town or village. They have few notions of cleanliness. Their carpet is a thin wash of cow-dung and water over an earthen floor. Their furniture a few brass or earthenware vessels. The animals herd in the small courtyard of each house, if not in an adjoining apartment. The streets run with sewage, and the air is charged with smells. About their ordinary vocations the greater part of the male population go nearly naked. The diet is either flour or rice flavoured with salt and pepper, relished with onions, and washed down with tepid water. So extremely filthy are all native towns and villages that no European could exist in close proximity to them, far less in them. Yet, be it in Calcutta, or in Madras, the natives themselves prefer such neighbourhoods and residences to anything cleaner and better. The rains in India are periodical, and while they fall the country looks rather fresh and green; but in the dry months which succeed, the surface is scorched, and in colour a dull brown varied by the yellow of the withered grass. Agriculture is very hawkdaw, being pursued under great difficulties. The plough is of wood, drawn by oxen. The cattle in India are miserable, dwarfed, ill-fed, and lean. In the rainy season there is grass for them, but in the dry weather they have to pick up a subsistence how they may. In consequence, they are stunted and incapable of heavy draught. The cows, again, belong to the same order, and have much the make of an English calf. The milk they give is of inferior quality, and even in European stations these animals are given stable litter to eat: on the coast they eat fish, so that Indian milk will not bear inspection, and tracing it to its source is enough to turn the strongest stomach. The fowls are not better tended than the other animals, so that their eggs have a taste, and the flesh is particularly spleen and uninviting. In the districts butcher's meat is not to be had to buy, as the people seldom use it. Milk, eggs, and fowls are the articles of food that go by the name of supplies; and it is a singular proof of the extreme destitution of the country that a traveller—and an assistant engineer is always more or less a traveller—has generally to arm himself with the order of a Government official, directing the villagers along his route to sell him provisions, which for mere money's sake they will not do. In many places where the assistant-engineer is sent to, he has to subsist almost entirely on preserved provisions brought out from England, and it is rarely he can anywhere do without

some of them to supplement the scanty nutriment the country affords. The employment of an assistant-engineer is so various that it cannot be minutely described here. He is supposed to be furnished with designs by the executive engineer, and to have the carrying of them out. If he can get contractors, he has merely to measure their work; but, if not, he has to hire labour, keep the accounts, and disburse the pay. To assist him in this he has sometimes a European overseer or two, and always a certain number of natives. These latter have usually no theoretical knowledge, and very little practical information. They have most of them probably never seen good workmanship in their lives. Their pay is as low as their position, and they are of course naturally ever on the watch to make it up by peculation. If intrusted with petty purchases, as they must be now and then, they take a percentage systematically. Government have a great dread of entrusting capable men on liberal salaries. An assistant engineer who offered 10*l.* a month to one superintendent would run a risk of being turned out of his appointment; but he might take on ten persons, on 1*l.* a month, without any question being asked, or, still easier, five on 2*l.* a month. The duties of an assistant engineer are often not of a very high order, and many of them are beneath a highly educated professional man. He has, besides his surveys and designs, to direct workpeople, compile accounts, and disburse pay. As a rule, also, he is given more to look after than one individual can, without being constantly on the stretch, satisfactorily superintend. So that to perform what is set him at all fairly his constitution must be excellent, and he must have what is more rare,—a willingness to in all weathers go about the country, foregoing society and amusement, lodging and feeding in a poor way, while discharging functions that very often require little more than common sense and common honesty. At first starting it is almost impossible for an assistant-engineer not to be beset with an idea that a service of this nature was not what he was trained for, or suited to him; and it may be questioned whether, when he has overcome this feeling, he has gained anything to speak of. The whole arises from Government giving a lower salary to an engineer than to a young civil servant, and letting native subordinates into the Department before they are thoroughly educated, and also in the general state of depression in which the country is sunk. The upper subordinates of the Department are now, for the most part, European soldiers, who have gone to one of the four civil-engineering colleges, and there received a brief preparation. The course is mainly one of surveying, and when they leave the college they have of necessity to be taught the details of masonry, carpentry, and the like by those whom they are sent to assist. If not put to too heavy or too scattered work, and they can be instructed by any one above them, they answer very fairly as a class, and many are excellent subordinates. But in the case of men sent out into the districts, where with their scant allowances they cannot procure decent shelter or nourishing food, and are debarr'd from all associates of their own rank or colour, there is much temptation to unsteadiness. Where European overseers are chiefly found to fail is, however, in skill; for never having served a regular apprenticeship to the practical crafts, they have no standard to guide them, and want incessant watching and direction. There are very few upper subordinates natives. The charges are so large that an ordinary native is not physically capable of managing them. The travelling and exposure are too severe for him. He is also not so accurate, and not so persevering as a European, who gives his mind to a piece of work, and goes about what he is doing mechanically. Besides, in the Public Works Department, in the case of posts wored more than a small sum, the opinion acted upon in Lord Cornwallis's time in all departments, that no native is to be trusted, seems to survive. It is not altogether unfounded, because there are few natives in the position of subordinates who will not take per-centages from contractors and on purchases, and connive at those beneath them doing so as well. The practice is of long standing; and in the independent territories of feudatory princes all officiate take bribes and have perquisites, from the Prime Minister downwards. A native overseer intrusted with the payment of gangs of labourers can, if he choose, appropriate a large amount to himself with hardly any risk of detection; and if

* See p. 83, ante.

he permits similar inroads by those under him, the cost of establishment becomes very high. The European overseer is found out at once if he attempts to misappropriate, on the other hand, and is, besides, disposed to rest satisfied with his salary, which the native is not. Another reason why natives are not numerous in the Public Works Department is that they do not think it a desirable line to take to. Engineering as a profession has hardly naturalized itself yet in India. The natives see, for one thing, that it is the worst paid kind of service, considering the responsibility, under Government; that most of the members of the Department are always travelling about the country in a most uncomfortable way; that the duties are more financial than scientific; and as their fellow countrymen have scarcely learnt to appreciate roads or bridges, or public buildings, which the general run of them say our forefathers did very well without, their engaging in their construction will bring them no honour or advantage. In fact, there are in India master masons who do most of the works, such as houses, bathing-places, temples, and wells. They are low in the scale of caste, but have a rude practical notion of building, and the rules of thumb as their caste secrets. These men are generally made use of by the Public Works Department in actual construction, but they are too illiterate to make designs or organize a large series of works. However, the natives see most of the work done by the Department of so simple a kind as to be within these men's capacity, and European engineers are tacitly set down as the equivalents in their own country of the master-mason degree.

Natives and other candidates for the Public Works Department are educated at civil engineering colleges, established at Roorkee, in the north of India, and at Calcutta, Poona, and Madras. Roorkee is on the largest scale, and prepares the bulk of the subordinates for the Bengal side. These facilities are, however, far too few for the enormous extent of India. It is as if the engineers of France were all trained at Moscow. Did such a practice prevail in Europe, the profession would be filled with Russians. There are immense tracts of India, say between the Nerhudda and the Ganges, all Durmah, the Nizam's dominions, and other districts, where public works of magnitude are in progress, or sorely required, and there are no colleges at which the natives of those localities can receive a scientific education; and in consequence the agents of the Department are all strangers, and the service can never be popular because it excludes as unqualified every one belonging to the indigenous population, who is not willing or able to go hundreds of miles away from home to attend a civil engineering college. Natives are very fond of their own neighbourhoods, and dislike removing, unless actually driven to migrate in search of a subsistence. Though India is generally talked of as one empire, it is very composite; being made up of a number of provinces differing in climate, customs, wealth, and mode of government. Much of the central part of India, for instance, is thinly peopled, unhealthy, or desolate, and even to a native it is not the same thing living there as in the rich, and cheap, and for him salubrious, plains of Lower Bengal or Oudh. Salaries, however, except in a few notoriously deadly localities, are exactly the same all throughout the service, where provisions are moderate in price, as where they are twice as dear. Only in the three presidency towns is any difference made. It would tend to improve the Department, if colleges of instruction were multiplied, so as to bring them within reach of the inhabitants of every district. In the less important, they of course need not aim at so high a standard as in the colleges already established. These, however, especially Roorkee, turn out far too many half-educated subordinates; partly because the demand is so great, and partly in hopes that they will pick up a further amount of knowledge on works, which, as opportunities are not abundant, and the stock of it upon which to build is limited, not one in ten perhaps does. This is particularly noticeable in the class of draughtsmen. The men sent out in this capacity, are the most miserable performers possible. They know nothing of free-hand drawing or perspective, and can do little more than trace from plans that have been pencilled in for them. This is entirely due to the course they have gone through being too hurried, and to the very small salaries offered in executive engineers' offices. The illustrations in the colleges' own publications show that, with proper instru-

tion, good linnars can be produced. The theory is that, once in an executive engineer's office, a draughtsman will improve; just as that subordinates who have never seen a stone quarried or the inside of a carpenter's shop, will learn all that is necessary while they are nominally assisting him, but whilst in reality that officer has to stand the brunt of their mistakes, which his superiors, who must hold some one to blame, invariably visit upon him. The duties of an executive engineer, who is, as it may be termed, the working man of the Public Works Department, are defined as follows by Government. The executive engineer, it says, is the officer in immediate charge of a division. In him is vested the management of all public works within that division. He arranges all the details of their construction; he superintends the works and accounts; he receives all cash advances and distributes funds to his subordinates; he is responsible for the proper custody and efficient repair of every work or building; and is answerable for the exact performance of all duties of whatever description connected with the Department. It is part of the duty of the executive engineer to suggest public improvements, and to prepare detailed designs for them; he is also to report on and suggest measures for the protection of any public monument or building of architectural or historical interest which appears likely to fall into decay. In addition to his other duties, he will consider himself to be *ex officio* the professional adviser of all departments of the administration within the limits of his charge. Executive engineers will prepare designs and estimates under the orders of the superintending engineer, and they are responsible for the accuracy of all drawings they submit. It is the duty of the executive engineer to pay strict attention to economical application of all labour and materials; he should also strive to bring economically into use, on all occasions, the articles procurable in the local markets and the natural resources of his district. He is held responsible for the good quality of all work done under his orders. He will afford his assistants every aid in acquiring professional knowledge, and must exact from his subordinates a correct performance of their duties, furnishing them with working drawings and written instructions as to the execution of any works they may be entrusted with.

Considering that a division may be the size of Yorkshire, his assistants new to India, and the subordinates college educated in theory alone, or corrupt, or intemperate, these qualifications expected from an executive engineer are pretty comprehensive. He has, let it be observed, not only to design all works, but to carry them out, and make most of the payments, and keep all the accounts connected with them. He is responsible for everything. If stupidity is shown by his subordinates, Government immediately says it is his fault, for not looking sufficiently closely after them;—if fraud occurs, that he has been too easy-going;—if prices are high, that he ought to have kept them lower, because three or four hundred miles off some one else does so;—if an estimate is exceeded, that it is very discreditably to him; and so on. At any rate, it would be thought that an official from whom so very much was asked, and who had so large a charge, would be very well paid in India. The remuneration, however, is thus arranged:—There are four grades of executive engineers: the civil engineer's salary in the lowest is 50*l.* a month, and in the highest 90*l.*, the intermediate grades being 60*l.* and 75*l.* These grades have no necessary connexion with the extent or importance of the division of works held. They depend upon length of service chiefly. Thus an engineer of the fourth grade may be exceeded in the same district or station by one of the first or second grade, and two engineers may be side by side with equal functions to fulfil, and yet the one receives about double the pay of the other.

Government dislikes making a promotion from grade to grade oftener than once in two years, so that there is little encouragement to merit,—in fact, everything to stifle rising merit. For civil servants, that is, collectors of revenue and district judges, the successive steps are 47*l.*, 53*l.*, 112*l.*, 180*l.*, 230*l.*, 250*l.*, and 300*l.* a month; while, for civil engineers, they are 20*l.*, 30*l.*, 40*l.*, 50*l.*, 60*l.*, 75*l.*, 90*l.*, and 100*l.*, and very few appointments of a higher description. It is not generally known in England, that for a married man to live in India in respectability 50*l.* is the very lowest sum required. It need to be less, but of

late years the necessities of life have almost doubled in price. About 80*l.* a month income would just enable a person in the position of an executive engineer to pay his way and maintain a tolerable status. With less he would be far better off in England on 350*l.* a year. Hitherto Government, treating the Public Works Department as connected with the military service, have argued that if they get officers to remain with regiments for twenty-five to thirty years on pay not rising above 60*l.* or 30*l.* a month, and for half that time not above 25*l.* or 30*l.* a month, they ought to get first-class engineers on the same terms, and do not take into account the essential difference between a scientific and civil, and a purely military service; one which demands a mere school-boy's education, and one that calls for considerable culture and ability. The situation of an officer with his regiment, an hon'r morning parade, billiards during the day, and a pleasant mess party in the evening, no travelling, or no anxiety, except making two ends meet, is slightly different from a civil engineer out by himself in lonely seclusion, feeding how he can, charged with difficult works, burdened with accounts, and exposed to sun and weather.

Besides there being little in the grading, or in the salaries themselves, of executive engineers to really reward efficiency, especially in the case of young and rising men, the lift to the rank above is, pecuniarily speaking, a small one. The step from executive to superintending engineer is only worth at first 10*l.* a month. When, however, the duties of that class are recounted, it will be seen what further value it has. A superintending engineer, says the Government, is the officer next in rank in the executive branch to the chief engineer. A superintending engineer shall have nothing to do with the actual execution of public works, or with the disbursement of public money on account of works, nor with the provision or custody of any materials for the construction of public works, otherwise than as an officer of control. The permanent residence of the superintending engineer will be at some central point within his circle, which will be fixed by the local government. It has been already observed that there is in almost every province or considerable district a chief town at which there is some comfort and an agreeable European society to be obtained; while, on the other hand, without it, the country is destitute of everything of the kind, and often even of the commonest supplies. The consequence of this is that there is every temptation to be in the stations as long as and as much as possible. Subordinates and assistant engineers are pushed out to do the hard work, and have the solitude and discomfort, while those above them take it as their earned privilege to be able to remain at their cheerful head-quarters. The superfluous amount of routine and office work is a further tie on the side of executive engineers, who do,—or, at least, the tendency must be for them to do,—as much as they can by correspondence, and as little by personal contact with their subordinates. It is not at all pleasant to leave family and friends and snug home, to go out and live in tents and huts and far distant places, for the sake of imparting elementary instruction to subordinates and workmen. The temptation is great to make occasional and rapid runs, bestowing a few words of cation and invective on the way, instead of that continuous and painstaking progress which anticipates all their omissions and errors. It does not follow that every executive engineer sniffs his convenience; but the climate and nature of India are such as to deter officials from being out in their districts as much as perhaps they ought to be. Superintending engineers especially, when they have to wide a circle to move over, and the means of communication are slow, are apt to stay at head-quarters, in place of diffusing their experience. They then slide into post offices between their staff and chief engineer, sometimes forgetting, in fussing about works lying near them, much that would be well worthy of a visit. Another feature of the Department is that a man may be a good architect and set to lay out roads; or he may be in charge of a canal one day and of barracks the next; or may be a fair mechanical engineer and at home in a workshop, and given bridges and drains to build. An engineer also with a desire to improve himself, has so seldom the opportunity. He is left alone if at an outpost, and scolded when he is supposed to have, or has, done wrong. Sharp, stinging, now and

then abusive, censuro is unfortunately the characteristic tone of the Department, brought about by the unyielding economy of Government, which before all things exacts the cheapest rates, and the little superior officers know of the difficulties that the agents of the Department have to encounter in the prosecution of works. When it is not so bad as this, the attitude towards an engineer is always one of suspicion. A large share of the professional experiences of the departmental officers is got from their mistakes. The accumulated stock handed down from one member to another is very small. The process of this individual acquisition is painful not less than the performance of functions more or less of an office clerk and having to lead a vagrant vagabond sort of life, on allowances from a third to a half of those of the civil service. Now, this is not an overstrained depiction of this Public Works Department, as it will be found by a large proportion of the civil engineers who come out to India. As far as payment is concerned, the Indian Government always assert that economy must be studied; but why it is necessary to apply it to the Public Works Department more than to any other department does not appear. Economy is not very rigidly looked to in India, for there were the other day in a single military station in the south of the peninsula no less than forty majors and colonels drawing from 644, to 821 a month for doing literally nothing, or what is known as "general duty." Possibly there are throughout the Indian army 150 officers of high rank on the active list in receipt of these emoluments, and giving no equivalent; 150 civil engineers on the same pay would be a signal addition to the Public Works Department. The domestic drawbacks to India can be met to a certain extent by increasing the number of engineers. The amount of space to be travelled over would not be so great, and the lessening of human nature to civilized society would be indulged without sacrifice of efficiency. On the railways the resident engineers are much nearer each other, and have many advantages over the civil district engineer in Government employ. The profession, above all, needs raising. Neither in the eyes of the natives, nor most assuredly in the estimation of the authorities, is the Public Works Department much thought of. The civil officials have seen too often young men taken from regiments and drabbed engineers, and have also seen the consequences of want of a theoretical and practical training too frequently to entertain much respect for it. They take note of the inner working of the Department, and see that most of the energy, time, and ability of the establishments go in the preparation and rendering of accounts, and that the powers of the local superintending engineers are so restricted that what they most want done cannot be done. The most detestable structures rise up in spite of them, and the most impassable roads are made under their noses; yet they can do nothing, as the Public Works Department has its own heads and rules, and is out of reach of criticism and complaint. The work objected to is a sanctioned and a hudget work, and must go on. They also cannot but remark the secondary sort of place given to engineers in the scale of remuneration, which does not come up to that of police-officers, or of natives in the Judicial Department sometimes. The grand remedy for all this resides, however, in the Government of India spending two or three times what they now do in public works.

THE NEW PRIVATE BILLS.

ILLUSTRATIONS by maps and drawings convey, concerning many affairs, whether the progress of a campaign in Abyssinia, the rearrangement of the representation of the people by a Reform Bill, or the improvements projected in a great city, more vivid and accurate impressions than can be given by any quantity of letter-press. Mr. Stanford, the geographical publisher, of Charing-cross, is enterprising in taking advantage of the capabilities of his art, as the public and those specially interested may be reminded by the issue of his annual map, showing the railways and other public improvements affecting the metropolis, for which plans may have been lodged at the public offices on or prior to the 30th of November in each year, and for which Parliamentary sanction is to be asked in the ensuing session. The new map just published contains an extra portion, showing the environs of London on a smaller scale, and embracing the greater part of Middlesex, with portions of the counties of Surrey, Kent, Essex, and Hert-

ford. The extra map was needed to display the schemes of the four projects by which it has been proposed to obtain power to provide above 100 miles of street tramway in a single session. Only a small proportion of the mileage originally contemplated by these schemes is likely to be asked for, one of the most imposing, which proposed to lay sixty-two miles, having been already dropped. In addition to the four tramway schemes, which take four-fifths of the red lines in which proposed new works are shown, the map shows works proposed by fifteen existing or proposed railway companies, and nine miscellaneous schemes, such as markets, gas, and water Bills.

The new railways proposed to be constructed, according to the plans lodged on the 30th November last, embrace about fifteen miles within the metropolitan district; but the schemes likely to be presented will not probably ask for more than a fraction of that extent, several of the most important of them being already dropped, including the Hyde Park and City, the Eastern Metropolitan Underground, the Clapham and London Bridge, and others. Some useful works are proposed, not for the greater part of very great extent, by the London and North-Western Company, a new approach from Euston-square; by the London, Chatham and Dover Company, station walls at Ludgate-hill; by the Metropolitan Company, station works at Westminster and at Brompton; and by the Metropolitan Company, alteration of station at Gower-street. Notices are given of a Courts of Justice Concentration Bill, for the Strand site already fixed, not adjoining the Thames Embankment; and for a Public Offices Concentration Bill at Westminster. The lodged plans include markets for Belgrave, and for Belgravia and Chelsea, adjoining each other in the Chelsea Bridge-road; a Baywater market and baths; and a Westbourne market. Plans are also lodged for the long-proposed Park-lane improvement, at the end of Piccadilly; for a metropolitan improved water supply; and for certain new works of the Imperial Gas Company at West Ham.

NEW WAREHOUSES AND OFFICES, ST. JOHN-STREET, WEST SMITHFIELD.

DURING the night of the 10th of March last the premises belonging to Messrs. George Farmiloe & Sons, lead and glass merchants, in St. John-street, were consumed by fire. The "devouring element" left little more standing than the external walls, and those were so injured by the combined action of fire and water that it was not deemed advisable to re-use them in the new structure. A considerable time was occupied in removing the debris and salvage. Amongst the latter were hundreds of tons of lead and glass fused into one common mass. Tenders having been invited for the new building forming the subject of our illustration, that of Messrs. Brown & Robinson, for 12,916*l.*, was accepted.

The size of the building necessitated its division into two parts, so that the requirements of the Building Act might be complied with as regards the cubical contents of the buildings. A court-yard, 45 ft. long by 30 ft. wide, to which access is afforded by a gateway in front, serves the double purpose of forming the necessary division of the buildings, and of loading and unloading goods without inconvenience to foot passengers in the street.

A noticeable feature in the construction is the massive character of the foundations and floors to bear the enormous weights that will be placed upon them. This is especially the case with the ground floor of the hack warehouse, designed to receive the lead kept in store, which has been constructed of rolled iron joists and girders, calculated to bear a working load of 10 cwt. on every foot superficial. The ironwork in these joists and girders, and throughout the building, was applied by Messrs. W. & T. Phillips, of the Coal Exchange. The loading and unloading will be performed by means of steam-cranes supplied by the Newington Ironworks Company, the steam being generated by gas.

The front is composed of Portland stone and white Suffolk brick, the bases of the piers and the columns of the centre windows being of polished Aberdeen granite from the quarries of Messrs. Manuelle; the carving being entrusted to Mr. Seale. The whole has been executed from the designs and under the able superintendence of Mr. Lewis H. Isaacs, architect, Gray's-inn. Mr. Boulden acted as clerk of the works.

THE NEW ROOMS OF THE ROYAL ACADEMY.

As the new galleries and schools of the Royal Academy are fast approaching completion, our readers will be glad to know their arrangement and the precise accommodation they will afford. We therefore give plans showing the two floors. The buildings have been erected from the designs and under the superintendence of Mr. Sydney Smirke, R.A., and consist of a large oblong block, parallel with Burlington House, and separated from it only by a few feet, but extending on both sides considerably beyond its frontage.

The exhibition-rooms are on the first-floor, and are divided into three lines or rows; five, each, in the north and south rows, and four in the middle. The central room is a domed octagonal sculpture-saloon. Occupying the whole space westward of this is the "Great Room," where the annual dinner will be given. Eastward of the central saloon is a lecture-hall; the remaining space eastward affords a room intended for water-colour drawings, and the gallery south of that will be set apart for architectural drawings.

All the exhibition-rooms communicate with each other, and the circulation is complete.

These are the precise dimensions of the apartments:—

	Ft.	Fl.
The Picture Gallery at top of stairs ...	43	by 31
Central Sculpture Saloon, diameter ...	43	
Sculpture Room	43	„ 32½
North Picture Galleries, each	40	„ 32½
The Great Room	82	53
Water-colour Room	43	26
Architectural Room	40	31
South Picture Galleries, each	40	31
Hall for distribution of prizes, and for lectures	55	43

The floors are fireproof, being laid on brick-vaulting throughout; they are covered with Arrowsmith's solid *parquet* work of wainscot and walnut wood. The doors and their dressings are of the same materials, with the moldings carved, except at nine of the principal doorways, where they are of marble of various colours, chiefly from Belgium and the Pyrenees. The ceilings are for the most part coved, having the enrichments gilt. The walls of the picture-galleries are being finished of a deep, subdued red (with a sanded pattern), down to a dado of black wood and walnut. The choice rested between this and "phœasant's egg" colour.

The octagonal vestibule will be for the larger works of sculpture, and the upper part of the walls will be ornamented with busts of the most eminent artists of past times.

The ceiling decorations of the Great Room are somewhat more elaborate than those of other apartments, and include a series of demi-angels, holding emblems, as corbels. The lighting is by means of a large central skylight in each gallery, excepting the sculpture-room, where there is a side light.

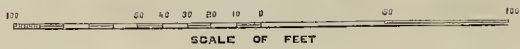
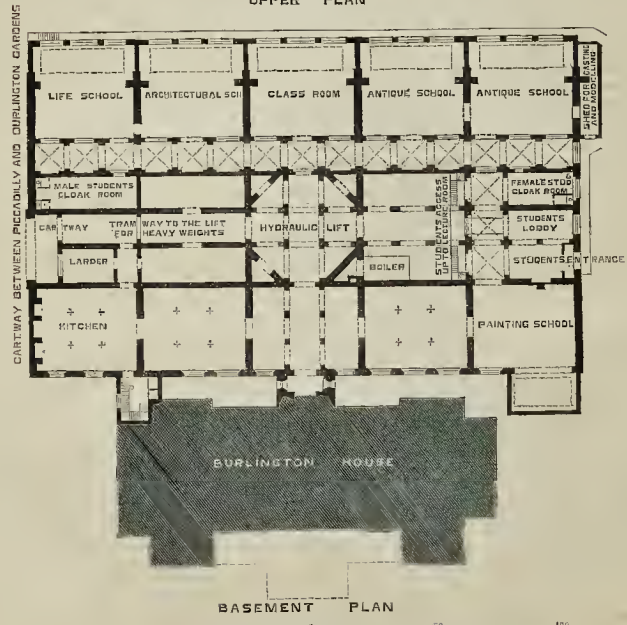
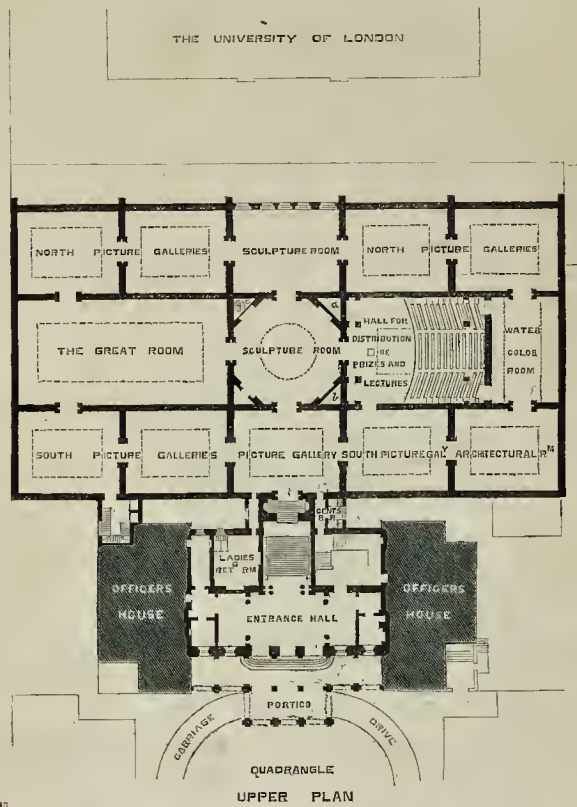
The height of the walls in the Great Room to top of cornice is 27 ft.; the cove occupies 11 ft., making the height to the underside of lantern 38 ft. In the lesser rooms, the height to the top of the cornice is 23 ft., and the cove occupies 9 ft.

We may add that the galleries promise to form a very handsome and well-lighted range. The central saloon will probably be less light.

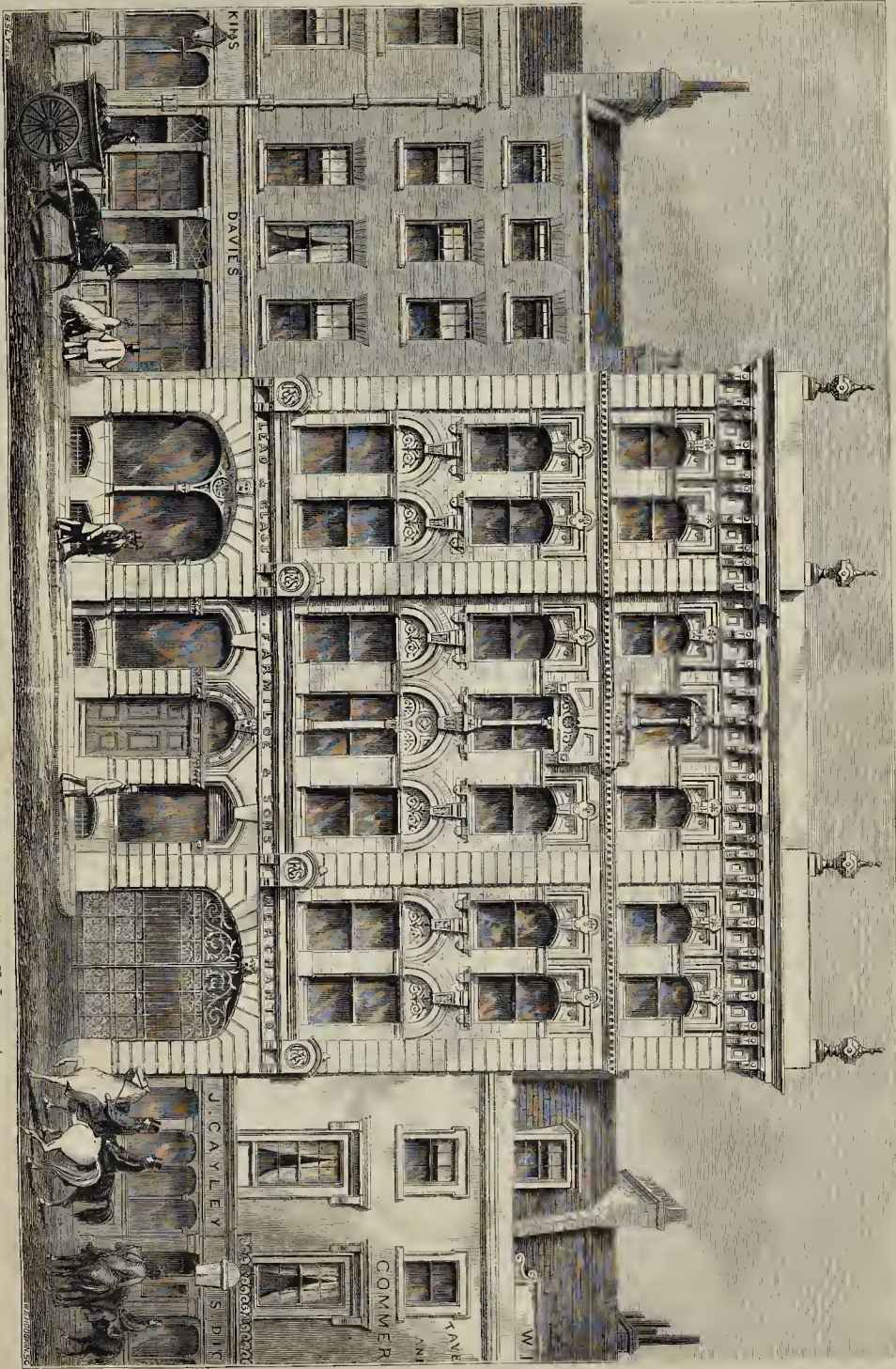
The schools are very spacious and airy, being 19 ft. high. Their appropriation is shown on the plan. The corridors, 10 ft. wide, are lined with white glazed tiles. The male and female students have separate apartments, of ample size. The whole of the schools, as well as the exhibition galleries, are warmed by Messrs. Haden's warm-water apparatus, the channels for warm air being rendered available for the introduction of cool air in summer. The access for the students will be from the Burlington Gardens entrance, where also all works for exhibition will be received. The general contractors are Messrs. Jackson & Shaw, and the decorations are being executed by Mr. Leonard Gollmann, in his usual good manner.

The foundations are being put in for the houses of the Learned Societies, next Piccadilly, and along the east and west sides of the quadrangle, under the direction of Messrs. Banks & Barry. Until these buildings are up, visitors to the Academy who ride will set down in Piccadilly, and proceed by a temporary corridor, now nearly completed, right across the quadrangle to the entrance-hall of Burlington House, where ultimately will be a carriage portico, as shown on our plan.

THE ROYAL ACADEMY, BURLINGTON HOUSE, PICCADILLY.—MR. SYDNEY SMIRKE, R.A., ARCHITECT.



a. & b, Ventilating Shafts. C. Iron Stairs to Roof.



NEW WAREHOUSES AND OFFICES, ST. JOHN STREET, WEST SMITHFIELD.—Mr. LEWIS H. ISAACS, ARCHITECT.

KIPS

DAVIES

LEAD & GLASS

J. BARNITT & SONS

DEPARTMENT

J. CAVILEY

S. DINE

COMMER

W. I.

THE "SOUTH KENSINGTON MUSEUM."

Sir,—You have doubtless observed that the *Albumen* of Jan. 16 followed the *Builder's* "lead" of the previous week, in protesting against the uselessly long name of the South Kensington Museum. Unlike the *Builder*, it does not suggest a substitute, but contents itself with saying the title is "much too long, even for a museum; it is fast becoming known as 'the S. K. M.," which is at least briefer." Now I, who originated the printed objection to the lengthy appellation, protested most strongly against the S. K. M. [M I L K] abbreviation, and suggested "The Art-Museum" as a substitute; but it has been represented to me that this definition is scarcely appropriate, as it would be ignoring the grand collection possessed by the British Museum of the highest of all art, so far as sculpture is concerned; and to this I may add, ignoring also the collection of highest pictorial art contained in the National Gallery.

It thus becomes a necessity to find some other name for our Museum which shall, if possible, be perfectly appropriate, and shall be acceptable to everybody. To meet this necessity, I would propose that her Majesty's permission should be sought to allow it to be called after her beloved consort, "The Albert Museum."

When we remember that it grew out of the '51 Exhibition, which was fostered, promoted, and brought into being by Prince Albert, and could not possibly have been carried through successfully without him; that he administered the electric spark which has vivified industrial art in England; and that the art-collection at South Kensington was his own idea, and was continually watched over and benefited by his good taste and wise counsels, besides being materially augmented by his generous donations; when, I say, we remember all this, it seems marvellous that the suggestion has never occurred to any one connected with the Museum to call it after the name of its producer and benefactor. I think this little act of grateful, though tardy, justice could scarcely fail to be agreeable to our Queen, and perhaps even she might feel willing personally to bestow upon her dear husband's foster-child, the name that is revered and beloved by all her subjects as well as by herself. Should this suggestion meet with her Majesty's approval, some little "state and ceremony" would of course be arranged, so as to do honour to the occasion and make the day a notable one; and if it could be set apart as a holiday for the people, this would the better carry out the wishes of "Albert the Good," whose desire it was to make this museum peculiarly the people's museum.

If, then, in future, we should be allowed to call our Museum by such a familiar and household name as "The Albert Museum," this title will get rid of all difficulties: it will be short, euphonious, and pleasant on our lips; will not derogate from other collections of art; and will deliver us from the confusion that arises, especially with country-people and foreigners, between Kensington proper and South Kensington, which latter is really Brompton.

When last I sent you a few "notes" on the loan portion of the Museum, I described the beautiful mosaic table lent by Mrs. Hope. This is no longer to be found where it then stood; during some alterations it has been moved elsewhere, whether to return or not remains to be proved. Another extremely interesting object has also gone: the International Volunteer Trophy. As I have seen no description of this in print, it would be well here to preserve its memory, lest it should not again be publicly exhibited.

The size of the trophy I should judge to be 6 ft. long by 1 ft. 6 in. wide, and 3 ft., or 3 ft. 6 in. high. It is of silver, frosted, and only sparingly burnished in parts; and it was designed by A. Wilms, and executed by Elkington. It is, as your readers doubtless know, held for a year by that nation whose representatives have been most successful in rifle-shooting.

A short wide pedestal supports a column, on each side of which stands a well-modelled statuette, about 1 ft. high: one in Scotch dress, the other clad as an English officer of volunteers; and on the summit of the column stands Patriotism holding a torch and crown. Beneath his feet, and round the top of the column, runs the motto, "*Amor Patriæ*." "Defence, not Defiance," is the admirably appropriate legend beneath one of the statuettes; while under the other is inscribed, "*Si vis pacem para bellum*." These subjects, with gronped

flags, &c., form the centre of the trophy. At the base of the large pedestal are placed four groups of a mother and child. For the sake of explanation, we must designate one portion of the trophy as the War, and the other as the Peace, end. The grouped figures on the War end, then, represent a mother embracing her eager little son, who brandishes his father's sword, and struggles to free himself from her detaining arms; in the other group, the child has returned with the sword broken, and with his tears coursing down his mournful visage, while the mother encircles him with one arm, and hides her bowed face with the other hand. Immediately in front of these figures is placed a chariot—the classic biga—erect in which stands a young warrior, with a firm sad expression on his beautiful features. He holds a sword aloft in his right hand, and his long robes flow in most graceful folds on to the floor of the chariot. The chariot-wheels have a gorgon's head for the nave, and the spokes are wreathed with oak and laurel; garlands of the same, form the harness of the horses, which are led by a small child, who, in spite of his brave helmet, seems ready to burst into tears, as if he knew he had done wrong, and felt he deserved the chastisement which was about to descend upon him.

On the Peace end of the trophy, a female figure and child in one of the groups amass fruits and vegetables; and in the other, note down on tablets the gains of Commerce. In front of them, Peace, crowned with flowers, stands erect in her chariot, which is drawn by two fat, sleek oxen, garlanded with flowers, olive-branches, &c., and led by a smiling little archer, also garlanded with flowers. The naves of the wheels are formed of bosses of fruits, while a wreath of hops and flowers decorates the spokes.

Two more figures of boys, seated one on each side of the base of the pedestal, bear, the one a telescope and the other recording tablets. These subjects are placed midway between Peace and War, they being applicable to both states.

After this description, it is needless to speak of the thoughtfulness, care, and artistic skill that have been brought to bear upon the design and execution of this Volunteer trophy: it is a very excellent work, and well repays patient examination.

To return to the noble collection of art-objects lent by Mrs. Hope. The large plaque of Limoges enamel—supposed to be by Leonard Limousin himself, date about 1550—containing six acrochats piled together in one group, is a marvelously fine thing. Other grand objects are, the "Cistern on three feet," majolica di Urbino, sixteenth century; and a large vase, about 2 ft. high, of French earthenware, Palissy style, seventeenth century. Two carved jade vases, with perforated covers, are also very handsome; and the large studded tazza of jade, supported on a delicate silver stand of European manufacture, formed of twelve mermaids and interwoven cords, is very beautiful and graceful. There are likewise some fine dishes and plates, enamelled in colours; some admirable majolica dishes; a beautiful, rich-looking majolica jug; two specimens of Henri Deux ware; and one very charming plate—or saucer, for the centre is a deep hole, as if to take the cup—the design on which consists of five little boys, one with the prettiest face imaginable, playing at leap-frog, the colouring of the whole being the most tender and delicate I have ever seen in majolica.

At the back of this case is placed the elliptic jewel of white enamel, bearing the "bloody hand" of Ulster, the only known badge extant of the Order of Baronets. The jewel is set round with large precious stones of various colours, ruby, emerald, and diamond alternately. It is of British workmanship, date 1664, and is lent by Sir George Duckett, bart.

A beautiful Biberon of Faience d'Oiron (Henri Deux ware), date 1530 or 1540, lent by Mr. J. Malcolm, of Paltaloch, has a singular hinged cover of the same material that is worthy of notice; and, because they are placed near at hand, I will here mention the smarg-bowl, cover and spoon of white earthenware and good form, lent by Miss Dale, probably of Leeds manufacture, and also the butter-boat, salt-glazed Staffordshire ware, lent by Professor Church. The hunting group, in white porcelain, from the manufacture of the Duc d'Angoulême, is spirited and graceful; date about 1780. Not far off is a snuff-box, lent by Mr. Beresford Hope, formed of beautiful slabs of "lunachelli," which I take to be matrix of opal; and there is a fine one of spar, inlaid with houses and trees in hard stones; a gold snuff-box, con-

taining the freedom of the City, with the City arms enamelled on the lid, presented in 1811 to Lieut.-General Sir W. C. Beresford; and from the same collection comes the flattened oval sardonyx ewer, mounted in gold, enamelled and jewelled, ornamented with graceful little enamelled figures, and having a wonderful dragon for handle.

In the adjoining glass-case is still to be seen the extremely interesting, and minutely carved, violin of boxwood, given by Queen Elizabeth to the Earl of Leicester. Its date is about 1330 to 1340, so it must have been a curiosity in Elizabeth's time; and we may well suppose it to have figured as one of those costly New Year's gifts which the Queen was so fond of receiving and bestowing. Possibly this violin was given by her to Leicester, in return for the rich present he made her on the New Year's-day of 1571.2—namely, "one armet, or shakell of gold, all over fairly garnished with rubies and diamonds, having in the closing thereof a clocke, and in the fore part of the same a fayre lozengie diamonde without a foyle, hanging thereat a round jully fully garnished with diamonds, and perle pendant weying 11 oz. gr. dim., and fastinge gold weight: in a case of purple vellato, all over embranderid with Venice gold, and ynde with greene yallat."

Supposing the violin to have been the choice return-gift for this sumptuous bracelet of 1571.2, the "additions" to it in 1573 may have been made by Leicester's order to suit his own fancy; and probably at the same time the shields bearing his arms, and those of the Queen, were placed on the finger-board. It is lent by the Earl of Warwick And here I must close my "Notes" for this present. ART-LOVER.

THE DUBLIN SCHOOL OF ART.

THE distribution of medals and prizes to the students of the Dublin School of Art took place in the theatre of the Royal Dublin Society on the evening of Thursday, the 28th ult., his Excellency Earl Spencer presiding. Lord Strathnairn, the Commander of the forces in Ireland, the Lord Mayor, the Lord Chancellor, and many other distinguished persons were present.

Mr. George Woods Mansell opened the proceedings, and explained to his Excellency that the Dublin School of Art stood first, considering the number of national awards in proportion to the number of students, of all the schools in the United Kingdom.

Lieut.-Col. Adamson, the President of the Fine Arts Department, alluded to the difficulty which the artisan classes of Ireland had in finding time and means to proceed to South Kensington, and under these circumstances he considered that a small museum of ornamental art should be established in connexion with the Dublin School. Col. Adamson then read the report of the Committee of Fine Arts. The attendance of students during the year 1868 has been 519, showing an increase of 87 over the year 1867. Eleven national awards were gained, including one of the two Princess of Wales's scholarships.

The President then distributed the awards to the students, who were introduced to him by Mr. Lyne, the head-master of the school.

Lord Clancarty proposed a vote of thanks to the Lord-Lieutenant and to Lady Spencer, for their kindness in attending on so interesting an occasion, which was seconded by the Lord Mayor.

His Excellency made a long and very able speech. He expressed the gratification he felt in hearing the report of the Chairman of the Fine Arts Committee, and congratulated the society that the head-master of their schools, Mr. Edwin Lyne, had gained a second place amongst the art-teachers of all England for the success of his instruction. Lord Spencer then said:—I do not feel that I have any right to enter largely upon the subject of art, but I feel bound to make one or two observations, which I do with great diffidence. I think it is very often not appreciated how great a power art has upon the history of the country,—I mean in recording the deeds of our countrymen, and the noble acts which they do for the benefit of their country. I believe that art, peculiarly the art of painting and sculpture, takes a great part in educating one generation as to the deeds of another. I believe that in Great Britain, at this time, we have made very great strides towards the improvement of the fine arts, and the part

which Ireland is to play in promoting the fine arts of Great Britain is by no means a small one; for I believe that it belongs to this people to be eminently artistic. I believe that there are qualities belonging to the Irish people which are singularly propitious to the development of high art. We have the poetic imagination, which is so well known to exist among your people; we have that warm-heartedness without which, I hold, true art cannot be maintained, for without it you have not proper sympathies with all the different relations of life. You have the love of the beautiful very strongly developed among your people. It is, then, a noble work, which I feel sure this society will nobly carry out—the development of the artistic feeling among the Irish people.

It is the duty of societies like this to properly cultivate taste among all classes. Let them not pander to the public taste. Let them not be led into pandering toawkish sentimentality or sensational excitement, but let them try to immortalize the great deeds that have been and still can be done in this country, and then they will do a great work worthy of their country.

One thing more I will say, and that is, that I should wish to see a taste for the fine arts permeate the whole country. A taste for the fine arts, in other words, is a taste for what is correct. In old days, in Italy, nearly everything that was used in daily life was remarkable for some hearty, either of form or of colour. Why should not this be so in our days? Why should we not cultivate taste in such a way that everything about us, whether the architecture of our houses, our carriages, our furniture, our crockery, our dress even, should be governed by the excellence of taste? I believe there is nothing that will develop and spread itself so much as good taste; and there is no knowing what pleasure it gives to those who would have everything about them in good taste.

GRAINING FROM THE NATURAL SURFACE OF WOODS.

At the close of the paper on this subject, read by Mr. Dean at the Society of Arts, and printed in our last.*

The Chairman (Mr. Godwin), in inviting discussion, remarked that the mention which had been made of Mr. Herbert Minton and Mr. Hullmandel must have brought to the minds of many present the remembrance of what immense progress had been made within the last thirty or thirty-five years in many of the useful arts. At the period alluded to in the paper, chromolithographs were unknown, at least in England, and encaustic tiles were not in use, whilst the large trade in both these articles was now patent to everybody. Still, there was much room for further development, especially in the matter of encaustic tiles, which were, he had almost said, shamefully expensive in many cases; and were the price reduced, their use would be largely increased. These things, however, were not the only matters in which great progress had been made during the period he had named, and, although their country was often spoken of as Old England, she might be regarded as still in her youth, so far as progress was concerned. They had only had a Royal Academy for about a hundred years, and steam-engines, railways, and the electric telegraph had been introduced within the memory of most persons present. Coming more immediately to the subject of the evening, he must beg leave to take exception to the name that had been given to the process described, for "xylography" (*xylo*, wood, and *grapho* I engrave) meant wood-engraving, as any dictionary would show. He would suggest Wood-Printing as a more appropriate term. He had no great love for graining himself, although he did not go quite the length of some who abominated it as a sham. Graining, under some circumstances, was no doubt defensible, but the inexcusable character of some shams which had been put forward had had the effect of inducing many men who were anxious to associate architecture only with what was noble and honest, to set their faces against all imitations whatever. Putting aside that consideration, and looking at the matter commercially, it appeared to him that this new process had advantages, not the least of which was that it would have, he hoped, the effect of banishing that wretched apology for graining which sometimes was seen dis-

figuring and disgracing people's houses. He should like to hear from Mr. Dean whether the closer-grained woods could be printed from in this manner, as the majority of the specimens appeared to be oak; and he was not certain whether mahogany, rosewood, and the harder woods could be imitated. He should also like to know whether the paper from which the impression was produced must be taken from the original on the spot, or whether it could be taken by workmen at a distance; and he did not understand whether the specified times within which a given quantity of work had been done included the printing of the paper, or only the transferring of the impression to the wood. Mr. Dean had just handed him a specimen of imitated hollywood, which was certainly commendable, as there was a quietness and modesty about it not always seen in grained work.

Mr. J. Blore (taking from the table a tile with a wood pattern upon it) could not quite see the advantage of manufacturing tiles in imitation of wood, though the invention was very ingenious, and would, no doubt, prove exceedingly useful. He would also like to know whether the durability of this system for external work had been tried.

The Chairman observed that this would probably depend on the varnish, and that there seemed nothing in the process itself which would make it differ in this respect from other graining. He thought making the tiles look like wood quite indefensible.

Mr. Bottomley said the process of printing from the grain of wood on paper was not new, as it had been in use some time by the French for paperhangings, which had been imported into this country rather extensively during the last few years.

Mr. Morant inquired whether the graining was applied to the wood direct, or whether a "ground" had first to be prepared.

Mr. Bottomley said, in correction of one statement in Mr. Dean's paper, that the best oak graining was now not done in distemper, but always in oil; the inferior work was done in spirit.

Mr. John Land said the process had been mentioned as being more durable than ordinary graining; but he saw nothing in it to render the effect more lasting than graining in oil. He saw nothing in the specimens exhibited beyond what he had seen produced on paper in distemper, which, when applied to woodwork and varnished, had exactly the same appearance. He should have liked to see more variety in the specimens, and did not doubt but that many other kinds of wood could be imitated.

He hoped leave to call Mr. Dean's attention to the beautiful specimens of wood in the museum at Kew, some of which would be very difficult indeed to imitate by hand, and, therefore, if they could be copied by this process, there would be a real advantage in it. At present they were confined to two or three descriptions of wood for interior work in houses owing to the difficulty of imitating others, which, in some cases, would no doubt render the copy as costly as the original; therefore, if some of these beautiful woods, both English and foreign, could be imitated at a reasonable cost by this process, decorators would have their means of ornamentation much extended. He understood from Mr. Dean that the cost of his process was about a shilling per yard.

Mr. Laing said he had had an opportunity of inspecting the specimens by daylight, and was very much pleased with them: one feature about the work which had struck him particularly was, that the mouldings were as elaborately finished as the plain work, which was not the case with graining done by hand, where mouldings and such like parts were simply run down with the coruh. Of course, the men being paid by the piece, their object was to get through as much work as possible in the time, and the more difficult parts, such as mouldings, were accordingly done just so as to pass muster. In the specimens exhibited, however, one part was as good as another. It had struck him that the light and dark specimens were clearer and more distinct than the intermediate shades. To his mind, the great advantage of this process was that graining of first-rate quality could now be executed in the provinces, where it was at present difficult, if not impossible, to obtain the requisite skilled workmen to do it by hand, and thus many country houses would now be decorated in this way where, hitherto, such a thing would have been out of the question.

Mr. Yardley thought there were one or two

inaccuracies in the paper which he should like to correct. It was said that there was a reluctance on the part of architects to employ graining, on account of the had manner in which it was often done; but, he believed, the real reason was the desire, which had been alluded to by the chairman, to avoid everything in the nature of a sham, and also the question of expense. It was much cheaper to stain deal, which, in many cases, showed a very beautiful grain through the stain, than to have it painted and grained. He should like to know whether Mr. Dean's process was applied to the wood plain, or whether it required painting first, because, of course, if the latter were the case the cost would be increased. Mr. Dean had spoken of 2s. and 2s. 6d. a yard being paid for graining, but he had never known more than 2s. or 2s. 3d. being allowed by an architect, including the preliminary painting, and two coats of varnish afterwards. He should like to know whether the process was applicable to delicate woods, such as bird's-eye maple and satin wood.

Mr. Miller asked if the process could be applied in imitation of parquet flooring, and if so, at what expense?

Mr. Dean, in reply to the questions which had been put, referred first to that put by the chairman as to the transfer of hard woods. A specimen of bay wood was on the table, and there were also specimens of Hungarian ash; and bird's-eye maple was in process of trial. The fact was, however, that he had not as yet been able fully to experiment on many of these kinds of wood, from being engaged in carrying out his patent commercially, and also from the difficulty which was experienced in getting suitable specimens of wood with which to experiment.

He thought the question as to the applicability of the process to encaustic tiles had been made sufficiently evident by reference to the case of Mr. Robson, of Liverpool, who had used nearly 1,000 yards of tiles embellished in this manner in the dados and staircases of the new public offices. Mr. Bottomley had stated quite correctly that for some years past the French had transferred the natural grain of wood to paper for paperhangings, but they had not gone beyond that; whereas he had succeeded in re-transferring the impression from the paper to either a painted or plain deal surface, the latter being specially applicable for churches. He had carefully examined the many beautiful specimens of woods in the museum at Kew, and he had not the smallest doubt that very many of them could be successfully employed in this process; but experiments would have to be made, which would take some little time. He had had great difficulty in procuring specimens of bird's-eye maple and Hungarian ash suitable for his purpose. These difficulties would no doubt vanish by degrees, but still they were sufficient to show that time was required for the perfecting and development of the invention. At Bradford, in Yorkshire, while in conversation with one of the principal painters and decorators, it was suggested to him that his system would be very useful to men who were not in a position to employ first-rate grainers; his reply to that was, that in a week he could put these second and third-rate men in a position to compete with, if not to surpass, those who employed the best grainers money could procure. As to the price, he had given pretty full details in the paper, and he would add that Mr. Crossley, of Newark, had told him he had paid as much as 5s. a yard for graining alone. He did not think the system was applicable to parquet flooring, for floors were intended to be walked upon, and however good might be the varnish the pattern must be rubbed out in a comparatively short space of time. The encaustic tiles in imitation of parquetry had, however, been used to a considerable extent, and for the borders of rooms appeared particularly applicable. It was only right, however, to say that many persons had taken exception to the application of the process to tiles, and he had for this reason mentioned its employment by Mr. Robson, at Liverpool, where it had been considered very successful.

The Chairman then moved a vote of thanks to Mr. Dean, which was carried unanimously.

The Discovery of the Guildford Castle Vaults.—With respect to this discovery, the *Surrey Advertiser* states that a petition has been extensively signed in Guildford to Lord Granley, the owner of the property, asking his lordship's permission to prosecute the excavations.

* See p. 81, ante.

THE WORKMEN'S INTERNATIONAL EXHIBITION.

A public meeting has been held in the Town-hall, Tunbridge Wells, in support of the scheme for holding this exhibition. The Hon. F. G. Molyneux occupied the chair. There was a good attendance of working men.

Mr. Beckmaster, who was present, said that Tunbridge Wells was a very celebrated place more than 100 years ago, when Dr. Johnson drank twenty-seven cups of tea with Mrs. Thralo on the promenade. Every place and every trade has its traditions, but the story of the Tunbridge ware is not very romantic. An Italian refugee, wrecked on the Sussex coast about 100 years ago, made his way to Tunbridge Wells, and there started a trade, which was at that time unknown in England. The work, chiefly in rough mosaic, and much inferior to what we see now, excited great curiosity. The Italian had a monopoly of the trade; he kept the secret to himself, and became wealthy. At last some enterprising man, tempted by the success of the Italian refugee, who was reputed to be rich, climbed to the top of his workshop, took off a tile, and watched the process from beginning to end, and from that time there was free trade in Tunbridge ware. We want you to help with your Tunbridge ware and any other productions, the result either of your skill or invention, or both. And what is the object of all this? It is to make a man feel that there is something noble in labour; to cultivate between the workmen of different countries feelings of good will and kindly brotherhood; to encourage good work, and revive the honest pride and feeling of bygone times. I have seen in common clay a jug made by a potter, years ago, with this inscription, ornamented with birds and flowers: "To my sweetheart, Jane Wilson. Made by my own hands.—George Brown." The writing was the worst part of the work. There must have been a pride and a pleasure of which we know but little when Quentin Matsys looked upon the ironwork made with his own hands. Most working men endeavour to make something. We want to get this work together; the success of our efforts will depend mainly on the working men themselves. They have their full share in the management, and we mean that the credit of good work shall be given to those who deserve it.

MUNICIPAL GOVERNMENT OF THE METROPOLIS.

THE daily papers have made widely known that the Home Secretary, Mr. Bruce, gave a deputation of the Metropolitan Municipal Association, who went to him last week, full assurance that the Government are disposed to aid them in their endeavours to obtain a better form of government for the metropolis. This Association has been established for the purpose of collecting facts and statistics in relation to the present local government of the metropolis, and for diffusing the information so collected by means of public meetings, lectures, and through the public press; and further, to promote by every available means the attainment of a Legislative enactment that will secure a more direct and thorough municipal representation of the ratepayers, and a more responsible, efficient, and economical form of government for the metropolis. All who feel the importance of this improvement should join it. Mr. James Bial, of 209, Piccadilly, is the Hon. Secretary.

HALIFAX.

A VERY important work has just been commenced here—the constructing of a new road to connect the borough of Halifax with the adjoining township of Southowram, and to be called Southoran-road. The road is over a mile in length (including a side branch), and is 30 ft. wide between the walls. It winds along the side of Beacon-hill, whose natural slope is an incline of 1 to 1½, and is supported on the lower side by a dry retaining wall, topped with a 4 ft. 6 in. fence wall, the higher side having a fence wall only, and the ground above cut down to a slope of 1 to 1. The height of the retaining wall, in some places, is over 40 ft. There is an earthenware pipe drain from end to end, commencing at 2 ft. diameter, and tapering to 12 in. The road rises 244 ft. in its entire length, its steepest gradient being 1 in 15, and is intended to replace the existing road to Southowram, which is

an incline of 1 in 6, and not at all adapted for the immense amount of stone traffic that runs over it. Some idea of the magnitude of the work may be gathered from the quantities, there being over 50,000 cubic yards of excavation, and 15,000 cubic yards of stone in retaining and fence walls. The total quantity of stone used will be considerably over 20,000 cubic yards.

It is expected that this road will open out a great tract of cheap building ground, as it goes over what is now nothing more than a barren waste.

The contract is let to Messrs. Chapman & Shaw, for the sum of 8,200*l.*, and is to be completed in eighteen months. Mr. Henry Alty is the engineer appointed by the Halifax corporation to carry out the works.

THE THAMES EMBANKMENT AND THE LAW COURTS.

SIR,—I stated at the Metropolitan Board of Works that it is not possible to place Mr. Street's building, as now designed, on Sir C. Trevelyan's site on the Thames Embankment, inasmuch as the latter is too small by about 40,000 ft. A few figures will show this. Mr. Street's plan at the Institute is 740 ft. by 500 ft., which dimensions give 370,000 square feet. Sir Charles Trevelyan's site is bounded by the Strand on the north, the Temple on the east, the Embankment on the south, and King's College on the west. Allowing for streets for light and air on the east and west sides, this plot is as nearly as possible 660 ft. by 500 ft., or 330,000 square feet, and is, therefore, as I stated at the Board of Works, too small by 40,000 ft., for Mr. Street's present plan, to say nothing of any future extension of it. It is, however, more than sufficient for either the courts or the offices, in a separate building, according to my proposal. I have taken all my dimensions from official plans, and cannot understand Sir Charles's assertion that his site, exclusive of King's College, and without including any portion of the embankment, contains 446,500 superficial feet.

WILLIAM TITE.

THE COLISEUM, LONDON.

SIR,—Can you inform me where I can find any description of the Coliseum in the Regent's Park, with plans and sections of the building? * I am sorry to see that it is to be pulled down. Could it not be saved? It seems to me extraordinary that while this building is available, we should be erecting a very similar one at South Kensington for a purpose for which, if we are to put the slightest faith in the laws of Acoustics, it must be very ill-adapted. However, there must be many purposes to which the Coliseum building would be very suitable, and for which I trust to see it yet preserved. In these anti-Ritualistic days, why should it not be converted into a church? Its great prototype, the Pantheon at Rome, is so used, and Ferguson, in his Handbook, affirms that it is well adapted for the purpose. Neither of the buildings is cruciform in plan, but the light from above would satisfy the lovers of symbolism. Again, there is a great want of a really public library in London. Could a building be obtained, there are hundreds of men in London who would come forward with donations of money and books to stock it, and we should no longer bear the reproach of being behind the other great cities of Europe and America in possessing no free library in London. You have done so much for the working man in London in sanitary matters, help him in this too. J. B. Major.

THE FAILURE OF STONE.

I BELIEVE if the decayed stones in a building were carefully examined a large majority would prove to be face-bedded; yet some good judges tell us that in Portland, Bath, Granite, and some others, it does not matter whether the stone fixed in work is face-bedded or not. I think the contrary might easily be proved, as stone laid on its natural bed, "with its teeth out"—to use a quarry phrase—presents a greater resistance to the effects of wind and weather, than when laid in any other position.

In addition to stone being laid on its natural

* "Public Buildings of London." By Britton & Pugin.—Ed.

bed, I think it ought to be well seasoned, for even our worst stones when well seasoned will stand for a long time before exhibiting any signs of decay, and a careful observer will find in buildings recently erected stones perishing, but after a time the decay is arrested, as it were, by some invisible agency, more particularly so in Portland and Ancaster stone. This is nature throwing out a coating or weathering to the surface.

This coating is most remarkable in the Ancaster stone, as many builders know to their cost who neglect the cleaning-down of buildings till it is formed.

In this age of steam we quarry hy steam, we convey hy steam; we saw and work by steam—I had almost said we fix hy steam—so that the stone has no time to get rid of the quarry sap. To season stone we require some such desiccating process as that to which timber is subjected. Thus, although the stone quarried in the present day is as good as at any former period, the continual outcry is—"There is no good stone to be had now."

What I say is this—When we have made choice of the stone to be used, select the best of that kind, season it well, have a properly-cleansed surface before it leaves the banker, set it on its natural or quarry bed, and we may defy the influence of London smoke or soot; but I hope we shall see many more articles on this subject in your valuable journal, as, in the multitude of counsel there is wisdom. D. H. R.

INAUGURATION OF THE WALSALL AGRICULTURAL HALL.

THIS edifice has been inaugurated by a concert in aid of the Walsall Cottage Hospital. The building, which was designed by Mr. G. B. Nichols, West Bromwich, architect, has been erected by Messrs. Trow & Sons, of Wednesbury, contractors. It provides a hall 80 ft. by 50 ft., with a spacious vestibule entrance, on each side of which, on the ground floor, are placed the settling-rooms, forming arched recesses, which may be used as refreshment-rooms or for other general purposes, over which are placed retiring-rooms for ladies and gentlemen, divided by an arched lobby, arranged to overlook the whole of the hall. There is a stage at the end of the hall, 36 ft. wide by 31 ft. deep, with a platform in front, the stage being recessed by an archway of 21 ft. span, and 21 ft. 6 in. high, on each side of which are lobbies fitted up with water-closets, lavatories, &c., and dressing-rooms for performers. The basement provides an extensive area of vaults, adapted for letting off for storage. The doorway is the chief feature of the front of the edifice, and is executed in Bath stone, having double pilasters, with carved capitals, raised on a moulded pedestal, with a moulded lintel, supported with light ornamental cast-iron columns, and having a plain frieze and cornice, surmounted with a deep blocking course for a large semi-circular window, which lights the gallery lobby. This is the only noticeable feature of stonework in the building, the other portion of the front being executed in red brickwork, the detail being simply worked out with moulded bricks, slightly relieved with bands of white bricks. The style of the building is bordering on Italian. The roof being the chief feature, is constructed of timber, open internally, in the form of half a hexadecagon, or sixteen-sided polygon, of 50 ft. span, without any tie-rod, the angular portions being relieved with wrought-ironwork. The principals, seven in number, are partly supported on cast-iron columns. The whole of the interior walling is executed in panels of red and white brickwork, ornamentation being obtained by a variety of moulded and perforated bricks and quarrics, which perforations afford ventilation. The lighting is effected by means of wrought-iron sky-lights, extending the whole length of the building on either side. The panels of the ceilings, the archways, and the roof-timber are all decorated in distemper, and the ironwork is painted in party colours. The archway forming the stage has been fitted up with a proscenium border; and a painted act-drop, by Messrs. Day & Watson, of Birmingham, has been hung, representing a harvest landscape. The lighting of the hall by night is by means of fourteen star-light burners, which have been fitted up for the contractors by Messrs. Brown & Chesterton, of Walsall. The red bricks were obtained from the Paddock Works, and the white bricks from the works of the Hednesford Colliery Company.

The heating and ventilation have been carried out by Messrs. Haden & Son, of Trowbridge. The interior decorations have been done by the contractors from the designs and under the special superintendence of the architect.

DWELLINGS FOR THE POOR AND THE NEW LAW COURTS SITE.

SIR,—If the publication of Sir C. Trevelyan's letters in the *Times*, and that powerful journal's advocacy of similar views should prevail, and the Thames Embankment be ultimately selected for the New Courts of Law, might not the site near Carey-street be used for the benefit of that class whose wretched dwellings were cleared away to make room for them? It seems to me that our architects have the genius to cover that vacant space with habitations that would be both ornamental and convenient; and I do not believe the country would grudge the cost (that could not be covered by returns in the shape of rent), of thus supplementing the experiments already made.

But supposing this site cannot be thus utilized, will you, nevertheless, allow me this opportunity to say a word on the general subject of the dwellings of the poor in London. As one walks miles and miles between big uniform houses, evidently adapted only for richer people, would it not be a relief to the eye as well as mind, to see in good positions houses of another kind? I feel confident our architects (and it is because I wish them to see these lines, that I ask you to grant the space for them), could, as occasion offered, build streets for the poor, and at the same time add to, rather than diminish the beauty of the metropolis. Fancy a village without cottages! Why a metropolis without dwellings for the poor, except out of the way, in close courts or dingy back streets? F. F.

DISSENTING CHURCH-BUILDING NEWS.

Landkey.—The new Wesleyan chapel here, erected at a cost of nearly 800*l.*, has been opened for divine worship. The design is in the Middle-Pointed period of Gothic architecture. The plan comprises porch, nave, and an end gallery for the school children. It is built of hammer-dressed Swynbridge stone, with dark bands of Venn stone. The side and end fronts are in hammer-dressed Venn stone. The dressings are in Bath stone. A large five-light window forms the principal feature of the front, with traceried head. Below it, the entrance doorway has pillars with carved Bath stone caps and coloured shafts of Marwood Hill stone. The principal feature internally is the open roof. It is divided into five bays, the principals springing from carved circles in Gannan's Down stone. It is celled to the collar, and the whole is boarded and stained. Provision is made for ventilation by a row of cinque foil piercing in the centre of collar ceiling and of quatrefoil piercings in the cornice. Fresh air is admitted by regulator valves in the sills of windows and in the ground-floor aisle. It is supposed to warm the chapel with one of Musgrave's slow combustion stoves. The open seating in ground floor and gallery is framed with inclined backs, book-boards, and hat-rails complete. The gallery front is projected on cast brackets, and is framed with pierced panel framing. The windows are glazed with obscured glass and green border, leaded. The glazing and staining have been executed by Mr. John Clarke, of Barnstaple. The corona lights, suspended from the sweeps of the roof, were made by Mr. Harper, of Barnstaple. The contractors were Messrs. Pulford (Barnstaple), Youatt (Swynbridge), and Southwood (Landkey). The works have been carried out according to the plans, and under the superintendence of the architect, Mr. Lander, of Barnstaple.

Barnstaple.—The Wesleyan new chapel here has been opened for divine service. The plan is a parallelogram 70 ft. by 50 ft., and there is a deep gallery round three of the sides. Care has been taken to provide for ready ingress egress to and from the building, the entrance to the galleries being entirely separate. That to the galleries is by two commodious staircases at the higher end of the building, and that to the body of the chapel and the large schoolrooms, at the lower end. A separate staircase entrance is provided for the Sunday-school children. All the doors open outward from the building so as to give the readiest egress in the event of a panic. The style of the edifice is in the fourteenth century period of Gothic

architecture. The side of the chapel being towards the street, gave the opportunity of scoring an effective façade. The elevation is dependent on the internal plan. It is divided in height by a string-course marking the line of galleries, and the sky-line marking the construction of the roof. For the purpose of ventilation, the roof is divided into nave and transept, and this transept forms the principle feature in the front elevation, rising as a gable to the height of 50 ft. from the street line. In it is a large five-light window with traceried head. In the opposite gable is a proportionate "Alpha and Omega," or wheel-window, of geometric tracery. The entrances are marked with indicated porches, the doorways having pillars with carved capitals and shafts of polished Marwood-hill stone. The arches have mouldings of Early English character. The bays between the porches and transept are filled in with triplet windows accentuated within and without, with pillars having carved caps and bars, and polished shafts of Marwood-hill stone. The heads are filled in with tracery of varied designs. The lower windows are three-light windows, with traceried heads of uniform design. All the arches are in alternate bands of Bath stone and Marwood-hill stone. The cornice is of bold and simple design, formed partly of stone and partly of the ornamental ironwork of the shutes. Some of the members are filled in with carved patera, and the sky-line is formed with running iron ornament. The whole of the front rising from the splayed granite plinth course is in brickwork, faced throughout with Bath freestone. This portion of the work has been executed by Mr. Youngs. The roof is an adaptation of the roof timbers of the old chapel. The galleries are carried on coupled cast-iron pillars, with foliated brackets and pierced intersecting panels. These were from the foundry of Mr. Charles S. Willsheire. They are painted a brown colour, the brackets and caps picked out with gold. The gallery fronts are of pierced panel framing, carried out in brackets from the beams, with cornice and architrave moulding. Extraction pipes are laid throughout under the galleries, which lead to openings over the gas coronas, and at each end to an opening in the outer wall. Pipes for the ingress of fresh air supplied with regulator valves throughout are brought under the aisles of the ground floor, in the steps of gallery floors, and in the soil-boards of the windows. The lighting of the chapel is by a large quatrefoil corona with clustered lights, hung from the large ventilator in the centre of the nave and transept of roof. On the ground-floor are seven four-light coronas, hung from ventilator in the centre of the gallery ceiling. The whole are painted blue, picked out with gold. The whole of these are from the designs of the architect, and the workmanship of them throughout was done by Mr. Claude Rafara, the manager of the Barnstaple Gas Works. The contractors were—Mr. Thomas Brown, for the mason's work; Mr. William Youngs, for the stone-mason's work; Messrs. Oliver & Son for the carpenter and joiner's work; Mr. William Britton, for the glazier, painter, and stainer's work; the carving, by Mr. Hems; and the polishing, by Mr. Arnold. Mr. Lander, of Barnstaple, was the architect.

SCHOOLS OF ART.

The Birmingham School.—The inaugural meeting of the Students' Art Literature Class has taken place in the Library, Midland Institute. Mr. D. Raimbach (the head master) presided. It was unanimously resolved that the statement of the provisional committee and the draft of the rules be adopted, and that the proposed class for the study of literature will be beneficial to the students of the School of Art. The committee has issued a programme.

The Darlington School.—The annual meeting, *conversazione*, and exhibition in connexion with this school has been held in the Mechanics' Institute, Darlington. The room was enlivened by an exhibition of the students' drawings, together with a collection of photographs, engravings, etchings, and other works of art from the South Kensington Museum. The Secretary (Mr. J. C. Inanson) read the tenth annual report, which said:—

"The committee of the School of Art have much pleasure in reporting that during the last twelve months the school has been carried on with increasing success. The number of students under instruction has been larger than in any previous year, and the number who passed the ex-

amination in March also shows a considerable increase. The total number of students under instruction at the end of the year, including both the central school and the North-road branch, has been 178, as compared with 161 in 1868; and out of the 191 who were examined in March last, 58 were successful, and to 13 of these prizes have been awarded for special proficiency.

There were also 17 awards made for drawings in the elementary section, in the shape of payments to the school, and out of these 4 were selected as deserving of prizes. Three works were also selected for national competition, but did not succeed in gaining this higher distinction."

The Kidderminster School.—This school continues to hold on its satisfactory course, and the past year's work excels that of all former ones. The annual meeting was held in the Music Hall, Kidderminster. Sir Digby Wyatt presided. The report was in the following terms:—

"The Committee have again the satisfaction of placing before the subscribers and friends to the institution an excellent report of the condition and progress of the school during the past year. The total number of students who have attended the school during the past twelve months has been 81 (an increase of 16 over the previous year); of this number 74 comprise the evening class, and 10 the day class. An analysis of the occupations classified out of these 81 persons shows that about two-thirds of the number are designers, who are thus qualifying themselves for advancing the local trade, and are filling or are about to fill important posts in the various carpet works of the town. The examination in the second grade took place in April last, and out of 82 students who were examined 45 were successful. A competition of the works from the London and provincial schools took place at South Kensington in July last, at which this school was eminently successful. One silver medal (out of the twenty medals competed for by 120 schools), one bronze medal, three Queen's prizes, and seven third-grade prizes, making a total of twelve national awards, were obtained by the students of the Kidderminster School. In order to afford a right estimate of the relative position of the Kidderminster School as compared with others at the Competitive National Examination, it should be observed that only three schools obtained more than two Queen's prizes. South Kensington, with its 992 students, obtained three Queen's prizes; Dublin, with 432 students, four Queen's prizes; and Kidderminster, with its 81 students, three Queen's prizes."

COMPETITIONS.

Grandham.—A new Congregational church is about to be erected here. It is to occupy a central and prominent position in the town. A design by Mr. Tait, of Leicester, has been selected in a limited competition.

Hartley Winney New Church.—We are asked to say, with reference to the competition in this matter, that certain drawings are at present retained as being amongst the five best designs received by the committee; that one of these five, "Fides" is preferred, providing the author can satisfy the committee that his plans can be carried out for the sum named in their instructions and the other four, namely, "Well Considered," "Fiat Justitia," "Intergate Solâ," "To be or not to be," are retained for further consideration in the event of his failing to do so.

FLAMBOYANT ARCHITECTURE.

At the Friday evening meeting last week, at the Royal Institution, Mr. John Ruskin delivered a lecture upon "The Flamboyant Architecture of the Valley of the Somme." We avail ourselves of a report of it in the *Telegraph*.

Mr. Ruskin said that he would first explain why he chose "The Flamboyant Architecture of the Valley of the Somme" as the subject of his lecture. Gothic architecture lasted altogether no more than 300 years; it began about A.D. 1200, and expired three centuries later. His object was to inquire why it did not so quickly, whether from any faults of its own, or from other causes. During the three centuries it lasted there were three schools of Gothic architecture. The first was the massive school, wherein the heavy stonework was carved in some simple manner at the edges. Next came the school in which the surface is done away with; the carving becomes important and delicate, and perfectly represents organic forms. In the last school the organic forms are lost, and all the surface is chopped away in an intricate manner. Did the Gothic, then, perish by its own fault or by the faults of others? or was it because no more could be got out of it? or did it give way because other styles were better? To give clear ideas on this subject, he wished to show his hearers something of the very last of Gothic architecture; and the latest he could find in Europe was in the valley of the Somme. The churches here are very numerous, and in the middle of the valley are many which exhibit the Flamboyant, or "flame-like" specimens of the Gothic; for Gothic architecture came to the valley of the Somme to die. It perished before the revival of literature, and before the Reformation, which latter was an entirely illiterate

movement. He wished to impress upon the minds of all present that an artist always leaves the impression of his own mind upon his works, and this as decidedly in architecture as in anything else. A foolish person will build foolishly, and an intelligent man will build sensibly. Therefore, in architecture, the characters of the artists, or of the nation, may be read at any time. When the architecture is too ornamental, the artist was too vain; and when it is too plain, he was stupid, idle, or contemptible. Thus the manners and mind of a nation can be read in its architecture as surely as the presence of a spider's web proves that it was made by a spider. Manufacture is the work of the hands only, but architecture is the work of the spirit. That architecture which is born of valour and honour acquires valour and honour, and its effect upon the nation is invaluable; yet English gentlemen of high standing have denied this principle, and the growth of such ideas has much to do with the decline in English art. . . . Flamboyant architecture is not a granite architecture, like that of Egypt, constructed in a granite age; neither is it a marble architecture, like that of Greece. The Flamboyant is essentially a chalk architecture. The designs are cut deeply upon a soft, cheesy substance, which gives way easily under the chisel, so that the finished design is something like lace upon a black ground; and this is its chief fault of the style. The first style of building (he said) was very simple, and consisted essentially of one stone placed on the top of two others; in later times the Greeks added ornament to this, which is a very stable and simple architecture. Last of all came arches high in air, and things which do stand, yet look as if they could not. Thus, when the mind at last is taken up with mechanical details, it necessarily forgets all about human passions. When masonry deals with passion and poetry it is great, but when it deals with mechanical problems it becomes mean and dies. The artists of the Flamboyant school delighted in loose, fluttering lines, instead of those of organic form; and this was a sure sign of decay. Moreover, they threw into their work a strange fear and melody, derived from their ancient Scandinavian religion, with its dread of a physical hell. Then, at last, the stonework took the ague, becoming loose and wanton, and fantastical. The Gothic did not die because it was too rich, for Beethoven is rich, and so are the clouds of heaven; but it fell because its profusion was cold and heartless, and had ceased to be sincere. It died because it had lost sentiment. Good architecture can only be built by a thoughtful and pure people, by a nation with a common pride and a common wealth. In good architectural work the mason must be pure and intelligent, with plenty of art taste; he must not be paid too much, nor must those below him be paid too little. There must be a common wealth and a common pride to produce good architecture in a nation; that is to say, the taste for beauty must be diffused, and beautiful homes erected for the poor. He did not object to happiness and luxury when everybody was happy and luxurious. At the present time the metropolis is spending seven millions a year upon the London poor, yet pauperism is largely on the increase; the payment shows no generosity; in fact, it is a fine paid by the rich for their neglect of the poor. Instead of lighting candles by daylight, it would be better to light and warm the houses of the poor, and to build up tabernacles that will keep out wind and rain from human bodies. When this is done, luxury may be introduced, and a glorious Flamboyant dragon may be carved over every poor man's door.

THE BOROUGH OF PORTSMOUTH DRAINAGE WORKS.

The corporation have called in Mr. Hawley to report upon the efficiency of the extensive scheme of drainage which has been the cause of so much local dispute and vexation. Mr. Hawley reports favourably of the general arrangements, including the outfall works, upon which the greatest difference of opinion existed. Mr. Hawley states,—"In conclusion I may remark, that whilst I see nothing to condemn, I observe much to commend in the arrangements. In this instance, as in all cases in which the physical difficulties of collecting and discharging the sewage are similar, an amount of intelligence, and watchfulness will be demanded from the officers in charge, altogether unknown under more usual and more favourable conditions." The scheme was designed in 1863, by Mr. Lewis Angell, C.E. The upper and lower level main sewers and outfall works were constructed by Mr. F. Furness, under conditions involving great difficulties. The engine-house was erected by Messrs. Light, and the subsidiary sewers are let at a schedule of prices to Messrs. Neave & Fry. Mr. Grotorex is the resident borough engineer.

RAILWAY BRIDGES IN THE METROPOLIS.

Sir,—I have just had a conversation with one of the jurymen who sat on the inquest on the body of the gentleman killed by being thrown from a vehicle, the horse having taken fright from the thundering noise caused by trains rattling through the iron tank (it can't be called a bridge) over Westminster Bridge-road. It came out in evidence that other accidents have occurred from the same cause. The verdict was "accidental death;" thus no one is amenable. Surely, Sir, this danger ought not to be allowed to continue. Railway companies must remedy it. Moreover, it is prognosticated that these dangerous nuisances will ere long crash down with a train. Hard wood rails (the inner sides) to be sheet-ironed to prevent the rim from fraying the wood) would do the cin. The first rails were wood, and in America they are so now. It is astonishing the wear and weight hard wood will stand vertically. This clattering of iron wheels on iron rails in iron tanks is intolerable. R. T.

SIZE OF OPERA-HOUSES.

Sir,—Can any of your correspondents oblige me by giving the relative dimensions of the operasouses at London (Covent Garden), St. Petersburg, and Moscow? A. W.

THE GREENING OF STONE.

Sir,—I will be obliged if some of your readers will give any information as to the cause of stone greening over, and how to prevent it. A.

ROAD MAKING AT CAMBERWELL.

Sir,—I have read the correspondence in your paper on roads and road-making. The following has been the process just carried out in this locality. After a long dry summer last year, and when the road had become thoroughly dry and hard, four or five inches of coarse ballast were spread over the entire surface, and rain falling immediately after, this was speedily ground up (at a vast expenditure of horse power) into a quagmire, and deep and remained so for about a week, when more ballast was spread on this, which is now amalgamated with the aforesaid, forming a mixture of mud, horse-dung, and crushed ballast, and which only awaits more rain to be carried away by what they call road-sand or drift, or to be craved into blinding clouds of dust by the next wind that blows. SIXTEEN.

LANDS AND RAILWAYS CLAUSES CONSOLIDATION ACTS.

DAMAGE TO GOODS.

Knock v. The Metropolitan Railway Company.
The house of the plaintiff in this case received structural damage from the works of the defendants, and damage was also thereby occasioned to his goods. An arbitrator awarded the plaintiff compensation for the injury to the goods, as well as for the other damage. The *Solicitors' Journal* says:—"It was objected, in an action upon the award, that the arbitrator had no power under the Lands and Railways Clauses Act, 1845, to award compensation for damage done to goods. It seems therefore to be a question on this point, although the universal practice is to give compensation in such cases for damage done to goods. The Court decided that such compensation could be given under the words of the Act, and they considered the matter too clear to grant a rule to have the point argued. It is curious that there should have been any doubt on this question, but probably it has hitherto been thought so clear that the objection has not before been taken, and so, until now, there has been no reported case upon the subject."

BUILDING CONTRACTS.

For some time past the unsatisfactory and uncertain state of the relation between the architect and the contractor, in carrying out work, has been attracting the attention of the architectural profession and of the builders in Liverpool; and some months ago a sub-committee was appointed, at the instance of the Liverpool Architectural Society, to consider the question, and to endeavour to frame such a form of building contract as would be likely to be acceptable to both architects and builders; and which, while leaving no loophole by which the contractor could evade any part of his engagement, might nevertheless protect him from any undue or unjust pressure on the part of the architect. The committee, which consisted, on the side of the architects, of Messrs. T. J. Kilpin, J. Bonit, and H. H. Statlam; and, on the side of the builders, of Messrs. J. Jones, T. Haigh, and J. Roberts, though meeting in a most amicable spirit, had considerable difficulty in adjusting clauses so as to meet the wishes of both sides; the principal difference arising on the questions as to the appointment of an arbitrator to whom each party might appeal in case of dispute, and as to the extent to which bills of quantities should be incorporated in the contract. Finally, however, after a good deal of discussion, a middle course was adopted on both these points, and the members of the committee are now enabled to recommend to their respective societies, the Liverpool Architectural Society and the Liverpool Builders' Association, the following form of contract for adoption. The advisability of adopt-

ing this form of contract, and the means for practically bringing it into operation if approved of, will form the subject for discussion at the meeting of the Liverpool Architectural Society next week:—

"This Contract made the day of 1869, between of the one part, and of the other part, witnesseth, that the parties hereto have mutually contracted and agreed with each other; and the said Contractor, so far as the stipulations and provisions of this contract, and the works, matters, and things herein mentioned or referred to, are to be performed and observed by him, hereby agrees with the said Proprietor; and the said Proprietor, so far as the said stipulations and provisions, matters and things, are to be performed by him, hereby agrees with the said Contractor as follows, namely:—

1. In the construction of these presents, when the Contract will admit of it, the term 'Contractor' shall mean the said ; the term 'Architect' shall mean the or other the Architect for the time being employed by the Proprietor to superintend the erection and completion of the works; and the term 'works' shall mean all the works, acts, matters, and things specified and described in the specification, plans, and other drawings, and detailed bills of quantities supplied, hereinafter mentioned, and such other works, matters, and things as are hereby contracted to be done and performed by the Contractor.

2. The Contractor shall well and substantially, and in the best and most workmanlike manner, with the best materials of their respective kinds, and under the direction of the Architect, make, execute, finish, and complete, and deliver over to the Proprietor, on or before the day of the several works, acts, matters, and things mentioned or referred to in the specification, plans, and drawings already prepared by the Architect and signed by the parties, and in the detailed bills of quantities supplied, with such additions, enlargements, and alterations of, and deviations from, the said works (if any) as the Architect may from time to time, during the progress of the works, direct; but further time shall be allowed, if with reasonable diligence on the part of the contractor, such additions, enlargement, alterations, and deviations should be the cause of delay in the execution and completion of the works.

3. The Contractor shall find all materials, labour, services, tools, scaffolding, implements, tents, and machinery, and power of every kind, for the full, safe, expeditious, and proper carrying on and completion of the works.

4. The Contractor shall be answerable for, restore and make good all injuries, damages, re-operations, and repairs occasioned or rendered necessary by accidental causes, or by flood, storm, tempest, fire, trespass, or other means, to the works, previously to the completion and delivery of the same, and hold the Proprietor harmless from any damage to person or property arising from the Contractor's operations or neglect. The Contractor shall insure the works from damage by fire in the sum of £, such damages to be effected in the joint names of the Contractor and the Proprietor. If the Contractor fails to effect such insurance to the satisfaction of the Proprietor, it shall be lawful for (but not obligatory upon) the Proprietor to insure the same, and to retain and deduct the sums paid for such insurance from any money which may be owing to the Contractor.

5. The Proprietor shall pay to the Contractor, for the full and perfect completion of this Contract, the sum of £. But if the Architect shall direct any addition to, or omission of, or variation from, the works, the value of such addition, omission, or variation, shall be added to or deducted from the said sum of £, as the case may be; and if there should be found to be any error in the detailed bills of quantities supplied, such error shall be rectified, and an addition be made to the Contractor, or deducted from him, as the case may be, in respect of such error.

6. The sum payable under the last clause shall be paid by instalments in manner following, namely—Instalment as the works proceed over every month after commencing the works, at the rate of per cent, upon the value of the work done and materials provided and delivered upon the ground, such materials to become the property of the Proprietor, as certified in writing from time to time by the Architect, until the amount reserved by the Proprietor shall equal 100 per cent. on the said sum of £; and when the same shall amount to such 10 per cent, the instalments shall be the full value of the work and materials so certified, and, after full completion and delivery of works, whatever balance may be owing after the payments aforesaid, and the ascertaining the value of any extras and deductions, shall be paid by the Proprietor to the Contractor within from such completion as payable until the expiration of three days after giving the Architect's certificate to the Proprietor, either personally or, by leaving the same for him at his place of business or residence; and no instalment of a less amount than £; shall be required to be paid during the progress of the works.

7. The Contractor shall, during the execution of the works, when directed and required by the Architect, remove from the Proprietor's premises all materials and works which shall not, in the opinion of the Architect, be in accordance with the specification, plans, and drawings, either as regards quality of materials or workmanship; or which he shall consider unsound, ill-seasoned, defective, unsuitable, or improper. And the Contractor shall, when so directed and required by the Architect, remove and take down all work which the Architect shall best opinion is not done according to the specification, plans, and drawings, or otherwise imperfectly executed; and in either case proper and satisfactory materials and work shall be substituted. And if after forty-eight hours' notice the Contractor shall not comply with such direction or requisition, it shall be lawful for the Architect to cause the removal and taking down of the material and works objected to, and to cause materials and works to be found and executed by some other person or persons, and the costs, charges, and expenses of the same or otherwise as he may think fit, shall be deducted from the amount payable to the Contractor under this Contract, or otherwise shall be paid by the Contractor to the Proprietor.

8. If the Contractor shall become bankrupt or compound with or make an assignment for the benefit of his creditors, or shall wilfully suspend or delay the per-

* The words printed in italics may be omitted when the quantities are taken out by a surveyor appointed or agreed to by the contractors.

formance of his part of this Contract for forty-eight hours, after a notice shall be served upon him or left at his last known place of abode by the Architect requiring him to proceed with and perform the same, it shall be lawful for the Proprietor by the Architect to enter upon and take possession of the works, and to employ any other person or persons to carry on and complete the said works, and may authorize him or them to use the plant, tools, materials, and property of the Contractor there being, and the costs and charges incurred in any way in carrying on and completing the said works shall be paid to the Proprietor by the Contractor, or he set off by the Proprietor against any money due or to become payable to the Contractor.

9. The Contractor shall, if the Architect direct, suspend the whole or any part of the works during inclement weather; and if the same shall be suspended by such direction, or shall be necessarily suspended from any cause over which the Contractor has no control, or any local or general strike, then the completion of the works may be delayed for a period equivalent to the time of such suspension.

10. In case the works and things hereby contracted to be done by the Contractor shall not be done and completed at the time hereinbefore mentioned, the Contractor shall pay on demand to the Proprietor, as liquidated and ascertained damages, a sum not exceeding £10 for every week which may elapse between the appointed and actual time of completion and delivery hereinbefore mentioned, or the Proprietor may deduct the same from any moneys payable or to become payable to the Contractor, allowance being made for delay, if any occasioned, in the execution and completion of the works by reason of additions, enlargements, alterations, deviations, and other causes, as provided for in Clauses 2 and 3.

11. The Contractor shall provide and keep on the premises where the works are to be carried on a good and efficient foreman; and if the Contractor shall not provide such foreman, the Architect shall be at liberty, after giving forty-eight hours' notice in writing to the Contractor to employ a foreman, and the costs of so doing shall be paid by the Contractor; and if the Contractor's Architect may dismiss any foreman, and also any workman, for incompetence or misconduct.

12. Should any flaws, cracks, settlements, shrinking, or other defects arise or occur during the progress of the works, or within after the delivery thereof, arising from bad materials or workmanship, the payment of moneys due on the giving of any such certificate as aforesaid by the Architect shall not exonerate the Contractor from liability, but the same shall be rectified by him at his own expense.

13. The Contractor shall give all necessary notice to the Road Surveyors or other Surveyor, and to all other persons or persons to whom notice is required to be given.

14. The Contractor shall not assign or sublet this contract, or any part thereof, without the consent of the Architect.

15. If in any difference between the parties touching the premises, they or either of them shall be dissatisfied with the decision of the Architect the subject shall be referred to a third party; but if he shall refuse to act, or shall die, then to such person as the President for the time being of the Liverpool Architectural and Archaeological Society may appoint, it being understood that such reference shall not be opened until the works are completed, without the concurrence of the Architect; and this sub-mission to arbitration, with the award of the Arbitrator, may be made a rule of any of Her Majesty's Courts of Record in England. The cost of the arbitration and award shall be in the discretion of the Arbitrator.

As witness the hands of the parties the day and year first before written."

METROPOLITAN BUILDINGS ACT.

LIABILITY OF OWNERS FOR FEES.

Mr. G. Wood, of Devonshire Wharf, Camden Town, was summoned before Mr. Dayman, at the Wandsworth Police Court, for the sum of £1 18s, district surveyor's fees due from him as the owner of six houses in Fenchurch-street, Wandsworth-road. The defendant pleaded that at the time the fees came due he was not the owner, being merely the mortgagee; that though he had subsequently fore-closed, he had since parted with the property, and was not now the owner; and that the builder was the proper person to pay the fees. Mr. Dayman decided that any builder, owner, or occupier, is liable under the Act; and that the fees being of the nature of a charge on the property, any owner is liable, provided he is the owner at the time the claim is made upon him; and that having subsequently parted with the property, did not affect his liability. He also ruled that the mortgagee is the owner, though he may not have foreclosed.

ARBITRATION CLAUSES IN CONTRACTS.

The leading builders of London and of the provinces have had under much consideration lately the effect of the Arbitration Clauses in Contracts, and have been in communication with the Institute of British Architects on the subject. As contracts are now drawn, the architect is absolute,—practically he may act with injustice towards the builder, the latter being entirely without remedy. The only plea on which such power can be placed in the hands of any individual is, that he should occupy the position of an umpire or judge without bias on one side or the other, and this is a position which some architects conceive they ought to occupy. But the builders say with justice that an architect is naturally bound up with the interests of his clients, who employ and pay him. Moreover, he has often to decide on matters in which his direct personal interests are concerned. The architects say, "We are quite willing to give an arbitration clause as regards the value of extra or omitted works, but on no other point." The builders reply that this arbitration clause is utterly useless, unless there can

be also a reference as to the builder's right to a final certificate of completion; for, according to the wording of all contracts, the architect's certificate is made a condition precedent to obtaining payment, and although the amount due to a contractor may be definitely settled, he is unable to enforce payment of the same without the architect's certificate, which may be withheld without any reason being assigned. Such is the law.

Two cases may be cited to show the arbitrary unfairness of the working of this condition. In one case, the builder was directed by the specification to use material unfit for the purpose. When the building was nearly finished the unfit materials had to be substituted by other materials. The architect in this case refuses his certificate until the builder consents to deduct from his account a sum equal to the whole cost of the substituted materials, and this he does manifestly in order to save himself with his client. In the other case, the builder was bound in a heavy penalty to complete by a certain date; the architect leaves his office for some weeks, during which the builder is brought almost to a standstill for drawings and instructions; the accounts are made up and agreed to, but the architect says, "I will not give you my certificate (the only mode by which you can obtain payments) unless you consent to take off a large sum by way of forfeit for delay." Here, again, the architect is able to make the contract in his own indulgence, because the contract is so drawn that he is absolute master of the situation. The builders consider it high time that such a state of things should be amended. A. B. C.

YORKSHIRE ARCHITECTURAL SOCIETY.

A GENERAL meeting of the members of this society has been held, in the council-room of the Yorkshire Philosophical Society, at York. The hon. and very rev. the dean in the chair. The attendance was only meagre. The Rev. Geo. Rowe read the report, which was adopted, and which stated that the committee had the pleasure of reporting that the flourishing condition of the society in former years continued, both as to the number of members and the state of the finances. The reappointment of the committee and officers of the society took place; and the Rev. G. Lewthwaite then read a paper "On the Antiquities of the Parish of Adel," about six miles from Leeds. The Rev. Geo. Rowe then, referring to the church at Brompton, Northallerton, said that in digging the foundations for the reconstruction there were found several crosses and cross slabs and other stones. The crosses were of the same age probably as the other stones, having the same interlaced cord as an ornamentation. Of the other stones there were portions of eleven or twelve. These were about 4 ft. 4 in. long, 1 ft. 4 in. high, and 6 in. in thickness. They had stood in the ground on one of the longer sides, and either end had a figure which was most like that of a bear, sometimes with two, sometimes with four paws. It was usually muzzled, but in one instance the paws acted as a muzzle. Out of their mouths proceeded the upper member of a rude characteristic ornamentation, consisting of various forms of fretwork and interlaced hands. In some cases an arch was sunk a short distance into the middle of the lower part of the stone. The Rev. J. R. Lunn then read a paper descriptive of the ecclesiology of the rural deanery of Knaresborough, in the diocese of Ripon.

LIGHT AND AIR.

WHEN DOES RIGHT COME.

Courtoult v. Leigh.—This was a special case, in the Court of Exchequer, in which the facts were stated by an arbitrator for the opinion of the Court, and raised a question both novel and important with respect to the condition as to the completion and fitness for habitation in which a newly-built house must be before the owner of it can gain any right to light and air as against an adjoining proprietor. The plaintiff's and defendant's premises were adjoining houses in Lewes-creecent, Kemp-town, Brighton. In 1830 the plaintiff's house having been recently built, was, after remaining some time in carcase, completed, so far as the structure was concerned, and had windows formed and casements put in, but it was still unfinished internally, and unfit for habitation. More recently, and within the last twenty years, it was finished and inhabited. More than twenty years after this, defendant

added rooms at the back of his house, whereby the access of light and air to the plaintiff's windows was diminished.

Mr. Garth, Q.C. (with whom was the Hon. Mr. Thesiger), for the plaintiff, contended that so soon as the house and windows were completed the plaintiff's right began to run as against the defendant.

Mr. Charles E. Pollock (with whom was Mr. Thripp), for the defendant, contended that so long as the plaintiff's house remained unfit for habitation, there was no such enjoyment as was requisite to acquire a right under the statute.

The Court gave judgment for the plaintiff, holding that the house, being finished in 1830, all but internal fittings, and the windows being put in, the plaintiff's right dated from that period, and consequently that he had enjoyed it for more than twenty years, and was entitled to maintain an action against the defendant for the disturbance of it.

THE CHARGES FOR QUANTITIES.

Sir.—A paragraph in your paper with respect to the Halifax Board charging for sketches, and your opinion thereon, prompts me to say that the architects of a London job, for which I see twenty-three firms tendered, had the modesty to demand a guinea for every copy of quantities, not to be returned, as I positively ascertained, in this case producing very nearly 1 per cent. on the job beforehand. Do you know of any precedent for such practice?

AN INTENDING COMPETITOR.

MONUMENTAL.

The Monument to Alderman Beckford.—It has been resolved by the Court of Common Council to restore the monument to Alderman Beckford, in Guildhall. Mr. Higginbotham, in moving the resolution, alluded to a statement by some clever fellow in one of the daily papers a few days ago, in reference to the motion, that it was very doubtful whether the speech reported to have been made to his Majesty George III. by this great City worthy, on the 23rd of May, 1770, had ever been uttered by him; and he read extracts from the "Annual Register" of that date, and the minutes and journals of the Court of Common Council itself, which, he said, left no doubt whatever that the speech really was made as represented.

The Statue of Queen Anne, in Leeds.—It has now been decided to keep the statue of Queen Anne at the Leeds Town-hall, and workmen have been engaged in placing her Majesty in the niche at the right-hand side of the Great Geopre-stre entrance. There is a vacant niche on the opposite side of the entrance.

Robert the Bruce on a Corinthian Column.—A meeting has been held in the small town of Lochmaben, in Scotland, which claims, together with Turnbury, to have been the native place of King Robert the Bruce, and resolutions have been agreed to by acclamation, that a statue of Robert be placed on the top of a Corinthian column at Lochmaben, the figure to be looking towards Banockburn and Edinburgh, and pointing to Dumfries,—that is, looking in two directions and pointing in a third. One speaker said the Wallace Memorial at Stirling should encourage them to proceed: we should have rather thought it would discourage them. At any rate, anything more ridiculously inappropriate than a Corinthian column with the Medieval Bruce on the top of it could scarcely be suggested.

Books Received.

Metropolitan Board of Works: Ideas of the Streets and Places in the Metropolis. WATERLOW & SONS, Printers, London-walk.

This very comprehensive index of the streets and places in the metropolis, according to the existing nomenclature, has been compiled by Mr. Newall in the department of the Superintending Architect, to assist the Board and its officers in the naming of new streets, under the 87th section of the Metropolitan Local Management Act of 1862. It has been in preparation for several years, according as opportunities permitted. Copies are to be sent to the vestries and district boards, and to the Post Office authorities and county courts, for use and revision, and are to be placed in the hands of the nomenclature clerks and

examined in each locality. By these means it is hoped that the Board will soon be in possession of an amount of information in reference to the existing arbitrary and irregular nomenclature that will render the work of reforming it extremely easy. The present index is simply a proof for revision; we may very shortly expect to have in succeeding issues a standard list. There is great need for such a revision and reform of street nomenclature. The number of streets of the same name throughout the metropolis is extraordinary. There are no less than seventy John-streets, for example, over and above a long list of John-streets North, John-streets South, &c., &c. There are long lists, too, of Cross-streets, Crown-courts, King-streets, and a host of others. The re-naming the whole will be a task of no little difficulty. The Board have already made some little progress, but that is as nothing to what has yet to be done. We may here state that the new street leading from the new meat-market to the top of Holborn-hill has been named Charterhouse-street. The open space of ground at the top of the hill, facing Hatton-garden, will be called Holborn-circus; a new street, called St. Andrew's-street, to connect Holborn-circus and Farringdon-street, will pass at the back of St. Andrew's Church, cross Stonecutner-street, and open into Farringdon-street, near Black Horse-court.

VARIORUM.

The *Popular Science Review* for January, is a generally interesting one. The leading paper is on Flying Machines, by Mr. F. W. Brearey, honorary secretary to the Aeronautical Society of Great Britain. In a paper on the planet Mars, by Mr. Proctor, there are a series of curious and new diagrams and sketches, with a new chart of the planet. "Report on a Project for the Drainage of Bombay. Also Report on Mr. Sowerby's Memorandum on the Drainage of Bombay." By Hector Talloch, Captain Royal Engineers. Bombay: printed at the Education Society's Press, Byculla, 1868. Captain Talloch's project appears to be entirely in accord with the views of the Secretary of State and the recommendations of Mr. Rawlinson. It proposes to utilize the sewage for irrigational purposes at a point distant from the town, and thus in the long run to make the works remunerative. If such utilization is found a failure, the sewage can still be discharged at Colaba or anywhere else at a less cost. The whole island and the city, present and future, would be drained by this project, while Mr. Aitken's leaves, it is said, a great portion untouched. The storm waters would be separated from the sewage, and all the floods on the flats and the town drained. The total cost, including sewage utilization, pumping station, outlets to the sea, and of course the sewers and street drains, sluices, manholes, &c., would be about 75 lakhs of rupees.—North of England Institute of Mining Engineers: On the Hauglage of Coal; being the Report of the Committee appointed by the Mining Institute to investigate the Subject." Newcastle-upon-Tyne: A. Reid, 1869. This voluminous report contains a mass of information as to haulage of coal by endless chains, endless ropes, &c., both above ground and below, including details of many experiments, and upwards of fifty illustrative plates.—Cassell's Primary Series: "The Boy's First Reader, for Elementary Schools." Part I.: "The Girl's First Reader;" Part I.: "An Explanatory Introduction to Geography, for Elementary Schools," by F. Young, F.R.G.S., Cassell, Petter, & Galpin. These are enticing little books for children, well adapted to excite their interest by engravings, which are also useful in illustration of the simple lessons taught.

Miscellaneous.

Communication between Passengers, Guards, and Drivers.—Mr. Weir's atmospheric system has been tested on the South-Western Railway. The whole principle of the plan is the transmission of pulsations of air through tubes communicating with air chambers, and giving motion to a simple arrangement by which a bell is struck. A lever fixed to a rod releases a short saphophone or signal arm, which, dropping down at the side of the carriage, at once indicates to the guard the spot where he is wanted.

The Science and Art Exhibition for South Staffordshire.—This exhibition, which is to be opened in May next, and closed at about the end of September, will have a building erected for the purpose. Molineux House, which the committee have taken, will be made available, but more as an annex than otherwise, the exhibition being that presented in the main building. That structure will take the form of a large central nave, 150 ft. long by 60 ft. wide, roofed over in one span. The framing will be of timber, covered externally with corrugated iron over felt on boards, and internally it will be lined with boarding. A gallery 14 ft. wide will be framed along the north and south sides, and 19 ft. wide at the ends of the building. Two annexes or wings added on each side the main building increase the ground floor area to a total width of 80 ft. The approach to the building will be under a covered way from the garden entrance of Molineux House. The main building is progressing with rapidity. It was commenced on the 8th inst., and it will be given up for use on the 31st of March. The contractor is Mr. F. N. Clark, of Wolverhampton, and the architect is Mr. George Bidlake, of the same town. Messrs. R. Lowe & Co., nurserymen, are re-arranging the grounds.

General Exhibition of Water-Colour Drawings.—The fifth exhibition of water-colour drawings in the Dudley Gallery, Egyptian Hall, Piccadilly, comprises 721 works. It can scarcely be considered equal to its predecessor, but is nevertheless an interesting collection.

Society of Engineers.—At the meeting of the Society of Engineers, held on the 1st inst., Mr. F. W. Bryant, president, in the chair, a paper was read on "Explosive Compounds for Engineering Purposes," by Mr. Perry F. Nursey. The following candidates were balloted for, and duly elected Associates, viz., Messrs. Charles Cockburn Gibbons, and Alfred Rubery.

Public Mortuaries.—The movement for providing these buildings in the metropolis appears to be progressing. A large number of the north-eastern and north-western parishes have already arranged for their erection in suitable localities, and the eastern districts seem to be following their example with commendable rapidity. At a late meeting of the Poplar Board of Works the plans for the erection of a mortuary for that parish, as approved by the medical officer, were agreed to, and forwarded for the approval of the rector and vestry. A site is being sought for one at Bow. The term "mortuary" is scarcely the right one for these receiving-houses, but seems to be pretty generally adopted.

New Forms of Permanent Magnet.—A discovery has been made by an old contributor to the *Builder*, Mr. F. A. Paget, C.E., which must become a subject of interest among electricians. It is well known that it is impossible to magnetize a plate except in the direction of its greatest length; and that a square one cannot be made to show magnetic action at all. Mr. Paget, however, finds that by cutting slits nearly up to the middle of a steel plate, a square plate in one piece can with such slits be regularly magnetized; and by this means even an oblong square plate can be regularly magnetized and with as many poles as may be required, in a direction transverse to its greatest length. Mr. Paget also suggests that a parallelepipedon or cube may, perhaps, be convertible in this way into a connected series of magnets. It may be said, of course, that it is just separate oblong magnets that are thus made; but they are not separate; and the influence of this Siamese twin sort of connexion is just one of those curious points which require investigation. May not the oblong connexion be in itself a diamagnet? and if so the mutual reactions of the diamagnet and the magnets, may evolve something new in regard to magnetic and diamagnetic laws.

Maldstone Cottage Improvement Company (Limited).—The annual meeting of this useful society has just been held. It was reported that the shares taken up to the 31st of December last amounted to 4,200l. The net income for the year amounted to 298l. 2s. 7d., out of which a dividend was declared at the rate of 5 per cent., the balance (65l. 10s. 5d.) being added to the reserve fund, which now amounts to 250l. 0s. 5d. Since the last report eight cottages have been purchased, making now 55 in possession of the company. Many cottages in the town still urgently require improvement.

The Improvement of the Cam.—The works were commenced on New Year's day. The contractor for the first part of the work—dredging and restoring the river between Jesus Sluice Locks and Baitstite to its original depth and width—has commenced operations with the powerful dredger of the South Level Commissioners at a point nearly opposite Logan's boat-house. When the new dredger, just built for the Conservators of the Cam, has done its work of dredging the river between Queen's College and Jesus Sluice Lock, it will probably be also at the disposal of the contractor. The other measures proposed by the committee, under the advice of Mr. J. Hawkshaw, are—widening the passage through the railway bridge, and reducing the sharpness of some of the most prominent corners. The rough estimate for carrying out all these improvements was 6,000l., of which upwards of 5,000l. have been already subscribed.

Masonic Archæological Institute.—On the 29th ult. the first meeting of this institution, just established, was held at the Freemasons' Hall, Mr. James Glaisher in the chair. Several donations to the library and museum were reported. The inaugural address was delivered by Mr. Hyde Clarke, treasurer, pointing out, as subjects for investigation, the history of Freemasonry in the last century and middle ages; its relations to secret societies and guilds and associations of working men; the possible influence of gnosticism and the ancient mysteries on its symbolism; and its place in the study of the philosophy of the human mind. A vote of thanks was moved by Mr. Glaisher, seconded by Mr. C. H. Gregory. The next paper was announced to be on the ritual used by Frederick the Great when Crown Prince, brought over to this country recently by his Royal Highness the Crown Prince of Prussia.

Buildings in Birmingham in 1868.—The Borough Surveyor has made his usual return of the number and class of buildings erected in Birmingham during the past year, in accordance with plans registered at the surveyor's office. In the total the number is higher than for the four preceding years, as will be seen from the subjoined comparison:—

Year.	Buildings erected.
1861	952
1862	1,359
1863	1,694
1864	1,419
1865	1,056
1866	1,411
1867	1,408
1868	1,513

House building is considerably on the increase within the borough, as compared with the last four years, and the number of houses built in 1868 is much higher than the result given by a long average.

Preparing for Earthquakes.—Some time ago we pointed out the desirability of building with reference to the possible occurrence of earthquakes. The citizens of San Francisco have formed a committee to inquire into the means of preventing or lessening the destruction of property by such disasters. The bricks used in building are reported to be very defective, and it is proposed to adopt a method of bracing buildings with iron rods.

The Chicago River Tunnel.—The tunnel under the Chicago river, known as the Washington-street tunnel, connecting the south and west divisions of the city by a roadway, has just been completed, and was opened to the public on New Year's day. The contract price was 328,500 dollars. The length of the work is about 1,605 ft.; of the retaining walls of the open approach, on the west side, about 320 ft.; and 275 ft. on the east side. The length of the main archway, or covered way, is 952 ft. There are three archways leading through the tunnel; one is for foot passengers, and two are for teams and horses.

Reclamation of Land.—Sir: I am very glad that in mentioning Mr. Wheeler's "History of the Fens," you called attention to the waste land that might be brought into cultivation on our coasts, as it seems to me that no more desirable channel could possibly be found for the surplus capital of the country than in bringing these lands into cultivation. I am aware that you have on many former occasions brought this matter forward, but public attention cannot be too often called to it until something new is done, and it is just one of those measures for the public good that the *Builder* especially delights in advocating.—H.

The Knightsbridge Barracks.—The desirability of removing these barracks, as often urged by us, is further strengthened by a circumstance recently referred to by the *Lancet*. Several of the officers have been driven out of their apartments by an unwholesome smell, as of decomposing animal matter, which has been felt ever since a chimney took fire in one of them. The usual futile endeavour to obtain an authoritative investigation into the cause has been made; but no such investigation has yet been allowed, and the cause is still undiscovered. It has been suggested that the fire may have smoked or burned a colony of rats to death, and that the nuisance may arise from their decomposing bodies.

College Improvements at Cambridge.—Alluding to the late attempt to Gothicise the Hall of St. Catherine's College, as a first step towards the renovation of the whole of the college in the same style, the *Guardian* says:—Most of our readers are familiar with the plain, respectable, but perfectly uninteresting red-brick buildings of this college. Any alteration, they may be inclined to think, must be for the better. This is hardly the case at present. Perhaps when the work is carried further, the effect may be less incongruous. The new Gonville Court at Gains College is rapidly rising, and has now reached the second story. It will be a picturesque building in the Renaissance style, recalling the Chateau at Blois. The architect is Mr. Waterhouse, to whom Cambridge is also indebted for the "Union"—the club, not the workhouse. Trinity is beginning to reface its chapel with stone, and, therefore, we may conclude, is not intending to enter into competition with St. John's, whose new chapel—Mr. Scott's design—is approaching completion. The carved wooden ceiling is being decorated with polychrome; it will exhibit in its eighteen compartments representative men of the eighteen Christian centuries; our Lord in majesty fills the nineteenth compartment over the altar. The designs and execution are due to Messrs. Clayton & Bell, who are also employed on the windows.

The Noxious Vapours in Galvanizing Works.—The Wolverhampton Corrugated Iron Company have adopted a plan of consuming the bath vapour in galvanizing iron, for which they have secured provisional protection, and with which Mr. R. Baker, factories inspector, it is said, expressed his decided satisfaction when he lately saw it in operation. The top of the bath in which the process goes on is surrounded by an open flue, which forms a projecting lip, and from this run one or more pipes, which communicate by a powerful fan worked by a steam-engine. From the fan a large flue extends to a furnace, which in this case is used for annealing the sheets or articles galvanized. The fan, by exhausting the air from the pipes which extend to it from the bath, causes a strong downward current of air to sweep over the surface of the metal, which drives the vapour into the flue, down the pipes, and from the fan to the furnace, where it is entirely consumed.

The Longley Memorial Church at Oxford.—It is proposed to erect a church at Oxford to the memory of the late Archbishop of Canterbury. The site of the building will be in the new ecclesiastical district of Cowley St. John. Cowley was the first scene of Archbishop Longley's pastoral labours. The village church in which he used to labour has been recently enlarged and restored. It is proposed to erect the new church for 1,000 persons within a few paces of Magdalen Bridge, the anticipated cost being from 15,000, to 20,000. The new Archbishop of Canterbury and the bishop of the diocese have promised their support, and upwards of 2,000, have been already promised or subscribed.

Destruction of a Picture Gallery by Fire.—A destructive fire is reported from Exeter. The picture-gallery of Mr. Hodge, near the Guildhall, was found to be on fire, through, it is supposed, an explosion of gas. In a short time about a hundred pictures were destroyed, including one by Rubens, for which 900l. had been offered.

"Masonic Buildings."—In reply to "H.," a one correspondent, "I. B. S.," advises him to study a Lodge in Weymouth, built about the beginning of the present century. Two other correspondents offer to advise personally, but to this we cannot be a party.

The Maidstone Sewage Question.—The local Board have decided upon borrowing 9,000l. for the purpose of proceeding with the drainage of the town, leaving the question of the ultimate disposal of the sewage for future consideration. The scheme originally proposed by the Board was of a much larger and more expensive character: the estimated outlay, as submitted by the authors of the plan, fell little short of 25,000l. The Board now throw aside altogether—at least, for the present—the most difficult portion of the subject, namely, the ultimate disposal of the sewage, and confine their proposal to the completion of the existing system of drainage in the town.

The Proposal to Supply London with Water from the Severn.—At the twelfth annual meeting of the Canal Association, held at Birmingham last month, Mr. E. Leader Williams, speaking of the river Severn, and particularly in connexion with Mr. Bateman's project for supplying London with that which he designates "the surplus water of the Severn," to the extent of 200,000,000 gallons per day, observed that nothing was known of any surplus water, inasmuch as the maintenance of the estuary of the river is dependent upon the velocity and volume of the winter floods, without which the estuary and the whole of the lower reaches of the river would become choked with mud and silt brought up by the far too powerful spring tides. The tendency of these tides to choke up the lower reaches of the Severn had, he said, been specially demonstrated during the drought of the past summer, as the deep reaches and pools near Gloucester became so filled with deposit as to prevent navigation, depending upon the top of spring tides.

Birmingham Society of Artisans.—The annual dinner of the Birmingham Artisans' Society was held on Monday evening, at the Acon Hall, Temple-street, Mr. George Dixon, M.P., occupied the chair, and Mr. J. A. Langford the vice-chair. The Chairman, in proposing "The Birmingham Artisans' Society," said that during the past year three papers on different subjects had been read by members of the society, and a memorial had been sent to the Society of Arts, advocating the claims of such towns as Birmingham to Government contributions for local museums. When Mr. Samuelson obtained a committee of the House of Commons to investigate the large question of scientific instruction, one of the members of the Birmingham Artisans' Society was sent up to give evidence,—the only representative of the working men from the whole country which appeared before that committee. The Chairman then reviewed some of the leading questions of the day, in which he desired to see such a society become interested.

The Count de Beerski, Painter.—The American papers record the death, at Rochester, New York, of Count de Beerski, a Russian nobleman, and an artist of considerable repute. He inherited a valuable estate near Moscow, together with 250 serfs, all of whom he emancipated. When Nicholas ascended the throne, the count, in consequence of his liberal views, was obliged to leave his native country and all his possessions. Accustomed as he had been to wealth and luxury, he now found himself obliged to do something for subsistence. He was well educated, and possessed a taste for drawing. He resolved to paint miniatures; and in Hamburg, Paris, and London attracted considerable notice as an artist. Some of his paintings were exhibited in Hyde Park in 1851, and won first-class honours. Count de Beerski was subsequently employed, we believe, to paint portraits of her Majesty and the Royal Family. He emigrated to America in 1859, and was much esteemed by all who knew him.

A New Bath-heating Stove.—Mr. Richard Head has invented and patented a stove so constructed as to fill the usual opening of a fireplace, and act as an ordinary stove, while it is surmounted by a boiler sufficiently large to supply a bath. The boiler has tapering flues running up through it, and it is partly surrounded by hot-air spaces so that the heating of the water is said to be effected in a much shorter time than by other bath-heating stoves. The bath is filled through a pipe, and may be placed anywhere either on the same floor, or a floor below. The filling of the boiler is also effected by a pipe. The arrangements are said to prevent risk of explosion, and avoid filling the room with steam.

Deptford Paving Tenders.—At a recent meeting of the Greenwich Board of Works, the road surveyor presented a plan and estimate with regard to the paving, &c., of Manor-road, Upper Lewisham-road, Deptford. The report having been adopted, Mr. Halsey moved that tenders be advertised for in respect of Manor-road. Mr. Gillespie seconded, and (it being understood that the advertisements would be sent to the local papers as well as the *Builder*) said he considered the former a useless expenditure, for every one likely to send in a tender would read the columns of the *Builder*. He did not wish to disparage the local papers, but believed as a matter of economy it would be unprofitable to send to them. Mr. Bartlett and others were of a different opinion, and it was agreed that the advertisements be sent to the *Builder* and the local papers.

Death of the late Borough Surveyor of South Shields.—Mr. T. M. Clemence, late borough surveyor of South Shields, is dead. The deceased gentleman had been connected officially with the borough some eight or nine years, and by his gentlemanly and scholarly bearing, it is said, won the friendship and respect of all who knew him. He was about forty-two years of age.

Mr. Sedding, of Penzance, architect, read a paper lately before the Exeter Diocesan Architectural Society, upon the interesting churches of St. Buryan, St. Leven, and St. Sennen.

TENDERS.

For alterations to 281, Westminster Bridge-road, for Mr. Page. Mr. W. E. Williams, architect.	
Nixon & Son	4,633 0 0
Ennor	472 0 0
Auley	459 0 0
Marr (accepted)	431 0 0
Fittings, Extension of Front, &c.	
Marr	163 18 0

For alterations and additions to Grapes and Can, Goswell-road, for Mr. May. Mr. W. E. Williams, architect.	
Tracey & Co.	537 0 0
Marr	477 0 0
Auley	425 0 0
Ennor (accepted)	419 0 0

For the erection of Lancaster Buildings, Titebarrett, Liverpool, for the Liverpool Financial Association. Messrs. Pictor, Chambers, & Bradley, architects. Quantities supplied.	
Campbell	213,042 0 0
Mullin	11,815 0 0
Hughes	11,700 0 0
Hugh & Co.	11,624 0 0
Jones & Son	11,534 0 0
Holme & Nicol	11,492 0 0
Rome	11,300 0 0
Nicholson & Ayle	11,270 0 0
Callie	11,170 0 0
Westmoreland	11,120 0 0
Urmon (accepted)	10,938 0 0

For alterations and additions to stationery warehouses, No. 42, Rathbone-place, for Messrs. Jeremiah Smith & Co. Mr. John Farring, architect.	
Barratt & Son	2,807 17 0
Simpson	777 7 7
Shurmur	734 0 0
Saunders	635 0 0
Richards	619 0 0
Shepherd	640 0 0
Robinson	694 0 0

For alterations, &c., at 28, Jewry-street, Aldgate, for Trustees of Sir John Cox's School. Mr. H. Wales, architect.	
Ashby & Horner	£1,398 0 0
Ashby & Sons	1,947 0 0
Ryder	1,008 0 0
Henshaw	3,383 0 0
Corder	1,837 0 0
King & Sons	1,835 0 0

For alterations and repairs at Five Lodges in St. George's-road, Southwark, for Mr. E. W. Rolls, Mr. H. J. Dickinson, surveyor.	
Cooper & Cullum	£1,068 0 0
Langfield	945 0 0
Palmer	937 0 0
Yates	908 0 0
Kent	819 0 0
Estuace (accepted)	818 0 0

For tramps' wards, lodge, &c., Kingston Union. Messrs. Musfield & Luck, architects. Quantities supplied by Mr. Northcott.	
Bennet	25,050 0 0
Collings	4,668 18 0
Simpson	4,429 0 0
Wicks, Bangs & Co.	4,400 0 0
Till	4,300 0 0
Towel	4,222 0 0
Gannon	4,124 0 0
Kilby	4,187 0 0
Winslip	3,965 0 0
Manley & Rogers (accepted)	3,834 0 0
Foote	3,737 0 0
Smart	3,564 11 0

The Builder.

VOL. XXVII.—No. 1358.

The New Law Courts and the Offices.

THE question of the site of the New Law Courts and Offices is now exciting so much attention, that we have thought it right to obtain the means of arranging the plan which we present to our readers to-day.* It shows Mr. Street's enlarged plan of the Courts as exhibited at the Royal Institute of British Architects, modified in accordance with Mr. Tite's suggestion for the division of the building as brought by him before the Metropolitan Board of Works on the 22nd of January, 1869. His observations on the subject we gave

soon after. We intended to give a plan of Sir Charles Trevelyan's site, derived from his descriptions; but as he announced in the *Times* of Saturday last that he is about to publish it himself, we, of course, willingly wait for that document. Our remarks on the present occasion apply mainly to Mr. Tite's proposition. We should be glad if we could go with those who urge that Courts and Offices should all be placed on the embankment side of the Strand; but careful consideration has led us to the belief that this cannot be wisely done; the rigid limits of the site (the Embankment, the Strand, Somerset House, and the Temple) preventing the possibility of any extension hereafter, the enormous extra expenditure it would entail, notwithstanding what has been said to the contrary, and its inferiority in point of convenience for lawyers, are all against it.

The Incorporated Law Society, in a protest just now issued, say:—

"The Carey-street site has been purchased; nearly 800,000*l.* have been expended in its acquisition; nearly all the buildings have been cleared away; a number of architects of eminence were invited to compete for the office of architect; full and elaborate instructions for the guidance of the architects were prepared under the personal superintendence of members of the commission; the several designs underwent a very careful and minute examination; an enormous amount of labour was bestowed on the several plans and arrangements by the several members of the commission; after Mr. Street had been appointed the architect, the commissioners were in constant communication with him, arranging the details of the final plans; and this laborious work of years has been so far completed, that it was confidently expected the buildings would be commenced in the spring of this year.

All the plans and the arrangements for the grouping of the several courts and offices so as to afford the greatest amount of convenience to all who have business to transact there, have been made with reference to the special form of the Carey-street site. A site of any other shape would render necessary new plans and other internal arrangements. In fact, for a site of a different shape, a great part of this labour would have to be undertaken anew.

It is part of the Carey-street design that the courts should be placed on the first floor, in the inner quadrangle, and that, for ensuring to the profession safe and convenient access to the courts and offices, bridges on the court-floor level should be thrown across the Strand and Carey-street, so as to avoid the risk of crossing either of these thoroughfares among the carts and carriages. Hostile criticism has attempted to direct the shaft of ridicule against courts placed so high as the first floor. The critics possibly forgot that the Houses of Parliament are on the first floor, and the court of the Judges, the Committee of the Privy Council also; and that those important tribunals, the committees of the House of Commons, are on the second floor."

* See p. 126.

The comparative advantages of the two sites depend unquestionably on the comparative facilities of access. But the access wanted is for the legal profession, not for laymen, and from the private chambers and offices of the bar and solicitors, and not so much from railway stations.

"The number of jurors, witnesses, and others daily called direct from their own homes or offices to the courts and offices of the law is comparatively small; certainly not 2,000 a-day. A large number of the witnesses go to the attorney's offices on their way to court. But it has been ascertained from accurate observation that in the transaction of the business of suitors from 12,000 to 15,000 visits are daily made by the solicitors and their clerks to the different offices, going and returning several times in the course of the day, and nearly as many visits probably are daily made by them to the several courts. If several hundred yards be added to the distance to be on each occasion traversed in from 12,000 to 15,000 daily visits to the offices, and as many to the courts, it is vexatious to contemplate the miles on miles of wasteful traversing which would be inflicted on the profession, and through them on the suitors, and the weeks and months of delay which will be added to the inevitable annoyances of litigation."

Since this matter came under discussion, another suggestion has been made, namely, to take the Probate Offices to the new Offices, Fetter-lane. But, with the extensive arrangements required for the archives, our figures will presently show that no sufficient space can be found there for such a purpose.

That more land must now be bought if all the Courts and Offices are to be erected on the Strand site appears certain, and the question must be asked, who is to blame for the error of calculation that has been made. When we remember the enormous and costly machinery that was set in motion to obtain all the information requisite to determine what was wanted, the present state of things seems inexplicable, and scarcely excusable.

Let us look now, however, to the plan we publish. It has appeared to many that in attempting to combine in one building the whole of the new Courts and Offices, the zealous advocates of concentration might go too far. Mr. Tite urged this view of the case in the House of Commons last session, and much that has occurred lately has tended to strengthen the impression that the separation of the Offices from the Courts would be an advantage, both architecturally and otherwise. This view has found many supporters in the press, who have advocated the division of the work, and pleaded for a reconsideration of the question on the basis of the suggestion of two buildings instead of one. It will be seen by the plan that Mr. Tite proposes to build the Courts on the present Strand site, and to place the Offices on the Thames Embankment in a building which would admit of ready extension. At present the portion on the Embankment, including the first quadrangle, would be all that is required, as will be seen by a few figures.

The proposal now before Parliament is to spend 600,000*l.* in acquiring additions to the present site; this sum does not include the expense (which must be very large) of forming any new streets for access to the new Courts and Offices. The necessity for this large expenditure would be altogether avoided by the adoption of Mr. Tite's plan, according to which the cost of the site would not exceed 250,000*l.*, while its accessible position would render it unnecessary to lay out anything in forming new streets. The cost of the Embankment site for offices has been estimated by an experienced surveyor, and though it does not include any frontage to the Strand, and only involves the purchase of yards and unimportant premises, it is not considered prudent to estimate it at a lower figure than has been said. Judging by such data the cost of Sir C. Trevelyan's site, with its expensive frontage to the Strand along its whole length, and its compulsory purchase of the Metropolitan District Railway station, and other important premises, would seem to be too sanguinely estimated at only a million and a half.

Considering its position adjoining Somerset House, which is 93 ft. high, in five stories, Mr. Tite proposes that his building should be about

the same height and have the same number of stories, and it would contain more than 320,000 square feet of accommodation. After deducting one half for the thickness of walls, passages, staircases, &c., there would remain 160,000 square feet of accommodation, on all the floors, suitable for offices.

The area prescribed by the Courts of Justice Commission for the Courts and the Offices immediately connected with them is 191,506 square feet, and for the offices not immediately connected with the Courts 148,742 square feet on all floors. The site proposed is therefore amply for the latter class of offices, for which it possesses great advantages, and the present Strand site is sufficient for all the Courts without the necessity for any further outlay. The plan provides for easy extension of the Offices at any future time in the direction of the Strand. The building space on the plan is 64,700 square feet, and estimating the cost of the building at the rate laid down on the authority of Mr. Scott, R.A., by the Royal Commission on the Government Offices for buildings four stories high at 6*l.* per foot, the cost of its erection would be 388,200*l.*, or 485,250*l.* if one-fourth extra be allowed on account of the additional story. The new Courts and Offices connected therewith, four stories high, would require a building space of 96,000 square feet, and this, at 6*l.* per foot, would cost 576,000*l.* for the building. It is probable, however, that the cost of the Courts might be more than the cost of ordinary Offices; and, supposing by a liberal estimate the difference to be as much as 50 per cent., the necessary outlay on the Courts in the Strand, at 9*l.* per foot, would be 864,000*l.*

To the above estimates must be added the cost of the Will Tower for the Probate department.

The cubic space required by the Royal Commission for the storage of wills is 350,000 cubic feet, and would probably cost about 80,000*l.*

The area of the site at present secured by the Royal Commissioners is amply sufficient, as the plan shows, for the erection of the Courts and Offices immediately connected with them.

A very grave question, of course, immediately arises:—How will the interest of suitors and lawyers be affected by the separation of the Offices from the Courts? If we may judge from the remarks of one of the professional papers the change would not be objected to. The *Law Times*, for example, says,—

"A suggestion has been offered which ought to reconcile the differences of the rival sites; it is to use both of them. The Carey-street site is not sufficient, and a much larger area must be cleared, at an enormous cost, for the property that bounds it is extremely valuable. The proposition is, to place the courts on the Embankment, and the offices in Carey-street. This seems to present a combination of advantages. In the first place, it would be desirable to separate the Courts from the Offices. The effect of crowding a multitude of rooms in and about public halls is to stifle the assembly-room in its auxiliaries. It is not only destructive of architectural and pictorial effect, but it is extremely inconvenient in those who have business there. If proof of this be wanting, look at the palace at Westminster—a complete labyrinth, only to be threaded by long practice. Nor can we discover any serious disadvantages in such a severance. There is no necessary connexion between the Courts and the Offices. Their distance apart would be no more than ten minutes in time of transit, and no references from the Courts to the Offices are of such urgency that a messenger could not convey them in good time for all practical purposes. Chambers might be provided for the chief clerks attached to each of the Equity Courts; and a Judge should sit daily in a Practice Court to do the work of the Chamber Judges; and attached to the court should be chambers for the Masters. For this the Embankment offers a site without rival in Europe, while the offices, removed to the Carey-street site, would be conveniently near to those who most want to use them. Lastly, there is the still greater advantage, that the work will be done better and more speedily. The Courts will not be marred without nor cramped within, and they will be completed in a moderate time from designs which, under the improved conditions, may be expected to rival and excel anything hitherto produced.

We trust that Parliament will be induced to reconsider the question on the basis of this new suggestion of two buildings instead of one."

It is obvious that the building on the Embankment might be made, from its position, an ornament to London. It would be conveniently placed with reference to the Temple and the new Law Courts. It would be directly accessible to the public by the Strand and the Thames Embankment. It would adjoin a steamboat pier

and a station on the Metropolitan District Railway, and would thus be in communication with every part of London. The site would be cheaper, quieter, with more light and air, and better in every respect than any other that could be found in the neighbourhood.

Finally, the adoption of this plan would utilize and adorn a large portion of the Thames Embankment, and would save to the public, as compared with the proposed purchase of more land round about the Strand site, half a million of money.

If the scheme be carried out, and two buildings be determined on instead of one, the opportunity should be used (we have no hesitation in adding) to repair a great injustice, by appointing Mr. E. M. Barry as architect for the second building.

IRISH ANTIQUITIES AND THE LATE DR. PETRIE.

THE biography of this eminent man, which appeared at the close of 1868, within a few days of two years from the date of his death, is a most acceptable addition to the science of history and archaeology.* Dr. Petrie's labours in the fields of Irish antiquity and art were altogether of a desultory kind. His long life and incessant occupation in these subjects contributed only one volume to the shelves of the British Museum. The further records of his labours are to be found in scattered tracts in the Transactions of the Royal Irish Academy, and in one or two short-lived magazines, which he was chiefly instrumental in promoting. Dr. Stokes has now brought under notice all his labours in the moderate compass of an octavo volume, and reveals, in addition to what was before accessible to the public, the existence in M.S. of a large collection of Notes and drawings, much of it possessing great value, but unfortunately wanting both in completeness and arrangement.

Dr. Stokes writes of his deceased friend with great simplicity and modesty of expression, but his book is characterised by a tone of eulogy throughout of which it might be urged that so much of favourable expression is premature, and that a decision as to the character and merits of his subject should have been left more to the public judgment. If this be so, it may nevertheless be admitted that the biographer, in the course of a long intimacy, had opportunities of learning to admire, and reasons for loving to do so, which the outside world cannot possess; and it may even be found that his easy and natural expression of his feelings will often carry those of the reader with him, so as to make it difficult to think of the facts put forward as independently as might be desirable.

George Petrie was born in Dublin in 1789, the only child of a portrait-painter of ability. From the first he devoted himself to landscape drawing and painting, and passed his early years in sketching tours amongst the scenery of Dublin, Wicklow, and other parts of Leinster, in the course of which his predilection for writing the antiquarian subject with the picturesque was very soon developed. Dr. Stokes divides his biographical treatise into heads which treat separately of the lines of thought and occupation which engaged Petrie. First of his artist life; then of his antiquarian and historical studies; next of his scientific duties on the great Ordnance survey of Ireland, then of the architectural treatises which he either published or projected; and lastly, of his musical powers and his contributions towards the preservation of the ancient, but still current, national Irish music.

The desultory nature of the work which Petrie has left behind him was perhaps almost the certain result of the profession which both his tastes and the necessity of circumstances led him to adopt. His livelihood depended on the use of his pencil and his brush; and even when his skill and accuracy in this art, united to his archaeological knowledge and acumen, had procured for him a Government appointment on the Ordnance survey, he was only temporarily relieved from this necessity. The thirteen years from 1833 to 1846, during which he held this appointment, drew him out of the sphere of private employment, which made it yet more arduous under advancing years, when his only resource was to return to it for a living. Dr. Stokes combats more than once the opinion which was

often expressed by Petrie's contemporaries, that a certain indolence of disposition deprived the public of the full use of his powers. Dr. Stokes points to his incessant occupation as a sufficient refutation, and tells us that his great patience and caution in investigation, and his anxiety to collect sufficient evidence before forming, much less pronouncing a decision, were the qualities which were mistaken for indolence. That his mind was of the quality described by the biographer cannot, we think, be doubted, whilst we believe that the circumstances under which, through his whole life, he self-trained and self-educated his mind, might have been used to add to the force of the biographer's refutation.

Petrie's talents as an artist gave him a high reputation in Ireland, and he held for many years the post of president of the Royal Hibernian Academy, a society distinct from the Royal Irish Academy, of which we shall often speak presently. On this side of the Channel Petrie's larger water-colour works are but little known, though in Ireland some of his latest are amongst the most esteemed of his pictures. In early life he was largely employed in furnishing illustrations to the tourist volumes then so much in vogue. To Cromwell's excursions through Ireland, a duodecimo book, of three volumes, published in 1820, he contributed the drawings for ninety-six plates. Without overlooking the artistic share which the engraver may claim for any commendation due to these subjects, they will always reflect favourably on Petrie's fame when compared generally with other works, or only with subjects treated by other artists in the same volumes. The writer of these lines has had many opportunities of criticising on the subjects themselves the accuracy of Petrie's representations. None but those who try know the difficulties of truthful limning, where a truthful result is the only one sought; and such will know best how to respect the accuracy which seldom falls in Petrie's work, and the honesty and most independent testimonies to Petrie's faithfulness of representation is to be found in the fact, that one utterly opposed to his antiquarian views has purchased a number of the woodcuts executed for Petrie, and from his drawings, and has applied them to the support of a theory which, if there was anything in it, would subvert every conclusion on antiquity that Petrie entertained.*

When Petrie began to study Irish antiquity, his profession led him first to see and examine objects of antiquity, and next he set himself to learn what light history could throw upon them. At this time Vallancey was still living, who may be regarded as the founder of the Pagan school of Irish archaeologists. In a long life General Vallancey had proceeded in exactly an opposite method to that which Petrie was led to adopt. Vallancey imagined that he understood the Irish language, the Sanscrit and Phœnician, and probably many more as recondite as the latter; or he was never at a loss for a jingle of sounds, or of letters, which would enable him to resort to some remote ages and corner of the world to interpret an Irish difficulty. Dr. Stokes speaks of Petrie as the founder of the opposite school. It is doubtful, however, if Petrie can single-handed hold this position. When 100 years ago Vallancey began to be a dictator amongst Irish antiquaries, and the speculative school flourished in Ireland, we in England were not very differently placed. The followers of Dr. Stukely had their notions in the ascendant; now we can hardly fail to smile at the crudities of either. The ground was not then prepared for architectural investigation. Neither here nor in Ireland had the antiquaries recovered from the false cover thrown over all our national antiquities in the times of the Stuarts by the tendency to glorify everything classic, and denounce all else as barbaric. Early in the present century the more just methods of thought began to prevail here; and Petrie, with others, carried on as it were by the same way, were simultaneously labouring in Ireland. The question of priority amongst those engaged must be a difficult one to solve, but that Petrie ultimately held by far the most important place in his sphere is not to be questioned. The making of his own opportunities led to the creation of opportunities for him, and having pre-eminently qualified himself for research, no man obtained so great a chance for acquiring knowledge as he had from his connexion with the Ordnance

survey. Dr. Stokes laments the untimely severance of this connexion, but it must fairly be admitted that no British Government could have maintained it. Sir Thomas Larcom's conception to add a topographical department to the survey was an admirable one. At its head in 1833 he placed Mr. Petrie. Mr. Petrie drew together a small staff of assistants, and the services rendered by these in naming, with a near approach to correctness, the places to be marked on the Ordnance maps are of incalculable value. In a country so repeatedly revolutionized as Ireland has been, with a native language whose last literary remains were, under well-grounded fears, it was thought, expiring, the recovery, identity, and preservation of ancient names was not only an historical but a real practical necessity. Mr. Petrie's staff discovered and recorded besides on the maps a vast number of historical monuments. Dr. Stokes regrets that the fuller description, the minute memoir of every subject, which Mr. Petrie designed, has never seen the light. The immensity of the design is a mark of the patient power of Petrie's intellect, but the impracticability of its immensity will be apparent to others. One volume only of the memoir was ever published (in 1837), and this is a closely printed quarto of about 250 pages. It deals minutely with the history and antiquities, the present and past state of the population in various statistical and social aspects, the geological and physical nature, and the natural history, of *one parish!* that of Templemore, in which the town of Londonderry is situated. One other subject only of this vast design has been printed, viz., in the Transactions of the Royal Irish Academy, vol. xvi., an account extending to 216 quarto pages, not of a parish, but only of the group of antiquities on the famous Hill of Tara. Mr. Petrie communicated this production of his own to this learned body in 1837 by permission of the heads of the Ordnance survey. That the subject well deserved to be committed to the Transactions of the Royal Irish Academy is certain, but that it was unfit for a Government state-paper is probably not less certain. No Government could foresee the limits of an undertaking which in minute portions presented such a gigantic mass of detail; and with the prospect of being called upon to exercise similar historical functions in the sister countries if the project were continued in Ireland, we can easily understand why even the recommendation of a commission for its continuance was disregarded, and the Irish topographical department extinguished. It is no small honour to this department that it cultivated such a man as the late Dr. O'Donovan; and it is satisfactory to know that some of the fruits of Petrie's design were realised in the production of O'Donovan's edition of the Annals of the Four Masters, in which he so largely and ably dealt with the ancient topography of the country.

Petrie's essay on the Hill of Tara is regarded by Dr. Stokes as one of his masterpieces, and is placed by him alongside of his still larger work, "The Ecclesiastical Architecture of Ireland." The essay on Tara is complete, as Petrie intended it should be, and is one of the few literary efforts which he brought to completion. When the Ordnance surveyors had made a satisfactory map of the remains of the hill, the purpose of Petrie was to see if they could be identified with ancient descriptions of the buildings. This celebrated place, the chief seat of the sovereigns of Ireland, from a fabulous period down to the middle of the sixth century, had its buildings ruined and deserted 600 years before the earliest extant description of them was transcribed. Fables and poems, ancient and modern, had attributed grandeur and splendor to the place, for which no authority existed beyond the imaginations of the writers. The question was whether any traces could be found in the past which could be identified with certainty as marks of the old royal residence, and be harmonized with reliable historical documents. Petrie was prepared with a document from which he did establish the identity of the remains for the most part in a very satisfactory manner; and here we may well imagine, when the treatment of the subject was considered by Government they would think his labours should end. Not so did Petrie think; he marshalled around it a mass of curious inquiry and ancient evidence on matters relating to history, which he deemed it important to elucidate, with reference to Tara Hill. He considered and convinced himself of the age of the various remains, and travelled into many kindred questions. Because St. Patrick had visited it, the Book of Armagh, of hour

* The Life and Labours in Art and Archaeology of George Petrie, LL.D., M.R.I.A. By William Stokes, M.D., D.C.L., Oxon. 8vo. 1868. London: Longmans, Green, & Co.

* See "Keane's Towers and Temples of Ireland," 1868.

antiquity, is explored to produce the best evidence and to reject what is unreliable in the story of St. Patrick; the history of the kings is traced from the remotest ages, a discussion on the introduction of letters, and another on laws, occurs, the whole forming a mass of learning, of which an adequate idea cannot be conveyed in these few lines. In this treatise we see fully the desultory nature of the author's mind, as well as its compass, its anxiety to amass evidence, and in this point the difference between him and many of his predecessors and compilers that it was evidence and not mere dreaming which he amassed. The identification of the mounds and banks, the fountains and the cross, with the raths, castles, and houses, the wells and mill-stream, rested on the authenticity of documents 700 years old, in which mention, and even description, of all of them was found. In one point he seems to have surprised himself, not less than others who hear it now for the first time will be surprised, viz., when he convinced himself that the *Lia-fail*, the *Stone of Destiny* of the Irish kings, is not now in Westminster Abbey, but is still on the Hill of Tara. Finding the stone mentioned in his records, he looked for it on the hill in the place assigned to it, and discovered that until 1793 a pillar stone had stood there. It was then removed to mark the grave of the insurgents buried there in that year. If this be not the *Lia-fail*, as Petrie thinks, at any rate it is a formidable competitor with the stone in the coronation chair at Westminster, brought there from Scone in Scotland, in 1296, by Edward I. Petrie contends that until after this date the story of the stone being carried into Scotland by the Irish princes of Albany was unknown; and finding a pillar stone on Tara Hill, whose place agreed with that of the ancient relic, he stands out for the belief that down to the time of his inquiry the *stone of destiny* never had been carried away.

This paper unexpectedly provoked in the Royal Irish Academy a violent feeling of opposition to Petrie, and led to a schism in the council. The wisdom of that body was loudly called in question, and their justice in awarding their honorary medals amongst themselves was the point on which the most effective thrust was made against them; Petrie, himself on the council, being on this occasion the recipient of his third medal.

His paper on the Ecclesiastical Architecture and Round Towers of Ireland was originally delivered at the Royal Irish Academy in 1833. It obtained for him one of the honorary medals. It was, however, very long before it appeared in print. The Academy had only a few years before awarded their medal to a learned lady, Miss Beaufort, for her essay on the Round Towers, in which she attributed to them an Eastern origin. Petrie, elected to the council of the Academy in 1830, sought, as Dr. Stokes indicates, an opportunity for relieving the council from the responsibility of approving that theory which he conceived their medal to have imposed. His movement led to the offer of a premium and medal for the best essay on the subject, and in the end, as we have said, his own essay was declared the successful one. So beset, however, was the council with the difficulty of distributing their arbitrary honours, that they found themselves bound to satisfy another competitor (Mr. O'Brien) and his friends by creating a lesser premium after the first had been awarded, and giving it in favour of another essay, which went to show that their award to Petrie was for a worthless paper. Petrie's essay was finally printed in 1845. It then appeared in a very much extended form. He had added authorities, multiplied examples, and increased it from an essay on the Round Towers to a book on Ancient Irish Architecture, in which, in fact, the Towers make but a small figure, and we were led to expect another volume on them, which, however, never appeared. Negatively it deals with the Round Tower subject, in exposing what he considered the fallacies of Vallancey, and the weakness of Ledwich, O'Brien, Beaufort, and others, and shows the slight grounds on which they had in turn been believed to be mystic towers of some unknown Eastern races, astronomical indexes, Angin towers, Druidical monuments, anchorite prisons, Danish buildings, &c. Petrie then himself adopts the course of considering the nature of the buildings with which they are associated, and this occupies the bulk of his book, introducing us to an acquaintance with a vast number of early Irish church edifices. The Round Towers he finds to be invariably associated with some of these buildings, and hence concludes that they are church build-

ings too, and the belfries of the churches. To a certain extent he shows that the architectural features of the earliest churches agree with those of the towers, and, with a promise of more on the subject, his belief is expressed that the towers range in date from the sixth to the twelfth centuries. Amongst English students there are very few who will not think the general truth of his conclusion fully established. Mr. Parker, in the *Gentleman's Magazine* in 1864, insisted on his own peculiar tenets, which forbid him to believe in any architecture in these islands before the twelfth century, or in any stone erection before the year 1000, and appears to think Mr. Petrie mistaken only in placing any of the towers before the twelfth century. Some of Mr. Parker's assistants, in his articles on "Irish Architecture," accept, however, a belief in a much earlier date. In Ireland promises of theories which are to subvert Petrie's have not been infrequent; but their nature and grounds have been scarcely broached, except in the extraordinary book by Mr. Marcus Keane, published in 1867. Here we have a country gentleman, whose every sheet (there are nearly 500 quarto pages) declares him to be innocent of any acquaintance with architecture, rushing to decide the age of the ancient Irish churches and round towers. He discovers them to be Cuthite temples! History is set at defiance; the well-known Cistercian monastery at Jerpoint is declared to be a Cuthite temple; a tomb at Cashel, palpably of the fifteenth or sixteenth century, is declared to be Cuthite sculpture; the Irish saints are Buddhist deities; and the Cuthites are a people who inhabited Ireland some two thousand years before Christ, from whose days down to the Norman Conquest arts and architecture were unknown in the country. It is a strange turn in the tide of affairs that the very plates which Petrie designed for the use of his further volume should have been purchased by this gentleman, and used to illustrate his extravagant imaginations. That Petrie was in many respects eminently qualified for the task he undertook must be admitted: he was conversant with general architectural history, and had studied its monuments in Ireland with the closeness which none but a draughtsman can apply; he had carefully sought out not one class only, but, as far as possible, all the architectural monuments of the country; he had familiarized himself with its historical sources of information, and in his acquaintance with ancient Irish literature had fitted himself to distinguish the poetic, and to apply the matter of fact. However just his main conclusion, it is not to be supposed that Petrie was always right in detail. He seems constantly, in fact, to have mistrusted his own decisions, and often made up his mind only on some onward pressure of time or circumstances. As to the age of some particular buildings, his conclusions are certainly not always maintainable, and are arrived at on slender grounds. The chancel of the church of Rahin, or Rathain, in King's County, he thinks of about the year 750; and the only ground for this belief is the fact that a certain ecclesiastic named Ua Snuainigh, who flourished at that time, was afterwards regarded as patron of the place. In respect to his church, we prefer Mr. Parker's belief; and, judging from its architecture, should place it in the twelfth century. That Mr. Petrie modified his opinion as to the extreme antiquity assigned by him to some of the Christian monuments is clear from his letter to Lord Dunraven, drawn from him by Parker's articles, in which he expressly admits that he had corrected his former opinion, and now arrived at the same conclusion as the writer of the article on Glendalough as to the age of the Priory Church (herein declared to be of the twelfth century), as well as of some others of the churches there. Petrie must have found it difficult to convince himself lately of the identity of any existing church which would extend the compass of Christian architectural remains even to the eighth century; and although Dr. Stokes asserts that he did not withdraw from his belief in the existence of work of the sixth century, it is manifest that Petrie's admission with respect to Glendalough will go much further than that particular example, and will apply to a host of others which are analogous to it. In matters of fact, his honesty of purpose has not always secured him against error. His representation of the cross on the door of Antrim tower, so important to the Christian theory, is not absolutely correct. At Duleek he has overlooked the very curious feature of the impression of a round tower which is apparent, and, we

believe, hitherto quite unnoticed on the north side of the existing square church tower. This evidence is important to his theory, because Duleek happens to be one of the few places at which an early belfry is noticed in the annals. At Rathoo he omits to notice the curious ornament of the round-tower door, and falls into the mistake of assigning to antiquity the hasement and causeway of the tower, both of which are well known to be modern constructions.

In his admirable descriptions of ancient metal-work, we find the same anxiety to arrive at the truth, and often very satisfactory grounds for assigning an early antiquity, but still, also, the same balancing of his mind. In the case of that curious book-cover, or shrine, in which is still preserved a most ancient book of the Gospels, formerly belonging to the monastery of Clones, he ably shows the age of the outer cover to be of the fourteenth century. The book itself is too tender to bear examination, but he finds it not devoid of evidence which may make it as old as the time of St. Patrick himself. It is immediately laid in a wooden box, and between this and the outer casing can partly be seen a third cover, designed with interlaced work, such as we see on the Irish crosses: this must be of intermediate age between the book and the external plating. Petrie takes a wide margin, and assigns it to some period between the sixth and twelfth centuries.

The long delay in the production of his volume on Irish architecture discouraged the Academy from any further aid in the prosecution of his work, and hence the promised continuation has never appeared, nor does it seem that any matter had been arranged for it beyond the engravings, which have now passed into other hands. His paper on "Military Architecture," delivered in 1834, was also withdrawn from the Academy, no doubt to be perfected to his own satisfaction, and is still in MS. From Dr. Stokes's account, its chief interest seems to lie in the explanation it gives of the more ancient modes of fortification—the duns, cathars, castles, raths, and mounds. He explodes altogether the popular notion that any of these are the work of the Danes, and reasons to show that they are the work of the Irish themselves, from before the Norman conquest back to times so remote as to make the origin of some of the stupendous walls of Aran and the west coast a matter of conjecture.

We must leave it to others to dwell on the patriotic services of Petrie in his zealous efforts to preserve the ancient Irish music, and content ourselves with giving, in the words of Dr. Stokes, the picturesque scene which he records during Petrie's visit to Aran Islands in 1857. To a cottage near the little village of Kilonan,—

"When evening fell, Petrie, with his manuscript music-book and violin, and always accompanied by his friend O'Curry, used to proceed. Nothing could exceed the strange picturesqueness of the scenes which night after night were thus presented. On approaching the house, always lighted up by a blazing turf fire, it was seen surrounded by the islanders, while its interior was crowded with figures, the rich colours of whose dresses heightened by the fire-light showed with a strange vividness and variety, while their fine countenances were all animated with curiosity and pleasure. It would have required a Rembrandt to paint the scene. The minstrel—sometimes an old woman, sometimes a beautiful girl or young man—was seated on a low stool in the chimney-corner, while chairs for Petrie and O'Curry were placed opposite; the rest of the crowded audience remained standing. The song having been given, O'Curry wrote the Irish words, when Petrie's work began. The singer recommenced, stopping at a signal from him at every two or three bars of the melody to permit the writing of the notes, and often repeating the passage until it was correctly taken down, and then going on with the melody exactly from the point where the singing was interrupted. The entire air being at last obtained, the singer a second time was called to give the song continuously, and when all corrections had been made, the violin, an instrument of great sweetness and power, was produced, and the air played as Petrie alone could play it, and often repeated.

Never was the inherent love of music among the Irish people more shown than on this occasion. They listened with deep attention, while their heartfelt pleasure was expressed less by exclamations than by gestures; and when the music ceased, a general and murmured conversa-

tion in their own language took place, which would continue until the next song was commenced."

Petrie's artistic tours and explorations, and his duties on the Ordnance survey, made him acquainted with the existence of a vast number of the minor monuments of antiquity, the utensils, ornamented trappings, jewelry, and weapons of the past, many of them disregarded and neglected; others in obscure corners, but nevertheless the objects of popular veneration. The preservation of such objects, the elucidation of them, and the assembling of them under an orderly method whenever practicable, were objects which from his early days he never lost sight of. For the furtherance of this design "I sought," as he himself expresses it, "for knowledge in every available quarter, with an ardent and untiring devotion." To this spirit we owe in a great measure the collection of antiquities at the Royal Irish Academy. Petrie pointed out for acquisition most of its most prized treasures, and led the way to the inspiration of others with large views for its aggrandizement. Amongst his projected labours was the compilation of a catalogue of this collection, which he indeed commenced; but faith in his resolution to push it to completion being wanting, the further prosecution of the design was committed to the hands of Sir William

Wilde. Ten years have passed, and it is not now completed.

One of Petrie's latest occupations was the catalogue of his own museum, which must be added to his fragmentary works. His papers on the different shrines and reliquaries, and the ancient bells and minor antiquities, show how attentively he had used his opportunities of research in every corner. Amongst his collections ought to be noticed his series of ancient Irish inscriptions, chiefly monumental.

One characteristic which will not fail to strike the reader is Petrie's small care for his own aggrandizement. To one who had sought so little for himself, and done so much substantial service to the public, it was no more than a just recognition of his public spirit when, in 1849, at the age of 60 years, his name was placed on the Civil List. Dr. Stokes claims for his friend the possession of an altogether amiable nature—a point on which, as strangers, we only wish heartily to agree with the biographer; but it shows how rancorously archaeological disputes have been waged in Ireland when Petrie, usually so mild and moderate, even when decided in his expressions of dissent, could write of the statements of a deceased advocate of opposite views, that "nothing but the artfulness could exceed the audacious mendacity" of their author.

THE COLSTON HALL, BRISTOL.

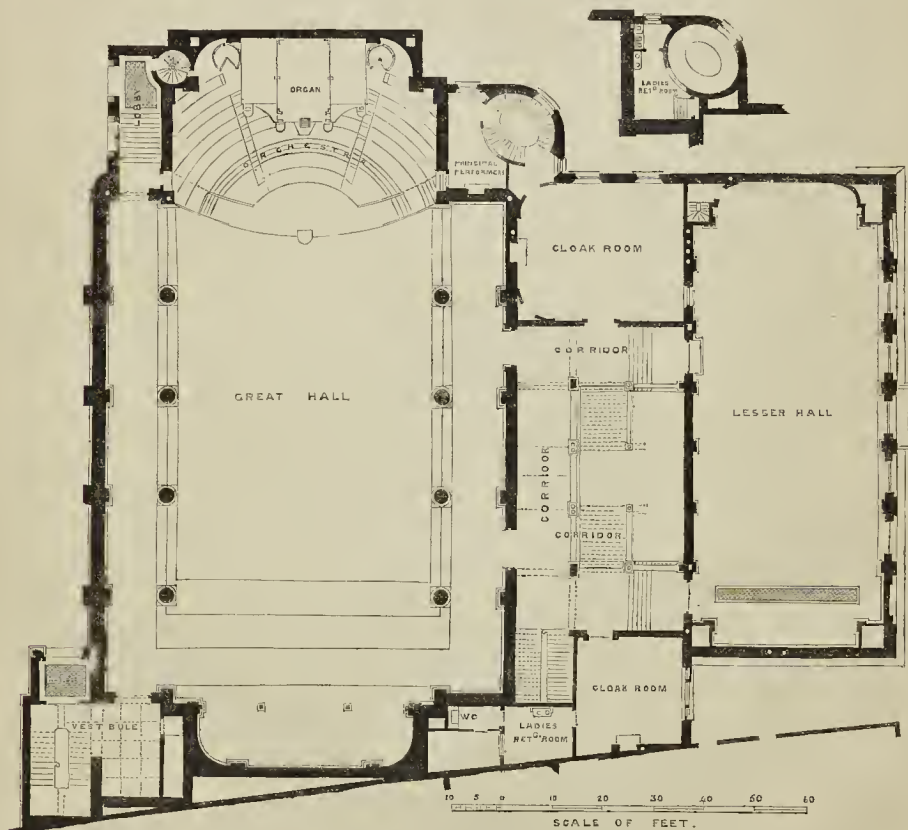
The building illustrated in our present number is the undertaking of a limited liability company. The Great Hall and the two stories of bonded cellars underneath it were completed some time ago. The foundations only have been constructed of the front portion of the building, comprising the principal entrance and staircase, a smaller hall and refreshment-rooms, cloak-rooms, cooking and warming arrangements.

The Great Hall is 150 ft. by 80 ft., and 72 ft. high internally. The central area is 55 ft. wide between the axes of the columns, which are placed 20 ft. apart from centre to centre. The columns, pilasters, door-cases, and balconies are of Bath stone, and there is a dado of Bath stone, 10 ft. high, round the walls. The entablature and the vaulting of the aisles are constructed with brickwork and rubble, and the central vault is formed with bracketing upon the laminated timber ribs of the roof. The form of the vault is elliptical, the height above the principal cornice being 5 ft. greater than the width. The whole of the work above the stone capitals of the columns is finished with plaster. The hall will seat about 3,000 persons, including those in the orchestra.

The remaining portions of the plan will be carried out as soon as the company have made

THE COLSTON HALL, BRISTOL.

PLAN OF MEZZANINE FLOOR
UNDER PRINCIPAL PERFORMERS' ROOM



Plan of Principal Floor.

the necessary financial arrangements. Messrs. Foster & Wood, of Bristol, are the architects, and Messrs. James & Joseph Foster, of Bristol, are the contractors. The gas fittings were supplied by Messrs. Skidmore & Co., of Coventry. The sculptures were executed by Messrs. Boulton, Divall, E. White, Palmer, and Sheppard; and the stained glass was made by Mr. Joseph Bell, of Bristol. The orchestra, which is permanent, was arranged by Mr. Henry Willis, the organ-builder.

Acoustically, the hall, we are told, may be considered successful both for music and speaking, the ordinary conditions being complied with, viz., that the hall be fairly filled and the speaker be fairly skilled in the use of his voice.

A TOUR IN SHROPSHIRE.

HAVING completed a tour of a few weeks in Shropshire at the end of last year my observations, such as they are, may not perhaps be unacceptable to some of your readers. Starting from Cheltenham, you pass through a dull country till reaching Bewdley, whence the train runs by the edge of the valley to Bridgnorth. The situation of this place is extremely picturesque, and though the station is at a very short distance from the town, it has suffered very little change from the proximity; and indeed it may be said of Shropshire towns that such is generally the case. In fact, it may be affirmed that there is hardly any county in England less visited by strangers. The church, dedicated to St. Leonard, which is built of red sandstone, stands on the most elevated situation in the town, and is of course visible from every part of the valley. The precincts, if I may so term them, are picturesque in character from several old houses, the antique-looking parsonage and the grammar-school, rather an extensive building in the Elizabethan style. The church was restored some eight years ago, being in a most wretched condition at the time. The nave is almost a "square," much resembling that of Great Yarmouth. The plaster ceiling in that portion of it having been removed under Mr. Slater's directions, a fine oak roof was discovered underneath. In the chancel also is an oak roof, but much inferior. There is no ancient stained glass; but a modern window on the south side has been inserted from a motive which deserves to be recorded.

"This window and door were restored in the year of our Lord MDCCCXLVII. by a Priest of the English Church, as a poor offering of thankfulness to Almighty God for many means of grace, and good instruction vouchsafed both in this church and at the adjoining grammar-school." The name of this individual, as I learnt, was the Rev. J. Boulton. Equally worthy of commemoration is a brass plate on the north side with an inscription purporting that Thomas Whitmore, esq., who died February 6th, 1846, being patron of both the churches in this town, with exemplary munificence made over the tithes held by his family as lay impropricators to the ministers thereof for ever! The Church of St. Mary Magdalen, not far from the large fragment of the ancient castle, which might not be inaptly denominated the Leaning Tower, was taken down and rebuilt in 1796, and the date alone is quite sufficient to show what sort of structure supplied the place of the old church. As seen, however, at some distance from the town, it groups very well with the fragment of the castle and St. Leonard.

In this place commence the "white and black" timber houses, which are still to be met with in this and the adjoining county Cheshire, and of which the Swan Inn is a good example. Few though they be, they give an antique air of cheerfulness, which pleasingly breaks in upon the monotony of the modern style of building.

The line from Bridgnorth to Shrewsbury, of which there is a branch to Wenlock, enables the tourist to make a morning visit both to that and Buildwas, simply by making a little detour. The proximity of the former to the quiet little town after which it is named detracts but little from its situation and surroundings. It is said to have been founded about 680, by Milburga, of the royal line of Mercia. The remains are of considerable extent, including about thirty acres. The length of the abbey from east to west is 401 ft.; breadth of the nave and aisles, 66 ft. There are some good examples of Pointed architecture, particularly in one of the transepts, where there is a triforium, lofty and elegant; but the gem of the whole is undoubtedly the chapter-house, the walls of which have a series

of interlaced Norman arches, with every variety of detail; but unfortunately I could obtain no photograph which represented these with any distinctness. A picturesque grouping of the ruins is obtained from the adjacent churchyard. This includes also the prior's house, a most curious and interesting structure, nearly perfect, and tenanted by Mr. Gaskill, late M.P. for the borough, and his family. A narrow cloister, with an upper and lower ambulatory, runs along the front, communicating with all the rooms. An author, named Moore, writing in 1787, says, "Many years ago great part of the abbey was pulled down by an agent of the manor, to 'rebuild some houses,' of which he had a lease, though further demolitions were stopped by the then Sir Watkin Williams Wynne." The reproach of making antiquity so very picturesque must not be entirely thrown upon Oliver Cromwell and his troops.

The ruins of the Cistercian Abbey of Buildwas are situated among meadows, a little elevated above the banks of the Severn, environed by gentle eminences, rather thickly wooded, and a more delightful and characteristic spot for conventional retirement is seldom to be met with. The foundation is attributed to Roger de Clinton, in 1135. The nave has seven arches, resting on massive cylindrical piers, and above are clerestory windows, also of an early character. The chapter-house ranges with the north transept. It has an oblong form, is vaulted in nine compartments, supported by four slender columns. The descent is by three or four steps, with a window on either side of the doorway and three opposite. Some portion of the abbey still remaining is occupied as a farmhouse, and was under repair when I saw it. The line to Shrewsbury passes within no great distance.

The view of Shrewsbury from the railway viaduct is very striking, with the two spires of St. Mary and St. Alkmund, and the castle conspicuous above the railway station. Perhaps as a town it has suffered less than many others from the progress of change; and if all the five ancient churches had remained whole and unscathed, it would have been a true gratification to the ecclesiologist. Unfortunately of these, St. Mary and the Abbey Church are alone whole and entire, for St. Alkmund and St. Julian, while they retain the one its spire and the other its tower, are deprived of all the rest. St. Chad has been rebuilt, and may perhaps vie with the most "splendid" London churches of 1792. Its arrangement is that of the "foreign houses of the Legislature," being a semicircle, in which the seats are so arranged that "every one is enabled to see the officiating clergyman" as in the former,—every individual member can see the speaker or president. This was built near the Quarry, one of the finest public walks which any town in the kingdom possesses; and if it had been fated to be reconstructed at the present day, would have harmonized so well with the stately avenues of lofty limes, whose arching branches entwine themselves sometimes into a natural arcade. A portion of the old church was left, and is still in use. St. Mary's is highly interesting in many respects, and among others as affording specimens of style from early Norman to Perpendicular. The lower basement of the tower is of red sandstone, and from its style of windows was, no doubt, that belonging to the original edifice, which is said to have been founded by King Edgar about 980. This is corroborated by the circumstance that during the restoration the foundations of an older structure were found, extending the whole length of the nave. On the base of this tower has been raised a continuation of the same, with a battlement and pinnacles capped by a very lofty spire. The south porch of the nave has a Norman door. The ceiling is a remarkable specimen of the most ancient kind of groined vault, having neither boss nor ornament of any kind. There are besides two other Norman doorways, one on the same side, the south, and the other on the north. The windows of the transepts are early English.

There are few churches of which the interior is, perhaps, more satisfactory. The nave is separated from the aisles by four bays, consisting of semicircular arches resting on Early English columns, with foliated capitals of different devices. This is a singular arrangement, since the pointed arch is sometimes found resting upon the Norman pillar, but quite exceptionally the reverse. Three very fine pointed arches separate the choir from its very wide transepts, and from the nave. Over the choir arch are two triforium arches with enriched capitals, which

give a striking effect to the view as seen from the west end. The view terminates with the east window, the "Root of Jesse," which was presented to the church in 1791, having escaped the destruction which befel the old church of St. Chad. There may be, perhaps, rather too great a predominance of yellow, but yet the general effect is a richness that satisfies the eye. The ceiling of the nave is of oak, the intersection of the beams being formed into panels, richly decorated. That of the chancel is much the same. But one of the great charms of this church is the being completely filled with stained glass, some of no ordinary excellence; and may I be allowed to say, that where the eye is gratified with colour in the windows, that gratification is more heightened, relieved, and diversified by architectural detail than by any amount of fresco painting, however excellent; for then the two impressions do not interfere with one another. The specimens of German and Flemish glass are, indeed, peculiarly good. Of the former may be especially noticed that in an Early English triple lancet window with very acute arches on the north side of the altar. This comprises a series of incidents in the life of St. Bernard, said to have been brought from the church of St. Savin, at Cologne. There are fourteen subjects, in the majority of which the drawing is both correct and spirited, and the draperies very flowing. Of these may be especially mentioned one in which the saint is "healing the blind," and another, returning thanks for recovery from sickness. Both are remarkable for good and effective drawing and excellence of colour. Like the windows at Fairford, they have been attributed to Albert Dürer. Two centre windows on the south side of the nave have special reference to Count Horn and his Countess, and are equally excellent specimens of the Flemish style of glass-painting. They are both represented in attitudes of devotion, the latter with an abbot bearing his crozier, with vestments of peculiar beauty, in colour and detail. The apex, and indeed almost the whole of the upper part of the windows, are filled with elegant frieze work; the lower with coats of arms, including those of the Count and Countess. Both in the north and south aisles of the nave are specimens of German glass, equally worthy of being carefully looked at. In the vestry are also some curious specimens of the Flemish style in "griallies," about the size of that in the Bodleian Library, Oxford.

Being placed nearer the eye, they can be more attentively studied than those within the church itself. As a curious instance of the manner in which Medieval artists adapted themselves to the representation of the most incongruous subjects, we have specimens from a window in the south aisle which represents swarms of flies whom St. Bernard had excommunicated, being literally swept out of the Abbey of Foigny. Besides the figure of Bishop Butler, whose reputation is so intimately connected with Shrewsbury School, there is another which deserves some attention—that of General Cureton. This is placed in the vestibule or open part of the tower, which might have been once a "louvre" or "lantern," and is entered by a "memorial" oak screen. It is a recumbent figure, in a military cloak, the folds of which are very carefully manipulated, even down to the feet. The countenance possesses that air of tranquillity which those who, like himself, fell on the field of battle are frequently said to exhibit. I may add that the Sunday service in this church is carefully and reverentially performed with a surprised choir. It is also accessible, and constantly open during "every" day in the week. The entrance is "then" by the north porch, and generally at no other.

In the Medieval times the vicars of St. Mary's were "exempted from episcopal jurisdiction" by many consecutive Papal bulls. Whether this privilege, if it may be so termed, is existing at present, I am unable to say.

The Abbey Church of the Holy Rood, dedicated to SS. Peter and Paul, is situated on the other side of the river crossing the English bridge, while very near to it is the line of the Severn Valley Railway. Though now deprived of all the monastic accessories with one single exception, yet the massive western tower of red sandstone, with its large perpendicular window, presents an air of dignified contrast to the surrounding scene. When entire it must have been a stately cruciform structure; but consequently on the dissolution, with others of the kind, it consists at present only of the nave and side aisles, with the western tower above mentioned. The nave having been from a "very

early" period appropriated to the use of the neighbouring inhabitants, was consequently saved from the wanton outrages of the Royal Commissioners, fortunate if they were not obliged to "purchase" the exemption for a heavy sum, as at Tewkesbury. The three windows are all at present of the Perpendicular style; but there are prints of older date which show the two smaller to have been of a different character. The portal is a deeply recessed "semicircular arch," terminating in a pointed doorway. The bell-chamber has two windows on each side; between those of the western front, in a canopied niche, is the statue of an armed knight, having a conical basinet encircled by a crown. This figure is with good reason supposed to represent Edward III., in whose reign the tower was probably begun. The south doorway is plain Norman in character, resting on slender shafts, and adjoining is the ruined wall of the transept. The choir having been destroyed, the eastern end now terminates in a wall run up between the remains or the two western piers, which supported the central tower. Of course, in the interior the altar stands here, above which are placed Norman windows, containing six figures in stained glass of kings and apostles, by Evans, a native artist. They are deep and brilliant in colour, and the drawing is good. Below is a reredos, forming a series of five Norman arches.

The interior of the abbey is a fine specimen of solid Norman work; indeed, I hardly know any to which the term "massive" may be more appropriately applied. The whole is in that style, except what is beyond the three semicircular arches westward, where there is a very wide pier, on the eastern and western extremities of which are half columns of the arcades, and to the middle is attached a flat pilaster. From hence the remainder of the nave displays the commencement of a different style, and the Norman gives place to the pure Gothic of the fourteenth century, as at Gloucester. This terminates in a beautiful pointed arch, 52 ft. in height, which divides the tower from the nave, and by the removal of the organ gallery and screen, the whole extent of the great western window is now displayed, which certainly imparts a very striking appearance to that portion of the building. The entire window is filled with a series of armorial bearings of some of England's ancient peers, as well as a few very modern. It is, in fact, a perfect study of heraldry. There are several monuments of interest, but the most singular is one which stands on the north side of the altar, which at the first view presents the appearance of two tombs, but on examination proves to be only "one," the double appearance being given by a centre buttress, which is not carried over the ledge, upon which rest two figures, the head of the one at the feet of the other. They are supposed to represent the "same" individual who had abandoned the military for the eremitical life, but there is not the slightest clue to the name.

The walls of the nave, with the pillars and arches were, in 1855, cleared of their plaster covering; but such a state of dilapidation was developed as to necessitate a thorough restoration, which appears to have been carefully and effectually carried out. A visit to the vestry will at once show the depth of the incrustation which disfigured the buildings. That has been left in its original state, with the exception of a very small portion of a column behind the door, the lower part of which having been cleared of the white or yellow wash, the remaining portion shows to what a thickness these gradual accumulations had reached. It may be proper to mention that on the fall of St. Chad's, and the demolition of St. Alkmund's, the walls of which "were in such a sound state as to require a very great amount of labour to remove them," several ancient monuments found a place within the walls of the abbey.

Of the monastic remains no traces are now to be met with. The shell of what is supposed to have been the monks' infirmary, but detached from the main body of the abbey, was existing in 1826, as well as a considerable portion of the external wall. If any portions remained they were demolished when the adjoining railway was constructed. Nothing now exists but the stone pulpit on the opposite side of the road, which has been left a solitary relic, surrounded with a wooden railing. It is supposed to have stood in the refectory, and was the "lectern" of the "dining-room." The interior forms an oriel, the roof being vaulted on eight delicate ribs. Some old houses near it have been also cleared away.

Of ancient buildings Shrewsbury possesses several fine specimens. The Market-house is, perhaps, one of the most curious in the kingdom of its kind. The basement is 105 ft. in length, and is used on Saturdays as the corn-market. Over the principal front are the royal arms of Queen Elizabeth, and the date 1596. In one of the nearest streets stands "Ireland's Manston," constituting, in fact, several houses. There is an old black and white timber house on Pride-hill,—and many others, indeed, distributed in various parts of the town. There are also some in the suburb over the Welsh Bridge. The incumbent of St. Alkmund's has made the frontage of his house, once modern, another contribution to these varieties in domestic architecture, being a complete copy of the olden style. The town walls, a considerable portion of which still exists, have been deprived of their battlements. One solitary tower yet remains.

The remainder of my notes will form another article.

A MEMBER OF THE OXFORD ARCHITECTURAL SOCIETY.

CHARACTER IN BUILDING.*

If it were desired to provide a series of puzzles for those who may come after us in Britain, scarcely anything better could be devised than the curious fancies prevailing in the fashions of a large proportion of our buildings, in which the desire to follow in those lines which lead to "business" has misdirected their designers, and robbed their works of that essential element, character, without which our art becomes weak in the present, and of little worth for the future.

Character in works of art, as in their producer, man, is that which most gives individuality; and as the character is high or low, interesting or dull, lifts or depresses each above or below the average mark of ordinary humanity, or of every-day design.

Character in architecture may be entirely independent of style, decoration, or material; but, on the other hand, the indolent selection or treatment of those may be made to conduce essentially to the character desired; while a fashion of adopting one style, or class of styles, for buildings of all natures, tends directly to debar the artist from sources of character in his works, which independence of choice would place at his command.

Character, again, may be quite apart from such qualities as are expressed by the terms beautiful, grand, elegant, and the like, since the qualities these express may be justly attributed to works which can with equal justice be pronounced very deficient in real character.

It may be perfectly consonant with the true character of a building that beauty or that elegance should pervade its features; and yet again these qualities may be felt as very agreeably presented to the eye of the spectator, while he can discover nothing to give him an idea of any special aim in a design; and such special aim successfully attained and indicated is that which alone will really make a building characteristic.

I do not, as you will see, mean such an aim as that simply of making a building beautiful, or even grand, but the purpose of deducing from all the circumstances attending the production of a design—the general form, arrangement of parts, measure of enrichments, and style of finish—which shall be most in accordance with the site, purposes, and cost of the building designed; and as respects such various points, and the due measure of their influence, I propose now to speak.

An independent exercise of judgment in selection of style, in defiance of any prevailing fashion, or even recognised custom, local or general, is a preliminary essential in the architect who desires to give real character to his works; and as a result of the too common lack of such independence of thought we have at the present day a number of meritorious designs in one general, if often slightly varied, style, but which, with all their cleverness—and they evince much—fail to impress us with any idea of special character.

Not first, however, though, in sequence from what I have just said, I have first named it, should the question of style be settled by the architect in beginning a design; the real first

step, in my opinion, is to find the absolute general form which his work must assume to meet the particular purpose of its production, and to do this in the most simple, direct, obvious, and, in most cases, the most economical way.

None, I think, will deny in words—although too many, alas! called architects do in design—that every class of buildings, and each individual of each class, demands from the true artist special treatment consistent with its use. Did this fact dwell with its due weight, however, in the minds of designers, we should not have to sigh over so many hybrids of design as we meet with, in museums like convents, hospitals like hotels, churches like theatres, and many like solecisms; nor should we have to lament, as we must, for so many opportunities lost of giving new interest to our towns, and fresh life to our landscapes, by the production of works really marking their purpose by their form and treatment.

I believe it is best to leave all thought of ultimate style out of sight in dealing in the first instance with the plan of a new work, unless, indeed, a style has been enjoined, or for some overwhelming reason obviously required; and even then I would not allow its consideration more weight in respect of plan than so much as will prevent the adoption of a form flagrantly at variance with the essentials of the style prescribed; since every style deserving that distinctive title will be found to have so much of vitality in capable hands as to adapt itself, when well studied, to most of the many purposes of architecture with which we are conversant, and when so adapted affording often a poignant example in novelty of application as to use or of form as influenced by site.

Out of the pale of our profession the idea is very common that a design which has been found to satisfy its requirements on one site will do so on another, and that it can be transferred again and again to new situations, and always be found suitable. The only case in which this holds true is that of houses built in rows, and with absolutely the same aspect; and an alteration of aspect, in even a moderate degree, will prove the attempt abortive if, in the first instance, the designer has really considered all essential points in laying out his plan.

In regard to isolated buildings of any kind, I question if a single case could be found in which such a transfer of design could work satisfactorily, since it is all but impossible to find two instances of the requirements of accommodation, the aspect, the approaches, and the lines of view being the same, and under no other conditions can such a transfer be well made.

With respect to character, as influenced by site, both the plan and sections of site should be allowed full weight, and of course the points of approach and the aspects and points of prospect belong to the question of plan. The simplest and most direct adaptation of the building plan to these will always be found to yield the best working basis for the superstructure; and it is certain when, for special reasons (generally sufficient), it has been determined to work against these, which may be called the natural motives of plan, that in proceeding to raise the work in whatever style from this groundwork, difficulties will meet us in properly apportioning the more important apartments or divisions of our building, whatever its class or purpose be.

The peculiar sections of site affect secondarily the question of plan; and if individuality and force of character are to be preserved, these must be dealt with not as matters to be artificially masked or changed, but to be met and welcomed, as giving opportunity for escaping from the trite and commonplace in design. Take such examples as Durham Cathedral, Tintern Abbey, Arundel Castle, and say whether they would not have lost vastly in their force and individual character if, instead of adapting the designs to the greater or less varieties of level presented by their sites, the ground had been smoothed out for them, and they had been constructed on the sober every-day system of a dead flat site.

No class of buildings better illustrate the value of adaptation to actual site than the Medieval castles of this country and the European Continent, since defence and not effect was their chief aim; but in gaining that they eminently realised the latter; and whether in the British Isles, in Germany, Italy, or the Spanish Peninsula, the lover of the bold in character and the picturesque in form will find no more charming studies than are afforded by buildings

* From a paper "On Characteristic Design in Architecture," by Mr. H. P. Horsey, read at a meeting of the Liverpool Architectural Society.

of what we may call the Fortified Domestic styles.

I alluded to Durham Cathedral as an ecclesiastical example of what this principle of adaptation gains for characteristic effect; and I would add, that I hold it wise, wherever a site suggests such treatment, for the church designer to avail himself fully of the facilities presented, and I would cite the very successful example of the church on Hulton-hill, near Rancorn, as a modern instance in point, and I can say from my own experience that no designs have ever seemed to me to grow so naturally under the hand as those which had to be fitted on such irregularities of surface section.

I spoke of adaptation to site not only in the simplest and most direct, but also the most obvious way, and this I mean as applying to the spectator, as well as the designer of an architectural work. It is possible to adapt a building really in a simple manner to the natural features of its site, while these, as the directing causes, may be in great measure unseen when the work is completed, as we know is often done by planting and other devices. This, for the sake of real character, I believe, had better be avoided, unless the natural features yielded to are of an unsightly or disagreeable character. The plea is often advanced of planting for the appearance of shelter; the reality of this is a most desirable aim, of course; but to clothe natural irregularities in foliage seems only to give warmth or protection, is to sacrifice the picturesque to the artificial,—as great a mistake as can be made, but too often fallen into when the completion of grounds or approaches is committed, independently of the opinion or intention of the architect, to some so-called landscape gardener, who is not unlike, happily, some we know of that class, a man of artistic taste and feeling.

I am sure that those professing that charming art who really appreciate the mutual gain from well-associated architecture and landscape will always be found anxious to work with, rather than independently of, the architect; and if this were always done many a failure in effect, many a solecism in taste, many a contradiction in artistic character would be happily avoided. I repeat that the obvious causes of peculiar form in plan should, as far as possible, be kept visible in the completed work, if individual and forcible character are desired to be preserved.

It is seldom that views of strict economy can be safely lost sight of in any architectural project, even those vast and costly ones which seem to stand at the very antipodes of such repressive considerations; and, however real, substantial, and lasting we aim to make our structure, wastefulness even in those respects is a grave error; and thus I hold comes under view one other point on which, with respect to site, it is ever best to aim at the preservation, as far as practicable, of all natural peculiarities. It is, of course, not always possible to avoid even costly displacement of what stands more or less in the way of our particular aim, and especially shall we find this the fact, as I can testify, in the case of extensions or additions to existing buildings; but wherever it is possible to save cost by leaving undisturbed what, even in a slight measure conduces to mark the natural character of a site, such economy of labour will be more than repaid by the gain thus obtained in natural and real effect; and it would be well for architects, in planning their buildings, to look forward as much as possible to the probability of future enlargement, and so to place them with respect to the neighbouring natural objects as to avoid, as far as may be, all risk of heavy and otherwise needless labour in the future.

I have said briefly what seems to me most applicable on this subject with regard to site, and in leaving this part of the matter would only add that, as regards approach, the character aimed at, as of seclusion, dignity, mere comfort, palatial display, or whatever else, the architect should deal with his work so that it shall meet the spectator's view in such direction and at such distance as shall best conduce to the main effect proposed; and I cannot say, in my own experience, that I have ever known a case in which I have found a previous work afford any sure guidance, so varied, so unlimited in variety, are the natural circumstances which we have to consider and adapt our work to in respect of approach and aspect.

As regards Plan, that well-defined foundation from which our work gains its primary vertical outline and sections, the geometrical relations of

form and proportion afford the first and best guide, and we shall look in vain, especially as regards interior effect, for any character so finely and truly marked as will be found in those structures in which this real basis of plan has, happily for the architect, been found possible to preserve.

It must often be the case that this cannot be strictly done; but still regularity of form, justness of proportion, and directness and simplicity of union or connexion (I mean either absolute ad-joinment or communication by passages) in all the principal parts of a design will be found most to conduce to distinctness and strength of character. This must be so if the points I have previously pressed with respect to site have been observed; for supposing that it is true, as I am certain myself it is, that such adaptation to site is the step towards securing characteristic effect, the most direct derivation of solid form from that of site, through plan, will most surely lead a step onward in respect of character.

I may be met by objections on the ground of the picturesque of irregular structures, and of the limitation imposed by the small number of regular figures suitable to plan, if such are to be adhered to; but my answer is, that many of the so-called irregular buildings grow from a strictly arranged and proportioned plan, and it is no irregularity of their basis which gives them the charm to which we give the title of the picturesque, but the treatment of the terminations upwards of their necessary constituent parts, often very materially assisted by that very precision of plan (and by precision I do not necessarily mean absolute symmetry) which may be supposed inimical to such effect.

I would call your attention to the fact that many structures directly planned with the idea of securing effect by studied irregularity of plan prove utter failures as to this special aim, having an appearance of fritter and fluter most disagreeable in so real and solid a thing as a building, and losing comfort and convenience of plan for the sake of an external character which they do not secure.

In treating, however concisely, of so large a subject as I have undertaken to address you upon, it seems impossible to avoid treading on ground which you have before traversed in company with others, or perhaps with myself, and it is in the nature of our Art that its important points of study, effect, consistency, reality, &c., overlap and intertwine with each other; and you will, considering this, be indulgent to me, I hope, if I cannot avoid repeating in a measure things which I have said in some shape or manner before: not that I purposely shall do so, but I am conscious of constantly touching or passing the border of other cognate parts of our general subject.

These buildings in which absolute geometrical arrangement can be preserved gain greatly in dignity of character over such as must depart from it, and little argument will be needed on this point if we but consider the impressions on our own minds of the cathedrals and other great churches of our own or other countries; not of course, that greatness of scale does not conduce to such impressions; but still, even in moderately-sized—yes, even in small—buildings, such geometrical symmetry gives dignity and greatness of character, and no graver mistake can be made in works devoted to the solemn services of religion than aiming by a needlessly irregular form of plan to gain an effect of variety, losing the opportunity of preserving a dignified solemnity, which, as I have said, is consistent even with a very moderate scale, and giving in its place a character which is distracting, not sobering, in its effects, and better fitted for a ball-room than a church—yes, or even than a theatre.

Yeovil Gas-meting.—A Yeovil gas-consumer says he entered a house at Michaelmas last, and on discovering that there was some slight defect in the metre he resolved not to burn any gas for the whole of the quarter. This he adhered to, and during the whole of that period he never lighted the gas once. Very recently, however, to his surprise, the collector of the company presented to him a bill for upwards of 2,900 ft. of gas, consumed between Michaelmas and Christmas, although he was able to furnish the most abundant evidence that he had never used the gas, and that the metre was in exactly the same state as when he took possession of the house. It is to be feared that Yeovil is not the only place where this sort of gas-meting occurs.

BRITISH ARCHAEOLOGICAL SOCIETY OF ROME.

SUBSCRIPTIONS are still asked for by the managers of the Exploration Fund. The following statement of what has been paid for excavations and researches made in Rome during 1868 serves to show what has been done, as well as how the money has been expended:—

Portion of the wall of Servius Tullius	625
Chambers of the Mamertine prison	588
Foundations of the Porta Capena and pavement of the Via Appia	628
One of the chambers of the Piscina Publica?	250
Castellum Aquæ of Trajan, near the Porta Capena ..	390
Remains of the Edes Cæsarum?	225
Mouth of the Aqua Appia and course of the Specus ..	125
The source of the Aqua Appia	125
Reservoirs of Aqueducts in the same vineyard as the Minerva Medica	225
Other reservoirs of aqueducts, south of the Porta Maggiore; and the Specus Vetus on the Cælian ..	328
Porta Trigemina, and pier of the Sublætan Bridge ..	125
Cave under the Palatine. Imperial of Augustus? ..	141
Porta Lateranensis, exterior	125
Porta Chiusa, interior	150
Mausoleum of Augustus, original entrance	250
Templum Urbis Romæ? doorway of the time of Hadrian, on the south side of Ss. Cosmas et Damian	250

Fr. 4,960

At a recent meeting of the British Archaeological Society of Rome Mr. Parker objected to give an explanation in detail of the projects proposed, and the results obtained by those excavations and researches during the first season.

The exact site of the Porta Capena had long been a matter of dispute; volumes of learned dissertations have been written on the subject; but no one had hit upon the real site. Some good antiquaries, the last of whom was Canina, had come nearer to it, but their nearest point was a hundred yards to the south of the actual site. The real site, that is the line where the Wall of Servius Tullius crosses the valley from the Cælian to the Aventine was first pointed out by Mr. Parker two years ago, but neither the Roman nor the German Archaeologists would agree to it. Yet in this exact line it has now been found. Drawings and plans were shown to the meeting, exhibiting the actual sill of the gate with the raised footpaths on each side of it, and the pavement of the Via Appia between them, at the depth of nearly 30 ft. from the surface. One of the square towers of Servius Tullius, by the side of the gate, was also found, and drawings of it were shown. This part of the Wall of the Kings has also been excavated in three other places, and two of them are now left open for inspection. In these the members may stand upon the wall of masonry and see the arcades of two aqueducts, one on either side abutting against the wall. Mr. F. Gori, who was employed by Mr. Parker to superintend the works in his absence during the summer months, went down to Pompeii to compare the principal gate of that city with the principal gate of Rome. He found them exactly the same in every respect. The width of the road is only 8 ft. in both instances, and this is in accordance with the law of the Twelve Tables.

The aqueduct of Trajan was carried on the same line as the older aqueduct across the valley, and his tall brick piers to carry his lofty arcade rest upon the Wall of the Kings. Several of these piers remain in their places in a mutilated state, and these were what first guided Mr. Parker to fix on this line.

One of the reservoirs of Trajan, on the cliff of the Cælian, was excavated, and is left open for the inspection of members; this was at one end of his lofty arcade; at the other end he built another reservoir on the site of the Piscina Publica, a portion of which has also been excavated, sufficient to show the *signum* or cement to hold water, the certain sign of an aqueduct or reservoir; one of the seven chambers only has been excavated: the others being all alike, it would have been useless expense to do more. This is also left open for the inspection of members. Various other particulars respecting the buildings in the first Regio called after the Porta Capena were given by Mr. Parker, the site of which may now be fixed with probability. The ideas of the Roman antiquaries that the Porta Capena was at the junction of the Via Latina with the Via Appia near the Church of S. Cesareo, and that this Regio extended outside of the walls is now shown to be erroneous; the length of the Regio from the Porta Capena to the Porta di S. Sebastiano is just a mile, and the number of 2,211 ft. contained in the Regio according to the Regionaries will not admit of a greater length.

CABINET MAKERS OF LONDON.

Your correspondent, Mr. Warren, in a recent number, protests against the charge of incompetency brought by the Marquis of Bute against the cabinet-makers of London, and endeavours to fix the stigma on the foremen only, who, he says, are often selected for other qualities than those which tend to promote good workmanship; and further insists that until we have a system of industrial partnerships we cannot expect much improvement. Having for some years filled the positions of journeyman, foreman, and master cabinet-maker in London, up to very recent times, I should like to say a few words on the subject.

In the first place, your correspondent appears to me to fall into the very common error of supposing that his little world is all the world. He is evidently a man accustomed to work in a good, perhaps (and more than likely) one of the best, West-end shops, where every job is made to a supplied design, and seldom repeated; where the work is either done day-work or valued at hook price, and with such work as he mentions an addition of a considerable per-centage above hook price. But he forgets that not one-twentieth, nay, nor one fiftieth, of the work produced in London is made in such shops as these. Let him take a walk through the town, and set down as he passes the number of furniture-shops in which he finds really good work against those in which he sees nothing but scamp work, and I am sure he will be convinced of this. For it must be borne in mind that of ordinary furniture we import none from other countries. Then where is it made? In London. London is the great furniture manufactory for the empire. Round and about Tottenham-court road, Paddington, Clerkenwell, Bethnal-green, Shoreditch, Hoxton, and part of Islington, are the localities where the great bulk of the work is produced. Here you will find workshops, the number of whose occupants vary from as high as twenty down to the solitary individual workman, who, as he often says, likes his liberty and cannot bear the restraint of a big shop. In these places each man has his speciality, to which, in most cases, he rigidly adheres. The one kind of article he begins to make in his youth, he continues through his life, and so he comes to be not a cabinetmaker really, but a wardrobe, or a sideboard, or a cheffonier, or a table, or a chair, or sofa, or a drawer maker, and so on, through all the various articles in use. And in many cases the labour is even more subdivided than this: for instance, take a Davenport. The action, as the rising part is usually called, is made by one man, the desk part by another, and the pedestal containing the cupboard or drawers by a third, besides the carving, which makes a fourth or fifth. Again, the men who work mahogany seldom use rosewood or walnut wood. Deal bedroom furniture is a branch of the trade quite apart from the rest, and is as much subdivided as the others.

Sideboards and cheffoniers are made by as many men as there are varieties of goods. Workshops, too, are divided into two classes—frame shops and carcass shops, frames being such as chairs and sofas; and carcasses such as wardrobes, sideboards, &c.; and these two classes of goods are seldom or never made in one shop.

All this work is invariably made by the piece, the price paid being just as little as the employer can get the men to do them for. And as boys' labour soon becomes valuable, the master takes as many apprentices as he can get, especially if they bring a premium, though only a very small one, as 5*l.*, which is a very common sum to pay; and he will think himself extremely fortunate if he obtains 50*l.* to 80*l.* with a boy, as I have known foolish parents and guardians pay to masters, many of whom date their success in life to the advent of such a premium.

In many shops the boys, though paid a fixed wage, are put to taskwork, a certain *minimum* quantity of a *minimum* quality being required of them, any additional quantity done beyond which may increase the pocket-money. The wages which these boys earn when they become men varies as their speed in producing. I have seen a man make two chests of five drawers each, in mahogany, with all partitions, heads, locks, &c. complete, in a week, at the price of 30*s.* each for his labour, while another working alongside on the same work could not complete one in less than nine days. Again, one man will make the carcasses of two large-shaped cheffoniers in walnut or rosewood, in a week, at a price of 25*s.* to 30*s.* each, while another would take ten days to make one.

Of course, the rapid rate is the exception, but if a man finds he can do it, and does it once or twice, a policy of hedges is adopted by the master to keep his wages down, which often ends by his starting for himself. And this is very easy. He can rent a workshop or room at some two or three shillings a week, and can buy a bench for a dozen shillings. With a sovereign or thirty shillings he can buy materials enough at the timber-yard to make his first job, which, when completed, he hawks about in cart or harrow round to the various warehouses or shops, until he sells it; it may be for its value, or it may not: he has to take just as much as he can induce the warehouseman or shopkeeper to give.

If the workman is of an imaginative temperament, he may make a new kind of furniture, or vary an old form so as to give a freshness to his work. This will enable him to sell for a little while, but in a short time other makers see it and copy, and it becomes a neck-and-neck race who can produce at the lowest price. He may then devise another new thing, and for a time he is able to live, till, if he is fortunate and careful, and with premiums from apprentices, &c., he is able to avoid the wholesale warehouses, who cut his prices down to starvation, and does as they do—visits the country shops, and takes orders direct. But as these customers almost invariably require credit, it is uphill work. He cannot buy a stock of timber to be thoroughly seasoned before being made up, and has to get his supplies direct from the retail yards, and make it up at once; so that the work is scarcely put together before it parts by shrinking, and requires to be repaired.

To counteract this evil he uses as little wood in the job as possible; and it used to be a standing joke that the work required to have a big stone fastened to it to prevent it being blown away, so light were the carcasses.

If carving has to be used to decorate the article, it is supplied by the wood-carver, who, like the cabinet-maker, has a workshop with workmen and apprentices. This carving is done at so much per set. It may be appropriate, or it may not. There it is. If the cabinet-maker finds it sells well, he adopts it, and produces the pattern *ad infinitum*. Other cabinet-makers also buy, and with quite a different style of carcass attached, the article is offered for sale.

These carvers also are as journeymen divided into two classes,—those who rough out the work, called howsters, and those who finish, called finishers. These men, in forty-nine cases out of fifty, could not design a very simple ornament differing in a very small degree from the style to which they have been used. The master is sometimes able to use his pencil a little, but not always, and there are some now in business who have been tolerably successful on patterns, on which they have worked since they began years ago. But even among those who can draw at all, the element of design is so wanting, their ignorance of natural forms is so great, that even when they produce flowers or fruit, it is impossible to determine to what order or genus they belong; and I have frequently, when asked the question, replied that I knew of nothing in nature like them, and that I usually called them carvers' fruit.

There was a man, a German, who received a tolerably good artistic education at the King's School in Munich, who afterwards came hither, and worked as a wood-carver, and I have no doubt that that man has made more designs for wood-carving during the last fifteen years than have been made by all the other carvers put together. For if he was hard up, as he sometimes was through drink, he would soon sketch off a number of designs in various styles, all workable, and these he would sell to the master carvers, who were themselves unable to design. This was quite a godsend to the carvers. I have seen that man's designs in every town in England, Scotland, and Ireland, in which I have been; and in India and Australia they are frequently to be met with.

I have entered thus into details, because I believe that it is only by a thorough *exposé* of the whole business, that the public will be able to understand why they do not get better furniture.

At the present time I am thoroughly convinced that the majority of the workmen are quite incapable of producing better, and that if better required they must be educated up to it. This will, of course, take time; but the public have only to determine that they will no longer be satisfied with the results of the very disorganized system at present obtaining, to set the ball rolling in the right direction. Let artists and architects, as well as others who have any

pretensions to taste, declare, as some friends of my own did to me last week, that they would never buy another piece of ordinary furniture; and let there be a demand for good designs as well as for good workmen to execute them, and I have no doubt whatever that both will soon be forthcoming. Let them avoid the great advertising shops, who sell the work made under the circumstances which I have described, and mostly that only; let them avoid them as they would the plague (for they are a plague in an artistic sense), and I shall then have hopes of my countrymen. In the past and present, show and glitter reign supreme;—I had almost said in everything, physical and moral. Let the qualities of fitness and goodness take their place; let our schools of art be multiplied and liberally supported; and above all let there be established without delay trade schools for the young, in which the neophyte may be introduced to the theory of construction as well as that of decoration, and I have no doubt both complaints and protests will then become things of the past.

E. G.

THE RISK OF WINDERS.

GALVEY'S CHAIRING CROSS HOTEL COMPANY.

This was an action brought in the Court of Queen's Bench, Westminster, by a gentleman, in consequence of his wife having broken her leg by falling down a staircase in the Charing Cross Hotel. The stairs in question are called the "Second Visitors' Stairs." They are 5*ft.* wide, with 12 in. treads and 6 in. risers, and at the quarter-spaces there are winders $\frac{1}{2}$ in. wide in their narrowest parts. The handrail is carried by balusters let into the ends of the steps. It was contended by the plaintiff that the winders were a source of danger, for which the defendants were liable, and the damages were laid at 1,760*l.* The plaintiff's counsel read medical evidence taken in Dublin, to the effect that Mrs. Galwey was injured for life, and that the fracture was of a very bad description, known as "Pott's fracture." Mr. Galwey, jun., Mr. E. Nash, Mr. E. Roberts, and Mr. E. Tasker were called to show that the winders were dangerous, and that there was not sufficient light when the accident occurred. They all admitted, however, that they had frequently used winders in their own practice. For the defence it was shown that nearly 300,000 persons had visited the hotel since its opening, and that about 150 servants were there employed, but that no complaint had ever been made of the stairs. Mr. E. M. Barry and Professor Kerr stated that the stairs are in every way safe, and such as are ordinarily constructed; that they are lighted by a skylight over the well-hole, and eleven windows besides borrowed lights, and that though they are necessarily darker at the bottom than the top, there is no such deficiency of light as to cause danger.

The following members of the profession were in attendance to support this view, but were not called:—Mr. T. H. Wyatt, Professor Hayter Lewis, Mr. Clifton, and Mr. Marrable. Mr. P. C. Hardwick was prevented from attending in consequence of a recent accident. Mr. Plucknett and several practical witnesses were also called. As regards the medical evidence, Mr. Hancock, senior surgeon of Charing Cross Hospital, and Mr. Lee stated that the injury had been exaggerated, that it was not "Pott's fracture," and that in their opinion Mrs. Galwey would soon be as well as she had ever been.

Mr. Justice Lush told the jury that if they thought the company guilty of negligence, the verdict should be for the plaintiff, with proper damages; but that there was such a thing as plaintiff's negligence. The company had a right to expect ordinary care and caution from those who used their premises, and ought not to be punished for their negligence.

The jury withdrew for a short time, and found a verdict for the defendants.

The counsel engaged were Mr. Hawkins, Q.C., Mr. McAlvey, and Mr. Griffiths, for the plaintiff; Mr. O'Malley, Q.C., Mr. Theobald, and Mr. Lanyon for the defendants.

Malvern College.—The Council's annual report states that application has been made to the Malvern College Building Company to build one or more boarding-houses for the College, and to this the company have assented. It appears that 34,000*l.* have already been expended in buildings, besides 34,000*l.* on the College. During the past year the number of pupils has increased from 130 to 170.

THE FIRE-PROOF PROPERTIES OF ASPHALTE.*

We have before us a communication recently made to the French Société des Ingénieurs Civils by M.M. Flachot and Noisette, detailing experiments made by them to ascertain the extent of the fire-proof properties of asphalté. They relate that five fires having occurred in different buildings that contained asphalté flooring, in which all the floors and other wood-work were destroyed except that covered with the asphalté, it occurred to them that this material, hitherto only used as a flooring on which to store ovens or stables, could be further utilized as a fire-proof material. In each instance the fires mentioned were arrested at the story laid in with asphalté, whether it covered the stables on the ground floor, or had been used on the upper floor of the granaries above them. The asphalté in some portion of its thickness softened or liquified by the fire, but when help arrived and it was covered with water, it hardened again and returned to its original condition. The wood shafts which communicated from floor to floor were in each case sources of extra damage, a fact that leads to the suggestion of a fire-proof material for this part of such structures for the future.

The first experiments detailed were made in the workshops of the Compagnie des Omnibus. Five tables, covered with white deal of 0.027 millimètres in thickness, resting upon four feet, about 1 mètre in height, were coated with the following materials:—1st. Asphalté from the stores of the Compagnie Générale des Asphaltés, of 15 millimètres in thickness; 2nd. Plaster of 30 millimètres in thickness; 3rd. Béton Coignet of 40 millimètres in thickness; 4th. Portland cement of 25 millimètres in thickness; 5th. Asphalté of the same nature and thickness of No. 1 spread upon a bed of baked earth 25 millimètres in thickness. Table No. 1 received the contents of two grilles of incandescent charcoal, upon which groundwork wood was piled and supplied afresh, till the fire had burnt for an hour and three quarters, during which time no indication of the fire communicating with the planks below the coating of asphalté appeared. On the removal of the fire it was found that the asphalté had liquified towards the centre, and also scorched the plank below it, which was also slightly carbonized to a thickness of from 1 to 3 millimètres. The experimentalists considered it was proved that a bed of asphalté 0.015 millimètres thick preserved the planks from ignition for an hour and a half. Whether it would do so for an indefinite period after fusion and the exhaustion of the combustible vapours contained within it, has yet to be ascertained.

A similar proceeding upon the second and third tables showed that the plaster and Coignet's concrete had perfectly preserved the planks from fire. The water contained in the last-mentioned was transformed into vapour, with several superficial explosions, which caused a slight reduction in the thickness of the concrete, but no further damage.

The coating of cement in the fourth experiment, like that just mentioned, altered in some places by explosions arising from the water it contained. The cracks were larger here, owing to the thickness being less, 25 millimètres instead of 40. The planks below it were carbonized where the heat was most intense.

The fifth experiment gave a most satisfactory result. The fire was renewed twice, and prolonged for an hour and a half. When the ashes were cleared away, and the asphalté cooled by water, it was found that it retained its toughness, that its thickness was not sensibly diminished, that the burnt earth remained intact, and that the planking was as completely preserved as under the grille and béton Coignet. In all the experiments the fires were more intense than they could be in a conflagration; and the results show that the obstacles the several coatings present to the progress of the flames, would give the necessary time to obtain help after the discovery of a disaster.

Another experiment was made to ascertain the combustibility of asphalté. Some fragments of it were placed in a brazier of burning charcoal, open to the air on all sides. A certain amount of gaseous matters was burnt, and an inconsiderable amount of the asphalté melted

round about the grille; but in less than a quarter of an hour the fire became powerless to pierce it, and gradually went out.

The authors of the experiments next consider the price, weight, duration, and appropriateness of the different materials as floorings for large granaries, with stables below them. Portland cement they price at 3 francs the square mètre; béton Coignet at 2 francs 80 centimes. Both of these have the drawback of yielding a dust that is pernicious in its effects upon the horses' teeth. The plaster costs but 95 centimes the square mètre, but it labours under the disadvantages of prolonged desiccation, is not so durable, and yields a dust that is bad for the forage, and renders it unfit for the storage of oats; and neither of these articles adapts itself to the shrinkage of the boards of the floor. The asphalté upon the burnt earth they price at 2 francs 90 centimes, and consider that its surface is suitable for the storage of both grain and forage; that it adapts itself to the deformation of the flooring; that it is dry, and can be washed; and, in cases of fire, beyond either of the other materials, would be serviceable in preventing water from filtering through the boards, and destroying grain garnered in stories below it.

Additional experiments were made by the Compagnie des Omnibus, in the presence of members of the Conseil d'Administration and chiefs of the Corps des Sapeurs Pompiers de la Ville, and other interested persons, in the court of the dépôt at Montmartre. Two tables were prepared as before, and covered with a bed of asphalté of 15 millimètres laid upon one of the terre à four of 25 millimètres in thickness. Fire was applied to one of them, as in the other investigations, for an hour and a quarter; and there was a brisk wind blowing upon it. The softening of the asphalté, the vaporization of the essential oils it contained, the eruption of little jets of white vapour, all proceeded as before; and when the cinders and débris were removed it was found that the slight thickness of the asphalté that had been altered by the fire formed a crust over the rest that quite protected it. This was lifted up and the earth below uncovered, which was found unaltered in any particular, and the planks below this were so little affected by the intense heat that had been raging about them that the hand could be kept upon them. The upper surface of the asphalté, although deprived of some of its essential oil, was not so altered but that on cooling it returned to its former degree of hardness. The fire was lighted under the other table, and was soon at work upon the joists of the boards and upon their lower surface; but not being able to ascend through the hermetically sealed planks of the bed of asphalté above, it remained inactive; and when the feet of the table were consumed, the top sank down, and put out its own fire, and that upon the hearth below it at the same time. The last experiment was but a reproduction of a fact first observed in a conflagration at the asphalté works at Seyssel. A cauldron, one of eight, full of bitumen, cracked, and this inflammable matter, escaping on to the hearth, caught fire. The flames began to lick the joists and beams of the floor above. As it happened that the upper floor was intended to receive heaps of asphalté dust, which would have filtered through the planks after the heat below had caused them to shrink, the floor had been covered, at the instance of M. Malo, with sheets of strong grey paper, and a layer of bituminous mastic laid over it. This imprisoned the flames, and would have kept them powerless but for the circumstance that it did not extend over the whole floor. The flames, making their way from joist to joist, came at last to the unprotected place, and the roof was soon in a blaze. The firemen played upon the roof, without much result, for the fire from the basement fed that above; till at last the beams of the floor carbonized gave way, and the floor sank, carrying with it the bed of asphalté, which extinguished the fire instantly.

The Compagnie des Omnibus have adopted the asphalté and earthen flooring for their granaries when they are of wood. Where iron is used, the intervals will be filled with plaster in the Italian manner, and the earth and asphalté laid over the plaster. The authors of the communication recommend this mode of flooring for all industrial establishments and magazines containing combustibles. Private houses, they say, might apply the asphalté between the joists under the boards. They give particulars of a fire which broke out in a

row of workmen's dwellings at Soyssel, where a bed of asphalté completely preserved the floor, with the ceiling below it, notwithstanding that the furniture standing upon it was consumed.

THE SOCIETY OF ARTS REPORT ON TECHNICAL EDUCATION.

As already noted, the report of the committee appointed at a conference held at the Society of Arts, in January, 1868, on Technical Education, has been published (by Bell & Daldy). The report is too long for us to give any comprehensive abstract of it; but we quote some of its conclusions:—

- (a.) For the purposes of dissemination, technical education should be deemed to exclude the manual instruction in arts and manufactures which is given in the workshop.
- (b.) That the term 'technical education' is understood by the sub-committee to mean general instruction in those sciences the principles of which are applicable to various employments of life.
- (c.) That technical instruction, as defined above, should not, as a rule, be given in separate professional institutions, but in institutions established for general education.
- (d.) That, with a view to the development of a system of scientific education, it is desirable that schools be established having for their main object the teaching of science as a mental discipline. These science schools should prepare some youths for the higher courses of a college, and other less ambitious pupils for their professional pupillage.
- (e.) That the subject of secondary instruction having been reported upon ably and deliberately by the Schools Inquiry Commission, the Committee do not feel it necessary to enter into the details of this subject, while they desire emphatically to express their opinion of the necessity for the introduction of scientific teaching in all secondary schools.
- (f.) That it is desirable that the higher scientific instruction should be tested by public examinations, and that the proficiency of persons who pass these examinations should be certified by diploma.
- (g.) That the preparation for the business considered by the Committee is not sufficient until due scientific instruction has been followed by practical pupillage in efficient works.
- (h.) The Committee recommend employers of labour and others in the habit of taking pupils, apprentices, and clerks, to give the preference as far as possible to those adding evidence of the possession of adequate instruction in the sciences applicable respectively to their professions or occupations.

The reporters are of opinion that it is desirable that Government, colleges, and the leading civil and mechanical engineers, architects, merchants, ship-owners, chemists, manufacturers, and agriculturists, should encourage systematic scientific instruction by certain specific measures set forth in the report; the Government, for example, by aiding in the establishment of science-teaching in schools, colleges, and universities; by providing free libraries, night classes, and prizes for workmen, &c.; and professional men and others by creating scholarships, and recognising and privileging diplomas, &c.

The report reserves for separate consideration the technical education of those who are producers of works of fine or decorative art; or directors of art manufactures. The Committee are of opinion that:—

"Provision should be made for the teaching of drawing in all schools, primary and secondary, as a branch of general education, in order to train the eye and hand, and in order to cultivate habits of observation. It is essential that drawing should be part of the regular school course, and not an extra lesson; and, further, that it should be taught intelligently, not from mere copies, but from real objects.

The art-workman needs, in addition to a power of free-hand drawing, an acquaintance with geometrical drawing, in order that he may be able to execute work correctly, in accordance with the designs of the artist who directs him.

For artists, designers, and directors of art manufacturers, the education should be a liberal one, in order that they may understand the feelings of those on whom they desire to make an impression. Their education should also be, to some extent, scientific, in order that they may have a knowledge of the properties of the materials they employ, and be able to adapt those materials to the structure of the objects produced, and those objects to the uses for which they are intended.

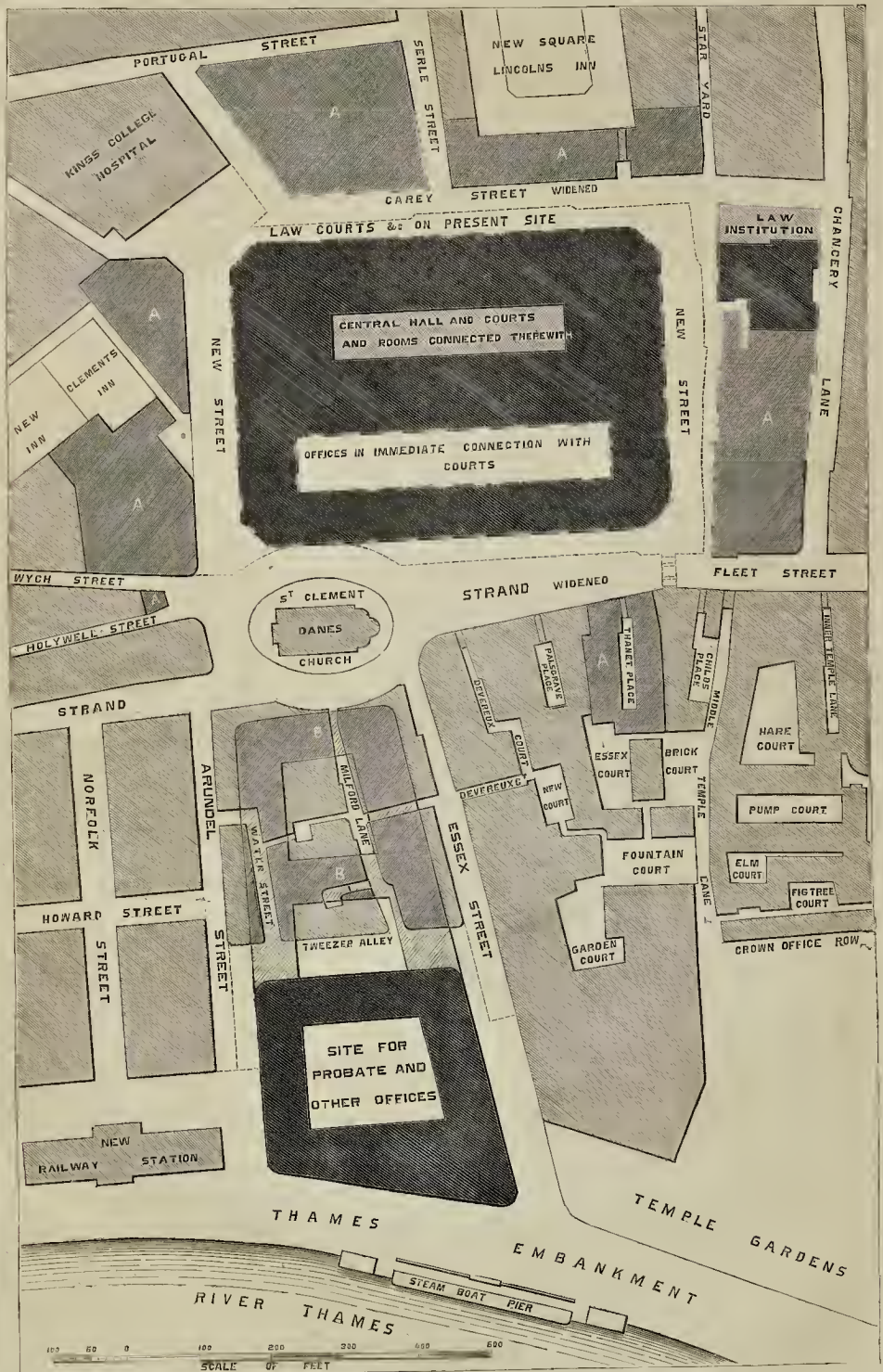
It is desirable, both for the artist-workmen and for those engaged in the highest branches of art, that opportunity should be given, by access to museums and to evening classes, for the study both of the theory and history of art.

Your Committee are of opinion that the universities may render great service to the technical education of those engaged in artistic pursuits, by the recognition of art as an element in general education, and by professional lectures. Some steps in this direction have been taken, by the regulations attaching importance to drawing in the local examinations; but your Committee would gladly see the practice carried further, and applied to the higher stages of academic education. They cannot doubt that the study of works of ancient and modern art would have a tendency, in connexion with literature, to diffuse culture throughout the nation, and to raise the standard of education."

The report is signed W. Hawes, Chairman of the Sub-committee; and P. Le Neve Foster, Secretary.

Preparing for Earthquakes.—A Californian has applied for a patent for an earthquake-proof chimney.

* Note descriptives des Expériences faites par M.M. Eugène Flachot et Noisette sur l'Application de l'Asphalté coulé sur les Planchers des Magasins et Greniers pour empêcher la Propagation de l'Incendie. Extrait des Mémoires de la Société des Ingénieurs Civils.



PLAN SHOWING THE STRAND SITE FOR COURTS OF LAW, AND THE SITE ON THE THAMES EMBANKMENT, PROPOSED BY MR. TITE, M.P., FOR OFFICES.

A. A. Plots proposed to be purchased by the Royal Commission, at an estimated cost of 668,000.

B. B. Site for Extension of Law Offices.



POCOCK

THE COLSTON HALL, BRISTOL. — MESSRS. FOSTER & WOOD, ARCHITECTS.

See p. 120, ante.



TREE AND SERPENT WORSHIP.

At the Royal Institution on Friday evening, the 5th, Mr. Jas. Fergusson, F.R.S., lectured "On Tree and Serpent Worship, as exemplified by recently discovered Indian Monuments." In the course of his discourse he called attention to drawings and photographs of parts of three temples in different parts of India, especially that of Sanchi, whereon trees and snakes were largely sculptured. He said that Buddha was born of royal parents in the year 623 B.C., in a district at the foot of the Himalayas; he had a happy childhood and a happy marriage, but, being struck with the miseries of humanity, he resolved to reform society, and, leaving his home and friends, he spent six years in secluded prayer and thought, at the foot of a tree which is called to this day the "tree of knowledge." There he preached and made many converts, till, in the year 543 B.C., he died, at the age of 80. Buddhism was afterwards sometimes favoured and sometimes persecuted, till, in the year 250 B.C., Asoka did for Buddhism what Constantine did for Christianity, and made it the state religion, after which it also spread rapidly in the countries surrounding India. At the present time there is probably not one single Buddhist in India, although this religion is prevalent in the neighbouring countries, and is followed by a very large proportion of the inhabitants of the earth. It is, therefore, interesting to inquire how these changes took place. India, more especially in its southern portion, was in very early times inhabited by the Turanian race. They were then conquered by an Aryan Sanscrit-speaking race, who mixed and intermarried with the Turanians, and planted the Vedic religion among the people. Finally, both the Vedic religion and the Aryan gradually became corrupt, and then Buddha urged the natives to rise, and to drive out the Aryans and their religion together. The Turanians are a building race, and this character distinguishes them from the Aryans. Buddha seems to have revived the ancient religion of the country, and not to have started an entirely new one. It was not till after his days that the Turanian element gained the ascendancy, which is probably the reason why no temple in India is older than the time of Asoka. This king erected pagodas, monasteries, and churches, the latter being very much like our own, with an altar, and a place for the choir, besides other resemblances. The serpent, and sacred trees, and Buddha are carved in most of these churches, one of the most remarkable of the temples being that of Sanchi, built about the year 200 B.C. There is evidence that, after a time, snake worship became more prominent than Buddhism itself. As far as he could trace it, tree and serpent worship spread all over the world, wherever there is an underlying Turanian element in the population. In the opening chapters of Genesis, the "myth" which has troubled many, is probably a curse upon serpent worship. The brazen serpent, uplifted by Moses, is the first healing serpent on record, though there have been many since, even in Greece and Rome. Hezekiah is narrated to have turned the serpents out of the temples, and to have destroyed the groves; so it would appear that tree and serpent worship was then followed among as the Jews, though the habit was looked upon as a heathenish by their priests. In Assyria, as shown by the monuments, tree worship was very common, but serpent worship was followed to a lesser extent. The Egyptians can hardly be said to have been serpent worshippers, though the serpent is often used allegorically in their monuments; but the case was different among the ancient Greeks, who were of the Turanian and not the Aryan race. The Homeric myths, and not the Aryan race, the ancient traditions, give evidence of the prevalence of this superstition; the oracle at Delphi was pythonic; and at last the partial serpent worship of the Greeks spread to Rome, till tans snakes became so plentiful in the latter city that they were a nuisance. Wherever there is an underlying Turanian element in the population, there will traces of tree or serpent worship be found. The Germans in ancient times worshipped trees, and in Scandinavia, among the Finns and Laps, who are of Turanian origin, tree and serpent worship is an important element in the religion. In Esthonia trees were worshipped down to a very late date, and some of the prayers to them which are yet preserved show that the religion is evidently an offshoot of the Hindoo mythology. He thought there was a little evidence that tree and serpent worship once reached the North of Scotland, as indicated

by ancient stones and legends, met with more especially in the Orkneys. In England only the faintest shadow of such a worship is found; and if it came here it must have been introduced by some southern route. What are possibly traces of it are found mostly in Wales and its borders. In Africa tree and serpent worship prevails largely at the present day, more especially at Dahomey, where it forms the sole or chief religion of the country, and where thousands of snakes are kept, all descended, it is said, from one primeval serpent. In parts of America, especially in Mexico, serpent worship was once common, and seems to have been of Turanian origin. In fact, remnants of this old religion crop up everywhere, and are found nearly all over the world. Conjoined with it is found the custom of building up rude stones into cromlechs and circles. In India many of the tribes are building cromlechs at the present day, just like those found so plentifully in Wales, Brittany, Southern Europe, Asia Minor, Syria, and nearly all over the world. Very recently an Indian officer, while breaking through some jungle in that country, came upon thirty or forty ancient cromlechs, and, strange to say, in company with them were twenty or more large rough stone crosses, evidently Christian; so he photographed the scene and sent home the pictures.

THE TRADES MOVEMENT.

The Trades Union Commission have at length brought their labours to a close. The report—which is understood to be not wholly unanimous—is agreed to, and will be published as soon as practicable.

A conference of trades unions is to be held in Birmingham in June next, and the following twelve subjects have been selected as those on which papers would be allowed to be read or resolutions proposed:—1. Justification of trades unions. 2. Legislation of trades unions and the commissioners' report. 3. Trades unions, political economy, and foreign competition. 4. Reduction of the hours of labour beneficial to the nation. 5. Limitation of the number of apprentices. 6. Strikes and lock-outs; their cause and effects. 7. The necessity of assimilating the Factory and Workshops Act of 1867. 8. How far will co-operative production and industrial partnerships assist in settling the conflicting interests of capital and labour. 9. The absolute necessity of trades unionists having representatives at the meetings of the Social Science Association. 10. Primary education. 11. The best means to secure the direct representation of labour in the House of Commons. 12. The necessity for working-class newspapers, and the best means for their establishment.

A free labour deputation, from nearly all the manufacturers and merchants of Manchester and its vicinity recently presented an address, signed by upwards of 300 of them, to a meeting of the local building trades, held for the purpose. The address was of course in favour of free labour, which the Free Labour Society urged upon the attention of the builders, as an essential part of free trade. Mr. Alderman Bennet said, that unless the architects would specify machine-made bricks, builders were almost powerless in the matter. Thanks were given on the part of the builders by Alderman Neill. A paragraph was read from the operative masons' fortnightly report, stating that strikes existed at the present time among the masons in nearly forty towns, against the introduction of machine or quarry-worked stone, and that the masons were spending nearly 500*l.* per fortnight, or upwards of 12,000*l.* per annum, in fighting against machinery. This is little less than madness.

The eight hours' law in America is now acknowledged by the Republican press to be a complete failure. The framers of the Act are said to be quite satisfied with the result of its trial. They threw out a bait just before an election, and the working-classes took it without suspicion. But although a law may say that eight hours shall constitute a day's labour, it cannot regulate the rate of wages. Employers paid for eight hours, and no more, and the workmen were obliged to ask for the privilege of completing the regular day.

The London Trades Council, through their secretary, Mr. G. Odger, are endeavouring to gain the co-operation of the various trade societies throughout the kingdom in their movement for the establishment of Boards of Arbitration for the settlement of trade disputes. Mr. Odger has just received a letter from Mr. Dronfield,

secretary of the Association of Organized Trades of Sheffield, enclosing the following resolution, unanimously passed by that body:—"That the delegates respectfully recommend the trade unionists of Sheffield to consider the importance and desirability of taking steps to establish Boards of Arbitration in their respective trades with as little delay as possible."

METAL WORK.

MANCHESTER ARCHITECTURAL ASSOCIATION.

The fourth ordinary meeting of the session was held in the Rooms of the Association, Lord's Chambers, Corporation-street, on Tuesday evening, January 26th; the president, Mr. Isaac Blackwell, in the chair. After the election of members, and a discussion on the Architectural Education question, which was referred to the council, Mr. Angelo Tyler, of Birmingham, read the paper for the evening on "Metal Work."

In the course of his remarks the author said,—From the Classic and Pre-classic periods the desire and power to treat works in metal artistically has continually been apparent, the vehicle of working varying according to the idiosyncrasy of the nation. Among the ancient Greeks we find the practice of working through the agency of sand-casting more prevalent, though it is probable that they equally excelled in hammered work. The civilized nations of the ancient East were undoubtedly great workers in the sheet metal; at least we may so infer if we take into consideration the skill in hammer-raising displayed by their descendants, which is indubitably of native growth.

Coming more nearly to European history, we find a powerful fostering and development of art-metal working by the congenial home and profitable market for the reception of Eastern methods of working and design existing amongst what I may call the Christian orientalism of Early Byzantium. When I say Eastern methods of working, I mean the practice always extant of rendering design subservient to facilities of working, a practice which was eminently a characteristic of Byzantine metal work. From Byzantine metal work and its equally vigorous Runic sister we have a varied character, culminating in the twelfth century to a peculiar grace and beauty, though still carrying a barbaric tinge, inherent no doubt from the want of power in the age to cull and develop, or at any rate adhere to and perpetuate its Eastern peculiarity of touch and expression until Western Ecclesiasticism gradually dominated, when we find the production of a crabbéd Mediævalism, as shown in the metal work of the fourteenth, fifteenth, and sixteenth centuries, meritorious in some points, as must necessarily be on account of the protecting influences of a collegiate though circumscribed age.

The extraordinary impetus given to art metal-working through the wonderful manipulating excellence and grace of design of the school of Ghiberti and Cellini has extended its civilizing influence to the present day; the present so-called Mediæval revival (which, by the way, is more archaeological than artistic) gradually becoming toned by its power, and yielding to its many beauties, in spite of an interested manufacture. I am of opinion that the principle involved in the single word revival is incorrect, because obstructive, through setting up the idol of a bygone merit as a goal of perfection: hence we have our metal-workers ignoring the beautiful in one style, to exalt it in another, developing into spiral extravagances and jewelled deformities of design, instead of taking up the staff of art metal progress as it fell from the decrepit hands of a yielding past, worse than slavishly imitating, because parodying, by idly adapting in iron the gold and silver work peculiarities of examples of the twelfth century, such as the Reliquary of the Virgin, Aix la Chapelle. We have, amongst others, a fourteenth and fifteenth-century crocketed railing after examples unfortunately resuscitated by the late A. W. Pugin, in his moments of, let us hope, transition to pure and less bigoted art; brightly polishing their work because it was a fifteenth or sixteenth century canon to do so, and in which they have been ably seconded by the rest of the Mediæval metal work revival school, blossoming into maple and ivy-leaved productions, and religiously adhering to that most convenient, a cusped and traecedilinging. I do not see why we should ignore principles of manufacture, many of which were generated in Italy during the Cinquecento, and also are our, I think, modern advantages. Why exclude all

bronzing and parcel relief? Why so persistently exclude that most beautiful vehicle cast on chased surfaces? A most valuable medium is cast malleable on account of its non-oxidation, strength, and ductility; and yet architects who will patronise common cast-iron because known in Mediaeval times will purposely exclude cast malleable, because those interesting contemporaries of the swash-bucklers were in a state of ignorance as to its making. Amongst decorators (Mediaeval revival) we find their guiding inspiration is the Byzantine *herba benedicta*, which is undergoing some remarkable developments, parallel, I am sorry to think, with some of the extraordinary architecture of the day, which shows much more of licence engendered by an invention running riot than a correct appreciation of true art.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the ninth meeting of the present session of this Society, held on Wednesday last, the secretary announced that the council had received thirteen sets of drawings in competition for the Students' Prize; the subject being a design for a row of street-houses, to be executed in brick, with terra-cotta or ornamental tile decorations. The meeting then proceeded to the consideration of the proposed form of building contract (printed in our last number), the clauses being gone through *seriatim*. Various points of objection were raised, and amendments proposed, with reference to several of the clauses, and an additional clause was adopted by the meeting, for insertion after the third clause of the original form, providing that after the architect had furnished one complete set of copies of the drawings for the use of the contractor, the latter should be responsible for furnishing all additional copies necessary for the use of the workmen or the sub-contractors. Owing to shortness of time, the consideration of the form of contract was not carried further than up to the sixth clause, and no definite resolution was arrived at upon the subject, the further consideration of which was adjourned till such period as the Council of the Society should determine upon.

SOCIETY OF FEMALE ARTISTS.

The thirteenth exhibition of this society, now open in the Conduit-street Gallery, comprises 484 pictures, contributed by 183 lady artists. It is a very agreeable collection, much superior to that of last year; and Miss Warren, Miss Adelaide Burgess, Miss Gastineau, the Misses Swift, Mrs. E. M. Ward, Madame Bodichon, Miss E. D'O. James, Mrs. J. W. Brown, Mrs. Lee Bridell, Miss Margaret Bayner, Mrs. Robertson Blaine, Miss Stannard, and Miss Louisa Starr materially contribute to make it so. Two special features of the exhibition are a dozen very clever drawings, by Miss Louise Rayner, of buildings in Chester; and sixteen by Mrs. Marrable, illustrating the Engadine, Switzerland. Two views of the Roseg Glacier, amongst the latter, are particularly good.

PARIS.

The project of a law relative to the works at the heights of Trocadero has led to a slight difference between the Corps Legislatif and M. Haussmann. The prefect of the Seine demands from the Chamber the small trifle of 132,000*l.* to pay for the earthwork. The Chamber replied that the inhabitants of Paris must pay for the whims of M. Haussmann, and that the departments have nothing to do with them. At the Place du Chateau d'Eau, the new fountain proceeds but slowly, and the huge bill-stuck amphitheatre of hoarding is all that is to be seen after years of labour. Various are the conjectures daily put forth as to the future destination of the pile of buildings on the north of the place, called the Magazines Réunis, built by a company who took upon themselves to reimburse integrally to all purchasers of articles of whatever nature they might be—from a rat-trap to a *Sèvres vase*—the sums laid out by them in their establishment. But they did not, preferring bankruptcy. At the south side of the place a new monster shop, "Panvro Jacques," has been located in a well-built and commodious pile. This is one of the monster houses of Paris which have been of successful duration. Other houses worthy of the site are being erected on the south-west side, so that the place will shortly be regularised.

Accidents have frequently occurred in Paris

from the falling of cornices of houses owing to the decay of the stone or the plaster, and a few days ago one was very nearly rendered fatal. At the Place de la Concorde a portion of the cornice of the Hôtel de Crillon fell upon the street with a loud crash, and was broken into a thousand pieces; owing to the early hour (8 a.m.) there were few passers by, but a pastry cook's boy had a narrow escape from destruction as the mass fell at his feet just as he was passing.

The French association for preventing the abuse of tobacco has named the following officers for the year 1869:—M. M. Blatin, president; Dr. Jules Guerin, first vice-president; Dr. Verneis, second ditto; Decroix, general secretary; Rassel, secretary of meetings; Beaupré, secretary archivist; Crivelli, foreign secretary; Dr. Joly was named president of honour.

A frightful tornado passed over Paris on the 1st of February. Several workmen were injured by being blown off scaffolding, &c. The trains of the circular railway passing over the Anteuil viaduct on the Seine were nearly shipwrecked: one engine lost her chimney, which fell into the river and sank a boat. One of the open-roofed carriages was stripped, to the great alarm of the passengers. A horse was decapitated in the Rue de Vivienne by a fragment of metal plate which fell from the roof of a house into the street.

ST. EDMUND'S CHURCH, RIBY, LINCOLNSHIRE.

This church has undergone a complete transformation; those who remember it in former days would hardly recognize the building now. The interesting portions of the ancient fourteenth century church which remained were the centre tower, the walls of which battered considerably; the transept, and nave, with a good arcade. The original chancel had been replaced by a wretched structure, with round-headed windows, and otherwise entirely devoid of architectural character. The north aisle of the nave had been similarly treated. The transepts and chancel had been cut off from the nave, and were never used for divine service. The nave was filled with high square pews, and a ponderous pulpit and desk were piled against the screen, which divided the nave from the eastern portion.

By the munificence of Mr. George Tomline, M.P., this state of things has been completely changed. The modern chancel has given place to a new one, designed in the Decorated style. The interior has three bays of groining, springing from triple vaulting shafts. The ribs and bosses are of Ancaster stone, and the groins filled in with chalk, banded by courses of Ancaster stone. The east end has a triplet window, and the sides are lighted by triplet windows, with traceried heads. The chancel is fitted up with oak stalls, and the walls are lined with oak, having an ornamental brattishing. The tower has been groined, and the nave and all other parts are ashlined with Ancaster stone. The nave and transept ceilings are of polygonal form, with oak panels, divided by ribs and ornamental bosses. The nave is fitted up with oak open benches. The ancient portions of the church, which have been most carefully preserved and restored, are the centre tower and nave arcade, of good Decorated character. In the north wall of the nave a very early Norman doorway had been embedded; it was not *in situ*, but had probably belonged to the original church. The works have been executed by Messrs. Dove, Brothers, from the designs of Mr. Ferrey, F.S.A. The entire cost, amounting to about 5,000*l.*, has been defrayed by Mr. George Tomline, M.P.

THE MILITARY STATIONS IN KENT.

The Army Medical Department Report has just been issued. It appears from this report that, taken as a whole, the stations for dépôt battalions appear to be more healthy than those in the large seaport towns, dockyards, or London and Dublin; their mortality being in the year 1866, 8.66 ratio per 1,000 of strength, and the sick 43.10. As regards the army on the home stations generally, fevers of an eruptive kind have not prevailed to any great extent.

The medical and sanitary officers gave a favourable report of the South-eastern District and Shoreliffe Camp. Respecting these the report says:—"Nothing has transpired during the year affecting their sanitary condition to any material extent. The various defects connected with the barrack buildings at Dover have been

referred to in reports of previous years. The latrines and urinals at the Western Heights, and some of those at the casemates in the citadel, are very objectionable; their positions alone at the latter place being sufficient to render them so."

Woolwich is also favourably mentioned in the report as follows:—"No sanitary changes, beyond those of a minor character, have been carried out during the year. The barrack accommodation has nearly equalled that recommended by the Army Sanitary Committee. The accommodation for married soldiers is, in many instances, indifferent, and the condition of the brick cottages is said to be unsatisfactory in drainage and other respects." In the Chatham district objections are made as to the site and construction of some of the barracks. The buildings are said to be generally old, and not all in accordance with modern views, although they may be improved by the alterations in progress. A few remarks of the Deputy Inspector General of Hospitals may be worth quoting.

As regards ventilation, in 1854 Dr. Fraser recommended the more or less entire removal of the partition wall separating the front and back rooms in Chatham barracks. The latrines are, in his opinion, ill-drained, the floors not being sufficiently sloped, and, in consequence, always damp and sloppy. He recommends their reconstruction on improved principles. He urges that measures be adopted for providing a certain amount of hot water weekly in every corps, especially in winter, as a sanitary measure of importance in relation to cleanliness. The surgeon of the Royal Engineers pointed out that both the position and the construction of the latrines in the Royal Engineers' barracks are objectionable, and recommends their reconstruction on modern principles, and their further removal from the rooms. A part of this measure was in progress. Dr. Fraser suggests the entire removal of the school latrines from such objectionable proximity to the Female Hospital. The Milton barracks at Gravesend consist of brick-built huts, and are reported by the medical officer as very good in respect to position, construction, and arrangement. An ablution-room is attached to each hut. There is also an excellent bath-house, with separate baths. At Tilbury there is an ordinary ablution-room. An excellent bath-room has been built during the year. At New Town Fort there is an ordinary ablution-room, but no bath-house. Bathing parades are not possible at this station. Ventilation has been improved at Tilbury and New Tavern Forts, by the erection of fresh air inlets, fan air outlet shafts, and warm air grates; but the barracks at both places are old and ill-constructed. Intermittent fevers have, as usual, prevailed to a certain extent among the men stationed at Tilbury. The cause is, of course, the flat and marshy nature of the surrounding country. There has been no overcrowding, nor any defective ventilation or drainage, and no diseases attributable to such causes have occurred.

Upon the whole, the military stations in Kent present favourable contrast, in a sanitary point of view, with many others in different parts of the kingdom.

CHURCH-BUILDING NEWS.

St. Wendron, Helston, Cornwall.—The church of St. Wendron, near Helston, has lately undergone a restoration. The edifice is situated in one of the highest parts of West Cornwall. Previously to its restoration, the roofs were in a very dilapidated condition. It was found necessary to put new roofs to the nave and chancel, and the other roofs throughout the church have been opened and repaired; new copings and crosses have been added to the gables; some portion of the walling, including the nave-arcade, rebuilt; a vestry added; and the doors, windows, &c., repaired wherever necessary. In the place of the broken-down pews, open free seats have been provided throughout the church. Improvements have been effected in the chancel by the rearrangement of the step levels for the new tiled pavement; the raising of the east window, which will now allow of a new reredos at some future time; and by the marking off of the chancel from the nave and aisles with screens, now being decorated by the architect, Mr. J. D. Sedding, as also the boarded roof over the sacristy. On an covering the face of the wall in the north transept, a series of holes with occasional corbel were discovered at a uniform height of about 5 ft. from the floor, and it has been suggested with some appearance of probability, that it was in this portion of the building that the stag

was erected periodically in Medieval times for the performance of miracle plays. It is well known the portrayal of religious mysteries was common in these parts; and there is in this church of St. Wendron one of the low recesses known by the name of Easter Sepulchres, where the figure of our Lord was placed on Good Friday at the hour of His death. The work of the restoration has been carried out by Messrs. Boue & Son, of Liskeard, builders, under the direction of Messrs. Edmund and John D. Sedding, of Penzance, architects.

Ruiford.—The foundation-stone of St. Mary's Church, Ruiford, has been laid by Lady Arabella Fermor-Hesketh, with full Masonic honours. The new edifice will occupy the place of the present church, of which the outer walls and roof alone are at present standing. It is to be in the Gothic style of architecture, and much larger than the old structure which it replaces. Messrs. Dawson & Davison, of Liverpool, are the architects of the new church; and Messrs. Sale & Hnrst, of Southport, the contractors; the brickwork having been let to Mr. R. Gregory, also of the latter town.

Ripon.—The choir of the cathedral has been re-opened. Since July, 1862, the choir has been in the hands of the workmen, who have carried out the restorations under Mr. G. G. Scott; public worship, in the meantime, having been celebrated in the nave. In this interval the appearance of the choir has been greatly changed. The galleries which disguised the aisles have been removed; the whitewash has disappeared from the stonework; the carved oak screens of the aisles, and the canopies of the stalls, have had the ravages of time repaired; the sedilia have been removed to the easternmost bay of the chancel, south arcade; the whole of the choir and its aisles have been re-seated and re-floored,—the pavement within the chancel rails in a design of various coloured marbles; the arcading behind the altar altered so as to harmonise with similar work in the aisles; and the whole of the choir restored and beautified so as to make it correspond as nearly as possible with its original condition. The towers, which were previously in a very insecure condition, have been strengthened. In the transepts, and beneath the central tower, oak ceilings, panelled and relieved by designs in colour, have been put in. The old ceiling of the nave as yet has not been touched, but there is every probability of this portion of the edifices sharing in the work of restoration and embellishment.

Stalbridge.—The new tower of the parish church has been formally opened. The tower has been built at the sole cost of the Rev. Henry Boucher, of Thornhill. The architect was Mr. E. Hicks, of Dorchester; and the builder, Mr. G. Green, of Blandford.

Padiham, Lancashire.—The new church of St. Leonard which has just been completed is a stone structure, designed in the style which prevailed in the former part of the fifteenth century. The plan consists of nave and nave aisles, chancel and chancel aisles, north and south transepts, tower, south porch, and vestry. The tower rises to the height of 115 ft., finished by eight crocketed pinnacles, the centre ones being broken by large grotesques. Access is gained to the galleries in the transepts by spiral staircases in octagonal turrets. All the windows have tracery heads, with moulded capitals, and beneath the porch entrance is a carved head of the patron saint. The church is finished internally with chiselled stone. The shafts bearing the ornamental curved brackets of the nave roof are supported by carved angels in stone. The curved ribs of the chancel roof rest on blocks carved in representation of the twelve apostles. The benches have framed tracery heads. The choir seats have open tracery backs, the ends being carved; those in front are finished with carved angels, in a sitting posture, bearing musical instruments. The reredos is carved in Caen stone. Ten of the principal windows are already filled with stained glass, small (except one by Messrs. Edmondson, of Manchester) being from the works of Mr. Wailes, of Newcastle-upon-Tyne. The lighting is effected by brass coronas suspended from the centre of the nave, and chancel arches furnished by Messrs. Thomason, of Birmingham. The heating apparatus has been supplied by Messrs. Bacon, of London. The reredos and the other carving has been executed by Messrs. Williams, of Manchester, and the rest of the work by local contractors. The church will seat about 1,000 people, and will cost over 8,000l. The architect

is Mr. William Waddington, of Burnley and Padiham.

Sheffield.—All Saints' Church, Brightside, has been opened for divine service. The church stands on the top of a hill, and its spire is hence a conspicuous object for a great distance round. It has been erected at the sole expense of Sir John Brown, and the cost is said to be nearly 12,000l. Messrs. Flockton & Ahhot were the architects. The edifice is cruciform, and has a tower and spire at the west end. The tower is 120 ft. in height, and consequently is about 10 ft. higher than the tower of the parish church. The extreme dimensions of the church are 130 ft. by 76 ft. in the transepts, and 56 ft. in the nave and aisles. It will accommodate about 720 adults, and 259 children, the sittings of the latter being in a small gallery in the tower, and in two galleries, one on each side of the transepts, which are approached by distinct entrances. There are three aisles, and all the pews are open. The chancel decorations are the work of Messrs. Rodgers, of Sheffield. In an archway just beyond the reading-desk there is an organ, which has been built by Mr. J. Stacey, and the organ case and the reredos are the work of Messrs. Mannel & Son. The pulpit and reading-desk, which are also of wood, are by Mr. G. Shaw, of Manchester. The masonry work has been done by Mr. G. Wade, and the carpenters' and joiners' work by Messrs. Ash & Clayton. —The new church, dedicated to St. Silas, at the crossing of Broomhall and Hanover streets, in what is known as the Gillcar district, has been consecrated. The church is the gift of Mr. Henry Wilson, and is the second church he has built in Sheffield within the last ten or twelve years. The cost is between 7,000l. and 8,000l. The church consists of a nave 80 ft. long, by 27 ft. wide, north and south aisles, and chancel, on the one side of which are the organ chapel and the vestry, and on the other seats for the Sunday-school children. The tower is at the corner of Hanover and Broomhall streets, and is terminated by eight pinnacles, the total height from the ground being 94 ft. The heltry stage is ornamented with eight windows, the arches of which are supported by clusters of columns. The cornice is foliated with conventional ornaments, and there are gargoyles at the angles; the lower part forms a porch. There are no galleries to the church, but the floor furnishes accommodation for 800 persons. The nave arches are simple, carried on circular columns, with shafts of conventional foliage. The pews are of red deal, stained and varnished, and the free-sitting plan will be adopted in regard to them. The chancel is paved with black and red tiles, manufactured by Messrs. Maw; the roof is wagon-headed in form, with the view of bringing out the voices of the choristers. The church is lighted at the west end by a five-light window, and at the east end by a four-light window, but the clearstory windows were mainly relied upon. The roof is of open timber-work—red deal and pitch pine, hoarded and stained. The height of the church from the floor to the apex of the roof is about 55 ft. Artificial light is afforded in the nave by gas brackets upon the arches, in the aisles by small coronas, and in the chancel by two wrought brass standards. The church is warmed by means of Messrs. Stuart & Smith's (Sheffield) Gill stove. The architects are Messrs. Blackmoor & Mitchell-Withers, and the contract for the whole of the work was given to Messrs. Badger & Holmes.

SCHOOL-BUILDING NEWS.

Lightcliffe (Bradford).—New schools at Lightcliffe, erected at a cost of nearly 5,000l., have been publicly opened as national schools. The building, which has a situation on an elevated piece of ground opposite the railway station, is the gift of Mr. E. C. Sutherland-Walker, formerly of Crow Nest, Lightcliffe, and consists of boys', and girls', and infants' school-rooms, with class-rooms, reading-rooms, and a residence at each end for master and mistress. There is also attached to the school a piece of land of about 3 acres, to be appropriated as a recreation-ground. The ground in front of the premises is divided into terrace-walks and ornamental shrubbery.

Northampton.—New Sunday-schools have been erected and inaugurated in connexion with the Commercial-street Chapel, in this town. They consist, on the ground floor, of a lecture-room, measuring 28 ft. wide by 36 ft. long; two class-rooms, capable of being thrown into one; a minister's vestry, and also a vestry for the

deacons. There are separate staircases (of stone) for boys and girls, leading to the upper floor, where there is a school-room, 28 ft. wide by 51 ft. long; also two class-rooms, and a small room for the superintendent. The building being contiguous to the chapel, access is given to each gallery by a door in the upper school-room, and there is also a connexion between the lecture-room and the chapel. The upper room has an open roof, with light iron trusses; the windows have cast-iron casements, with ornamental horders. There is a platform at one end of the room. The woodwork is principally of deal, stained and varnished. The exterior is designed to harmonize in outline with the chapel. The cost amounts to 1,300l. Mr. T. Heygate Vernon, of London, was the architect.

Hanley Castle.—The new grammar-school here for the middle and indistrious classes has been opened. The building is a plain one, in the style of James I., 76 ft. by 22 ft. It has an open timbered roof with arched braces, the open wood-work being stained and varnished. Adjoining the principal room, which is furnished with a movable wooden partition for separating the two schools, is a small class-room. The architect was Mr. Cheek, of Upton; and the builder, Mr. James Griffiths, of Malvern.

Wakefield.—The new parish schools have been opened. The new buildings have frontage into Vicarage, Zetland, and Frederick streets, and comprise boys' school, 61 ft. by 20 ft.; girls' school, 66 ft. by 20 ft.; infants' school, 52 ft. by 21 ft.; two class-rooms, each 16 ft. by 16 ft.; and lavatories and cloak-rooms adjoining the entrances. The principal entrance is from Vicarage-street, by which the girls and infants reach their respective rooms. The boys' entrance is in Zetland-street. The buildings are of Gothic design, externally walled with pitched wall stones in courses, and tooled stone-dressings. The roofs are of high pitch, covered with alternate hands of blue and purple slates, surmounted with red tile ridging, and having at the intersections and gables foliated iron terminals. The roof-timbers inside are exposed to view, planed, and stop-chamfered. On the apex of each school roof are fixed two ornamental patent syphon ventilators. Internally the walls are all plastered, and the woodwork all stained and varnished. The boys and girls' rooms are so arranged that they can be used as one, by throwing open large folding doors. Separate playgrounds are provided for boys and girls, enclosed with walls; that for the girls being surmounted by ornamental iron railing. The various works, which will cost about 2,000l., have been executed by Mr. George Fawcett (mason's work), Mr. J. R. Goldthorpe (woodwork), Mr. C. Driver (plastering), Mr. J. P. Hill (slating), Mr. Drake (plumbing), Mr. S. Kirk (ironwork), and Messrs. Hodgson & Son (painting and staining), from the designs and under the superintendence of Mr. William Watson, of this town, architect.

HOT-WATER PIPES AND THE BUILDING ACT.

SIR,—With reference to the inquiry of "a Surveyor and Engineer" in a recent number,*—The hot-water pipes which are dangerous are those known as "high-pressure hot-water apparatus." In this system there is not only a close boiler, but the pipes themselves, after being filled, are hermetically sealed, leaving only a certain limited space for expansion. High-pressure pipes are frequently worked at a temperature of 400°, and sometimes considerably higher. They have been known to become luminous in the dark, and fires have certainly sometimes been caused by interruptions to the circulation, generally arising from frost. It was with reference to these pipes that the late Mr. Braidwood suggested the restrictions which are very properly imposed by the present Building Act.

Ordinary cast-iron hot-water pipes, such as are generally used under a low pressure for warming public buildings, houses, conservatories, &c., are not dangerous; and there is no reason why they should not be fixed, when convenient, in contact with woodwork. No regard is ever paid in this respect to the provisions of the Building Act beyond the metropolitan area.

The pipes of an ordinary low-pressure hot-water apparatus seldom attain a temperature above 180°, and even where the height of the feed-cistern above the boiler, which is the

* See p. 99, ante.

circumstance that determines the temperature, is as great as it can be in any ordinary house,—say, if it were at the top of the building, and supplying a furnace in the basement,—the boiling point under that head would rarely exceed 240°, and the temperature of the pipes would generally be several degrees lower.

Low-pressure apparatus, as well as high-pressure, have close boilers, although of different construction; but the real safety of the common apparatus arises from the pipes and boiler being supplied from an open cistern at a moderate elevation. This arrangement allows of an unrestricted expansion of the water, the want of which is the cause of danger from the high-pressure pipes.

Speaking as a practical man, and in the habit of erecting both kinds of the apparatus, I would venture to suggest that the existing provisions of the Building Act should be confined to wrought-iron hot-water pipes, hermetically sealed; and, consequently, liable to be worked under an unknown pressure, and that they should be altogether waived as regards the ordinary cast-iron pipes used for warming.

HOT-WATER ENGINEER.

Sir.—As the remarks with which you favoured my letter cannot refer to hot-water apparatus for dwellings, &c. as fitted with expansion-pipes, I, therefore, write to call your attention to the fact, believing that now you have allowed the subject to be mooted in your journal some definite and practical rule will result.

I have myself had more or less to do with several hundred apparatus, and in those where the largeness of the cooling surface to that of the boiler did not render it impossible for the water to overheat, an expansion-pipe has been used, viz., an open pipe placed on the apparatus near the boiler, and rising higher than the level of the cistern, it having a clear opening to the exterior air of from 10 to 19 square inches. Now, sir, I feel sure you will perceive that no description of accident could happen that could hermetically seal up a 3-in., 4-in., or 5-in. pipe so as to stand the pressure of steam, which might otherwise be supposed to occur by the accidental fouling of the supply-pipe from the cistern. And in some very extensive apparatus there should be an arrangement of expansion-pipes, but to describe these would be entering upon another subject.

A SURVEYOR AND ENGINEER.

Sir.—Thinking that a practical illustration of the dangers attending the fitting up of hot-water pipes, as commonly practised, may be useful, I have ventured to trouble you with the following:—

After many years of practice as surveyor and assessor of fire losses, I have had but one case (that I remember) of accidental burning resulting from hot-water pipes, and this took place some few months since.

At a gentleman's residence, in London, a warm bath on the first story was supplied by means of a circuit of hot-water pipes from a boiler in basement. The pipes in the several stories were enclosed by a wooden casing, placed at a distance of 3 in. from the pipes as required by the Act.

Notice of a fire loss having been given, I attended, and learnt from the inmates that the hot-water pipes had ignited the woodwork, in proof of which a portion of the charred woodwork of the casing removed by the fire brigade was shown to me, who reported to the inmates that the works had been properly constructed.

On minutely examining the grain of woodwork offered for my inspection, I found a fibre of hemp adhering to it. I required that the whole of the debris resulting from the fire, which had been carefully removed to the house to me; and on descending to the dusthole in the basement, to which place it had been taken, I quickly discovered the probable cause of the fire.

The casing and hot-water pipes had been packed with hemp and tow, in addition to a coating of felt. There had been probably a leakage of water, which had caused the hemp to ignite. This had probably been smouldering for some hours, as there was little or no draught of air, and thus timely notice of danger was obtained, fortunately in midday.

Had there been a delay of a few hours, or had the fire acquired a draught and mastery of the building during the hours of the night; or had the early intimation of danger been unheeded by the inmates, a very serious destruction of property would have ensued.

A FIRE OFFICE SURVEYOR.

SCHOOLS OF ART.

The Worcester School.—The sixteenth annual meeting of this school, for the distribution of prizes, has been held in the Music-hall. The attendance was both numerous and influential. In the absence of the Earl of Dudley, the chair was taken by the Rev. David Melville, rector of Witley. The report said:—

"Your committee have much pleasure in reporting to the subscribers and friends of the School of Art, at its sixteenth annual meeting, that the progress of the institution during the past year, with respect to the attendance of students and their advances in work, has been satisfactory. 194 students have been under instruction during the past year, which number includes 53 in the day classes and 141 in the evening classes at the central school. The system of teaching, as directed by the Department in London, continues to be adopted, and the examinations in free-hand drawing, practical geometry, perspective and model drawing, were conducted as usual under the direction of the committee. In the examinations 30 papers were successfully taken and 6 prizes. 32 works were sent to London in March last, and prizes were obtained in the national competition by George Evans and Frederick J. Jones."

The chairman distributed the prizes.

The Nottingham School.—The annual meeting of the governors of this school has been held, for revising the report of the committee for the past year, confirming the accounts, electing officers, and transacting the general business of the institution. Mr. R. Birkin, president, occupied the chair. The President, in opening the proceedings, remarked upon the sparseness of the attendance, which he attributed to the fact of the meeting following so closely the one held for the distribution of prizes. He was glad to observe from the report that the institution was in a more satisfactory condition than last year, and hoped that soon they would be out of the difficulties. The reports of Mr. Rawley, the head master, and of the committee, were then read, and the master's zeal and efficiency were acknowledged by special resolution.

COMPETITIONS.

St. Paul's Girls' School, Tottenham.—Designs were submitted in a select competition for this building, by Messrs. Cook, Franklin, Eytan, James, and Warren. The design by Mr. Joseph James was selected as the best, and will be commenced immediately; it has received the sanction of the societies giving grants to the building fund.

ACCIDENTS.

A NEW building for an undertaker's coach-house and joiner's shop, in course of erection, in Hunslet-road, Leeds, has collapsed, hurrying four labourers, one of whom has been seriously injured.

At Coatham, Redcar, the west end of a new chapel has been blown down by the wind. The loss, about 150*l.*, will fall upon the contractors, Mr. T. Wilson, joiner, Redcar, and Messrs. Scott & Lord, builders, Middlesbrough.

At the Northampton Gasworks a new tank has given way. It was 102 ft. in diameter and 30 ft. deep, and was completed about two months since. It is suspected there is a quicksand on the site, which is within the old bed of the river.

At Birmingham there has been a landslide, in George-street, bringing down a 9 in. brick wall, built on arches to aid in supporting a bank of soft red sandstone. The wall fell on adjoining premises, doing them considerable damage. The late rains are blamed.

At Liverpool a slip has occurred in a sewer work in Kerford-street, Everton, the earth falling on a sewer contractor's workman, and killing him. He had neglected to shore up the excavation as directed. An old drain seems to have caused the earth to slip.

RIGHT- AND LEFT-HAND LOCKS.

SIR.—In answer to your correspondent, the bolt of a right-hand lock always shoots from left to right, and a left-hand lock from right to left, as you stand on the outside of the door. Mistakes with respect to the hand of locks are of daily occurrence. What the carpenter calls a right-hand lock, the locksmith calls a left-hand, and vice versa. Standing on the outside of the door, and locking the lock by turning the key in the right hand locks to the right, and in the left hand locks to the left. If the bolt comes out to the left it is a left-hand lock; if to the right it is a right-hand lock; the level of the latch-bolt will be towards you. This is the locksmith's rule.* It may be well to notice that for a closet in a room in which the door of the closet is constructed to pull towards you, if a rim-lock be required to be fixed on such a door so as to be inside the closet when the door is closed, the bolt or latch would require to be bevelled just the contrary way to the ordinary locks, as in closing you push the lock away from you instead of pulling it towards you. Such a lock is called by locksmiths a reverse lock, and it requires to be fitted with a striking-plate for the door-case instead of ordinary box staple of the other locks. If the knob or the keyhole is required to be any particular distance from the edge of the door, always measure from it to the centre of spindle-hole and the centre of keyhole respectively.

In ordering locks, never run down the price, because whatever reduction you may get from the regular and fair price is certain to be made out to you in so much less security, so much less

strength, and so much less finish. By the way, you may think you have saved, the maker will have got more, as there is always more profit in proportion attending the manufacture of a common article than one of a superior quality.

To illustrate this fact we may state a circumstance which is of frequent occurrence. A small manufacturer takes a pattern of a certain sized lock to the wholesale buyer, and names a certain adoption of such a system, however much you price per dozen; this pattern is kept by the dealer, and on another maker calling, the pattern is produced, and the latter maker's price is asked for a similar article. The first, perhaps, was low enough, but the second maker's is still lower; an order with the pattern is given to him, and he sends the several parts to the brass-founder to be cast from. The locks are made and delivered, and the second maker has made quite as much profit out of the reduced price as the first maker would have got from the higher price; and this arises from the circumstance that the limbs which formed the lock having been cast from the limbs of the pattern lock were, after dressing, so much less in size, and consequently so much less in weight. By this mode 3-inch till locks in time measure but 2½ in., and all the parts are light in proportion. Whoever the grinding "system" is adopted, the work in the language of the workshop is "devilled" just in the same ratio. We believe this holds good in every other trade.

CHARLES AUBIN.

SIR.—May I venture to submit a more precise definition of the hands of door-locks than that given in the *Builder*?

1st. In all cases, whether a door opens inwards or outwards, if, when you stand outside facing the door, the lock shoots towards the right hand, it is a right-hand lock; if towards the left hand, it is a left-hand lock. This rule applies equally to dead, spring, or two-bolt locks.

2nd. For two-bolt or spring locks, when the doors open outwards, apply the same rule, and add the words "reverse bolt."

Any locksmith can supply locks of the proper hands if these rules be adhered to.

JOHN CHUBB.

INAUGURATION OF BELLS AT BIRMINGHAM.

A NEW peal of eight bells has been opened at Bishop Ryder's church, Birmingham. The peal, which is the first founded in Birmingham, consists of eight bells, the tenor weighing about 13 cwt., and the aggregate weight being 55 cwt. The total cost is about 600*l.* At the conclusion of a special service on the occasion, Canon Cattley, the Rev. H. T. Ellacombe, and Mr. E. Denison, Q.C., with the assistance of several Birmingham campanologists, rang a series of peals upon the new bells, the result of which was highly favourable report of the entire work.

In the evening, the Rev. H. T. Ellacombe, rector of Clyst, Devonshire, an old correspondent of the *Builder*, as our readers know, and the author of several important campanological works, delivered a lecture on bells. The art of change-ringing, he remarked, was greatly admired by all who understood it; for there was no amusement so conducive to health, employing as it did so many faculties both of body and mind; and there was no music, when performed by skillful hands, which could afford more agreeable or more melodious sounds than bells,—eight, ten, or twelve. Church bells had a language which was capable of very definite and appropriate meanings; but to secure these, a toll or a chime must be rung at proper times, and in a manner which would properly discriminate between what was joyous and what was solemn and mournful. The art of change-ringing, however, was in many instances so used—*or, rather, abused*—as to mean everything, or nothing at all. The reason that bells were often so badly rung, was that they were entrusted to the hands of persons who never took any trouble at all to acquaint themselves with change-ringing, and to whom, as a matter of course, the practice was mere drudgery. The lecturer described the process of manufacturing bells, and the elements necessary for perfect musical intonation, illustrating his remarks by models. The oldest peal of bells in parish churches, he said, was to be found at Beverley. It was established in the ninth or tenth century.

* As we have already said.—E.N.

RESPONSIBILITY FOR GAS ENGINEERS' CHARGES.

A CASE of importance to gas engineers, architects, and others, has been tried before the Sheriff, at Dunfermline, on Saturday. Plans had been prepared about twenty years since for the erection of gasworks, at Inverkeithing, in Fife-shire, but had been laid aside, and a small portion of them lost. A new committee had resolved to carry out the plan, and one of their number to obtain a new plan to replace that which was lost. He applied to the pursuer, Mr. Macaulay, of Dunfermline, architect, who prepared new plans altogether, which the committee rejected, and returned to the pursuer. Ultimately the gasworks were erected for 418*s.*, the contract price, and about 50*l.* of extras, from plans prepared by Mr. Christie, of Newburgh, Fife-shire. Pursuer had made out no specification, but had stated the cost of carrying out his plans at 700*l.*, for which the usual charge of 5 per cent., or 35*l.*, would be made. The action was raised against the members of the committee. The Sheriff, having taken the case into consideration, found (1) that the defender William Thomson called on the pursuer, and employed him to prepare a design for a gasworks; (2) that the pursuer accepted said employment, and, in pursuance thereof, prepared a plan, with relative specification and estimate of cost; (3) that the charges contained in the account libelled are reasonable; (4) that the defenders, other than the said William Thomson, did not authorise, or afterwards homologate, said employment, they having instructed the said William Thomson to employ the pursuer to supply a portion of an old plan which had been lost. The Sheriff further found that the defender, William Thomson, is alone liable to the pursuer in the account sued for, and therefore decrees, in terms of the conclusions of the summons, against the said William Thomson, and finds him liable in expenses; assizes the whole other defenders, and decrees, and finds them entitled to expenses from pursuer; and being fixing the amount of said several expenses, allows the pursuer and the defenders who have been assized to lodge a note of expenses claimed by them.

SALE OF ST. MARGARET'S CHURCH, LIVERPOOL.

Sir,—Liverpool has been much surprised to learn, by an advertisement and letter from Mr. Horsfall, that for the reasons therein stated, he has determined to sell his church and parsonage. These have been erected from designs by Mr. Street, in native brick, with stone and red brick dressings, by a builder from Wolverhampton, a Mr. Horeman, a stranger to the town, who was appointed contractor without competition. The public very naturally inquire whether a clergyman of equal ability to Mr. Clark (whose refusal to come has led Mr. Horsfall to advertise the church for sale), could be found to fill his place; or whether if Mr. Clark had not declined to do so, but death had intervened, the same course of action would have been pursued? G.

DRAINAGE OF TOWNS.

Sir,—Can your correspondents give me any instances where two towns or districts, under separate and distinct local government, have united for the purpose of constructing for their joint use a main intercepting sewer? and if so, the particulars as to apportionment of charges? Is there any town of magnitude in which a main sewer has been carried under a river, such as the River Forth, upon land embanked from the river? With any particulars of cost, size, and efficiency of working. ENGINEER.

GRAINING FROM SURFACE OF WOODS.

Sir,—In the *Builder* I notice a report of a paper read by Mr. Dean, sen., before the Society of Arts on this subject. Without any desire to deteriorate the value of the invention, I would wish to make a few remarks. In the first place, "Xylographic" graining I believe to be over twenty years old, and, if I mistake not, the invention of a Belgian. The specimens shown to me by Mr. Dean were only partially produced, being mostly finished by hand; as for all close-grained woods, such as maple, satinwood, &c., it is simply useless. The prices paid for best oak graining put forward by Mr. Dean are ridiculous, and calculated to mislead people unconnected with the trade. Grainers to the trade are not always fairly dealt with, those who employ them often requiring too much and paying too little, thereby obtaining work according to price. If fault be found, it will be visited upon the unfortunate grainer; if praise, it will be pocketed with the cash. I am happy to say British imitations hold honour that few branches of English industry can boast, having obtained first-class prizes at all international exhibitions. Xylographic graining will have to make immense strides, and show vastly different results, before it can even compete with graining by hand. A LONDON GRAINER FOR THE TRADE.

TAKING OUT QUANTITIES.

The committee for the enlargement of the Poplar workhouse have reported on the utilization of the Town-hall for indoor paupers. They instructed Mr. Morris to make the requisite alterations, and gave instructions to the architect in reference to the alterations to be made in the present workhouse. They authorized Mr. Morris to prepare the necessary drawings and specifications for the builders; and in their report to the Board they suggest that he should be allowed to take the quantities required, and be responsible to the builder whose tender may be accepted by the Board for the correctness of these quantities. The committee further recommended that Mr. Morris be allowed a commission of 1*l.* per cent. on the value of taking out these quantities. Mr. Bracebridge, at a meeting of the Board, said he did not agree with that portion of the report which recommended that Mr. Morris take out the quantities, and he should not himself agree to it. He objected, such a thing to himself, and it was not the business of the surveyor to do it. No respectable surveyor would think of doing it. He proposed that that portion of the report be omitted.

Mr. Cole seconded the proposition, and after a lengthy discussion on the question, it was resolved that the suggestion of the committee be not approved. Mr. Bracebridge then moved that Mr. William Dobson be appointed to take out the quantities at 1*l.* per cent. The Rev. Mr. Driffield having gone into figures, gave it as his opinion that 1 per cent. was too much for taking out the quantities, and proposed as an amendment that 1/2 per cent. be paid. Some discussion having taken place, the amendment was carried by a majority of four. Mr. Robey proposed that Messrs. Hills & Fletcher be appointed to take out the quantities in lieu of Mr. Dobson. The Rev. Mr. Driffield seconded this, and on its being put to the vote, there appeared for— Messrs. Hills & Fletcher 4 Mr. Dobson 6 The committee's report was then adopted, with the exceptions specified.

Books Received.

Smoking Fires: their Cause and Cure. By the Rev. ALEX. COLVIN AINSLIE, M.A., Vicar of Corfe, Somerset. London: Longmans. 1869. The Rev. author may well say that it is a saddening sight to see, from the fifth or sixth floor of a London hotel, the host of distorted and hideous chimney appendages there displayed. His volume contains many practical suggestions, with all of which, however, we do not agree; as, for example, where he recommends the opening for fresh and cold air to a fire which he speaks to be placed at the side of the hearth. A perpetual draught of cold air to feet and ankles is not likely to promote either the comfort or the safety of a seat by the fireside. The opening could easily be placed so as to be nonobjectionable in this respect. In the concluding chapter, addressed to architects and those engaged in house building, the author says:—

"Men who know their business will find little or nothing new in these pages, nothing that they have not successfully carried out in their practice; but it is not always the fate of those that huld to fall into the hands of men who know their business, and a little more knowledge of true principles will often be useful to those whose practice runs in the old groove, who design and build houses as their predecessors did, and trust to good luck for their being comfortably habitable.

1. Avoid, if possible, chimneys in outer walls, especially in walls with a northern aspect.
2. Especially avoid chimneys passing up through the eaves of high-pitched roofs. If such chimneys must be built, carry them up higher than the ridge of the roof.
3. Let the masonry of chimneys in external walls be as thick as possible.
4. Let the flues be large, and of circular section to secure their being thoroughly swept. Glazed drain-pipe, 1 ft. in diameter, is excellent for the purpose.
5. Avoid all unnecessary heads and elbows.
6. Carry up the chimney-stacks as high as possible. Make them a principal feature in your design, and take pains with their proportions and positions, relatively to one another and the general design of the building. The architect is to blame if it becomes afterwards necessary to disfigure his building with zinc tubes and wind-guards.
7. In chimney-stacks containing many flues let their outlets be at different levels.
8. Let the flue of the kitchen fire be always at the north or east end of a stack.
9. Take means to supply every fireplace with its own air drawn from the coldest side of the house. This may be done by one general wind trunk to supply all the flues in one stack, or by a separate arrangement for each fireplace. But no house can be considered scientifically built in which this is not provided."

Miscellaneous.

The "Builder's" Fire.—A correspondent, Mr. C. Warner Lewis, writing from the Temple, informs us that he has applied to "The *Builder's* Fire," which he has found useful, a hinged iron plate, so that he can either close up the bottom of the grate with the plate, as in "The *Builder's* Fire" when rapid combustion is not wanted, or let the plate fall down so as to open the bottom of the grate, and allow a free access of air below as long as may be desired. The hinges would thus appear to be a convenience. The plate can be easily put up or down by means of a poker.

The Prevention of Floods.—This is a subject which occupies much attention in France at the present time. Engineers are generally convinced that the best and only satisfactory solution of the problem of moderating the effects of the sudden overflowing of large rivers, is in forming reservoirs along the banks of the more dangerous tributaries by means of transversal embankments. The waters may be thus collected, and after the flood has passed away, may be turned to account for irrigation during dry weather, and for supplying water to mills or canals. *Galignani* says that the embankment of Pinay, thrown up under Louis XIV., at a distance of 80 kilometres above Roanne, has preserved that town and the valley of the Loire, by supporting 100 millions of cubic metres of water and upwards. A recent paper, by M. Graff, addressed to the French Academy of Sciences, speaks of the reservoir of the Gouffre d'Enfer, on the Frens, above St. Etienne (a work of his own construction), where a dyke 50 metres in altitude, incloses a basin 2,500 hectares in surface, which will contain 1,500,000 cubic metres of water, to ward off inundation in that district.

Poor-rate Valuations.—A return prepared by the Poor-Law Board shows that in April last the valuation lists had been completely revised and returned approved in 588 Unions in England and Wales. The rateable value of those Unions upon which the contribution to the common fund were calculated at Lady-day, 1867, was 77,775,305*l.*; the rateable value in 1868, as settled by the assessment committee in the lists approved, was 79,962,956*l.*, an increase of 2,187,651*l.* The increase in Middlesex is from 4,771,780*l.* to 5,085,230*l.*; in Surrey, from 2,545,702*l.* to 2,682,479*l.*; in Lancashire from 7,493,747*l.* to 7,759,599*l.* In July last the lists in all the Unions in 44 counties had been completely revised. The expenses incurred by the Guardians in the year 1866-67 amounted to 32,890*l.*; and in the year 1867-68 to 35,176*l.* The costs of appeals in the former year were 4,912*l.*, and in the latter 9,091*l.*, but the return may be incomplete under this head. The amount of compensation paid to the clerks was 19,899*l.*

City District Surveyorship.—At the meeting of the Metropolitan Board of Works, on Friday, the 5th, Mr. Silas Taylor, on bringing up the report of the Building Act Committee, recommending that steps be taken to fill up, on the usual conditions, the vacancy in the district surveyorship of the southern division of the city of London, caused by the death of Mr. Smith, stated that the income of the office last year was only 143*l.* 18*s.* 9*d.*, and the committee had considered as to re-arranging the City districts; but as the new street from Blackfriars to the Mansion House was in the district now vacant, and there would be much building going on for the next few years, they would not recommend any alteration, but that the office be filled up in the usual manner.

Discovery at Godalming.—In a field at no great distance from Busbridge Hall, known as the Chapel Field or the Old Minster Field, some digging has disclosed the foundation of what must have been a small up-angled building, 41 ft. in length by 21 ft. in width. The area is divided into two compartments by two inner foundation walls running parallel to the shorter sides. A number of skeletons in good preservation were found within the inclosure. These were huddled up in different postures, some in a crouching attitude and some lying flat, the legs of some of the latter extending under the stonework. Further excavations have been going on. In "Brayley's History of Surrey" it is stated that in the "Old Minster Field," near Busbridge, was formerly a chapel and burying-ground, which in the reign of Edward VI. were granted to Laurence Eliot, to hold during pleasure, as, by description, "a chapel in Godalming called Old Mynster."

The Proposed New Corn-Exchange, Rochester.—At a meeting of the Estate Committee of the Corporation, it was decided to invite six architects to send in designs for the new corn-exchange which the corporation intends building in this city, at a sum not exceeding 5,000*l.* The length of the proposed new building is to be at least 100 ft. by 68 ft. in width, with the usual suites of smaller rooms for committees, meetings, and offices. The new corn-exchange will be erected at right angles to the present building, which will be used as an entrance to the new exchange.

Monument in Commemoration of Dutch Independence.—A public monument is to be inaugurated at the Hague in the course of the present year. It is to commemorate the revolution which gave independence to the states, and will be more than 70 ft. high, and carry seven bronze figures of colossal dimensions. A circular flight of steps, surrounded with candelabra, will form an approach to the monument, the basement of which will be ornamented with bas-reliefs and inscriptions. On pedestals projecting from the basement will be placed the following statues:—In front, a statue of Guillaume I.; on the sides, two figures representing Religion and History; and at the back, a group of three figures, representing the Counts Hogendorp, Limburg, Stirum, and Van der Dayn van Maasdam, the heroes of the War of Independence, and members of the Provisional Government. On the summit is to be placed a female figure symbolical of Liberty and Independence. At the foot of the figure will be the Dutch lion freed from his chains.

Moving a House.—The process of removing bodily the boatman's house on Caversham Bridge was successfully accomplished, under the superintendence of Mr. Neat, who is managing the works on behalf of Messrs. Head & Co., the contractors; and to those who merely saw the conclusion of the process it did not appear such a formidable undertaking as might have been imagined. An inspection of the necessary preliminary operations, however, dispelled this idea. The house, which was nearly square, with four rooms on the ground floor, and two stories above, was first of all underpinned; but an additional difficulty had to be overcome from the circumstance that the bridge itself had been made use of as the foundation for the front of the house, and it was therefore necessary to support the upper rooms with a number of upright timbers. A strong piece of timber, extending from front to back, and side to side, was then adjusted under each wall, the framework, when completed, forming a square divided into four compartments. The timbers from front to back were protected at bottom by a partial coating of iron; under these were laid similar timbers, protected likewise with strips of iron, but only on the upper surface, and between the two were placed at intervals of about 6 in., some small iron rollers, 1 in. or so in diameter. The building itself was fastened together beyond the possibility of slipping by strong bars of iron, and the bottom framework was securely fixed by diagonal timbers. Everything being ready, some hydraulic engines were tried, but were not quite in working order, and recourse was then had to three "screwjacks" placed against the wooden framework opposite to each of the sliding timbers, with the buttress of the bridge as a fulcrum. Each "jack" was worked by two men, and almost imperceptibly the building commenced its retreat without the slightest sign of resistance. The rate of movement was about 6 in. in four or five minutes, but as the "jacks" were worked out they had to be removed, and the intervening space filled with blocks of wood, when the screw was again put on, and this was repeated until the building reached the destined spot. The whole operation of moving, from its commencement, occupied about two hours and a half, the distance traversed being 8 ft.

A Curator for the Architectural Museum. Here is an appointment open, wherein the right man could do much good to others besides himself. The committee will meet in a few days to make the selection.

The late Mr. Pettit's Architectural Drawings.—Arrangements have been made to exhibit 250 of Mr. Pettit's best sketches at the forthcoming architectural exhibition.

TENDERS.

For finishing two carriages, at Park, Tottenham, for Mr. W. Bairr. Mr. S. Cooper, architect:—

Cook & Greu	£498 0 0
Marion	490 0 0
Yates	465 0 0
Hill & Co.	439 0 0
Stone	415 0 0
Houghton	399 0 0
Hart & Brown	367 5 0
Warr	359 5 0
Rowe & Co.	339 0 0
Smith	339 0 0
Allen	338 0 0
Godwell	329 0 0
Abraham & Sons	298 0 0
Chapman	275 0 0
Davies	275 0 0
Norman	250 0 0

For alterations to Messrs. Parton's premises, Dimlicoe. Messrs. Jarvis & Son, architects:—

Thompson	£827 0 0
Turner & Sons	791 0 0
Banley	750 0 0
Tarrant	749 0 0
Henshaw	728 0 0
Jones & Sons	614 0 0
Richardson	609 0 0
Stimpson	605 0 0

For the erection of offices and stores, Victoria-street, Liverpool, for Messrs. Fowler, Brothers, Messrs. Pictou, Chambers, & Bradley, architects. Quantities supplied:—

Roberts & Robinson	£28,318 0 0
Henshaw	6,180 0 0
Boroughs & Son	6,174 0 0
Jones & Sons	6,141 0 0
Callie	6,114 0 0
Urmsion	6,066 0 0
Ray	6,055 0 0
Hugh & Co.	5,868 0 0
Hughes	5,995 0 0

For fitting up lavatories at Southall Schools. Mr. H. Saxton, architect:—

G. Jennings	£347 6 6
Jeakes & Co.	320 0 0
Keane	275 0 0
Gibson, Brothers	225 0 0
T. Jennings	222 0 0
Potter & Sons (accepted)	185 0 0

For the erection of a pair of villa residences, in The Grove, Redford, for Mr. Thomas Lester, Mr. Usher, architect. Quantities supplied:—

Winn & Foster	£1,506 6 0
Corby	1,459 0 0
Lawsen	1,450 0 0
Di keus	1,433 0 0
Moore	1,431 0 0
Hull	1,429 0 0
Cuvill	1,435 0 0

For main sewers for the Welthamshaw South-Eastern District. Mr. John T. Bressy, Surveyor:—

Smith	£3,318 14 6
Smart	2,875 10 0
Parker	2,754 17 6
Reed	2,650 0 0
Dickinson & Oliver	2,600 0 0
Turpin	2,600 0 0
Topkins	2,547 0 0
G. Harris	2,539 0 0
Jackson	2,487 0 0
J. Porter	2,440 0 0
Howe & Preeney	2,400 0 0
W. Harris	2,373 0 0
Jones & Pugh	2,258 0 0
Stenson	2,232 0 0
Thackrah	2,200 0 0
Gardner	2,187 0 0
Anderson & Son	2,115 0 0
King	2,104 0 0
Crockett	2,100 0 0
Tunley	2,070 0 0
Austin	1,988 0 0
Young	1,985 0 0
Knight	1,984 0 0
Bloomfield	1,973 0 0
Nicholson	1,888 0 0
Cole	1,882 0 0
Maxwell	1,869 0 0
P. Porter	1,805 0 0
Pull	1,782 0 0
Wigmore	1,775 0 0
Cartor	1,840 0 0

For building a pair of houses at Putney. Mr. E. Wyndham Tarn, architect:—

Adams	£1,500 0 0
Ebbage	1,455 0 0

For re-instatement of damage by fire at the premises of the Religious Tract Society, Palmerston-row. Mr. E. Wyndham Tarn, architect:—

Holland & Hansen	£519 0 0
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For building church at Newton-upon-Awcliffe, near Pickering. Mr. E. Wyndham Tarn, architect:—

Tusley	£279 0 0
Watson	162 0 0

For building four pairs of houses, in concrete, at Acton. Quantities supplied. Apparatus for concrete building provided by the proprietor. Mr. E. Wyndham, architect:—

	Per Pair.	Fence Walls per Yard Lineal.
Holmes	£690	
Ebbs	649	6s. 6d.
Drake & Reid	635	3 0
Watkins	574	3 0
Corpe	567	2 0
Turner	519	3 0
Hewson	500	
Wright	500	

* Fence wall of concrete, 6 in. thick, and 5 ft. high, with foundation, 9 in. by 9 in.

For nine houses at Loughborough Park, Eriston. Mr. Aldred R. Pite, architect:—

Suton & Dudley	£5,014 0 0
Cowland	5,257 0 0
Baker & Constable	5,179 0 0
Kilton	5,059 0 0
Manley & Rogers	4,977 0 0
Watkins	4,879 0 0
Riley	4,847 0 0
Johnson	4,105 0 0

For erection of church, at Balderstone, Rochdale. Messrs. Medland & H. Taylor, architects:—

Clay	£9,089 0 0
Ellis & Hinefield	8,317 0 0
Rogers & Booth	8,230 0 0
Bullman & Son	7,668 0 0
Thompson	7,568 0 0
Storia	7,555 0 0
Foggett	7,522 0 0

For four shops at New Swindon, Wills, for Messrs. Pateman, Mr. T. Lansdown, architect:—

Dyer	£2,615 0 0
Wheeler	2,580 0 0
Levyatt	2,617 0 0
Kimberley	2,400 0 0
Newcombe	2,370 0 0
Smith	2,300 0 0
Barrett	2,220 0 0
Drew	2,214 0 0

For four cottages for Mr. Fisher, Swindon. Mr. T. S. Lansdown, architect:—

Wheeler	£807 0 0
Drew, of Highworth	792 10 0
Dyer	725 0 0
Drew, of Chalford	697 10 0
Newcombe	690 0 0
Barrett	659 10 0
Willshire	558 0 0

For re-building the King's Arms Hotel, Swindon. Mr. T. S. Lansdown, architect:—

Wheeler	£1,210 0 0
Dyer	1,200 0 0
James	1,198 0 0
Levyatt	1,183 11 0
Kimberley	1,100 0 0
Drew	1,077 0 0
Frampton	1,000 0 0
Barrett	1,038 10 4
Phillips	1,048 0 0
Newcombe (accepted)	1,025 0 0

For additions to Mr. Sewell's house, Swindon. Mr. T. S. Lansdown, architect:—

Kimberley	£556 0 0
Drew	532 0 0
Dyer	520 0 0
Levyatt	520 0 0
Barrett	479 0 0
Newcombe (accepted)	430 0 0

For erecting stable and coachhouse, for Mr. Grimby. Balls Pond-road. Mr. J. Tanner, architect:—

Easton & Chapman	£290 0 0
Hayworth (accepted)	181 0 0

For restoration of Ashford church, Derbyshire. Messrs. Medland & H. Taylor, architects. Quantities by Mr. H. Bressy:—

Gyts & Thorpe	£1,195 18 5
Brown & Co	960 2 10

For new workhouse, at Edmonton, for the Strand Union. Mr. W. S. Cross, architect. Quantities furnished by Messrs. W. S. & A. Cross:—

Nyers & Sons	£32,865 0 0
Newman & Mann	52,335 0 0
Ball & Russell	51,616 0 0
Wigmore	51,285 0 0
Ball & Son	49,254 0 0
Henshaw	49,050 0 0
Higgs & Co.	48,678 0 0
Tunley	47,645 0 0
Macey	47,322 0 0
Perry & Sons	48,497 0 0
Patman & Fotheringham	48,253 0 0
Gammon & Sons	47,917 0 0
Manley & Rogers	47,809 0 0
Phillips	47,300 0 0
Sewell & Sons	47,280 0 0
Howell	47,045 0 0
Jackson & Shaw	46,388 0 0
Blackmore & Morley	47,200 0 0
Kirk	46,500 0 0
Howard (accepted)	46,000 0 0
Hill, Keddell, & Waldron	45,257 0 0
Cooper & Cullum	44,715 0 0
Hart	43,940 0 0

For a villa residence, and billiard-room, at Eritch, Kent. Mr. H. Ford, architect. Quantities supplied:—

Pritchard	£5,234 0 0
Turner & Sons	5,113 0 0
Serretter & White	5,067 8 0
Crabb & Vaughan	4,931 6 0
Bayes	4,894 17 3
Sanders	4,813 3 0
Kilby	4,806 0 0
Nightingale	4,470 0 0
Francis	4,424 12 0
Clements (too late)	4,648 10 0
Targue	4,504 10 8
Turner (error 106L)	4,462 0 0
Foale	4,314 0 0

TO CORRESPONDENTS.

Chimney Sticks.—Sir: I should feel very much obliged if one of your correspondents would give me the exact measures of the largest chimney stack in Great Britain; its height, largest and smallest outside diameter; and where a description of it can be found. I have found out the height of Messrs. Towns' in Glasgow, from a copy of the *Builder*; but I believe there will be one still higher, either in Manchester or Birmingham. I have, however, found no means to ascertain this.—A. K.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

WANTED, by a thoroughly qualified ASSISTANT, an ENGAGEMENT for three days a week, or to take the Management of an Office. First-class references to present employers.—Address, A. No. 454, Office of "The Builder."

TO MASTER PLUMBERS, PAINTERS, AND OTHERS. WANTED, by the Advertiser, a SITUATION. Well up in general repairs, setting stoves, ranges and copper; roofs (slate or tile), drains, plain plastering, white-washing, painting, &c. First-class references given.—W. G. 134, Bury-street, Great Russell-street.

TO CARPENTERS AND BUILDERS. WANTED, EMPLOYMENT, by a steady young Man, a CARPENTER and JOINER. Has been over six years in the trade. Has a good knowledge of stair-work. Wants not so much an object as a constancy.—Address, W. J. care of Mr. W. Dewhurst, 2, Park road, Battersea.

TO ARCHITECTS AND SURVEYORS. WANTED, a SITUATION in an Office of the above, as JUNIOR ASSISTANT. Town preferred.—Address, A. B. 3, Aldridge-road-villa, Westbourne Park, W.

WANTED, a SITUATION as WORKING FOREMAN of CARPENTERS. No objection to country.—Address, T. S. 15, New Kings-road, Edinboro, Fife.

TO BUILDERS, CONTRACTORS, &c. WANTED, by a WORKING FOREMAN, a JOB, to DO, MAKE, and BURN BRICKS by the Thousand. Good character.—Address, R. H. W. 6, Exmouth-place, W. 1, street, Hackney, N. E.

TO BUILDERS. WANTED, a RE-ENGAGEMENT as OUT-DOOR FOREMAN. Carpenter and Joiner by trade or Work by the Piece. Labour only. Salary moderate. No objection to country.—Address, L. P. 45, Gower-place, Gower-street, London.

TO SURVEYORS TO LOCAL BOARDS. WANTED, by a Young Man, a RE-ENGAGEMENT with the above, to survey, level, and prepare plans for improvements, &c. and to take the office work.—Address, R. D. Office of "The Builder."

WANTED, a RE-ENGAGEMENT, as SHOP FOREMAN, or GENERAL FOREMAN of CARPENTERS and JOINERS, or as Foreman of Works. Has carried out good jobs. Is thoroughly practical and energetic. No objection to working for home. Good references to London builders.—Address, G. K. Post-office, Richmond.

TO ARCHITECTS. WANTED, by the Advertiser, an ENGAGEMENT, Town or country. Cheap. Salary moderate.—Address, J. H. 35, Upper Berkeley-street, Fortin-square, W.

TO BUILDERS, SMITHS, AND ENGINEERS. WANTED, by a thoroughly practical Man, a RE-ENGAGEMENT as FOREMAN of SMITHS, FITTERS, and ENGINEERS. Can make drawings, give estimates, and is well up in all kinds of house work. Has no objection to go abroad. Can give good references.—Address, J. R. 25, Doughty-street, Finsbury.

WANTED, by a thoroughly competent CLERK, a RE-ENGAGEMENT in a Builder's Office.—Address, H. B. 10, Albany, Moore Park, Fife.

WANTED, by an experienced middle-aged Man, a RE-ENGAGEMENT as Out-door or Shop FOREMAN. No objection to the country.—Address, M. E. 226, Colindale-street, Islington, N.

WANTED, a RE-ENGAGEMENT as GENERAL ASSISTANT or MANAGER to a respectable Builder, or as an Estate Office, or as a Broker, or to take a temporary Engagement to make up the books. Locally no object. Unexceptionable reference. Security if required. Wages moderate.—Address, G. L. 2, Harley-street, W. 1.

TO ARCHITECTS. WANTED, a RE-ENGAGEMENT, temporary or otherwise. In a good draughtsman and designer; also well up in perspective, detail, and coloring. Specimens shown. Salary moderate.—Address, L. G. 28, Manchester-street, W. 1.

TO BRICKMAKERS, BUILDERS, &c. WANTED, by a thoroughly practical Man, a SITUATION as FOREMAN and MANAGER of BRICK-FIELDS, or to take at per 1000. First-class references given.—Address, R. A. J. Wellington-street, Slough, Bucks.

TO ARCHITECTS AND BUILDERS. WANTED, by a thoroughly practical and energetic Man, a SITUATION as CLERK of WORKS or GENERAL FOREMAN. Town or country. Good references.—Address, 453, Office of "The Builder."

TO FURNISHING IRONMONGERS, SMITHS, &c. WANTED, a SITUATION as MANAGING or WORKING FOREMAN, by a first-class Mechanic, in the smith, blacksmith, gasfitter, close range, bath, steam, and all kinds of hot water work. First-class reference.—Address, A. E. 10, Victoria-grove, Marshwood-road, Victoria Park, N. E.

WANTED, a RE-ENGAGEMENT as CLERK of WORKS or General Foreman, by an experienced practical Man, who has just completed a Gothic's job of stone. Has a thorough knowledge of estimate, g. measuring, &c. References, &c.—Address, 272, Office of "The Builder."

TO BUILDERS, PLUMBERS, &c. WANTED, by an experienced Man, a SITUATION as PLUMBER and GAS FITTER, or as a three-branch band, in or near London. Reference if required.—Address, F. N. W. 105, Foston-street, Foston-road.

TO ARCHITECTS. WANTED, a SITUATION, by an experienced CLERK of WORKS. Good references and local residence. Well versed in Gothic.—Address, C. E. care of Mr. Farwell, 14, Falcon-road, St. George.

TO BUILDERS, &c. WANTED, by a practical, steady Man, a RE-ENGAGEMENT as SHOP or OUTDOOR FOREMAN, or Charge of a Job: by trade a carpenter and joiner. Has a good knowledge of all the trade.—Address, A. B. 59, Rye-lane, Peckham.

TO MARBLE MASONS AND BUILDERS. WANTED, by a Young Man, aged 18, who has served three years of his Apprenticeship to the Marble Masonry, in consequence of his mother's bankruptcy, to be TURNED OVER. Good references. Can keep books.—Address, R. J. 5, Douglas-street, Vincent-square, Westminster.

TO PLUMBERS AND BUILDERS. WANTED, by a first-class PLUMBER, a CONTINGENT JOB. No objection to fill up time in other branches. Town or country (Town preferred). Good reference.—Address, 278, Office of "The Builder."

WANTED, a RE-ENGAGEMENT as FOREMAN of BRICKLAYERS, or Charge of a Job. Good references.—First-class London firm. Town or country.—Address, A. R. 52, North-tree, Maidenhill, W.

TO BUILDERS, ROAD-MAKERS, AND CONTRACTORS. WANTED, by a first-class practical Man, a Cartwright Taylor, Street Mason, Grant's Dealer (Wood Bricks, Dutch Clunks, or Tiles), to TAKE WORK by the PIECE only. G. of testimonials and references.—Address, JAMES DRITCHLEY, No. 7, Jamaica-place, North-street, Tottenham.

WANTED, by a Young Man, aged 21, a SITUATION as an IMPROVER in the PLUMBING BRANCH. Fill up time with gas-fitting and painting.—Address, ALFRED C. THORPE, 40, Richmond-place, Plumstead, Kent.

TO BRICKLAYERS.—TO BE LET, Labour only, TWELVE HOUSES.—SHAPLEY & WEBSTER, Peckham Rye.

THE Advertiser, aged 21, is desirous of an ENGAGEMENT with an ARCHITECT and SURVEYOR, temporary or otherwise. Has not long since completed his articles with an Architect and Surveyor (London).—Address, TUSCAN, Smith's Library, 7, Wellington-terrace, Edinboro, Fife.

TO CONTRACTORS, BUILDERS, &c. THE Advertiser desires an ENGAGEMENT as FOREMAN. Carpenter by trade; also in keeping accounts, measuring, and estimating. Unexceptionable reference.—Address, Y. Z. Estate-office, Hestley, Surrey.

TO BUILDERS OR QUANTITY SURVEYORS. THE Advertiser, aged 21, is desirous of an ENGAGEMENT with the above. Accustomed to make working and detail drawings, &c. and understands in making up estimates. High testimonials. Salary moderate.—Address, 504, Office of "The Builder."

TOWN or COUNTRY.—WANTED, by a thoroughly experienced Man, a Carpenter and Joiner, aged 40, a SITUATION, as SHOP or GENERAL FOREMAN. Has filled similar situations. Can estimate, take work by the piece, and of a good jobbing business, or on a gentleman's estate.—Apply to ALFRA, Macmillan's Library, King's-road, Chelsea, S. W.

TO BUILDERS AND CONTRACTORS, DECORATORS, &c. THE Advertiser seeks a RE-ENGAGEMENT as BOOKKEEPER, COLLECTOR, or any position of confidence and trust. Thoroughly acquainted with all the duties of the office. Satisfactory reference. Security if required.—Address, 458, Office of "The Builder."

TO ARCHITECTS, BUILDERS, &c. THE Advertiser is open to a RE-ENGAGEMENT as CLERK of WORKS or GENERAL FOREMAN. Good references can be relied on from the largest Builders in London. Town or country. No objection to go abroad.—Address, S. J. 35, Jolter by trade.—Address, H. N. II. care of Mr. Theobald Taylor, 40, Clontarf-road, Edinboro, N.

THE Advertiser is open to an ENGAGEMENT as GENERAL MACHINIST. Can work in any class of saw, moulding machine; can sharpen teeth of circular saws. No objection to town or country. A good reference will be given.—Address, S. D. 5, Westland-street, Walthamstow, Surrey.

TO BUILDERS AND CONTRACTORS. THE CASHIER in a large well-known Building Firm in the City will shortly be at liberty to make a fresh ENGAGEMENT in a similar capacity. London preferred, but country not objected to. Thoroughly conversant with the business. Highest references.—Address, 397, Office of "The Builder."

TO LAND SURVEYORS AND ARCHITECTS. THE Advertiser, an Architect, is desirous of a PARTNERSHIP in the country, where the two businesses may be combined.—Address, 10, Bedford-street, London, W. 1.

TO BUILDERS AND CONTRACTORS. PLASTERING WANTED, by a thoroughly practical Man. Town or country. Labour only. Good references.—Address, 245, Office of "The Builder."

GRAINER, PAINTER, &c.—WANTED, by a Young Man, a CONSTANCY, as above. Has been used to take charge of good work.—Address, stading ways, No. R. E. 1, Park-street, Kensington-grove, S. W.

TO MASTERS, BUILDERS, AND CONTRACTORS. ENGINE DRIVING AND STOKING. WANTED, by a steady, sober, and well-experienced Man, both in stations of portable engines.—Address, D. W. 6, Old Galloway-street, St. Pancras-road, N. W.

EMPLOYMENT WANTED, Town or Country, by a general PAINTER, good at painting, papering, writing, gilding, and gauding.—Address, W. CHAPMAN, 5, Bull-lane, St. Giles, E.

ENGAGEMENT WANTED, by a first-class MACHINIST, to Work (patent or ordinary) General Joint, Trippler and Spinning Machine, Milling Machine, Tearing Machine, Band Saw, or as the Beach. Joiner by trade. Can work the steam machine to considerable advantage, make other tools.—Address, J. H. 35, Jolter by trade.

TO ARCHITECTS. A THOROUGHLY PRACTICAL CLERK of WORKS with fifteen years' experience, is disengaged, and would be glad to meet with an APPOINTMENT.—Address, A. Z. Mrs. PIERCE, St. James's, Strand, E. C.

An experienced GENERAL ASSISTANT, estimating and measuring, is disengaged, and is a thoroughly competent draughtsman and designer for working, detail, or competition drawings. Has had twelve years' experience in the Trade London office.—Address, VIOL, care of Mr. Kelly, Vice Agent, Gray's-inn, Holborn.

TO ARCHITECTS. A CLERK of WORKS, well versed in his duties, with testimonials and references unexceptionable, requires a SITUATION.—Address, Z. 46, Great Chertsey-street, N. W.

TO BUILDERS AND PLUMBERS. A YOUNG MAN is in WANT of EMPLOYMENT as PLUMBER and GAS-FITTER, or as Three-branch Band, 84, per hour. Good references if required.—Address, Y. Z. 5, Little Chertsey-street, Red-bassett, Chelsea.

A FOREMAN of BRICKLAYERS Wants a RE-ENGAGEMENT. Can take the entire charge of any class of brickwork. Well up in setting out and measuring up. Is prompt and energetic. Or will take brickwork, floorwork, labour only, or as a constancy.—Address, 39, St. George's, Metropolitan and Provincial firms as to ability and responsibility.—Address, M. No. 131, Upper Gower-street, Old Kent-road, S. E.

TO LAND AGENTS, SURVEYORS, AND AUCTIONEERS. An efficient LAND SURVEYOR, Draughtsman, and Land Agent's Assistant, of fourteen years' experience, requires an ENGAGEMENT. Aged 23. Good testimonials.—Address, G. 35, Moreton-terrace, Edinboro, road, S. W.

AS CLERK of WORKS, GENERAL FOREMAN, or MANAGER, on an Estate, a thoroughly practical and energetic Man, with a good knowledge of Gothic, ecclesiastical, and modern architecture, and other drawings, estimates, and measure works. Has a good knowledge of Gothic, ecclesiastical, and modern architecture, and other drawings, estimates, and measure works. Has a good knowledge of Gothic, ecclesiastical, and modern architecture, and other drawings, estimates, and measure works.—Address, T. S. 15, New Kings-road, Edinboro, Fife.

A THOROUGHLY COMPETENT and Experienced BUILDERS CLERK desires a RE-ENGAGEMENT. Good manager in the absence of the principal. Age 35. Terms moderate. Unexceptionable references.—Address, J. M. B. Chabot's Post-office, Upper Bayswater-road, Portman-square, W.

TO BUILDERS, PAINTERS, &c. A YOUNG MAN from the country, who has worked several years in Town at gilding, plumbing, and painting, wants EMPLOYMENT. Good references.—Address, S. G. 4, Hildes-street, Westbourne-road, Bayswater, N.

TO ARCHITECTS, &c. A FRENCH Gentleman, late Assistant to M. VIOLETTE-LE-DU, references to whom are permitted, desires an ENGAGEMENT at HOME to prepare Working Drawings and Design. Outline, colour, &c. Large experience in the Gothic. Address, R. OMBRETT, care of St. Albert-street, Regent's-park.

A YOUNG MAN wants a SITUATION in a Jobber's shop as IMPROVER. He has been used to good work.—Address, A. W. 35, Talbot-road, Bayswater.

A FIRST-CLASS DRAUGHTSMAN and SURVEYOR is open to an ENGAGEMENT.—Address, DIGRAMA, care of Mr. Laxton, Bookseller, Duley.

AS IMPROVER.—A Young Man, having just finished his apprenticeship as carpenter and joiner, wishes for EMPLOYMENT in a respectable building firm.—Address, T. S. Annesley-street, Upper Bayswater.

TO CIVIL ENGINEERS, ARCHITECTS, AND BUILDERS. AN ASSISTANT, capable of making neat Working Drawings, Tracing, and Writing; having also a Knowledge of construction and design in Italian and Gothic, desires an ENGAGEMENT.—Address, 150, Office of "The Builder."

TO ARCHITECTS. A GENTLEMAN, aged 35, requires a POSITION of TRUST in the Office of an Architect. Is an experienced draughtsman, and has had a long and varied career. Terms moderate.—Address, R. S. care of Mr. Jennings, Stationer, North-end, Croydon, E.

TO IRONMONGERS, STEAM, AND HOT-WATER HANDS. THE Advertiser WANTS a SITUATION as above. Is well acquainted with close ranges and the work. Town or country. Good references.—Address, 150, Office of "The Builder."

TO ARCHITECTS AND SURVEYORS. A COMPETENT ASSISTANT desires a RE-ENGAGEMENT. Can prepare finished, perspective, and detail drawings, &c. and is accustomed to the regular routine of office work.—Address, 455, Office of "The Builder."

TO BUILDERS, CONTRACTORS, AND OTHERS. AS TIMEKEEPER, STOREKEEPER, or JUNIOR CLERK, a Young Man, aged 23. Has just completed an extensive contract on the banks of the Thames, and has had good experience on railway and other works, where large numbers of men have been employed.—Address, A. B. 35, Clifton-road, Grove-street, Milland, E.

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The Builder.

VOL. XXVII.—No. 1359.

Miss Coutts's Market, Bethnal-green.



DOZEN years ago and afterwards, the conductor of this journal described the condition of Crab-tree-row, Bethnal-green; Nova Scotia-gardens, and other parts of the neighbourhood. In Nova Scotia-gardens was a mighty mound of refuse, of which a view was given.* Afterwards Miss Brdrett Coutts, prompted by head as well as heart, became possessed of a considerable tract of the land there; erected first some large blocks of buildings, divided into residences (which, we may say, in passing, are fully tenanted); and more recently has formed a market, with surrounding shops and costly market-hall. With a view to this, powers were granted by Parliament in 1866 to make a new leading thoroughfare, 40 ft. wide, and to improve Crab-tree-row,

the existing south thoroughfare, both communicating directly with the Hackney-road.

The buildings, designed by Mr. H. A. Darbishire, were begun in May, 1864, and are now so nearly completed that the market will be opened for business by a public ceremonial in May or June. The works, we may at once say, have been exceedingly well performed by the firm known as Messrs. W. Cubitt & Co., Mr. Wheeler being their representative on the spot, and Mr. Weller the clerk of works.

The objects Miss Coutts has in view in establishing the market are to supply the surrounding poor with wholesome food at a fair rate; to bring the producer and consumer into closer communication with each other; and to promote habits of industry and thrift among the humblest class of traders. To secure these objects it is intended that the wholesale dealers shall be selected from those who have already established a position and character for respectability in other markets; that the shops shall be occupied by farmers or their agents, who will be their own esleemen, and thus free their customers from the penalties inflicted by their dealing with the middleman; and, lastly, that the costermongers and hawkers shall have the option either of selling in the open market-square, seen in the plan we give, or of hiring their barrows and carts from the market stores upon such terms as will secure to them a better profit than that which they now receive on their hard day's work.

Another object was considered desirable, namely, the provision of better lodgings for City clerks, who complain with reason, that while model dwellings are provided in various parts of London for the working classes, they are still left to the discomforts and expenses of inferior lodgings, far away from their daily occupation. It was thought, therefore, that their interests might be advanced and an important want supplied, if a certain number of convenient dwellings were provided having private entrances and other arrangements which should render them entirely independent of the traffic of the market.

These residences occupy the wings which flank the east and west buildings, and they are arranged in flats. It is thought not unlikely that an entire wing may be taken by one City firm and re-let to its principal assistants.

The market is situated between New-street and Crab Tree-row, close to Shoreditch Church. These thoroughfares bound it on the north and south, and two private roads connected with them are its limits on the east and west. The space thus enclosed is nearly square, and covers about two acres.

The plan, it will be seen, consists of four blocks of buildings with arcades, surrounding an open quadrangle. The buildings, which occupy the east and west sides of the quadrangle, are similar in design, and are each 210 ft. long by 45 ft. wide. They each comprise six shops and two wings, flanking a central archway leading to the quadrangle.*

The shops are four stories high, including their basements. Their accommodation consists of kitchen, cellar, store, and closets in the basement; shop, parlour or office, and private entrance on the ground-floor; and sitting-room and four bedrooms, with closets, &c., on the two stories above. They are intended for first-class dealers. The wings are four stories high, exclusive of their basements, which are cellared for market purposes. One wing is occupied as a tavern, and the others are intended as residences for clerks, as already referred to. Each residence occupies a separate story, approached by a common staircase, and contains parlour, kitchen, scullery, store, closets, and four bedrooms. The residences in the east building are called "Georgina Gardens" those in the west building, "Angela Gardens;" the former look over Columbia-square; the latter over an ornamental plantation of plane trees and flowering shrubs.

The central archway, which leads to the quadrangle, has stores and cellars in its basement, and a suite of rooms above, intended, like those in the wings, as a residence for clerks and tenants of the same class. The third or topmost story is carried up as a tower, and contains large filtering cisterns, which supply the entire building with water.

The tavern occupies the entire north wing of the east buildings, and contains in the basement—kitchen, scullery, larder, cellars, stores, &c.; on the ground-floor—coffee-room, bar, two parlours, public and private entrances; and on the two upper floors—first and second class bedrooms, &c. Near to this, still further north, is the Watchman's House, with public closets and stopping places.

The buildings which occupy the north side of the quadrangle consist of the market-hall, the corridors affording access to the quadrangle from the market-yard and New-street, and the staircases leading to the several basements and vaults below.

The hall, of which we give an interior view,† is only one story high, exclusive of its cellars. It measures within the walls 104 ft. in length by 50 ft. in width, and is 50 ft. in height. Its length is divided into seven bays by clustered granite

pillars (Aberdeen and Peterhead) 2 ft. in diameter and 35 ft. high from the floor to the top of their capitals, which are of bronze and of varied design. Each cluster of columns is bound together by bronze bands at certain heights, four in number. From the capitals spring the moulded ribs of the roof, which is groined throughout with pitch pine. The space in the centre of the hall, affording an area of about 2,600 superficial feet, will be unobstructed by fixtures of any kind, as it is intended for the accommodation of small dealers, but in the aisles, immediately behind the pillars, are ranged twenty-four small shops, 13 ft. deep, 6 ft. 9 in. wide, and 8 ft. high each, supplied with office containing fireplace, desk, &c., and furnished with sink, counter, and other fittings necessary for the sale of meat, fish, and poultry. They are lined on all sides with polished Irish marble. These are intended for second-class dealers. Above the shops are galleries, each affording an area of 676 superficial feet, for the sale of flowers, roots, and fruit, and these are approached by staircases adjacent to the principal entrances of the hall. The hall is lighted on all sides by large mullioned and tracery windows, which extend from a few feet above the galleries to the groining of the roof with which their heads are concentric. Two compartments in each window are furnished with casements, which are made to open outwards for ventilation. The building has four entrances: that on the south side, fronting the quadrangle, is the most important, and consists of a groined porch of considerable depth, forming the lowermost stage of a clock-tower and heltry, which rise to the height of 115 ft. above it; two entrances lead from the corridors at the ends of the hall, already mentioned, and the fourth is on the north side leading from the market-yard and New-street. Its basement story contains twenty-six cellars, situated on either side of a central passage, 7 ft. wide, which traverses it from end to end, and communicates with two staircases leading from the corridors and entrances in the market-yard above. This yard covers about 8,000 superficial feet, and, though connected with the central quadrangle is independent of it. In it carts will unload, and most of the wholesale business of the market be carried on, so that the retail traffic which, from the character of the neighbourhood is likely to be the most important, will not be interfered with.

The buildings occupying the south side of the quadrangle, and fronting Crab Tree row, are of the same length as those on the north side just described, viz., 160 ft. Their width, however, is nearly uniform, and does not extend beyond 35 ft. They consist of a gate-house and two arcades, connecting it on each side with the east and west buildings.

The gate-house is three stories high, exclusive of its basement, which is cellared for market stores. On the ground story a lofty archway, with ornamental iron gates, forms the principal approach to the quadrangle, and leads to a public and private staircase connected with the upper floors: the former communicates with the market-office on the first floor; the latter is for the use of the clerk of the market (Mr. Russhent), who occupies the floor above.

The arcades on each side of the gate-house are only one story high. They are intended for dealers of the third class, or those who do not require the accommodation of a shop. The area of each is 2,275 superficial feet. On the side towards Crabtree-row the arches are furnished with very handsome folding iron gates, which double back, so as to clear the openings during the day, and serve as efficient protection when the market is closed at night. Each arcade is supplied with a granite washing fountain, 6 ft. in diameter, and contains eighteen stores for vegetables in its basement.

The central quadrangle which is surrounded

* A view of the West Elevation, and a plan of the buildings, will be found in our volume for 1869 (xvii. pp. 786, 787).

† See p. 147.

* See also "Town Swamps and Social Bridges," by George Godwin, 1859.

by the four blocks of buildings above described occupies an area of about 14,000 superficial feet. It is paved with a bluish-coloured granite divided by lines of red granite into spaces 6 ft. square, which are intended as stations for dealers of the fourth class, or those who require the least accommodation for the sale of their goods. A large lamp, surrounded by four granite washing-basins and hydrants for the supply of water will occupy the centre of the quadrangle. Underneath the whole area are vaults 11 ft. high, communicating with the market-yard by staircases near the hall. These have been so arranged that they may be let to wine merchants, brewers, and others, and they now wait for tenants. Lighted up with gas, they present a remarkable appearance. They are constructed with iron uprights, carrying iron girders and brick arches. The surface above is formed with concrete, asphalt, and paving.

It will be seen from this description that the market buildings have been designed to meet the requirements of five different classes of occupiers, viz., clerks, who will occupy 14 residences in Angela and Georgina Gardens; first-class dealers, who will occupy 12 large shops and residences in the east and west buildings; second-class dealers, who will occupy 24 small shops and offices in the market-hall; third-class dealers, who will occupy 9,850 superficial feet, apportioned into 273 spaces, 6 ft. square, on the ground floor, and in the galleries of the market-hall, and in the south arcades; and, lastly, fourth-class dealers, who will occupy 14,000 superficial feet apportioned into 400 spaces 6 ft. square in the central quadrangle. The rent at present asked for each shop, with office in the market-hall, is 10s. a week. The rent of the houses east and west of the quadrangle, each comprising a shop and nine rooms, is 52l. 10s. per annum each. Several of them are occupied.

The buildings are enriched with carvings and details characteristic of the style prevailing in the early part of the fourteenth century. Their construction is substantial. The walls are of yellow brick, terra cotta being employed for their external angles and for much of the moulded work of the doors, windows, and arcades. All the copings, strings, oills, cornices, capitals, traceries, and carvings, which are exposed to the weather, are of Portland stone. Granite pitching is employed for paving the private roads and large open spaces. Yorkshire stone is used for all corridors, footways, and internal passages, and plain tiles serve for kitchens, sculleries, and minor offices. The roofs are covered with Cumberland slates of a green colour. Almost all the external woodwork, such as the top story of the turrets, is executed in teak.

The endeavour here nobly made to establish a market, and to bring order and elegance, as well as economy and comfort, into the midst of poverty, squalidness, and misery, deserves the warmest wishes of all who are interested in the improved condition and welfare of their fellow creatures. We sincerely hope that it may be as successful as its admirable founder can desire. Much will of course depend on the means which exist for the supply of the market.

THE TERM "ARCHITECTURESQUE."

The claims of the new word "Architecturesque" to a place in our language, with a well-defined meaning attached to it, have now been urged with such fluency, force, vivacity, and ingenuity, that a student of the vicissitudes of language generally may well watch with interest the fortune that awaits it. Many will be curious as to the result of its struggle for existence who do not feel called upon to interfere actively with the conditions of the contest. Will it make good its ground as effectively as the officially sanctioned *telegram*, or will it share the fate of *vicissitudes*, which seems to have been strangled in its birth,—a word that would have had a better chance of life had its originator not missed its applicability,—supposing, as it would seem, that "vicissitudes of fortune" only mean "persistent neediness" in which case "necessitous" would have served his turn equally well?

For a new word to gain currency with welcome and advantage, it must happily meet a want,—supply usefully and agreeably a defect of language; the word must be demanded to furnish a new name for a new thing,—as in the case of *telegram* or *hangaroo*,—or a name for a thing which, however old, has inconveniently been destitute of a name. Who will be the benefactor to endow the English language with a word that

will signify either brother or sister indifferently, as "child" is applicable to either son or daughter? A new word may be required to take up the duty of an old one that by accident or abuse has become "ill sorted," vulgarized, or, to share functions with another word as a synonym of contrasted sound, and useful therefore in conjunction with a varied set of words, or supplying relief to the ear when otherwise repetitions are inevitable.

In any case, if the purpose of the new word is to be effected happily and agreeably, it must be elegant, expressive, unequivocal.

"Architecturesque" is proposed as the title of that quality by which a structure has claim to be an example of fine art and artistic effect, and so to be distinguished from a mere building. On the ground of elegance, and agreeableness of sound, there can be no objection—seldom, indeed, can there be to any word that directly affiliates on a language so fastidious in its laws of sequent consonation as the Greek. The question whether it can be held strictly and unequivocally to the meaning it is proposed to express presents itself somewhat differently.

To any word that does not present itself as—*intus et in cute*, "hido and hair o't"—a complete new coinage, meanings and reflections of meanings will cling that it hovers an uteror thereof to take wary account of; meanings and shades of meanings that depend upon its relationship to antecedents, competitors, analogues—in a broad way of stating it—on its history and its derivation. In the present case there can be no uncertainty or cavil as to the main stem of the word, but everything turns upon the analogies of its termination, which has a root meaning of its own, and its historical accretions of association equally.

The tenacity with which the original meaning of a root will hold on to a derivative and influence application long after it has ceased to have an independent existence, is one of the guiding principles of the etymologist. Thanks to this principle, words can be used with the strictest accuracy by those who are perfectly ignorant of their derivation, and the hospital nurse has as definite an idea of a "paroxysm" as the M.D. Cantab. to whom she reports its manifestation; and tradition would no doubt accurately carry down the application, though the traditional derivation should be lost. It is on the strength of this fact that an uncertain root is confidently verified only by consentient habitual associations. Derivation corrects use in such a case as "paroxysm," but in a dispute as to such a word as "buoyancy" we must inevitably fall back upon the leading notion in popular usage to determine between one or other of the derivations in the languages through which it may be tracked. Diverge a word or a characteristic termination of such associations we cannot; such nature we vainly shall endeavour to repel under any penalty whatever: the penalty will be braved, he incurred,—but nature will be recurrent.

How stands it then with "architecturesque" and its congeners; we have the artistically analogous, Pictorial and Picturesque, Sculptural and Sculpturesque, and why not then complete the ternary by Architectural and Architecturesque?

Reason there is none whatever, but a condition most stringent: this is no less than that the new word shall complete a pair analogous in their relationship to the pairs that are in established acceptance; for these it will scarcely be sufficiently strong to fight with,—to thrust into disuse or altered use, or to resist in their conjoint determination to enforce it to conformity.

Thus, new as the word "architecturesque" may seem, we are soon made conscious that we are not exactly free to consider what meaning we shall resolve to attach to it; we are indeed much less so than enforced to consider what it means independently, what sense it will inexorably assert for itself, and by hereditary right and by the vigorous aid of its natural kin and alliances compel us to allow or to take the alternative of leaving it alone.

The terms "picturesque" and "sculpturesque" conform with true fraternal loyalty. We do not speak of a painting as picturesque, nor of a group in marble as sculpturesque; these qualifying terms apply to the subjects of the respective arts, not to the works, in which justice even the most worthy has been done to the most appropriate subjects. Nay, even with reference to subjects, we describe them in such phrases rather perhaps from a sense that they in a manner simulate the effects of the respective

arts than as lending themselves most aptly as models. We may say of a child that she is a picturesque little being,—of a district of country, that it is marvelously varied and picturesque,—and yet be disinclined to carry our sketch-book to the hills in one case or to recommend the girlish face we so admire for a fancy picture. There is no inconsistency: the subjects in either case are picturesque because they comprise not only much that a painter would value in a subject, but a semblance moreover of much of the peculiar treatment he would be expected to superinduce; a semblance, not a completion; a commencement so far advanced as to hamper him, not so far nor so purely as dispense with that air of pervading originality that must spring from a germ of true artistic thought, and govern selection throughout and treatment absolutely.

It is thus that experiments with models that are originally too picturesque rarely succeed. If a well-bearded mendicant is transferred to the studio to be ennobled on canvas as a hamished lord, he will be likely but ill to become his elevation, unless the painter has known how far to recast his features by the suggestions of the ideal that but little likeness of the original picturesque remains. A landscape of high pictorial capabilities is one thing, a highly picturesque landscape is another; preference for a subject of the latter class would not prepare us for recognizing pre-eminently in the finished work the qualities which should essentially determine it as a work of art.

Picturesqueness is thus not the best quality of a picture in a picture, but the guarantee of some striking characteristics of a picture in what is not,—perhaps ought not to be, or could not possibly be,—a picture. The sculpturesque has exactly the same relations to sculpture; if sculpture is sculpturesque, it is not something more, but something less than truly sculptural, and the term therefore could only be applied in disparagement, and better not at all. The terms become truly applicable and useful only when we would indicate defects, or at least characterize some of the less legitimate modes in which the genius of one art makes inroads upon another. The Nightingale monument of Rouhiliac is rather picturesque than truly sculptural, yet who desires a transference of the subject actually to a picture? On the other hand, the processional triumph of Andrea Mantegna is rather sculpturesque than pictorial. What picturesque language implies is understood by all, and even here the antithesis to sculpturesque would hold, if we compare the characteristics of florid Ciceronian eloquence with the nerve of Demosthenic.

The contrast might be further pursued between picturesque architecture and architecture that is sculpturesque; but that we may more appropriately inquire now how far reciprocity of antithesis applies to architecturesque. There is little question of bow we may apply the term, but very much indeed of how we must. A view down an avenue of tall straight trees meeting at very regular height overhead, with gracefully-curved branches, reminds us necessarily of architecture; the same is the case with a defile between walls of rock marked with very level lines of stratification, and overhanging in parts with ledge-like projections; such views are assuredly not architectural,—are they not as assuredly architecturesque? Does not the word lend itself, impose itself as descriptive by all the analogies of its derivation, to aid in specifying, not architecture, but what is like architecture,—not art in its best realization, but art that is hinted at— at most mimetic intimation of art in natural accidents? The word thus accepted on its own conditions seems a good word, and susceptible of large application. We have spoken of the possibility of qualifying eloquence as sculpturesque, in some other forms where the flow of invention is dominated by an exact observance of balance, by regularity of subdivision, by scrupulously proportioned members—exordium, peroration, and so forth, we might with at least equal appropriateness—always assuming some worthy dignity pervading the whole, qualify it as architecturesque. Sculpture becomes architectonicsque in the caryatides of the Erechthium, unless we say that it is architecture that becomes sculpturesque. Where shall we recognise an example of painting that can fairly challenge the title "architecturesque?" What pictures have the semblance of architectural almost as much as of pictorial works? The built-up scenes of a theatre, or such combinations of modelled perspective and background as the Olympian Theatre of

Palladio, perhaps claim the title less appropriately than more proper pictures, which, like the "Last Supper" of Leonardo da Vinci, but with expression more hardened, are designed with a certain strictness of symmetrical formality, for the direct purpose of blending harmoniously with symmetrically-arranged architecture around. In this sense many of the vast paintings of Paul Veronese—as the "Marriage of Cana," now in the Louvre, or others somewhat smaller, as his fine reflecting picture at Vicenza—may be appropriately styled architectureesque. Can we again find another term,—can we find a better,—for the characteristic style of the sculpture of the Parthenon, in so far as it is modified with direct intention to relieve the rigidity of architectural lines, and to combine harmoniously into balanced masses responsive to architectural symmetry, than the architectureesque?

In what sense, then, architectureesque will insist upon being used, if it is used at all, appears pretty clearly: it is decided by the foregoing precedents of common usage, and will persist in spite of whatever ingenuity of argument or remonstrance, whether soft or vehement: usage has taken firm hold of the family of vocables it pertains to, and will not revolutionize its code to accommodate a claimant that has a fair enough position, as matters stand, to thrive in currency—

— ut vult usus

Quem pene arbitrum est, et ius, et norma dicendi."

There is then most certainly a common notion that clings to the common termination *esque*, as qualifying an adjective, and whether this has no deeper roots than the established and possibly accidental habit, of which we have seen the strength, or has spread from an original germ of consistent derivation, matters not much. So far as the analogies of language present themselves to not very deep research, they are all in favour of established usage. The termination comes to us along with many words imported from Italy by the route of France,—as *pittoresque*, *pittoresco*,—grotesque, *grotesco*,—burlesque, &c.; and it seems in these combinations to be at almost equal distance from Teutonic forms on the one hand, and Greek on the other. The Greek diminutive *iscus* appears in such words as *asterisk*, a little star; *obelisk*, a small, a fine spit; *Paniscus*, a little Pan,—such a companion as trots through Titian's picture dragging a calf's head by a string; the relation seems to be to *iskos*, to make like,—and beyond that again to *iscos*, "equal" or "like." Likeness, however, has seldom to be adverted to without an intimation of characteristic tendency, as among others, of aspiration neither vain nor ignoble, as when we say godlike, manlike, or manly, the same word; or of futile imitation, as when Rosalind talks of "mannish" towards,—

"That do outface it with their semblances."

The termination *ish* in English (= Anglo-Saxon *isc*), carries with it usually along with likeness the implication of disparagement,—first in respect of magnitude or degree, and then of moral value. There could be little mistake if such gibberish—this word itself is an illustration—were permissible, how much less than a compliment would be implied by picturish, sculpturish, architecturish. The termination *esque* scarcely escapes from some shade of like imputation; the thoroughly architectural word *Romanesque* at least can only be understood as antithetical to Roman, as significant of Roman with a difference in the direction of the corrupt and provincial, if not absolutely debased, in the first instance; an embossed Romanesque style developed itself, no doubt, at last; but then it becomes entitled to be distinguished by a new name from the corrupt Romanesque and from the Roman also.

There are ethnological as well as etymological secrets latent in the form *English*, which here we can only commend to the study of those whom it may concern. As regards our proper subject, the conviction, after whatever fluctuations due to the ability of the advocate, comes back decidedly enough at last, that architecture on the whole may be well content, even at her very highest flight, to remain architectural. If there is any cognate term whatever that she might be excused for passing upon as an alternative expression for the noblest quality of her noblest aspirations,—achievements,—it is that Architectonic that both Aristotle and Plato have recourse to when they would characterise the function of organizing energy in its most dignified social exercise. But here, again, the appropriation is made and cannot be set aside,

and the authority of Peripatetic and Academician apart, the analogies of language are as decisively exclusive of the Architectonic as of Architectureesque.

ON THE FUTURE EXTENSION OF THE RAILWAY SYSTEM.

At an ordinary general meeting of the Institution of Surveyors on February the 8th, Mr. John Bailey Denton read a paper on this subject with special reference to the influence of railways on landed property and agriculture.

Earnestly (he said in the course of it) as I advocate the internal improvement of landed estates, I may at once state that, in a commercial sense, I consider that there is no improvement so economical to the landowner as that which railways secure. Whether we regard them as a means of raising the rental or income from cultivated land or woodland, or from minerals, upon which the fee-simple value may be calculated by pure arithmetic, or view them as a means of enhancing the residential enjoyment, or developing the capabilities of estates, the return from which is neither so positive nor simple, it cannot be denied that the selling value of rural property, when brought within the full influence of railway communication, is raised at least 10 per cent. above what it was in its former state; supposing all other things to be equal, and viewing this rise in connexion with the means by which it has been hitherto obtained, the advantage stands in bold relief above all other estate improvements. This statement has been confirmed by some of the first authorities in the country, who have, however, always qualified their opinions by explanations pointing to the differences which necessarily regulate results. [Some of these opinions Mr. Denton read.]

Many authorities have kindly supplied me with corroborative evidence, showing that the improvement which landowners gain from railways, in one way or another, varies from 5 to 20 per cent., or from one and a half to six years' purchase, according to the proximity of station, and the character and amount of accommodation afforded. It may hardly be necessary to adduce to you evidence of the advantages which railways afford to the owners of rural property, though, as they have now come to a complete stand-still and can only be revived by the action of land-owners themselves, it may be well to make prominent a few facts and figures which may draw attention to the object.

The first Railway Act authorized for the conveyance of passengers was passed in the year 1825, more than forty-eight years ago. It was from Darlington to Stockton-on-Tees, and it was upon this railway that George Stephenson first introduced the steam locomotive, for the working of which powers were given by an Act obtained in 1825. The population of England and Wales in 1825 was 12,000,236, and Mr. Porter, in his work on "The Progress of the Nation," estimated the number of persons who travelled daily, by coach and like conveyances, at 82,000 in the whole of Great Britain. The population of England and Wales, to which it is desirable to confine our attention at the present moment, is estimated by Mr. Foulhanque, in his Report to the Board of Trade on Agricultural Statistics, to be 21,649,377, which shows an increase of 80 per cent. in forty-eight years, while the desire for travelling has increased at a much greater ratio than the population itself. The number of persons who travelled in England and Wales in 1867 amounted to 250,598,982, exclusive of season-ticket holders, who numbered 84,418, many of whom travelled twice a day for six days in the week, raising the daily average, according to the *Quarterly Review*, to 850,000, or upwards of ten times as much as Mr. Porter had represented to be the travelling population in the whole of Great Britain before railways existed. To comprehend the magnitude of these figures, it should be stated, that the result is equal to a journey by every man, woman, and child, in England and Wales, fifteen times in the course of the year.

From these facts, it can be well understood how the competition for land, and the demands for country occupations, are on the increase, and, as a necessary consequence, how the value of rural property has advanced to the amount stated. The desire for living in the country, while engaged in the businesses of towns, is shown by the annual Board of Trade

returns, to be vastly increasing with all professional men and tradesmen; and the suburbs of all our large towns are, consequently, extending in a manner to surprise the most sanguine advocates of railway enterprise, and explain how land, within a moderate distance of towns, has been raised from an agricultural value, calculated by tens of pounds per acre, to that of building and accommodation value, which hardly stops at hundreds.

All classes of society now connect their town life with country occupations, and many of our legislators, peers, and commoners, evade the expense of a house in London, and run up from the country with the members of their families, whenever Parliament, court, or fashion calls them thither. It is much the same with the merchants and tradesmen of Liverpool, Manchester, Birmingham, Bristol, and all large towns. For a distance of from 15 to 20 miles the suburbs of this metropolis extend, and to get to business in London for the day, and back to the country for the night, have called into existence regular services of trains which make this amphibious sort of life easy of existence. In the morning there are those trains to arrive in London at 9 o'clock for the "early birds," those at 10 for the "daily breads," and those at 11 for the "lazy dogs;" and in the evening there are corresponding trains which deliver the "early diners" at home at 6, the "late diners" at 7, and the "snapper passengers" at 8 or 9 o'clock.

On this point the Registrar-General tells a pithy truth. He says, in his Report for the year 1867, that "the population within the registration limits is, by estimate, 2,995,513, but beyond this central mass there is a ring of life growing rapidly, and extending along the railway lines for a circle of 15 miles from Charing-cross. The population within the circle patrolled by the metropolitan police is 3,463,771." If these figures apply truly to the neighbourhood of London, and only in a less degree to other large towns, it is unnecessary to show how railways, having converted agricultural into suburban land, bring the more backward farms into a forward position, and thus equalize the character of properties, and raise the value of the whole. These figures, in fact, fully support the opinions I have quoted from our leading authorities, as to the extraordinary increase in value of building and accommodation land, and the less but certain improvement in farming land. To appreciate, however, the full benefit which railways confer upon agriculturists, we must again have reference to Mr. Foulhanque's recent agricultural statistics, published by the Board of Trade, by which it appears that the total number of live-stock in England and Wales was, in the year 1867, as follows:—

Cattle	4,013,564
Sheep	22,025,498
Pigs	2,778,672

By comparing these figures with those given in the returns furnished by the railway companies to the Board of Trade of the same year (1867), representing the number of live stock that travelled by railway in England and Wales, we find the following results, which would almost lead us to question the accuracy of the figures I quote. First, it appears that the total number of neat cattle that, in spite of the restrictive influence of the cattle disease, travelled by railway was 2,310,368, which is equal to more than half the total quantity possessed by the farmers of England and Wales; second, that of sheep, 7,171,412 travelled, which is equal to one-third of the whole number of sheep they possessed; and, third, that of pigs there were 1,389,582, which is as nearly as possible equal to half the number that belonged to the farmers when the returns were made to the Board of Trade.

Of course, it should be understood that in these railway returns are included all the animals imported from foreign countries, as well as the native stock which move from one part of the country to the other, and sometimes make two or three movements in a year.

As a set-off to advantages from railways we often hear of the loss of land to agriculturists, which results from the absorption of the quantity taken up by them. According to the most recent returns, the number of acres already purchased by railway companies for authorized lines open and not yet open, in England and Wales, is 121,120 acres and 37 poles. This quantity does not, however, include all the lands in the country which railways have absorbed

but only those of which the directors have made returns to the Government. The omissions form but a very small proportion. It is probable, therefore, that the total acreage in England and Wales, when the omissions are supplied, may reach 130,000 acres. This quantity includes the land in towns and enburbs. It would not be far wrong to assume that 100,000 acres have been absorbed by the railways made and making through rural districts alone. This quantity is arrived at thus:—the length of lines already opened in England and Wales is 10,037 miles, and the quantity of land per mile has been ascertained to be 12.97 acres. Of this length I estimate that one-fifth, or, say, 2,037 miles, has passed through towns and suburbs, leaving 8,000 miles as the length passing through rural districts. If we take 12 acres per mile, including village stations, as the average mileage quantity through rural districts, 96,000 acres will be due to the 8,000 miles, to which 4,000 acres may be added for lines making. Now, if we compare these 100,000 acres with the waste of land which exists all over the country, we shall see how insignificant it is. It is not many years since it was the practice with surveyors to allow 1 acre in 16 as a loss in cultivated farms, of average condition, arising from waste in hedges, farm roads, balks, &c., and what we now consider slovenly farming. This loss, however, is now yearly becoming less, and may average 1 acre in 20, instead of 1 in 16.

The total quantity of land under crops, bare fallow and grass, in 1867, was, according to Mr. Fonblanque:—

In England	29,982,366
In Wales	2,415,139

Making a total of ... 25,347,495

Now, if one-twentieth part of this quantity, which is 1,267,375 acres, is still wasted, or lost to cultivation, it follows that there is twelve and a half times the space occupied by railways, a great part of which is within the power of the farmer to recover and make productive, though, at the present moment, it is producing nothing. Thus the agriculturists of England and Wales have only to save from waste less than two-fifths of an acre in every 100 acres they occupy, to make up the quantity which railways, so essential to the commerce and comfort of our common country, have taken from them.

Having disposed of this drawback, there can but remain one general acknowledgment of the vast benefits which railways have conferred upon all branches of industry; yet in spite of this there seems to have been no limit to the demands which have been made upon railway shareholders, whereby the amount of money actually applicable to works has been reduced to a minimum, and the cost of use and maintenance raised to a maximum.

The reader then traced the causes of the present stagnant condition of railway enterprise, dividing them under the following heads:—

1st. The heavy Parliamentary expenses which have been inflicted on all railways, more or less.

2nd. The excessive cost of land.

3rd. The heavy cost of railway works and maintenance, and the wasteful mode of raising capital.

Under the first head he said,—Putting these more flagrant cases of waste out of view, it may serve our present purpose if I give the particulars of certain lines, which, by the courtesy of the secretaries of the several companies interested, I am enabled to do. The figures they present may be accepted as a fair sample of what railways through rural districts have hitherto paid in Parliamentary expenses, although it will, no doubt, be objected that the lines specified bring into communication certain large towns, and, therefore, cannot be strictly called "rural railways." To meet such objection I have endeavored to get the same information respecting lines which are indisputably and wholly rural, and, although I have not obtained figures I can precisely quote, I have ascertained that in most cases they have been made bones of contention between large opposing companies claiming the territory they traverse; and that though conceived by their promoters in the chivalry of competition or independence, have almost invariably become the property of one of the contending large companies, after causing an expenditure of which the average mileage amount would probably be found to be even greater than that which the following tabulated railways expose:—

Name of Railway	Length in miles.	Acres per mile.	Total acreage.	Total outlay of capital.	Parliamentary Expenses.			Land for Line.		
					Total cost.	Cost per mile.	Cost per acre.	Total cost.	Cost per mile.	Cost per acre.
Furness Railway... Manchester, Sheffield, and Lincolnshire	93	15	1397 0 0	2,523,365	£. 68,870	630	£. 42	159,233	1,712	£. 114
North Staffordshire (pt.)	249	11½	2804 1 22	12,373,978	628,690	2,555	224	827,015	3,362	295
Whitehaven, Cleator, & Egremont	123	12	1476 0 0	6,266,274	141,172	1,148	95	658,388	5,353	416
Cockermouth, Keswick, & Penrith	21	9½	200 0 0	335,000	5,740	273	28½	49,845	2,373	222
Maryport and Carlisle	31½	7½	237 1 30	322,967	3,850	124	16	50,500	1,629	239
.....	38	12½	487 3 13	707,705	15,070	397	31	84,064	2,228	173
.....	5524	—	6692 2 28	22,565,289	853,101	—	—	1,729,645	—	—
Average on the whole	—	12	—	40,879 per mile.	—	1,546 per mile	129 per acre.	—	3,133 per mile.	262 per acre.

The acreage is obtained from the Board of Trade Returns, and the outlay from the Secretaries of the different Railway Companies.

If, as I am disposed to assume, these lines of railway convey results fairly representing that part of the existing railway system which we have now in view, it would appear that the outlay in Parliamentary expenses has been, on an average, 1,545l. per mile, which, for the 8,000 miles I have considered was the extent of the railways made through rural districts in England and Wales, up to the end of 1867, would amount to 12,360,000l., of which the 12,000,000l. at least would have been saved if the Legislature had adopted, in the first instance, that course which every one now admits would have been the best, of investigating, through a competent medium, the requirements of districts, and have predetermined the position of those railways which were necessary.

Cost of Land.—With respect to the outlay in the purchase of land, I am able to give a few more particulars, in consequence of having been very kindly assisted by the secretaries of several of the railway companies and by many of the members of this Institution, who have had large experience in railway purchases. The following tabulated statement exhibits past experiences in the purchase of several lines, which will serve as an index to the remainder. In most cases the acreage cost includes surveyors' charges on both sides, but excludes the solicitors' costs of conveyancing:—

added for severance and compulsory sale. The readiness with which landowners will sell their land at a very moderate cost, or even give it, for railways, if they cannot get them without, quite sanctions this assertion. In the Isle of Angelsea the land for the Central Railway, eighteen miles in length, was purchased for 5,000l., and this was done by the secretary himself applying to the landowners before any other steps were taken. Again, the land for the Ringwood and Christchurch line, 7½ miles in length, was purchased for 1,200l., or 15l. an acre; and at this moment the greater part of the land for an extension in North Devon is very wisely offered for nothing, if by such means the parent company can be induced to make it. I cannot give many instances of this sort, for, unfortunately, though great professions of liberality have frequently been made to induce the promoters of railways to make them, directly an Act has been obtained for the purpose, legal reasons have been found for discarding preliminary professions, and the obligations of trustees and of persons under disability have been made the pretext for squeezing out of railway companies as much as could possibly be got. If experience had shown that the prices obtained by landowners were only such as would qualify them to make a proper abatement of rent to their tenants, the statements I have made would utterly fail in truth and fair-

Name of Railway.	Length.	Cost per Acre.	Authority.
Cockermouth, Keswick, and Penrith	31½	222	Secretary.
Whitehaven and Egremont ...	21	249	"
Furness	93	114	"
Manchester, Sheffield, and Lincolnshire	248	295	Mr. Bidwell, Company's surveyor.
Doncaster and Gainsborough	17½	191	"
Lincoln and Honington	18½	288	"
Chester and Holyhead	80	275	Mr. Fuller
Chester and Mold	16	309	"
North Staffordshire	123	446	Secretary.
Kettering, Thrapstone, and Huntingdon	26½	175	Mr. Denton, Company's surveyor.
Great Northern Main Line ...	235	440l., including townlands and property...	"
Spalding and March	19	294	Secretary.
Peterborough and Wisbeach	24	230	Mr. Fuller
Royston and Hitchin	17 m. 82 ch.	190	Mr. Denton
Great Eastern Branches through Rural Districts, ...	...	250	Mr. Adams
Sutton Junction	13	690	Mr. Fuller
Horsham and Dorking	20	230	"
Cockfield and Tunbridge Wells	18	180	"
Bognor	4	300	"
South Eastern Rural Lines, average .....	...	390	Mr. Hyde
Tunbridge and Bedford Lines .....	...	200	"
Strood and Bickley, London, Chatham, & Dover Railway	20	300	Mr. Oakley
Alton and Winchester, South Western Railway	17	215	Mr. Denton
Chertsey Branch, S. W. Ry.	2½	330	"
Swindon and Cheltenham .....	...	290	Mr. Wall
Stonehouse and Nailsworth ...	6	400	Mr. Fuller

In several of the above costs the compensation to the occupiers is excluded.

Having regard only to those lines in the foregoing schedule which may be called rural, and taking off from the remainder a fair proportion of the length of those in which lands of mixed character were purchased, 240l. may safely be taken as the average amount of money paid large to landowners exclusive of the occupiers' interest. This amount, it cannot be denied, has been paid in four cases out of five, where the land would have been well sold at thirty years' purchase on its rental, without anything being

ness; but I feel sure you will agree with me that the cases are very few in which landowners have not gained considerable profit—i. e., increased income—by the sale of their land, after making such abatement as they may have made to their tenants. Isolated cases, no doubt, could be found where injury has been done for which no adequate compensation has been given; but, fortunately, they are few. In a very large majority of instances no abatement has been made to the tenant, and none has been asked beyond

the simple proportionate amount per acre for the land taken,—generally calculated on the bare rent of the farm; though the inconveniences which a tenant-at-will suffers have not always been fully compensated by the money he has received of the railway company.

I am now speaking before an Institution the members of which have the most perfect knowledge of facts, and I would ask whether this statement is at all exaggerated? Mr. Beadell writes, "As a general principle, I think a landowner might well afford to sell his land at its bare value, giving up all claim for overvalue and compulsory sale; but taking care that, so far as accommodation works are concerned, he is properly protected." This is precisely my view of the question; and, in order that we may appreciate the full extent and effect of the over-payment to landowners, which has donehitherto had something to do with the present condition of railways, and the dead-lock to which they have come, we may assume that an average of 60l. an acre—i.e. 2l. (tithe-free) × 30 years' purchase, would have been ample payment for the 100,000 acres which railways have absorbed in rural districts. If this be so, and 240l. an acre has been paid for this quantity of land, the total amount must have reached 24,000,000l., when 6,000,000l. should have sufficed. Hence it follows that 18,000,000l. have actually been lost to the railways, and gained by those individuals of the landed interest who have been lucky enough to possess lands required for making them. I will illustrate the way in which the landowner's profit has been gained, by three cases within my own experience, believing them to be typical of others. In one case, acting for a landowner, I was instrumental in obtaining the sum of 1,700l. for 3½ acres of land. The case was one of very bad overvalue, there being upwards of 250 acres of productive arable land cut off from the homestead by the railway, which crossed on a level. The statement made to the tenant was 20l. a year, and the landowner having applied the money obtained in the redemption of the land-tax, and in the purchase of additional land, obtained nearly 60l. a year, so that he gained a profit of nearly 40l. a year. In the next case, a noble marquis, now deceased, sold between thirteen and fourteen acres of land, on a branch railway (purely agricultural), at 120l. an acre, for which he was receiving about 25s. tithe-free rent, and represented the proportion of the land-tax as merely nominal, while he pleaded great generosity in selling the land at the price. The railway was taken on lease, during construction, by one of the great parent lines, and though effort was made to apportion the land-tax, difficulties were found in doing so, and it was postponed until the lease was perfected. The noble marquis then demanded a re-apportionment of the land-tax, *ad valorem*, on the ground that agriculture was depressed, and the railway interest on the ascendant. The case was taken before the local Commissioners, and they being unable to resist the law, fixed on the railway each an amount of land-tax that, when redeemed, the price of the land purchased was raised to 175l. an acre. As a large part of the land in the parish belonged to the marquis, he, of course, gained by the increased amount apportioned on the railway. The third case is one in which a line was promoted by the landowners of the district. It passed through a property, under trust, for which an eminent solicitor, much connected with railway enterprise, was acting. He, being versed in such matters, opposed the Bill in Parliament, and came to terms in the committee-room. I refrain from mentioning the amount agreed upon, though it was a large one, but it is certain that the tenant, from that day to this, has received no abatement of rent; on the contrary, he has re-hired the farm on lease, without desiring any reduction, being satisfied that the accommodation the railway affords compensates him for the loss of the land taken. While referring to this latter case, I am reminded of the observation of our highly-esteemed friend and Associate, Mr. John Horatio Lloyd, on the evening of our first meeting, when he said, speaking of our position as surveyors, that the zeal for the interests of our employers not infrequently warps our judgment and puts a strain upon our consciences. Now, my experience leads me to the conclusion that though many surveyors are led in their zeal to do the best they can for claimants against railways, whose cases are put into their hands, there seldom is wanting, in the worse cases of exaction, a legal adviser who, with a full knowledge of the value

of the accommodation railways afford, instructs the surveyor employed to obtain the very utmost he can, and frequently adopts the most paltry expedient to grasp it. Great reliance is placed on the disposition of juries and juries to split difference, and it is not an uncommon practice for solicitors and surveyors so to prepare their cases, after having ascertained the very outside to which the railway company will go, as to furnish figures, in evidence, so much above the sum they really hope to get as the company's offer is below it.

Every purchaser for railway companies is alive to these tactics, and will acknowledge that, so long as the only alternative to yielding is an appeal to jury or arbitration, with all the expense of counsel, solicitors, and witnesses, it is doubtful whether it is not better, on the ground of expediency, to succumb to exaction rather than to resist it on the ground of principle. Though exposure of the manoeuvre by which money is squeezed out of companies oftentimes acts advantageously in checking for a time the greed of individuals, it cannot be denied that, on the whole, recourse to jury, and, not infrequently, arbitration, results in a lamentable failure of justice; and if the railway system is to extend, by branch lines and additional connecting lines, to those places and districts which are still without them, I think it will be found necessary to adopt a very different mode of proceeding for the acquisition of land. It is believed by many that, wherever a turnpike road now exists, a railway of some description or other should be made, and if made at a cost not exceeding 5,000l., will pay a fair dividend; and the Legislature, by the Act of last session ("The Regulation of Railways Act, 1868,") delegated to the Board of Trade the power of granting licences to construct and work *light railways*, which may be suitable for the majority of lines still remaining to be made. To reduce the cost of land, therefore, by an acceptable mode of proceeding is a primary consideration. With a view to raise a discussion on this point, I will now venture to place before you some suggestions for that purpose. I have already proposed that no payment should be made for compulsory sale nor for severance, but that a fixed number of years' purchase on the annual value, with proper accommodation works, should be the only basis of compensation when the land is simply farming land. It then remains to be considered whether the land should be paid for outright. It is the opinion of some persons that a very long lease or easement at an annual rental, say for 999 years, such as exists in the case of the Blyth and Tyne Railway, would be the better mode of acquiring land; and, if this latter plan were adopted, subject to a revision of rental at certain periods, so as to give the landowner the benefit of a general rise in value, it is not open to much objection. It would have this advantage, that many legal expenses would be avoided which appertain to the purchase of land. The question would then be, by what means should the annual value of land be ascertained?

An opinion has been expressed that the Board of Trade, who now, in the place of justices, appoint surveyors to value for possession where any land is required by railway companies before settlement can be made, are fully competent to appoint an umpire, whose decision shall be final, to determine the amount to be paid or the rent to be fixed, where the landowner or his agent and the agent of the company cannot agree; and it has been suggested that it should be entirely within the breast of such umpire to decide whether any evidence beyond that of the agents on both sides is necessary to enable him to form a proper judgment. Whether or not, there should be a power of appeal against such decision is a matter worthy of consideration; but, under any circumstances, it is conceded that some such inexpensive process should regulate the future price of land for railways in rural districts, and that one and the same person should be appointed to act as umpire throughout the entire length of any future branch railway.

Discoveries in St. Mary's Church, Rochester.—During the alterations in St. Mary's Church, two Norman arches have been brought to light, both of which had been previously walled up. They are at the western end of the edifice, and are supposed to be all that now remains of the old church.

ART-WORKMANSHIP AT THE SOCIETY OF ARTS.

THE council of the Society of Arts offered last year, to art-workmen, a large number of prizes, ranging from 15l. each, under two heads,—namely, first, for specimens of art-workmanship in prescribed processes, such as enamelling on metal, painting on earthenware slabs, the execution of "filigrani" in glass, damascening on gold or silver, the combination of marquetry with carving in low relief, and the inlay of hard woods; and, secondly, for specimens of the application to ordinary industry of prescribed art processes. Under this second heading prizes, for example, were offered for the most beautiful dial-face for a clock, the most beautiful frame for a miniature, the most beautiful set of fire-irons, the most beautiful earthenware slab, painted in enamel colours and fired, for insertion in a chimney-piece; a pedestal for a base of carved marble combined with mosaic; ornamental ironwork for the balcony of a window, and so on. There is also the North London Exhibition Prize (the interest of 167l. 7s. 3d. Consols.) to be awarded for the best example of skilful workmanship amongst the specimens sent in. And when, in addition to these prizes, it was known that the Department of Art have always purchased a number of the rewarded works, extending 50l. or 60l., according to circumstances, there were surely strong inducements for men anxious to advance themselves, if not their art, to submit works showing what they could do.

The response is not equal to what might justly have been expected. It is all very well for workmen to say they wish to elevate themselves: "Show us a road?" "How can we do it?" and so forth; but something more is needed: they must do as those above them are forced to do,—work long hours on an occasion, and do as well as talk.

In competition for the prizes offered under the first head, there are but eight works; for those under the second, seventeen. In addition to these there are forty-one subjects sent in for exhibition, not in accordance with prescribed processes. The most meritorious under the first head are a Clock-Case in amboyna and purple-wood, with inlay of ivory, neat and freely cut, by Thomas Jacob; the centre of a chimney-piece, with mosaic inlay, by J. E. Daly; and a carved and inlaid panel by Thomas Codfrey. In the second division J. B. Evans deserves, and will doubtless get, reward for his painted slab, for insertion in a chimney-piece, a most praiseworthy work. A frame for a miniature, and a ring tray, of strongly gilt gilding metal, and enamelled, by Frederic Lowe, are very creditable. A slab, by W. H. Slater, "Pluto" painted on blackware, and some Book Covers sent by C. Ffardor, deserve notice. E. Millard's Set of Fire-irons are certainly not "beautiful," whatever other merit they may have. Two or three of the Clock Dial sent by J. Thwaites are very good; we do not include the one of quasi-Gothic pattern.

Amongst the subjects not in accordance with prescribed processes, though eligible for rewards, the most excellent work of its kind is a piece of Porcelain painting ("Giving a Bite," after Mulready), by W. P. Simpson. Some of the colours are excellently hit, in the face of difficulties. Some stone carving by John Barker, a Boy's Head in relief, marble, by W. X. D., and a relief in boxwood, by Thomas Wills, deserve praise. As do, in even greater degree, the Head of a female, modelled from life, and a steel die from the same of reduced size, both by G. Morgan.

THE EAST WINDOW, ST. PAUL'S CATHEDRAL.

ON Wednesday, the 10th instant, St. Paul's Cathedral received a painted window, representing the Crucifixion, and occupying the principal opening of the central compartment of the apse. This magnificent donation of the Drapers' Company was uncovered in the presence of a large gathering of the members of the company, and as many of the cathedral clergy as could attend. The donors are recorded in the window, with the addition, "Unto God only be honour and glory."

The design, in common with that of the other principal painted windows intended for the cathedral, of which one (the west window—Mr. Brown's gift) had already been for some time in its place, represents the historical subject enclosed in an imaginary architectural framework. The justification of this style of treatment is founded on

the almost universal practice of the Renaissance artists of France and Belgium.

The window was executed in Munich, at the Royal establishment, under the superintendence of the Chevalier Max. Aimmiller, to whose care and skill the recent success of the Munich establishment are mainly due. The fault which in former times deservedly attached to the Munich school of glass-painting—namely, the unjustifiable use of enamel colour, has been laid aside in the windows recently executed for St. Paul's, as well as in those sent to Glasgow and Edinburgh, which are as completely mosaic as the Mediaeval examples.

The fine old veteran painter, Julius Schnorr von Carolsfeld, designed the figures, which, in their expression of deep feeling and solemnity, may be classed with any of the works by which his reputation has been established. The full-sized cartoon was made by his pupil Strübiner. The architectural decoration was designed by the surveyor to the fabric of St. Paul's, Mr. F. C. Penrose, who also prepared the general scheme of the windows in concert with two members of the St. Paul's committee, whose names are in the world of art in general—Charles Winston and John Lewis Petit.

This window, in consequence of the amount of labour and thought which has been bestowed upon it, deserves to be carefully examined, and we anticipate that, however little acceptance it may receive from those who have made up their minds strongly in favour of a different style of treatment, it will nevertheless enlist a sufficient number of admirers to justify the donors and the committee in the belief that they have not only introduced a great ornament into the cathedral, but also have rendered an important service to the British school, by inciting the public to demand a more artistic description of glass painting than is now in too many instances put up with.

The cost of this window, irrespective of home charges and fixing, is about 900*l.* The fixing was intrusted to Mr. Miller, of Brewer's-street, who appears to have executed his task with great care.

Two other windows for the apse are in progress, being respectively the gifts of the Goldsmiths' Company, and of Dr. Rogers, in memory of his martyr-ancestor, Canon Rogers; and one for the end of the south aisle of the choir, in memory of the late Mr. William Cotton.

ON THE SCIENCE OF COLOUR.*

THE results which I have endeavoured to deduce from the study of the prismatic colours are fully confirmed by all sorts of experiments made with the colours of pigments. For instance, we may test the colours of pigments with the prism in a beautifully simple way. We have merely to cover a small part of a strip of white paper with the pigment, and view it over a dark cavity through the prism, and we see the spectrum of the pigment-colour adjoining to that of the white, and detect at once the rays which are absorbed or extinguished by the pigment, and those which it sends to the eye, to which its colour is due. Thus, with respect to yellow, which many will still maintain, I suppose, to be a primary colour, unconvinced by the experiments on the combination of the prismatic rays (which show that the best yellow is produced by throwing together all from the first red to the last green ray); if we analyse the colour of anemolin, of chrome yellow, or of king's yellow, or the petals of any bright yellow flower, we uniformly find that, the better and clearer the yellow, the more perfectly the object reflects all the red and all the green rays, absorbing only the blue. Hence, if blue is a primary colour, it is difficult to see how it can be supposed that a colour produced by all the other rays of the spectrum is not made up of both the other primaries combined, whatever those primaries are. Some strips of paper, coloured in parts with different pigments, will be found on the table amongst the objects for prismatic observation.

Again, we may determine correctly all the intermediate colours between any two given colours, and ascertain the accurate mean between two given colours, without the slightest difficulty or possibility of error, by the beautiful method which was first used by the celebrated Lambert in the

last century, and which I have, in my late treatise on the science of colour, endeavoured to improve and apply to this purpose. We have merely to hold a slip of clean polished glass, perpendicularly, between spots of the given colours, so as to see the near spot reflected from that part of the glass through which we see the other spot. If spots of white and black are placed opposite to each on alternate sides of the given colours, the position of the eye, in which half the light is reflected and half transmitted, is readily found, and the result there observed must be the mean of the colours. When the reflection is more oblique, the reflected light will be in higher proportion than the transmitted, and the contrary with a less oblique reflection.

Those who suppose that they can get the colours intermediate between the colours of two pigments by mixing the pigments, should compare the results obtained by that fallacious method with those obtained by this elegant and easy experiment. Gamboge and Prussian blue, for instance, make, by mixture or superposition, a green, darker than either the yellow or the blue of those pigments; the scientific method gives, as their intermediate colour, a gray of mean brightness, in agreement with the results obtained by our experiments on the combination of the prismatic rays. So, also, it does with the colours of king's yellow and cobalt, or lemon yellow and French blue or ultramarine.

If we avail ourselves of the well-known property of Iceland spar to give double images of two coloured spots, and arrange the spots so that one image of both shall fall together, which is easily done, we obtain the same results. And so, also, if we excite the sensation of the two colours in rapid succession on the same part of the retina, as by the well-known method of rotation. But neither of these methods is so convenient in practice as that of the slip of glass; and I only mention them to show that, in whatever way we can mingle two different colour-sensations, we obtain the same results. Small spots of the colours of vermilion, emerald green, and cobalt, or verdigris, rose madder and king's yellow, with the requisite appliances, have been prepared for the purpose of illustrating these methods of finding their means; and any one who will examine the matter will see that the latter three pigments are very nearly complementary in hue with the former three; that is, the means between vermilion and verdigris, between emerald green and rose madder, and between cobalt and king's yellow, are very nearly neutral grays. The results of all our experiments with colours of pigments, therefore, plainly agree with those of our former experiments on the combination of the prismatic rays, and confirm the opinion that red, green, and blue are the primary, and sea-green, pink, and yellow the secondary colours.

In perfect agreement with the facts I have stated about the complementary colours, are all those apparent changes of colour which are perceived when the retina, having been strongly excited by some one or other colour, becomes less sensible to it than usual, and every object to which we direct the eye appears, therefore, more or less tinged with the complementary colour, as if a wash of that colour had been laid over it. For it is always found that in an eye excited by red, by green, or by blue, objects appear tinged with sea-green, with pink, or with yellow; and the reverse; and that by intermediate colours intermediate effects are produced.

I am aware that some of these effects have been otherwise described by several writers: it is usual, for instance, to hear it said red tinges the adjoining colours with green; but this is not correct, unless the one be a pink-red, or crimson, and the other a sea-green. So again, it is usual to say, that blue and orange mutually depon each other; but for this to be true, the blue must be of a sea-green-blue or azure hue, and the orange must be yellowish.

The most careful experiments, made by looking steadfastly at spots coloured with those pigments which best represent the principal compounds of the prismatic colours, and brilliantly illuminated upon a black ground, and then suddenly directing the eye to a perfectly neutral gray ground, will always clearly show the gray surface darkened and modified in hue in accordance with what I have already pointed out as the real or natural complementaries. Thus, an eye affected with bright red or scarlet, like that of vermilion, turns the gray into a grayish sea-green of the hue of verdigris; one affected with green, like that of emerald green, turns it a

grayish pink, of about the hue of rose madder; one affected with blue, like that of cobalt, turns it into a grayish yellow, of the hue of king's yellow, and the reverse. The same effects are seen in the shadows cast by a sunbeam which has passed through strongly-coloured glass, upon a gray surface otherwise illuminated by a neutral light; and in many other ways, if due precautions are used. And no doubt the peculiar improvement in depth, which is evident in truly complementary colours when viewed in juxtaposition, the eye glancing rapidly from one to the other of them, arises from the same cause. It is evident, therefore, that the eye itself is so constituted as to agree in this respect with the deductions of science concerning the actual relations of colours.

The attempt to reconcile these obvious ocular effects with the common doctrine as to what colours are complementary to each other has led some to regard the deep prismatic blue, which Newton called indigo, as being violet in hue, and the deep prismatic red as being orange red. It is a great incidental advantage in the system I advocate, that it abides by the invariable colours of the spectrum as the standard by which all the colours of natural objects are easily tested; for if we depart from these, we may widely alter the hues of our simple colours one way or another, and be quite uncertain what is right, having nothing but the general vague idea of redness, blueness, &c., to guide us. The terms used to distinguish colours are among the most indefinite in all languages; and the loose way in which they are applied, and the different meanings attached to them by different authors, would lead one to suppose that our colour-sensations are so different in different persons, and so variable in the same, that they are more fanciful than real, and that no certainty is attainable in them. Yet, in fact, if we except the comparatively few persons who are only capable of the sensations of yellow and blue, and those whose eyes are less sensible than they should be to red, there is a wonderful uniformity and certainty in the sensations excited by light. Only let the rays which enter the eye be the same in quality and quantity, and let the eye be in the same normal condition, without any present or very recent strong excitement, and we may rely upon the results being the same.

But the difference between the new doctrine and the old is more than a difference of terms, for the utmost latitude of interpretation cannot reconcile them.

In a diagram, intended to represent in its lower part the effect of three luminous beams, red, green, and blue, falling in partly overlapping circles upon a reflecting screen otherwise dark, I have endeavoured to imitate as well as I could the natural complementary colours, as seen in the spectra of white and black bands and edges, which perfectly accord with the ocular effects I have just alluded to. These colours lights produce, where the red and green lights fall together, a yellow of double brightness; where the green and blue fall together, a sea-green of double brightness; and where the blue and red fall together, a pink of double brightness; and, lastly, where all three overlap, a white of triple brightness. The upper part of the diagram, on the other hand, exhibits the effects of taking away from white the same three colours, as if by laying over the white, in three overlapping circles, transparent washes of some perfect sea-green, pink, and yellow pigments, producing red where the pink and yellow washes overlap, green where the yellow and sea-green overlap, blue where the sea-green and pink overlap, and, lastly, black where all three overlap.*

By comparing the colours in this diagram with the commonly received primary and secondary colours, as shown in the accompanying large and small diagrams sold for the use of the Schools of Design, which give the best representation of them that I could find, the essential differences between the two systems are made very apparent. Except red and blue, which both admit as primaries, all the other colours differ materially. The middle primary is deep green in the one, and bright yellow in the other; the first secondary is bright sea-green in the one, and yellowish green in the other; the second is bright rosy pink in the one, and dark bluish purple, or even violet, in the other; the third is bright yellow in the one, and a very red orange in the other. In the one it is endeavoured to

* From a paper by Mr. W. Benson, read at the Institute of Architects on the 15th inst. Mr. Benson's views have already been set forth at some length in our pages.

* This diagram was an enlarged copy of one in the author's treatise on the "Science of Colour," page 11.

get all the colours as nearly as possible of their full strength, in which they must be as nearly as possible of equal strength, so as to neutralize each other in equal quantities. In the other, their strengths are supposed to be proportioned according to certain arbitrary rules laid down by Mr. Field upon no sound reason whatever, and which moreover are not and cannot easily be fulfilled. In the one, by the enlightened study of the prismatic spectrum, and the use of satisfactory methods of testing the lines and the strengths of the pigments used, we make a tolerable approach towards correctness, or at least can ascertain pretty nearly how far we err; in the other, by following rules which a mistaken theory derives from the results of mixing pigments, or superimposing coloured glasses (regardless of the fact that such a process gives neither the sum nor the mean of their separate colours), not one of the pairs of nominal complementaries neutralize each other; for the red and green compound a dark orange yellow or citrine; the yellow and purple produce a reddish mixture; and the mean between the blue and orange is a good purple—much stronger and better than that given as the colour complementary to yellow.

The comparison of the natural and conventional systems of colour seems to me to be much to the advantage of the former. There is a certain beauty in combinations of colour devised under the latter, such as those in the diagrams for the Schools of Design; but this is attained without completeness of range or compass;—without including the most powerful colours of all the several kinds, which surely ought to be included in a scheme for showing the relations of colour;—and no reason is apparent in the included colours themselves why they should be placed in that particular order. The peculiar congruity of the true primaries in darkness and depth, and of the true secondaries in brightness and clearness, also tends to give, as it seems to me, a chastened richness and charm to any orderly combination of those colours which must be essentially wanting in similar combinations of the conventional primaries and secondaries.

I think, then, I am not wrong in asserting that an approach to scientific truth will be advantageous to art, and that the best natural taste may be directed and improved by understanding and observing the laws of nature. But in colour true science has hitherto scarcely been in the field at all, and taste has in fact had the battle to itself, not only unaided by true science, but even misled by false or pretended science. No wonder, then, that writers on taste in colour should be inclined to repudiate science altogether; and that Sir J. Gardner Wilkinson, for instance, in the beginning of his valuable work on that subject, should make such remarks as the following:—"Every one willingly admits the great utility of rules; but we must first make ourselves masters of the subject, and be contented to seek for facts to guide us in their formation." . . . "It is of more importance for the proper arrangement of colours to ascertain which harmonize in juxtaposition, than to occupy ourselves with abstract questions respecting their properties, or the laws by which they ought to be regulated; which, though they may display great thought and scientific knowledge, are here of little practical use, and which, like the constitutions of certain wise professors, appear as plausible on paper as they are impossible in practice. From facts and actual experience we may obtain something positive and useful: from theory nothing can be expected, so long as the subject itself is not thoroughly understood, except the most vague and contradictory conclusions."*

As to the impossibility of rightly treating red, yellow, and blue, according to the same rules as primary colours, the same writer also well observes (pp. 61, 62);—"Though red and blue in juxtaposition have the appearance of purple, and yellow placed next to red gives it an orange hue, the same illusion is not caused by the contact of the other two primary colours, blue and yellow, and these do not look green when in juxtaposition, except in certain cases. Nor is the change then so marked as when blue and red, or yellow and red, are in contact. And this is one of many proofs that all the three primary colours are not under the same conditions in relation to each other. It is not, therefore, necessary to lay down the same general and invariable rule respecting the three primaries, that "in making new patterns or ornaments, red and blue

should not join, nor yellow and red, nor yellow and blue," as though the three combinations were exactly similar, and subject to the same laws. For yellow and blue do not deceive the eye to the same extent as the others, when in juxtaposition. Nor has red with green the same effect as red with blue and yellow, and still less have red blue and yellow the same effect as these three colours when united in one;—that is, according to the theory which the author received, they have not the same effect as white.

Such anomalies as those noticed in this extract are the necessary consequences of an erroneous theory. Of course, blue and yellow cannot be treated in the composition by the same rules as blue and red; for blue is complementary to yellow and not to red. Still less can yellow and red be treated by the same rules as yellow and blue; for yellow harmonizes with red, itself containing the full red in conjunction with the full green, whilst it contrasts as the opposite colour to blue. No wonder that red, yellow, and blue together have not the same effect as red and green together, nor yet the same effect as white; for the mean of the first combination is always reddish, and of the second yellowish, and neither of them white or neutral, whatever proportions are taken.

I believe, however, that if we dispense with false theory and admit scientific truth we shall lose these anomalies, and introduce no new ones. We shall be enabled to treat red, green, and blue under the same rules as primary colours, and sea-green, pink, and yellow under the same rules as secondaries, if only we bear in mind the differences in the depth and clearness of the pigments we use to represent them; these, of course, modifying the effects in a large degree. Two primaries of similar depth may please the eye when side by side, while the same two, equally true in hue, but not alike in depth, may fail to do so. A great step will assuredly be gained if we establish correctly the hues of the three simple colour-sensations, and of their complementaries; for these, together with black and white, will give us the eight principal colours upon which to work, and will enable us to determine all the intermediate colours correctly, and to arrange them all with due regard to their natural gradations and contrasts of every kind.

Did I not fear to exceed the limits proper for this occasion, and to stand in the way of that expression of the views entertained by others which I hope this paper will elicit, I would add some remarks on the true limits of colours in strength of hue, which, when ascertained with some approach to correctness, might be substituted with great advantage for Field's doctrine of chromatic equivalents; on their limits in depth and clearness; also on gradations and contrasts of colour, and on the means which I have proposed as a key or directory to the endless natural harmonies of colour; combinations of which, in one form or another, must be (if I am not greatly mistaken) the groundwork of all that naturally delights the eye in colour-compositions, and makes them praiseworthy as works of art.

MEANS FOR THE IMPROVEMENT OF THE PEOPLE.

ENGLISH REPORTS ON THE FRENCH EXHIBITION.

FIVE of the six volumes in which it is proposed to include the reports on the Paris Universal Exhibition, prepared for the Science and Art Department, in accordance with the directions of the Lords of the Committee of Council on Education, have been issued.* The first volume, which is to contain a general report and tables of statistics, has yet to be published. We hope Mr. Cole will speak out in it. The sixth, or last issued, contains so many useful plans and so much information, that it deserves to be made widely known, and to be consulted. It is unlike the other volumes, not in its character, it is exclusively English. The third, which, for the sake of order, we will proceed to notice first, on the other hand contains notices of foreign methods of manufacture of various goods, carrying out the instructions the reporters received to turn their attention to the objects exhibited by the British colonies and by foreign countries, rather than to those shown by the United Kingdom. Passing over the reports re-

* Reports on the Paris Universal Exhibition, 1867. Presented to both Houses of Parliament by command of her Majesty. London: Printed by George E. Eyre & William Spottiswoode, for her Majesty's Stationery Office, 1867.

lating to cotton, linen, worsted, silk and lace manufactures, we come, in this volume, to a series of subjects belonging more to our own provinces.

Foremost in this series we must place Mr. Chadwick's amply illustrated report upon examples of dwellings characterized by cheapness, combined with the conditions necessary for health and comfort. It has already been noticed in these columns; but in its present completeness deserves further comment. The result of his survey of all the means and appliances for improving dwellings gathered together on the occasion of the exhibition, is a conviction that there are, already at hand, many plans and contrivances for very important advances. We give the items on which he considers progress has been made in the order in which he states them:—

In the means of relieving houses from the cesspool smell, or the bad drain, or sewer emanations and smell,
From the foul wall smell, and from the wall vermin.
From the damp wall.
From the smoke nuisance.
From a great proportion of the waste of fuel, and the loss of heat.
From stagnant and vitiated air.
From the deterioration of good water supplies.
From much of the exclusion from sunlight.
And in appliances by which they are made warmer in winter, and cooler in summer.

As he states, by way of heading to his report, that he considers the exhibition presented "evidence of only incidental, and an utterly incommensurate amount of attention to the great subject," we feel it is a source of congratulation that so many details can be picked out as having been improved. We also feel justified in being sanguine in our estimates of the advances yet to come when the matter receives more extended consideration. France, who did not open the question at all in 1856, constructed six models in 1867; Prussia and Austria appearing also in the field for the first time with one model each. The next exhibition will doubtless show these countries putting forth further strength, other nations taking the subject up, and progress made corresponding with the immense importance of the subject in reference to the comfort of the great mass of mankind. Informed as we are that the best class of cottage construction now in use among us, such as that on her Majesty's estate at Osborne, reduces the death rate of the occupiers by one half, it is clear that additional strides towards perfection must still further reduce the chances of premature death. We have turned from the items Mr. Chadwick has strung together to his consideration of the improvements effected in each, and find that he thinks the step in advance made in the matter of cottage walls is shown in an eminent degree in those devised by M. Ferrand. These, it will be remembered, are built double, and formed of hollow bricks, held together and the bearing power obtained by what Mr. Chadwick calls the Crystal Palace principle, a system of iron columns, beams, and cross-streets. This form of wall is thinner, it is urged, than a common brick wall, therefore takes up less space, warmer in winter and cooler in summer, because of the couch of air between the two surfaces, and it is a better non-conductor of sound than an ordinary one. At first M. Ferrand faced his wall with soft plaster and paper, but having his attention directed to the great desirability of a washable face, he has invented a new surface, that is nearly as white as alabaster, having that property. Furnished with this fine impermeable surface, which would do away with many of the offensive smells, and much of the dirt found in some houses, the cost of M. Ferrand's wall is still said to be less than that of an ordinary brick one. As to hollow walls generally, we have no hesitation in saying that, through the difficulty of getting them properly executed, they are five times out of six simply a delusion and a snare. Further experiments and improvements in concrete will probably direct future attention into this channel. A cheap walling, non absorbent, non-conducting, and having a washable internal facing, invented by Mr. B. Nicoll, is spoken of by Mr. Chadwick with praise. We have so frequently mentioned the Emperor's ill-planned concrete-hull houses that we need not again refer to them. There are plans of them, as well as an elevation, in the report; besides plans and elevations of the houses designed by the associated workmen who, assisted by a grant from the Emperor, undertook to build the accommodation they considered, perfect, sans architects et sans entrepreneur; and of those designed for the Co-operative Society of Paris, the last-mentioned body adopted M. Ferrand's

* Sir J. G. Wilkinson on Colour and Taste, pp. 6 and 8.

walling, sections of which are given. Referring to the dislike expressed by Parisian workmen to be *caserné*, or barracked, and to the fact that the associated experimentalists secured well-to-do neighbours by forming the lower part of their dwellings into shops, Mr. Chadwick remarks he has noticed a similar preference for neighbours of a superior class in England.—

"A *cité ouvrière* exclusively—a dead level of society—is not good for them. Their wives prefer to have high instead of exclusively low neighbours, and to see, and have their children see, what is going on about and above them. This feeling is also widely prevalent in England. The cottager's wife would prefer being near the Hall, or the Mansion, or the Parsonage, or to people of high rather than those of low degree. Cottagers' wives and children, occupying cottages in wares or by-ways, always lose in cleanliness, tidiness, and in other respects, by being out of the observation of "my lady," or of the clergyman's wife, or of the squire, or of the clergyman. Go where you will the occupiers of cottages in out-of-the-way places are of inferior social condition."

From the wall he passes to the window. In this item the improvement possible is the use of thick plate-glass instead of the thin glass, in small panes, in general use. The Austrian dwellings were furnished with double windows; with this exception, all the others in the Exhibition were glazed with the heat-wasting thin glass. One-third of the heat of the fire in a room escapes by means of this really extravagant article, and a great deal more goes up the chimneys. Mr. Chadwick dwells upon the three smells commonly perceived in an inferior dwelling—the cesspool smell, the wall smell, and the smoky-chimney smell. The last-mentioned, he considers, is nearly vanquished in some of the French model dwellings, by means of the capital cooking-stoves in use. Many experiments, or experiences, as the French phrase it, have been made by General Morin, in the matter of cottage ventilation, which our readers, interested in the question should look over. The leading principles which Mr. Chadwick mentions as having been recognized by the General are, "first, the superiority of the principle of ventilation by suction—by the method of the hot-water tank acting on the vitiated air-flue—over the existing method of ventilation by driving fresh air into rooms by steam-power; second, the principle that the vitiated air should be taken out as closely as possible from the sources of vitiation; in hospitals, near each bed; third, that the avoidance of the inconvenience of draughts, fresh air should be brought in from a distance to the place of supply. These principles may now be applied to the removal of air in exactly fixed quantities and temperatures; and fourthly, that the heat in entrance-halls, passages, &c., should be kept up to the same heat as the inner chambers." A deep underground covered tank for the reception of rain-water is the best plan proposed for keeping this indispensable article clean and cool. The water supply in France is notoriously impure, being brought by hand from wells and fountains to the houses. The Emperor's model cottages at Vincennes, Mr. Chadwick observed, were without a proper provision for collecting and storing rain-water; and yet this article, which in first-class condition, is so superior for ablutions and laundry operations to hard water that the heat houses must be considered short of a luxury when without it. For drainage, water-closets of the syphon type, properly connected with a self-cleansing and trapped drain made of concrete, are the best means yet devised. After discussing all the items fully, Mr. Chadwick submits that what is now wanted is a series of public trials of the different materials available for construction. He also suggests that "completing manufactures under one head" were also wanted, where the first cost of moulds would be spread over such a mass of productions as not to make them costly. We have contented ourselves with simply indicating to our readers the kind of information of which they can avail themselves, and now pass on to notice the leading features in Mr. R. H. Soden Smith's report on household furniture.

An examination of the furniture and clothing of nations showed Mr. Smith that the more civilization claimed by the people the more complete the absence of anything like art-beauty in the objects of their domestic use. The rude household goods of Oriental nations, tribes of Northern Africa, races in the distant parts of the Russian empire, he says, show an understanding of colour that renders them models for the study of the skillful European. The only department that gives him any consolation is that of ceramic ware, where he perceives taste is getting to be more and more recognized. Perhaps, of all the objects exhibited, some

Spanish matting gave him the most satisfaction; for out of the humbly materials grass and rush a pleasing object was produced, good in design and harmonious in colouring. Canadian household furniture, unpainted and unvarnished, made of oak, light pine, and hickory, stood out well by the side of that of other countries, for a chair of hickory could be sold for 1s. 6d., an armchair for 2s., and a chest of drawers, of the same woods unvarnished, for 15s. It is for the good of manufacturers to know the comprehensible figure their productions make when they are glorified by artistic feeling. Mr. Smith says:—

"It is scarcely possible to conceive anything more false in taste, more absurd in the application of what is called ornament, than the majority of the objects displayed in Class 91; nevertheless, in many cases the application to these articles of a very little true art would instantly raise their mercantile value. Houblic's drawings and Flaxman's designs gave money value to Wedgwood's pottery even at the time when it was produced, and Wedgwood well understood this. As far as the requirements of cheap manufacture go, it would be almost impossible to find carpets, rugs, and mats, at least, offensive to the eye as to weave things that are hideous; an Oriental workman using his inheritance of art-practice goes right, as it were, by instinct; at this side of the world art-education is needed."

The Rev. Canon Norris, in his report on means for instructing children, gives the different forms of desks and seats in use among other points. In Sweden each child has a desk and seat to himself, thus admitting of the free passage of the teacher in any direction. In Spain, instead of a form running the whole length of a desk, with the attendant inconvenience of stepping over it, each seat, though attached to the desk is round like a music-stool. When required to stand the child does so at the side of his seat. The Rev. M. Mitchell's report on libraries and apparatus used in the instruction of adults gives some hopeful information. In the first French Exhibition there were but 180 exponents in this department: in 1867 there were 500, and twice as many were refused space. The improvement of which this increase was the visible sign consists both in buildings and materials of construction, and in the methods of instruction. In France, education that was before only recommended is now, in several branches, made compulsory. Agriculture, horticulture, gymnastics, the living languages, commercial geography, laws relative to workmen and industrial economy have been thrown open to students. In the two years previous to the Exhibition France erected 1,202 schools. It is clear we must now enter into a different kind of rivalry with this great country from that of our forefathers.

There is, too, a report on toys, by Mr. G. C. T. Bartley, which we must not overlook, because we have frequently urged in these columns the usefulness of improving these sources of primary ideas in children. The chief French toy is a doll, not a representation of an infant for a child to fondle, but a model of a lady attired in the height of fashion, a leading manufacturer changing the costume every month to ensure accuracy. As an excuse for this apparently early inoculation of childhood with a love of finery, it is explained that these dolls serve as models to colonial and other extra-Parisian milliners before they are handed over to their children. French dolls, unlike our wax-faced natives, have china heads. Mechanical toys, made in tin out of such refuse material as empty biscuit and sardine boxes by M. Desein, are, however, in more commendable taste. This ingenious toymaker manufactures a train, consisting of a locomotive, tender, and carriage, in separate compartments, with a finish that admits of their running smoothly, packed in a cardboard box, for twopenny halfpenny. His economical genius is rewarded with an annual sale of a million railway-carriages. Another train, having clockwork movement, which enables it to run round a table, he sells for less than three shillings. The mechanical singing-birds of M. Bontemps, shown in the Exhibition, attracted much admiration, but were too costly to become general favorites. Military toys, too, in France, command a large sale. M. Andreux manufactures 70,000 toy guns per annum, besides immense quantities of cannon, gun-carriages, swords, and other military equipments. The taste for military toys is, however, on the decline, owing, Mr. Barclay says, to the present notion of giving children objects suggestive of the arts of peace. Nevertheless, M. Andreux sold 38,000 toy imitations of the Prussian needle-gun in three months, when that weapon was under public consideration. Prussian toys, as represented in the Exhibition, were not nelle-

guns, but the furnitures of dolls' houses, horses and carts, sensible dolls open to caresses without certainty of destruction, and glass marbles. Mr. Barclay gives the palm to Biberach for tin toys. Messrs. Rock & Craner seem to manufacture every description of carriage, cart, cab, omnibus, and perambulator of every nationality; our own insular peculiarities being catered for in the shape of Hansom's cabs, with little wheels on the feet of the horses as well as on the vehicles. Bavaria has an original idea or two about toys. One of these is the popular model of a shop, manufactured at Nuremberg. The kind of shop that commands the largest sale is a grocer's,—a selection accounted for on the ground of its having the most drawers to open and shut, fill and empty. Another toy, not domiciled with us yet, consists of pictures of men, animals, carts, trees, painted on stiff cardboard, and furnished with a block of wood, to enable them to stand upright, which children can arrange in different combinations, and which appear likely to exercise their taste and ingenuity. This Austrian conception of a toy appears to be, that it should be a musical-box internally, whatever form it may take externally; the Danish, that it should be an implement; the Moorish, that it should be either a trumpet or a top; and the Russian, that it should be made of india-rubber.

We must content ourselves with drawing the attention of all interested in means for instructing the blind to Mr. E. C. Johnson's report upon the subject, which has several illustrations of the different systems of writing and musical notation. Mr. B. Jerrold's report on articles of all kinds manufactured by skilled workmen has a wider though perhaps not more intense interest. We are reminded of the many workmen from foreign parts who pursued their occupation in this class; the Arabs embroidering slippers, the Algerine embroidering purses, the Tlemcen jewellers making flagree-work, the cameo-cutters, and others. Mr. Jerrold says the object of forming this new class was generous and lofty. We must refer our readers to his report for the reasons the result was not satisfactory.

The whole of the sixth volume is devoted to the returns relative to the new order of reward. And to this we will give attention in our next.

INUNDATIONS.

SIR,—In the last number of the *Builder* the problem of freeing lands from inundations is again mooted. I beg to take up the question, beginning with Eton, "the water glade," where I resided two years (unfortunately). The floods there are sudden and impetuous, augmented by winter snows from the Cleaven Hills and upland streams. I will relate an incident. While at dinner one day the waters came in at the back door very fast (ceasestating the finishing of the meal upstairs); the water rose high enough to quench the fire in the grate; the water and thick sedimentary deposits remained beneath the flooring, causing, for months, dampness and effluvia, producing sickness and death. The inhabitants believe it to be an inevitable evil: generations have endured it, and they must grin and bear it. Ambitious dolls! Provided a premium were offered, would not a remedy be devised? I think so. I will endeavour to explain a plan of mine:—Past the aits the torrent rushes in great force. From one of these aits to the shore I would erect a large and wide water-wheel (or two) to work a powerful set of force-pumps to impel the water through pipes (earthen, iron, or brick) of the largest bore, to a point below weirs and locks: this, whenever these mighty rushes of waters came down, the wheels would commence revolving, and cease when lower. Greater the flow, quicker would the wheels revolve. Many thousand tons per hour, night and day, would be expedited on its way seaward, instead of overflowing low lands.

Churchyards in these districts are very moist. If they do not drown their dead, many meet with a watery grave.

R. T.

P.S.—Locate Dutchmen here, and they would soon dam the place.

A District Surveyor for this City.—The election of a district surveyor for the southern division of the City of London took place last Friday, at the offices of the Metropolitan Board of Works, when Mr. Edward Power, jun., was elected by a majority of six votes.

IMPORTANCE OF VENTILATION TO LIFE AND HEALTH.

REGISTRAR-GENERAL'S RETURNS.

UNDER the title of "A New Reading of the Returns of the Registrar-General, on Life, Health, and Disease," and with the motto, "For the life of the flesh is in the blood," Mr. E. T. Craig writes a long and able letter, of which we give an abstract, merely remarking, beforehand, that it affords no new reading to us, who have so long pioneered the way to better health and lessened mortality, by urging the importance of better ventilation in dwellings, especially in bedrooms, and by night, with less overcrowding.

"It has been justly observed that in some branches of knowledge great errors may be made with little loss to society, but this is not the case when dealing with the principles that lie at the very foundations of the laws of life, health, and disease, and their relations with the principles and practice of medicine. Any error in estimating the laws for the preservation of health and vital force may daily be the cause of death to thousands. If the laws that affect the first germs of existence, and throughout life govern the conditions of health and disease, be not understood, or their teachings not wisely applied, then the premature deaths of vast multitudes must be the result, as is the case at present in all our great struggling manufacturing centres of existence. Consumption, for instance, always annually, in England alone, some 60,000 persons, and every year, throughout the civilized world, some 600,000 human beings. Diarrhoea, fever, and other spreading diseases are also the immediate causes of an incalculable amount of suffering and sorrow, and a rate of mortality which might to a very great extent be reduced by attention to a few laws essential to health.

The Registrar-General's statements, however, have an importance far higher than that of the mere statistics of death. In the returns for the spring and summer quarters of 1868, we are supplied with some very striking contrasts; reasons are assigned for the varying numbers of the killed, and counsel offered as to the future line of action required to reduce the death-roll. Here it is that the ground is weak. While many writers are at a loss to account for the high rate of mortality, the registrar-general fails to embrace the whole question in his counsel to the authorities of towns, and hence the necessity for reviewing the proposed line of action, to ensure success in future contests with disease and death. We have facts in abundance.

There is, however, but little hope that the millennium of perfect public health will ever be attained by the suggestion of the Registrar-General, comprised in the mere removal or interment of every kind of fermenting impurity, so that 'the diarrhoea, cholera, and analogous diseases, which spoil the finest summers, will then be as rare in those days as migrating birds; for, finding nothing to feed upon, they will no longer infest our cities and villages.'

As this state of matters would be desirable, we are naturally induced to turn over the pages of the Registrar-General, and the 'notes' of his useful body of District Registrars, to ascertain if any other means of preventing disease—diarrhoea, and death—are advocated, and find none; while the remedy suggested has been the prevailing prescription as a sanitary cure for many years; and, although true in part, fails to grasp the whole question as to the origin of a class of diseases that yearly constitute very prominent items in the bills of mortality. The plans proposed are those which have been acted upon by many towns, and yet the mortality from some diseases, such as in consumption, is as high as before the enormous expenditure of public funds had been incurred. The truth is, the public authorities are put on a wrong course, and, as they seek a false issue, they are all disappointed.

While admitting the full influence of judicious and effective drainage, and ready to advocate its completion wherever required, we contend that great disturbing causes of ill-health and mortality would not be removed by the most efficient sewerage system that could possibly be devised while the present crowded and defective conditions of dwellings exist. These disturbing causes and defective conditions must be better understood and altered, or there will be a constant recurrence of these variations in the conditions of public health. We differ, therefore, from the Registrar-General as to the efficiency of

'the works' which the authorities are advised to accelerate as a remedy for consumption, or even for diarrhoea, 'the malady so fatal to the population.'

While admitting the fullest advantages that may be claimed for efficient sanitary measures, I contend that whatever system of sewerage may exist, the prevalence of consumption and other diseases would be developed and aggravated by disturbing causes arising exclusively within the dwellings.

If we so construct our dwellings, offices, schools, and places of public assembly, and so arrange our bedrooms that the pre-breathed air cannot escape into the outer air, we shall, at all times, have present a sufficient cause of disease whether the sewerage works are perfected or not.

Therefore, to go on year after year, advocating an extension of sewerage works, without perceiving or appreciating the power which other measures would exercise in arresting the cause and the progress of diseases, such as consumption and diarrhoea, is to misdirect the public, and to incur a grave responsibility in urging the authorities in a course which must in the end prove but a fool's errand, and lead to disappointment.

The temperature of the atmosphere was very much raised, there was little wind, and during a part of the summer but little rain. There would be less oxygen in the same volume of air than in the previous quarter; the ozone would be abstracted more rapidly or more effectively by the decomposition of putrescent materials; the carbonic acid gas thrown out by animals and the inhabitants would pervade the air, while the upper sashes of the windows of hundreds of houses in a town were not made to open, to afford the half-stifled inhabitants any relief from the poisonous influences arising from heated pre-breathed air from their own lungs; so that they were literally surrounded, night and day, with an atmosphere only a few degrees above of being deadly destructive.

Now, as we have seen the constructive arrangements of dwelling-houses are such as to prevent the escape of pre-breathed air, the result is an additional cause for the increase of diarrhoea, consumption, functional disease of the heart, as well as a source of fever and other spreading diseases.

I have shown that in the great battle of life the main cause of the heavy catalogues of disease and death from diarrhoea are mainly due to the destructiveness involved in our health-destroying system of house construction and the absence of efficient ventilation."

The only remark we need add to Mr. Craig's letter is, that to the stolid public it is not sufficient to insist that they ventilate their dwellings, and especially their bed-rooms, more thoroughly; but they ought to be pointedly and explicitly informed that by ventilating their bed-rooms better, is meant that such ventilation is most of all requisite by night, and while they are occupying these bed-rooms. In thousands of instances they will willingly throw open their bed-room windows and air their bedding by day, while they will as carefully close up every crevice by night. And the poor, with their miserable supply of bed-clothing, are, in winter, especially liable to do so; but, from the lowest to the highest, the desire to be snug and safe from draughts overrules all consideration of ventilation. Nor is it easy to ventilate bed-rooms by night thoroughly, while keeping them free from draughts, far less for the poor in winter to keep sufficient warmth about them along with ventilation, even when safe from draughts.

The whole subject is one which well merits continual agitation.

NEW CEMETERIES.

Leamington.—The Bishop of Worcester has situated a portion of the new cemetery, consecrated in the Whitnash-road, near this town. The grounds comprise a strip of land on the north side of the old graveyard, fronting the road, a large portion at the west end, and a piece on the south side. Mr. Candall, of Birmingham, who under the late Mr. Squirhill superintended the works in connexion with the old graveyard, is the architect. Plans and specifications of the buildings to be erected were prepared by him, and the Board advertised for tenders for carrying the same into effect. The tender of Mr. W. Green, of Leamington, was accepted for the erection of the chapel, the construction of the necessary walks, the execution

of the drainage, and other work; and that of Mr. G. F. Smith, of Milverton, for the boundary fences and all the ironwork in connexion with the building. Each chapel is in the Norman style of architecture. It is built of red pressed bricks, with blue brick plinths and Bath stone dressings. The roof is covered in with red Staffordshire tiles, with a triple hand of black ones introduced half-way up the roof. The principal entrance is at the west end, by a doorway of Bath stone, with a circular moulded arch, supported by light annulated pillars with carved capitals. The whole of the windows have circular moulded heads, with light pillars and Norman capitals of Bath stone. The principal feature of the interior is the arch, of which is of pressed brick in the form of a dog-tooth Norman carving, with an inner moulded arch of Bath stone. The floor is laid with Minton tiles. On each side of the tier are movable seats of stained deal, and in the body of the chapel are four other seats, two on each side of the building. The Episcopalian is somewhat more ornamental than the Dissenters' chapel.

Diss.—The site of the new cemetery is on the road leading from Diss to Burston and Diss Heywood. The area of the ground comprises about five acres. The style of the architecture adopted for the chapels is Early Perpendicular, both being 32 ft. long by 16 ft. wide, and each having a vestry 9 ft. by 7 ft. The Episcopalian chapel stands east and west, and the Nonconformists' chapel north and south, the two being connected by porches with an arch between, the entrances being at either side of the archway. The walls are built of flint from Mr. Bishop's pit, at Roydon, near Diss, faced with split, varied with whole flints in the arches, the interior being lined with red brick, relieved at intervals with bands of black; the floors paved with Minton's black and red tiles, and raised at the ends so as to form a dais, on which stand the reading-desks. The roofs, which are not celled, are constructed of open-combed rafters, stained and varnished, being boarded at the eaves, and covered with dark Staffordshire tiles, and ornamented ridge tiles. The windows and door-jamb, arches, and tracery are executed in Bath stone, as also are the coping to the gables, weathering to buttresses, and the bell-turret. Sitting accommodation is provided in each chapel for about twenty-four persons, the benches being constructed of deal, stained and varnished. The lodge for the residence of the keeper of the cemetery is built at the north side of the entrance-gates, of the same material, and corresponds in character with the chapels. The work of the chapels and lodge has been executed by Messrs. C. Bishop & Son, Diss, and the front wall by the same firm, and Mr. J. Ward, stonemason, Diss, the iron-work being executed by Mr. W. Bishop, Diss. The whole of the work has been carried out from competitive plans under the superintendence of Mr. John Thomas Musket, the architect and town surveyor, Diss. The total cost of the chapels, lodge, and wall is about 1,750*l.*, exclusive of the price of the land.

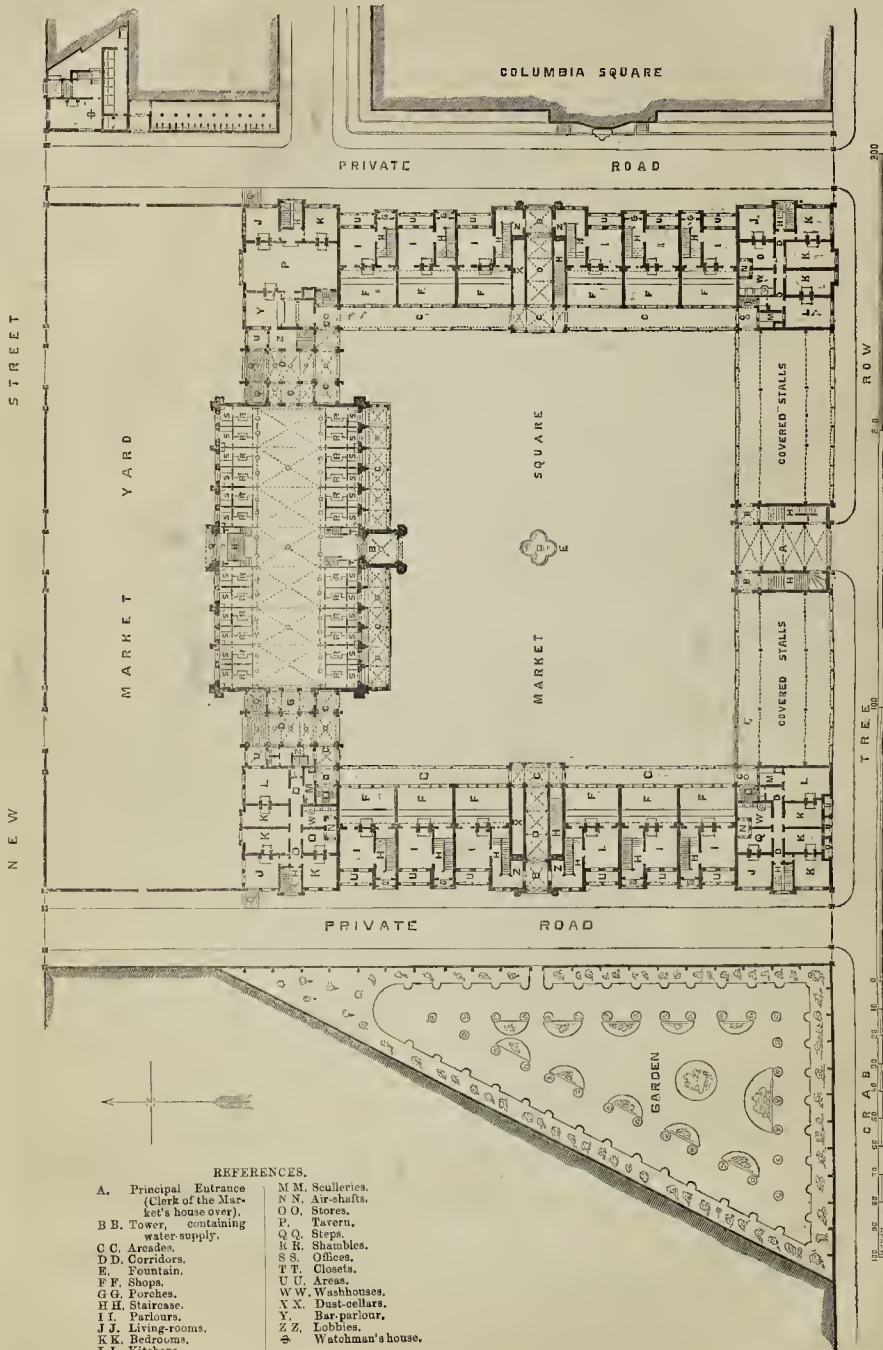
A PLUMB BOB.

A CORRESPONDENT signing himself "A Working Joiner," writes,—"Will you inform me in your next issue whether practically speaking a plummet, or plumb-bob (commonly called) can be made of any other material than lead? I find in my dictionary that *plumb* is from the Latin (*plumbum*), and therefore conclude, as *plumbum* means lead, that a bob made of brass cannot be a plumb-bob."

A piece of lead attached to a string and used to attain a perpendicular line, or test the perpendicularity of a line in building or otherwise, was called a plummet or plumb because of the lead—*plumbum*. As in other similar cases, the name now attaches to the use rather than to the material. A wall standing perpendicular is correctly described as "plumb;" the French for "upright" is *aplomb*; and we apprehend it is now perfectly correct to term any weight used to ascertain a perpendicular position a plumb-bob without reference to the material of which it consists. Milton uses the word "plumb" as descriptive of the sudden downright fall of a man; and the sea is often plumbed with a weight that is not lead.

The Borough Architect, Liverpool.—Mr. Robson has resigned this office.

COLUMBIA MARKET, BETHNAL-GREEN.



REFERENCES.

- | | |
|--|---------------------|
| A. Principal Entrance
(Clerk of the Market's house office). | M. M. Sculleries. |
| B. B. Tower, containing water-supply. | N. N. Air-shafts. |
| C. C. Arcades. | O. O. Stores. |
| D. D. Corridors. | P. P. Tavern. |
| E. E. Fountain. | Q. Q. Steps. |
| F. F. Shops. | R. R. Shambles. |
| G. G. Porches. | S. S. Offices. |
| H. H. Staircase. | T. T. Closets. |
| I. I. Parlours. | U. U. Areas. |
| J. J. Living-rooms. | W. W. Washhouses. |
| K. K. Bedrooms. | X. X. Dust-cellars. |
| L. L. Kitchens. | Y. Y. Bar-parlour. |
| | Z. Z. Lobbies. |
| | ⊙ Watchman's house. |



COLUMBIA MARKET, BETHNAL-GREEN: INTERIOR OF MARKET HALL.
MR. HENRY A. DARBISHIRE, ARCHITECT.

[See p. 137, ante.]

THE FORTHCOMING INDUSTRIAL AND OTHER EXHIBITIONS.

The Utrecht International Exhibition of 1869.—The council of the Society of Arts, on application to the Court of Common Council, has obtained permission to intending exhibitors at the Utrecht International Exhibition of articles of domestic economy, in the ensuing summer, to hold a preliminary exhibition in the Guildhall, London. From the specimens there exhibited those most suitable in price and quality may be selected and sent over to Holland. In addition to such articles there would also be sent the plans, drawings, and specification of model dwellings for the poor. In order to carry out the suggestion, funds will be required; but the sum need not be large; and the council think that this might be raised by a subscription among those who take an interest in the undertaking: the council undertake to contribute. The court were unanimous in according the use of the hall.

Postponement of Workmen's International Exhibition until 1870.—A circular has been issued, announcing the determination of the council of the Working Men's Club and Institute Union to hold this Exhibition in 1870 instead of 1869. They have received many communications from home and abroad as to the difficulty of preparing articles of the best workmanship in time for an Exhibition to be held in the present year.

South London Working Classes Industrial Exhibition.—An aggregate meeting of exhibitors was held in the Lambeth Baths, to choose the adjudicators, the space and vigilance committees, and to transact other business. The following gentlemen were chosen as adjudicators in the artistic department:—Sir M. D. Wyatt, P.S.A.; Messrs. T. E. Butters; Henry Cole, C.B.; George Cruikshank; F. H. Fowler, M.R.I.B.A.; W. Hinchliff; R. Hudson, F.R.S.; W. H. Miller; and R. Redgrave, R.A. For the mechanical: Messrs. T. Beggs, A. Hawkins, jun., G. Jennings, T. Lambert, R. Miller, Norman, Searle, S. S. Taylor, G. Thorneole, and R. Thwaites. For the general, or third class: Messrs. J. Glazier, J. Hill, G. Howlett, jun., G. Pritchard, E. Dresser Rogers, S. S. Taylor, H. Wallace, and W. R. Selway; and a number of ladies for deciding upon the fabrics and fancy work. The space committee and a vigilance committee (composed entirely of exhibitors) were then appointed, all the resolutions being unanimous. The chairman replied to many questions from the exhibitors, the chief query eliciting the fact that protection for designs and improvements had been granted by the Board of Trade under the Industrial Exhibitors Act of 1865.

THE (ALBERT) MUSEUM, SOUTH KENSINGTON.

In the glass case containing the Elizabeth-and-Leicester violin stands a very fine vase of Castel-Durante make, lent by Mr. John Webb. It is about 2 ft. high, and dates from the middle of the sixteenth century. In the same case is an elegantly shaped dressing-table, formed of satin wood, painted with grisaille medallions, garlands of flowers and fruits in natural colours, and having a border of small cornets, jeweled ribbon, and little green chaplets enclosing jewel-like pendants. On the table, two pedestal cupboards support a shield-shaped looking-glass, crowned with flowers; and the slender legs of the table are held together by gracefully arranged hands that rise in the centre and terminate in a plateau, which supports an oval casket of satin-wood, painted with flowers to match the table.

A corresponding chest of drawers will be found in the first glass case on the left, after entering the loan portion of the Museum; but the drawers are even more beautiful than the table. They are also of satin-wood, painted with garlands and flowers, but the flowers are of larger size, and more care has been bestowed in consequence. On the top, a semicircular rustic landscape of most happy colouring is placed close to the bordering at the back; the space in front is filled by delicate garlands, and a representation of a Wedgwood medallion on lilac ground. The bordering, which runs all round the top of the drawers on the flat, consists of most natural-looking "eyes" of peacock feathers, and is as beautiful as quaint. These two elegant pieces of furniture *de luxe* are of English manufacture, date late eighteenth century, and are lent by Mr. J. James.

By the side of the chest of drawers stands a

grand vase of painted porcelain, lent by Mr. J. Mordlock. It is Rockingham ware, and dates from about 1800. The form is a large egg, divided into three sides by rustic handles of tree-stems, gilt; the egg form subsides into three animal legs, with large paws, white, and the claws gilt; a trellis of gilt oak-branches, acorns and leaves, runs over the legs on to the body of the vase. Each of the three sides is handsomely painted in rich dark colours, with a bouquet of large flowers standing in a vase; on two of the sides a glimpse of a bright landscape, in pale tender tints, is seen beyond the flowers. The neck of the vase has an outer shell of honeycomb-work in white and gold, with three marvellously life-like bees entering the cells; the cover is of a compressed bell shape, with more painted flowers and gilt oak trellis, and it has for handle a rhinoceros, also gilt. The vase stands on a triangular base, the corners of which are rounded off; it is coloured a rich Magenta crimson, and is *semé* with tiny groups of musical and warlike instruments.

In the glass-case immediately behind the one containing this Rockingham vase, is a set of Roundels, the box belonging lying under one of them. Six are exhibited, which, from the size of the box, I presume to be the whole number. They are described on the "temporary label" as of wood covered with painted and gilt paper, with rhyming inscriptions, and it is said they were "used similarly to playing-cards." They are lent by Mr. W. Walker, are English, and of the seventeenth century. If this is known to have been their use, the sort of game played with them is not less the known also; but it is difficult to imagine it could have been one of frantic excitement. To a nineteenth-century observer these roundels suggest nothing so much as tabernacles; and when one remembers the laboriously polished tables that were, in days gone by, the pride of a "downtie howswife," these roundels seem invented on purpose to counteract the damaging effect of hot-grog glasses. It is difficult to judge, through the plate-glass, of their construction, but they appear to have had the flowers and inscriptions printed on the paper, and then to have been painted by hand. The following are the quaint legends on the six that are open to view:—

"If my goodman will twarthe with me,
He'll finde me some as twarthe as he;
If hee speake faire I do the same,
Then maie we gree, els heis to blame."

The logic in this is fine!

"Feede mynde with myrth, thy mawe with meate,
And eate to lyeve, not lyeve to eate;
For gorging doth offende thy health,
Thy god, thy soule, thy witt, and wealth."

A lowring wyfe I woulde not haue,
And from a skoule cure Lord me sane;
A prouing wyfe I woulde lause none,
But godd sende me a merry one."

"At meate and meale make myrth with geast,
Of absent folkes reporte the best;
Mirth pleaseth with civillitee,
The rest is but securillitee."

"The hartesse is a pleasant flower, and dothe in garden growe,
So woulde it rest within my harte and were not for a shrowe:
Wyues wyne wo with wilfulness."

"A dowghtie howswife such one as gaine,
A world of goods by trauell and paynes;
For what els loeth at night by her playe,
Shee gathes agayne by sleping all day."

The *ad libitum* style of the orthography in the above, is not the least amusing part of the inscriptions; they run round the edge of the roundels on the flat face, and the flowers are daintily painted on a pale yellow ground that is covered with black dots. Nevertheless, these roundels are infinitely superior in point of art to the two packs of playing-cards exhibited by Mr. W. Tate, M.P., and which, just now, are to be seen in the flat glass-case immediately to the left before descending the three steps into the loan portion of the Museum. One of the packs is from Berlin, and dates from the beginning of

* This sort of warning to scolding wives seems to have been a favourite subject with the makers of roundels. On one figured in the *Gentleman's Magazine* for May, 1793, are the following lines:—

"A woman that ys wyfull ys a plague off the worst,
As good lyeve in hell, as wylthe a wyffe that is curse."

This roundel is one of ten, attributed to the time of Henry VII. or VIII. It has been suggested that roundels were used as "conversation cards," or as fortune-telling cards. The supposition that they were treasurers for cheese or sweetmeats has had supporters. Some interesting notes on the subject will be found in vol. i. of "The Journal of the British Archaeological Association," 1843, p. 329.—Ed.

the eighteenth century; the other is of about the same date as the roundels, namely, seventeenth century, and is from famed Nuremberg, whose "hand goes through every land;" but methinks if the "hand" had not produced better things than these cards, the town had been less famed. The designs are of the roughest; but there's something to be got out of them, as out of most things. On one card a man, looking very like an old witch, is floating in air, and below is the word "Hex," not to be found in Flügel's Wörterbuch, but doubtless the masculine of *Hexe*, witch; then comes a pile of Wurst, sausages; so in Fatherland, superstition and sausages have long held sway. The spiteful cat, with back up, and the word "miau," is perfectly comprehensible in English as well as in German; and on another card the maker did a neat stroke of advertising, when he painted a house and put below it, "Zu finde bey Joh. Heinrich Schenck, Nürnberg."

While writing of cards, there is in a flat glass case, at present on the loan side of the Museum, one that brings a choking sensation into the throat, and well-nigh makes tears spring into the eyes of the beholder, from loving remembrance and hopeless regret. This card lies in a small crimson leather case, lined with green-watered silk, the whole and a short explanation being contained in a larger case of puce morocco and velvet. It is the season ticket of his Royal Highness the Prince Consort for the Great Exhibition of 1851, and is presented by the Queen to the Museum; it bears the well-known "Albert" signature of the noble-hearted, noble-minded "holder." It is doubtless fresh in the memory of most readers of the *Builder*, that when the question was raised as to who should have free admissions to the Exhibition, and there being so many persons who thought themselves entitled to the privilege, that had all claimants been satisfied, the receipts must have greatly suffered in consequence, Prince Albert at once declared his intention of paying for his ticket, thus putting himself on a par with the most private person in the land who had three guineas to spare for a season-ticket. Yet he, after all his untiring exertions and unflagging zeal in promoting the Exhibition, might assuredly have claimed as a right that which he declined to accept, though universally acknowledged to be his due. AAT-LOVER.

THE UNEMPLOYED.

Sir,—As everything connected with the improvement of the condition of the working man is one of the special provinces of the *Builder*, I beg to call your attention to the following extract from the *Times* of the 11th inst.:

"The London Mechanics' Institution, Southampton Buildings, Chancery Lane, is taking up the question of the unemployed poor, and is about to convene a public meeting to consider the following resolution:—'In the opinion of this meeting the enforced idleness of enormous numbers of the people, their compulsory residence in the filthy slums of large towns, allowing the professional thief and mendicant; the rearing of children in these slums in ignorance, idleness, and dirt, with the ever-present examples of immorality, drunkenness, and a hatred of work, are the chief causes of crime, pauperism, and disease; and that Parliament be at once petitioned to consider the following remedies for these evils and the present scarcity of employment, viz.:—1. An Act authorizing the Government to establish factories and start public works in all parts of the United Kingdom. 2. An Act authorizing the Government to establish schools in all parts of the United Kingdom for the housing, feeding, clothing, and educating the children of the poor and working-classes between the ages of three and twelve years. 3. An Act authorizing the Government to make life insurance compulsory on every man and woman on attaining the age of twenty-one years, no matter what their state of health may be. 4. An Act for a national rate on property of 100l. and upwards for the immediate exigencies of the poor.'"

In framing the above "remedies" for the evils they are hoped to rectify, the meeting omitted one most important item, namely, "An Act authorizing the Government to *assist* on every workman being allowed by his fellow-workmen to take as many conscientious as he may desire, and as he can conscientiously instruct."

It is useless to talk of want of work while there is so much work everywhere waiting to be done, if only the hands and minds could be found to do it properly. As it is, people are obliged to put up with unsuitable and unsatisfactory things, because they can't get better, and frequently do without a thing because they can't have what they want. When workmen and workwomen shall be properly instructed in their respective businesses, we may then hope to have houses built in which we can live with comfort without having to pull them to pieces directly we begin to inhabit them, in order to rectify some blunder of

ignorant or careless workmen; we may then have windows and doors that will open and shut; locks that will fasten; bells that will ring; pipes that will carry off refuse and let water flow; hot-water pipes that won't set the house on fire; chimneys that won't smoke; cooks that can dress dinners; clothes that can be worn without inconvenience; and boots that don't lame us: to say nothing of the more important branches of trade, such as Manchester cottons that won't burn themselves to tinder before they reach their destination, as—with shame be it said—was the case not long ago with various shiploads sent out to India. "Sham" and "want of truthfulness in act" are the bane of this generation.

A THINKER.

THE FRENCH POLAR EXPEDITION.

A FRESH attempt is about to be made by France to reach the North Pole, under the patronage of the Geographical Society of France. This expedition is not on a beaten track. It does not propose to reach the North Pole either by the route of Smith's Straits, proposed by Captain Sheard Osborn in 1865, following up the track of the American explorer, Elisha Kane; or by that named in preference by the *Builder* and Dr. Augustus Petermann, the German traveller, who recommend the passage between Spitzbergen and Nova-Zembla, returning, on Dr. Petermann's suggestion, by the Barentz track. The newly-proposed route is one hitherto unattempted, but founded on conclusions drawn from the best scientific researches. This passage is by Behring's Straits, through which a ready access is obtainable, to reach the free and open polar sea (known by the name of Polynia), and hence the pole itself. In order to carry out this project, the services of a practical traveller, accustomed to the vicissitudes of climate, and fully experienced in the geographical position of the path he is engaged to seek, were necessary. The choice of the committee fell upon M. Gustavus Lambort, whose projected route to reach the North Pole, founded upon practical observations made by him beyond Behring's Straits, and corroborated by remarkable theoretical considerations, was deemed the most eligible.

In 1776 Captain Cook was sent to explore the Pacific, and observed a probable passage thence to the pole; he was on the right track, that of Behring's Straits, which he passed, and reconnoitred land in several places. He was only prevented from returning to his explorations by the untimely fate he met with in the Sandwich Islands.

The French Polar Expedition is to take a direction which has been profoundly studied by M. Gustavus Lambert, but which has never been attempted except by one—Captain Cook. Others who have passed the Straits of Behring have only left us records of frosts corroborating the existence of a constantly open polar sea. It is on this sea that the promoters of this expedition place their confidence: it is the basis of their operations.

Subscriptions for this expedition, which cannot fail to interest all merchants and traders, can be effected by sending name and address to the Société Générale pour le Développement du Commerce et de l'Industrie, Bureau G, Boulevard Saut Germain, 79, Paris; or to the Société de Géographie, 3, Rue Christine, Paris. It will suffice to state the amount, which will be collected by a proper agent. The total amounts received are 10,000l.; the ship has been bought for 7,000l.

PRINCESS'S THEATRE.

MR. PALGRAVE SIMPSON, in his new drama, "Marie Antoinette," has given a most effective and truthful picture of the terrible time that intervened between the 1st of October, 1789, and the 16th of October, 1793, when the brave, if not wise, queen made her last toilette. A series of remarkable pictures are presented, and, although, as the author says, "bound together with no more fiction than is necessary to give the coherence and continuity essential to a dramatic form," produce a whole that leaves a strong impression on the mind of the spectator. Mlle. Beatrice, a foreign lady, who first appeared a few years ago at the Haymarket Theatre, exhibits dignity and pathos, and is, from first to last, the great centre of each group. Mr. Vining has put the piece upon the stage in a magnificent manner, and plays the part of the King with great finesse and skill, indicating admirably

his known characteristics. Mr. Rignold has made his first appearance here as *Count de Fersen*, a chivalric lover of the Queen, and promises to be a valuable addition to the company. Mr. Dominick Murray, who plays a semi-comic character, a man of the people led by love for his master to aid the Royalist plots, had scarcely got hold of the part on the first night, and will do more with it presently. The scenery, by Mr. F. Lloyds, Mr. Dayes, and Mr. Matt. Morgan, is admirable. The Gato of Varennes, with the arrival of the Berlines; the Gardens of the Priory of the Temple; and the last scene, the Place de la Revolution, deserve especial praise. The grouping on several occasions recalls pictures by E. M. Ward and Elmore, though we did not observe that any attempt at aerial reproduction was made. Mr. Palgrave Simpson, who has been recently elected secretary to the Society of Dramatic Authors, may be fairly congratulated on a legitimate success.

NEWINGTON SICK ASYLUM COMPETITION.

SIR,—I beg to enclose the correspondence between myself and Mr. Jarvis, two of the competitors in the above matter. The competitors, with the exception of Mr. Jarvis and Mr. Knightley, are agreed that the object for which the Board adopted "mottoes" being defeated, it is only just to the managers themselves that some architects of eminence, or some authority in the Poor-law Board, should select the best plan.

The managers have endeavoured to adopt the motto principle, and its failure cannot be attributed to them. It is, however, now incumbent upon them to show that they are no parties to so flagrant a violation of the rules of competition. These gentlemen are aware of the correspondence in the *Builder* of last July and August, in regard to the Walworth Estate Competition, and will, I am sure, be anxious to see a more pleasant termination to the present one.

JOHN GILES (Giles & Biven).

*** The correspondence is too entirely personal to justify us in giving to it the space it would require. Mr. Giles sets forth very good reasons why the managers should refer the plans to some architect not connected with the district, or to the Poor Law Board. Mr. Jarvis declines to join in such a request, on the ground that the proposition was not made till the eleventh hour, and after the designs had been seen. He agrees with those who, like ourselves, view the mottoes as a delusion and a sham.

Though all the competitors may not agree in the request, the managers, if they are wise, will comply with it.

THE DUBLIN SCHOOL OF ART.

SIR,—I see by your report that it was asserted by one of the speakers at the meeting of the Dublin School, that this school "stood first" among the schools of art in the United Kingdom. I beg to say that the statement is incorrect, Dublin being fourth on the list instead of first.

The highest Government honours were awarded to the masters of the Edinburgh, Nottingham, and Stoke schools, and the fourth honours to the master of the Dublin school. I think it only fair to those masters who have gained such hard fought honours that the truth should be stated. I will not take up your space by a complex tabulated comparison, but, if challenged, can supply the necessary figures to substantiate my statement.

ART-MASTER.

STEAM CULTIVATION.

At the annual meeting of the Midland Farmers' Club, at Birmingham, the subject of Steam Cultivation came on for discussion, introduced by Mr. James Howard, M.P., of Bedford. The interest in steam cultivation, he said, had grown year by year. Nearly all doubts as to profitable employment of steam power in tillage had been removed, and the two great questions to be solved were, how to apply the power of the engine to the best advantage? and the best form of implement to yoke to that power? The cost of the largest apparatus, having two engines drawing two ploughs simultaneously, was about 1,800l., complete, and the daily expenses, calculated upon 200 working days, 4l. 2s. 6d. Taking 40 acres as a day's work, the cost would be

2s. 1d. per acre. Whenever steam-power was introduced upon a farm, deeper tillage is, or ought to be the result. In closing the discussion, which followed the reading of his paper, Mr. Howard remarked that as they could not extend the width of the land in England, they must look to depth for an increase of the produce of the soil. He was free to admit that he thought in those localities where the farms were small, steam cultivation, by hired machinery, would not pay; but it was his opinion that persons with large holdings, and with sufficient capital, should have a cultivator of their own, just as they would have a plough or a harrow.

"SMOKING FIRES."

SIR,—In your notice of a book on this subject by the Rev. A. C. Ainslie, a quotation is given in which "glazed drain-pipes" are recommended for flues. I have known several instances of these being used, and the general complaint has been that the soot is constantly falling into the grate. This arises from the fact of the surface being glazed, as the soot cannot adhere to it. Unglazed pipes should always be preferred. There is, also, another objection to drain-pipes, namely, their liability to crack from the settlement of the walls.*

E. W. T.

PAYMENT FOR "QUANTITIES."

We have received several letters lately from surveyors who, having taken out the quantities for estimates on their own speculation, complain that they often fail to get paid by any one. All we need say is this:—If surveyors take out the quantities for estimates without being appointed either by the architect or the builders, they must of course run the chance of getting no payment for their pains. The remuneration can come only from those individual tenderers who make a special agreement with the surveyor.

The quantity surveyor referred to by our correspondent, "J. S." (p. 92, ante), has sent six pages of foolscap, in reply, for which we are unable to find room, especially as they leave the actual facts very nearly as stated. The surveyor goes into a defence of those who take out the quantities without being asked by any one to do so, but we cannot go with him.

ENGINEERS AND CONTRACTORS.

We have received a somewhat curious statement, dedicated to Lord Redesdale, and signed "John Masgrave, Clerk of Works, North London Railway, City Branch," as to the manner in which the works were carried out, and the results which have followed. Old bricks, he states, were used, though prohibited; and arches, he asserts, are falling in consequence. He gives a number of names, but we should probably subject ourselves to an action for libel if we printed what he sends.

THE NORTHERN ARCHITECTURAL ASSOCIATION.

The annual meeting was held on the 9th inst., Mr. J. E. Watson, president, in the chair. The report read by the honorary secretary stated the number of members to be fifty-two. It was agreed that the excursion this year be to Lambton and Lamley Castles and Chester-le-Street. It was stated that the interior decorations of Lambton Castle were now finished. Three years had been occupied over the drawing room. The work had been done by Messrs. Richardson & Coxon, of this town, from designs by Mr. Collmann, London.

The president then delivered the annual address. In the course of it he reviewed the principal buildings in progress or completed in Newcastle and neighbourhood during the past year.

"The restoration of St. Nicholas's Church tower and steeple is one of the most important undertakings, requiring the greatest judgment and skill. The works seemed to be progressing satisfactorily; and he hoped funds would be forthcoming, so that the noble structure of which the tower is justly proud may be completed. So far, all must admire the improvement in the spires, by the clear, sharp manner in which the detail is executed. St. Stephen's Church, Scotswood-road, is an addition to our ecclesiastical edifices, and an ornament to that neigh-

* Mr. Ainslie wishes it said that his suggestion for bringing air to the fire, on which we commented, includes a fender made long enough to cover the opening and confine the air to the fireplace.

hood, as well as an advantage to the residents of that locality, under such an able, intelligent, and persevering pastor as Mr. Lutott. The Orphan Institution, Moor Edge, and the Industrial School, are additions to our public institutions for which (with prominent architectural features) we are indebted to that charitable lady, Mrs. Albot, who has provided the whole of the necessary funds. The Female Convalescent Home at Whitely is another institution of which we may well feel proud, it being of noble dimensions and appearance, and well worthy of that illustrious nobleman whose memory it was intended to commemorate. The new buildings and streets at Tynemouth, intended to be carried out by the Duke of Northumberland, will be a great addition and improvement, and, no doubt, will have the effect of making it a first-class marine and fashionable watering town. The Gatehead Town-hall is progressing rapidly; and after the many contentions, misfortunes, and delays, and after the wasteful expenditure of money, its completion would give Gatehead a great addition to its architecture, and a higher standing in respect to the quality of its buildings. The hospital at the workhouse, after many difficulties, might, let them trust, be satisfactory in its results. The new buildings at the corner of the Side and Sandhill have just been finished, and the result was a considerable improvement to that narrow and confined place. The Lunatic Asylum at Colodgo is amongst the largest of our public institutions, now nearly completed; it will add to the architectural features of that neighbourhood.

The speaker remarked, that in one of the latest and most extensive competitions a bad precedent was shown by some of the competitors, at the request of the building committee, furnishing detailed working drawings, specifications, and estimates, before the merits of the different designs were decided on, and without any premium being offered for such a vast amount of labour.

Mr. Johnson, as one of the competitors on the occasion referred to, thanked him for the sympathy he had shown in his remarks as to the preparation of working drawings.

Mr. Oliver said they would soon have to pay a premium for competing.

And whose fault is it?

LONDON OMNIBUSES.

The report of the General Omnibus Company, about to be presented, shows that the gross receipts of the company during the half-year ending December 31st, 1868, were 284,077. 5s. 11d.; in the corresponding period of 1867 they were 290,805. 10s. 11d., giving a decrease of 6,728. 5s. The number of passengers carried in the half-year of 1868 was 20,654,306, and in the corresponding half-year of 1867, 20,757,127. The average number of omnibuses working on week-days, respectively, was 593 and 602; on Sundays, 474 and 472. The average traffic receipts per omnibus per week was 17l. 18s. 6½d. and 15l. 1s. 6½d.; ditto, per day of working, 2l. 12s. 9d. and 2l. 13s. 5½d. The average fare received per passenger was 325d. and 320d.; ditto, earnings per mile run 108d. and 111½d. The total number of miles run, 67,7632 and 6,135,972. The largely-increased extent of accommodation afforded by railways in the metropolis during the past two years has, no doubt, had a certain influence in diminishing the omnibus traffic on certain roads, and has rendered it difficult to find new traffic to compensate for the loss. Some new routes have, however, been opened with promising results, and others of the old-established routes, including some of those partially in competition with railways, continue to produce increasing revenue. The expenses show a decrease of 18,178l., of which 5,279l. are due to the substitution of *matte* for oats. It is proposed to declare a dividend equal to 5 per cent. for the year.

STOCKPORT.

A new bridge, or high-level viaduct, called St. Peter's Gate Bridge, has been erected by the corporation, and recently opened to the public, with a view to facilitate traffic to the Market-place and central parts of the town. The bridge consists of six arches or spans, that cover the street called Underbank being formed of cast-iron girders, with road plates and ornamental parapet railings; the other arches are in brickwork, having stone parapet, with nine bold stone carved pedestals carrying ornamental pillars,—width between parapets, 30 ft. The roadway is paved with granite cubes set in asphalt. Two broad staircases of stone give access from the higher to the low level street, the difference of level being about 32 ft. One feature in the construction of this bridge is the appropriation of the arches to useful purposes. The faces of the piers to Underbank are provided with folding doors, panelled and moulded, with segmental beads, and with circular-headed windows: these form the frontage to extensive

wine and spirit stores and offices occupied by Messrs. Turner, who have paid the corporation 2,000l. for the use of part only of the arches for this purpose. The total cost of the bridge, including land and compensation, will be about 12,000l. The works have been designed and carried out by Mr. Brierley, of Blackburn, civil engineer.

BUILDER'S CHARGE FOR ESTIMATING.

A SURVEYOR writes:—"Will you kindly answer the following query?—Tenders were invited from two builders for the erection of a villa; plans and specifications were supplied, but no quantities; the work was not carried out, but one of the builders puts in a claim for taking out the quantities. Is this right?"

If the builders tendered under the belief that one of them was to be employed, such a charge would most certainly be right. If they were warned before going into the business that possibly neither tender would be accepted, they took the risk, and could make no charge. Suppose two men were led to pay 10l. each for right to rifle for a horse, and when the winner went for his prize he was told there was no horse, would that be right? The least he would ask for would be to have his own money again.

THE GAS SUPPLY OF THE METROPOLIS.

THE president of the Board of Trade (Mr. Bright), has received a deputation from the delegates appointed by the metropolitan vestries and district Boards on the question of the gas supply of the metropolis. The deputation was introduced by Mr. Dilke, M.P. The object of the deputation was to urge the president of the Board of Trade to carry on a Bill of which his predecessor in office, the Duke of Richmond, had given notice, and which provided that if gas consumers were not supplied with good gas at a reasonable rate the Metropolitan Board of Works, or any vestry or local authority might, by agreement or compulsion, purchase the existing works of gas companies and erect additional works. Mr. Bright referred to the probability of the metropolis being divided into municipalities, and asked whether it would not be better to defer the discussion of the subject till the question of municipalities for the metropolis—in favour of which memorials had been received signed by one-third of the inhabitants of the metropolis,—had been settled. Mr. Beale objected to this proposal that the question of municipalities had been under discussion since 1835, and might remain open a long while yet. Besides, many gentlemen present were opposed to municipalities, whilst they were all agreed as to the necessity of some action for obtaining better and cheaper gas. Mr. Bright said the subject would receive the fullest consideration from his colleagues and himself.

A NEW MINERAL PAINT.

MUCH interest has been excited in the United States by the discovery of a mineral which is said to possess the most valuable qualities of white lead, while superior in many respects to the manufactured article. The mine in which it has been found is situate in North Carolina, and has been worked for many years as a silver and lead mine. The vein, however, presents an unprecedented variety and association of minerals. Lead, silver, zinc, copper, gold, iron, and manganese are found in the workings, which are continually varying in character. The ore usually averages about 30 per cent. of lead. The powder manufactured from the ore, when mixed with oil, it is said, forms the most durable paint known, and a yacht upon which it has been tried has been sailing for the past summer without copping of any kind. The works for manufacturing this powder into white lead are situate at Bergen Point, New Jersey. There is something not clear, however, in what is said as to the nature of the paint: it is said to stand a fierce heat without change.

SUN-DIALING.

Sir,—I am about to erect a horizontal sun-dial, and should be glad if any of your readers could state the exact angle at which the gnomon should be placed, and the most correct method for dividing the hours on the dial. The mention of the author's name by whom the best work on the above has been written would prove of equal assistance. S. H. W.

TAKING OUT QUANTITIES.

POPULAR WORKHOUSE.

Sir,—My attention has been called to a statement in your publication of last week, in page 133. It is there said that the Rev. Mr. Driffield proposed as an amendment, that 3 per cent. be paid, and that it was carried by a majority of 47.

The true facts are these:—The Rev. G. T. Driffield considered the payment of 1 per cent., or a sum of 3000l. for this work of taking out the quantities, which was stated would not occupy more than three weeks, was something monstrous. He would, therefore, move, as an amendment, that the remuneration be 3 per cent. only.

This amendment was seconded by Mr. Robey, but on being put from the chair, it was lost by 7 votes against 3.

Mr. Bracebridge moved, and Mr. Hoare seconded the appointment of Mr. Dobson to take out the quantities.

Mr. Robey moved, and the Rev. G. T. Driffield seconded as an amendment, the appointment of Messrs. Hill & Fletcher.

The amendment was lost by 7 votes against 4, and the original motion carried *nem con.*

W. L. DOBSON.

BUILDERS' RESPONSIBILITIES.

GILBERT V. HILL AND ANOTHER.

THIS was an action (Court of Exchequer) by the widow of a carpenter, on behalf of herself and two children, to receive compensation in damages for his death, which was caused by the falling of a building in the Lower-road, Deptford, which was in course of erection by the defendants for a floor-cloth manufacturer.

Mr. Day and Mr. Willis appeared for the plaintiff; Mr. Sergeant Parry and Mr. Beasley for the defendants.

The building fell during a gale that prevailed in July, 1867, and it was said in consequence of the improper removal of certain struts and braces.

The defence was that neither the defendants nor any foreman in their employ ordered or authorised the removal of those supports to the building.

The jury, after having been locked up for some time, not being able to agree, were discharged without giving a verdict.

STONE'S END IN THE BOROUGH.

Is this beyond the care of the Board of Works? Here is a fair opportunity of widening the thoroughfare, I am afraid, going to be thrown away. This spot may be regarded as one of the entrances into London. A plot of ground has been lying unutilised on now some years, where stood the Old Stone's-end public-house. It is reported that a new police-station is about to be built on it. Now, there are houses standing singly on both sides of this way about 12 ft. in advance of the line from Trinity-street, and it is plain that a few years will see them all rebuilt to Horsemen-gate, or as far as the Sessions-house. Would it not be a pity to neglect initiating so great an improvement?

As an old inhabitant of the Borough, I feel ashamed that it should be necessary to point out so manifest a dereliction of duty to all concerned. Do lend your powerful aid, Mr. Editor, to rouse them.

ONLY A TAILOR.

A NEW PIN WANTED.

Sir,—In this age of scientific progress it is not possible to make a coil-headed pin? We have a safety pin which, in point of fact, is an old Roman fibula, or brooch, or oress; but if you have several children they are always bent and out of order. Now, what is wanted is a pin that could be affixed to a garment by Sir Thomas English-coat of arms, a needle and thread, so as to be affixed thereto for permanent use. On a larger scale, I believe, if made of well-rolled wire, they would be much more useful for training plants than any ordinary cast-iron eyes, being not so brittle. Such iron eyes I well know are sold by florists in Covent-garden Market.

CIVIS LONDINENSIS.

THE LAW COURTS.

Sir,—It is very much to be regretted that when a Government evinces an anxiety to effect improvements in the town by erecting suitable buildings for the administration of justice, it should cause such an agitation among architects and their friends for obtaining the prize of erecting these Courts, as to discourage for the future all attempts to improve the public buildings of London.

I think too much stress is laid on the ornamentation of these new Law Courts. Let them by all means be respectably built, but I see no good reason why money should be lavished on more decorations. Utility should be the aim of architects in erecting public buildings, plenty of light and ventilation, and the simpler the construction the more likely to succeed.

Is it advisable to let the building in one tender? Could it not be divided into four tenders, and a fourth part built first, which would enable the public to judge of the merit of the building as applicable to the hearing of law suits? This cautious way of proceeding would ease the pressure on the fund devoted to the expense of the erections; possibly the caution would not be without its reward; it would afford an opportunity of pausing where an error is to be avoided. Altogether I think no sufficient reasons have been advanced for delaying to begin to erect the Law Courts on the Carey-street site. PRICES.

GRAINING.

Sir,—I cannot agree with any of the speakers at the Society of Arts who opposed "Graining" on the sole idea that it is in most instances badly done. I grant that the graining that is at present done in the new houses that are so fast springing up is positively disgraceful; but that is the reason that the work is done so badly? It is the price that is paid to inexperienced workmen, who are now executing oak graining at the price of 3½d. per yard for several builders at the West-end, a price that no "grainer" who is at all entitled to the name would accept if even doubled.

I have tried nearly every invention that during the last twenty-five years has attempted to displace graining and marbling, and have found that in every respect it has failed to give the same pleasing effect as an experienced grainer can give. I trust that in time to the many eminent workmen in the above branch (who have worked their way up to their present high position solely through hard study direct from real specimens) you will insert this note.

Decorative Artists.
P.S.—Another point is, if master painters were to pay a little more for their graining work, it would not spoil the painter's work that often so much time is spent on. They forget that the graining is the work that is looked at when the job is finished, and if well done it would often hide defects underneath it.

CHURCH-BUILDING NEWS.

Bishampton.—The bishop of the diocese, the Duc d'Anmale, and Miss Porter, of Birmingham, have each given 500*l.* towards rebuilding the parish church of Bishampton, and Mr. Freedy, of London, has been engaged as the architect. The present building is ancient, and very dilapidated, the only thing done for it of late having been the re-roofing of the chancel by the Duc d'Anmale, who is lord of the manor. There is Norman and Perpendicular work in the church, but the whole is greatly disfigured, and its dilapidations are disguised by plaster and whitewash, the yellow ochre and the artistic sylvage of black which a village daber formerly put on the outlines of windows and arches having given way to the all-prevailing white. It is hoped that in the renewal of the building care will be taken to preserve the ancient iron frame which held the hour-glass at the pulpit for the preachers in the seventeenth century.

Chester.—The new church of the Holy Trinity has been consecrated. The new edifice is on the site of the old one, but covers the old burial ground, and is on a line with the other modern buildings of Water-gate street. The style of architecture is Decorated. The church consists of a nave, chancel, north and south aisles, two vestries, and a tower with spire at the west end of the south aisle. The length from east to west is 101 ft., the width from north to south walls 68 ft., and the spire is 155 ft. high. The buttresses of the tower terminate in gables, and the spire, with lancet lights, rises from within a parapet of open quatrefoils, which has crocketed pinnacles at the angles. A similar parapet is carried round the building by a tablet of foliage supported by carved corbels. The principal entrance at present is under the tower from Water-gate-street, and is sculptured. There is an entrance at the west end of the nave, in Linen-hall-street, but this is not yet completed. The nave is lighted east and west by two seven-light windows, and also in the clear-story by two-light windows, the tracery being geometrical in character; while the aisles are lighted by two and three-light windows of the same description. The nave is covered by an open timber roof, while the choir and chancel have an inner timber roof, enriched by bosses of carved foliage. The reredos is the gift of Mr. C. T. W. Parry, and is by Mr. Earp. It consists of seven sunk panels, divided by shafts of Balmaloe marble, with carved capitals supporting crocketed canopies, the finials of which rise above the hood moulds. The gables are filled by emblematical subjects, and the space between them and those below is filled up with chaste diaper work. Among other gifts are two stained windows. The one in the north aisle, almost hidden by the organ, consists of three lights, with angelic figures in the tracery and cinquefoils above. In the centre light is the Saviour as the Good Shepherd, and on either side St. Peter and St. Paul. The stained window in the south aisle has also three lights, but a double row of subjects, the tracery having trefoils and quatrefoils. The following texts are illustrated by the artist: 1. "From a child thou hast known the Holy Scriptures;" 2. "I was naked and ye clothed me;" 3. The prayer of faith shall save the sick;" 4. "Ye must be born again;" 5. "I was sick and ye visited me;" 6. "I was thirsty and ye gave me drink." The architects were the late Mr. James Harrison and his successors, Messrs. Kelly & Edwards, of Chester. Mr. Thomas Hughes, of Aldford, was the builder. The seats have been made by Mr. Appleyard, of Chester. The gasfittings, altar-rail, and iron-work were by Messrs. Peard & Jackson, London.

Eccleshall.—The north aisle of the church has been reopened; and, after an interval scarcely exceeding three months, the church has been restored almost as it was before the fire. There is, indeed, little change to notice in the appearance, beyond the addition of a painted window,

given by Miss Buckley. It is a two-light window, at the west end of the south aisle. Two subjects have been introduced: the raising of Lazarus from the tomb by Christ, and the restoring of Tabitha to life, in her sick chamber, by St. Peter. The artists were Messrs. Clayton & Bell, of London.

Bury St. Edmund's.—The chancel of St. James's Church has now been completed. The chancel is 58 ft. long by 23 ft. wide, and 40 ft. 3 in. from the floor to the apex of the roof, and rises in three stages from the nave to the east end, there being one step under the chancel arch, two others in a line with the side doors, and two more at the altar-rail. In all three divisions the floor has been laid with Minton's tiles. Adjacent to the nave is placed, on either side the chancel, a row of ten oaken stalls, in front of which are benches for the choristers; and on the south of the altar are sedilia in three compartments, executed in Caen stone, to be surmounted with carved Gothic canopies and finials. Between the sedilia and the reredos is also a small credence-table of Ancaster stone, supported on moulded brackets. The reredos has been put up at the expense of the members of the firm of Oakes, Bevan, & Co., of this town, and occupies the whole of the eastern wall beneath the string-course. A decorated window, designed by the architect, Mr. G. G. Scott, has been inserted at the east end, and has been filled with stained glass, purchased by subscription, and executed by Messrs. Hardman, of Birmingham, as a memorial of the late pair of the living, Mr. Henry Wilson, of Stowington Hall. The stalls and choir-benches in the chancel have been made by Mr. Darkin, clerk of the works, and the stone sedilia by Mr. Plowman, of this town. The whole of the remainder of the work has been executed by Mr. Jackman.

Manchester.—The church of St. Gabriel, Hulme, Manchester, has been consecrated. The church occupies a prominent position in Erskine-street, midway between the Stretford and City roads. The church is of considerable height, and, although the steeple is still unfinished, rises well above the adjoining buildings. St. Gabriel's is, we believe, the only example in Manchester of a brick church—one in which the facing bricks show both outside and in. The outside of the building is of red brick relieved with blue in bands and patterns, whilst in the interior the walls are lined throughout with white bricks, with arches, strings, and various devices worked in red brick, on a white ground. The outline of the site being a simple rectangle, and of not more than sufficient size, the plan of the church is likewise a parallelogram, terminating tri-axially at the east end, which faces Erskine-street. The north aisle extends to the extreme western limit of the site, but the nave and south aisle stop a little short of it, so as to allow access to and from the central west door. A portion of the western bay of the south aisle contains a brick-built porch, which is the main entrance for the congregation. For other uses and for exit there are in all six doors, three at the western and three at the eastern end of the building. The nave is divided from the north and south aisles by arcades of five arches each. The pillars are of cream-coloured Bath stone, the shafts being banded with red stone. The baptistry—oblong in shape—is at the west end of the north aisle, and is marked off from the aisle by a couple of tall narrow arches, resting on a central pillar. The chancel, which is 43 ft. by 20 ft., projects a little more to the east than the two smaller apses, and is about double their height. The smaller apses are lighted by an arcade of lancet windows, all round; while the great central apse has three two-light stone tracery windows, divided by circular brick buttresses, terminating with carved and conical caps. Inside and out, the apses have moulded brick cornices. The steeple will come over the western bay of the chancel. The aisle windows are in pairs, with stone cuspied heads. Each bay in the clear-story has a stone rose-window in the centre, with a lancet on each side. The west end is lighted by a three-light window, upwards of 20 ft. high, with a single lancet on each side of it. The roofs are covered with purple slates, with bands and patterns of green-coloured slates. The ridges have red terra-cotta cresting of original design. Want of funds, however, has caused the work to be let in many contracts, and ordered bit by bit as circumstances appeared to justify; and thus it happens that even at the time of consecration much that is desirable is still unfinished. Oak chancel-stalls, and tiling for passages and chancel, are still in preparation.

A few only of the benches for the nave have been made, but it is hoped funds will soon allow more to be ordered. The temporary gas-fittings consist of brackets in the spandrels of the arches above the nave pillars. The heating apparatus was put in by Messrs. Haden. The light is softened by tinted and partially opaque thick glass in two or three colours. The architects were Messrs. Medland & Taylor, of Manchester.

Miscellaneous.

Manchester Architects and Machine-Made Bricks.—In reference to a remark by Alderman Bennet at a meeting of Manchester builders, &c., to receive a free-labour deputation, that "unless the architects would specify machine-made bricks, builders were almost powerless in the matter" of promoting free labour, a letter signed by various well-known Manchester architects says:—"We think that we should not be acting in the interest of any one except the manufacturer of machine-made bricks were we to debar ourselves from that to which we conceive we have an undoubted right, viz., the use of whatever material seems to us the best for the particular purpose intended. To determine that machine-made bricks should be used would certainly be construed as implying the exclusion of those made by hand, and this would be encouraging a monopoly in its most objectionable shape, and depriving the makers of both of that healthy stimulus which competition alone can give. There can be no doubt, on the other hand, that if machine-made bricks could be had in Manchester equal to hand-made ones, but at a lower price, or superior to them at the same price, no protective influence would be required on our part to cause them to be generally used."

Wire-rope Transport.—Mr. Hodgson, C.E., has patented an invention based on East Indian, Chinese, and other Eastern practice, in the formation of a light and cheap mode of transporting mineral or agricultural produce, suspended from a pair of wire ropes, and moved by steam or horse power at one end of the line, through an endless running rope. The goods are conveyed in boxes, which pass the supporting pulleys without interruption. The line is not unlike that of a telegraph, reminding one of the old lady's idea of having her umbrella returned by telegraph. One has been erected near Leicester, and is said to work well. The inventor, however, chiefly intends it for use in the colonies.

Gas and Water Supply Corporations and their Customers.—A case of considerable interest has been heard at the Carlisle County Court. It was an action brought against the Corporation of Carlisle to recover 5*l.* for damage sustained by reason of the defendants cutting off their supply of gas. The Corporation are the proprietors of both the gasworks and the water-works, and the plaintiffs having fallen into arrears of water rate to the extent of 7*s.* 4*d.*, the defendants cut off their supply of gas. The plaintiffs submitted that the defendants had no right to stop the supply of gas for any default in respect of water. The defendants contended that they could cut off the supply of gas at any time. The judge held that they could not. If he said, they agreed to supply a customer, a contract was implied which could only be invalidated by his breaking their rules and falling into arrears for gas.—Verdict for the plaintiffs for 20*s.*

The Value of Land in Bristol.—After considerable negotiation, the Local Board of Health have purchased a narrow strip of ground lying between the inside margin of the footpath and the line of the new City Hotel. The company, it is said, first asked 800*l.* for the strip, but ultimately received the half of that sum. The effect will be the immediate repair of the footpath.

A Cheap and Good Whitewash.—Sir: Seeing a recipe for whitewash last week put me in mind of one that I have been using, which I find is very good, as well as very cheap. It is as follows:—Dissolve 6 lb. of fine white pipe-clay in as much water as will make it as thick as paint; soak and dissolve 4 lb. of good glue; add and mix well; then add ½ lb. of fat or dripping of any kind, put on the fire and boil a few minutes, and use while hot. The fat being boiled with the pipe-clay forms a kind of insoluble soap, which, if used while hot, defies all kinds of weather. It may be coloured to suit the taste.—R.

The Proposed New Chapels at the Chatham Cemetery.—A special meeting of a committee representing the various Nonconformist bodies in Chatham has been held on the subject of the Nonconformist chapel proposed to be erected at the new cemetery, which, as at present proposed, is exceedingly distasteful to Nonconformists, from its presenting an odious comparison to the chapel proposed to be built for the use of the members of the establishment. A resolution was passed directing the Board of Health, acting as the local Board, to make such alterations as would be satisfactory to the general body of Nonconformists. A deputation waited on the Burial Board, when that body, after consultation with an architect (Mr. Young), agreed to make the alterations required by the Nonconformists, and two chapels will accordingly be as nearly as possible alike.

How to Catch Rats.—For catching rats in a cheap and effective manner we recommend the following:—Cover a common harrel with stiff paper, tying the edge around the barrel; place a board so that the rats may have easy access to the top; sprinkle cheese-parings or other "feed" for the rats on the paper for several days, until they begin to believe that they have caught their daily rations from this source; on place in the bottom of the harrel a piece of oil cloth, about 6 in. or 7 in. high, filling with water until only enough of it projects above the water to enable one rat to lodge upon. Now replace the cover, first putting a cross in the middle, and then a first rat that comes on the harrel-top goes through into the water, and climbs on the rock. The paper comes back to the place, and the second rat follows the first. Then begins a fight for the possession of the dry place on the stone, the noise of which attracts the rest, who share the same fate.—*Scientific Farmer.*

New Drinking-fountain in the Old Kent-road.—A new drinking-fountain has been erected in the Old Kent-road, outside the Deaf and Dumb Asylum, and nearly opposite the Bricklayers' Arms Station. The fountain has two large drinking-troughs for animals attached to it, and about three months since a local committee was formed, and an appeal made to the inhabitants for the necessary funds. More than 1200 signatures were soon subscribed, and the committee placed themselves in communication with the Metropolitan Drinking-fountain and Cattle-trough Association. A site was granted by the vestry of St. George the Martyr, and the first of two fountains which are to be erected by the Association has now been opened for the use of the public. The directors of the Southwark and Vauxhall Water Company have granted a free supply of water for it. The Metropolitan Drinking-fountain and Cattle-trough Association have 124 fountains and 114 troughs in the metropolis, and as many as 700 horses have been known to drink at one trough in a single day, besides other animals. The society is supported entirely by voluntary contributions, and has offices at 1, Shorter's-court, Throgmorton-street, E.C.

The Sanitary Condition of Bridport.—A meeting of the Town Council has been held to consider the question, and whether some means should be adopted for bringing a supply of water to the town. Mr. H. E. Hounsell having given notice at the last meeting that he would make a motion to that effect. Mr. Hounsell's motion was—“That some means be adopted to bring a supply of water into the town.” They had heard, he said, that the mortality had been very high, but in the last quarter it was heavy because they had had fever. It was because of it that fever that his motion was made, and it was that fever that ought to be prevented by a good water supply as one of the means, and by sundry other precautions. After a good deal of discussion it was finally resolved by 11 against 9 that the matter be adjourned for two months.

The Proposed Tunnel between England and France.—Mr. H. Beckett, F.G.S., the gentleman appointed to report upon the possibility of effecting a communication between the two countries by a submarine tunnel under the Straits of Dover, presided at a meeting of the Midley Geological Society on Monday evening, and read a paper on the scheme. Mr. Beckett is one of the promoters of the scheme proposed to be two parallel tunnels for a single line of rails, and were of opinion that the total cost would be considerably less than 10,000,000 £ sterling.

Ventilation by Air Fountains.—A mode of ventilating churches, halls, &c., by means of jets of fresh air passing through pipes to the centre of the space to be ventilated, and above reach of the heads of those present; in conjunction with ways of egress for the foul air through the floor, after being cooled by the fresh air mixed with it, is proposed by Mr. R. Moffat Smith, of Manchester, architect. The system of ventilation, Mr. Smith observes, could be combined with warming apparatus. The fresh air would enter the central space through ornamental tube standards, or could descend from the roof, as in a ball-room, although the jets would be turned upwards. By means of valves or taps the air could be regulated at pleasure.

The New Law Courts.—At a recent Court of Common Council, the Remembrancer stated that he had received a communication intimating that the Government had given notice of their intention to introduce a Bill for the purpose of making a bridge to connect the new Courts of Justice and the Temple. He recommended that the communication be referred to the City Lands Committee, with power to confer with the Government and the commissioners employed in constructing the Courts. This was agreed to.

Destruction of the Hull Theatre Royal.—At this fire, of which by this time most of our readers have heard, it was evident from the first that none of the fire-extinguishing appliances at the disposal of the firemen would be of the slightest avail. As is usual with theatres, the flames made rapid and irresistible progress, and within a few minutes from the time that the fire was first observed the entire building was in flames. As yet the cause of the fire, if known, has not been explained. The audience, together with the company and assistants, had all left the building before the fire broke out. Very little property was saved from the flames. The old Theatre Royal was destroyed by fire in October, 1859, and it was six years before this new one was erected, so that it was only four years old. The North British and Mercantile Insurance Company is liable to the extent of 2,000 £.

Report on Expenditure of Boston Local Board.—A report of Mr. W. H. Wheeler, C.E., the borough surveyor, on the expenditure of the local board for 1862-68 has been printed. It states that the average ordinary expenditure has been 3,190 £ per annum, and that during this period a sum of 1,057 £ has been paid for works of permanent improvement, in addition to 3,876 £ paid during the same period in repayment of loan and interest on money borrowed for paving the town, and included in the ordinary expenditure.

The Improved Industrial Dwellings Company (Limited).—The report to the eleventh half-yearly meeting of shareholders states that the properties belonging to the company at present completed and occupied, are as follows:—

	Tenements.
Cobden Buildings, King's Cross-road.....	20
Nelson Buildings, Bridge-street, Greenwich.....	40
Tower Buildings, Brewhouse-lane, High-street, Wapping.....	60
Stanley Buildings, Old St. Pancras-road, King's Cross.....	104
Palmerston Buildings, City Garden-row, City-road 72	
Cromwell Buildings, Red Cross-street, Southwark	24
Derby Buildings, Britanni-street and Wicklow-street, King's Cross-road.....	168
Gladstone Buildings, Willow-street, Finsbury	84
Total	573
Buildings in course of completion at Willow-street and at the Bethnal Green Estate—to be occupied very shortly.....	102
	674

The company have also a site in Ebury-street, and mean to erect dwellings for about 100 more families; so that this company provides improved dwellings for 778 families, or 3,890 persons, besides 180 ordinary houses at Bethnal-green. A dividend of 5 per cent. has been declared.

Fatal Fall of a Mill Chimney at Glasgow.—A boisterous wind has blown down the square brick stalk, about 80 ft. high, in connexion with the paper-mill of Mr. Robert Bruce, situated at South Woodside, off Park-road, near Kelvin Bridge, Great Western-road. The stalk was blown down literally from top to base. It fell upon the roofs of four houses, the greater part of the debris levelling two centre buildings, which formed the residences of three separate families. Eight persons, mostly females, were killed, and others injured.

Report on Cleansing Newcastle-upon-Tyne.—A report by Mr. John Fulton, C.E., the borough engineer, to the Town Council, on the cleansing of the borough, has been printed. The report, at the conclusion, says:—

“Having recently, under your instructions, visited several of the most important towns of England, I can confidently affirm that, as regards surface-cleansing, Newcastle bears a favorable comparison with any of them. It is true that many of our modern streets are not paved, and are consequently in a wretched condition, but the defect is yet in a fair way of being remedied, and, as a proof of this, I may state that upwards of five lineal miles of new streets were severed, paved, and flagged during last year. At this rate of progress two years will suffice to complete all the streets in the town at present unpaved, provided the requisite funds be forthcoming.”

Experiments have been made with chloride of calcium (Cooper's patent) for the purpose of saving expense in street watering, and the report states that “it was found that when used in very strong solution, it had the effect of hardening the surface of the roads, and thus preventing the formation of dust, and the consequent necessity for watering. Further experiments are to be made next summer with this material.”

East London Museum.—On Saturday last the Lord President and Vice-President of the Council for Education (Earl de Grey and Ripon and Mr. Forster, M.P.) received a deputation for the purpose of formally accepting from them the gift to the nation of the title-deeds of the site which the promoters of the East London Museum scheme have conveyed to the Science and Art Department, under the powers of the Act of Parliament obtained for that purpose. Mr. Holms, M.P., introduced the deputation, and Mr. Brady explained that the Government had agreed to erect a museum in East London, on condition that the promoters selected and defrayed the expense and the cost of site. Mr. Brady then proceeded to point out what the promoters' views were as regards the sort of museum they wished to secure. Their leading idea was that it should be educational in the widest sense of the term. As regards fine arts and schools of design, the promoters did not know of any institutions of more importance. They also hoped that the museum might be made subservient to technical education generally. The title was complete, and divested of all prior trusts. A condition of the general proposal was that the museum should be open in the evenings. It would be erected on 43 acres of land in Bethnal-green. Two millions of people resided within a radius of three miles of the site. The Lord President, after formally receiving the title-deeds, said that Government accepted the trust most willingly, and would do their utmost to render the contemplated museum as publicly beneficial as possible.

Hearts of Oak Benefit Society.—The official auditor's report on the financial operations of this society for the year 1868 has just appeared, and it seems to indicate that, in spite of the commercial depression which has prevailed, the year has been in every way most successful. The society began the year with 13,565 members, and finished it with 15,902. The income for the year was 30,249 £. 5s. 9d., or 2,520 £ per month, against 26,801 £. 5s. 7d., or 2,233 £ per month, in 1867. The average quarterly contribution was 9s. 4d., against 9s. 6d. in 1867. The amount received was appropriated as follows:—22,934 £. 0s. 1d. were paid for sickness, funerals, and other benefits; 559 £. 1s. 5d. were spent in postage, reports, &c.; 1,573 £. 2s. 1d. was the cost of management; and the remainder, or 5,153 £. 2s. 2d., was added to the reserve fund, which now amounts to close upon 55,000 £. The cost of management was 67. 4s. per cent. upon the gross income, and it was covered by the fines, thus leaving the whole of the ordinary contributions available for the satisfaction of claims, and for the augmentation of the reserve fund.

The Architectural Museum.—On the 15th the Committee saw four candidates for the office of Curator, and ultimately appointed Mr. Joseph H. Wallis. The new building in Westminster is ready, and the collection is now to be removed without delay.

A Bolton Philanthropist.—The Chadwick Charity trustees at Bolton have had notice given them that Dr. Chadwick, of Southport, and formerly of Bolton, had placed at their disposal a further sum of 5,000 £, in addition to 17,000 £ previously given, making in all 22,000 £, to be devoted to the erection of artisans' model dwellings and an orphan asylum.

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TO BUILDERS, &c. WANTED, a RE-ENGAGEMENT either as ASSISTANT SHOP or GENERAL FOREMAN or CLERK of WORKS. Is a masterly draughtsman, as well as systematical Manager. No objection to the country.—Address, R. 107, Upper Kensington-lane, London, S.

TO ARCHITECTS and BUILDERS. WANTED, by a good DRAUGHTSMAN, an immediate RE-ENGAGEMENT. Address, H. G. care of W. Nunn, Esq. Architect, 25, College-hill, City, E.C.

TO HOUSE AGENTS and DECORATORS. WANTED, a constant SITUATION, as PLASTERER and BRICKLAYER. One who has held the same situation in a decoration's shop over seven years. No objection to town or country, or to take the general repairs on an estate.—Address, A. Z. 7, Tottenham-court, Portico, Pall-mall, W.

TO BUILDERS. WANTED, a RE-ENGAGEMENT as SHOP or GENERAL FOREMAN, or to take charge of a moderate-sized Business. Understands Gothic and church work well up in drawings and accounts. Joiner by trade. Satisfactory references as to character and ability. Salary reasonable.—Address, S. 103, Old-street, London, E.C.

TO BUILDERS and OTHERS. WANTED, by a first-class CARPENTER and JOINER, or Stradares Hand, PIECEWORK, labour only. Town or country, or to take general work if required.—Address, A. Z. 30, Courthouse-street, Station-road, W.C.

TO BUILDERS and CONTRACTORS. WANTED, a RE-ENGAGEMENT, as GENERAL FOREMAN. Well accustomed to extensive work. First-class testimonials and references.—Address, A. Z. care of M. Taylor, 1, Market-place, London-road, Upper Holloway.

TO TIMBER MERCHANTS and OTHERS. WANTED, by a Gentleman, who has a large connexion with Architects, Builders, and others, an AGENCY, on commission or otherwise. Is well acquainted with building in all branches.—Address, 55, Office of "The Builder."

TO ENGINEERS, BUILDERS, ARCHITECTS, &c. WANTED, to Place a RESPECTABLE YOUTH in the OFFICE of either of the above. Is a fair Draughtsman.—Address, 101A, 10, Queen's-road West, Chelsea.

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TO PAPERHANGING MANUFACTURERS and HOSE DECORATORS. WANTED, by a thoroughly practical Man, a SITUATION as PAPERHANGER, Glazier, and Paper-hanger, by a respectable, confidential, practical Man. A fair writer, greater glider, &c.; sea design, and paint in oil and water, estimate work. Keep accounts books, or to make a business. Good testimonials, as to ability, punctuality, and general conduct.—Address, G. H. Frost-street, St. Andrew's-road, Ramfear.

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The Builder.

VOL. XXVII.—No. 1360.



On some Modern Architectural Work.

WHEN we say that the architectural practice of the present day goes almost entirely according to fashion, we say what is fast becoming a stale truism. We are as familiar with the different types in vogue as we are with the different species of dogs; we can separate them into distinct classes, each with its recognizable peculiarities and markings; if we get sight of a chamfer termination, or a capital from one of them, we can conjecture all the features that go with it, almost as well as a comparative anatomist can compile a body from a single bone, unless it be in the case of those abnormal buildings which occasionally startle us, and which can only be defined as resembling nothing at all, either in heaven, or in earth, or in the waters under the earth. Whether it will ever be possible for us, in the present state of society, with all its varied interests, and with our constantly increasing locomotive and intercommunicative facilities, to be of one mind in our ideas as to architectural style, and to agree in our opinions on the merit of modern designs as we almost universally do agree on the merits of ancient ones, it is impossible to say; at all events, for the present there seems little sign of such unity, and we must be content just now to accept our various current styles, and reproductions of styles, for what they are worth, content if we can see at least good Classic and Gothic, Renaissance and Romanesque, well and artistically treated, and not too captiously reject these, which are at least coherent styles, in the desire for some imaginary and hypothetical form of architecture which is to answer all our needs. We are willing to be grateful to a practitioner of one school for a building showing breadth of composition and elegance in treatment of detail, even though its leading features be borrowed from Greece or Italy, and its delicate contour of moulding seem comparatively ineffective in our climate; and we will give thanks to any one of the Gothic persuasion who will give us a building effective and picturesque in sky-line and appropriate ornament, though it be open to the objection that it recalls a social and intellectual state widely different from that of our own day. But this *laissez faire* criticism cannot be universally applied; there are some things brought out nowadays under the title of Gothic which would be "too cruel anywhere," even in the high tide of the Middle Ages, and a *fortiori* in these our enlightened times,—a class of designs referable in reality to no principles and to no style that ever existed, which are, nevertheless, rapidly getting into a temporary popularity, and which

we can only comprehend under the general title of "Barbarisms."

The tendency to the revival of fashions long worn out and laid by as antiquated is familiar to all who keep their eyes open. We have had various developments of it lately,—revivals of coarseness and irreverent sermonizing and hymnizing belonging to the religion of the early Methodist type; revivals of grotesque and ill-fashioned antique melodies and incomprehensible harmonies under the title of "pure Church music;" and revivals of minstrel galleries, and portentous open fireplaces, and bare stone walls, in mansions supposed to be built for the use of English gentlemen of modern civilized tastes and habits. But with regard to Architecture, with which chiefly we are concerned, matters have gone even farther than this. Mere revivalism of Medieval styles has become too tame and commonplace a source of effect in the craving for novelty which besets so large a portion of the architectural profession,—a craving which is stimulated and excited still further by the system of architectural competitions, where each man feels that his best chance for distinction is to put forth something more wild and startling than his neighbours have done. Consequently, we see designs in every direction passing entirely over the bounds of the picturesque, which was the characteristic of the best of the genuine Medieval buildings, and entering the domain of the barbarous and grotesque. It was the object of the designers, in the finest and most complete of past architectural styles, such as the Greek Doric and the Early English Gothic, to refine the rude material of their walls into elegant and beautiful forms arranged more or less symmetrically in well-balanced masses, connected into one whole by some obvious unity of purpose or treatment, subordinating the various parts to the general design; and while it is quite a misrepresentation to imagine the Greeks as tyrannized over in their buildings by the wish for absolute symmetry of the two halves of a building as a *sine quâ non*, it requires also to be pointed out that the works of the best data of English Gothic are by no means characterized by a meaningless and forced defiance of symmetry. The Medieval builders sought no such adventitious sources of effect: their plans are unsymmetrical only in so far as the requirements and uses of the different portions of a building influenced the sizes and shapes of the various compartments; like the Erechtheion, they are collections of symmetrically planned compartments grouped together in the way most convenient for their various purposes. But look at a large proportion of the drawings sent in for architectural competitions now. They are Gothic, of course; for no one who seriously aims at gaining a prize in a competition lottery would do wisely in sending in a Classic design; his most careful drawing of columns and cornice and window dressings will only result in his drawing a blank. But the Gothic has none of the refinement which characterized its best Medieval prototypes. The plans and the sky-line are studiously and carefully cut up into irregular lines, and jutting corners and odd nooks and hiding-places. The main object seems to be, that no one part of the building should in the least resemble another. There will be a high tower in one corner, with no special object; then a row of low buildings; then a sudden skip up to a greater height, and a more dignified style of fenestration; then another tower or two, and so on; while the roof of the building will present, in the perspective view especially, a wild mazy dance of turrets and ornamental chimney-stacks, which, perhaps, may be

"Then regular, when most Irregular they seem;"

but which on the whole convey the idea that the top of the building has been bottled to prevent naughty boys climbing over it. If a mansion is to be erected, it will have a frowning machi-

colated tower, with narrow slits for windows, suggestive of dungeons and domestic tyranny, adjoining a modern conservatory; if it is to be a town-hall or Law Courts, towers again on a larger scale and in greater numbers, with outlines like those of an old kitchen clock, corbelled out to an impossible extent at the top, cropping up just where you do not expect them, and terminating with conical roofs suggestive of gigantic extinguishers; and if a new church is in prospect, all the odd "doges" of masonry and heavy piling up of buttresses without any proper finish, and abnormal forms of plate-traceried windows, that can be raked together out of old village churches in France, will be thrown together into one jumble. With this class of designers, all attempt at giving refinement of character to a building, by careful proportioning of the various parts, and by designing each portion and each ornamental detail with reference to its effect on the whole, is apparently scouted as so much child's play calculated to interfere with the "vigour" and piousness of the design, and to bring the designer down to the level of the wretched and pitiable Renaissance. It is enough that the building represents a conglomeration of all that is most uncount and strange in Middle-age art, all which peculiarly belongs to the Middle Ages as a period of semi-barbarism and uncultivated life, and that all the real beauty and artistic power of the Medieval styles is obliterated; and nothing more is needed than for the "artist" to append his name and address in grotesque and illegible hieroglyphica.

But this spirit of barbarism is even more discernible when we come to consider the details of buildings, than in their general design. Go into a church of the current type, for instance, and see what monstrosities will strike the eye of any observer who is sufficiently independent in his judgment to be able to stand apart from the reigning fashion. One system of obtaining originality has consisted in the perpetual shortening of the shafts employed in Gothic work, so that in designs for pulpits and fonts, the bases and caps of the shafts which support them are only separated from each other by a few inches of shaft, which threatens to disappear altogether presently, and leave cap and base in conjunction; and even in the piers supporting the nave arcades in our churches it has become the fashion to stunt the columns (where columns are need) to the utmost possible extent, creating a heavy and clumsy effect quite at variance with the spirit of Pointed architecture as a vertical style. The font and pulpit, too, are fields for a liberal exercise of barbarism, in the shape of bas-relief designs of stiff archaic figures, such as would at once ruin the chance of any candidate for admission to a "life" school. The roof timbers are ornamented by being striped and dotted round in successive transverse bands of colour, interfering with, instead of emphasizing, their principal lines, and giving a "spotty" and gewgaw appearance, at variance entirely with the repose necessary to dignified architectural effect. The "reredos," as it is called, looks like a sort of lean-to erection, with a sloping roof cut and faceted to imitate tiling, with the same stunted shafts and mis-shapen figures as decorate the font and pulpit, and with a background of inlaid ornament, supposed to be symbolic, and often of the most barbarous and childish type; indeed, it is becoming the fashion now to go for studies of inlaid ornament to those glorious remains of art, the Egyptian hieroglyphics and decorations of mummy-cases. Hints, no doubt, may be obtained from these, and many other antique sources; but it is one thing to work out hints from barbaric design, another to reproduce the same type of thing, with scarcely any modification, in a modern building. Then on the walls of our church we see texts which no one can read, so studiously

are the letters archaized, and windows filled with stained-glass figures standing on the tips of their toes, with no knees or elbows, and showing evidently the anatomy of the period. But the crowning beauty is in the grotesque heads and figures with which the building is decorated at appropriate points. "Why do you architects sculpture devils on the outside of your churches?" said a clergyman to us the other day. "Is it to indicate that they have been expelled from the interior?" This is a happy thought, and we commend it to those Gothic gentlemen who may be called upon to furnish a reason for the hideous and disgusting figures which are perched over the spout-heads of some of their churches: they may sometimes find themselves rather at a loss for a defence. It is to be presumed, on the same theory, that commercial and other pursuits are being much purified from diabolical agency, seeing that these same elegant decorations are to be seen on the exterior of many recently erected buildings for secular purposes; and there are actually to be found wisacres who give great part of their time to the designing and inventing of these absurdities, and even rest a reputation thereupon, or seem to hope to do so. And finally, the barbaric mania has spread to our furniture and private decorations; and we are beset with designs for chairs and other moveable (or rather immovable) furniture of the most clumsy and unwieldy type, with studiously ugly outlines; bookcases inlaid with different woods, with an absence of all definite and studied design, just as we might expect to find them in the Sandwich Islands, or among any barbarous people; pianofortes looking as if they would go off into a display of fireworks, and organ-cases, with the pipes splashed over with all imaginable violent colours, in a manner calculated to give one ophthalmia, and perhaps further decorated by inlaid figures of angels "censing," and other devices supposed to represent the spirit of adoration in its latest and most exalted forms.

Now all these sources of effect, or attempt at effect, which we have mentioned as characteristic of much of architectural practice at present (and which are, indeed, before the eyes of our readers), belong to what we may rightly and naturally term the barbaric spirit in art. It is of the essence of barbarism to rejoice in all such gawgaw displays of colour and jumble of intricate form as we have been commenting upon. The spirit of self-restraint in design, so valuable, so necessary to the production of all great and refined works of art, the spirit to choose the good and reject the bad, is just that which is absent from all previous schools of barbaric art. In the art of the Hindoos, and of the Turanian races generally, we see it to perfection: in their copious lavishing of ornament upon every part of a building, their love of bright colour, their indifference to correct drawing of the human form, and adherence to conventional types thereof (especially in ecclesiastical structures), and their love of the grotesque. This is almost exactly the state in which the school of architecture popular among the younger members of the profession now is, with the difference that much of the ornamental detail employed by the ultra-modern Goth of the present day is inferior to that which may be found in Hindoo and Chinese work. There is no more real art, no more consideration of form and proportion, no more evidence of the presence of an educated mind in many of the designs which are sent in for competition nowadays than there is in the most *outré* of the temples on the banks of the Ganges; those who have well studied Indian architecture would probably say, "much less." But, at any rate, the faults of the two styles are of just the same nature, only the Hindoo was the work of people who were doing the best they could, and who had no better models, while the modern abortions referred to are the work of men who have had the opportunity of studying the remains of all the best art that the world has hitherto produced, so far as we know, and have wilfully turned their backs upon these, and elected to be of their own choice barbarians. And so far as the prevailing popular style of church decoration is concerned, the similarity in the two cases is most singularly striking; for a stiff conventionalized style of symbolic decoration, a love of violently contrasted colour, and a contempt for correct figure-drawing, have always accompanied the existence of a slavish adherence to ritual, which imparts a supposed perfection to all things designed for the service of the temple, and judges religious art by a different standard from that used by "externs." And how far the

modern ultra-medievalists are from all which educated men in general understand by Art, we may see at once, if we compare what passes for art with our best artists in the exhibition-rooms with what passes for art in a church, so far as at any rate as the drawing of the figure is concerned. If a stranger from another planet were to visit us, and were shown a painting by Mulready or Maclise, or a statue by Foley, alongside of one of the fashionable designs for a pulpit, or reredos, or stained-glass window, could he for a moment suppose that the two belonged to the art of the same period and the same nation? The young men who are spending their time on these precious productions of ecclesiastical and very Gothic art, may go on and complacently in their own self-satisfied round, and think themselves artists; but the best circle of educated men around them can see the real value of such a class of designs, and regard them with scorn; a scorn which posterity, if it should have the means of knowing anything at all of them, will abundantly ratify.

MEANS FOR THE IMPROVEMENT OF THE PEOPLE.

We ended our first notice of the English official reports on the Free Exhibition of 1867 with mention of the sixth volume, which is devoted to the returns relative to a proposed new Order of reward. This, we need scarcely remind our readers, was a distinct order of reward instituted, in official terms, "in favour of the persons, establishments, or localities which, by a special organization, or special among all those devoted a spirit of harmony among all those co-operating in the same work, and have provided for the material, moral, and intellectual well-being of the workmen;" and it was endowed with prizes to the value of 5,000*l.* and twenty honourable mentions. It was left to each country to collect its own information, and this sixth volume contains that which relates to such establishments or institutions in England. There was at first some little reserve and delicacy, and in some cases absolute refusal to send in any particulars in competition; but, it being pointed out that a knowledge of good was for the general good, these scruples were to some extent removed, though not so far as the objection to money rewards. Forms were accordingly circulated by her Majesty's Commissioners for claimants to fill in, containing a sufficient number of questions to elicit all the leading facts and points of the undertakings under their charge or devised by them. Thirty-seven commercial firms responded; ten building societies; thirteen co-operative societies; thirteen sailors' homes; two localities having special institutions; and thirty-seven institutions of a miscellaneous character, varying from a cripples' home to a working-women's college, and including one of the new boards of arbitration and conciliation, making a total of 102 returns. The mass of information thus gained, and now at everybody's service for a nominal sum, is supplemented with several valuable plans. There is a bird's-eye view of Akroyd, the famous *cité ouvrière* of Messrs. Akroyd & Son, in Yorkshire; and there is another of Copley village, belonging to the same firm, with plans of the houses in them. These are followed by a comprehensive plan of Salthaire, the property of Mr. Salt. Then there are an elevation of Miss Bardett Contts's market, in connexion with Columbia-square; an elevation and plan of the dwellings of the Improved Industrial Dwellings; a view and plan of Gatliff Buildings, belonging to the Metropolitan Association; and a plan, elevations, and section of the Spitalfields Metropolitan Buildings. It is thus easy to mark the differences and advantages of the several plans. Akroyd (previously illustrated in our own pages) is a quadrangular town, forming a hollow square, is a quadrangular town, forming a hollow square, in round an open piece of ornamental ground, in the centre of which the plan shows a handsome fountain, throwing up a jet of water which falls again in three stages of tazza. On two sides of the square the houses are in a double row, with a narrow street between them; in a third there are three streets, one behind the other; on the fourth there is a double row again. The blocks illustrated in plans have cellars furnished with coppers for washing, a place for coals, and a sink; above these is a living-room, with a small scullery, with a sink in it, partitioned off, and a staircase leading to a large and small bedchamber above; the latter being over the space cut off from the living-room as a scullery. These houses are

rectangular. Two other blocks have a small projection in the rear, in which the larder and coal-place are located in the cellar, and above these the scullery; and above this a small bedroom; the front of the house, consisting of a large cellar for washhouse, furnished with copper and sink; a good living-room on the ground-floor, and two bedrooms on the first, and a small yard in the rear, containing W.C. and place for ashes. In the Copley houses shown we do not find much to admire. They are built back to back, and the ash-places and W.C.s are in front of them; though even here the living-rooms have little sculleries, furnished with sinks, partitioned off from them. Each houselet, or *maisonnette*, as it would be called on the other side of the Channel, has two small bedrooms above stairs. Both Akroyd and Copley are in the enjoyment of many schemes and societies for the general benefit devised by the firm, such as a library, a choral society, a library and scientific society, a horticultural and floral society; but neither, as far as we learn, is in possession of the means of technical education, as supplementary to that primarily afforded by the schools, in this respect contrasting disadvantageously with the establishment of Le Creusot, in France. In the schools belonging to these great iron coal works, there are twenty-three teachers, and the highest classes attain what the Rev. M. Mitchell describes as "a very extended acquaintance with literature as well as science, exercises in style, history, cosmogony, arithmetic, algebra, geometry (descriptive), mechanical physics, chemistry, and the elements of sculpture and drawing." From these schools the factory is furnished with intelligent workmen. Let us hope that the importance of keeping pace with our neighbours on this particular, will not be overlooked by employers, who have shown themselves in so many ways anxious to improve the condition of those whom circumstances have placed in their power to benefit. We have ourselves given particulars of Salthaire. It is here represented by a plan only, which although it shows its extent, the relative position of its church, chapel, dining-hall, baths and wash-houses, literary and philosophical institution, boys', girls', and infants' schools and playgrounds, almshouses, dispensary, allotment gardens, cricket ground, croquet ground, bowling-green, fire-engine house, and offices, does not show the interior arrangement of the 748 houses. The return makes no mention of technical education having obtained footing here; but where a firm exhibits in such a princely manner its determination to do good to its generation, it is unlikely that it will be long absent. Mr. Salt declined to subject Salthaire to the arbitration of the Imperial Commission.

There are other of the firms making returns that have erected houses for the accommodation of their workmen, of which no plans are given. The Messrs. Besbrook, Spinning, & Co., in Ireland, have built 280 within the last twenty years, with kitchen and scullery, sleeping-rooms above, back yards and privies, at an average cost of 50*l.* each; Messrs. Bliss & Son, Chipping Norton, have built 75, at a cost of 5,131*l.* 4s. 6d.; Messrs. Briggs, Yorkshire, have built 170, costing from 70*l.* to 110*l.* each, and when they sent in their return, were intending to erect 62 more; Messrs. Brook & Brothers, Yorkshire, have built 140 cottages, with three rooms in some, and four and five in others, at a cost of nearly 20,000*l.*; Messrs. Campbell & Co., Belfast, built 23 two-storied houses for 60*l.* each, for 90*l.* each; at Cornstall Mill 413 cottages have been built at different times within the last thirty years, at a cost of 100*l.* each; the Consett Iron Company have 1,000 two-roomed cottages; the Dowlaia Iron Company, Merthyr Tydfil, have built 500 Iron Company, Merthyr Tydfil, have built 500 cottages, of which no particulars are given; 200 have been built at Gifford, Wilts; the Messrs. Holmes, Derby, have built 40, varying from 80*l.* to 120*l.*; at Laverstoke Mills 18 detached cottages have been built, with two and three bedrooms, at an average of 160*l.* each; at New Bagley Mills, about 100, built of stone, varying from 100*l.* to 140*l.* each; at the Panmure Works, Dundee, dwelling-houses to accommodate thirty families, and thirty self-contained cottages, of three rooms each, besides some single apartments for single women, have been built within the last ten years, at a cost of 7,800*l.*; Messrs. Ransome & Co., Suffolk, have built fifty cottages of five rooms each, and Messrs. Winfield & Co., Birmingham, thirty, costing about 100*l.*; but without plans it is impossible to learn more from

this list than the bare figures quoted. If we include the Ackroyd and Salsaire Dwellings, we here see an aggregate of 4,000 houses. It is difficult to over-rate the amount of comfort and health that might have been conferred upon their occupants if every sanitary provision now available and recognised had been adopted in their construction. Consumption and typhoid fever have still to be rooted out. One piece of information imparted by Mr. Rhind, the surgeon, respecting Salsaire, should be repeated in every possible quarter. When, during the visitation of cholera, a system of disinfecting and deodorising, by means of the application of carbolic acid and chloride of lime to the drains, ashpits, privies, and sinks, was carried out, not only was cholera absent, but an immunity from typhoid fever was experienced.

In reply to the question addressed to the building societies, "Has the establishment been remunerative or not?" most of them answered in the affirmative. Columbia-square realizes a return on the cost of 2½ per cent., as nearly as possible; the Hastings Cottage Improvement Society, of 5 per cent.; the Industrial Dwellings, 5 per cent.; the London Labourers' Dwellings, 6 per cent.; the Marylebone Association, 2 per cent.; while the Leeds Permanent Building Society speaks of success in more general terms, and the Metropolitan Association begins to share the prosperity of its fellows. Of Mr. Vance's Dublin Model Lodging-houses, only those for families have been remunerative. All consider themselves successful in other respects, such as their appreciation by tenants, favourable influence on the death-rate, and general prosperity.

Nine of the co-operative societies declare their respective establishments to be remunerative. Their various modes of operations, restrictions, and qualifications are here all seen at a glance. Tracing the career, by way of specimen, of the Rochdale Equitable Pioneers, we are told the principal object of the establishment was to purchase food, firing, clothes, and other necessaries, and to improve the social and domestic condition of its members; that it was formed by some twenty or thirty working men, mostly flannel weavers, joiners, and warpers, in 1844; that it employs 138 males and youths to sell goods and make clothing in its shops; that it has realized a profit of 187,850*l.* up to 1866; its annual income at that date was 249,122*l.*, but increases every year; its annual expense the same year for its nine grocery and branch shops and wages was 7,795*l.* 4*s.* 4*d.*; that its paid officers consist of ten committee-men, who are allowed on an average 1*l.* 6*s.* per week, for attending a meeting to manage the prosperous concern once a week, and various other particulars, not the least praiseworthy being an annual apportionment of the sum of 700*l.* and more to the support of a library and eleven news and reading rooms, and 493*l.* for educational purposes. The fortunes of all the other societies also deserve consultation, and the map of them, so to speak, spread out before the eye, must suggest servicable comparisons.

On the other hand, none of the Sailors' Homes are remunerative; nor is it intended they should be so. One glance at the bill of fare at the Cornwall House, which tells of eggs and bacon for breakfast; roast beef, beer, vegetables, and plum-pudding for dinner, and beef-steaks with tea, and at the separate hot and cold bath, explains this fact. As a large number of those who avail themselves of its hospitalities are either sick, shipwrecked, hurt, or destitute, this, and of course similar institutions, must provide for very disastrous needs. No plans are given of the buildings.

The minute particulars of the miscellaneous institutions give this comprehensive volume an additional interest. Never before, indeed, has there been such a specification laid before the world of what great-hearted people have devised at different times and in different places, to benefit sections of their fellow-creatures. The two localities claiming to have special institutions were Halifax and Ipswich. To go to Halifax really seems as wise a proceeding as it is possible to any one. This proverbially celebrated town was created a borough twenty years ago, and in the interval has laid out 415,943*l.* 17*s.* 9*d.* in improvements, and at the date of the report was expending 133,759*l.* in improving these and making others; these sums, with the cost of the park presented by Sir Francis Crossley, bring up the municipal properties to a value of considerably more than half a million of money. Nearly 60,000*l.* have been expended in sewerage works;

and the amount of money laid out by the wealthy manufacturers upon the building and maintenance of charitable institutions is much more considerable. Thirty-two schools, three sets of almshouses, an orphanage, five relief and friendly societies, five co-operative institutions, six literary institutions, a school of art, a chamber of commerce, a piece hall with 315 rooms in it, and a building society, surely entitle Halifax to say to neighbouring towns, "Do ye likewise."

The Ipswich claim is represented by much smaller figures. The locality is limited to the district of St. John's, California, a tract of unproductive land purchased by a freehold land society, in 1850, and subsequently allotted out in plots, many of which were built upon. The particulars state that about twenty persons occupy houses of a rental of upwards of 10*l.*, about 1,800 persons occupy others varying from 7*l.* to 10*l.*, and about 100 occupy houses of less rental. Of these 320 are freeholders. This industrial settlement is furnished with eight spiritual institutions, such as a church, a chapel, Sunday school, district visitors, &c.; six intellectual institutions, including a working man's institute, a national school, and a library; and five physical institutions, a penny savings-bank, a clothing club, a mothers' meeting, a lying-in charity, and a coal-club. The town of Ipswich enjoys institutions on a larger scale, five-and-thirty of which are mentioned. Let us hope the number of worthy claimants under this heading will, on any future occasion, be much larger.

A French jurymen and artist, M. Dufresne, in one pithy sentence, expressed the pent-up determination for future effort and scorn of all national sloth and slovenliness that must have animated many a breast as its owner strayed through the wondrous courts of the great market that elicited these reports—Miserable is that country which, after this exhibition, cannot comprehend the necessity of progress. We heartily commend our own Department of Science and Art for its attempt to bring many of the lessons taught by it home to those whom they concern.

IMPROVED INDUSTRIAL DWELLINGS, AND INCREASED INDUSTRIAL BURDENS.

FROM either extreme of the social scale we are supplied with forcible illustrations of the magnitude of the revolution which is actually taking place in the country. These indications are not confined to extremes. In every rank and walk of life similar cases occur. But each of us is apt to consider his own case as special, or to hope that his own inconvenience is temporary. In the hurry of daily life it is rare that a man can find time to take philosophical and comprehensive views as to the relation of social phenomena, or to connect the increase of his weekly bills, or the continued want of a tenant for the house he has to let, with any great national change, or secular movement.

Yet, for many reasons, it is highly desirable that such broader views should be at all events occasionally taken; and especially will this prove to be the case when the condition of the poorest and the most helpless members of the community appears to involve unusual, or increasing, hardship. Want is the most eloquent and the most terrible missionary of discontent. The hungry man, still more strongly the husband of a hungry wife, the father of hungry children, is likely enough to question very urgently the justice of that state of society in which it is possible for a stalwart, industrious, orderly man to be hungry. He is apt to lend a very ready ear to those who tell him that political change means the cheapening of the quarter loaf, and work for all who want it. Can those of us who have not his bitter experience blame him very severely? Be that as it may, one lesson is taught by all history, with one consent, and that is—that the great instigator of all violent and disastrous political revolution has been widespread and intolerable want.

The revolution which, with silent and rapid step, is advancing in this country, is not political. At least it is not to the political changes, he more or less important, that have succeeded the great movement of 1832, that we at all wish now to refer. But there is an impression, right or wrong, in the minds of many, that, amid all the brilliant triumphs of science, march of art, and spread of education, the poor man is becoming daily poorer, and the rich man richer; that the disparity between the two extremes of the social

scale is rapidly on the increase; and that, for all intermediate ranks, the battle of life is becoming, day by day, one in which the combatants are more likely to succumb.

The question is a wide one. It is, however, to one branch of the subject that we will confine our attention; and the chief reason for now bringing the matter before our readers is the wish to call their attention to an instance of which we may call commercial courage and benevolence in the face of considerable discouragement.

A distinct, positive, tangible proof of the increase of pressure upon the poor may be found in the increase of rates. The visits of the tax-gatherer, we are told by those who well know what they are saying, are viewed with undigested dismay by the occupants of weekly tenements. So much is this the case, that there is a disposition to prefer the meanest and most squalid lodging, in which this functionary is unknown, to those more decent, healthy, and commodious dwellings, which a wise and charitable enterprise is now gradually offering to the industrious poor, where the moderate rent is accompanied by the obnoxious quarterly demand. Nor is this to be wondered at, when we glance at the statistics of the case. In the parish of St. Pancras, the local taxation on a five-shilling tenement is 8*d.*, the rent specified being weekly; of this 8*d.*, 3*d.* is an increase due to recent legislation. In St. James's, Clerkenwell, the taxation on a 6*s.* weekly rent is 9*d.*; an increase of a little over 2*d.*. In St. Saviour's, Southwark, for 6*s.* paid as rent, the tax-gatherer demands 10½*d.*, being an increase of about 3½*d.*. In the parish of St. Mary, Islington, both the proportion and the increase of taxation are nearly identical with those in Clerkenwell. The average increase of taxation on all small tenements in these four parishes, consequent upon the enactments of the Reform Bill of last session, is 37½ per cent. A measure that proposed for the first time to give political rights to the working-classes of the metropolis has saddled them with an increase of nearly 40 per cent. on the taxation of one of the first necessities of life. No such increased burden is imposed by the Act on the middle and upper classes.

Such is the testimony of Alderman Sir Sydney Waterlow, M.P., a man whose name is far from being unknown among those who have striven to draw a broad and permanent line of demarcation between the exercise of practical and permanent charity, and the relief and encouragement of mendicancy. Our readers may be aware that a few years ago a company was established, on the limited liability principle, for the purpose of improving the dwellings of the working classes in the metropolis. The leading idea of this enterprise was, that charity would be most efficient if placed on such a basis as to be self-supporting. In other words, so wide a margin existed between the enormous rack-rents exacted by the proprietors of those pestilential and squalid dens in which the very poor are driven to take shelter by the night or by the week, and the payments that would yield a fair return, in the shape of rent, for money invested in the erection of decent and well-considered tenements, that persons who could not afford large donations, might yet render good service to their fellow citizens by investing a certain amount of money, not with a view to actual profit, but, at the same time, without losing the ordinary rate of interest which might be obtained by other safe means of placing such funds.

With this view 50,000*l.* were subscribed in 100*l.* shares. 46,575*l.* have been subscribed in 25*l.* shares, and 3,425*l.* are still required to make up the total proposed capital of 100,000*l.* On the completion of this capital, the company will be able to borrow a second 100,000*l.* of the Government, at the rate of 4 per cent. per annum, making a total available capital of 200,000*l.* The company have purchased estates in the neighbourhoods of Greenwich, Southwark, Willow-street, City Garden-row, Wapping, Old St. Pancras-road, Bagnigge-wells, and Briantia-street; and are in negotiation for a lease of a large plot of land at the end of Ebury-street. On the Willow-street estate, 168 tenements, arranged in six blocks, are half completed, and almost fully occupied. It is expected that the whole will be tenanted by the beginning of March. The Bethnal-green holdings will be ready for occupation in a couple of months. The rental of the finished buildings, after making proper reductions for repairs, and for the redemption funds on account of leasehold property,

allows of a dividend at the rate of 5 per cent per annum, carrying forward an undistributed balance of 800*l.* to credit, that of the former half-year having been 526*l.*

It appears that the different objects of the association have been thus far fully attained. That essential element of civilisation, of morality, and of health, a decent home, has been provided, and is being provided, for 3,890 persons of the working classes, in those great centres of population to which we have before referred. The benevolent work of the company is being gradually, but surely carried out; and this worthy and admirable enterprise is shown to be based on a strictly self-supporting principle. We have here all those elements which are most in accordance with the example of him who showed mercy to his neighbour who had fallen among thieves.

It is lamentable to see the directors of this model enterprise confronted, and almost paralysed, by the enormous increase of rates above referred to. At present, the directors have taken this heavy loss upon the shoulders of the company. In the hope that things would mend, and that the burden would not be of long continuance, they have forbore to ease the pressure on their resources by any increase of rent. They have not as yet thrown the load upon the ultimate point of resistance—the poor man. But while they, perhaps rather nobly than providently, have shunned to discharge their natural function in the distribution of legislative justice, what has been the case elsewhere? What other landlord has made a present to his poor tenantry of an amount equal to an augmentation of local taxation of from 40 to 60 per cent? The effort of the conductors of this company may enable us to gauge the torments amount of pressure, (which the mild winter of 1868-9 has to some extent alleviated) thrown upon the unrepresented and uncomplaining poor.

One cause of this pressure may be found, there can be little doubt, in the cost of those improvements which are now for the first time enabling London to take a respectable architectural rank among the cities of Europe. We naturally feel inclined to regard such expenditure rather with reference to the ultimate reproductiveness of its results, and to the justice of its temporary distribution, than as objecting to its actual amount. But there is, as we promised, a deeper cause at work. Increase of rent, increase of taxes, increase of the cost of food, of firing, of clothing, of every necessary of life, are not peculiar to London. Such increase occurs at Paris, at Florence, at Berlin, at Naples, at New York, at Sydney. Wherever we have any statistical return the same tale is told. In many cases some special reason may be offered for the change. The Parisians will debit the luxury of the Second Empire, and the munificence (with their funds) of their absolute prefect, with the increased cost of the means of living in their gay capital. The Florentines will attribute it to the elevation of their city to the new dignity of metropolis of the kingdom of Italy. So with Berlin. New York may point to the thronging crowds of emigrants, or to the anomalies of the "gold ring." Other places may have little to say except that so it is, that they do not understand why, and that the fact is almost intolerable. A more cosmopolitan reply may be found in the very ugly fact that the 2,600,000 soldiers who were (at least on paper) under arms in 1818, have swelled to no less than 7,000,000 in 1869. But there is yet another cause, and that is the unconscious, silent, steady change that has been wrought in all the monetary relations of the civilized world by the large and sustained influx of gold from Australia and California.

When gold, which measures all things, itself varies in value, disturbance is sure to ensue. In the changing ratio of value that occurs between commodity and commodity,—between gold, for instance, and iron, gold and paper, gold and flour,—matters will sooner or later adjust themselves with more or less accuracy. But in the disturbance which takes place between the price of commodities and the price of labour, this self-adjustment is more difficult. The employer of labour does not see it. Those whom he employs tell him they have to pay higher rents, higher prices for food—more money, we may say, to keep the wolf from the door,—and he replies, "So do I; we are all in the same boat. I do not obtain more labour from you than I did in 1818; therefore I cannot afford to pay more wages."

Very true. But the employer is actually

paying less. He forgets, or he does not know, that the quarter of an ounce of gold with which he remunerates the week's labour of a workman is not now what it was in 1818. It is the same in weight, the same in purity; it bears the same image and superscription; but it is not the same in purchasing power. The workman cannot purchase so many of the absolute necessities of life, turn where he may, with that quarter of an ounce of gold, that he could twenty years ago. Therefore it is not actually, although it is nominally, the same wage that it was at that time.

It is a matter of minute and curious investigation to appreciate the amount of this disturbance of value. We are not about here to attempt it. We may indicate some of the facts which must be collected and compared in order to throw light on the subject. On the one hand, there is the steady increase in the annual supply of gold. The annual yield of all the gold districts in the world at the beginning of the present century was a little over four millions and a half sterling. In 1818, it had risen to nearly nine millions. The importation of gold coin and bullion during 1867, into the United Kingdom alone, was 15,800,000*l.*, or between three and four times the annual product of the whole world sixty years ago. Such a change must, infallibly, tend to stimulate luxury, to diminish the purchasing power of gold, and to increase the difference between the actual and the nominal value of wages.

In articles of luxury and of *virtù* the disturbance of price has been most palpable. Diamonds and some other jewels command three times the price which they would have fetched a quarter of a century since. A yet more remarkable increase has taken place in certain species of china and porcelain. There is an annual addition to the number of jewels, whether that addition be more or less proportionate to the increase of the amount of gold in treasure and in circulation. But if we take objects of which there is not, and cannot be expected to be, any increase in number, while their character as articles of *virtù* is such as to lead to a sharp competition for their ownership, on any occasion of their changing hands, we shall find yet more extraordinary indications of the decline of the purchasing power of gold, or of the increase of that nominal wealth which is displayed by a lavish expenditure. There is a rare kind of earthenware called by the name of *Henri Deux*, ware, of which only sixty-seven specimens are known to be in existence. One of these, of the size of an ordinary dining-dish, was purchased, in 1857, for 140*l.*, at the sale of a French collector, who had given 3*l.* 4*s.* for the article. Another specimen of the same ware, a highly decorated ewer, was purchased, in 1812, for 80*l.*, and is now estimated as worth 2,000*l.* Specimens of a manufacture which is not to compare with the fine porcelains of China in beauty, will now fetch more than their own weight in gold.

It is thus clear that, in any attempt to improve the condition of the poorer classes, in any investigation of the laws for the protection or regulation of labour, and in all questions that relate to the community of interest that exists between the rich and the poor, we shall work altogether in the dark, if we neglect to allow for the important element of the depreciation of money. This has nothing to do, or at least little to do, with the question of the price of money measured by itself; that is to say, the rate of usance. Five per cent. may be the average annual usance for a hundred sovereigns, whether their purchasing power be more or less. But in all quarters we may detect a steady decrease in the purchasing power. In articles of imaginary or of merely æsthetic value, this decrease is the most enormous. In such matters as rent and taxes, it presses most closely upon the poor man. An adjustment, voluntary or compulsory, of the remuneration given for labour, is necessary, under such circumstances, to continue to the poor the means of subsistence. It is the theory of a certain school that this adjustment must be spontaneous, and cannot, with safety, be interfered with by legislative enactment, or by any means that should clash with the working of the law of supply and demand. We are not, now, about to controvert that view. But it is, at least, necessary that the subject should be understood. It is essential to the continuance of any satisfactory relation between capital and labour, that it should be understood on all hands that 1*l.* a week, in the year of grace 1869, is very different from 1*l.* a week in the year 1847. It would even be desirable to know the rate of this

difference. But it is quite clear that the employer ought to be aware that, in paying the same nominal sum, he is not paying the same actual wages. His pay costs him less—it will purchase less for his servant. If the employer of labour choose to say,—“Labour is so much more plentiful now than it was twenty years ago, that I can get plenty of men to do for 10*s.* 6*d.* per week work for which I used to pay 1*l.* a week, and I shall take advantage of that change in circumstances,” his language is perfectly intelligible, and quite accordant with the doctrine of the school to which we refer. But if he says, “I paid 1*l.* twenty years ago, and I pay the same now, although the present value of 1*l.* is, to the former value or purchasing power of the same sum, reduced to the worth of, let us say, 10*s.* 6*d.*,” he is deceiving either himself or his workman, or both. It is high time that this confusion should no longer form one of those numerous evils that render still harder the fate of the poor man. The very noteworthy struggle of the directors of the company for promoting improved dwellings for the poor, against that increase of rent which is one of the effects of this silent but prodigious change in the purchasing powers of the poor man's weekly wages, deserves to be made known to their honour. The attention both of the producer and of the consumer of labour, of the labourer and the capitalist, cannot be too carefully given to this aspect of that never-closed controversy which assumes, ever and anon, some fresh phase. Let us not have to add, some fresh feature of bitterness.

THE ARCHITECTURESQUE.

Nor only am I personally obliged to the learned writer in your last issue for his painstaking treatment of the question I have ventured to raise, but I think the cause involved (for, as I have repeatedly said, I advocate the word merely to formulate the much more important idea) is materially served by such scientific investigation, and therefore I hope there will be more of it.

It seems to me that your article has fixed much more effectively than I had done a definite and separable meaning to the termination “*esque*,” and I think I can fully accept that meaning, and turn it to most useful account. Let us for the occasion take the syllable in question as a separable word, and speak of the “*esque*” (under reserve) as an entity of language, and, of course, of thought and criticism. Now it is this *esque* of architecture for which I claim recognition; and I cordially agree with you that “there is little question of how we may apply the term, but very much indeed of how we must.” Architectural criticism, I consider, has arrived at that point in England when the study of this *esque* as an idea ought to be taken in hand; and I cannot help acknowledging it to be of vital importance to the idea itself that its phraseological formula should have no uncertain sound. Indeed, it is obvious enough that analogy alone has suggested the term I have proposed; and therefore, as I have appealed to analogy, to analogy I must go.

This *esque*, then, means *like*. Pietresque is like a picture. Sarcosque is like a statue. Sculpturesque is like sculpture. Grottesque is like the grotto. Barlesque is like the *barlure*, to like the grotesque, or rather was, like the Roman; Arabesque, like the Arabian; Moorsque, like the Moorish. Structuresque, let me go on to submit, is like structure, and architecturesque like architecture; and, indeed, I see no objection to accept the suggestion which arises, that there may be a good many more of these *esques* (chiefly, if not invariably, matters of art), not as empty phrases, but as substantial facts, worthy of recognition and contemplation, each in its degree.

Now for the analogy. Every one of these *esques* is a “*like*”; but the *likes* are not all one *like*. Translate the word *like* in each case by a perfect synonym, and it will be found that your synonyms are different—not very materially, but no matter how slightly. They will all agree however, in one respect—that in no case will they properly apply to mere superficialism so much as to an occult spirit under the surface. The *esque* is a *soul*. The architecturesque is the soul of architecture, as opposed to the semblance.

Again, there are the *esque* in matter, the *esque* in manner, and the *esque* in product—in artistic subject, that is to say, in artistic treatment, and in artistic result. So we perceive the

first picturesque in the bearded mendicant, the second picturesque in the painter's process of ennobling him, and the third picturesque in the banished lord. Likewise we may perceive the matter architecturesque in the structure-forms of the building, the manner architecturesque in the artistic treatment of those forms in detail, and the product architecturesque in the resulting art-work of a perfect architectural whole.

As a foil to the *esque*, let us take the *ish*, in pursuance of another good suggestion of your accomplished writer. "Picturish" I think formulates a very common fact; I am sure "architecturish" does so. If the *esque* is a soul, the *ish* is a semblance, a *simulacrum*, very much of a cheat. This is a readier way of expressing what I have called the spurious of the *esque*. But, as it savours of a cant phrase, I should not like to apply it practically except in avowed contempt; to everything whose error was more respectable I should prefer to use the more respectful term of spurious, or pseudo, or even fallacious architecturesque. The Brighton Pavilion, and one at least of the Thamea bridges, and a great deal of the shabbier class of our current *Cathartes picturans*, are architecturish; Somerset House, with its superfluous of great columns built up as mere buttresses to a wall; or St. Paul's, with its sham sides and sham dome; or the Duke of York's Column, with a stair in its bowels and a cage on its head, I prefer to treat more in sorrow than in anger, as aberrations of the architecturesque.

The avenue of trees I should scarcely venture to call in any sense architecturesque; its "likeness" to architecture is only in semblance, and incidental, not to say accidental. But Stonehenge I should call architecturesque, although not architectural, for the sake of its array. So also Trafalgar-square is very creditably architecturesque in plan, and Charing-cross very discreditably the reverse. The French are masters of the architecturesque in site: Trafalgar-square is almost on a par with some of their average efforts, whilst Charing-cross is more worthy of the genius of Hotentotland, and is likely ever to remain so. Would that Hansmann had the handling of it!

What is called an "Italian or architectural garden" seems to be an example worth contemplating. A natural garden would be something entirely unregulated by art, however charming in effect; if *naturalesque*, it would be artistic on the basis of being "like" the natural; if *picturesque*, it would be picture-like in the usual sense of the term; if *architectural*, properly speaking, it would involve some smob compositions as terrace-walls and balustrades, pavilions and fountains; if adorned, to whatever extent, with sculpture or statuary, it would be an error to call it either *sculpturesque* or *statuesque*; but, if merely disposed in architecture-like array, although the features may be but plain

curbs and edgings, and clipped hedges and geometrical plan, it is *architecturesque*; and if we would consent for the future so to designate it—an "architecturesque garden"—how much more expressive is the name!

A hasty problem,—an iron bridge; first, strictly structural; then structuresque, like structure; then architecturesque, animated by the spirit of architecture (of which the structuresque or architectonic, as I think, is obviously an important element); then, if you desire it, picturesque, by way of special licence. Observe, in passing, that the architecturesque, in such an example, asserts itself very distinctly as the artistically structural plus the structurally artistic.

Permit me to repeat my thanks to my collaborator, and to express the hope that he will consider me not to have in any way contradicted his excellent argument, but only to have done my best to carry it forward. ROBERT KERR.

THE GUTHRIE MEMORIAL CHAPEL, CLIFTON COLLEGE.

The Guthrie Memorial Chapel, which we illustrate this week, was completed and consecrated by the Bishop of Gloucester and Bristol during the summer of 1867.

The Very Rev. Canon Guthrie, in whose memory this chapel is erected, was the first chairman of the Clifton College Company, and might almost be styled the founder of the College from the great zeal he displayed in its establishment. Dying during the year 1866, his widow resolved to erect a chapel at the College in memory of her husband, well knowing that it had always been his earnest wish to see the chapel built, and for which object he had offered the sum of 500*l*. Before the walls were half up, Mrs. Guthrie also died, and thus the building is in a double sense the Guthrie Memorial Chapel.

The designs were prepared by Messrs. Charles F. Hansom & Son, the architects to the Clifton College Company; and when the college is completed the chapel will be joined to the main building by a continuation of the cloister.

The entrance to the chapel is at the west end, and opposite the door is the archway (now blocked up) which will communicate with the completed college buildings. On the right is the antechapel, over which is a tribune for visitors, approached by the large stone staircase in the tower, immediately on the left of the porch. The remainder of the building consists of nave, 75 by 33 ft.; chancel, 37 by 26 ft.; and organ chamber and vestry, with heating vault beneath them.

The antechapel is divided into three bays by stone arches, has a stone seat all round, and is lighted by an arcade at the west, the whole of

which is filled with stained glass. Each bay has a beautifully carved cornice running all round. In the central bay is the archway leading into the nave. The seats for the boys are arranged on either side, each raised a step higher than that in front, in the proper collegiate form, and a certain number of stalls are provided at the west end for the masters, the one for the head master having a carved canopy. The nave is ceiled in a polygonal form, and divided into panels by wood mouldings. Only one bay is at present decorated. The height of the nave is 50 ft.

The chancel arch is 42 ft. high by 22 ft. wide, with triple shafts and carved capitals. The chancel terminates in an apse semi-diagonal in form; in each angle are stone shafts supporting the ribs of the roof. The ceiling is curved and divided into panels like the nave, the whole being decorated with medallions of gold and colours on a light-blue ground, executed by Mr. John Buggins, of Bristol. An arcade runs round the chancel under the windows, with Devonshire red marble shafts and carved caps. The windows above have also marble shafts and carved caps. The whole of the sculpture and carving was executed by Mr. R. L. Boulton, of Obeltenham, who also executed the pulpit in Caen stone from the designs of the architects.

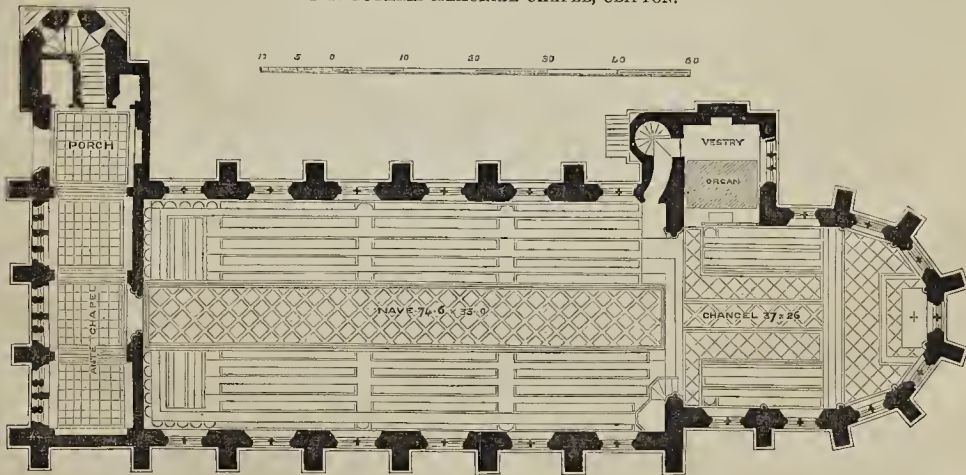
The floors of nave, chancel, and antechapel, except under the stalls, &c., are laid with encaustic tiles by Messrs. Maw & Co.

Stalls are provided in the chancel for the choir, and immediately behind those on the north side stands the organ. A small circular staircase gives communication between the vestry and the outside. The chapel is heated with hot air by Messrs. Haden & Son, of Trowbridge.

Externally, the nave is divided into seven bays by rather massive buttresses, between which are two-light windows. The windows of the chancel are also of two lights, but much longer than those of the nave. The ground falls considerably at the east end, and gives the apse great elevation, being about 40 ft. from the ground to the eaves: a freestone cornice runs all round above the windows, ornamented by carved heads. The west end contains a large circular window in the gable, of very rich tracery; also three carved medallions with angels holding scrolls or musical instruments; in the lower part is the arcade of small windows lighting the antechapel. At the north-west corner stands the small tower containing clock and bells. The clock stands out on a bracket at right angles to the tower, so as to be seen from the college playground. The tower is about 100 ft. high, and this, together with the foundations of the chapel, was built by the council of the college as their memorial to the late chairman, at a cost of about 1,000*l*.

The style of the chapel is Early Decorated. The tracery of all the windows is geometric. The three end windows of the apse contain

THE GUTHRIE MEMORIAL CHAPEL, CLIFTON.



stained glass by Messrs. Hardman; the two are filled with stained glass by Mr. Joseph Bell, of Bristol, who also manufactured that of the antechapel, and the nave side window giving upon the tribune. The west circular window contains stained glass by Wailes, of Newcastle. This window has demi-figures of the twelve apostles, with our Lord in the centre circle, surrounded by cherubim, and was especially designed for this subject. There is an oak lectern by Hardman.

This building, without the tower, was erected for the sum of 4,500*l.* by Mr. James Diment, builder, of Bristol; Mr. Charles Lewis being the clerk of works. Several of the stained-glass windows, fittings, &c., have been contrived by the masters, boys, and friends of the college, and more stained glass is now being prepared by Messrs. Hardman.

ON VENTILATION.

On the 24th inst. Dr. Edward Smith, F.R.S., read a paper on this subject, at the Society of Arts. After setting forth, first, general principles, and, second, modes of ventilation, the lecturer stated thus the conclusions to which a consideration of the subject and his official experience had led him:—

1. Interchange of air which proceeds both by diffusion and removal is not instantaneous. The rapidity of the interchange varies with many circumstances.
2. The effects of any natural system of ventilation vary with the season as well as with the special conditions of a building and the number of inmates.
3. There is a relation between ventilation and temperature, which in reference to inhabited rooms is generally an inverse one, and as the human body requires a temperature of the air of from 55° to 65°, according to the season, ventilation in cold weather must be restricted by the lower, and in hot weather by the higher temperature.
4. The movement of the air, although so essential to health, must not be very perceptible, lest it should cause discomfort and disease. Hence the inlets and outlets must not be very near to the inmates, and the current must be divided.
5. The ventilation should, if possible, be self-acting, after the amount required in a given room and under given conditions has been fixed.
6. Any general rule which may be laid down as to the number and size of the ventilators required in a room will demand modification by experience, since the admission of air will depend upon the elevation of the site, the direction of prevalent winds, and the impediments which surrounding walls and buildings offer, and these cannot be the same on all sides of a building.
7. Some differences in the plan, and much in the extent to which the plan should be carried, must depend upon the use of the rooms and the destination of the building, as to whether it be a private house, a public building with a fixed number of occupants, or a building, as a theatre, with a very varying number.
8. There is a relation between space and ventilation, for it is evident that with defective ventilation (not entire absence of ventilation) the larger the quantity of air in relation to the number of occupants the less the immediate evil, whilst at the same time, the larger the mass of air to be moved the greater is the force, or the more extended are the means, required to move it. In private houses the cost is often unimportant, but in general, and particularly in reference to workhouses, hospitals, and other charities supported by voluntary contributions, the aim should be, by providing the best ventilation, to reduce space to the strict requirements of the occupants, and thus to utilize in the greatest degree the money to be expended. That relation must be determined by experiment. Both architects and amateurs are apt to give undue weight to the lofty, spacious, and handsome appearance of their buildings, and too little to the solution of the problem of fitness with economy.
9. The test cannot be the life or death of the inmates, for health may be falling long before it ceases. Moreover, there are various degrees of health, and each person has a separate aspect of health, and it is not at all easy to indicate in particular cases the first period when some injury may have been done to it. A test is required by

which we may infer that injury would result if the cause were continued, and this must clearly be derived from observation. A close-smelling or a foul-smelling room may not be immediately injurious to health, but it is disagreeable at the least, and as such should not be allowed; and although the most injurious emanations from the body are not offensive to the smell, their emission is accompanied by the emission of offensive odours, and the two will co-exist. There is thus a relation between them which may be made useful as a test, so that if in an inhabited room the air be foul to the sense of smell it may be regarded as injurious to health. But the degree of relationship is not exact, since an uncleanly person, or even a cleanly one having the peculiarity of emitting strong odours in an unusual degree, will cause the air to be foul almost as soon as he enters, whilst another cleanly person may stay some time in the same room before rendering it offensive. Hence, in making the estimate, we must strive to ascertain whether the foul smell proceeds from dirty clothes, and particularly dirty stockings and unwashed skins, or is simply that which occurs with cleanly persons. When there is no offensive smell it may be assumed that the ventilation is sufficient; but as a certain amount of want of freshness, or closelessness, is found in our bedrooms or other rooms without known injury to health, I am of opinion that the ventilation is sufficient when the air, after the night's use, is not more offensive than is found in an ordinary private bedroom of the middle classes. Absolute purity of air in inhabited places, whether rooms, houses, public buildings, courts, streets, or towns, however desirable, is not necessary to health, and is not attainable.

10. The test cannot be the means provided to effect the passage of a given quantity of air through a room in a given time, for if the ventilation depend upon natural agencies, it will vary with the force and direction of the winds, the impediments to their action upon a particular ventilator, the frequency with which doors are opened, and other varying causes. If the room were closed, except at particular places, and the air were, by artificial means, conveyed through apertures at a known rate, it would be possible. We do not, however, live in closed boxes, and we cannot separate ourselves from the influence of natural causes.

11. Where persons do not occupy the same room or rooms throughout the 24 hours, but use other rooms, and particularly spend much time in the open air, defective ventilation of those rooms will be less injurious in proportion as they are used for a shorter period of time.

12. The cost of ventilating buildings is usually of importance. None can be so little as that mode which introduces the external air directly, but with proper safeguards, whilst all artificial systems are expensive.

13. No system can be efficient, in a public institution, which depends upon windows, doors, and fireplaces alone; but, for thoroughly renewing the air on fitting occasions, it is desirable that there be windows on both sides of a room, and particularly in public buildings.

14. When air is introduced on one side of a room only, whether by windows or by ventilators, the extent of its influence will vary with the conditions already named; but there is a relation also between it and the width of the room in reference to satisfactory ventilation. It is evident that, with little force of wind, the air will penetrate into the room but little, and with greater force the more; and also that, with a given force of current, the narrower the room the more certainly will it traverse it, and the wider the more certainly it will not traverse it. Hence, with such an arrangement, a wide room will be less perfectly ventilated than a narrow one, and a point may be readily reached at which the influence of such means of ventilation will be nil. Rooms with windows or ventilators on one side only should be very narrow, and still more so if there be no ventilation apart from the windows. A wide room, with windows only on one side, and no special ventilators which act permanently, must be ill-ventilated and unhealthy, as has been shown in the Nightingale Ward of King's College Hospital.

15. When air is introduced on two opposite sides of a room by windows or special ventilators, the current will usually extend further than twice the length of the current from one side of a room; and, as the wind will usually act upon one or the other side, the current will have greater force than with air-openings on one side only. But there is a limit to the width of rooms

so arranged; for, as the current must not be too great to be borne by those inmates who are placed near the external walls, its power to traverse the inner space is restricted. In very wide wards the ventilation in the middle is not so satisfactory as that near the external walls.

16. Where air is introduced into the centre of the floor of the room, a current is produced in the part over which the inmates pass and re-pass; and is, therefore, very perceptible. Cold air in considerable quantity can rarely be introduced with propriety in that position, but warmed air might be borne.

17. Each room should be so constructed that its ventilation may be independent of that of staircases or any other room; but where two rooms are placed side by side with a partition wall between them, each having windows on one side only, the ventilation of each is improved in proportion as a part of the partition wall is removed. Thus, one room may improve the ventilation of the other, and both be as if they had windows or ventilators on both sides.

18. Ventilators should be placed on opposite sides of a room, be of small size, sufficiently numerous to affect all parts of the room, defended on the inside by finely perforated zinc, and be placed at the floor-level and ceiling-level.

19. Ventilators in a small part of a room only are insufficient for ventilation, since when a current of air passes between two openings the greater portion goes in a direct line, and does not greatly mix with the air lying on either side of it. This may be readily seen when smoke is admitted by an inlet and emitted by an outlet ventilator, or such an arrangement as exists in prison cells.

20. Where the conditions rapidly vary, as in churches, chapels, and theatres, it is impossible to devise a system which will not require modification by an intelligent person. At present the system is universally defective, and only after the heat has become great and the persons very sensitive to cold are the doors or windows opened. The aim should be to regulate the admission of air from the moment when persons enter, so that the temperature shall never be materially increased, but remain at, say 56° in winter and 62° in summer. Cool air without draughts is better borne than hot air with intolerant draughts. In very lofty rooms the apertures for the admission and emission of air should be below the top, not too far removed from the occupants of the seats, the sources of the heat. In addition to this, however, ventilators should be placed in various parts of the ceiling, and be kept under control by a competent person.

21. Such rooms should be thoroughly aired after every occasion of their use, by the full opening of windows. At present, with three services at a church or chapel, this is neglected, and the air is close, heavy, and foul in the afternoon and evening.

22. No artificial means of ventilation should be relied upon solely, which will not act by day and night and throughout the year. Hence with ventilating stoves, which are very valuable, and ventilating air-floes, there should be other and self-acting means of ventilation.

In conclusion, it may be useful that I should sum up the principal errors into which architects are now falling in the systems of ventilation which they recommend. They are:—

1. In not duly estimating the practical limits of the law, that heated air ascends; and the relation of numbers of inmates and size of rooms in the application of the law.
2. In not duly considering that air-shafts, acting under that law, cannot act in all seasons, and with and without fire alike.
3. In not duly estimating the amount of air which can be admitted by windows and doors alone.
4. In not duly estimating the practical limits to which an entering current may be carried, whether from one or both sides of a room.
5. In not duly considering the effects of currents upon inmates, and the limitation thus demanded upon the amount, force, and elevation of currents.
6. In not duly estimating the inverse relation of ventilation to temperature in its effect upon inmates, and particularly upon the old and the young.
7. In not duly estimating the influence of the winds, and the impediments of surrounding buildings, &c., upon each aspect of a building.
8. In having incorrect views as to the direction of the current through ventilators at different elevations.

BLACKFRIARS BRIDGE.

This new bridge, whose progress we have on several occasions noticed, and an illustration of which appeared in our volume for 1862 (Oct. 11), is making progress. Mr. Joseph Cubitt is the engineer-in-chief, and Mr. Bryant is the resident engineer, with whose aid we are able to describe the present state of the work.

The bridge has now arrived at such a stage, especially at the Surrey end, that a very fair idea may be gained of what the general effect will be when the whole is finished and freed from the confusing influence of the forest of scaffolding that now hems it in on both sides.

The axis of the new bridge coincides exactly with that of the old one, but the new structure will have the following great advantages over its predecessor, viz.—first, in having the roadway over the central arch only 10 ft. 6 in. above that of the banks on either side, or half the rise of the old bridge; secondly, in being 75 ft. wide between the parapets (45 ft. roadway, and two footpaths of 15 ft. each) against 12 ft. originally; and, thirdly, in consisting of only five spans or arches, thereby giving greater and more convenient waterway. The length of these arches corresponds very closely with the spans of the London, Chatham, and Dover Railway bridge, which is in close proximity to it on the eastern side, for the purpose of facilitating the navigation of the river.

The central arch is 185 ft. in clear between the piers, those on either side 175 ft. each, and the end arches springing from the land abutments each 155 ft. span. The central piers are 20 ft. 6 in. wide, and the remaining two 18 ft. 6 in. each, making a total length of bridge clear of the shore abutments of 938 ft.

Great care was taken in preparing a good foundation for the piers. Metal caissons were sunk into the bed of the river for about 38 ft. under low-water mark, and filled with concrete for half this height. Upon these foundations solid brickwork was raised to the level of the natural bed of the river, and upon these again was built the pier itself, consisting of solid brickwork faced with granite.

The plan of these piers is similar to that of the adjoining bridge, and resembles a double stemmed ship with sharp outwater. A short distance above high-water mark, these outwaters are played back in two orders, until the sub-plinth and plinth are reached, upon which rests the base of the detached columns. The mouldings of these bases, and also those to the caps, are of an Early Gothic character, and have the lower roll carved with bold conventional leaves, and their under-side is level with the springing line of the arches.

The shafts are of polished red Aberdeen granite, those in the centre being 7 ft. 4 in., and the side shafts 6 ft. 8 in. in diameter respectively, and all tapering slightly towards the cap.

The caps are of stone, octagonal on plan, the bell being carved, and the abacus enriched with the nail-head ornament. Upon the abacus rests the stone parapet, which forms a semi-octagonal balcony or recess from the footway, having seats inside, and raised above the footway by two steps. Each external face of this balcony has two sunk and tracered circles.

The carving of the caps to the columns under the balconies has been entrusted to Mr. J. B. Philip, of Hans-place; and, judging from the models and partially-finished caps, they promise to be the most artistic and attractive features of the bridge.

Mr. Philip has conceived the "happy thought" of brightening the contrast between the two sides of the bridge, by introducing into the carved caps, on the river or western side, birds and plants, such as the stork, bittern, swan, &c., that are to be found in fresh water; and on the sea or eastern side, the sea-gull, sea-weed, &c. *et id genus omnia*.

The shore abutments are composed of massive wing walls, which are flanked with pilasters that form the base of large pedestals, and three counterforts of brickwork, the space between being filled in with concrete. These pedestals have a simple moulded base, and carved and moulded capitals finished with a square blocking course, on which equestrian statues might be placed with good effect. From these pedestals a low wall runs landwards, and terminates against circular piers suitable for supporting lamps.

Down the outside of the wing walls will run the stone steps leading to the river and Thames embankment. On the Surrey side a bridge will

lead over these steps directly into the Blackfriars station of the London, Chatham, and Dover Railway.

On the shore abutments the skew backs, from which the curved iron ribs that form each arch-spring are about 5 ft. above Trinity high-water mark; but in the piers they are more elevated, the springing line of the central arch being about 5 ft. higher.

Each arch is composed of nine curved ribs of wrought iron, segmental in form, braced together with short lattice girders, the spandrel being filled in with lattice work terminating against a horizontal girder above, upon which rests the cross girders that support the metal joists to which the iron plates are screwed.

These plates will be laid over the whole of the bridge, and are slightly hollowed in the centre for the better holding of the concrete and asphalt that will receive the paving of the road and footways.

The lattice work to the external ribs is of an ornamental character, having bosses or flowers at the intersections. The external ribs are finished above with enriched corbels supporting a bold cornice, from which rises the plinth to the parapet. This plinth is hollow, and on the inside, next to the footway, is pierced by a small continuous arcade.

The parapet is composed of alternate couples of plain and twisted shafts, on circular moulded bases, resting on square dies. The caps contain foliage formally treated under a square abacus, from which springs a circular moulded trefoil arch, with foliated cusps. The coping or hand-rail consists of a three-quarter round, with hollows and rope mouldings on either side.

The works on the Surrey end are much more advanced than those at the opposite end of the bridge, the pedestals being nearly completed. The caps to these pedestals have the foliage boldly carved and well arranged; but the neck mould, a plain roll, from which the leaves spring, is too large for the finish of the carving. It should be made up of several small members.

A portion of the iron parapet is in its place over the first arch, counting from the Surrey shore, and the joists laid to receive the metal plates. The caps to the first pier are now being carved; on the sea side the subject is sea-gulls, with extended wings and heads turned on one side; the remaining portion of the bell being occupied with seaweed, conventionally treated. In the opposite cap, on the river side, are storks with wings hanging down against their sides, and bills on their breasts, as though watching for fish. These again are separated by freshwater plants.

The second pier has reached to half-way between the springing of the arch and the level of the roadway, the caps being still in the rough.

The third pier, on the opposite side of the central arch, is finished to the top of the skew-back, but the two arches that spring from it have nearly all the cross girders laid.

The first pier on the Middlesex side has the caps *in situ*, but the arch between it and the shore abutment has little more than the curved ribs erected.

The Middlesex abutment is now level with the top of the cross girders, the eastern plaster being of the same height; but that on the western, or river side, has not yet been commenced.

Judging from the amount of work already completed, and the average rate of progress, the bridge and its approaches should be finished by the end of next autumn.

The original estimated cost of the works was 265,000*l.* The mason's work is being executed by Messrs. Thorn & Co.; and the metal work supplied by Messrs. Lloyds, Fosters, & Co., of Wednesbury.

A TOUR IN SHROPSHIRE.*

A PLEASANT excursion of four miles may be made to Haughmond Abbey, which stands on the side of a gentle eminence. The ruins are not very extensive, but from one part you obtain a very rich and extensive view of the great plain in which Shrewsbury stands. The chapter-house is nearly entire, the front of triple arches with a variety of mouldings. These Norman arches are deeply recessed and highly ornate.† In another of the same character, and in a different portion of the abbey, being supposed to be one of the

* See p. 121, ante.

† Some illustrations will be found in another volume of the Builder.

entrances into the church, you have that and the Early English in the same juxtaposition as at St. Mary's, Shrewsbury. The aliot's lodge is in part standing, and the shell of a large hall. In the former an oriel window was to be found some years ago, but it fell in. Among the privileges granted to the abbey was one by Pope Alexander III., A.D. 1172, which allows "that where there should happen to be a general interdict the monks might perform the divine office in a low voice, but with closed doors." The country adjacent is on every side delightfully rural.

Though it is not exactly within the province of this letter, yet I may mention that it being only an easy two hours by rail from Shrewsbury to Lichfield, I took advantage of it to renew my acquaintance with that place, which I had not seen for some years. As my stay was limited to a few hours, I can of course only convey my general impression of the cathedral of the Black Country. I must honestly confess my repugnance to a "three" spired cathedral. It may be that, having for many years admired and appreciated (and who, indeed, does not?) the heaven-borne spire of Salisbury, I could not bring myself to appreciate "three" repetitions of the same architectural feature in all respects inferior. Besides, at Lichfield, the other two churches have also spires, so that to me the unpleasant effect was repeated. It has, I think, been suggested that a feature resembling the dome or cupola, of course with various modifications, would have been a fine architectural substitute for the central spire. The beauty of the nave admits of no dispute, as well as the choir; but here we find carried out *à outrance* the prevailing disposition to render it as little as possible a "sanctuary" for divine service. Stalls there are none, and the backs of the seats are so low that really, if I may be allowed to use a very homely expression, the congregation in the choir and its aisles are all "mumbled together." I was informed that Mr. Scott proposed to raise the backs by 1 ft., which would in some slight degree mitigate the heterogeneous effect. The apse, with its stained-glass windows as seen over the rood-loft, is very striking. I was informed that the old glass (which consisted of splendid figures of bishops and other ecclesiastics) was destroyed during the Commonwealth time. An illuminated MS., in the possession of the Earl of Winchelsea, is said to contain a representation of these. I attended the afternoon service, but I cannot say that the musical portion was satisfactory. The chanting of the Psalms was both loud and indistinct, and the organ accompaniment equally overpowering. I was gratified to find the report that some hitherto unknown substance, vegetable or mineral, had spread itself over the beautiful recumbent figures of the children by Chantry, was quite unfounded. In the afternoon I returned to Shrewsbury.

Church Stretton, which was my next move, is a very small town, perhaps more approaching its village. The scenery around is very delightful as you are close to the "Long Mynd," a range of about ten miles in extent, a style of scenery, though on a smaller scale resembling that in the principality. In the church, which was under repair and enlargement, I did not find anything of interest. The old townhall, with its arcade underneath, was removed in 1833, as the neighbouring gentry are said to have found it inconvenient. The modern structure is plain and unpretending. A very pleasant walk of two miles will take the tourist to the little village, or rather hamlet, of Hope Bowdler, pleasantly situated in the valley. The first part of the name is by no means uncommon in this county and Herefordshire. The situation of the church is very delightful. It is a "most perfect facsimile" of the old Norman building which was taken down as being "irreparable"; whether truly so or not I had no means of ascertaining. But, at any rate, the facsimile is a very perfect one. The windows have been filled with grisaille.

The pleasant little town of Ludlow stands on an eminence, commanding fine views of the surrounding country. The church and castle, apparently embosomed in trees, are seen to great advantage from the high bank called Whitcliffe, to which you cross by a bridge over the river Teme. The church, dedicated to St. Lawrence, stands upon the highest ground in the town, the churchyard being supported towards the north by a portion of the ancient wall. A smaller church stood here in the twelfth century, the remains of which, discovered during the renovation by Mr. Scott, was supplanted by that in the Early English style. The present edifice is

cruciform, consisting of a nave, choir, chancel, transepts, side aisles, and two large chantry chapels, with a finely-proportioned and lofty tower in the centre, having at each angle an octangular turret surmounted by a pinnacle. The principal entrance from the town is on the south side by a capacious hexagonal porch embattled, which, with the exception of that at St. Mary Redcliff, Bristol, is unique of its kind. It had become exceedingly ruinous, and the committee who had undertaken the task had given up all hopes of its restoration, when Lord Boyne came forward and undertook it as a memorial to his parents. The view on the north side in the churchyard looking towards the hilly country round Church Stretton is varied and picturesque. In the churchyard itself are some splendid yew trees. The river is seen from every part of the neighbourhood. There are few parish churches in the kingdom of a more imposing interior. The view from the west window is directed to the magnificent arch which terminates the nave, across the lunette or lantern, which is upwards of 80 ft. high, then to the chancel arch of equal dimensions, with its open screen, all terminating in the splendid east window filled with stained glass. The nave is divided from the aisles by six lofty pointed arches on each side, springing from light-clustered pillars, whose only defect is perhaps an appearance of "tenuity" which detracts somewhat from the dignity and solidity of this portion of the edifice. Passing under the screen, we enter the chancel, lighted on each side by five lofty Perpendicular windows, filled with full-length figures of bishops and other dignitaries, while in the great east window, also of the same style, is represented the legend of the martyrdom of St. Lawrence, the patron saint of the church. An inscription, very imperfect, shows that it was the gift of Spofford, Bishop of Hereford, whose episcopacy was from 1421 to 1443. This window, occupying the whole breadth of the chancel, 18 ft. in width and 30 ft. in height, was repaired in a very imperfect manner about a century ago, but skilfully restored in 1828 by Evans, of Shrewsbury. It contains six-five compartments, in which are displayed the life, martyrdom, and miracles of the saint; but the window was at one time so wantonly injured that some of the subjects can with difficulty be traced. He is said to have suffered martyrdom by being broiled over a fire upon a gridiron for having, when a deacon to Sixtus, the Bishop of Rome in 259, refused to deliver up the church treasury to the heathen persecutors. This and other incidents are depicted in various compartments. In the seventh, under which is the inscription, "Lanreucius dicitur coram ydolis," he is represented as led by the heathen emperor before idols, who are represented as "falling to pieces through the sanctity of his presence." This legend was, no doubt, derived from that in one of the Apocryphal Gospels, which narrates that the idols of Egypt fell before the Holy Child Jesus when being carried thither by His father Joseph. In the twenty-second compartment is a representation of a cruciform church, with a small octangular turret in the centre, a curious specimen of ancient architecture. Underneath this window was a modern altar-screen of oak wainscot, which concealed the original reredos, elaborately carved in stone, consisting of a series of pointed niches and aculpture, extending the entire length of the wall. This was restored by Lord Dunsannon, with the zealous co-operation of the then rector. On the south side of the altar are, as usual, the piscina and canopied sedilia. The ceiling is of oak, divided into five compartments, resting on corbels. These are alternately painted of a green and red ground. It was not unusual for the larger parochial churches to have stalls in the chancel, especially when there were several chantries in them, the priests of which were bound to assist the incumbent at the divine office during festivals, as at Nantwich, in Cheshire. These stalls remain on each side of the chancel, and were used by the ten priests of the adjoining chantry of St. John. I have before observed that the lofty windows on each side are rich in figures. In the centre compartment of the window nearest the altar is that of a bearded and crowned king, showing how exactly the vestments agree in shape with those of the two archbishops on each side. Nothing can more surely demonstrate that the ecclesiastical is "borrowed" from the regal costume, as we know to be the case. The offering of the Wise Men occupies the lowest portion of the window, furthest from the altar. Two of these are repre-

sented with very high and much-enriched crowns. It will not, I hope, be considered profane, if I remark, that the attitude and general appearance of the one whose garments are red bear a strong resemblance to the *Knave in our packs of cards*. "It cannot be imagined for a moment," as Mr. Winston observes, "that the Mediaeval glass-painters ever drew intentionally ill." Yet, as all must admit, there is a most striking and manifest discrepancy in most of our ancient churches between the "heathenful symmetry" of the architecture and the lank and often grotesque appearance of the figures in the painted windows. The chapels north and south of the choir correspond in size, and are approached from the transepts by handsome carved screens. The chapel of St. John is north of the choir, and is of excellent Perpendicular work. There is some curious stained glass in the east window, but that, as well as the side windows, is in a very fragmentary state, the designs being often carried across the window without any reference to the mullions. On the south side, enclosed by a palisading, are the recumbent figures, in marble, of Sir John Brydgeman, sergeant-at-law, and chief justice of Chester, with his wife.—A.D. 1637. These are very highly finished, and the whole detail of costume is most accurate. I have never seen any faces which convey more clearly the idea of their being "genuine portraits" of the individuals. Unfortunately the hands have been knocked off. They are conjectured to have been the work of Fanelli, who was much employed in England during the reign of Charles I. The windows of the south chapel were once, no doubt, rich in stained glass; but a portion only exists at the east end, which seems to have represented a genealogical history of the Prophets.

During the years 1859 and 1860, the interior of the church underwent a thorough restoration under the direction of Mr. Scott. About that period the magnificent west window was put up, designed and executed by Mr. T. Willment. It represents the eminent persons in the Mediaeval periods who are connected with the history of the town and castle. The surcoats over the armour of some of the royal personages who are kneeling are truly rich and splendid in colour. As a commemorative window of that kind it can have but few rivals.

The service in this church, like that of St. Mary, Shrewsbury, is conducted in the most satisfactory manner. There is not a surpliced choir, but the talented organist, Mr. Bartholomew, takes great pains in their instruction. The castle is entered from the town by a strongly-hilted tower gateway. Passing under its pointed arch we are introduced to an extensive area, which in former times was called the "base," or "lower court,"—sometimes also the "committed to the care of a special officer, and portion of the garrison charged with its defence. It is now usually called the "outer court," and is covered with green turf, which forms a pleasing contrast to the principal front, where a stone bridge of two arches, on which are some remains of an embattled parapet, probably of the age of Sir Henry Sydney, supplies the place of the ancient drawbridge. It is a great defect in this building, that most of the narrow Norman windows have been cut away during the reign of Elizabeth, to make openings for larger ones of the Tudor period. In the outer court, standing at present quite apart, is the chapel, the nave of which now alone remains, "circular in form;" and if the account of its origin be correct, one of the earliest buildings of the kind in this kingdom with the round church at Cambridge, that at Northampton, and the Middle Temple. It is entered by a remarkably elegant Norman doorway, on the opposite side of which is another arch of the same style, which formed the entrance into the destroyed choir. The "state apartments" are at no great distance from the gateway between them, which "was" in existence so late as in 1768. Indeed, the "past tense" is most prominently presented to our mind and feelings when we take a survey of this castle. One writer of a tour through Great Britain observes, "It will be no wonder that this noble castle is 'the perfection of decay' when we acquaint our readers that the present inhabitants live by the sale of the materials. All the five courts, the royal apartments, halls, and rooms of state lie open and abandoned, and some of them falling down." And we need not marvel at this when we learn that soon after the accession of George I. an order came down for

unroofing the buildings and stripping them of their lead. Decay, of course, soon ensued. Other castles, it is true, have suffered in the same way, but to a castle like Ludlow the damage done has been peculiarly detrimental. To some, for example, like Kenilworth, not standing upon an eminence, but nearly on a level with the surrounding country, the "green turf being found everywhere" as we wander among the relics of a past age, "decay and even worse" is not detrimental to the general effect. Ruined edifices and unroofed vegetation are then harmoniously combined. But the very dignity of Ludlow Castle is now its detriment. Viewed from one of the lime-tree walks, which almost encircle a portion of the hill on which it stands, nothing can be more majestic than its general appearance; but when we penetrate the interior the charm is gone. The walls, it is true, remain; but everything which could gratify the eye or soothe the feeling has departed, and we feel this the more keenly as it was not the work of Mediaeval violence, but of modern indifference to the intrinsically beautiful. Who would not have wished to see the hall (not the bare walls only) in which that exquisite and most poetical of dramas, the mask of "Comus," was exhibited? I do not pretend to say that there are not architectural features of interest; but, perhaps, most persons will agree that a visit to the interior of Warwick Castle is far more gratifying. I remarked that in some portions of the wall the interstices were filled up with *cyster-shells*. Descending one of the principal streets in the town, we pass under an ancient gateway which leads us to Ludford Bridge crossing the Teme to the Hereford-road. Lealand, mentioning it in his "Itinerary" says, "There be three fayre arches in this bridge over Teme, and a pretty chapel upon it of S. Catherine. It is about a hundred years since this bridge was built, men passed afore by a ford a little beneath." The chapel of St. Catherine is gone, but there must be few bridges in the kingdom which can lay claim to such antiquity. As in other Shropshire towns, there are some good specimens of white and black houses, especially the "Feathers" hotel, as in modern parlance all substantial inns are denominated. There are also considerable remains of the old wall to be found at intervals on the edge of the hill on which the town is situated.

On my return homeward I remained for a few hours at Hereford, in order to visit the cathedral. The cloisters remain in the same state as when I last saw them. No one can but admire the magnificent screen, and yet I must confess that one of "stone" or "wood" in my eyes would have harmonized better with the building. It is lighted up on a winter's evening, the effect must be very brilliant. When I attended the morning service sitting on the Decanet side, close to the screen, I could not but again remark that every word of the lesson read from the lectern came back to the ear, apparently from the north aisle of the nave. The echo was perfect.

I am not quite certain as to how long the see of Hereford continued to be reckoned among the Welsh, or, to speak more appropriately, the British hipsticks, but that language must have continued to be spoken in Shropshire to a comparatively late period. The author of "Robinson Crusoe" in his "Tour in Great Britain," in 1753, speaking of Shrewsbury, says "Over the market-house is a kind of hall for the manufacturers which are sold here weekly, in very large quantities: they speak all English in the town, but on a market-day you would think you were in Wales. The only relics of the language at present are the names of a few places bordering on Montgomery and Denbigh."

A MEMBER OF THE OXFORD ARCHITECTURAL SOCIETY.

A New Paint.—At a recent meeting of the French Academy, M. Sacc called attention to the fact that tungstate of baryta forms an excellent white paint, which has as good a tone and depth as white lead, and has the advantage above this of not getting blackened on exposure to the atmosphere. Zinc white, which was tried as a substitute for white lead, has failed, he said, through wanting body. M. Elie de Beaumont remarked that if this statement was confirmed, it would be of great importance; for we have no need to employ special mining operations for tungsten, as this metal is commonly found in company with tin.

THE (ALBERT) MUSEUM, SOUTH KENSINGTON.

In my last "notes" I mentioned the fine Castel-Durante vase lent by Mr. J. Webb. This gentleman exhibits many other rare and interesting objects, among which the fine cup or tazza of heliotrope—resembling translucent blood-stone—takes a prominent place. It is mounted on a stem formed of a female figure supported on the shoulders of a Triton with horse's fore-legs; the handles are winged figures terminating in masks; the whole is coloured and gemmed enamel and gold. The cup is supposed to be Italian sixteenth century; the enamelled mounting, modern French. Now, it would be interesting to know if this cup were mounted prior, or subsequent to the 1851 Exhibition. Compared with one purchased of the Messrs. Morel, of New Burlington-street, at that Exhibition for the Museum, and which is in a glass case nearly parallel with that containing Mr. Webb's heliotrope tazza, just across the contre-alley, it will be seen to be almost identical in design. Patriotism leads me to say, I am glad to think the English-mounting the more beautiful of the two; irrespective of the costly pearls which enrich the foot, the selection of enamel for the flesh, and gold for the drapery, I consider better taste, as being more suitable than the exactly contrary treatment in the French mounting; also, the faces are much more exquisitely modelled. I suppose both these stems have been designed from some Medieval specimen in the Louvre collection, or elsewhere. Of Mr. Morel's work, the "Report by the Jurors" of the Exhibition is as follows:—"Cup of Oriental agate, made in the form of a sea-shell. The pillar is composed of a female figure, borne by a Triton with horse's fore-legs: at the back part of the shell is the handle of the cup, formed of another female figure sitting upon a dolphin, and holding her flying drapery, the extremities being supported by Cupids: all these figures are enamelled with superior taste." The price paid for this beautiful object was 210*l*.

Respecting the heliotrope stone, many virtues were attributed to it in olden times. Marbodius says, in his "Lapidarium," that it gifts the wearer with prophetic eye, endows him with good fame and long life, checks the flow of blood, protects from poison, and, when united with the herb heliotrope, renders the wearer invisible. It has its name from the fact, that when set in water opposite the sun's rays, it turns their light to blood-colour.

To return to Mr. J. Webb's art-treasures. The covered bowl of lapis lazuli is very rich. It is Italian and sixteenth century. The bowl of white chalcidony, also Italian sixteenth-century, mounted with modern French enamel stand and handles of charming design and execution, is chaste and pure; and the agate vase, likewise mounted in modern French enamel, is excellent. There is a fine plate of lusted Gubbio-ware,—the subject, "Medea and her Children." This is signed by Maestro Giorgio, and dated 1528. From the same collection there is an enamelled ewer, painted in colours on copper,—French Limoges, latter half of sixteenth century; and another in grisaille,—subject, "Passage of the Red Sea," wherein the Egyptians, who are being overwhelmed, are habited like ancient Romans. There are likewise two fine bold figures in Limoges grisaille, signed T. Penevart, 1549, one being St. Luke, the other St. Mark; and a fine tazza and cover,—one of two, by the way, of French Limoges late sixteenth-century in grisaille. On the bowl is a skirmish of cavalry, and on the cover are four classic heads, which are admirable. The handle of the cover is a curious high ornament of scrolls. Some smaller objects are interesting to see, namely, the silver-gilt pomander, with eight distinct tiny perfume-bosses, each falling down by a hinge when open, and closing up into a small ball no larger than a moderate-sized walnut. It is seventeenth century, and is Dutch or German; the Italian seventeenth-century silver-gilt filigree jockey's cap, identical with those still worn at Epsom and Ascot; and the pretty little openwork silver-gilt case, containing two tiny scent-bottles, also seventeenth-century, probably French manufacture.

Very near to these objects stands the votive offering made by the community of Carcassonne during the plague in 1517, and lent to the Museum by Mr. Stephen Bam. It is of silver, gilt and ornamented with stones and enamel, and is labelled "Couronne d'Es Voto à la Madone, pour faire cesser la Peste en 1517, comme l'indiquent

l'inscription visible." It is more interesting than beautiful, and its principal curiosity is—finding it where it is.

Mr. Joseph Bond lends some fine art-objects, from which I would specify the large mug of Persian earthenware or porcelain, bearing a bold design of richly-coloured conventional flowers; also the tankard of Old Dresden, painted with subject of Apollo and Daphne, with silver-gilt mounts and cover, old German medals being let into, and bent to suit the shape of, the lid; date, early eighteenth century; two ewers of Oriental porcelain, the one bearing the cock being so metallic in appearance that it is difficult to believe it is not enamelled on copper; and a beautiful little chased gold *écus*, French, early eighteenth century.

This last object calls to mind the charming miniature stiletto belonging to Mr. T. Dyer Edwards, placed in the same glass-case as Mr. Tite's two packs of cards; it has a gold suspending ring, sheath, and handle, the latter in form of a statuette, and is Italian seventeenth century. This gentleman also exhibits a miniature on ivory of Mrs. Woffington studying the part of Ophelia, date about 1750; an onyx cameo, profile of Nelson given by him to Lady Hamilton, dated 1801. The gold frame is formed of laurel branches, terminating in an anchor—emblem of Hope, as well as a symbol of the sea. There is likewise a Gimmel ring, each portion of which is set with diamonds that form, when put together, a lozenge-shaped cluster; and in another glass case in the centre of the loan department, are the gold watch made for Benjamin West, P.R.A., ornamented with dark blue enamel, and set with enamel pearls; and the silver watch presented by the Duke of Marlborough to Sir Isaac Newton in 1714, of German manufacture, and enosed in a repoussé openwork cover.

To return to the location of the stiletto and onyx cameo. In close proximity are displayed several interesting objects; namely, a miniature, by Nicholas Hilliard, of Robert Devereux, Earl of Essex, which makes one think there must have been more than his melancholy, dissatisfied-looking face, so greatly to fascinate "Great Gloriana." This miniature is the property of Sir W. C. Trevelyan, bart., as is also the small portrait of Charles I., worked with his hair. Was this the one shown in the loan collection of miniatures some three years since at the Museum?

In the same glass case are three miniatures, lent by Miss Wilson, ascribed to Nicholas Hilliard:—Queen Elizabeth; Mary, Queen of Scots, with her son, James VI.; and Henry VIII., with his son Edward VI. They are in large openwork carved and gilt frames. It is singular to see, with all the care and finish bestowed upon the manipulation of these works, how utterly out of proportion are the children; they are diminutive men, not boys; or, rather, dolls. The heads are the most faulty portions, being scarcely more than a quarter the size they should be; whereas children's heads are always much larger in proportion to their bodies than those of adults.

Close to the above lies a noticeable miniature, on copper, of a lady, said to be the Duchess of Baireuth, sister of Frederic the Great. It is lent by Mr. W. Simmons. The wonderful manner in which her, so cleverly painted, grey hair is piled up and padded, quite eclipses the art of our modern helles and coiffeurs, spite of their "chignons" and "ringlets." The duchess wears a grey cap ingeniously chosen to match the colour of her hair, so as not to mar its effect, or clash in any way with Dama Nature's arrangement of neutral tints.

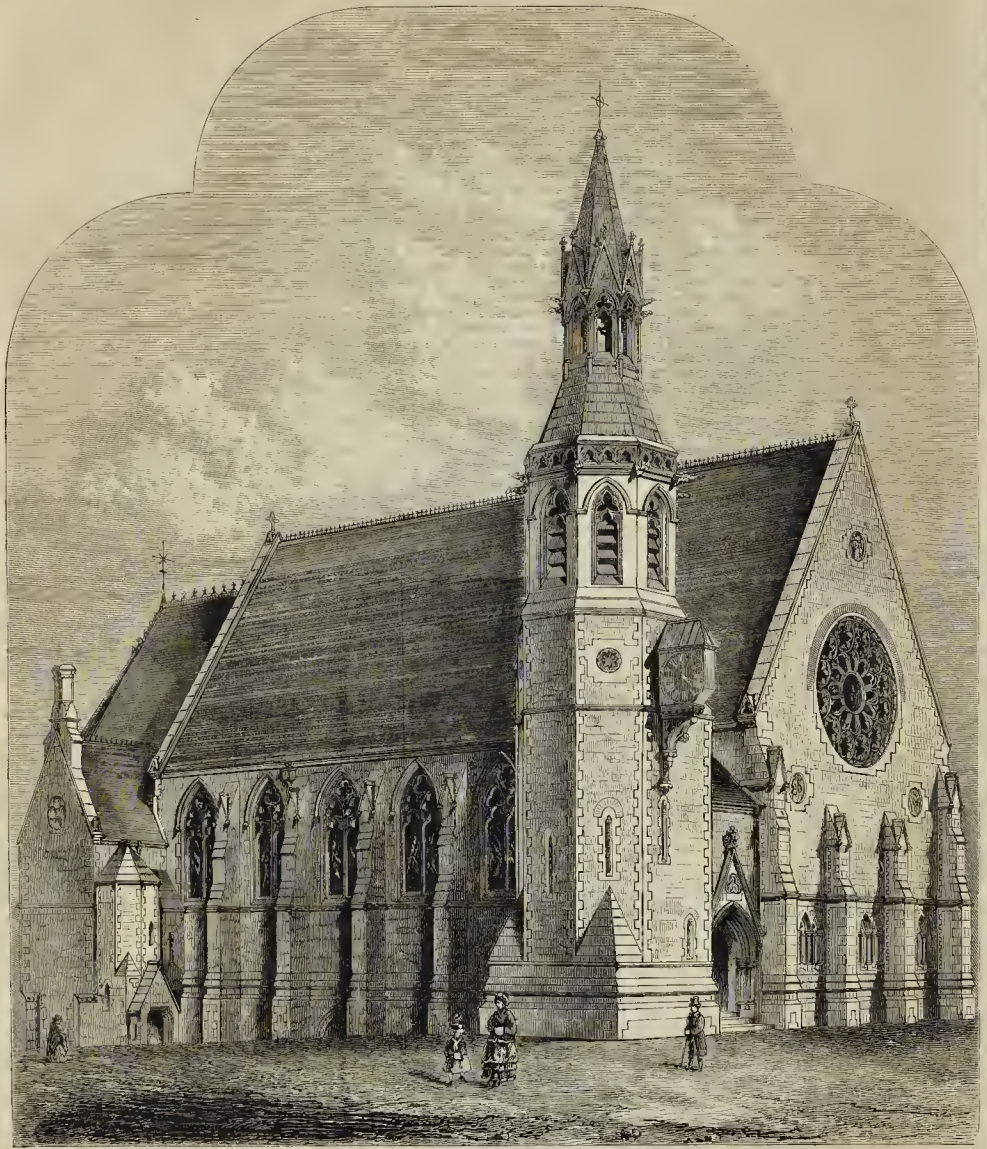
Returning to the centre of the hall, the beautiful amber canister, lent by her Majesty, attracts the eye. It is about 10 in. in height, octagonal in form, is very carefully carved in relief, with figures emblematic of the cardinal virtues, has a silver-gilt foot and cover, and dates from the seventeenth century. Close to the latter, a pilgrim bottle of rock crystal, carved with arabesque flowers and masks, Italian, sixteenth century, is lent by the Earl of Warwick; a large, rock-crystal drinking-cup, fluted and carved, by the Hon. A. G. Ponsonby; and the fine-coloured blue stone medallion, suspended to show both sides, which are painted in oil,—subjects, "Christ's Baptism" and "Peter walking on the Sea," is lent by Mr. J. P. R. Godfrey. Close to these stands an octagonal casket of crystal, with gilt and enamel framework, resting on eight terminal figures, Italian, sixteenth century, lent by Mr. Farquhar Matheson; next a small goblet of rock crystal, mounted

in coloured translucent enamel, having a cover with a child seated on it for handle, and for stem a salamander. It is a choice Italian, Italian sixteenth century work, and is lent by H.R.H. the Prince of Wales.

Two Arabic lamps of dusky-coloured glass, ornamented with medallions and Arabic inscriptions, have a strange outlandish appearance among these Western art-works. One of them is lent by the Rev. G. J. Chester, and dates from the thirteenth or fourteenth century; the other from the thirteenth, and is from the Meymar collection in the Paris Exhibition of 1867. Not far off stands a fine sepulchral vase of glass, antique Roman, lent by Mrs. Peircy, the beautiful iridescent colours of which, formed by exposure to the atmosphere, are very lovely. The silver seal with armorial shield, found in the Thames during the building of London Bridge, and lent by Sir W. Jolliffe, bart., is interesting; as are many of Mr. Barker's fine old German engraved glasses and goblets,—notably, the deep tazza ornamented with scrolls, canopies, and arabesques, having a multiform bowl and escalloped foot; another of quatre-foil shape, with cover; a deep tazza, multiform flattened bowl and escalloped foot; a Venetian pear-shaped vase of white glass, painted with green leaves, flowers, and goldfinches; a Gorman glass *gchelt*, painted in oil, with a knight and three coats-of-arms; a wine-glass, engraved with arms and minute scrolls; another, with a spiral pink thread inside the stem; a goblet, with a cut stem, which *unscarves* in the centre; a deep tazza, with multiform bowl, engraved with birds and scrolls, and octagonal foot. Several glasses, with flowers scratched upon them with a diamond, are curious, but are very poor in appearance, and not worth imitating. Dr. Salvini, although they are Venetian; and, with all due appreciation of your beautiful mosaics, allow me to say that, when you were reviving the delicate outlines and quaint conceits of the clever old glass-workers of Murano, it is much to be regretted you should also have revived the dusky-looking "metal," irregular form, and tottering appearance of many of your predecessors' productions. Those fine old fellows did the best they could with the appliances they had at command; but it is not to be believed that if they could have had the benefit of our nineteenth-century discoveries and conveniences of manufacture, they would have chosen to make their own heard, muddy-looking glass, in preference to our clear, crisp refreshing productions, any more than that they would have preferred to go a journey plodding on their toilsome way on foot, or on the back of the only less fatiguing mule, instead of profiting by the comfortable, speedy, and luxurious railway locomotion of our day. To be sure, railways are not of so much consequence in Murano and Venice; but the canal-surrounded position of these places does not nullify my hypothesis,—that the Medieval glass-blowers would have made their glass clear and pure, if they had only known how.

But is it certain that their glass when made, was of the dusky hue we now behold it? That glass does cloud and change colour with age and exposure to the atmosphere, is a well-known fact. Even in our time we have a notable instance, in the beautiful plum-coloured hne assumed by window plate-glass made any some thirty or forty years ago, owing to the particular flux employed in the manufacture; and the use of which flux has, I believe, been since discontinued in consequence. When the duty was taken off glass about twenty years ago, a sudden impulse was given to the trade, and then it was that the exquisitely pure glass which we now see everywhere—and in which I delight—was produced generally, because manufacturers could afford to experimentalize in, and adopt, all suggested improvements.

One of the objections that ultra-medievalists make to much modern glass is, that to "cut" glass is not a proper treatment for such a material: but why not? I contend that any treatment a material will bear, that does not render it a sham nor detract from its usefulness, is perfectly correct and admissible. Cutting does not appear a weakening of the strength of glass, because nobody asks for strength in glass; and even on that head experience is in favour of this mode of ornamentation; for, as every one knows, cut-wineglasses are far more durable than the delicate—though, I admit, very charming—"straw-stems" which make one tremble to touch them, for they seem almost too slight to bear the superimposed bowl. Those persons who extol dusky irregularly-formed blown glass to



THE GUTHRIE MEMORIAL CHAPEL, CLIFTON.

the disparagement of accurate contour, perfect transparency, and upright self-supportiveness of crystal flint glass, would, of course, be consistent, object to have facets cut on precious stones, and would prefer to wear a diamond in the rough.

I should be sorry, however, to have it inferred from what I have said above, that I cannot appreciate old Venetian glass; on the contrary, I admire it extremely, and can rival any dilettante in ecstatic delight over Mr. E. W. Cooke's beautiful collection, now on loan at the Museum. The playful elegance of form, varied outline, quaint conceits, and never-ending variety of design: all these I revel in; besides which there is a delicacy of taste, elegance of finish subdued colouring,

and general harmony of tone—much of the latter due, no doubt, to the blending and softening effects of time—about the old work, which we seek in vain in the modern imitations and reproductions; but what I desire to insist upon is, that having a purer and more beautiful material wherewith to go to work, our modern manufacturers should exert their skill, taste, and ingenuity in turning that to account, instead of ignoring its superiority, and servilely copying failings as well as graces from their "early masters."

Having written so much at length upon Venetian glass, I can scarcely permit myself to return to the subject on a future occasion; therefore, ere closing this notice, I will mention

Dr. Salvisti's mosaic panel, the semi-figure, life-size,—Salvator Mundi,—bought at the International Exhibition for 200*l.*—admirable in feeling as in execution; and the fine howl of old Venetian glass, lent by Mr. Alfred Seymour. The latter has a spiral white thread running all over it, and a twelve-fluted edge; in the centre is painted a female bust in rich full colours, the effect of which is very beautiful, and quite startling from being so life-like. It is a young handsome profile, with straight delicate nose, small mouth, and large soft brown eye; the hair is gilt, and a great jewel-ornament of red stones set in gold, rises from the forehead to the crown of the head. Enough, however, for the present.

ART-LOVER.



THE GUTHRIE MEMORIAL CHAPEL, CLIFTON COLLEGE, BRISTOL.
Interior, looking East.

MESSRS. C. J. HANSON & SON, ARCHITECTS.

[See p. 161, ante

KENSINGTON DISTRICT SCHOOLS COMPETITION.

Six architects were selected by the Board of Management to submit designs for the proposed schools at Ashford, Middlesex, each to receive 50l.; the successful competitor to be paid 500l., less the before-mentioned 50l., for carrying out the works, including expenses of all kinds; the drawings to be without tint, or tinted in one tint of sepia only; the buildings to afford school and living accommodation for 100 infants, 100 casual children, and 500 permanent children; accommodation for certain officers; infirmary for 100 children; and quarantine wards for 24. The designs, suspended in the council-room of the Royal Horticultural Society, are now under the consideration of the Board of Management. The names of the competitors, with the amounts at which they respectively estimate the cost of carrying out the designs, ran thus:—

Mr. Burden	£13,800
Mr. Collins	42,360
Mr. F. Fowler	37,312
Mr. Allom	28,797
Mr. Snell	27,250
Mr. Williams	25,000

The difference is sufficiently startling; comparing, however, the plans of the highest two competitors with those of the lowest two, it seems clear either that the former have provided more accommodation than the instructions and the Poor-Law Board call for, or the latter less.

The long line of front that Mr. Collins adopts, and the general openness of his very complete buildings, have advantages, but are necessarily costly. The elevations are properly kept very plain. Mr. Snell's is a compact plan, and can scarcely be called crowded.

The provision of "closet" accommodation in some of the designs is quite insufficient.

The majority of the competitors have foolishly disregarded the instructions that the drawings are to be without tint, or, at any rate, to have a tint of sepia only. It is not to be expected or hoped that a Board would select a had design in preference to a good one because the latter exhibited a little colour; but if such instructions are given, they should be attended to. Architects who desire strict honesty in their judges, should be strictly honest themselves.

A careful comparison of the various designs with the instructions as to the accommodation required and given should be made before any determination is come to.

THE STRAND GUARDIANS AND THEIR BUILDING OPERATIONS.

The guardians of the Strand Union have been having, what, we suppose, we must, by way of pleasantry, call their little bit of fun with the building trade. Perhaps, should the ratepayers come to think seriously over the matter, they may not see so much fun in it after all.

As has been seen in our columns, the guardians called for tenders for a new workhouse at Tottenham, to be built from the designs of Mr. W. S. Cross, the quantities being taken out by Messrs. W. S. & A. Cross. When the advertisements were out, twenty-three building firms, comprising leading names in the trade, tendered. For our present purpose we may pass over them all but the last four, and with respect to these we have something to say.

The first of the four, being also the nineteenth on the list, was Mr. Howard, of Russell-street, Covent Garden, for 45,800l.; the next was Messrs. Hill, Keddell, & Waldron, for 45,257l.; Messrs. Cooper & Callum, 44,745l.; and Mr. Hart, 43,940l. There is a good deal of very unpleasant talk going on just now, both in the building trade and in the Strand Union, about this very contract, and we may as well give the gist of the murmurings. The tender of Mr. Howard, a respectable local builder, was accepted.

Messrs. Hill, Keddell, & Waldron are well-known men, their present great work being the Holborn Viaduct. They tendered 543l. below the accepted tender, and there can be no question about their power and responsibility to carry out the work properly at the price they offered. If they are good enough and able enough to build an important work for the Corporation of the City of London, they certainly should be considered sufficiently strong to build a workhouse for any board of guardians whatever. The tender following was from a firm—Cooper & Callum—squally well known, and it

was 1,055l. below the accepted one; whilst the last of the rejected three, Mr. Hart, has been an important builder for many years; he tendered below the accepted one no less than 1,860l. The builders are asking, "Why is this?" The whole twenty-two firms who tendered want to know why they should have been put to the trouble and expense of making out estimates and sending in tenders, when the contract was, so to say, predetermined? It appears that Mr. Howard is an old parishioner of the Strand Union, and much thought of by all the guardians, but the ratepayers do not consider that a sufficient reason, in the absence of further explanation, for giving him a bonus of 1,860l. of their money. Nor do the builders think that they ought to have been duped by what they consider a sham advertisement. If the contract was intended for Mr. Howard, why not, in the name of all that is parochial and neighbourly, have given it to him at once; and not delude two-and-twenty other people, by mock invitations, to put themselves to unnecessary cost and anxiety?

THE COURTS OF LAW AND THE EMBANKMENT.

The correspondence in the *Times*, relative to the site for the proposed New Courts and Offices of Law, initiated by Sir Charles Trevelyan, has been published as promised.* It includes plans that show strikingly, what we have already pointed out, the unyielding limits of the insufficient and awkwardly-shaped site next the Embankment. To increase the space, the only road to the Embankment from the Strand is formed under the Law Courts. The buildings would come close up to the noisy part of the Strand on one front, and have a railway station close to them on the other.

Mr. Baillie Cochrane also has published a pamphlet on the subject in the shape of a letter to the Right Hon. A. H. Layard, advocating the site next the Embankment.

On Thursday, the 25th, Capt. Dawson Damer was to ask the Chancellor of the Exchequer if there were any intention of recommending an alteration in the proposed Courts of Justice; and Mr. Gregory has given notice that on the 5th of March he will call the attention of the House to the site of the new Courts, and move a resolution on the subject.

It is to be hoped that amidst this fight as to position, the necessity for a good plan and a noble and fitting exterior may not be lost sight of.

With whom does the responsibility in this respect now rest?

THE BELLS OF ST. MARY ABBOT'S, KENSINGTON.

The tower of the old parish church of Kensington contains a peal of eight bells in the key of E, the weight of the tenor being about 21 cwt.; and in a wooden turret surrounding the tower is a comparatively small clock bell.

The bells forming the peal were cast by Thomas Janaway—not Janeway, as stated in various topographical and other works,—of Chelsea, and they severally bear the following inscriptions:—

1. "PROSPERITY TO THE PARISH OF KENSINGTON. THOMAS JANAWAY, 1772."
2. "WHEN FROM THE BARKS OUR NOTES RESOUND, THE BELLS AND VALLEYS ECHO ROUND. THOMAS JANAWAY, 1772."
3. "MUSICA EST MENTIS MEDICINA. THOMAS JANAWAY, 1772."
4. "INACTUM SILBO, PERCUTE DULCE CANO. THOMAS JANAWAY, 1772."
5. "LET ABBON'S BELLS CONTINUALLY BE RUNG, THE WORD STILL PREACHT AND HALLELUJAH SUNG. THOMAS JANAWAY, 1772."
6. "THE RINGERS' ART OUR GRATEFUL NOTES, PROLONG, APOLLO LISTENS AND APPROVES THE SONG. THOMAS JANAWAY, 1772."
7. "YE RINGERS THAT ARE PUT IN TRUST TO JUDGE OF RING AND RIGHT, BE ALL YOUR JUDGMENTS TRUE AND JUST, REGARDING NO MAN'S MIGHT. THOMAS JANAWAY, 1772."
8. "BE IT KNOWN TO GREAT AND SMALL, THOMAS JANAWAY MADE US ALL. Cast July, 1772, by subscription, Rev. James Waller, D.D. vicar. John Stokes and William Simpson, churchwardens. John Lessingham, Esq. gave Twenty Pounds."

On the walls of the belfry are sixteen tablets, upon which are recorded various exploits of change-ringers from 1774 to 1850.

* J. Day, Savoy-street.

The present ringers are respectable young men, who have been instructed by Mr. G. Morris, of St. Martin's, and whose occasional performances, it is said, have given much satisfaction to the parishioners.

Before concluding, perhaps I may be allowed to state that the present old church having been pronounced unsafe to be used for public worship, is ordered to be taken down, and a new edifice erected within the limits of the churchyard, Mr. George Gilbert Scott, R.A., being the architect.

The Venerable Archdeacon Sinclair is treasurer of the building committee, and the Rev. W. Wright is honorary secretary, and among its members are the churchwardens, Mr. Greenway and Mr. Freeman, the Duke of Rutland, and other influential residents of Kensington. The estimated cost of the structure is about 35,000l., and the committee now appeal to the public for subscriptions in aid of the noble work, towards which her Majesty the Queen has been pleased to give 2000l., while the vicar of the parish, Archdeacon Sinclair, has made a donation of 1,000l.

With regard to the character of the edifice, the following extract from the architect's report will, I think, be found very interesting:—"I have aimed," says Mr. Scott, "at giving the church a degree of dignity proportioned to the important rank and position of the parish for which it is intended. It would, as it appears to me, be inconsistent to rebuild the parish church of so important a place as Kensington in any degree parallel to that of the cheaper class of churches which are built to meet the pressing demands of an increasing population. Churches of that less dignified class are a great necessity, and it is wise to limit their cost to such a degree that it shall not be a cause of preventing the erection of as many of them as the population demands; but when you come to deal with one of the great parish churches—and that of a wealthy and important parish—the abode of royalty—the case is much altered, and a proportionate architectural dignity becomes needful. I have accordingly, without going into a luxurious or extravagant scale, aimed at giving the church a character proportioned to its position."

THOMAS WALESBY.

THE VIADUCT ON THE EMBANKMENT.

In the House of Commons, the other day, when a committee was very properly appointed to inquire into the roadway and viaduct proposed to be made on the Thames Embankment from Hungerford Bridge to Wellington-street, Strand, and whether the site might not be more advantageously occupied by some public building; also to inquire whether any, and if so, what controlling power over public works in the metropolis was vested in and exercised by any Government department,—

Mr. Tito said he wished to explain that there was no such thing proposed as a viaduct from Charing-cross to Waterloo Bridge, nor had the Metropolitan Board to make any such road at Charing-cross. The road along the Embankment, 100 ft. wide, would be exactly one mile in length, and as it would be ridiculous to have such a thoroughfare running parallel to the Strand and Fleet-street without any intercommunication, it was proposed to connect the two lines at Wellington-street by means of an inclined plane. If the Metropolitan Board were to be released from the carrying out of the work, it would effect a saving of 230,000l. With regard to the control which might be had over such a work, he should be glad to acquiesce in any satisfactory settlement of the question which might seem desirable.

HARGRAVE CHURCH, NEAR BURY ST. EDMUNDS.

This church is situated about seven miles from Bury and one from the village of Hargrave, and adjoins the rectory grounds; and, with the exception of a farmhouse some two fields off, no houses are situated within a quarter of a mile. It stands in a commanding position at the top of a hill, and contains a chancel, nave, and tower; latterly, it has undergone enlargement and partly re-erecting, and has been opened with divine service. The old vestry has been taken down, and a new north aisle, 31 ft. long by 13 ft. 6 in. wide, has been erected. It accommodates ninety adults, and is connected to the nave by three stone arches with circular columns, moulded caps and bases, and three two-light windows, all of Ancaster stone. The walls are

built of Dalham stone, and faced with flints similar to the chancel, and have Ancaster stone quoins, weatherings, and dressings.

The roof is a lean-to against the nave, slated, open timbered, and boarded diagonally, with moulded cornice, all sized and varnished; the seats are open benches, stop-chamfered; the nave has been partly reseated, the old-fashioned pews have been taken down, and open benches to match those of the aisle substituted. The pulpit and desk have been removed from the south to the north side of the nave. The chancel was restored a few years back, with the exception of the seats; these, like the nave, have been swept away, and open benches for the choir have been added, with ornamental iron standards for children's desks. The whole of the woodwork is sized and varnished. A fine old Perpendicular screen, richly carved, separates the nave and chancel; this has been repaired, stained, and varnished. There is also a piscina, and sedilia, &c., in the chancel, restored some few years back.

Mr. Ralph Chamberlain, of London, was the architect employed; Mr. James Drake, of Ousden, the builder; Mr. Hopson, of Bury, the stonemason; and Mr. Shrivell, of London, did the ornamental ironwork.

CHURCH-BUILDING NEWS.

Great Yarmouth.—An appeal for further aid towards the restoration of the church of St. Nicholas has been issued by the vicar and churchwardens, in which they say:—"Four years have elapsed since the restoration of the tower and chancel of this noble church. Meanwhile, the south aisle has fallen into such a state of utter dilapidation, that our architect has pronounced it unsafe, and has recommended us to close it. The seats have accordingly been removed, and the aisle is boarded off from the rest of the church. The restoration, therefore, of the south aisle has become an urgent necessity. We are most anxious to avoid all unnecessary delay, and we earnestly hope to be able to commence the work early in the coming spring. But the funds are at present insufficient to complete a work of such magnitude. The south aisle is in length upwards of 110 ft., by 40 ft. in breadth. No parish church or cathedral in England has aisles of such a size. And the various works to be carried out include the south wall, which is hulged outwards, and must be rebuilt from the ground; an entirely new roof; the exterior west front of the aisle; and two of the four great western pinnacles, each 70 ft. in height. The estimates laid before the restoration committee amount to above 4,000l. In addition to the 6,900l. already expended on the tower and chancel, a sum of 3,400l. has been collected towards the restoration of the south aisle." The restoration committee still require from 700l. to 800l. They solicit aid from the public.

Hardingstone.—The parish church of St. Edmund's, Hardingstone, has been reopened, after undergoing an extensive and very necessary restoration. Externally there has been a general repair of the masonry work; the walls, where necessary, have been underpinned, and a dry area has been constructed round the walls of the church. Internally the whole of the fittings have been removed. The old high pews have been replaced by open deal seats varnished. The old timbers of the roof of the nave have been repaired and cleaned, and covered in with new boarding slightly stained. The roofs of the north and south aisles, which were found to be much decayed, have been replaced with new and more characteristic work. The Early archway in the tower, which, with its stone voussoirs of alternate colours artistically irregular in size, is a feature of the building, has been opened, and a two-light Decorated window has been inserted in the west wall. The window, the painted glass of which was designed by Messrs. Heaton, Butler, & Bayne, is the gift of the vicar. The masonry of the arcades has been stripped and cleaned from paint and whitewash, and the whole of the walls have been replastered. The alleys have been paved with Staffordshire tiles. An old two-light window, in the east wall of the north aisle, has been reopened, and glazed with the ordinary quarries. The old east window of the chancel has been removed, and a three-light Decorated stained-glass window, executed in Daston stone, has been erected in its place. It is filled with painted glass, by Wailes, of Newcastle, which has been put in by the tenants, and other inhabitants of the parish, as a testi-

mony of respect to the memory of the late Mr. and Mrs. Bouverie. The centre figure is Christ carrying a lamb, with the inscription, "I am the Good Shepherd." On either side are Peter and John, with the inscriptions, "Love as Brethren," "God is Love." The roof has been cleaned, and the wall-plates have been replaced on stone corbels. The "Hervey Chantry," with its interesting tombs, remains untouched. The church is lighted with standards and brackets, fitted with reservoirs for paraffine oil. The standards are by Messrs. Richardson & Slade. The church is warmed by an apparatus patented by Perkins & Son, of London. Before the restoration there were two entrances to the church by the north and south porches. These doors have both been blocked up, there being now only an entrance underneath the west tower. The porches have been utilized, one of them being used as a store-room, and the other appropriated to the warming apparatus. The churchyard has been remodelled, and a walk laid out from the entrance-gate to the west door. A short time since new schools were erected, and they form a view from the churchyard. The restoration has been carried out by Messrs. Smith Brothers, of Northampton, from the plans and under the direction of Mr. Robert Palgrave, architect, London.

Blackheath (Rowley Regis).—A new church has been consecrated in this part of the "black country." Mr. Wm. J. Hopkins, of Worcester, architect, designed the structure, and Messrs. Wilson & Son, of Birmingham, builders, have carried out the architect's plans. Mr. Boulton, of Cheltenham, was the carver; Mr. Brayshaw, clerk of the works. The bricks, many of which are moulded, were supplied by Mr. Partridge, of Kingswinford. The builders' contract was for 5,000l., exclusive of extras. The church, which is dedicated to St. Paul, contains 850 sittings, all open and free, and consists of a lofty nave, north and south aisles, vestry, organ-chamber, children's chapel, and a chancel. Nave and aisles are divided into six bays, and the nave is 80 ft. long, 29 ft. wide, and 54 ft. in height to the apex of the roof arch. The arches supporting the clearstory have simple mouldings in brick, resting upon brick pillars. The lights to the six bays of the nave have been varied, few of them being arranged alike. Gallies rise from the clearstory walls of one of the bays, both on the north and south side of the church, having three-light stone tracery windows. All the other windows in the nave are either two or three light lancet-headed windows, the heads of which are worked in brick, and have moulded brick rero-arches. The roof of the nave consists of double-arched trusses, rising nearly the whole height of the roof, and strengthened with wrought, twisted, ornamental iron tie-rods and kings. Over the arches of the nave is a diaper band of ornamental brickwork, and a hand of blue brick runs under the windows of the aisle. The chancel is raised considerably above the nave. On the south side is a chapel for children, opening into the nave and chancel by arches spanning the whole width; and on the north is a corresponding chamber for the organ and vestry. To the east of these arches are two-light stone-tracery windows, the one on the south side having its inner jambs lowered to form sedilia. At the east end there is a three-light tracery window of simple design. A band of brickwork diaper, similar to the one in the nave, runs under the inner wall-plate of the chancel roof. Godwin's tiles are laid on the chancel floor. The wall under the east window at present looks bare, but there is ample space for a reredos, which it is hoped will soon be added. The church is warmed by an apparatus supplied by Mr. Cornell, of Cheltenham, who also provided the ornamental ironwork in the building.

Melford.—The Church restorations recently undertaken have been completed. They have been almost entirely carried out (under the direction of the architect, Mr. Woodyer) by local tradesmen. Mr. Leeks, builder, of Melford, undertook the construction of the screens, &c., and also made half the benches, the other half being made by Mr. Fordham, of the same place; the carving is chiefly the work of Mr. Sprungin. The masonry of the tower arch, &c., was executed by Mr. Keogh, of Sudbury; the glazing was done by London workmen under the supervision of Mr. Almaack; the gasfittings were laid by Messrs. Ward & Silver, of Melford. Although much has been done, there is yet ample scope for further outlay.

Wolverhampton.—Christ Church, Waterloord has been reopened, after having been

enlarged. The first portion of the permanent church was opened as a mission chapel in February, 1867, among a population consisting chiefly of mechanics, and has been from the first overcrowded. The second portion of the edifice has now been added, consisting of a side aisle and extension of the nave. This increases the accommodation from 300 to about 500 seats. Funds are wanted to meet the expenditure that has been and has still to be incurred, and an appeal has been made for donations. Mr. Bidlake is the architect, and Messrs. Higham are the builders. Their contract was for the erection of north and south aisles, and extension of nave, including chancel arch. The north aisle and extension of nave have been opened, and the south aisle is now being proceeded with. The contract is 1,850l. The heating is by hot water, by Messrs. R. L. Jones & Son.

Rossmore (Rotherham).—The contract for the restoration of Rossmore Church tower has just been let to Mr. J. Harper, mason and builder, Mashov'. The plans were made by Messrs. Blacknor & Mitchell-Withers, of Sheffield and Rotherham. The cost of the undertaking will be about 700l.

DISSENTING CHURCH-BUILDING NEWS.

Lower Broughton, Manchester.—A new Wesleyan chapel has just been opened for divine service. It has been built from the designs of Mr. William Waddington, architect, Brnley. It is in the Italian style, has cost about 6,000l., and is capable of accommodating about 950 persons. The contractor was Mr. Mark Foggott, of Cheetam, Manchester.

STAINED GLASS.

Hyde Church.—A memorial window has been placed in the chancel of the parish church, Hyde, near Manchester. The style of the church is late Perpendicular, and the window consists of five lights of unusual height, and hold open tracery, the latter being filled with figures of angels holding scrolls inscribed with texts; and the background and cusped tops filled with canopy work and foliage. The five principal openings are divided laterally in the design of the glass, thus forming ten spaces, each of which is occupied by canopy work inclosing a subject, greater prominence being given to the two central divisions, which contain the "Crucifixion" and the "Ascension." The eight remaining spaces contain the following subjects:—"The Nativity," "Adoration of the Magi," "Baptism," "The last Supper," "Mary and Martha," "Mary anointing the Feet of our Saviour," "Raising Jairus's Daughter," and "Christ healing the Mother of Peter." An inscription at the foot of the window shows that it was put up by Mr. John Sidebotham, of Kingstow House, Hyde, in memory of his wife Elizabeth, and his sister, Jane Lowe Sidebotham. The artists were Messrs. R. B. Edmandson & Son, of Manchester.

Kingsworthy Church.—The brother officers of Mr. C. Turner, of the 60th Rifles, who was killed by an accident, have just caused to be inserted in the south wall of this church a memorial window, by Mr. Alex. Gibbs. The window consists of two lights. The left-hand compartment represents our Lord at the gate of Nain raising the widow's son. In the right hand compartment is a picture of our Lord as the Good Shepherd.

St. Margaret's, Sibsey.—A stained glass window has recently been placed in the chancel of this church, by Mr. Edmund Brown Waite, a former resident of the parish, in memory of his deceased wife. The subject is taken from the 10th chapter of St. Luke's Gospel, the three figures representing Christ, Martha, and Mary. There are now five memorial windows in the chancel of this church.

Arthurcl Church.—Messrs. J. Scott & Sons, of Carlisle, stained-glass manufacturers, have completed the first half of the window to be placed in Arthurcl Church to the memory of the late Sir James Graham. The design represents the twelve Apostles—one in each light of the window,—surmounted by a row of angels, and the emblems of the Evangelists, with a large dove in the central circular light.

Minty Church.—A stained glass window, says the *Bath Chronicle*, has been placed in Minty Church at the east end of the north aisle by Major Perry-Keene as a memorial of his parents, who lie buried near the spot, and of his eldest son, late of the 2nd West India Regiment, who died off Sierra Leone in 1863.

FROM IRELAND.

Belfast.—The students' chambers at the Presbyterian College have been inaugurated. These chambers have been erected as a memorial of the late Professor Gibson. The building has a frontage of nearly 100 ft. to the south, looking towards the Royal Botanic Gardens and the new residence of the professors. The elevation, whilst designed to harmonise in its main features with the Presbyterian College, to which it forms a wing, has been carried out in a more severe and simple style. The principal entrance, which is at the east end of the range, has its arched head supported on polished red granite columns, having foliated capitals, and the key-stone, which is also a corbel supporting a balcony overhead, is ornamented by a carved bust of the late Professor Gibson. The porch, which has its outer doors formed of wrought African teak-wood, is divided from the entrance-hall by an ornamental glazed screen. Immediately to the left of this hall are the rooms for the house-steward, and beyond them the dining-hall, 63 ft. long, 17½ ft. high, and 15 ft. wide. It is lighted by five large semicircular-headed windows, having a southern aspect, and divided into three bays by pilasters from which spring moulded corbels, on which rest transverse beams, moulded and panelled. The lower part of the walls is lined with pine boards to a height of 4½ ft., and these, as well as the other internal woodwork, are varnished to show the natural grain of the wood. A wide staircase, with ornamental balustrade and wall-side wainscoted, leads direct from the entrance-hall to the first and second floors. On each of these there are eleven single and two double chambers, entered from a central corridor, which receives light and air at each end. Lavatories, baths, &c., are fitted up at convenient places on each floor. There are also housemaids' rooms and napery closet, and at the rear are kitchens, &c. The builders are Messrs. J. & J. Guiler, and the architects Messrs. Young & Mackenzie. —A new warehouse is being erected in Great Victoria-street. The building is near completion. It is three stories high, with lofty ceilings, and an attic floor in Mansard roof, lighted by large dormer windows. The front is faced with Allan & Mann's white brick, from Glasgow, with cut-stone entrance-doorway, having carved spandrels, perforated parapet, &c. The building is erected on a piled foundation, the beams of floors being supported by metal columns. The roof is finished with wrought-iron cresting of an ornamental design, and on top of dormers are wrought-iron terminals. The work has been carried out from the plans and under the superintendance of Messrs. Boyd & Batt, architects, by Messrs. James M'Cracken & Son, contractors.

FROM SCOTLAND.

Aberdeen.—The Free West Church has been opened for divine service. It has been erected at a cost of 14,000l. at the west end of Union-street. It is built of "freestone," and therefore does not harmonize with the "granitic" Grecian structures in the street. It has been built from plans furnished by Mr. Matthews, and is in a somewhat ornate style. The spire is above 200 ft. high, and is seen all over the west end of the city. The church is seated for about 1,100.

ACCIDENTS.

A FIRE has destroyed the wood and timber yard of Messrs. Arthur & Co., King-street, Goswell-street, and at one time threatened destruction to a large number of houses by which it was surrounded. These houses were inhabited by labourers employed in the Brick-lane Casworks, and the whole of them were much burnt, and the furniture seriously damaged by fire, water, and hasty removal. While the fire was raging, a most formidable gang of thieves and other ruffians had assembled, all acting in concert, and making attacks upon every respectably-dressed person who came near them. For upwards of an hour this scene was continued. Half a dozen mounted constables at last put an end to it. This shows how to deal with such ruffians in future. There should be some restriction on timber-yards in the metropolis and other towns.

At Middleton, near Pickering, in Yorkshire, an old cottage adjoining the day-school house has been completely destroyed by a gale of wind, the entire roof falling inwards. The roof of

the school house was also so much shaken and damaged that it was not deemed safe to use it. This school will have to be rebuilt.

The scaffolding placed inside a vessel at present building at South Stockton, by Richardson, Duck, & Co., recently gave way, and three men were precipitated, a distance of 20 ft. One man was killed.

While a workman was engaged on a scaffold, 70 ft. high, at a new Roman Catholic chapel, at Longton, a chisel, which he had placed on the planks, rolled off, and fell on the head of a man who was stooping immediately under the scaffold. The sharp edge of the tool pierced the head of the unfortunate man, making a fearful gash, from which a portion of the brain protruded.

COMPETITIONS.

Kidderminster Infirmary.—The architects' designs for the new infirmary have been on view in the Corn Exchange for the last few days. The committee threw the matter open to general competition, and this led to a large number of architects competing. Messrs. C. H. Cooke & H. B. Carling, Mr. John Ladds, Mr. J. Toner, all of London; Mr. J. N. Crofts, Liverpool; Mr. G. Bidlake, Wolverhampton; Messrs. Haddon, Brothers, Great Malvern; Mr. J. T. Meredith, Kidderminster; Mr. B. Lawrence, Newport (Mon.); Messrs. Payne & Talbot, and Mr. J. G. Bland, Birmingham; Mr. Spaul, Oswestry; Mr. W. Watkins, Lincoln; Mr. F. Popplewell, Manchester; and Mr. E. L. Evans, are among the competitors. Four of the designs are marked with mottoes, names not being given. A meeting of the infirmary committee was held, when, ultimately, out of the nineteen plans which had been sent in, the committee selected two, between which their choice will lie. The plans selected were those of Mr. J. G. Bland, of Birmingham, and Mr. W. Watkins, of Lincoln.

Newington Sick Asylum.—The Board have awarded the first premium to Messrs. Jarvis, the second to Mr. Knightley, and the third to Messrs. Giles & Biven. Their designs were the three to which we directed attention in our notice.*

MONUMENTAL.

Pegg Monument at Derby.—The erection of a monumental structure has been completed in the Osmaston-road chapel, Derby, in memory of the late Mr. Pegg, J.E., who was mainly instrumental in the erection of that place of worship. The monument is in the Pointed style, in keeping with the architecture of the edifice. It is chiefly of alabaster, and has been executed by Mr. F. Warren, Derby, from a design by Messrs. T. Hine & Son, architects, Nottingham. It is placed in a recess on the north side, and immediately behind the stone pulpit, west of the north transept. The entire structure is over 10 ft. in height, 7 ft. wide, and is attached to the front wall dividing the recess from the baptistery. A dado of Caen stone, 2 ft. in depth, 7 ft. in breadth, comprising three sunken carved panels, and projecting about 1 ft. from the wall, stands upon a base, and sub-base or plinth of Hopton stone. At the height of between 3 ft. and 4 ft. it is surmounted by a deep Caen stone moulding, which forms the basement of four polished red Devonshire marble columns, with carved capitals of Caen stone, finished with an abacus of white polished alabaster, from which spring three deeply-moulded Gothic arches. Over the pillars the alabaster copings above the arches rise from carved bosses, which, like the two side panels of the dado below, show a variety of conventional foliage.

New Monument in Derry Cathedral.—A sarcophagus monument, of polished Aberdeen granite, has just been placed in Derry Cathedral burying-ground, over the grave of the late Bishop Lliggin. On each side of the bevelled top is sculptured, in relief, a representation of a bishop's crozier, broken, and a mitre; and on one of the sides underneath is engraved and gilt the inscription. At one side of the sarcophagus are large slabs of Aberdeen granite, to which iron rings are attached for the purpose of raising them when entrance is wanted into the vaults beneath. The monument is enclosed by an iron railing specially cast by Messrs. George Smith & Co., of the Sun Foundry, Glasgow. The low wall by which it is supported is formed of blocks of Aberdeen granite. The whole was designed

* See p. 99, ante.

by Mr. Frederick H. Smith, of Belfast. The working and polishing of the granite were done by Messrs. Mosman, of Glasgow, and the sculptured croziers and mitros on the top were executed by Messrs. Kirk, of Dublin. The putting up and enclosing of the monument have been carried out by Mr. Matthew McOleand, of Derry.

BRADFORD BUILDING TRADES' TECHNICAL SCHOOLS.

A MEETING of employers and foremen engaged in the several branches of the building trades, called by circular, has been held in the newly-erected premises of the Bradford Building Trades' Technical Schools, in Godwin-street, Bradford, the object of the meeting being to explain their arrangements for conducting the schools, and to endeavour to enlist the sympathy and co-operation of all engaged in the trade. Mr. Archibald Neill occupied the chair, and there were also present Messrs. B. Illingworth, John Beauland, J. H. Illingworth, Harland, Wm. Moulson, Wm. Tattersall, and a number of other influential employers.

The Chairman read the circular convening the meeting and also the prospectus of the schools, from which it appeared that it was the intention of the founders that in these schools the technical education of apprentices and operatives employed in the building trades should be carried on by a course of primary instruction in writing and arithmetic; and for the more advanced a course of instruction in practical geometry, mensuration, and drawing. The services of efficient and practical teachers had been secured, who would be aided by qualified assistants as occasion required. It was also intended to form a library of practical and useful works relating to the science and art of the building trade for the use of the members. The terms of payment were 3s. per quarter, which would secure all the advantages the schools might offer. At present the classes met two nights a week. There were now upwards of 120 scholars on the books, whose average attendance was 70 per cent. This was very encouraging, and the interest shown by the scholars was highly creditable. The rooms were comfortable and commodious, and contained ample accommodation for 200 scholars.

Mr. J. H. Illingworth moved the first resolution:—
"That this meeting pledges itself to assist and co-operate with the committee in continuing and supporting these schools."

This resolution was seconded by Mr. Harland and unanimously agreed to.

Mr. John Beauland moved the next resolution, in the following terms:—

"As the schools cannot be self-supporting for some time, the expenses incurred in furnishing rooms and providing class-books being very considerable, and the contribution of 3s. per quarter from each scholar not being sufficient for tuition and working expenses, until we have a large increase of scholars, it is desirable that a subscription be opened forthwith to defray the preliminary and working expenses; and all persons interested in the building trade should be invited to subscribe."

Mr. Wm. Tattersall seconded the resolution, which was also carried.

Mr. S. Wray moved, and Mr. S. Clarke seconded, a resolution, also carried, to the effect that books bearing upon the science and practical art of the trade, models, drawings, &c., being required, it was desirable that any one having it in his power should provide them.

Mr. Wm. Moulson then moved,—
"That all employers present pledge themselves to send their apprentices to these schools."

Mr. Hill seconded the resolution, which was also carried, as was one moved by Mr. B. Illingworth, and seconded by Mr. Isaac Verity, that this meeting nominate representatives from each branch of the trade to serve on the committee.

REVALUATION OF ST. GEORGE'S, HANOVER-SQUARE.

From the revaluation of the parish of St. George's, Hanover-square, by Mr. Charles Lee, which, as we hear, has been adopted by the vestry, we learn that the net rateable value of the whole parish last year was 905,812l., and that it has been increased by Mr. Lee to 1,213,077l., or about 33½ per cent. The revaluation for the basis of the county rate has been fixed by the magistrates at 1,240,827l.

BELGRAVE AND SOUTH KENSINGTON NEW ROAD.

This Bill is before Parliament again for an extension of time for carrying out the works, as the present Act expires in August next. The company by their Act are bound to recon the authorities the whole of the rates now received from the property that may be destroyed by the works until a better property is put on the land. The Bill has a clause by which they seek powers for the authorities of Chelsea to pay them for a period of fifteen years all the extra or improved rates that may accrue by this very important improvement. The road is to be commenced at Westbourne-place, and run across Sloane-street, the Pavilion land, and Quain Field, to the Grange at Brompton, so as to open up a direct communication from Eaton-square to South Kensington, forming a good access to upwards of thirty acres of the best building land in London, on which it is proposed to erect a great number of first-class mansions abutting on a grand boulevard.

The vestry of Chelsea last year approved of the company receiving the improved rates, and an attempt was made to rescind the resolution of the vestry at a special meeting, but it was confirmed by 26 to 18. About a fortnight since a second attempt was made to rescind the resolution, when the opponents of the road were again defeated by 23 to 11, although they required 23 to 12 in order to succeed. The matter now rests with Parliament, and it is hoped the company may succeed with their present Bill, as it is well known that capitalists are ready to furnish the necessary funds, provided the extra rates are allowed to be at the disposal of the company.

The land now lying waste cannot be built upon for the next fourteen or fifteen years, unless by Act of Parliament, as the present lease does not expire till then. Tox.

PROBATIONERSHIPS AT THE ROYAL ACADEMY.

Sir,—Will you kindly allow me a small space in your valuable columns to call attention to the subject of probationerships in architecture, at the Royal Academy of Arts? I confess that I am one of the many who have strictly complied with the council's instruction for the admission of students in architecture, and my drawings have been rejected. I have reason to understand that those I submitted were amply sufficient to show a reasonable degree of proficiency in architecture and architectural drawing. The fact of my not having been admitted has suggested the question—Who decide on admissions to probationerships in architecture? I may be told, the council. But of whom does the council consist? Surely there ought to be architects whose criticism should be invited and recognized. But is such the case? I hope I may be allowed to assert that architecture is an art, and should therefore be subject more particularly to the opinions of those who are professors in that art, when admissions to probationerships in architecture at the Royal Academy are to be decided upon.

ARCHITECTURAL ASSISTANT.

* I admit the query, but have not the slightest doubt that the drawings are usually submitted to a proper tribunal.

SMOKY CHIMNEYS.

Sir,—My house is square on plan. All the chimneys are external. Every chimney in the house smokes more or less. The current of air, instead of being upward, is downward.

When there are no fires in the grates, the cold air descends in a steady current, bringing soot with it, and spoiling everything in the house.

When the fires are going out at night, the hot air, charged with noxious gases, is forced into the rooms by the cold air pressing above it.

I have tried very many varieties of zinc chimney-pots, including some of the best patented ones, but they abate the evil very slightly. The down-draught still continues, although, of course, the volume of air which falls is not so heavy. The chimneys really appear to suck in the air from the top, and to distribute it, laden with soot, over the house. The stoves are the ordinary register stoves.

Opening doors or windows makes little difference. The draught still pours down the chimney and out at the door or window.

Can any of your readers suggest the cause or the cure? R. J.

THE MARSHES OF THE MEDITERRANEAN. INSTITUTION OF CIVIL ENGINEERS.

ON February 16th, the paper read was "On the Lagoons and Marshes of certain Parts of the Shores of the Mediterranean," by Professor D. T. Ansted, F.R.S. The following is a summary of the practical bearing of the facts adduced:—

First, That the malarious lagoons and marshes, of which there were so many examples on various shores, were the result of the interception of waters coming of small tracts of land, or of small and torrential streams, by banks of drifted sand and mud, proceeding from larger rivers, carrying out to some distance large quantities of detritus which was distributed by marine currents.

Secondly, That a study of the existing physical geography of each district affected by malaria, combined with a knowledge of its geology, was sufficient to explain the conditions, and to determine the history of a knowledge that had terminated in the formation of the malarious marshes and lagoons.

Thirdly, That the removal of malaria, whether to be effected by complete drainage or by partial drainage, accompanied by the keeping certain lagoons in free communication with the sea, could only be hoped for by engineering operations, based on the special history of the case under consideration, as determined by a knowledge of the physical geography and geology of the district.

Fourthly, That, in certain cases where small torrential streams had been kept back from the sea by the rapid accumulation of drifted sand, the drainage of the marshes and lagoons might be rendered comparatively easy by keeping open a permanent channel for such streams.

Fifthly, That the principle of breaking up the drainage areas supplying water to the lagoons into smaller areas, each of which admitted of separate treatment, being suggested by the history of lagoons generally, was the principle which should be adopted in all cases where sanitary improvement was called for, and would generally be found advantageous to an economic sense.

ARTISANS' AND LABOURERS' DWELLINGS ACT.

THE District Board of St. Saviour's, South-west, find themselves impeded in their design of putting this Act into operation by the provision for defraying the expense being by a special rate, a provision inserted by the House of Lords. The Board have determined to petition both Houses for an amendment of the Act in this respect.

OFFICES FOR THE POPLAR BOARD OF WORKS.

At the ordinary meeting of the Poplar District Board of Works last Tuesday evening, Mr. Edward Coleman in the chair, the following tenders were received for the erection of new offices for the Board.

The chairman said the approximated sum for the buildings was about 6,700l.

Table with 2 columns: Contractor Name and Amount. Includes Moore, Upper Norwood (£15,007 0 0), Girling, Bromley (10,903 0 0), Perry, Barking-road, Essex (5,775 0 0), Harris, Limehouse (9,663 0 0), Walls, Barking-road (5,921 0 0), Ennor, Commercial-road East (8,779 0 0), Morte, Stratford (8,743 0 0), Myers & Son, Lambeth (8,674 0 0), Crab & Vaughan, Kingland (8,663 0 0), Cook & Green, Kensington (5,386 0 0), Ancombe, Maidstone (5,623 0 0), Winthrop & Co., Lewisham (5,600 0 0), Abraham, Poplar (5,478 0 0), Hughesdon, Deptford (5,600 0 0), Webb & Sons, Bow (8,223 0 0), Sheffield, Poplar (5,357 0 0), Till, Hampstead (8,330 0 0), Hill, Keddell, & Waldron (8,315 0 0), Kilby, Limehouse (8,112 0 0), Wicks, Bangs, & Co., Limehouse (7,975 0 0), Turner, South Hornsey (7,809 0 0), Baker & Constable, Holloway (7,530 0 0).

The lowest four tenders were referred to a special committee, who are to report to the Board at a meeting next Tuesday evening.

GRAINING AND SHAMS.

Sir,—If you think this will not be out of place in your columns will you favour me by publishing it. I think we are hearing just a little too much about shams at present, and judging by the quarter from whence the outcry emanates, there is a simplicity about it that is quite refreshing. If the term sham applied to products of the imagination or ideal representations of nature, I am sure that some of these specimens of realism are perfectly innocent of anything like a sham. As regards to graining and marbling, I will venture to say that when the work is done by a first-class workman there is frequently as much of more ability, refinement, and true artistic feeling displayed than in any other branch of house decoration. Let us see what we get as a substitute for these so-called shams.

In nine cases out of ten we get in form the most elementary examples,—the straight, the indine, and the curve,—without one spark of subtlety or refinement to redeem them from the most hopeless commonplace. And in colour we have blue, red, and yellow,—yellow, red, and blue, neat or mixed, upside down, and inside out. A mere ebulition of the chromatic pack.

Almost the whole of the work is done by journeyman painters, who, by this overdone system of stenciling, are degraded to mere machines. I would ask those who cry out so much about shams, to look into their own art with a more loving eye, and they would possibly learn to appreciate the efforts of their more humble brethren. Also I would ask them to condemn Art only when it is bad, and not because it is not real. Mr. Dean, the Xylographer (I hope that is right), spoke of a gentleman who praised his work because he could not distinguish it from the real. I wonder whether that gentleman ever saw the admirable imitation of a late member of Parliament who was his head daily from 15 to 18 in an establishment in Baker-street? As a lifelike production I think it is unsurpassed.

A PRODUCER OF SHAMS.

GRAINING FROM THE SURFACE OF WOODS.

Sir,—In your paper of January 30th, I find, in a notice of a meeting of the Society of Arts, a description of a supposed new discovery, now christened xylography, and Mr. Dean claims to be the inventor. More than twenty years ago I transferred from prepared paper hundreds of yards of imitation of woods. More than eight years since a Frenchman invented printing from real wood, and thousands of pieces of it were sold in England for paperhanging at 1s. 3d. per piece; five years ago I produced it with an old mangle, a patent one, as follows:—I took ordinary lining

paper, and gave it a coat of size with a little treacle in it, or a coat of size made simply with gum arabic. I then placed the prepared paper on a slab of oak, which was previously rubbed in with oil graining colour. I then pressed it between the two rollers of the mangle, with a piece of molskin between the roller and paper. When the impression was dry, I varnished the work to be grained; and when the varnish was nearly dry I rubbed the printed paper previously damped, and the impression was left clean behind. I can show work done twenty years ago by myself, and you can purchase the French paper at any paper-shop. W. DAVIS.

** We have received a number of letters from grainers for and against the process, but no good end would be answered by printing them.

RAILWAY MATTERS.

As was to be expected, the foolish financiers of the London and Brighton line are being obliged to lower their fares again, the grasping and greedy attempt to raise them having lowered their profits by checking the traffic. How is it that they could not foresee this result as other people did? Surely another sort of management will now be substituted for the purlined one by which the shareholders have hitherto been led.

The dividends on most of the lines making up their accounts to the end of the year have now been declared, and they are upon the whole satisfactory—more so, indeed, than was anticipated a short time since. Railway companies have, during the last half-year, been fortunate in keeping down their working expenses, in consequence of the reduction which has taken place in almost all descriptions of material, and the prevailing lower rate of wages. The railways have gained by diminished charges for labour more than they have lost by the stagnation of trade. Hence the good dividend of the London and North-Western Railway, which is at least a 2 per cent. more than what had been reckoned upon. The completion of the Midland is now, however, beginning to tell severely upon the business of the North-Western, especially so in the item of mineral traffic between Rugby and London.

It is said that application has been made to his Royal Highness the Ranger for leave to construct a railway underneath the parks. The proposed line is intended to join the Charing-cross and Paddington Stations, and according to the plans, is to pass under St. James's-park, parallel with the Mall, thence underneath the Green-park parallel with Constitution-hill to a station at Knightsbridge; then diagonally across Hyde-park, with a station at the barracks to the vicinity of the Victoria-gate, from which it is to pass underneath the streets into one of the Paddington stations. The trains are to be propelled by rope system, and thus the disagreeable and deleterious gases in the underground lines as at present worked will be avoided. It is said that in construction the principal part will be tunnelled, so as not to interfere with the surface of the parks.

THE PROPOSED NEW BUILDING ACT.

Sir,—As a new "Building Act" is under consideration, I send a few remarks on the subject.

I must protest against such frequent changes of the law relating to building. The Act of 1774 lasted 70 years; that of 1844, though a very good and well-considered Act, only existed 11 years; and the last Act (of 1855), has only been in operation 14 years. If we must again be disturbed and inconvenienced by another new Act, I trust that it may be so thoroughly well considered that it will last another 70 years like the old Act of 1774. If it is to be a lasting Act it must not enter too much into minute, petty, and vexatious details.

The principal objects should be—to check the spread of fire; to provide for the safety of the public; sanitary regulations; and to obtain more substantial buildings. I think it would be well to repeal the whole of the previous Acts, and not as in the last Act, to leave small portions of the previous Acts unrepealed instead of embodying them in the new Act. I think the provisions and form of the last Act should be preserved as far as possible with only such alterations as are clearly necessary. A central professional controlling power is very desirable, somewhat after the plan of the Act of 1844.

The proceedings as to rebuilding party walls under revision. There is considerable difference of opinion and practice as to the meaning of several clauses of the present Act relating to party walls; for instance, as to who is the person upon whom the three months' notice should be served. The clauses relating to appointment of owner's surveyors and umpire are secure. No provision is made in case all three surveyors differ. The present Act does not define a "building." It does not mention a prevention of the spread of fire. It does not limit the time within which a district surveyor may take objection to any part of a building, unless erected without notice. It does not expressly require the district surveyor to inspect the drawings, or point out anything amiss in them, before the execution of the work. It does not recognise in walls.

Any absolute restrictions of the height of buildings should only apply, I think, to very thoroughfares.

A READER.

MEDIEVAL METAL CAPITALS.

SIR,—I should esteem it a favour if one of your correspondents would inform me whether metal capitals to pillars were used in any ancient Greek. I am aware that in modern adaptation Greek and Roman forms the capitals, when made of plaster, are often gilt; and if gilt, why could they not of course be made of metal? But I am not aware that capitals were ever used by the Medieval artists, or that metal was employed by them for the capitals. I should like to know.

T. M.

THE NEW CATTLE-MARKET, DONCASTER.

THE new markets, for the plans and designs of which the town council awarded the first premium in an open competition, about three years ago, to Mr. Watkins, of Lincoln, are now, so far as relates to the open markets for the sale of calves, sheep, pigs, &c., and the abattoirs, in a forward state of progress. These markets form a portion of the general system laid out for their enlargement and improvement, which comprises, in addition to those under notice, a new corn exchange (arranged also for large public assemblies), new vegetable and fish markets, a sessions hall and board of guardians' room, which are intended to follow. The style is Italian, freely adapted. The chief entrance is upon the site of the old White Horse Inn, and consists of a central carriage-way 13 ft. wide, and a hand-way on the north side, hung to large ornamental stone piers with carved caps. The sheep market occupies the centre of the upper portion of the open markets, and is arranged in two lairs, having a road down the centre 15 ft. wide. There are 184 sheep-pens, 34 fat beast lairs, and 10 pig-pens. The abattoirs occupy the north-east corner of the markets, and have two approaches therefrom. The quantity of iron used is 10 tons of cast iron, and 10 tons of wrought-iron being. The town council appointed Mr. T. H. Muley, the borough surveyor, clerk of the works, and Mr. Rawson as his assistant. Mr. E. Huddleston, of Lincoln, contracted for the general work, for 4,298l.; and Messrs. Ratcliffe & Muscheler, of the Hexthorpe Ironworks, for the iron pens, 1,544l. 10s.; and for the principal wrought-iron gate and the two side gates, 1,067l. The erection of the market-keeper's lodge, and other extras, will increase the outlay for the works.

G A S.

THE directors of the Gloucester Gas-light Company have proposed dividends to be declared of 10 per cent. for last year upon the class A shares, an additional 5l. per cent. in payment of the balance of the arrears of dividends due to this class of shareholders, and 10s. per cent. per annum upon Class B shares. These dividends absorb 2,573l. 3s. 6d., and leave a balance of 501l. 19s. 2d. to be carried over to the next half-year.—The Ipswich Gaslight Company have declared a dividend at the rate of 7 per cent. for the year, to be paid upon old shares, and 7l. per cent. upon new shares, that are to be placed to the credit of the fund for the depreciation and renewal of the meters on hire, and that a balance of 4,688l. be carried forward to the new profit and loss account.—The directors of the Longton Gas Company have re-

commended a dividend for last half-year at the rate of 6 per cent. per annum, free of income-tax, a balance of 218l. to be added to next account.—The Liverpool Gaslight Company have declared a dividend for the half-year of 5l. on every 100l. stock, and a dividend at the rate of 3l. 10s. for every 100l. for a half-year on the capital paid up in respect of the 7 per cent. shares.

Books Received.

VARIORUM.

"A SYSTEM of Taxation that would be to the Pennyrite Advantage of all." By T. H. Willis. The author of this scheme proposes the repeal and abolition of the property and income tax, Customs dues (reciprocity dues excepted), Excise levies, and all assessed taxes and rates; and the substitution of one general rate or tax, on land alone, covered by buildings as well as uncovered, and from tenants as well as landlords, at per acre, according to its productive character; increasing or lessening the assessments as Parliament may sanction, or as occasion may require. By this simple plan, Mr. Willis argues, a much larger revenue could be obtained, with less taxation to each, and more equal justice to all, than under the present complicated and expensive mode of raising the revenue. The special sources of taxation he divides into covered land; land worked as quarries, &c.; used as nurseries, &c.; employed in tillage, pasturage, &c.; and held for all other purposes. To this would fall to be added customs reciprocity dues, &c., crown lands, post-office, probate and legacy duty, stamps, and miscellaneous receipts. Covered land alone would yield, he calculates, about 35,000,000l. The same principle, he adds, might be applied, and with like advantages to occupying tenants, in respect to parochial rates and all other local rates and taxes. Mr. Willis is an old reformer, as regards rates and taxes, as some of our readers may recollect.—"London Water Supply: Facts and Fallacies discussed." By John Taylor, C.E. London: Spon. This is a series of letters which were written for and published in the *Courier* newspaper in 1866-7, chiefly with reference to the constant service and a future source of supply. The general tone of the whole is in support of the water companies and the quality and quantity of the supply; and Mr. Taylor points to the very exceptional summer of last past as against a constant service for London, although he admits its necessity throughout the slums of the metropolis.—"Sewage, in its general Application to Grass, Cereal, and Root Crops." By Thomas Cargill, C.E., *Mechanics' Magazine* Office. In this very timely-written and important pamphlet, the author shows the results obtained by actual experience down to the present date; with plans and sections, illustrating the methods of forming the ground for the different systems, and for distributing the sewage over the irrigated fields. He confines himself to the utilization of sewage in field irrigation, avoiding the question of the removal of sewage from cities, towns, and villages, as a separate question. Every one interested in sewage irrigation ought to have this pamphlet, which may help towards the solution of the sewage problem.—"On the Rainfall of Cobham and Chiswick." By George Dines, F.R.S. The tables and remarks here published in a separate form are extracted from the proceedings of the Meteorological Society for November last, and they contain the results of forty years' observations. They were made up by Mr. Dines with reference to a paper on the moon's influence upon rainfall, read before the society.—"The Court Suburb Magazine" is, as its title imports, more especially devoted to Kensington, but is not wholly so. It deals with "General Literature," as well as "Objects of Suburban Interest," is well edited by Miss Aikin Kortright (better known as the author of "The Dean"), by whom also it is issued at 21, Eldon-road, Kensington; and contains much agreeable writing.—A second edition has been published of "Other People's Windows" (Samson Low, Son, & Marston), by the author of "The Gentle Life," Mr. Hain Friswell. This very charming series of sketches, ingeniously and completely tied together into a whole, is now condensed into one pretty volume, and in that shape will, we have little doubt, run through many editions. Mr. Friswell writes like a gentleman, and the spirit of the book is excellent.

Miscellaneous.

The New Elephant-house of the Zoological Gardens is thus described in *Scientific Opinion*.—It is a fine building, though a little too red-brick in aspect. It is, however, calculated to provide luxuriously for the comforts and well-being of the pachyderms, and is unrivalled in size and general construction. It contains eight large divisions for elephants and rhinoceri, and is so arranged as to give the animals proper scope for exercise, and the public ample means of watching the habits of the beasts.

Health of Boston, Lincolnshire.—Mr. W. H. Wheeler, the borough surveyor of Boston, in a letter on the Weather and the Public Health, says:—The total number of deaths for the year has been 311, or 15 below the average of the last seven years, the average age being a little over 38 years. 75 were over 70 years of age, and 70 were one year or under. The per centage of the year is 20 deaths to every thousand inhabitants; 20 deaths arose from fever, 1 from diphtheria, 5 from whooping-cough, 2 from diarrhoea (exclusive of infants), 35 from consumption, 12 from lung diseases, 17 from bronchitis, 70 from infantile diseases, 47 from miscellaneous causes, 6 from tumours and cancers, 8 from heart disease, 27 from brain diseases, 5 from accidents, and 61 from decay of nature.

The Maintenance of Parish Churches. Vestry meetings have been held in several of the parishes throughout Shropshire for the consideration of the best mode of raising funds for the maintenance of the parish churches, hitherto provided for by compulsory rate. At Wem the adoption of the system of a voluntary rate was carried by a large majority. At Newport three propositions were brought before the meeting, one suggesting that all the seats in the church should be made free and unappropriated, and that the congregation should have the opportunity of making "weekly offerings;" the other two proposing the free appropriation of a portion of the seats, and the allotment of the remainder amongst such parishioners as might signify their intention of contributing towards the expenses of the church. The meeting, which was an adjourned one, again separated without arriving at a decision. At High Ercall, Shifnal, Wellington, and Church Aston the system of free and unappropriated sittings, combined with a weekly offertory, has been adopted with satisfactory results.

Society for the Encouragement of the Fine Arts.—On Thursday, the 18th, Mr. Wyke Baylis gave a lecture "On Dante, and Longfellow's recent Translation of 'The Divine Comedy.'"—Mr. Prescott Hewett in the chair,—introducing the subject with a short biographical notice of the poet, who, he said, woke the world to poetry and art, and who had not suffered so much from translation as other poets only because his translators had been so few. He characterized Longfellow's translation as a grave and scholar-like production that was free from Cary's imperfections and impertinences. Mr. Hurlstone, on being called upon, said Cary's was the more poetical, Longfellow's the more literal, translation, the title, "The Vision of Dante," giving the sense of the original far better than "The Divine Comedy," the signification of the word comedy having greatly changed since Dante's time.

The Peabody Gifts to the London Poor.—A statement of progress for the year 1868 has been published and circulated by the daily press. From this it appears that during the year a fourth range of buildings, forming Peabody-square, in Victoria-street, Westminster, has been erected. They contain 235 rooms, and accommodate 389 persons. The total population of all the buildings now completed by the trustees is 1,971. Amongst them are 132 laborers, 62 porters, 22 charwomen, 18 dressmakers, and so on. "The sanitary condition of the buildings shows an entire exemption from endemic diseases, and from those complaints incident to low and crowded localities. Good ventilation and cleanliness are characteristic of the dwellings. An unlimited supply of water, and bath-rooms free to every tenant, together with inclosed playgrounds for the children, have already produced a salutary effect, not only amongst the young, but perceptibly in the increased tidiness and cleanliness of the old." The total amount of the gifts is now 350,000l. The original fund of 150,000l. has already been increased by rents and interest by 23,313l.

TO CARPENTERS AND BUILDERS. WANTED, a SITUATION in a Good JOINING SHOP. Thoroughly acquainted with every branch of the trade.—Address, A. Z. R. 191, High-street, Peckham, London.

TO BUILDERS AND CONTRACTORS. WANTED, a RE-ENGAGEMENT, by a Young Man, to WORK a MOULDING MACHINE, Circular Saw and Band Saw, in connection with a Joiner's work. First-class reference from where last employed.—Address, J. C. 2, Hillen-road, Grove-road, Mile End.

TO ARCHITECTS, BUILDERS, AND OTHERS. WANTED, a RE-ENGAGEMENT as a CLERK of WORKS, or GENERAL FOREMAN of a JOB, Town or country. Capable and junior by trade. References good. Address, S. Q. 4, Upper St. Martin's Lane, W. O.

TO BUILDERS AND OTHERS. WANTED, by a respectable Man, constant EMPLOYMENT. Understands the painting and glazing. Wage, 12 per week.—Address, A. R. M. Webb, near the Duke's Head, Hampton, Middlesex.

WANTED, a SITUATION, by a thoroughly good GREENGLASS and MARBLER. Can do writing, editing and general decorating. Willing to take charge of work or fill up time with any other branch of the business. Can do plumbing if required. Good references.—Address, L. K. 8, 53, Bute-lane-street, Pittfield-street, Hoxton, London.

WANTED, a RE-ENGAGEMENT, by a very experienced BUILDERS' CLERK. Accustomed to all the routine of a London building-operative man of business, a good accountant and book-keeper, with first-class references.—L. L. Post-office, West-quay, S.

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TO BUILDERS AND CONTRACTORS. WANTED, by a thoroughly practical Man, a RE-ENGAGEMENT as FOREMAN of WORKS. Has had considerable experience in building construction; can manage any work, and make out bills, drawings, and estimate by trade. Good references.—Address, A. Y. 81, Paradise-street, Rotherhithe, S. E.

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WANTED, by a first class DRAUGHTSMAN, a permanent ENGAGEMENT, in any capacity with his abilities would be of service.—Address, J. R. 15, Kempford-road, Kensington-lane.

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TO MASTER PLUMBERS, &c. WANTED, by a Scotchman, a JOB as PLUMBER and GAS-FITTER.—Address, JOHN YOUNG, 73, Welles-street, W.

WANTED, as WORKING FOREMAN of JOINERS, or Charge of a Mill, a RE-ENGAGEMENT, by a respectable, persevering Young Man (Jouney, aged 28). Can work practically and do a very amount of hand labour any of the most improved or Power-improved joinery machines, make Razors, Workmen's, or Power-improved joinery machines, make cutters, set out work, make ordinary working drawings, &c. A preference would be the chief consideration.—Address, 725, Office of "The Builder."

WANTED, by a Young Man, a SITUATION in an Architect's or Builder's Office. Is of active habits, and would not object to any outdoor work, such as superintending or overlooking workmen, being of a mechanical turn. Satisfactory references as to respectability and capability.—Address, X. care of Mr. Wallis, Brixton-road, S. W.

TO ARCHITECTS. WANTED, a RE-ENGAGEMENT as a CLERK of WORKS, by a practical Man. Good references.—Address, "668," Office of "The Builder."

TO BUILDERS. WANTED, a SITUATION, as WORKING FOREMAN of PLASTERERS. No objection to the country. Good references.—Address, J. H. 30, Canfield-street, Portman-market.

TO BELLHANGERS, IRONMONGERS, &c. WANTED, by a good BELLHANGER, a SITUATION or JOB. Good references if required. No objection to the country.—Address, H. HARLOCK, 44, Bedford-street, Anderson-road, Holloway.

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WANTED, by a Gentleman, whose previous equipment will fully equip, ANOTHER; or would give TEMPORARY ASSISTANCE to Architects. Has lately been Clerk of Works to a large building in Mark-lane.—Address, CHAS. J. JONES, 24, Union-road, South Hackney.

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WANTED, by a thoroughly practical CLERK of WORKS, a RE-ENGAGEMENT. Has been employed for the last twelve years in preparing drawings and estimating for all kind of building, engineering, and ironing work. &c.—Address, G. W. care of Mr. Davidson, 31, Grove-street, Glasgow.

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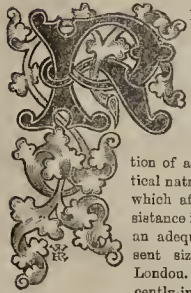
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VOL. XXVII.—No. 131.

London in 1868.



REGISTRAR-GENERAL, in his annual summary of the weekly returns of births and deaths in London, does well in prefacing his usual information of a sanitary and statistical nature with a few figures, which afford considerable assistance in the attempt to form an adequate idea of the present size and population of London. With all the recently-increased facilities for

metropolitan locomotion, a personal knowledge of the nature and extent of the whole of London is, from its very size, a rare accomplishment. It is well, therefore, now and then, to be reminded of such facts as the following:—

The area of London is about 78,000 acres, or nearly 122 square miles. This, it should be understood, is London as defined by the Registrar-General, including Hampstead, Kentish-town, and Stoke Newington, on the north; Wandsworth, Norwood, and Sydenham, on the south; Bow, Poplar, and Greenwich, on the east; and Kensington, Hammersmith, and Fulham, on the west. On this area, including these suburbs, stand over 400,000 inhabited houses, with an average of nearly eight persons to a house, giving a mean density of 40 persons to each acre. It is now nearly eight years since the last census, and we are dependent upon estimates for forming an idea of the present population of London. The estimate based upon the rate of increase which prevailed between 1841-61, gives 3,126,335 as the number of inhabitants of this large area, to the middle of 1868. The county-rate assessment of 1866 placed the annual value of property in London at 15,261,999*l.* The influence of elevation upon human health is now pretty generally known; the Registrar-General informs us that the population of London resides at a mean elevation of 39 ft. above Trinity high-water mark. The elevation of London varies from 11 ft. below high-water in Plumstead Marshes, to 429 ft. above high-water mark in Hampstead. On the north side of the Thames, Fulham, Pimlico, Westminster, and the Isle of Dogs are below high-water mark; on the south side, Battersea, Kennington, Camberwell, Bermondsey, and Rotherhithe. After Hampstead, the most considerable elevations within the limits of London are Shooter's-hill and Sydenham-hill, respectively 411 ft. and 360 ft. above high-water mark.

In the twenty-nine years 1840-68 the average annual rate of mortality was 24.3 per 1,000 persons living; the rate varied between 21.0 and 22.1, the lowest in 1850 and 1856, and 29.4 and 30.1 in 1854 and 1849, in each of which years a cholera epidemic prevailed. The last visitation of cholera in 1866 did not raise the death-rate of England above 26.5, which may be taken as evidence that through the growth and influence of sanitary knowledge the London population was in 1866 in a better condition to repel this hitherto alarming disease. In 1868 the rate of mortality in London was 23.6, and .7 per 1,000 below the average of twenty-nine years. In the fourteen large towns of the United Kingdom furnishing weekly returns, the aggregate

death-rate in 1868 was 25.6, and two per 1,000 above the rate which prevailed in London. In these fourteen large towns the rate of mortality during the year, ranged in order from the lowest, was as follows:—

Bristol	22.8
London	23.6
Birmingham	23.9
Hull	24.4
Dublin	24.6
Newcastle-upon-Tyne...	25.6
Bradford	26.5
Sheffield	26.6
Edinburgh	26.9
Leeds	27.5
Liverpool	29.2
Glasgow	30.5
Salford	30.8
Manchester	32.0

This list shows a difference of no less than 9.2 per 1,000 between the death-rates prevailing during the year in the towns occupying the first and last places. No less than 3,376 persons fell victims during the year to the excessive mortality in Manchester, who would have survived if the death-rate had not been higher than that which prevailed in Bristol. Compared with previous years, Newcastle occupies an improved position, and so does Liverpool, while Manchester and Salford appear lower in the list. Sheffield would have taken a higher place but for the epidemic of small-pox which was so fatal during the latter half of the year. The death-rate in Leeds was considerably below the average in the first six months of the year, but rose rapidly in the last few months, principally through the fatal prevalence of measles, and typhus and typhoid fevers.

In the different parts of London the death-rate during last year was 22.7 in the west districts, 22.9 in both the north and south districts, 24.7 in the central districts, and highest, 25.6 per 1,000 in the east districts. The excessive rate in the east districts must not be attributed to the distress which there prevailed during the greater portion of the year, as the average death-rate in that portion of London (including Shore-ditch, Bethnal-green, Whitechapel, St. George-in-the-East, Stepney, Mile-end Old Town, Bow, and Poplar) the death-rate in the twenty-nine years—1840-68—averaged 26.0 per 1,000, or slightly above the rate in 1868, as was the average rate in the same period for the whole of London. The Registrar-General shows that sanitary improvement has been most striking in South London, where, previously to 1856, the sewerage was especially defective, and the water supply drawn direct from the Thames, was heavily charged with sewage. During the five years, 1840-4, the death-rate in South London was 25 per 1,000, in 1845-9 it was 28, in 1850-4 it was 26, in 1855-9 it further fell to 23, in 1860-4 it was again 23, and in 1865-8 it ranged from 22 to 24. During the cholera epidemics of 1849, 1854, and 1866 the death-rate in this part of London, from all causes, was 38, 35, and 34 respectively. The mortality is now lower in South London than in North London.

The causes of death in London in 1868 do not present many remarkable features: we shall therefore confine ourselves to a brief notice of three classes of death,—those resulting from zymotic disease, those referred to affections of the respiratory organs, and to violent deaths. Of the 74,908 deaths which were registered in London during the fifty-three weeks of last year, 18,893 were referred to all diseases of a zymotic character, showing a proportion of 25.2 per cent. of the total deaths, against 21.3 in 1867, and 29.6 in 1866, when cholera was epidemic. The mortality from this class of diseases is in a great measure governed by the degree of fatality from infantile diarrhoea during the summer and early autumn; in 1860, when the summer season was remarkably cold and wet, both the death-rate in the year from all

causes and the proportion of fatal cases of zymotic disease were lower than in any of the past ten years. Small-pox, last year, was considerably less fatal than in recent years; while the deaths from scarlatina and diphtheria were decidedly more numerous, and those from whooping-cough and measles nearly corresponded with the average of previous years. The various forms of fever (including typhus, typhoid, enteric, and simple) caused 2,483 deaths, which, although showing a small increase upon 1867, were considerably lower than in any of the preceding five years. During the year no less than 4,060 deaths resulted from diarrhoea, of which 3,145 occurred in the three months ending September 30th; in the year 1860, above alluded to, only 1,383 deaths were referred to diarrhoea; and in the thirteen years, 1856-67, the highest number of deaths so caused was 3,557 in 1865. The unusual heat, combined with the remarkable drought of last summer, caused the excessive mortality from diarrhoea, principally infantile, which then prevailed.

Diseases of the respiratory organs, including phthisis, caused 21,203 deaths, or 28.3 per cent. of those from all causes. The heat of last summer scarcely affected the mortality from this class of diseases, and the unusual mildness of January, February, November, and December, was especially favourable to those affections, particularly to bronchitis, pneumonia, and others of an inflammatory nature. We might, therefore, have expected to find the mortality from the diseases of these organs unusually low; this, however, was not the case, although they were below the numbers returned in any of the four years, 1864-7. In 1859 only 16,975 deaths, or 27.5 per cent. of the total deaths, resulted from these diseases. The mean temperature of the air in 1868 was 51.6°, and 2.3° in excess of the average temperature in the 29 years, 1840-68, it also exceeded the average of any one of those years, the nearest approach to it being 51.3° in 1846. The dryness of the atmosphere was 6.8, the average of 29 years being 5.6. The rain-fall of the year was 25.2 inches, against an average of 24.3 inches; the deficiency during the summer being more than compensated by the heavy rains of January and December. The mean daily amount of horizontal movement of the air in the year was 293 miles, whereas the average during the 20 years, 1849-68, was only 247. The full effect of these meteorological conditions upon human health, and especially upon the respiratory organs, is at present scarcely sufficiently understood.

The statement that 2,567 deaths in London last year resulted from external causes, and were what are called "violent deaths," is somewhat startling, and yet such was the case. Of every 1,000 deaths during the year no less than thirty-four were cases of accident or negligence, homicide, suicide, or execution. It is worthy of remark that this class of deaths has steadily increased, with but slight fluctuations, from 1,839 in 1856, to the 2,567 during 1868. Such a waste of life from causes most decidedly within human control, does not reflect much credit upon the humanity of this nineteenth century. While advocating and encouraging sanitary efforts of all kinds, we must not forget to enforce measures for the safety of life and limb from violence; for this, however, we must the rather look to the Commissioner of Police, than to the Privy Council and to health officers. Of the 2,567 violent deaths in London last year, 2,126 resulted from accident and negligence, 112 from murder and manslaughter, 294 were suicides, and two executions. Among the accidents, 891 were caused by fractures, contusions, and wounds, 287 by burns and scalds, forty-four by poisoning, 339 by drowning, 386 (principally of infants) by suffocation, and in the other 179 the causes were imperfectly returned. Of the suicides, sixteen chose gunshot, fifty wounds by cutting or

stabbing, forty-six poisoning, seventy-two drowning, seventy-nine hanging, and in thirty-one the mode of suicides were not stated. The proportion of these violent deaths, it may be observed, is generally considerably smaller in London, indeed in most large cities and boroughs, than in the country at large; this may be accounted for in two ways—first, by the superior intelligence of town inhabitants, as so large a number of these accidents result from careless ignorance; and secondly, by the superior, and more easily accessible, hospital accommodation in large towns.

The 74,908 deaths last year in London included 12,326, or 16.5 per cent, which occurred in the public institutions; of these 6,789 were registered in workhouses, 4,647 in hospitals, 336 in Inebriety asylums, 75 in prisons, and the remaining 479 in other asylums and special institutions. There has been a continuous increase in this class of deaths since 1859, when only 9,633, or 15.3 per cent. of the total deaths, were so recorded. It is scarcely necessary to say that the proportion of these deaths is much larger in London than in other large towns in England.

The Registrar-General naturally deals in his report, at some detail, with the condition of the sewerage, and of the water supply of London in 1868. No one can well over-estimate the importance of these two subjects, or their direct influence upon the public health. We can, however, only, in concluding our notice of this important annual return, just touch upon these two points.

The main drainage system of sewerage for London is approaching completion, but not until it is complete can we judge of its full effect upon the river, and its influence on the health of London. The most important parts of the "low level sewer" are not yet constructed; namely, the part from Chelsea Hospital, including the first lift down to Westminster Bridge, and the part extending from the Temple to the Tower of London; so that many of the large sewers still pour their contents into the Thames." Consideration of this apparently probable purification of the Thames, at no very future date, from contamination of the sewage of London, at the actual outlay of millions of pounds, which have still further raised the already heavy tax burthens of London householders, is somewhat embittered by the knowledge that the result of this gigantic undertaking runs the risk of being in a great measure neutralized through the use of the river by Oxford, Reading, Windsor, Richmond, and other places above London, for the evacuation of their sewage. From another point of view this state of things appears still more fatal. Many years ago Parliament enacted that the London water companies should take their supply from above London, and beyond the reach of the contamination of London sewage. Each of the past few years has shown an increasing contamination of the Thames from the sewage of towns up the river. The public naturally looks anxiously for the long-delayed report of the Royal Commission appointed some years since to inquire into the whole subject. Even Dr. Letheby will have some difficulty in persuading the London water-consumers to consider themselves satisfactorily treated by the present water companies, either in quantity or quality.

The year 1868 was, it must be allowed, most unfavourable for the water supply of London, drawn as it is from a tidal river. The heavy rains of January, October, and December, caused the river to become turbid,—a result observed on many occasions in water drawn from the mains; the long drought of June, July, and August was moreover detrimental alike to the companies and to the consumers. Notwithstanding these circumstances, it is, however, satisfactory to be assured by so high an authority as Dr. Frankland, in his official report to the Registrar-General, that, probably from greater attention to and improved methods of filtration, the sewage contamination in the water supplied by all the London water companies (except the Kent) showed a reduction in 1868 upon 1867. The condition of the water supplied on many occasions during 1869 is reported by the same authority, however, to have been such as to render it totally unfit for domestic use. Chelsea, Southwark, and Lambeth were the principal offending companies, while the West Middlesex is said to stand pre-eminent as regards careful filtration, a matter of such vital importance, considering the source, and quality of the water used. The discovery of an excessive proportion of common salt in the Southwark

water in the autumn, at the latter end of the drought, suggested a suspicion of the admission to the company's reservoirs at Battersea of a proportion of tidal water. The possibility of such a thing, with the intimate relation which was proved between the outbreak of cholera and the East London water supply in 1866, fresh in our memory, is sufficiently alarming. Dr. Frankland furnishes a table showing, from analysis, the total impurity contained by waters drawn from the supply of several provincial towns, and compared with that of London. In 100,000 parts of each water, the "total solid impurity" of the London waters varied from 26.9 in the New River, to 45.3 in the Kent; while in Glasgow, supplied from Loch Katrine, it was only 3.0; in Lancaster, from Bleasdale Falls, 4.6; in Manchester, from Derbyshire hills, 6.2; in Kewick, from Skiddaw, 4.3; and in Whitehaven, from Ennerdale Lake, only 2.2. In each of the latter cases, "previous sewage or manure contamination" was nil, while in the London waters it varied from 1590 to 3842. Comment is unnecessary.

We must, while acknowledging the many satisfactory evidences of sanitary progress in London, and other large towns, in 1868, trust, and not without reasonable cause, for still more favourable results from continued and energetic efforts in the same direction during 1869, and the next few years.

THE CONFLICT OF METROPOLITAN AUTHORITIES AS TO ARCHITECTURAL IMPROVEMENTS.

It is now some eight centuries since the charter of the Norman Conqueror encouraged the citizens of London to form a sort of happy family on a large scale, or a little *imperium in imperio*. The first fruits of the original "social compact" are still existing, in the form of a corporation. But the difficult and anomalous part of the thing is, that this corporation does not now fulfil the originally prescribed conditions. It is not sole—it is not supreme. It has come, in the course of time, to be surrounded, encroached upon, and over-shadowed, by other corporate bodies, under various names. Of these the most general, and perhaps the most formidable, is the name BOARD. Under the direction of various Boards, or compound individualities, the independence of the primary unit, the citizen householder, has been altogether obliterated. He has nothing which he can call permanently his own. Not his house, which is liable to be "scheduled," or expropriated. Not his business, which may be destroyed by the same method, or by turning the traffic of a large thoroughfare from his door, or by a dozen other procedures, emanating from an equal number of Boards. We find Gas Corporations, Water Corporations, Railway Corporations, Paving Commissioners, Poor-law Commissioners, Police Commissioners, Board of Works, and district Boards of Works, all living, and apparently thriving, and certainly acting with the most absolute disregard of one another. They will not part with an iota of their independence, even for the sake of saving money. Why, indeed, should they? The money does not come out of their pockets. There are the police rate, the poor rate, the county rate, the rate of the Metropolitan Board of Works, and the new Metropolitan Asylums rate.

There is scarcely a resident householder of London who is not painfully aware of the truth of this description. Most of them know it to their cost,—their cost in time and in convenience, no less than in actual money. But even the latter item is no trifle. Suppose a certain great thoroughfare to be out of order, and that, after a proper amount of discussion, the "hoard" that presides over the spot has taken the matter in hand, and made good the road at the expense of 250*l.*; the removal of the implements of the servants of this board, which we will call No. 1, is the signal awaited by the servants of the board No. 2. They proceed to fix posts and rails in the newly-finished roadway, to re-open it from end to end, and to re-adjust the gas-main, which had been disturbed by the operations of board No. 1. A long trench, heaped over, when at last it is refilled, like a grave, only with the clay bank interspersed with road-metal, now divides the up and down traffic on the road, or would divide it if the traffic kept to its own side, as it is now becoming accustomed to do. But just about the time when the action of wheels and of hoofs has

nearly levelled this prolonged stumbling-block, the oozy state of the mixture attracts the notice of board No. 3. The waterworks people see that the precious element is escaping, their mains having been in their turn disturbed by preceding operations. Then comes a repetition of the proceedings of board No. 2. By the time that traffic is again allowed to adjust itself to the roadway, the season is so far advanced that the sewer authorities think it high time to perform a little work of their own in the same locality, and destruction No. 4 takes place accordingly. Now if the first proceeding was rightly priced at 250*l.*, we cannot allow a much smaller sum for either of the subsequent operations. We shall have, after six or eight months of interrupted traffic, a very bad road, which has cost the rate-payers, or the gas-consumers, or the water-consumers, or some taxable party, 1,000*l.*, while, by the mere expedient of combination, the work might have been done in two months for 400*l.* And if the only rational provision for laying mains, whether for water, or for gas, as well as for maintaining the sewers and protecting the wires of the electric telegraph,—the subway, had been adopted in the first instance, the original 250*l.* would have covered the entire outlay for maintenance for some two or three years.

In all this, our readers may think, there is unfortunately nothing very new. It was much the same ten or fifteen years ago. It is unpleasant, but it appears to be our normal condition.

But the pressure increases, year by year, with the growth of our vast metropolitan population. And not only does the pressure of old grievances increase, but, year after year, new grievances swell the list. The piercing, and burrowing, and arching, through London, proceeds with rapid pace. New streets suddenly open, like dissolving views, through ancient lines of frontage. Transformations, like those of a pantomime, occur so unexpectedly, that the oldest inhabitant, if confined to his bed for a twelve-month, would wonder where he was when he next went out for an airing. And, over-topping all other boards and corporations by a head and shoulders, stands, or rather moves, the gigantic figure of the Board of Works.

Now, not only have these numerous corporate entities entirely failed as yet to establish the "social compact" among themselves, but they act with a sturdy independence of one another, which has much the same result as the most lively hostility; and they act very vigorously, moreover. The result is, that some anomaly, or inconvenience, or absurdity is constantly threatening us, and nobody is to blame. Every one is right, within their own powers and limits, and from their own point of view. But as there is no combining or controlling agency, nothing to prevent the very admirable plan of Board No. 1, from coming into the most hopeless collision with the very admirable plan of Board No. 2, the Londoners are getting rather the worst of it.

"When things are at the worst, they sometimes mend." That we have arrived at this hopeful point we dare not assert; but it is at least something, that not only men interested in the architectural beauty of the metropolis, but actually some of the presiding geniuses of the conflicting Boards, have been driven, in their despair, to apply for the aid of the House of Commons, in the hope that that which made an unmake, at least a portion of the confusion.

For the marvel is, that nothing but new, *ad hoc*, legislation can avert a mischief which every one deprecates, and which no one advocates. Yet it will wreak itself, unless legislatively stopped. It is some frightful Frankenstein, which the House of Commons has called to life, why, how, and whence, no one seems to know. The Board of Works feel themselves bound to expend a quarter of a million sterling, which they have not by them, and which they do not know how to obtain, in the construction of a viaduct, which no one wishes to be built, which seems more likely to be an obstruction than a convenience to traffic, which would form an intolerable eyecore on one of the best architectural sites in the world, and which would destroy the saleable character of eight acres of land, reclaimed at great expense from the Thames, and which may be estimated as likely to fetch, if sold, at the very least 20,000*l.* per acre.

The whole affair appears to be all but incredible. The First Commissioner of Works says that he "really has nothing officially to do with the Thames Embankment, or with anything which might be erected on that great high-

way." The chairman of the Metropolitan Board of Works, and the Board itself, "are as much opposed to the making of the road" as is the helpless First Commissioner himself, who adds that he feels "assured that they, i. e., the Board of Works, would do all they could to put a stop to its construction." The District Board of Works "had never been consulted on the subject, and had petitioned against the work as soon as its true character became known." The vestry of St. James presented a petition to the House of Commons "declaring the proposed structure unwise and of questionable utility for purposes of traffic." The owners of Salisbury-street and Cecil-street had power given to them by the Act authorising this undesired structure to put up gates, which would intercept the communication with the Strand. The only speaker who made the slightest attempt to defend the scheme, merely made matters worse, by saying that "his chief object in rising was to show that the whole of the proceedings in the matter had been of a most deliberate character." An expensive, unwise, unnecessary, ill-adapted structure has obtained a legislative right to exist: no one knows why, or how, or when, in spite of the ill-will and opposition of every one. Such, at least, is the opinion of five gentlemen, each very competent to form a judgment, as expressed by them in the House of Commons on the 22nd of February.

The House has, very naturally, appointed a committee to investigate the subject, and we suppose there is little doubt that the legislation of 1869 will, in this respect, reverse the legislation of 1868. But what a ponderous, inefficient, haphazard mode of dealing with an important national question is this! How strongly does it tend to support the arguments of those who, either in or out of the House of Commons, urge the propriety of the appointment of some officer of the nature of an *auditor*,—of some central, commanding, impartial, permanent authority, to watch over the architectural welfare of the metropolis. A minister of public works holds the rank of a secretary of State in every European country of the first rank, except our own. Our "First Commissioner," who (Mr. Boreford Hope tells us) constantly sees his name in foreign journals as *le Ministre des Travaux publics*, "has no more authority over public buildings than the headle in Burlington Arcade." The ultimate authority, Parliament, supposing it to discard for once all party or personal motives, and to look at any project brought before it for authorisation solely on its merits, is placed in a most false and unfair position; for the merits of a part may be great, if the part alone is considered, although they may form the demerits of the whole. But at a general, comprehensive view of the bearing of any suggested alterations on the architectural or æsthetic unity of London, how would it be possible for the House, or a committee of the House, to arrive? It is the very highest effort, not only of the skill but of the genius, of the architect or of the engineer, to grasp the true principles of such a unity. How far, how very far, the designers of some of our modern works,—grand enough, it may be, in themselves,—are from estimating the effect they would produce, situated and surrounded as they are, we have ample proof. We may look at the two enormous wagon-roofed stations of Charing-cross and Cannon-street, as perhaps the most striking examples of what we mean. There can be no doubt that these are very skilful structures; triumphs of the talent of the engineer. To a spectator, under either of these roofs, the effect is extremely imposing, and the iron firmament above his head soars skywards with a dignity which tends to dwarf the crowd on the spacious platforms. But none the less do we believe these roofs to be mistakes. A more modest rise, and a division of the entire span into three, would have reduced the cost of the roofing by a considerable amount, and would have been, in every conceivable respect, as convenient for the working of the line. The great risk of damage by fire (already experienced), or by violent storms, would also have been reduced. These, however, it may be replied, are questions for the company alone, to settle with their own professional advisers. Just so. But when we consider that by going to an unnecessarily lavish expense, in the rearing of a disproportionately large roof, a great injury has been inflicted on the architectural character of the vicinity, it is clear that some one besides the company and their advisers ought to have had a word to say on the subject. Let any one differ as much as he likes from our opinion that the inner or under view of

each roof would have been more picturesque, while the structure would have been far cheaper and safer, if built in three spans instead of in one enormous emicircle, there is no room for dispute as to the effect of the outside of these structures. It is simply and unmitigatedly hideous. The proportion is such as even to destroy the sole inherent quality of great hulk—majesty. Who could call these large Noah's arks majestic? Ugly in themselves, they hopelessly dwarf and curh any building that comes near their standard. St. Paul's itself is obscured, from great part of London Bridge, by the unsightly block at Cannon-street. Nor, so long as these roofs stand in their present awkward magnitude, can the noble edifices that line, and that are intended to line, the magnificent esplanade rescued from the bed of the Thames, produce their proper architectural effect on the eye of the tasteful observer.

The intolerable confusion caused by the endless subdivision of responsibility and of authority is forcing the introduction of remedial measures. But they are only attempted hit by bit. It has not yet become clear how far any individual remedy may ultimately affect the general malady. The whimsical variety of rating, by which, according to the present system, house property in the metropolis is assessed at a different value, not only in every union, and in each non-union parish, but by each of the five or six rating authorities, whose collectors make their quarterly demands on the nuncley owners or occupiers, is one of those instances of hopeless jumble. So entirely indefensible is the state of affairs, that now that attention has once been clearly called to the subject, the Government finds itself compelled to confess the duty of providing a remedy. And it is more satisfactory to expect this remedy at the hands of the administration, than to look for it from the motion of any individual member, however much the ratepayers and householders of London may have cause to feel grateful to the honourable Baronet, who has obtained the recognition of the necessity.

The plain truth is, that the wise and simple system of local self-government which acted admirably well when London was a city ruled by its lord mayor and surrounded, at gentle distance, by outlying parishes, each with their vestries, churchwardens, wardens, constables, and overseers; becomes nothing but a dead-lock when the City has overspread the province, absorbed all the parishes in one continuous line of streets, and yet left the old boundaries, and the old machinery, with the least possible alteration, and with no attempt at any organization by bringing these different motive powers into union. The question of local government is deferred to another session; the question of equalization of rating cannot be approached, in any serious and business-like manner, while the wider question is left untouched. The concurrent, or rather discordant, rights of City authorities, Board of Works, First Commissioner, and Committees of the House of Commons, seem likely to be left to stumble over one another in the mean time. It will be a signal piece of good fortune if the works now carrying on, and about to be commenced, under the authorization of these heterogeneous powers, neither involve the cost of removal or reconstruction, nor destroy the good hope that sanguine persons were beginning to entertain, that the active rebuilding of the metropolis which is now going on may produce an architectural result worthy of the wealth of the largest capital in Europe, and the picturesque site which that capital occupies by the curving banks of the Thames.

THE RELATION OF SCIENCE TO ART.

At the annual distribution of prizes to the pupils of the Cirencester School of Art, last week, Professor Chmch made an address, in the course of which he said:—I will take up as they come into my mind a few subjects of artistic moment about which I have often thought. First among these stands the relation of science to art—its help and its interferences more particularly being in my view just now. It has often happened that the period in a nation's history when art has attained its greatest perfection has not been distinguished for special moral excellence, or large literary achievement. Chinese colour is most lovely, its combinations and modes of application afford splendid examples of refinement of taste, yet the stereotyped character of Chinese civilization is a by-word in Europe. In North Africa, again, we have

several rough and half-civilized tribes possessed of a style of ornament which, both as to design and colour, is worthy, I will not say of imitation merely, but of the deepest study. A bit of Arabic inlay, such as some of the Meymar specimens just added to the South Kensington Museum, or a plate of Persian faience, will show us that we must not disdain to learn from people far behind us in general civilization, who know less, but felt more, and commonly achieved, in some art directions, greater successes than are usual amongst us. Looking back 300 years, we find in Western Europe the splendid structures of Mediæval architecture, from A.D. 1200 to 1500, together with the perfect products of many kindred arts, coeval with a state of society, of feeling, and of general knowledge which, in some points was absolutely barbaric. Was it, then, I want to ask, the growth of science and the spirit of philosophical inquiry which deadened art then, or must we look to our own era before we can trace any great influence of this kind? I ask this question not because I can here answer it completely, but because it gives me the opportunity of mentioning one point of contact between science and art which leads often, in individual cases, to distinct failure. You know that men of science, who are always questioning nature and learning her secrets, can now do, at their will, and more perfectly than before, many things which men knew not the reason of formerly, and which came as it were hap-hazard, and now and then to the earlier workers. Take an example. When the great French potter, Bernard Palissy, was at work (he died in 1590), no knowledge of the real nature and affinities of the materials of pottery, its colours and glazes, was to be got. He struggled through years of experiments and years of disappointment, and achieved at last a success of no inconsiderable sort. During the last hundred years or more every problem that puzzled Palissy in glazing his ware has been solved by science. Invention and processes and improvements may even have been too abundant. Our manufacturers and those of Europe have done great things: but the ware may be perfect in texture and durability, the colours may be pure and bright as those of flowers, the glaze may have the polish of a jewel, but it there be lacking the artistic spirit to imbue the exquisitely prepared body with true life, the finest porcelain-paste, and enamels, and glazes are worse than dead. Those old potters whose works are now-a-days preserved as precious, did not invent their materials first, and then begin to think of design and colour; the idea of the form and the ornament had wrought itself into order, and then were sought by long-continued trials materials which should give it substance and adequately represent it. Now a chemist, or experimenter, or manufacturer invents a new glaze, and must needs dash it over everything—he makes the vessels to show off the wonderful new glaze, and not the glaze that it may enhance the beauty of the vessels. (See, as example, the Belleek porcelain.) Science has brightened our colours, too, but lay on bright chemical pigments thick as you can, glaze them with the juiciest of glazes, and, if feeling and art be wanting, science has not advantaged you, but done you harm. Most modern majolica with its hues gives you no satisfaction after you have seen it once or twice; while of the old Italian pieces, with their subdued harmonies of it, it may be, poor colours, you never tire. In Josiah Wedgwood you have an illustrations example of a man who pressed into the service of his manufacture all the resources of science, and yet so used them that they served only to exalt the artistic merit of his productions. For to Wedgwood's wares chemistry gave the right composition, while mechanical skill gave truth and perfection of texture and form. By countless trials under scientific guidance Wedgwood improved his materials, not to display them as such, but in order worthy to represent the lovely designs of Flaxman, and to reproduce the beauty of antique art. I have given you illustrations of the way in which science may help or endanger art; hundreds might be cited from painting or from architecture, where especially, mathematical precision and mechanical hardness are often quite fatal to beauty of effect; but I must rest content with having directed your thoughts to a question of such great importance as the right attitude of science to art. 2. I am naturally led to say a few words now on another topic, intimately connected with the last. We have seen or may infer that improvements in manufacture arising

nity of the kingdom. With the exception of the fiscal discussions of these questions in Parliament, and the somewhat meagre Blue Book we now propose to examine, there has been a notable absence of that ventilating process we pride ourselves so much on in England. Yet it is not from want of interest in the subject itself, for in our country the traffic of the public at large with the offices of Government is so general, that every class of the community has an interest in the matter; they are public offices in the fullest sense. Nor is it because it is only a professional question, for we see that when roused to it, the public does not hesitate to discuss the much deeper professional subject of guns and armour-plating; and the building profession is one particularly congenial to the Anglo-Saxon mind.

This report of a royal commission to inquire into the question of the accommodation of public departments, seems to offer a legitimate opening to the public, to try and learn something about this matter which interests them so much, and to see if they cannot form some idea of what is wanted, and how it can be most satisfactorily provided, notwithstanding the high art mysteries of the subject.

The report itself will not, it is to be feared, give the public much assistance in that way, for it is as slight and crude an affair as probably ever emanated from a royal commission; but, at all events, it affords several starting-points, and a general groundwork for discussion of the subject.

The problem put before the royal commission was not a very suitable one to be dealt with by such a body of counsellors: given a certain number of great departments of State, requiring respectively certain areas of ground for their accommodation,—to fit them all into a site already partly occupied by them, and in a manner which shall combine what Mr. Fergusson would style the three great qualities of the technic, the aesthetic, and the phonetic, in the highest possible degree; or what the uninitiated would style making them as useful and as ornamental as possible. It is a problem that can only be satisfactorily worked out by one master mind; and, therefore, when, having thus given the ingredients to make a certain dish, we find them put into the hands of half a dozen *chefs de cuisine*, it does not require the evidence of a Blue Book to enable us to foretell the result. The ingredients are of course worked up into six independent dishes, each admirable in itself, but each containing the particular idiosyncrasy *de cuisine* of its *chef*. No wonder the unfortunate professional empiric who was called in to taste each of these compounds found himself embarrassed to express his sentiments. It was impossible that so great an architect could be thoroughly satisfied with any plans so concocted; and the Government will have done wisely, if, as is understood, they have put the whole matter entirely into his hands.

That, however, need not prevent a general discussion of the question; indeed, such discussion can hardly fail to assist the architect in some degree; especially as the commissioners managed to involve it in a most curiously complicated knot.

Each member seems to have come with a plan ready made in his own mind, and his aim in taking the evidence seems to have been very much directed to inducing the witness to commit himself in favour of his plan; and the manner of taking the evidence was more suited to a private discussion of the subject between two associates than to a formal inquiry, which, with its evidence, was to form a collection of raw material at some future day to be reduced to order and bear fruit. The evidence of great statesmen and architects upon such a question might be most valuable to all succeeding generations of architects; but of what use could it be to ask Mr. G. G. Scott whether he did not think it desirable to remove existing public buildings which are inconvenient in themselves and architecturally inefficient? And when Mr. Scott naturally gives a somewhat evasive answer to such a thrust, he is doubled upon immediately by the counter thrust,—If, then, you would remove the Horse Guards, where would you put it? and feeling compelled to say something to this, he is further jammed into a corner by,—If you put the Horse Guards there, and the Foot Guards here, what will become of the Horse Marines? The Ordnance map of that part of London was, in fact, a kind of chessboard before the commissioners, with the public offices for pieces, and the commissioners on one side and the witness under examination on the other; each commissioner

playing in turn, and being expected to give check to the witness in three moves.

And what benefit to posterity could it be to know that Sir John Pakington prefers the blue site to the red site? It was probably expected to be a puzzling question to a minister who had just left the Admiralty for the War-office. Sir John showed, however, that he quite appreciated the respective merits of the quarters in question; he stuck to his colours, indeed he may be said to have nailed them to the mast.

The matter contained in the report and evidence—when one does get at it—is not very satisfactory; it reminds one rather of a case of special pleading in a court of justice than of the deliberate wisdom of the counsellors of the nation. There is too much of leading questions put to advocate a foregone opinion, and very little extraction of the real opinion of the witnesses upon the whole question. One salient idea seems to have been, that it is a matter of vital importance to the empire that, when the Minister of War wishes to speak to the Commander-in-Chief he should not be obliged to put on his hat. Probably either of those great persons would think twice about traversing several public streets to ask a question of the other, but neither of them would hesitate about crossing St. James's Park for the purpose. It is not the distance that makes the difficulty of communication between offices, but the impediments in the way. A public street between two offices is like a river between two towns; and a flight of stairs is like a mountain barrier between two countries. A mysterious importance seems to be attached to the idea of being under the same roof; but it would be quite possible to put all the buildings between Charing-cross and Great George-street under the same roof, and yet the facility of intercommunication might be less than it is now.

Another leading idea in the mind of at least one of the commissioners was that the public offices should be as near to the Houses of Parliament as possible; one would suppose, indeed, from the evidence that the perfect ideal of an arrangement of public departments was a great square with the House of Commons in the centre and the offices all round the sides; so that the Speaker sitting in his chair might, by a radiating system of telegraphs, call up any Secretary of State to answer a question put in the House, before the hon. member putting it had resumed his seat. Whether it is beneficial for the general interests of the empire that ministers of State should devote so much of their energies to answering questions in the House of Commons is not for an architect to consider; but, taking the practice as it stands, there seems to be no reasonable necessity for placing any of the offices nearer the Houses of Parliament than a distance that can be conveniently walked in about a quarter of an hour,—or about three-quarters of a mile; so that a minister of State can be quite sure of being in his place in Parliament within that time from his office. What is of much greater importance to the minister is that he should be able to walk that distance with his hands full of papers, and his head full of facts, without interruption. To insist on any closer communication than that is only sacrificing the general interests of the departmental offices to one particular theory of their duties. And to press for it, especially for the department of the army and navy, the two departments of the State which should be most free from Parliamentary interference in their details, looks more like a crotchet than a principle.

Indeed, from the site selected for these two departmental offices near the Thames Embankment, it looks as if there was an idea of giving the First Lord of the Admiralty and the Secretary for War a little practical experience in campaigning, by enabling them every time they went to the Houses of Parliament to execute a sort of combined naval and military operation, by first making a flank march along the underground railway, and then taking a penny boat to the river front of the Houses of Parliament.

Now, let us examine this in an architectural point of view; not in the small ornamental sense of that term, but as an Italian architect, engineer, and patriotic citizen of the fifteenth century would have viewed it.

The first data we have to bear in mind are that there are certain public buildings already existing on and about the sites which it is desirable to maintain. Inigo Jones's Banqueting House at Whitehall is one, about which there is no dispute. The Horse Guards is another, about

which there appear to be conflicting opinions. Some persons appear to consider it as too insignificant in character to be worth preserving; others, among whom must be placed Mr. Scott, think it quite worthy of preservation and improvement, both from its intrinsic merits and its historic interest. When there is a doubt about the destruction of a public institution the instincts of the British public generally go in favour of preserving it. Compared with its new neighbour, the palatial Foreign Office, it certainly might be considered insignificant in its present condition; but, as Mr. Scott observes, it has a picturesque character about it; the Florantine style in which it is built is one of the most suitable of the modern styles for England, and it is a fair specimen of the handsome simplicity of that style. If the square on its west side had been completed according to Kent's original design, there would probably have been no doubt about retaining it. There is, however, this difficulty about preserving it, that, from its character and position, it should form the central feature of the whole block of public offices; and for that it is hardly fit in its present condition. Mr. Scott seems to doubt whether it is capable of much improvement; but, with great respect for so high an authority, we venture to think that another story can be very suitably added to it, and that with other additions, and by completing the two sides of the square on the west, it can be formed into a very fitting centre for this seat of Government of Great Britain.

The other buildings it is desirable to retain are, of course, the new Foreign and India Offices, and, if practicable, the block called the Treasury Buildings, about which, however, there is considerable doubt, as it was not planned with much thought for further extension; and, finally, the Admiralty, a building which nobody seems to feel justified in pulling down, and yet which nobody wishes to keep. Beyond these there appear to be no other buildings on the St. James's Park side of the site, which if it is at all important to retain if their sites should be required for public offices. On the river side of the site there are, between Northumberland House and Bridge-street, some private buildings of sufficient importance to make it worth while to retain them; but, as they do not come within the area of any one of the present projects, it is unnecessary to consider them.

Bearing these reserved buildings in mind, the first point for discussion is whether the offices shall be massed in one continuous block on the Park side, or whether they shall be concentrated more towards the Westminster end, and placed partly on the Park side, and partly on the river side of the site.

To have a clear idea of the bearings of this question, it must be recollected that Whitehall and Parliament-street form a great highway of traffic between Westminster and London, a traffic which is likely to be increased rather than diminished by the opening of the Underground Railway and the Thames Embankment; and, further, that it appears to be agreed upon all sides, that it is desirable to keep this highway open as it is, and, in fact, to improve it by forming a broad handsome road of it the whole way from Charing-cross to Westminster. This road lies, roughly speaking, north and south; on the west side of it is a site extending from Spring Gardens to Great George-street, occupied chiefly by the existing public offices, and looking on to the Park at the back; on the east side of it, from Northumberland House to Bridge-street, is a site occupied chiefly by private buildings, and looking on to the Thames Embankment at the back.

It may be assumed as impossible to place the whole of the public offices on the eastern or other side, on account of those existing on the river side, which it is desired to retain; therefore there are only the two projects above mentioned that are practicable.

The arguments in favour of the second or divided project are,—

1st. That it is economical, from its requiring a less expensive site, and especially if combined with the idea of a double instead of a single Parliament-street.

2nd. It concentrates the offices nearer to the Houses of Parliament.

3rd. It forms a noble architectural approach to Westminster.

It is on this last point that we must beg to differ strongly from the opinions expressed in the evidence in favour of it. A row of handsome public buildings on each side of a fine roadway produces, in the ornamental view of architecture, undoubtedly a much better effect than a row on

one side only. But to make the effect truly architectural, that is, to make the effect equally good in a technic and phonetic as well as an aesthetic view, it is necessary that the roadway should lead to a definite centre of the buildings, and that it should not be so much of a public thoroughfare as to give the idea of a separation between the two sides. The project in question fails on both these points. Parliament-street leads to nothing. The promoters of the project have sought to remedy this defect by providing a branch street, so that the passenger when about half-way along, can, if he thinks of it, by looking out of his carriage window, get a side view of a side door of Westminster Abbey. Some people have said that that would not be such a very fine sight after all; but at all events it points the moral, which is that the main roadway does not lead to the Abbey. Nor does it to the Houses of Parliament, for, in point of fact, its direction passes just between the two.

But the division of the two blocks of offices by a main thoroughfare is a still more fatal objection in a true architectural view. For convenience of communication it would be a greater barrier than the length of St. James's Park. Think of the Secretary for War dodging boldly through a charge of Hansom cab-alty, or the First Lord taking shelter under the lee of the lamp-post in the middle of the roadstead; think of the poor clerks and messengers, and oh! awful chance—think of the crafty foreigner waylaying the convoy, and carrying off the secret despatch. Then the sentiment of architecture requires that the whole of the public offices should be united in one apparent block; they are not so many independent offices conveniently collected together, but, as before said, they are the seat of the Government. And though a Cabinet may possibly be divided in private it does not do to continually remind the public that at least two Ministers are always on the opposite side.

Nobody would wish to see the Louvre replanted to the other side of the Place de la Concorde in order to provide a fine approach to the Chamber of Deputies. Moreover, it would be quite possible to produce the ornamental effect by a row of private buildings on the opposite side of the road, but it would be impossible to prevent the inappropriate effect of dividing the block of public offices, and the Horse Guards could not be retained with this project, nothing could bring it into harmony with any such plan. The questionable advantage of a closer approximation to the House of Parliament has been already discussed; and when one hears in mind that the distance of the farthest part of any site proposed, Spring-gardens, is under half a mile from the Houses of Parliament, it seems hardly worth while to have any argument upon the merits of a greater or less concentration within that distance.

The economical advantage is a material one there is no disputing. The chief part of the saving appears to be obtained by leaving the private buildings on the west side of Parliament-street untouched, and forming the new street west of them, to get the view of the north side of the Abbey; and it is calculated that 500,000 will be saved by this, out of an expenditure of 3,000,000. 500,000, is a weighty argument, but the expense of compelling the owners to re-erect their buildings in a manner corresponding to the public offices, does not appear to have been taken into account.

Nor has it been taken into account what will be the result if this middle row of houses do not turn out a satisfactory thing after all. If it should be found out that it is inconvenient for traffic, too narrow and lofty for good effect, and that it totally destroys the unity of the public offices, an unsatisfactory remedy will have to be applied at a greater ultimate expense than any of the proposed projects.

Upon the whole, however, it appears that this project has the merit of economy, but that that is obtained at the expense of fitness and sentiment. But in an improving country like England to establish any institution on a doubtful or defective system for economy's sake, is a mistake which will lead to increased expenditure in the end,—witness the National Gallery, the Treasury buildings, and also others.

Now let us consider the alternative project of placing the whole of the offices on the west side of the main highway to Westminster. It is the necessity, and at the same time the merit, of any such project that the Horse Guards should be the central feature of it. One of the great architectural difficulties of the whole question is to arrange so huge a mass of buildings into one

harmonious group, so that they shall appear to be what they should be in internal arrangement, and what the establishments that occupy them are in reality, an organic body of many parts forming one system with a common centre. The Horse Guards, in its situation and arrangement and with its historic interest, offers this centre. It is no more necessary that the Prime Minister's offices should be there than that a king should sleep in the centre of his palace. The officer who guards the internal peace of the kingdom may very properly be placed there. In another communication we shall examine the plan submitted by Col. Clarke, R.E., and the modified plan that accompanies the present communication. I. B. C.

EXHIBITION OF THE ROYAL SCOTTISH ACADEMY.

The forty-third exhibition of the Royal Scottish Academy, now open, is hardly so interesting as was its predecessor, and that notwithstanding there is an unusual number of works in it which appeared in the exhibition of the Royal Academy last year; of these it will be unnecessary to say anything now in this place. Although there is nothing very striking or remarkable in the works of the local artists, it is satisfactory to observe that there is a steady advance evinced by most of them, particularly as regards colour—a quality in which the Scottish school was rather deficient. Conspicuous in this march of improvement stands Mr. Keely Halswell, who sends several subjects from Rome illustrative of life and character in the Eternal City: Nos. 111, "Dolce far niente," and 660, "Contadini waiting for Hire at the Theatre of Marcellus." Mr. Halswell need not indulge in crude intense local colour, but now his productions are marked by a rich and subdued tonality, accompanied by good texture and vigorous, though in parts loose, drawing. Our attention was arrested by a lovely piece of colour by Mr. G. P. Chalmers (No. 527), "Worn Out." It represents an old lady in a rich and quaint costume, who has fallen asleep beside her spinning wheel. The management of the line and red in the drapery is excellent, and that of the flesh colour equally so. The former works of this artist were deficient in drawing, but in this instance there is no cause for fault-finding in that respect. No. 145, "The Young Trawlers," by W. Macgarratt, is another example of improvement in colour, and the improvement is still more marked in other respects. Mr. Macgarratt has little of the sentimental in his nature, and it was not in his line to attempt to illustrate the works of the Poet Laureate. His present works are simple illustrations of everyday life, and yet they are the more truly poetical from the very absence of effort in that direction. The bevy of happy, healthy children, who have taken possession of a fishing boat and not, and are playing at the trade followed by their parents, is delightful to look upon. The accessories are so much subordinated to the figure; to have painted every mesh of the nets hanging on poles, which fill up one side of the picture, would, doubtless, have produced a harsh effect; but the sea and distant shores of the bay are so faintly indicated as to give them an appearance of unreality.

Besides his "Fairy Raid," which attracted a good deal of attention last year, Sir Noel Paton sends (No. 480) "Nicker the Soulless." The being represented is a quaint, weird creation—a man, and yet not quite a man. There is something about him that excites a smile, and yet produces a feeling of compassion and sympathy for the lonely creature as he sits among the reeds and water-plants singing his melancholy ditty. The detail is not so elaborately wrought out as is usual with the artist; but the general effect of it is, to our mind, more satisfactory. We cannot in nature count the blades of grass or the leaves on the trees, nor should we be able to do so in a painting. The subject is taken from "Brother Fabian's Manuscript":—

"Where by the marshes
Boometh the bittern,
Nicker the soulless one,
Sits with his bittern;
Sits inconsolable,
Friendless and foolless,
Waiting his destiny,
Nicker the soulless."

Mr. Hugh Cameron's scene from humble life are characterized by excellent taste, the colour is pure and delicate, and the individuals and incidents represented are in keeping with it. Contrast his "Responsibility" (No. 434) with Mr. Leggett's "Showing his Earnings" (No. 15),

where vulgarity is rampant. The incident in each is commonplace enough; but in the one case the halo of art is thrown around it; the other is "of the earth earthy."

No. 633, "King James and the Witches," by J. B. Macdonald. Mr. Macdonald is one of the few artists who adhere to historical painting, and the subjects are invariably taken from the history of his native land. The present is a large and ambitious work, representing the "Modern Solomon" trying an old and a young woman for the crime of witchcraft. The very appearance of the old crone is sufficient to have condemned her in the eyes of the superstitions; but it is different with her neighbour, a sensible, comely-looking damsel. Two Presbyterian clergymen stand behind the king's chair, and one appears to be arguing with the other, who seems to have grave doubts of the whole business, and not to place any reliance upon the test by probing to which the damsel is being subjected. Although she does not shrink from the ordeal, the very idea of the fair neck of the young woman being subjected to such treatment produces a disagreeable feeling upon the spectator. There is much character shown both in the expression and attitude of the different figures, and the manipulation is vigorous.

No. 123, "Salmon Fishing on the Tweed," is the best work we have seen from the studio of Mr. R. T. Ross, whose subjects were usually treated in a hard and crude manner; but this defect he has now overcome to a certain extent; were he entirely to succeed in mastering it, his works would be admirable, as they are characterized by good composition and animation.

No. 162, "The Lady and Huidhras," by Mr. Douglas, exhibits a good deal of character in the expressions of Huidhras and his squarer, but the colour is harsh and unnatural; the dress of the lady is positively ugly, and yet he can produce both good colour and texture, as is evinced by (No. 610) "Left Behind."

Mr. George Hay must be careful not to run the ludicrous into caricature, as in "Ritchie Monypie in Fleet-street" (No. 589). The character of Nigel's serving-man, as represented by Scott, is not that of a mountebank, but of an exceedingly vain, yet shrewd Scotsman. The street, with the row of open hoots and shopmen offering their wares for sale, are happily rendered, so as to give an air of reality to the scene.

As usual, the exhibition is strong in landscape. Sir George Harvey sends two (Nos. 475), "Ben Ladi" and (493) "Auchmoor—a Stronghold of the Douglas." The first, a grand mountain with the cool breezes playing around it, and the other a lonely moor with small remains of an ancient fortress; there is little in the subject, but the artist has made the most of it,—indeed, to have produced a picture out of so little gives evidence of a master's mind.

Mr. Bough's "Skiddaw from Waterlath" (No. 229) is not so fine a subject as his "Borrodale" of last year, but it exhibits the same effects of distance, air, and sunshine.

What a different picture Mr. Bough would have made of the magnificent scene represented in (No. 409) "Mountain Scenery in Strathlandshire, near Laxford," by Mr. A. Perigal. Mr. Perigal does not seem to know the value of gray in a landscape; the transitions from one point of distance to another are not graduated, but every feature is strongly marked, and even the most distant mountains out hard against the sky.

It is a relief to turn from this picture to (No. 581) "Morning on the Clyde at Dumharton," by James Cassie, the hazy atmospheric effect of which is true to nature.

Mr. Beattie Brown has been very successful in his view of "Caerlaverock Castle, Dumfriesshire" (No. 582); but he has hardly mastered the grandeur of the scene, "Among the Grampans—Loch Avon" (No. 73), one of the wildest and most impressive spots in the Highlands,—one which is little known to tourists from its being out of the ordinary route, and very difficult of access.

The visitor on entering the galleries is confronted with a remarkable statue, of heroic dimensions, of Dr. Livingstone, by Mrs. D. O. Hill. The attitude is spirited, and not over-strained, and the costume exceedingly picturesque; it is admirably adapted for an open-air monument, and would be much more effective and interesting than the generality of our public statues.

We will speak of the architectural drawings in our next.

SOME RECENT FARMS AND RESIDENCES.*

AMONG useful works we must always class those giving details of actual experience in building residences, whether for the great or small. Books of designs have their value, doubtless, for they may suggest how we can improve upon existing examples; but a record of good works accomplished is often doubtfully instructive. In process of execution many points in a residence are re-considered; a mass of information gradually accrues concerning some of them, which permits the adoption of useful conformation and appliances that would not have been thought of if the building had not passed beyond the stage of design. Hence, as we premised, a reference to works carried out by experienced architects is of use; and we should welcome the appearance of volumes in which the result of knowledge and practice is given. So we think, after looking through the pages of a recent work, by Mr. Dean, containing a selection from the buildings erected by him in different parts of the country. Some of these are country residences, erected on small landed estates, with pleasure-grounds surrounding them, and having lodges and gates; but most of them are buildings connected with the pursuit of agriculture, farmhouses, farm buildings, and labourers' cottages. They are prefaced with a few sensible remarks relating to choice of site, disposition of the premises, approaches, pleasure-grounds, water-supply, ventilation, and drainage; the desirability of employing architects instead of entrusting works to unacquainted minds; and the nature of different materials. The Tudor style is selected for praise.

The first building shown is the steward's house, built in the Home Park, Windsor, with a suite of rooms in it for the use of her Majesty and the late Prince Consort when visiting the adjoining farm. This was not, however, erected in the style Mr. Dean prefers. It has an Italian air, with its wide, low-pitched roof, and semi-circular-headed windows, arranged singly and in couplets. Her Majesty's rooms, three in number, with an entrance-porch giving access to the front, occupy the front of the house, facing the road to the Castle, which is only one story high; behind them rises the two-storied main body apportioned to the steward. The farm buildings are also amply illustrated, with plans, isometrical perspective, elevation, and sections. Those who are not already familiar with the leading scheme in the arrangement of this establishment may here make themselves acquainted with its clever combination of the pastoral, picturesque, and practical. We may give some indication of the ground-plan by describing it as three parallel lines of buildings, with wide yards between each, bordered on two sides by other lines at right-angles with them; the whole forming a quadrangle, the centre of which is occupied by sheep sheds and hulk-boxes. It is, however, so widely known that we need not dwell upon the nicety and finish that appear at every turn; the order and cleanliness meet for Dresden china shepherds and shepherdesses, in the passages behind the languid-eyed cattle, as in the wide open courts where the air seems never able to part with the sweet scent of hay, or in the pens and sties; nor upon the contrivances with which these are attained, and the sources of disorder turned to profit. We shall be giving our readers a better idea of the novelty that is to be found in Mr. Dean's hook, if we make more detailed mention of a farmstead erected by him on a large scale in Hungary, for Count Zelenksi. These buildings, our author says, must convince the agriculturists of this country of the importance of presenting an onward course in agriculture, if they do not wish to see foreigners supplying us with farm produce at a cheaper rate than they can do. This Hungarian establishment is at New Arad, a part of the world that does not seem to be in a very forward state of civilization in other respects, for the state of the country renders it necessary that it should be surrounded with a high wall. This defence follows an oblong form; and at the four corners there are watch-towers, on which sentinels keep guard. There is only one entrance,

which is constructed of double walls. On entering through this gateway, which has a clock turret over it, we find all the sheds, pens, and sties for the various animals grouped together in a regular manner, on the right; while on the left lies all the accommodation for the people employed, who consist of married and unmarried men and women: all live within the walls. Looking at the animals first, we see a hundred cows in one long shed—a double row, with fifty in each. Parallel with this, but with a pig-yard intervening, are sheds for fifteen additional cows and forty oxen. Beyond this, with another pig-yard intervening, is a line, of corresponding length, of piggeries, with a shed for forty more supplementing it at right angles; and the first line is bounded with another shed in which are housed the hay-machine, drills, ploughs, harrows, hoes, scarifiers, rollers, and carts, all having their appointed places. The engines, machinery, and most of the implements were sent out from this country. Then there is a shed for sick cattle, placed nearest the side of the farm inhabited by the servants; and there are three provision sheds at opposite distances. The dairy, with its scullery, is also placed at the part of ground most convenient to the servants. In the centre of every yard are manure-tanks. No sheep are provided for. The buildings destined for the home and work-places of the people employed on the farm group round three sides of a square, the fourth side being that which looks upon the sheds appropriated to the animals, which are accordingly in full view. In the centre of the quadrangle there is a large kitchen with a dining-room on both sides of it, and a larder, boiler-house, and wash-house behind it. Beginning at the angle of the quadrangle nearest the gate, we find the rooms for the superintendent, parlour, kitchen, and bedrooms. Close to these are rooms for unmarried servants; and beyond these, again, two cottages for married servants. Turning round into the adjoining side of the square are six more dwellings for married servants. Between the first three and the second, projects a very large workroom, which is well warmed with hot-water pipes; and, over all of them, is an upper story containing ten rooms for "cow maids." On the third side are two more cottages, a hospital, a carpenter's and smith's shop, and another room for the superintendent. Near the hospital is an airing-ground for invalids; and there are drying-grounds, kitchen gardens, and grass plots all around, within the walls: a model colony, fit for a new world as well as for New Arad.

Several of the buildings our author has erected for the Earl of Leicester are illustrated. We will look at two of them; that intended for his lordship's dairy of choice Devon cows, and a pair of labourers' cottages. In the first of these we have a set of buildings, arranged regularly, to run round three sides of an oblong, the outer line of the plan presenting nearly as straight an outline as Count Zelenksi's wall. The fourth side of the oblong is occupied by sheds for stock and hulk-boxes, with yards and sheds for other purposes, which project into the centre of the oblong and beyond it; forming, indeed, a second oblong group, placed within the first; with the difference between them that one is hollow, the other solid. The last is arranged very methodically. It is intersected by two straight passage ways, which are divided from one another by the hulk-boxes mentioned, and a continuation of them set out as calf-sheds and spare sheds, with piggeries. On either side of these passage-ways are the sheds for stock, central yards, and a shed for store pigs on one side, and store calves on the other. In the centre of the outer buildings stands the steaming-house, with sheds for roots and cakes on either side of it, and granary and store-room over them. A cow-house on one side, and boxes for show cattle, with shed for hay and straw, on the other, complete this side of the farm-buildings. In the two advancing wings are the horse-boxes, stables, and gighouse, on the one hand; and shed for cutting hay, another for cut hay, cart-lodge, harness-room, chaff-room, and stables, on the other. This is an arrangement Mr. Dean has repeated, with a few variations, at Leamington. The Earl's cottages shown are semi-detached. There is a projection on the front line of the plan formed by the living-rooms of the two dwellings, and carried up to the second story; but for this the outline would be that of an oblong figure. The entrance is through a porch in the side of the house, which does not project, but is carried up to the upper story, where, with some additional space over the larder, it forms a bedroom. There are no less

than four doors into the living-room: one from the porch, another into the larder, a third leading to the stairs, a fourth into the scullery on the rear of it. Above stairs there are three bedrooms. In another pair of semi-detached cottages, built near Warrington, Cheshire, Mr. Dean gives four doors to the living-room, which, we submit, is rather a large allowance.

We will turn now to one of the country residences built in the Tudor style. There are several of them. The first shown is that built for the occupation of one of the Earl of Leicester's tenants at Castle Acre, Norfolk. This, our author says, has been objected to on the score that it is good enough for the earl's eldest son. Without gainsaying this opinion, he adds, that he is sure it is not too good for the enterprising farmer for whom it is intended, nor, indeed, for many of the farmers on the same estate. The next is situated at Moorlands, near York, and presents in an eminent degree that variety of outline of which the author thinks the style so capable. It is, indeed, rather too much out of the principal front being a distinct feature, with a different construction to any of the rest. As Mr. Dean remarks in the course of his prefatory observations, "eminent attainments are not the produce of a day," but rather of diligence, favoured with some encouragement, and the full power and poetry of the style that produced some of our best old English mansions, cannot be grasped without a long study of it. The Tudor residences of to-day are, in reality, far behind the picturesque, pleasant-looking country-houses of Elizabethan times. Mr. Dean's are no exception to this rule. The long experience that he has brought to bear upon farm-buildings, has been so much time taken from more strictly artistic studies; and his Tudor façades suffer in consequence. The charming air of serenity and order, and the modest stateliness of the old houses, are but ill-rendered in our imitations of them. Modern lavishness with angular and everted projections, gables and lipped gables, is no compensation for these missing qualities: the more ins and outs, and odds and ends, the farther we get from the consummate repose of the old places.

In the drawing-room at Moorlands there are no less than fourteen projections and recesses, besides the chimney-breast and a large bow-window; and in the dining-room a similar profusion of corners is to be counted. A handsome feature in the internal arrangements makes some amends for the eccentricity in the principal rooms. Right through the house, at the point of its greatest width, sweeps one wide corridor, with a porch at each end of it. One of these last might have been dispensed with, perhaps, more especially as there is a third entrance from the grounds into a conservatory, projecting from the main front between the drawing and dining rooms, as well as a fourth or back door in the rear of the house. Doors are, we observe, very liberally dealt out again in the kitchen, where we count four more. We do not object to the nine in the corridor, because here they are in their proper place; but an ordinary-sized room with more than two doors in it scarcely retains its domestic character. We think Mr. Dean is happier in the Italian style, which evidently has not, in his mind, so many exigencies. Looking at the next example, which is of a residence in a park of 30 acres, near Lavenham, Suffolk, we see nearly as much accommodation, packed much closer together. Here one entrance-door unites, and one door apiece for the dining, drawing, and breakfast rooms. The kitchen has only three, one of which opens into a pantry, conveniently; but it has the drawback of being separated from the scullery, with which is combined a brew-house, by an intervening store-room and passage. In a line with the kitchen is a combination of dairy and larder. In the rear is a kitchen courtyard, where are the W.C.s and coal-house, built as lean-tos; and beyond this extends a long stable-yard, in which is a provision for six cows besides; a straw-house, a three-stalled stable, a couple of loose boxes, a coach-house, and a harness-room. And here we recognise Mr. Dean's special experience again. These successive accommodations are arranged with skill. The cows are not permitted to enter the yard, although their house is part of the yard-buildings, but are furnished with entrances outside of it; and the straw-house is close to them, and has two doors, from one of which the cows can be attended to, the other opening into the yard; which last door can be closed when the store of straw is being carried in, to prevent any litter in the yard. The

* A Series of selected Designs for Country Residences, Entrance Lodges, Farm Offices, Cottages, &c., which have been erected for H.R.H. the late Prince Consort, the Earl of Leicester, Lord Harris, Hon. G. W. Fitzwilliam, &c., under the superintendence of George Alfred Dean, Lancaster-place, Strand, London; and Messrs. Dean & Jermain, York. By G. A. Dean. Worthing: C. H. Knight, York; J. Sampson, London; Longmans, Green, Reader, & Dyer. 1867.

horses, too, are kept well away from the house by the intervention of the harness-room and coach-house. The front elevation, which is of two stories, is unpretending and pleasing. On the ground-floor are the windows of the dining and drawing rooms, five semicircular-headed lights grouped together, precisely alike. In the distance, extending beyond the block containing these rooms, on both sides of it, like diminutive wings, can be seen a portion of the offices, one story high, and corresponding exactly with one another. Over the dining and drawing room windows are two triplets of semicircular-headed lights, like those below, which belong to the rooms over them. The only break in the uniformity of the design is a low-pitched gable as a finish to the portion of the house occupied by the drawing-room and bed-room over, which, to admit of this feature, is brought slightly out beyond the line of the dining-room wall.

In plate 7 we are shown a Norfolk rectory and offices. This has a singularly straggling plan, affording a marked contrast to that just described. Adjoining part of the drawing-room wall is the pantry; while the kitchen and scullery are built in a rear wing, with a stable-yard beyond them. Altogether, a space of 100 ft. long by upwards of 60 ft. is covered with these buildings, and though the widest part of the ground plan of the house is not quite 70 ft., we are struck with the amount of ground occupied with the very modest accommodation. On the next sheet we have a house, built for a widow lady and her two daughters at Roehampton, Surrey, containing quite as many rooms of very nearly the same dimensions or less than two-thirds of the grounds. But in the design the Tudor style is abandoned. There is a neat, sunken basement to the little residence in which, we perceive, Mr. Dean places the servants' bed-room, again showing himself to be singularly content with an unsanitary arrangement for the human being, which he has not in one instance planned for an animal. With this exception the internal arrangements appear good.

On another sheet the author shows additions he made to a farmhouse in Lancashire, of which he is in charge as receiver, where all the arrangements are in favour of the large number of cows kept for dairying purposes, and of the proper storage of their produce.

We are shown two shooting-houses in Invernesshire,—one at Stratherrick, the other at Strathdean. These are both suited to their purpose. They each contain a small sitting-room, where the host and his friends can hide their hungry and impatient heads, should they arrive home earlier than they are expected from the treacherous, but all the more fascinating, moors; a large dining-room, in which they can compensate themselves; two or three little bedrooms, and a large bathroom; a good-sized kitchen, with a pantry, and a dairy sink in the basement. Both have a bedroom on the ground-floor, and in the first example a closet is cut off the kitchen for a servant's bedroom. The exteriors bring them, as near as possible, within the literal meaning of the term shooting-boxes. No idea of the cost of the respective buildings is given in any case. In most instances the information is not of much value, in consequence of the difference in price of materials in different parts of the country; but in this case it might have been useful, as indicating the possible value of any deduction from, or addition to, similar buildings in the same part of the country.

At Muswell-bill, Hornsey, the author appears to have realised a very popular wish. He has built a miniature farm: so small and compact and prepossessing, that we should not be surprised to hear that several have been since built in its neighbourhood in imitation of it, or that it has been taken to pieces and transported, like a Swiss toy-farm, to be erected elsewhere. Standing at the light iron gate, and looking into the farm-yard, you see a small cowhouse for four cows on the right of you; and on the left, built to correspond with this, another house divided into three compartments, for hens, geese, and ducks. Straight in front of you, across the yard, are two piggeries, with a passage-way behind them to the boiling-house in the angle beyond the cowshed; and that is all. To the left of the poultry-house is a second small yard, into which its doors open, so that the birds do not come into the farm-yard; and in the second yard there is, forming a sort of ornamental turret to the entrance gateway, a large dove-cote. Nothing on so small a scale could be more complete.

Our last selection from Mr. Dean's volume

shall be the buildings for a Cheshire farm of 1,000 acres of arable land. Here every point of vantage that could be gained by consideration and experience seems to have been obtained. The residence for the bailiff, with a garden before the front, occupies one angle of the large piece of ground, some 246 ft. by more, covered by this farmstead. Recessed from the house and hack garden, but containing the boundary line on one side, are the arrangements for the poultry and cows; the dairy open on three sides, and cooled with a fountain; the poultry-houses warmed with hot water in pipes through the scalding-house; the yards furnished with central tanks; the ducks with an artificial pond; the cow-boxes with feeding passages opening out of the provision-shed between them and the calf-pens. Departing from the house in the direction at right angles to this are the office, men's rooms, tool-house, drill-house, entrance from the public road, horse for wagons and carts, provision-shed, another house for carts and wagons on the other side of this, another entrance from the road, like the first, 16 ft. wide, a dung-pit and liquid manure tank in the corner of it, a carpenter's shop and blacksmith's shops in succession. Returning at right angles with this is a long implement-shed and engine-house, which brings us up to the barn, which occupies a central position on this outer line of the buildings. Right and left of the forepart of it are the provision-shed and chaff-house. At the rear end are two openings, one to a railway for corn-stacks, the other into the cornstack sheds. There is an upper floor to the barn, with a feeding-place for the thrashing-machine, and there is a granary over the chaff and provision sheds. On the other side of the last-mentioned places is a double row of cattle-boxes, with lofts over them. Mr. Dean explains that he considers lofts over sheds objectionable generally speaking, but in this instance they are not so, as there are an 8 ft. cart passage and tramway between the two rows of boxes. The straw required for littering the cattle is lowered through trap-doors over them, which economises labour. The last of the cattle-houses mentioned is separated from another dung-pit by a paved shoot. This brings us to the fourth side of the enclosure, in which are the accommodation for the horses, the gig-house, and an infirmary. Behind each horse as it stands in its stall is an enclosed recess for the harness. In the centre of the large square that we have now traced stands the boiling-house, with its food tanks, and right and left of this are piggeries, where nearly 200 pigs can be fattened; sheep-pens and cattle-sheds open to yards. A tramway facilitates the carriage of the food from the boiling-house, and in the case of the pigs a further saving of labour is effected by the use of a hose to the liquid food truck. Beneath the spired floors on which the sheep stand in their pens are powdered gypsum charcoal and burnt clay, for the purpose of utilizing their manure. The calves stand on perforated floors, which their hoofs do not cut. These are removable, like the spired floors, and are lifted up when the manure has to be removed. But the perfection with which everything is housed would not be completely indicated if we did not mention that an open shed is provided for the cornstacks, which need not, therefore, be thatched. They are placed on frame, and when one is required for the threshing-machine, a lower frame, on wheels, is driven under it, the blocks knocked away, and the stack, with its frame, drawn bodily by a rope attached to the steam-engine, to the feeding place of the machine.

The greater the number of people who are shown such model farms the fewer there will be content with more slovenly, extravagant, wasteful, inferior management and arrangements; and so the world gets helped on a little in one department.

A WORD FOR SUN-DIALS.

About three a year the questions of "S. H. W.," in the *Builder* of 20th February, recur, in precisely the same form: "What inclination am I to give the gnomon of my dial?"—without a hint as to where "I" lives; and how am I to divide the hour scale?"

Whoever can project the simplest constructions the carpenter requires in solid geometry—those for a hip-rafter, for instance,—may readily construct any kind of sun-dial whatever, for any latitude, on being simply informed of these two invariable rules:—

1. The shadow-casting edge is a straight line,

and must always, everywhere, and in whatever form of dial, be parallel to the earth's axis. Consequently, all the true gnomons in the world are parallel, and with one varying from their direction no true dial could be made, but its time would vary every day in the year.

2. The hour-lines, on whatever surface, plane or not, are the intersections of that surface by planes all meeting at the shadow-casting edge, and making equal angles therewith. Consequently, having found the twelve o'clock planes (which is the meridian), the eleven and one o'clock planes must be inclined thereto 15°, the ten and two o'clock planes 30°, and so on; their common intersection being the gnomon edge.

With a right gnomon then, hour lines may be marked over any surface or surfaces whatever. Whoever cannot do this cannot make the lines for a hip-rafter, or any the simplest matter in carpentry. I am obliged to say "carpentry," not *building*, because in no branch of building craft but the carpenter's do we any longer attempt more practical science than the builders of Timbuctoo. Four centuries ago, when a nation lived here that could build a Redcliff Church, independent of all timber, we might have said the dial problems were tests that would prove one not only no carpenter, but no mason. It is widely different, of course, in an age of Royal Institutes of Architects, &c., when the idea of requiring, for instance, a fire-proof repository for wills, is held to transcend just as much the science of an isle of Britain as of an isle of Madagascar.

"S. H. W." will perceive then, that the gnomon being required always to be perpendicular to the earth's equator, the divisions of the scale can only be equal (or drawn in a simple and obvious way), when they are on a circle (or other lines) parallel to the said plane, of the earth's equator. In fact, the most natural, most obvious, and best thing to do, is to make your dial with no surfaces but what are either parallel or perpendicular to that plane. The best thing, because all such equatorial dials are equally fitted to any place to which you carry them, as you have only to turn them to the true meridian, and tilt the whole bodily to the inclination answering to the latitude. Moreover, as one instance of the fact that the truest engineering form of everything will be found its most artistic form, I challenge any one to produce a non-equatorial dial of any kind, anywhere, that can be called a decently elegant object; but the elegant forms of equatorial ones are unlimited, from the hollow parts of globes, of ancient Greek design, in the British Museum, to the thick Latin cross, and all manner of Maltese and curvilinear crosses and trefoils, their edges, perpendicular to the equator, forming their own gnomons, with no thin trumpery metal to be always bent out of truth. But makers do not always remember that the minute scales are required, both at the upper and lower edges of these solids, the upper alone serving during the six winter months, and the lower during the summer. Moreover, the thickness requires to be such, that the greatest distance from any part of a scale to its gnomon may not exceed 2.3 times that gnomon's length; otherwise, at midsummer and midwinter the sun's declination of 23½° will carry the shadow entirely off the scale.

Contrasted with these, the hideous inventions known as horizontal and vertical dials, whose drawing the last two centuries exalted into an "art of dialling," with their flimsy unmechanical metal gnomons like caricature noses, must, of course, be each specially made for its latitude and oven its particular wall, and useless if removed. Sometimes an architect insists on a vertical one facing almost east or west, of which a peculiarly useless and ugly specimen may be seen on the new school at Highgate.

Most persons, probably, know that theoretic sun-dial time is not, except on four days of the year, the true clock time of the place; which latter again, away from the longitude of Greenwich, is not now railway time. But few are aware, for I have seen no book notice it, that the practical sun-dial time never is, or can be, within one minute of the theoretic, or that meant in all extant almanacs and "equation of time" tables. To make use of the sun-dial at present, it is necessary to distinguish these four kinds of time. Between the railway and local clock time (if the latter he used at all), the difference and its reasons are so generally understood that nothing need be said; except that people must remember the almanac columns headed "clock face, sun," and "clock aft. sun," refer to their local clock time, and could not be given in railway time

without a separate almanac for each town. They must, therefore, combine the numbers thus given, by addition or subtraction with the known constant difference from Greenwich time, due to their longitude.

The minutes of the equation of time, for any day, are generally the same every year, but not the seconds; and the four times of no equation or of maximum equation may each fall, in different years, on the former or latter of two days (just as the equinoxes may). The only reason the same table will not serve for two successive years is the excess of the year over an exact number of days. Thus, 1868 being a leap-year, was above 18 hours longer than a true year, while 1869 is to be nearly six hours less than a true one. If the excess were an exact quarter of a day, this table would be the same for any year as for the fourth before or after it; and four tables would serve by turns continually. But the defect of the fraction from six hours prevents this, and makes another gradual accumulation of differences, till the tables of two dates 96 years apart differ nearly as much as two successive years. This, again, in our present Gregorian style, is over-corrected by the day omitted from the centennial year; and yet again under-corrected by the retention of the day in the 400th year; and thus it happens that, practically, while the world stands, each year must have its own table.

In astronomical books, however, you see a practically permanent "equation of time" table made, by omitting days of the months, and substituting the sun's longitude. You may also regard it as dependent on the sun's declination only, in this way.—He crosses any given declination circle twice a year, and to each declination belong no more than two amounts of dial correction, one whenever the sun passes that declination in going southward, the other when he passes it in coming northward. (To each tropic, however, and to one intermediate circle, about 10° N., there belongs only one dial error.) Hence the Medicevals got a simple and elegant way of setting their clocks. In some Italian cathedrals the transept has a meridian line marked on the pavement, and a lens in the south window casts an image of the sun, whose centre of course crosses this line every day at dial noon; but further north or south each day, as his declination varies. Now do not imagine the Mediceval architects stopped here. They found how to construct another line, a most difficult curve, lying half east and half west of this straight one, that the sun's image crosses this curve every day at clock noon!

This curve, resembling a very lengthened figure of 8, is called the *analemma*. We may see it drawn now on a small scale, but never well, on a vacant part of the ocean of some terrestrial globe,—its lower or big loop standing on the south tropic, and its lesser loop reaching to the northern. If correctly drawn, the resemblance to an *Italic 8* would be so complete that it would lean a little from the meridian.

This figure, then, served (as it might again) all the purposes of our "equation of time" tables. Few people know that the two maximum errors, which occur in November and February, when the clock is furthest behind and before the sun, are not equal. One is nearly seventeen minutes, and the other barely sixteen. Now this arises from the *Italic* leaning of the 8, and is increasing, and will increase for many centuries to come. But about A.D. 1250 (from which date our globe-makers would seem to take their "*analemma*" unchanged) though the loops were more unequal than now, the 8 was upright. Before 1250, it had bent the other way, ever since Adam's time. But about his time it was not only upright, but the loops, instead of being at their greatest inequality (as in 1250), were equal, as they become only once in about 13,000 years. Throughout these 13,000 years the southern loop continues biggest; and then, for another 13,000, the northern will be biggest, and the present changes will all be repeated inversely. Thus I called the astronomers' tables, that substitute the sun's longitude for the months and days, "practically" permanent, but they do not serve for ever.

Tables and almanacs all refer to present or theoretic sun-dial time, namely, what would be marked on the dial by an infinitely bright point of light, occupying the place of the sun's centre. Now, most people may have noticed that an electric light, lime light, or even good gas light, when further off than a few yards, casts clearer and sharper shadows than the sun, or than the same lights when nearer. The reason is the smaller amount of *penumbra*. Penumbra is that

space from which the sun's disc (or gas flame or other light) is partly, but only partly, hidden. It forms a border, shading off from the edge of the *pure shadow* (which edge, observe, in the sun's case, is always quite perceptible) to another outer edge, which last is always quite imperceptible. Now the theoretic shadow's edge is half-way between these, or at the middle of the penumbra. But you cannot estimate this middle, because while, as I have said, the line dividing *pure shadow* from *penumbra* is well marked, so that all eyes tolerably good will agree upon it, the limit of *penumbra* from full light you shall hardly get two to agree upon. There are good optical reasons why this should be so.

Now, the *penumbra* covers always, on the sun-dial scale, two full minutes of time, unavoidably; and the only side of it, or part of it, that you can practically define is its division from *pure shadow*. Hence, you see, *practical* dial time must always be a full minute before the theoretic throughout the forenoon, and a full minute after it in the afternoon; or rather the former, whenever you are using the following side of a shadow, and the latter when using its advanced side; for dials may be so made that you employ the same side throughout the day, or variously. This correction may be considered practically invariable in amount, and always one full minute; though strictly it is always a little more, and varies about 2 seconds, the maximum being some 64 seconds in January, and the minimum 62 in July.

If you use a bar for a gnomon, the theoretic shadow is, at all distances, just as wide as the bar; but the *pure shadow* diminishes till, at 110 times the bar's width, it vanishes, and at that same distance the *penumbra* is double its width; but no eye would detect it to be so wide.

With these items of information, I will now propose to "S. H. W." or any reader, the exercise, which ought to be easy, of designing a dial, either above or below the eye, to show, by mere inspection, clock time (and no other), either local, or, if desired, railway time, or an approximation never erring 20 seconds therefrom; and this error to be avoided if two gnomons are provided for use alternately, half a year each.

E. L. G.

P.S.—The difference between the almanacs' dial time and that marked by the boundary of *pure shadow*, is both rather greater and more variable than I stated above. The *Nautical Magazine* has, on page 1 of each month, a column headed, "Sidereal Time of the Semidiameter passing the Meridian" (with a footnote for reducing the same to mean time), showing that this—unlike the semidiameter itself, which has but one maximum and one minimum in the year—has two minima of about 64 seconds, when the sun is in 2° N., on March 26 and September 17, whence it increases to a maximum of no less than 71 seconds at the southern tropic, and another of 69 at the northern. By setting off distances representing these, each way, from the 8-shaped *analemma* curve (as projected on a cylinder or Mercator's chart), we get two other slightly different 8s, which the sun's image from a lens would exactly touch, so as to be confined between them at the moment of clock noon throughout the year. Remember that the *analemma*, though always 8-shaped, is not the same when projected on a globe as on a cylinder; and would be quite different again on any plane, especially the horizontal floor of an Italian church, where the inequality of the two loops becomes exaggerated. On the globe projection we should get the new curves by applying the sun's semidiameter merely; but on the cylinder we must apply the times of its passing, as per *Nautical Almanac*. Now for these curves it would be easy to derive four profiles for halnester-shaped gnomons, which, being applied to an equatorial dial or dials, would mark mean time (and that of a different place, as Greenwich, if desired) without one half-second's error throughout the century; and each of the four might do so for above five months: the winter and spring gnomons both serving together from early in January to early in June, and the summer and autumn ones both serving from about the 1st of July to 1st of December. I name them by our northern seasons, but these gnomons would equally apply throughout the globe, and everywhere it is only for a few days before and after the June solstice, and about twenty before and after the December solstice, that we need be restricted to a single gnomon.

Six centuries ago, when the 8 was upright, a single gnomon might have been made to show clock time throughout the year, but I do not see

that it now could for quite six months. At the time of the upright 8, the exact solstices were times of no dial error, but now the corresponding times are a week earlier than each solstice, and at the exact tropics the sun is 1 min. 25 sec. behind, or 1 min. 17 secs. before the clock. These are not quantities that in railway times we can neglect, and as the leaning of the 8 will increase for centuries, it will become less and less possible to make one gnomon serve through the year.

Mean time was only introduced at Paris in 1815, and Arago says riots were anticipated at the workmen finding a noon struck by the clocks that would not truly bave the time between sunrise and sunset; but they seem not to have observed it. Before that date the clocks, though professedly adjusted to the sun daily, were sometimes striking for half an hour. Adjustment each day was quite needless, for James Ferguson showed in his "*Mechanics*" how a clock may, with very slight and quite practical additions, be made to keep apparent solar time. The principle is that of cams. But I am not aware of the problem now propounded, to make dials keep clock time, having ever been broached before.

E. L. G.

SIR,—Your correspondent, "S. H. W.," does not appear to know that to make a dial correctly it is necessary to ascertain the exact latitude of the place in which it is intended to erect it, as both "the angle at which the gnomon should be placed, and the method of dividing the hours," depend on this.

Works on dialling are not numerous, but the best I have met with is an old one, entitled, "The Art of Dialling," by Thomas Fale, printed at London in 1626.

There is a useful little pamphlet on this subject,—"*Dialling Diagrams*," by William Watson, of Pocklington, 1854, published at one shilling, by J. Forth, Pocklington.

I have been long looking out for a copy of Peter Nicholson, on Dialling, published many years ago, but now out of print. Should any of your readers know of a copy for sale, I should be glad to hear of it.

If "S. H. W." finds any difficulty in setting out his dial, I shall be happy to assist him, if he will give me the latitude required, as well as the size and shape he wishes his dial-plate to be made.

WM. OSMOND.

Salisbury.

SIR,—In reply to "S. H. W.," the gnomon of a dial must be placed at an angle corresponding with the latitude of the place where the dial is fixed, which will be seen by reference to an Ordnance map, half-inch or 1 in. to the mile. When the gnomon is set up the hour lines can be marked off on a fine day by means of a good clock or watch, provided this is set to solar time, which can be found by reference to an almanac. The base line of the triangle, of which the gnomon is hypotenuse, must point north for which the exact variation of compass must be found for present time. The variation of local time is four minutes per degree of longitude east fast and west slow; this may be ascertained by reference to the map. If your correspondent is well acquainted with mathematics, Hymér's astronomy is the best work to consult.

WALTER SCARBELL.

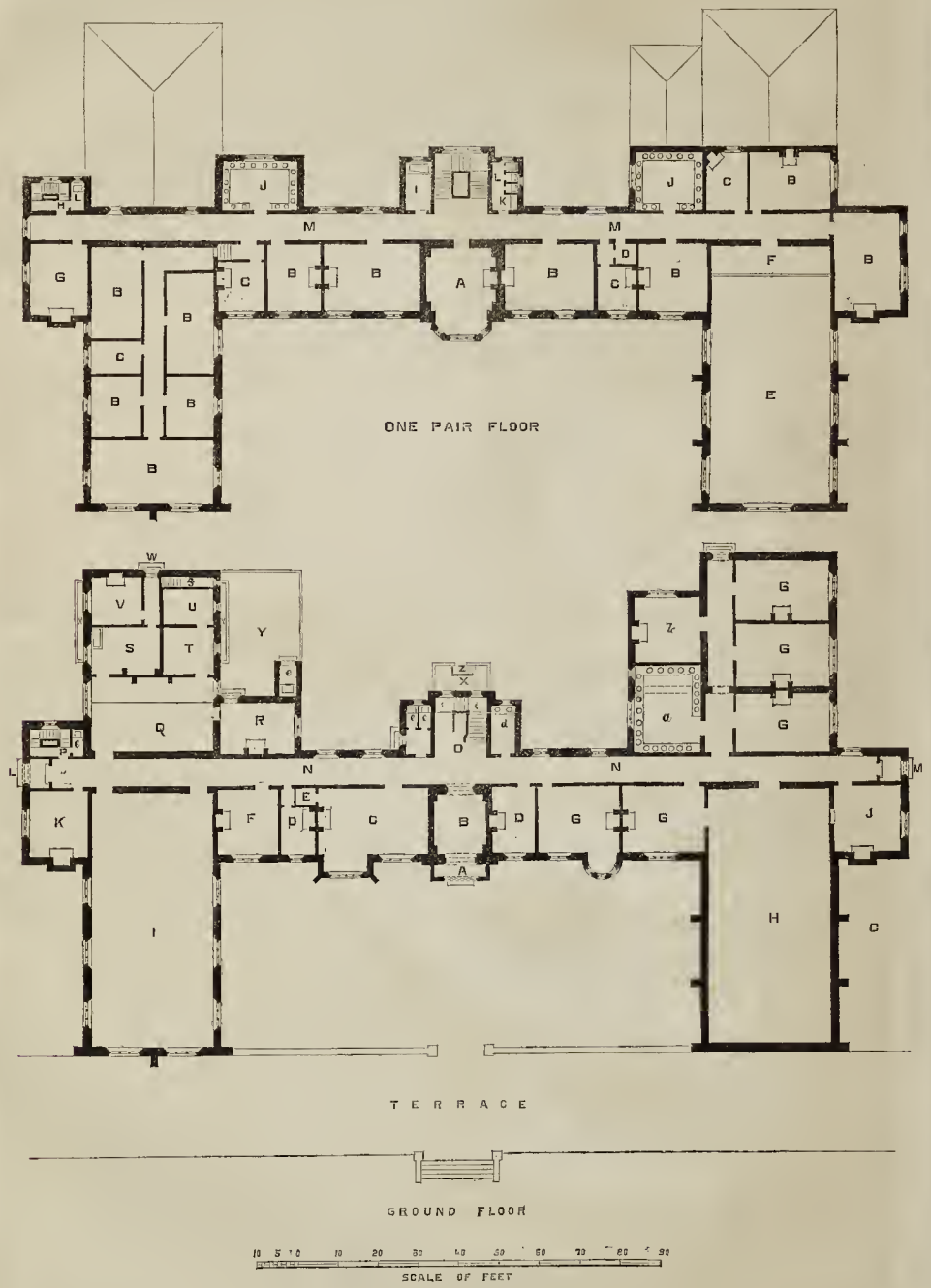
PAYMENT OF DISTRICT SURVEYORS' FEES.

It may be interesting to those concerned to know that, in the case of a claim for the fees of four houses near Queen's-road, Battersea, the owner has been adjudged liable to pay the district surveyor's fee, although an account had more than six months previously been rendered to the builder.

In evidence it was stated that the district surveyor had rendered an account to the builder more than six months previously; that he had applied to the builder, and had failed to obtain his fees from him. The fact of the ownership on the part of the party summoned was not disputed, neither was the account rendered to him; but the owner, through his solicitor, contended that the claim was not against the property, but against the owner; that he had become owner by purchase after the claim for fees was made, and, therefore, was not liable. The magistrate, however, decided that the owner or occupier remained liable until the fee was paid.

This, taken in conjunction with the recent case reported by you in the case of the District Surveyor against Wood, which was also in my district, leaves no doubt as to the liability of the owner, although the claim may have originally been made on the builder.

EDWARD PAXSON.



THE WEST OF ENGLAND DISSENTERS' COLLEGE.



THE WEST OF ENGLAND DISSENTERS' COLLEGE, TAUNTON.—Mr. Joseph James, Architect.

THE DISSENTERS' COLLEGE, TAUNTON.

The West of England Dissenters' Proprietary School was established at Taunton, in the year 1847, by "men anxious to elevate early instruction by combining it with religious instruction, and who have acted upon the conviction that the success of their project demanded that the education offered should be of such a character as to vie, both in excellence and economy, with the best grammar and endowed schools in the district."

The scheme has been worked with great success, both in regard to the scholars educated, many of whom are now in prominent positions, and also from a pecuniary point of view; inasmuch as, although a good dividend has generally been paid to the proprietors, a large sum has been allowed to accumulate, for the purposes of the new building.

In June, 1866, the committee invited designs from six architects, from which one by Mr. Joseph Jemes, of London, was accepted, and is now being carried out by Mr. Henry Davis, of Taunton, who re-erected the tower of St. Mary Magdalene, Taunton, some years since.

It will be seen by reference to the plan, that the general arrangement is such as to keep each department distinct, but at the same time within easy approach of each other. Accommodation is provided for 150 boys, in separate beds, in moderate-sized dormitories.

The present contract amounts to 10,500., but does not include covered playground, water-closets, heating apparatus, &c.

Advantage will be taken of a stream running through the estate to erect a covered plunge-bath, and ample space will be afforded for playgrounds. There is a large mansion on the estate, which was formerly used as a private lunatic asylum, and which is surrounded by some magnificent trees and shrubberies. This house will be used as a residence for the head master, and as a laundry.

The heating apparatus will be provided by Mr. J. M. Fisher, of Taunton, who has had much experience in this kind of work. Mr. George Salmon is the clerk of the works. The building, when completed, will form a prominent object to travellers by the Bristol and Exeter railway.

REFERENCES.

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| <p>GROUNDFLOOR.
A. Public entrance.
B. Entrances-hall.
C. Committee-room.
D. Master's.
E. Strong-room.
F. Principal's sitting-room.
G. Class-entrance.
H. School-room.
I. Dining-hall.
J. Junior master's day-room.
K. Steward's and matron's sitting-room.
L. Steward's entrance.
M. Boys' entrance.
N. Corridor.
O. Staircase.
P. Private staircase.
Q. Kitchen.
R. Servants' hall.
S. Scullery.
T. Larder.
U. Manservants' bed-rooms.
V. Trade entrance.
X. Area.</p> | <p>Y. Kitchen yard.
Z. To heating.
a. Day lavatory.
b. Music-room.
c. Play-grounds.
d. Lavatory.
e. W.C.
f. To stores.</p> |
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ONE-STAIR FLOOR.

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| <p>A. Linen-room.
B. Dormitory.
C. Master's.
D. Closet.
E. Upper part of school-room, with open-framed roof.
F. Music gallery.
G. Steward and matron's bedroom.
H. Private stairs.
I. Bath-room.
J. Lavatory.
K. Urinal.
L. W.C.
M. Corridor.</p> |
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THE GREAT VIADUCT ACROSS THE SOLWAY.

THE great engineering undertaking of forming a direct line of railway between the south of Scotland and the west coast of Cumberland by means of bridging the broad estuary of the Solway Firth, is now almost completed. The earthworks are finished throughout, the masonry may likewise be said to be finished, the viaduct has been completed for some time, and the permanent way has been laid for sixteen out of the eighteen miles of the line. The principal work remaining to be done is ballasting, the formation of the junctions, and the stations. An unreclaimed moor on the Cumberland side, over a mile and three-quarters of which the line has had to be carried, has been a great difficulty in the construction, very heavy and extensive draining operations being required, and great labour being occasioned in laying the way over it. The distinctive feature of the line is the viaduct across the Solway. At the point where

the railway crosses the Firth, the distance from shore to shore is 2,544 yards, or a mile and between three and four furlongs. Of this stretch nearly 600 yards are composed of sea embankment, and the remaining 1,950 yards consist of the iron viaduct. The sea bank on the Scottish shore is seven chains long, and 28 ft. deep at the extreme end where it joins the viaduct. On the Cumberland shore the sea bank measures twenty-one chains in length, and at the extreme end it is 29 ft. deep. These banks have been a source of considerable anxiety in making, as the spring-tides rise upon them 21 ft. and 22 ft. The core of the banks is made with clay. The outside is then puddle a depth of 1 ft.; a layer of broken stone and quarry red averaging 2 ft. in thickness is laid over the puddle; and upon the quarry red the pitching is set, the stone being from 15 in. to 19 in. deep. The Seafield bank on the north side of the Solway has been completed for some time, and the bank on the south or Cumberland shore is rapidly approaching completion.

The principle upon which the viaduct is constructed shows simplicity of design. The structure is built of wrought and cast iron. The wrought-iron is used for the girders which span the bays, and likewise for the cross-bracing which stiffens the whole structure. These bays or spans are 30 ft. in length. The pillars that support the girders at intervals of 30 ft. are composed of cast-iron. The foundations are piles about 20 ft. long; but these vary according to the nature of the strata in which they are driven. They are 12 in. in diameter, cast hollow, the thickness of the metal being 1 in. They were cast with a chilled point for driving, and were all driven at low water from barges fitted with patent pile-driving engines, the monkeys used for this operation weighing about 20 cwt. The levels of the foundation-piles vary with the bed of the Solway. The lowest level is in the English channel, where the top of the foundation-piles is within 18 inches of low water of spring tides; and the height from the foundation-piles to the level of the rails is 38 feet. Each pier is composed of six columns, of which the foundation or driving-pile is the lowest; and the height from the foundation-piles to the girders is made up of columns 9 ft. in length, cast with flange at their end, and bolted together at their junction, the face being turned in lathes to ensure a perfect fit. Angle-irons are placed between the columns, and the angle-irons are again tied together by diagonal bracing. Although there are six foundation-piles driven, five only are made use of for the single structure; but the addition of a sixth is all that is required to enable the line to be doubled at any future period, the directors determined to make this provision, the extra outlay being immaterial compared with what it would be to drive a single pile at each pier separately afterwards. The platform of the viaduct is covered with Malle's patent buckled plate, which are riveted to the girders and to each other by strips of iron, this helping to give stiffness to the structure. The permanent way is laid on longitudinal timbers, bolted through to the two middle girders. The longitudinal timbers are secured in their place by ties and transoms at intervals of 10 feet. The rails are secured by cast-iron chairs, spiked to the timbers. A light handrail, supported by cast-iron standards, is fixed on both sides of the viaduct for its entire length.

The total weight of cast-iron in the viaduct is 2,892 tons, and of wrought-iron 1,807 tons. The whole of the superstructure was erected without scaffolding. It is expected that the total cost of spanning the Solway and forming the sea-berke will not exceed 100,000.

LIFE AND DEATH MAPS.

IN an interesting article on the above subject, which appeared in the *Builder*, on the 23rd ult., you were good enough to notice my efforts to illustrate the geographical distribution of disease in England and Wales, and I thank you not only for your having taken the trouble to understand what I endeavoured to show at the Medical Society, but for the many proofs that the article contained of your opinion as to the public utility of my researches.

I have always contended that the geographical distribution of disease is a study of the highest importance, to us islanders especially; for our population is wonderfully increasing, and it is high time that our attention be directed to the

future sites of our new habitations, towns, and cities.

Before, however, entering further upon this subject, I wish to explain my reasons for using two colours instead of different shades of one in the cartographical illustrations of disease-distribution. In drawing and colouring my maps, the first object was to impress the idea of the student at once with the most prominent parts displayed. To do this, I tried the old plan of shading, and many new plans of my own, but found that they all more or less failed to accomplish what I desired. On using, however, the two colours, red and blue, I at once found how much easier my own task became in comprehending the groups. These two colours strike the eye at once, are pleasing to it, and give me an opportunity of using them to aid the memory technically in remembering which are the most and which the least healthy districts in respect of any disease displayed. The red is the healthy, the minus average colour, and is typical of the floridly red arterial or well-oxygenated blood; the blue or plus average colour is the reverse; it represents defective circulation and aëration; it is the colour of roused-up blue venous blood.

The quantity of residual air in houses and streets is greater than is imagined; it is always impure. Streets, therefore, and houses ought always to be so built as to admit of a thorough cleansing from this noxious medium. Streets should not only be built with due regard to the prevailing winds, but the houses should never be so continuous as not to admit of a thorough draught at certain points. Where streets are built at right angles to the current of pure air, the wind passes over them the same as it does over valleys similarly situated; the residual air is, under such circumstances, never thoroughly swept away. It is on this account that a building of a quadrangular form is the very worst for the purpose of a hospital; the same error old air hangs about a quadrangle, and gets in through the open windows day after day, and week after week, even in spite of brisk winds. These quadrangles resemble those valleys in some parts of England, inclosed on all sides, where we find heart disease and the cause of its excess most prevalent.

The map of the geographical distribution of heart disease teaches us a wonderful lesson in ventilation on the grandest scale possible. It shows distinctly that wherever the pure fresh air from the sea can penetrate up the valleys, there the cause of the excess of heart disease is at once destroyed or swept away. The great natural ventilators of our country are our tidal rivers, whose courses are in the axis of the prevailing winds and the tidal wave; the effect of a clean sweep of sea air up these channels is well seen in the map of heart disease; for in the midst of counties whose mortality from this cause is above the average we find wherever these rivers bend their health, so far as this disease is concerned, accompanies them, the riparian districts being invariably minus average, or the red. To build therefore a city or town with such a fact before us, with the streets running at right angles to the healthy wind current, would be to disregard the teaching of nature as we find them written in statistics. Many of our towns and cities are built upon this wrong principle, and therefore many having the natural advantages of a tidal river do not benefit from these advantages to the fullest extent. In reconstructing cities, as we are now doing, take London for instance, that ventilation ought to be one of the great objects of the scheme; no cellars as habitations, no alleys, no quadrangles, no cul-de-sacs, should remain for foul air to reside in and defy the best efforts of the medical man and statesman in their attempts to improve the sanitary condition of the poor. When the old streets are demolished, the new ones that are to replace them should be planned with due regard to the points whence are derived the prevailing winds, our natural air flushers. Were we to look upon our atmosphere as we do on our seas and rivers, and water generally, we should then possess a better idea of its power as a "cleanser." Pure water washes away our solid and liquid impurities, but only in the same manner as a brisk current of the medium in which we live does our aerial sewage. We live at the bottom of an aerial sea instead of swimming about in it as the fish do in theirs, or flying about in it as the birds, and we should find that we are subject to similar currents to those in the sea, and perchance to be regular ones, if we were only better acquainted with their laws.

ALFRED HAVILAND.

GAS EXPLOSIONS.

MANY of our readers have already read of an explosion of gas at the well-known hotel near Castle Howard, Yorkshire, in which two servants had most remarkable escapes, one girl being forced nearly 40 yards. It appears the housemaid opened the bar, a large and lofty room, and lighted a fire, observing at the time a strong smell of gas. It would seem gas had been escaping all night from the chandelier, and that the upper space was fully charged. Contrary to custom, the girl omitted to open the window. She had left the room for a second or two, when, on turning into the long corridor towards the kitchen, a tremendous explosion ensued, and the girl was carried forward as fast as she could run with a sensation of an immense fire behind her right down the outer flight of steps into the park. The explosion had blown out three doors, and through all these openings the girl was carried, the outer door being thrown down the steps into the park, although 30 yards from the explosion. It is believed the accident was the result of a want of water in the slide of the pendant, which permitted the escape of gas from the top. The hotel narrowly escaped being burned.

The science of gas-lighting is one of the great improvements of the nineteenth century; but like railways and steam-engines, its practical every-day working is attended with danger. More accidents, we venture to say, occur with gas explosions than any other casualty to which the art of constructing buildings may be subjected. But, then, this ought to be understood. Every one should understand that gas is explosive. It cannot be denied that it indicates its presence in the most unmistakable manner. Still, how common it is to see an ignorant man or woman rushing with a lighted candle into a cellar or close apartment already filled with one of the most combustible combinations of chemistry? The fact is, they might just as well set fire to a powder-cask. How stale and tiresome to us becomes the repetition of the simple rule, that in the event of a strong smell of gas the first thing to be done is to *shut off the supply* at the meter, and the next, to *open the doors and windows*, and admit fresh air. There are certain more complicated circumstances connected with this particular explosion at Castle Howard, which we may briefly notice, for the benefit of those persons who may be at a distance from a gasfitter, or to whom such accidents may occur during the night; but let us point out and press on the public attention, by all means, the salutary principle, that in all cases of an escape of gas, and under any circumstances almost, a gasfitter should be sent for at once. The circumstances we refer to are these:—"The gas had been escaping all night from the chandelier," and "it is believed that the accident was the want of water in the slide of the pendant." What seems to be meant by the reporter in using the word *slide* here is what we call the water joint. A water joint in a gas lustre, it is worth while to explain, is a very ingenious contrivance. It is simply an elongated lute. It differs from a gasometer, for example, in no other principle than that of possessing a small interior tube for conveying the gas in place of a large internal cylinder, and our conviction is based upon long and practical experience, that those water-joint gas-lamps are highly dangerous instruments in almost any dwelling-house, but particularly where they are under the control of ignorant servant-girls. The recent tendencies of the gasfitter's taste in manufacturing these lamps, is to reduce the size of the water cup as much as possible. Hence the whole lute often consists of the slender column of water that is contained between a $\frac{1}{2}$ in. and a $\frac{1}{4}$ in. metal tube! Of course this soon evaporates, especially in a warm room, and no barrier is then opposed to the escape of the deadly and combustible gas. It seems a simple precaution to pour in a little fresh water into this joint every month, more or less frequent, as the case requires. But alas! how many of our most fatal accidents arise from the neglect of simple precautions. We have found Colza oil a good substitute for water: it does not evaporate so quickly, and does not injure the apparatus by its freezing in winter, as water does. This not suiting the interests of the gasfitter, he tried to prevent us from using it, by croaking about smells and other evils; but many months have passed, and no such results have yet occurred. Even though the oil should begin to smell, it can then be easily replaced by new oil.

We may take the opportunity of adding that

the same dangerous risk belongs to the gas-meters, which from the same neglect of water often permit escape. In fact, most of the explosions of gas take place at the meter, which ought to have the supply-pipes so fitted as to rise from it in a regular declivity. This would allow of the "water in the pipes," which is in fact condensed gas, to flow back into the meter, keeping at once the pipes clear, and the meter additionally supplied with water. Even then it cannot be pointed out too strongly that a systematic inspection and regulation both of gas-meters and water joints are indispensable.

THE VELOCIPEDE MOVEMENT.

In originating this movement, as we think every reader of the *Builder*, even for the last few years, will admit that we are entitled to say we did, our purpose was utility, much more than recreation; and, although our friends, the French and the Americans, seem to have gone crazy about it, they have not yet come up to our mark, either as regards utility or as regards improvement of the vehicle. It is to be hoped that now we have ourselves set about it in England, we shall be able to do something worth while in both of these respects, avoiding much use of the velocipede in crowded streets, and cultivating its use rather in suburban and provincial towns, or country districts. One special improvement which we have all along desiderated is to get rid of the pedaling process by the invention of some other motive power, such as compressed air; and we have before noted that in America such a power is said to have been already applied to cabs or cars; and we do not see why it should not at once be applied to the velocipede. Two-wheeled velocipedes, like "safety" cabs, are by no means safe vehicles; and, at any rate, they are not likely to survive the application of mechanical motive power to these vehicles, whatever they may then be called. Indeed, the two-wheeled velocipede is rather a retrogradation than an improvement. We do not know whether Faraday's, on which he traversed Hampstead-hill, was a two-wheeler; but at all events, the old "dandy charger," if we recollect aright, was usually so, though it was, we think, without treads, the feet touching the ground. The withdrawal of the third or third and fourth wheel, therefore, is no novelty, although for amusement and recreation, and the display of agility and skill, it may still hold its place. On one of these two-wheelers, Mr. Mayall, jun., son of the well-known photographer, is said to have run from London to Brighton, the other day, at the rate of eight miles an hour, and part of the journey—down hill—at the rate of a mile in four minutes. This go-a-head vehicle, as the *Gentleman's Magazine* remarks, is exactly suited to American ideas, and walking, accordingly, is already on its last legs, as Yankee wags allege. Schools, with the imposing name of "Velocinasiums," for teaching the young idea how to gyrate, are being established; races are being run; and men and boys are whizzing here, there, and everywhere, at the speed of twelve miles an hour. Inventors are improving the machines, and manufacturers are making them, wholesale, the supply at present falling short of the demand. The mania is spreading everywhere throughout the States, and Western rhymers are engaged in singing the praises of the "easily-hossed" vehicle. One, Carl Benson, challenged the other day to find a rhyme for "velocipede," made it out thus,—

"There was a man on a velocipede
Who said, I need not give my horse a feed;
Without oats or hay
He will go all day!"

It's a cheap thing to keep a velocipede."

Whereupon another poet suggests this,—

"It 'tis a loss indeed
To give one's horse a feed,
And I can boss a steed
Of such a saucy breed,
Then anre, the boss I need
Is the velocipede."

In France the mania is quite as great as in America, and the last news on the subject is that the Prince Imperial of France is at it, being a great amateur of velocipedes. He has publicly gained a race in the Tuileries Gardens against his comrade, Dr. Conneau's son, and it is said that he has ordered a dozen velocipedes to make presents of to various young friends. The French Government are about to mount the rural postmen, we hear, on velocipedes,—an idea worth consideration at St. Martin's-le-Grand.

When all the novelty-hunters are done with the velocipede, we trust that one result may be that it will be improved in the way we wish, and made useful to those who cannot afford to "keep a gig;" especially in enabling these to live healthfully in out-of-the-way corners of the outskirts of London and other large towns while obliged to be in town all day at business.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the tenth meeting of the present session of this society, held on the 26th ult. last (Mr. F. Horner, president, in the chair), thirteen sets of drawings were exhibited, which had been submitted in competition for the annual prize offered by the society to the student members. The subject was a design for a row of ten seven-yard houses, the materials for the external design being restricted to brick, tiles, and terra-cotta, except for sills or steps. It was announced by the secretary, that the council had awarded the first prize to the set of drawings marked "*Par sit fortuna laboris*," by Mr. Stanley Fox, a pupil of Messrs. Audley; and the second prize to the set marked "*Terra cotta*," by Mr. P. Balmer, pupil of Mr. Wordley. It was observed that a larger number of designs had been submitted on this occasion than had for a long time past been sent in for the students' competitions.

Mr. S. Hoggins (author of the "Course and Current of Architecture") then read a paper, entitled "Letters from Shakspeare, the new capital of Australia, written by Scamozzi Smith, esq., architect, to his friends in England, in 1915-16." This paper, which was a continuation of one read during a former session of the society, and noticed in our pages at the time, had for its aim to present criticisms on architecture and the other fine arts, in their relation to one another, and to society and social habits the criticism being conveyed in the form of descriptions of imaginary buildings in a future antipodal style. The general tendency of the paper was to inculcate strongly the revival of the refining influence of classic feeling, combined with the freest possible use of all materials which, by their colour or texture, could add any new decorative features to the buildings; and also to plead strongly for the essentially fine-art character of the architect's profession, to be exhibited not only in elevation and ornament, but also in the contrivance of plan and landscape-gardening. The paper was illustrated by a number of original and suggestive designs by its author.

BIZARRE ARCHITECTURE.

Sir,—The best thanks of all our craft who value the fine-art character of architecture are due to you for the very able and spirited article, "On some Modern Architectural Work," in the last number of the *Builder*. It angurs well for some reformation of the folly therein exposed when the leading architectural journal takes up the subject in this direct and energetic strain; and to some of us, who have by voice and pen striven in our own localities to stem the muddy torrent of false design, no greater encouragement could be afforded us than aid such as your article gives.

It is remarkable how very insensible to the vices of the styles they affect,—for simple affectation it is,—the disciples of these most corrupt schools are; for you will hear them, as I have frequently witnessed, sneer at and depreciate works not of their own kidney, but, with whatever faults, of far higher art quality, and be evidently entirely ignorant of the real merits of what they deride, and of the points in which their own cannot bear comparison with it. I lately attended an opening service in a costly church which exhibited nearly all the peculiarities you enumerate, and the architect of which, a clever and enterprising young man, had to my own knowledge desired to embody in this work all that be thought best in ecclesiastical design. Well, I declare to you that the one only feature in the least pleasing to the eye was the monogram on the Communion table-cover; all else was crude, discordant, ill-proportioned, and bizarre; yet in the local papers there appeared critiques (!) commenting with unlimited admiration on the knowledge and taste displayed by the rising young architect, and no less on the happily-directed and guided liberality of the founder.

I some time afterwards, with a lady who had accompanied me on the previous occasion, was in a neighbouring church, built more than fifty

years since from a design of Rickman's, of Andor character and with much of what we now justly discard as past in the way of galleries, imitated material, &c. I formed a comparison in my own mind, and then asked my companion whether this or the church of the "new light" Gothic he had been at together were the more dignified architectural and ecclesiastical in effect, and she answered at once in accordance with my own feeling, the one we were then in beyond comparison; so certain is it that just proportions, well-studied detail, and carefully-designed ornament (all of which Rickman's works, as a rule, embody) commend themselves to the mind beyond all the results of affected massiveness, crude phases of form, and forced contrast of colour which these would-be Mediaeval structures exhibit; the higher artistic qualities in the earlier revival design more than compensating for the weaknesses belonging to the inherent timidity of such works. This, in the church, I have heard pointed out by the self-constituted local censors of the day as a thing only fit to laugh at; would that they possessed one tithing of the real refinement of the genial old Quaker architect! Unhappily, too, among those who run into no such excess of riot, there are not wanting some, and of metropolitan repute, who, in respect to the Pointed style, seem to act on a maxim which was often on the lips, and seemed a conclusive plea to the approval of a late eminent classical professor of our art, "The ancients did it." If only a precedent can be found for something in an old church or conventional building, it is held as beyond criticism; as if, forsooth, the Mediaeval designers never made blunders. I have before my mind's eye now a lately-built steeple attached to a church, which I heard pronounced a perfect model of correct Pointed design, the spire of which (very like one or two old ones I have seen) if drawn by a pupil of mine of six months' standing, I should tell him to rub out and be ashamed of. But if I, here in the provinces, should venture to attach this opinion to the church and designer instanced, I should be simply covered with ridicule.

Let the real principles of art, not the popular affections of the day, rule in the minds of those who have the duty, a noble one if well discharged, of marking for posterity the architectural position of our generation, and we shall soon get rid of the crinities, barbarities, and needless uglinesses of these unhappy caricatures of real architecture; and, whether preferring Classical or Pointed design (uniformity, I believe, impossible), they may give a character to the buildings of our day which shall hold their ground beyond it, which cannot, I believe, be the case with the class of works which, with you, I most sincerely deprecate.

A PROVINCIAL ARCHITECT.

RAILWAY MATTERS.

The report of the directors of the Metropolitan Underground Company states that the gross receipts from traffic for the half-year ending the 31st of December last were 155,769*l.*, as compared with 118,738*l.* for the corresponding half of 1867. The total traffic receipts for the year 1868 amounted to 234,243*l.* The net revenue account showed a credit balance of 150,278*l.* This balance would enable the proprietors to declare dividends at the following rates per annum, viz.: Upon the preference stock at 5 per cent.; the consolidated ordinary stock at 7 per cent.; the preferred stock at 6 per cent.; and the extension stock at 6 per cent., leaving a balance of 4,167*l.* The capital account to the 31st December showed that 6,390,656*l.* had been received, and 6,486,334*l.* expended, leaving a balance of 95,679*l.* against the company. The revenue account for the half-year ending the 31st of December last showed that 162,198*l.* had been received, and 57,989*l.* expended, leaving a balance of 104,209*l.* To this was added 1,674*l.* from the preceding half-year, 14,624*l.* from the new redeemable fund account, 42,600*l.* contractors' payment, 1,250*l.* from the St. John's Wood Railway Company, and 1,797*l.* bankers' and general interest account, making together 166,153*l.* From this was deducted 15,875*l.* interest on loans, and 146,111*l.* for preference and ordinary dividends as proposed in the report, leaving a balance of 4,167*l.* for the next half-year.

The traffic receipts of railways in the United Kingdom for the week ending February 14th, amounted on 13,419 miles to 685,955*l.*; and for the corresponding week in 1868, on 13,216 miles,

to 660,871*l.*, showing an increase of 203 miles, and of 25,084*l.*

Extensive works have been for some time in progress throughout the entire course of the North London Railway. An additional line of rails will be added from Broad-street Station to Camden-town, passing the stations of Shore-ditch, Agar-town, Dalston, Newington, Highbury, and Caledonian-road. Operations have been commenced at the Camden-town end of the line, and from this station to the Roman-road the embankment on which the rails will rest is in a more or less forward state. Beneath the Roman-road an additional bridge, with iron girders, spans the rails. The piers and abutments have been built, and iron girders will span the Great Northern line of rails, near the end of Frederick-street. The principal portion of the small brick arches between the Roman-road and Camden-town have been finished. Several houses have been pulled down in Liverpool-road and Arundel-square. Cumberland-street, lying between the Roman-road and Caledonian-road, and facing the railway, has been lined with plain new buildings of four stories; the greater portion of these are, however, yet unfinished.

The Great Eastern is able to pay a dividend of rather more than 1½ per cent.; but, "in view of the difficulties through which the company has been passing," they do not propose to pay it, but to carry the amount which would be available to divide as a reserve to the accounts of the current half-year. The Taff Vale dividend will be at the rate of 9 per cent. per annum.

A telegram from Lisbon states that the Portuguese Government is treating with one of the railway companies for the purchase of its lines.

FATAL FALL OF AN ARCH ON THE GREAT EASTERN RAILWAY.

A TERRIBLE accident has occurred on the Great Eastern. In Waterloo-town, Bethnal-green, Messrs. Lucas, the contractors, were doing some repairs for the company, and had a number of excavators and carpenters at work under one of the railway arches, which are about 60 ft. in height. A heavily-laden coal-truck passed over the spot where the men were at work, and without an instant's warning the whole structure, which was composed of brick, ironwork, and timber, fell bodily in, burying the men beneath several feet of masonry. One of the trucks in falling through capsized, and providentially was the means of saving the lives of some of the workmen. Forthwith, 100 of Messrs. Lucas's men proceeded to dig out the dying and the dead. Fourteen men were got out alive. The falling timber and iron girders had formed a sort of cavern over them. The dead bodies of five unfortunate men—four of whom were excavators, and one a carpenter—were then dug out from underneath a mass of earth. It is said that at the time of the accident one of the columns underneath the arch was being repaired, and the ironwork being weakened, the train passing over it caused the accident.

TECHNICAL INSTRUCTION FOR WORKMEN.

WE mentioned in our last that a memorial had been presented to the Earl de Grey and Ripon, by a deputation from the Workmen's Technical Education Committee. This committee was appointed at a general conference of operatives, held in London on the 14th of March, 1868. Among the suggestions made, the committee more especially solicit the favour of his lordship's attention to the recommendation, that the same systematic and detailed class-instruction which is given in the day-time at the Royal School of Mines in Jernyn-street, and at the Royal School of Chemistry in Oxford-street, should be given at night. The lectures which for several years past have been delivered in the former institution in the evenings, have been attended by large audiences of working men, and have been of the highest value. The committee feel, however, that more detailed instruction, such as that afforded by the day-classes, accompanied by demonstration and experiments, and giving the student the advantage of frequent examinations in the subjects studied, is now urgently needed, as well as the more popular survey of the physical sciences afforded by the lectures. They recommend that the building where such classes are held should be an "annexe" to the Royal School of Mines and Chemistry, not far

off, say Leicester-square or Golden-square. They are opposed to South Kensington, as being too distant from the residences of the majority of workmen. As to expenditure, it appears to them possible that the public might be induced to provide a site or buildings, if it were known that the State would provide all the expense connected with instruction; and if that view be adopted, the grant might be made conditional on suitable accommodation being provided.

The committee feel that it would be right and desirable that only those should be admitted to the proposed classes who are perfectly competent to avail themselves of the advantage to be derived from such classes; they therefore propose that the admission of any applicant should be rendered conditional on his having passed the lowest standard at the examinations which are held annually by the Science and Art Department, in the month of May.

COMPETITIONS.

Cemetery, Dover.—The first premium for designs for laying out ground and buildings for the new cemetery for the parish of St. Mary, Dover, has been awarded to Mr. Frederick A. Klein, of Cannon-street, London, who will be employed to carry out the works; the second, to Mr. Rowland Ross, of Bishopsgate-street Within.

Hartley Winney New Church.—The design sent in by "Fides" (Mr. Lansdowne, of Newport and Bristol) has been accepted by the building committee; and Messrs. Hibbard & Long, of Bath, have tendered to carry it out for 3,095*l.* The plans drawn by Mr. John Johnson, of Moorgate-street, London, and those by Messrs. W. H. & J. Ward, of Curzon Chambers, Birmingham, have been awarded the second and third premiums respectively.

Lambeth Workhouse and Infirmary.—Thirteen sets of designs were sent in on Monday last for a new infirmary for 600 persons, and a workhouse for 1,500 inmates, for the parish of St. Mary, Lambeth.

Kensington District Schools.—The design by Mr. Saxon Snell has been selected. We sufficiently marked our good opinion of this plan in our brief notice of the designs last week.

Peterborough Corn Exchange Extension.—In answer to advertisements, ten sets of designs were sent in on the 17th of February. The competitors were Messrs. S. Hemming, W. Pattenon, J. Wallis Chapman, and John Ladds, of London; Messrs. J. G. Traylen, Sibson, Edwin Bays, of Cambridge; Mr. J. Meggett and Daniel & James Ruddle, of London and Peterborough; Mr. B. Chubbill and Mr. John Ruddle, both of Peterborough, from whose designs the directors have selected those by Mr. John Ladds, to whom they have awarded the premium, with instructions to prepare working drawings and specifications, and obtain tenders at once.

CHURCH-BUILDING NEWS.

London.—The new church of St. John the Evangelist, St. George's East, has been consecrated by the new Bishop of London. The new church stands in Grove-street, Commercial-road East. It is a small edifice, built of brick and stone, in the Middle Pointed style of architecture. It occupies a site which was formerly a cooper's yard. The church contains about 600 sittings. It has been erected at a cost, as computed by the architect, of 4,300*l.*; although, all things included, the entire expense would amount to a considerably larger sum. The money has been subscribed partly from the Bishop of London's Fund, and the remainder from other sources. The Messrs. Francois were the architects.—A new church is about to be erected for an ecclesiastical district, consisting of the neighbourhood of Brownswood Park, to be taken out of the parish of Islington. The church will be dedicated to St. John the Evangelist.—Another new metropolitan church has been completed. It is situated in Barnsbury, and the district which is assigned to the new church is taken out of the parish of St. Luke, Holloway.

Bromley (Middlesex).—The church of St. Gabriel, Bromley, Middlesex, has been consecrated. The district assigned to the new church is taken from the parish of St. Michael, Bromley. It has a population of 7,000 of the poorer classes. The edifice has been built from the designs of Mr. R. J. Withers, by Messrs. Dove, Brothers, at a cost of 4,700*l.*, of which 2,000*l.* were given by the Bishop of London's Fund, the Church

Building Society, &c. It affords seats for 753 persons, all free.

Hitchin.—King's Walden Church, which has been closed for the purpose of being repaired and restored, has been re-opened for divine service. The church has been re-seated with benches of polished oak, and the reading-desk is also of oak. The pulpit and font are of stone, carved. The oaken screen, which divides the nave from the chancel, has been restored and redecorated. The works have been carried out by Messrs. Kersyth, of London, from the designs of Messrs. Nesfield & Shaw. An organ, built by Messrs. Waller & Jones, of London, has been put up. It is proposed to insert a painted east window, and to introduce colour in the roof and on the walls of the church.

Fulbourne (Cambs).—The parish church is to be restored by Mr. Tooley, of the "Church Restoration Works" in this town, his tender for the work, 3,100*l.*, having been accepted. Mr. A. J. Blomfield is the architect engaged.

Birmingham.—There is a prospect of a church being erected for the populous and daily-increasing district of Heath-street, in the parish of All Saints. The inhabitants being at a great distance from any church, have taken up the matter warmly, and the Church Extension Society have already purchased a piece of land at the junction of Heath-street and Winson-green-road, for church and parsonage, and made a grant of 500*l.* towards the erection of the church. A building committee has been formed, and plans for the church, which is to be called St. Cuthbert's, have been prepared by Messrs. Bateman & Corser. Estimated cost, 5,000*l.*

Ripon.—The chapel of St. Mary Magdalene has been consecrated. This edifice, which is from the designs of Mr. Crossland, architect, Leeds, has been erected through the liberality of Mrs. Mason, the widow of the late Rev. G. Mason, of Copt Hewick Hall. The old chapel, situated not far from the River Ure, contains an ancient pavement in front of the altar, supposed by some to be Roman, but more probably copied from a work of that period, of the date of the twelfth century. The new chapel contains two stained-glass windows, both to the memory of the late Rev. G. Mason. That in the east, representing the six Beatitudes, by O'Connor, of London, was the gift of Mrs. Mason; and that in the south, representing the three Graces—Faith, Hope, and Charity—was got up by subscription among a few friends of the late rev. gentleman. The chapel will hold about 150 persons.

STAINED GLASS.

St. James's, Derby.—The chancel of this church has recently been enriched by the insertion of seven stained-glass lancet windows, each of which is divided into three compartments. Six of the lights illustrates those saviours in the Litany which relate to the Saviour's Redemption, and the most important events in His life, beginning with the Nativity and concluding with the Ascension and the Descent of the Holy Ghost at Pentecost. The seventh light is devoted to the Martyrdom of St. Stephen, St. John, and the Holy Innocents. The artists were Messrs. Lavers, Barrand & Westlake, of London.

The Abbey Church, Bath.—A stained-glass window by Mr. Hughes, of London, has been placed in the south aisle of this church by Mrs. Brooke, of Malmesbury, in memory of her eldest son. The window contains five subjects, viz.,—The Raising of the Widow's Son, Our Lord addressing the Noblesman and telling him that his Son liveth, Christ receiving little Children, the Prayer in the Garden and the Sleep of the Disciples, and the Payment of Tribute Money. At the top of the window (which was exhibited at the Paris Exposition) are figures of angels bearing banners, on which texts are inscribed.

Marple Church.—A stained-glass window has been placed in the east end of All Saints' Church, Marple. On the upper part are representations of three angels, and near to them appears the word Alleluia, which is twice repeated, as though forming part of an angelic song. On the left-hand side of the central compartment is the representation of the Baptism of Jesus by John the Baptist. On the right-hand of the compartment is the representation of Our Lord's Last Supper.

In the centre compartment is the representation of the Saviour's Ascension. This is the first stained window erected in Marple Church, and is placed there by the eldest daughter of Mr. Skirrow, as a tribute of affection to her parents. The window is from the establishment of Mr. Hughes, of London.

Chichester Cathedral.—We understand that the erection of a new window of stained glass in the south transept of this cathedral has been intrusted to Mr. Wallis, of Newcastle-upon-Tyne, and that it will be immediately taken in hand.

Great Barford Church.—A stained-glass window has recently been put up in the chancel of this church. It is dedicated to the memory of the late Mr. John Arnold, who, on retiring from business as a London merchant, built a mansion in this parish, and here spent the latter years of his life. The window was designed and executed by Messrs. Hardman, of Birmingham.

PROVINCIAL NEWS.

Chatham.—A new wing is to be added to St. Mary's Convict Prison, Chatham, which will accommodate about 300 more convicts. Employment could be found on the dockyard extension works at St. Mary's Island for even a greater number.

Liverpool.—The new offices of the Liverpool and London and Globe Insurance Company, erected at a cost of 11,500*l.*, in Corn-street, are now completed and occupied. The architect was Mr. W. B. Gingell. The public office is a large room, with plastered roof, supported on columns of coloured stone. There are three suites of professional chambers over the company's office.

East Retford.—The first stone of a new Temperance-hall has been laid here. The building will be 54 ft. by 22 ft. inside, and of a plain character, and is estimated to cost 360*l.*

FROM AUSTRALIA.

Malbourne.—The church of St. Mary's, Hotbam, of which the *Illustrated News* of Melbourne gives an engraving, has been opened for divine service, after being enlarged by the addition of transepts and chancel. The style of the building is Gothic, of the Early Decorated period. Its external length is 112 ft., and across through the transepts it is 104 ft. The plan is cruciform. It consists of a nave, with north and south aisles (the portion of the building already in use), north and south transepts, chancel, baptistry, robing-room, and vestry. The church is constructed throughout of limestone, with freestone millions and tracery in the windows, and with Portland cement water-tables to the buttresses, &c. Each gable is terminated with a freestone cross or finial. The nave is a clearstory, and is lighted by windows of circular form, filled with tracery, and situated above the aisle roofs. At the intersection of the nave, chancel, and two transepts, there are four moulded stone arches, 24 ft. wide and 33 ft. high, the space which they enclose being finished with a groined ceiling, with moulded ribs, having carved bosses at their intersections. This ceiling, which hangs like a canopy over the space where the nave, chancel, and transepts meet, is one of the chief of the internal features of the building. All the other parts of the church have open timbered roofs, with moulded hammer-beams, and carved struts thereunder, springing from moulded brackets. The seating-room, when the whole of the interior fittings are completed, will afford accommodation for about 800 persons. The cost of the building so far, has been over 6,000*l.* The tower and spire, which will be 130 ft. high, as yet have only been commenced; and before the whole church is completed an organ-loft and organ will have to be built, as well as interior fittings and stained-glass windows added. At the eastern end of the chancel there is a large window, 12 ft. 6 in. wide by 25 ft. high, intended for a stained-glass design; and it is understood that a local firm have offered to design and manufacture the window for the sum of 400*l.* The architect was Mr. Lloyd Taylor.

The contractor for the new Lunatic Asylum has commenced operations. A large number of men will be employed in the erection of this extensive pile of buildings.

The contractor for the Alfred Graving Dock, Williamstown, has between seventy and eighty men at present employed on that work.

The new Yarra Graving Dock, built by Captains Sinnott and Hughes, has been opened. This dock has been in course of erection for the last two years. The length of the dock is 250 ft., breadth at top 55 ft., and at the bottom 40 ft. It is 16 ft. deep in dock, and has 13 ft. 3 in. of water on the sill at ordinary tides. The pumping machinery consists of a 20-in. centrifugal pump,

capable of raising 5,000 gallons per minute, and was manufactured to order by Mr. William Wright, of Little Bourke-street West. Mr. D. B. Pritchard, C.E., of this city, is the consulting engineer.

FROM SCOTLAND.

Edinburgh.—The Lords of the Treasury, according to the *Scotsman*, have sanctioned the erection of a large new Record Hall, on the vacant ground at the back of the old building, at a cost of about 8,000*l.*, the designs for which have been prepared by Mr. Matheson, of her Majesty's Board of Works. This increased accommodation for the records is rendered necessary by the Land Writs Registration Act of last session.—The directors of the Edinburgh Water Company have received a report from Mr. Hawkey, the hydraulic engineer, and from other engineers, pronouncing in strong terms in favour of the Company's scheme for bringing in a supply of water from the Moorfoot Hills. Mr. Hawkey estimates the cost of the St. Mary's Looch Scheme at 1,400,000*l.*

OBSTRUCTION OF PICCADILLY.

A CORRESPONDENT, T. H. H., whose letter represents two others on the same subject received by us, says,—The intrusion of a solid brick erection, measuring 27 ft. by 15 ft. and 20 ft. high, completely across the footway of Piccadilly, induces me to inquire whether there is any local authority to protect a public thoroughfare of such importance.

Opposite to the site which is now being excavated for the new buildings for the scientific societies opposite Burlington House, the boarding covers the whole footway, which is 12 ft. wide; but in the centre there is a further obstruction of 5 ft. upon the driveway, and a close porch, which has all the appearance of permanence, projects to the curb; thus cutting off the view of the street line, reducing the carriage-way in this most important street, and necessitating a railed gangway, by detour, for pedestrians. It may be alleged that the long corridor erected as an entrance to the Royal Academy, through the old courtyard, is only temporary; but it is likely to stand in the way for some years, until the new building is complete, to the annoyance and discomfiture of the public.

The architectural effect of this extemporaneous bit of luxury is by no means contemptible; nevertheless, for public use and convenience, it may be unreasonable to ask that in case a *velum*, or carriage awning, be absolutely requisite for Fellows or Patrons, a pair of pillars only be reserved on the curb to sustain the roof, and that the *transverse walls* be removed, so as to afford free intercourse for pedestrians in this the most important of our West London pavements.

WIDENING THE POULTRY.

SIR,—Nonsense! Abolish the Poultry. Surely they are not going to finish off the end of the new street from Blackfriars to the Mansion-house, and then see what a ridiculous appearance a "Middle-row" left will make.

Here must be the programme. Abolish the Poultry! Let Cheapside be lengthened to the Mansion-house. ONLY A TAILOR.

"MEDIEVAL METAL CAPITALS."

For the benefit of your correspondent "T. M." I would instance the case of Salisbury Cathedral, where the centre shaft of the west doorway has to its capital a bronze abacus. The section of the abacus is the same as the stone abaci on either side of it.

The bronze bands of Salisbury and the copper bands of Westminster are well known; whilst doubtless many other examples exist to ease the mind of "T. M." who appears desirous of making such legitimate use of metal, but is anxious to find a precedent. J. T. P.

SIR,—In reply to "T. M." I think if he will make inquiries, he will find many instances of Metal Capitals in ancient and modern times; to wit, the Pantheon, and St. Peter's (interior), Rome; Nelson Column, London. S. C. F.

THE PROPOSED NEW OFFICES FOR
POPULAR DISTRICT.

At a special meeting of the Popular District Board of Works, held last Tuesday evening, at the Board-room, East-India Dock-road, a report was read from a committee, to whom had been referred the four lowest tenders for the erection of new offices and Board-room. The four tenders were,—Mr. Kilby, 3,122.; Messrs. Wicks, Bangs, & Co., 7,975.; Mr. Turner, 7,890.; Messrs. Baker & Constable, 7,330l. The committee recommended that Messrs. Baker & Constable's tender be accepted. An amendment, to the effect that the tender had exceeded by about 2,330l. the original sum intended to be laid out, was moved, seconded, and persevered in; and after a protracted discussion the Board divided, and the amendment was lost by a majority of eight. A second amendment was then proposed and seconded, that the matter be referred back to the committee, with a view of reducing the sum to be laid out. This amendment was also lost. The report of the committee was then carried, and Messrs. Baker & Constable were informed that their tender had been accepted by the Board. The joint architects are Messrs. Hills & Fletcher, and Messrs. A. & C. Harston.

ROYAL INSTITUTE OF BRITISH
ARCHITECTS.

The President, Mr. W. Tite, M.P., announced at the last meeting of the Institute, held on Monday evening, the 1st inst., that the council proposed to recommend for the Royal Gold Medal of 1869, Professor C. R. Lepsius, archaeologist, of Berlin. The recommendation would come more formally before them at another meeting. Mr. Alfred Strong was elected a fellow, and Mr. W. F. Williams an associate; and then Mr. Wyatt Papworth read a memoir of the late Joseph Bonomi, architect and A.R.A., with a description of some of his designs. A number of Mr. Bonomi's drawings were exhibited.

Mr. Geo. Godwin read a paper on Masons' Marks in various countries, with special reference to the Chevalier Da Silva's work, "Signes qu'on voit gravés sur les Anciens Monuments du Portugal." The paper was illustrated with 43 sheets of marks from Egypt, the Holy Land, Lycia, Italy, England, Ireland, Scotland, France, the Tyrol, Switzerland, Sweden, Denmark, Germany, Austria, Spain, Portugal, and other countries. We shall print it hereafter.

THE ARCHITECTURAL EXHIBITION.

The annual exhibition will be opened on Wednesday, May 5th, and drawings must be sent to the galleries on Monday or Tuesday, the 5th and 6th days of April. The council desire to give to the architectural profession, and the public at large, a creditable and convenient opportunity of exhibiting and inspecting well-executed representations of the work now being executed by individual architects, and others interested in art. In furtherance of these objects, and in addition to the usual attractions of the exhibition, they are desirous of receiving perspective, geometrical, and working drawings of all new buildings, with such particulars as to plan, construction, cost, draughtsman, or artist, as may be desirable. The committee have also decided upon accepting a limited number of purely artistic drawings of architectural subjects. To bring the exhibition into prominence, it has this year been decided to open it free on Mondays and Saturdays.

CABINET-WORK IN LONDON.

Sir,—Your correspondent "E. G." gives a very fair sketch of the majority of the cabinet-makers in London, but he does not show that the remarks made by the Marquis of Eble were justified.

I understand that a statement was made by the noble marquis, to the effect that "there was at a man in England capable of designing a piece of cabinet-work; and if a good design were procured there were no men able to execute it." This is a sweeping charge of incompetency to bring against designers and workmen by a young and I feel justified in saying—inexperienced dilettante. In a few years he may think that he came to a hasty conclusion on this matter, and retract it. He has not, I believe, been in many of the best houses in London or the provinces, where really good designs for furniture are made

and carried out; for, if he had, I think that he would not have made such assertions. Those houses rarely advertise, and they are not much known outside their clients; but they manage to keep a quiet and even course.

One thing your correspondent "E. G." in his late letter, has not alluded to, is the great number of respectable houses in the upholstery, carpet, and antique furniture trade, that sell furniture, but do not make it. These firms procure good drawings, and give them out to a cabinetmaker, who undertakes to make the piece of cabinet-work for a certain sum, and they do not look to the quality of the work so much as to their full profit; therefore they are satisfied if their customers pass the work, and pay the bills. Yet there are some houses where the furniture is made on the premises under the supervision of the proprietor and designer (very few proprietors can draw), and some furniture is designed by our best architects and artists, and such furniture may be put in competition with that made by any house in the world.

Plain cabinet-work is made in these workshops, and it is as good as men can make, but the price seems high for it when compared, by an inexperienced person, with that made to sell only.

As a furniture and upholstery salesman, I have had to do with the designer, maker, and purchaser; and I consider the cause of so much bad furniture being made is the fault of the latter; for, if the purchaser were content with a neat and simple piece of furniture free from a quantity of wretched carving and inlay or marquetry, satisfaction to purchaser and maker would be the result.

J. S. B.

SOUTH LONDON WORKING CLASSES
INDUSTRIAL EXHIBITION.

On Monday last the third South London Working Classes Industrial Exhibition was opened at the Lameth Baths, the same building in which the two former were held, in the years 1864 and 1865. The exhibitors are mainly of West London, and the working-classes. The number of exhibitors is 450, and of these there is a much larger proportion of skilled workers than in any previous industrial exhibition. The adjudicators, the space committee, and a vigilance committee, have been chosen by the exhibitors from among themselves; and, in consequence of the pecuniary success of the exhibitions of 1864 and 1865, it was thought unnecessary to form a guarantee fund. The adjudicators have awarded the prize of 5l. for the best design for a medal to Marian B. Brook; and that of 2l. 2s. for the best design for a certificate to Helen J. Arndell Miles. Mr. S. Morley, M.P., presided at the opening ceremony, and Mr. Goschen, the Lord Mayor, and other gentlemen addressed the meeting.

TIMBER YARDS.

The late fire in the timber-yard, King-street, Clerkenwell, and its disastrous effects upon some poor tenements, whose tenants were wholly uninsured, again points to the necessity, so often urged in your pages, of placing these timber-yards under strict supervision, restrictions, and regulations.

No timber should be allowed to be stacked against adjoining dwelling-houses, nor within a distance of 30 feet of the external, flank, or other wall of any adjoining dwelling-house. By this regulation, timber-yards could only be made in fit and proper situations.

THE DISTRICT SURVEYOR.

A SANITARY GRIEVANCE.

The following letter to the Board of Guardians of St. George's caused some laughter, it is stated. Let us express a hope that it nevertheless awakened attention:—

"Collooney, February, 6, 1869.
I most respectfully beg leave to state, for your information, and the information of the whole board, there is a large heap of manure, the concentrated essence of Mr. Sim's whole concerns, within four yards of my kitchen door. I am an "unprotected female." I mean by that, gentlemen, I have never been married. I live by my industry, so far as keeping an eating-house. A very respectable farmer called in here a few days ago for refreshment; but in consequence of the scent of Mr. Sim's dung-pit up to my door, says he, 'Kitty, I cannot take the second cup of tea.' Gentlemen, I do not want to take any law proceedings against Mr. Sim, but I want him to leave me what the Great Being left the whole human species—the air.—I have the honour to be, your very humble and obedient servant,
CATHERINE M'DONOGH."

THE TREATMENT OF SEWAGE.

Six.—In these times of sanitary improvement many ideas spring up in people's mind as to the best and most economic plan of disposing of the sewage of our towns; and having had many occasions to study and think about it, I have now attempted to bring my thoughts to a practical termination, and trust the following ideas may be profitably imparted.

The ordinary plan of draining our towns into the neighbouring rivers and streams will not be any longer permitted. Sewage works have been established, but sufficient pollution is allowed to escape into the neighbouring rivers and streams, to establish cause for Chancery suits, &c. Earth closets have been made and talked about, but are not without many and grave objections.

The plan I propose to adopt is, that in large or small towns the drainage should all be carried or conducted to depots or sewage works. Two or three might be erected (according to the levels and size of the town) in different outskirts. These works would be very inexpensive, and made to be worked on the same principle as earth closets. There would be no annoyance worth mentioning, either in its collection or distribution. Every purchaser of the manure should be compelled to bring a certain quantity of earth, so that the supply would cost nothing; and I have no doubt such manure would meet with a ready sale and pay well.

Northampton.

GEORGE SMITH.

CLOSED DOORS AT SOUTH KEN.
SINGTON.

Six.—Being interested in the description of the Kensington District Schools Competition in your journal last week, I went to the Horticultural Society's Buildings on Saturday last, hoping to see the drawings referred to. It was informed that it was necessary to have a ticket from a certain Mr. Brown; but that gentleman not being in the way at the time, I and a friend who had with me were refused permission to enter the Council-room, where I understood from your remarks the drawings were visible.

Having gone once before to South Kensington to see some asylum district drawings, but being also then unsuccessful, I desire to call attention to the exclusiveness which, as applied to the competition itself, you have already commented upon with effect.

Again, may I urge the hardship—and it really amounts to this—of closing the South Kensington Museum against the public at four o'clock on Saturdays?—a time when of all others it is most desirable to have it open. If Mr. Cole could have seen the troops of people of all sorts, old and young, interested in the museum and other things, when the bell was rung at four o'clock last Saturday, and heard the expressions of regret at such a bright opportunity (for the sun was shining brilliantly) being lost for seeing more of the treasures being then locked up, he would have relented, I am sure, and stuck up a notice at once to the effect that on the next Saturday the doors would remain open till six o'clock at least.

When it is remembered how few, even with their Saturday half-holiday, can reach South Kensington before four o'clock, even with the railway advantages now available, it seems simply absurd for a popular institution to close its doors at that hour.

ONE "DISAPPOINTED."

HARD A-STARBOARD.

Six.—Electricians inform me that they can communicate across a wide lake, water alone being the conductor, the electric current being received on a broad copper shield, with a wire attached, for further transmission. This has led me to think how collisions at sea might be avoided from fast-going steamers dashing into each other on foggy nights, thick weather, inattention, &c.

The "paths of the sea" are laid out and kept with exactitude; thus they often meet, "passengers' dread and owners' bane," with frightful results. My plan is to have a battery constantly sending forth currents of electricity from the cut-water, to be received, and fire a gun, on board of any high-speed steamer that may be direct in her path, to indicate danger, and for one to alter course instantly.

It is recorded of an American mail steamer that made a quick passage from New York, a dense fog prevailed during the whole of the passage; they kept most accurate reckoning. When they shut off steam they were only a few yards from the Forthby lightship, off Liverpool. Is not this pushing one's luck? If protection can be devised the inventor must look for his reward in peace from "Jack," and his kinsmen, for I well know the Government will not recognize nor pay for anything of the kind, if invented by a poor Samaritan, but it is reversed if it is one of their own Salamanders.

H. T.

BILLS OF QUANTITIES.

Six.—As the question of payment for quantities is being discussed in the Builder from week to week, I make no apology for asking you, in the interest of all concerned in the erection of buildings, to give publicity to the following statement:—

A few months ago I sent a well-known firm of London architects a tender prepared upon bills of quantities which they supplied at a charge of 2l. per cent., in addition to other charges all included in the estimate in the usual way. I was informed that my tender was the lowest, and asked to wait upon the architects, who said they could not take any responsibility upon themselves; but, if my tender was accepted, I must myself verify the quantities within a fortnight after signing the contract. To this I consented, and intimated my intention of making a full examination of the drawings and specifications. Next I did my tender was not accepted. Surely a builder has enough responsibility and risk, without having a surveyor's liability thrown upon his shoulders, to enable an architect to pocket an extra 2l. per cent.

A BUILDER.

BEHAVIOUR OF CEMENT.

Six.—Can any of your readers inform me the reason why brick piers, say 7 ft. by 4 ft., built with Portland cement, after completion, begin to open in the horizontal joints, as if laid with hot mortar? The piers were well weighted on top. If any reader will give me the information required, he will much oblige

B., Builder.

GAS METERS.

SIR.—A correspondent complained to you for having to pay for a quarter's gas that he did not consume. Your correspondent and others have themselves greatly to blame for not looking after their own meters, and keep the quantities consumed, and not trust to the inspector altogether; for we know they are not a very well paid class of officials, and very often not the most intelligent. And since gas was first introduced for domestic use the principle has never altered, that is, of putting the gas meters under the kitchen sink, or some other filthy or out-of-the-way place.

Now, Mr. Editor, can you tell me why a gas meter should not be as ornamental as a timepiece in our lobby or rooms? It is not a matter of necessity to pack the works in the unmechanical and unsightly box they are now packed in. I see nothing to hinder them from being made ornaments for the finest houses, especially where there is plenty of accommodation. A tablet could be put up to show a timepiece, a gas meter, a barometer, and many other useful indicators. By having such arrangements in a house, the family would learn to read and know the use of the whole of them; whilst at the present time there are not ten out of every hundred can explain them. A. F.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

The second annual meeting of the members of this young and rising Society was held on Wednesday evening, the 24th ult., at the Offices, 14, Bedford-row. Mr. Charles Richardson was the chair. The attendance was small.

Mr. Richardson, the president of the year, opened the proceedings by calling upon Mr. Mullett, the secretary, to read the report. This document congratulated the subscribers on the advancing character of the institution, and stated that the annual meeting had been changed for the convenience of members from August to February. In alluding to the financial crisis of 1866 as being the past year, as compared with the previous one, it was stated that many donations were always given at the starting of a new society which would not be continued; and reference was also made to the financial crisis of 1866 as being injurious to the income of the succeeding years. Since the last meeting three healthy men, leading clerks in London, have been removed by death, and their loss is much regretted. There have been purchased 6000 stock in this 3 per Cents, an available balance at the bankers', and two widows have been placed on the pension list. In announcing the presidency of Mr. Richardson, the report passes a high eulogium on the retiring president, Mr. Honshaw, "for the very generous manner in which he has devoted both time, means, and influence towards advancing the interests of this young institution." Notwithstanding the discouraging aspect of the year, the results to the society have more than realised the expectations of the committee, and the continued support of friends and members is earnestly asked for.

The balance-sheet stands as follows:—To the 30th of July, 1867, 477. 11s. 5d. Subscriptions and donations, 250. 5s. Interest on banking accounts, 81. 0s. 3d. Total, 799. 15s. 8d. The expenditure, for rent, stationery, printing, postage, secretary's salary, and all working costs, the sum of 367. 4s. 6d. Relief and pensions, 122. 15s. Purchase of 6000 3 per Cents, and broker's commission, 601. 15s. Available cash, 100. 1s. 3d. Total, 799. 15s. 8d.

The Chairman, in moving the adoption, printing, and circulation of the documents just read, took occasion to congratulate the meeting on their success. There was a young society, only just started, and started, too, at a very bad time, when trade and commerce were dull. He hoped that the last year was rolling over us, and that better times were to come, and that they would all put their shoulder to the wheel. Builders' clerks wanted something of that kind; they often worked in offices that were not always healthy, and they did not get enough of out-door exercise.

The report having been adopted, resolutions were passed appointing the committee and officers for the year; and a special vote of thanks was passed to Mr. Haslam.

A conversation ensued as to the best means of inducing builders' clerks to take an interest in the society.

VITRUVIUS.

SIR.—As there is a disposition to afford a better professional training for those who pursue following the profession as architects, it has occurred to me that, supposing that any professor would take up Vitruvius as a basis, and deliver a course of lectures, using that book as a guide, commencing with the essentials of an excellent and good practical education in the first instance, and then follow the same course as laid down by the above talented and experienced great man, with all the improvements and changes which have taken place in nearly 2,000 years, the lectures or papers would form a most valuable nucleus for the young architect, laying down what system he should adopt, what works to study for theory or practice, the nature and improvement in all matters relating to building, their nature and properties, not confining himself to the mere routine of an architect's office, which he should never enter till he has been well grounded in drawing, &c., and as it is now proposed that he should, like the ancient masters, have a knowledge of the figure in drawing or modelling, and also in painting and sculpture, sufficient to be a guide to him in future life; and he would have much reason to be thankful to such a professor for his excellent advice in forming his mind, and rendering him in after-life an ornament to society.

I am merely throwing out these few hints as a stepping-stone for others to follow up in their better judgment. A SUBSCRIBER.

PROPOSED NEW BUILDINGS ACT.

SIR.—As it is proposed to revise or replace the existing Act, let us hope that it may be made applicable to the provinces, or that suitable clauses may be inserted for this object. I have no doubt that most architects in small towns will agree with me, as will any one who has witnessed what I have.

We can most of us remember the great fire in West-street, Gravesend, in 1846, when the whole of that weather-boarded substitute for a street was destroyed.

I was once offered a three-story house in a town of 20,000 inhabitants for 160*l*. The front wall was 9-in. brickwork, the back wall 6-in. brick on edge, the party walls represented by a quarter partitions. No W.C. or privy. Sashes all single hung. I on another occasion designed a pair of cottages for a country builder, who insisted on a wood partition between the two houses; and not only this, but at one part a party floor, not fireproof. On my remonstrating, he merely replied, "That he was going to insure the houses."

If a general Act is carried out, I must suggest a word of caution against local officials; for experience tells me that unless our counties are treated—at least, in this instance—as departments, the Act would be useless. W. S.

The present Act is ill-defined and indeterminate in point of law. We have simply to revert to the Act of 1844 as a model Act, and one that can only be improved by the introduction of a "Metropolitan Buildings Court," with summary jurisdiction, three architectural referees, and a legal assessor. In substance it is a most ship-drawn Act, and is singularly enough appealed to whenever a correct definition is required. This tribunal should be a final Court of Appeal, and independent of any other body. All these changes are productive of inconvenience. A. D. S.

THE DISCOVERIES AT GUILDFORD CASTLE.

At the risk of diminishing the romance which attaches to the discovery of the so-called "dungeons," I would suggest that the caverns now opened were once quarries, from which the supply of chalk was obtained for use in the various buildings, and notably in the interesting Church of St. Mary hard by, restored under my direction a few years since, in which the columns and arches and mullions and tracery of the windows were found to be of chalk, with Reigate fire-stone in parts. The harder chalk would be found at some depth—hence, probably, the extent of the excavation. There are three varieties of chalk in the neighbourhood of Guildford, viz., white chalk, grey chalk, and the beautiful veined chalk which has the aspect of veined marble when varnished. Chalk, however, is little used for building purposes in this Bath-stone age, but for interior use, especially above the line of wear, I think it is a very beautiful and tractable material, taking a good arsis and hardening with age. The lime burnt in the neighbourhood is justly celebrated. THOS. GOODCHILD.

Books Received.

Practical Remarks upon the Principle of Rating Railway, Gas, Water, and other Companies, Land, Buildings, &c. By CHAS. PENFOLD. Fifth Edition, rewritten by JOHN THOMAS KERSBOW. London: Knight & Co., Fleet-street, 1869.

A TIME is coming when a vast deal of valuation and re-valuation must be done, so that the appearance of this new edition of "Penfold on Rating" is opportune. Mr. Kersbow, who is one of a well-known firm of rating surveyors, and brings practical knowledge to the work, has extended the original book to make it include the effects of Acts of Parliament passed since the previous edition appeared. The present editor has a strong opinion as to the liabilities of companies, and has brought together cases that bear on this point. We can recommend the volume to all who are interested in the matter.

VARIORUM.

We need but announce the appearance, as usual, of "Debrett's Peerage for 1869," and "Debrett's Baronetage for 1869," now published by Dean & Son, Ludgate-hill. Great care is evidently taken to keep these works up to the time, and to maintain their ancient reputation. Mr. Hardwicke publishes a "Shilling Peerage," a "Shilling Baronetage," a "Shilling Knightage," and a "House of Commons 1869,"

also for a shilling. The fact that these are all edited by Mr. Edward Walford, M.A., sufficiently guarantees their correctness, so far as they go.

"The Railway, Banking, Insurance, and Commercial Almanac for 1869," edited by Mr. W. Page Smith, which reached us somewhat late in the year, contains its usual large amount of information connected with the interests it addresses.—*Fraser's Magazine* for March, contains "A Note on Paperism," by Florence Nightingale, which may be most usefully studied. Miss Nightingale's proposition as to the punishment of prisoners is less likely to meet with acceptance.—*Britannia*, a monthly magazine, has the advantage of being edited by Mr. Arthur A'Beckett, and illustrated by Mr. Mat. Morgan.

The current number of the *Broadway* contains an appreciative paper by Mr. William M. Rossetti, entitled "Ruskin as a Writer on Art."

The first Annual Report of the Amalgamated Society of House Decorators and Painters, from April, 1868, to December, 1868. Kenny, Printer, Camden-road. This society was established in April, 1868. The general secretary, Mr. G. Shipton, in his report, or remarks, says,—

"Our report for the quarter ending September showed there were 358 members in the society, fifteen of whom had joined under the full force of the rules; and after deducting the cost of sufficient property to start twenty-five branches, and the working expenses of the society, we were left with a balance in the general fund of 41*l*. 4s. 6d., or an average of 1*l*. 1*s*. 5d. per member. Thus it will be seen that nearly the whole of the members became free to all benefits beginning with October, placing before us the worst of the year. In addition to this, the sad depression on all branches of industry—of course including our own—made matters still more against us, and altogether likely to test the solidity of the society to the fullest possible extent.

Now, the lowest sum for which any member can join the society under the rules, before being free to all benefits, is 3*l*. 0*s*. 10*d*.; this ranges, according to the age of the member, up to 4*l*. 8*s*. 4*d*. Thus the many disadvantages under which the society was started will be evident, as upon the lowest payments the sum of 1,167*l*. 6*s*. 8*d*. would have been realised.

"During our short period of existence, the total income of the society has been 544*l*. 18*s*. 3*d*., and our expenditure for property, working expenses, and payment of benefits amounts to 653*l*. 13*s*. 11*d*., leaving a balance of 291*l*. 2*s*. 4*d*. in December. For funerals we have paid 10*l*. or an average of 6*s*d. per member; for sick benefit, 40*l*. 8*s*. 2*d*., or an average of 2*s*. 1*d*. per member; and for the all-important object of providing assistance for our unemployed members, no less than 273*l*. 6*s*. 3*d*. or an average of 1*l*. 7*d*. per member."

Liverpool Institute: The forty-fourth Annual Report of the Directors, January, 1869. Marples, printer, Lord-street, Liverpool.—This report congratulates the members upon the prosperous condition of all departments of the Institute. Various suggestions as to technical education have been carried out practically in the classes of the Institute. The report says as to the Government School of Art:—

"Under the energetic management of Mr. E. F. M. the school is steadily advancing, and it is hoped that the more enlarged management of the Government Art Department will cause an increase, both in numbers and efficiency."

"At the Second-Grade Examination, held in March, 1869, students were examined, of whom 88 wrote, and 108 drew, for excellence. This shows an increase, as compared with 1867, of 23 students who sat for examination, and of 23 hour appointed for candidates still exists, and prevents the late members of the ladies' class competing.

Seventy students sent advanced drawings to London. Money awards were made upon 23; 7 received prizes of the Third-Grade, and 1 received honourable mention. Two drawings were also selected for exhibition at South Kensington."

The twenty-third Annual Report of the Council of the Crewe Mechanics' Institution. Crewe: Bardsley, printer. The council give a satisfactory report of progress. There are science and art classes in connexion with the Government Science and Art Department. In the art division Mr. Turbull is the teacher of geometry and of perspective; and in the science division Mr. Gaister is the teacher of building construction.

Miscellanea.

Danger from Gaseller Brass Chains.—Correspondents of the *Times* have been drawing attention to the risk of the brass chains of gasellers giving way, and the weights falling off. Brass is liable to become brittle, as indeed other alloys occasionally do; and it is recommended that chains of copper should be substituted. Brittle brass, it may be noted, can be made tough and flexible again by annealing; and all brass is not equally liable to become brittle. Brass wire submitted to occasional vibration, while stretched, will sometimes become tender and brittle in a few weeks. Copper, it seems, is far safer than brass for chains.

Street Tramways for South London.—A meeting in support of the attempt to obtain Acts of Parliament for laying down tramways, especially in the south of London, has been held at Kennington. Mr. G. Hopkins, C.E., explained the plan more particularly proposed, including lines to Westminster, Southwark, and other bridges, from different points in the south of London. It is proposed also to connect Lambeth with Battersea Park, and Pimlico with Peckham and Greenwich. The maximum charge by the bills in Parliament would be 1d. per mile. The plan under consideration was heartily approved of, and a petition in its favour resolved on.

Park-lane Improvements.—A communication was received at the last meeting of the Metropolitan Board of Works from the Hon. C. A. Gore, Commissioner of Woods and Forests, in reference to the proposed improvement of Park-lane, and for which a bill is now before Parliament. Mr. Gore said he had consulted the Lords of the Treasury, and had prepared clauses for insertion in the bill for securing that proper compensation should be paid to the Crown and to the lessees and tenants of the houses and buildings in Hamilton-place, not only for the property which may be taken, but also for the diminution in value of the houses in Hamilton-place in consequence of its being converted into a thoroughfare, whether compensation is or is not payable in this respect under the Lands Clauses Consolidation Act, 1845. This letter led to an animated discussion, in which it was strongly enforced that no exception should be made in favour of the owners of this property over what was given to any others whose property was required for public improvements, and especially so as Mr. Gore had thrown every obstacle in the way with respect to the formation of the Thames Embankment. The letter was referred to the Works and General Purposes Committee.

What is to be done with the Irish Church Surplus Fund?—The total charges on the Church, said Mr. Gladstone, while laying down his plan for the Irish Church disestablishment, will amount to about eight millions and a half, and leave to the State seven millions and a half. How are we to dispose of the surplus? The money must be applied to Irish purposes, but not to ecclesiastical purposes. The people must be the recipients. The proposal is to apply the surplus to charitable purposes. Lunatic Asylums cost Ireland about 40,000*l.* a year; Deaf and Dumb Asylums and Blind Asylums are expensive in proportion to the numbers that are relieved; and the maintenance of such asylums is a purpose specially marked out for the utilization of such a surplus as that of the ecclesiastical property. Besides asylums for lunatics, blind and deaf mutes, the training of nurses, the support of infirmaries, of reformatories, and industrial schools might be provided for.

Chambered Tumulus, Brittany.—At the last meeting of the Anthropological Society, Mr. A. L. Lewis, in the course of "Reminiscences of a Visit to Locmariaquer and Gavrinis," said that Locmariaquer, or "Virgin Mary's Town," stands on the site of the ancient Darioirgum, the capital of the Veneti, on the Mer de Morbihan, Brittany, and is surrounded by innumerable remains of its ancient inhabitants. One of these was a dolmen, nearly 70 ft. long, which the author believed to have been intended for sepulchral purposes. Gavrinis, or "Goat's Island," is situated in the Morbihan sea, and is celebrated for its chambered tumulus, the chamber and gallery of which are together about 70 ft. long, 6 ft. high, and 3 ft. wide at the entrance, increasing gradually to a height and width of from 10 to 8 ft. The floor and roof are formed of large flat stones, the latter being supported by twenty-seven upright stones, nearly all of which are covered with incised ornamentations, composed chiefly of segments of concentric circles, interspersed with wavy lines, and resembling somewhat the Northumbrian rock-inscriptions, and those of the tumulus at New Grange, Ireland.

Herculaneum.—The exploration of Herculaneum, one of the cities buried in the great eruption of Vesuvius in A.D. 79, is to be resumed, thanks to a grant of money from King Victor Emmanuel. The researches into the tombs of this city have been interrupted for above twenty years, partly owing to the fact that it is buried not more deeply than Pompeii, and in a material much less easily excavated.

New and Gigantic Plant.—Within the last few days living specimens have been forwarded to this country from Nicaragua of one of the most gigantic plants in the vegetable kingdom. It is closely allied to the Arums (or "Lords and Ladies") of our hedges, and, until the present time, has wholly escaped the notice of travelling botanists. It produces but one leaf, nearly 14 ft. in length, supported on a stalk 10 ft. long. The stem of the flower is a foot in circumference, the spathe or flower 2 ft. long, purplish blue in colour, with a powerful carrion-like odour. As this remarkable species of Aroidæ is quite new to science, it has not yet received a name.

Dwellings for the Industrial Classes.—A meeting of gentlemen interested in providing dwellings for the higher classes of artisans, merchants, commercial, and bankers' clerks, &c., and thus supplying the need created by the construction of railways through the heart of the metropolis, has been held at the residence of the Hon. Arthur Kinnaird, M.P., Pall-mall East. The Earl of Shaftesbury presided. Mr. Haherston, the chairman of the directors of the Suburban Village Company, laid before the meeting their plans, the chief characteristic of which is, that the company proposes to build houses, and then to allot them to working men, who are to be shareholders, whose rents are, in a given number of years, to defray the cost of the dwellings, which then become their own property. The rents thus imposed be stated do not exceed those now paid for houses of a like size and character. The company have obtained a large piece of land from the Ecclesiastical Commissioners at the south-eastern extremity of Loughborough Park, Brixton. After a long discussion, a motion was carried highly laudatory of the scheme as not only advantageous to working men, but as being founded on a safe basis for those who invest their money. In the course of the meeting Lord Shaftesbury consented to lay the foundation-stone of the first block of buildings on Easter Tuesday.

Something like a Rope.—Messrs. John and Edwin Wright, Universe Works, Garrison-street, Birmingham, have just made an extraordinary rope with hemp cord and wire strands, for shipment abroad. It is 11,000 yards long, measures 5½ in. in circumference, and weighs over 60 tons! The entire length of wire, in 60 threads, is 738,000 yards, or 412½ miles. The length of yarn used for the centre—namely, 27 threads, is 405,000 yards, or about 230 miles. Thus there is a grand total of 1,143,000 yards, or 635 miles of material—to make up a wire and hemp rope a little under six miles long.

A Bladder in the Chimney.—A correspondent, "W. B.," writes,—"In your last issue I see a correspondent refers to a bladder being suspended in a chimney. I know of a man who had a chimney that smoked past bearing, and he was advised to suspend a bladder in the chimney, about 3 ft. from the top, and he did so, and he told me yesterday that it had never smoked since. It was an old-fashioned chimney, the bladder was suspended in the chimney the winter before this last, and it has been there ever since."

Tower Subway.—The report of the engineer, Mr. P. W. Barlow, jun., to the directors of the Tower Subway Co., was read at their general meeting on the 26th ult. It stated that the land had been so recently placed in the hands of the contractors, that there was little progress to report in the excavation of the work, but the contractor, Mr. Greathead, had arranged with Mr. Thomas Tilley to sink the shafts, and that the principal portion of the cast-iron shaft cylinders had arrived in London. Mr. Greathead had arranged with Bells, Goodman, & Co., of Newcastle, engineers, &c., to supply the castings for the tunnel. The shield for the tower side is also in course of manufacture by them. It will be constructed almost entirely of wrought iron, and fits over the iron tunnel like the lid of a telescope. The front plate has two openings, 2 ft. square in front of which the heading will be driven; it is provided with sliding doors, which may be closed instantly on the least appearance of water, thus rendering the tunnel water-tight. The lifts, it seems, are to be made for the passengers, but not for the carriages.

Architects' Benevolent Society.—Some of our readers may be glad to be reminded that the annual meeting of the society will be held in the Rooms in Conduit-street, on Wednesday, the 10th instant, at three o'clock.

The Phototype.—In *Scientific Opinion* for 24th ult., an interesting engraving from a surface block, prepared by the phototype process, is given, together with some account of that process, the details of which, however, have not yet been published. By its means, drawings, engravings, or even print, can be copied in facsimile, and printed from, in the form of surface blocks, along with types, without the necessity for employing an engraver, whose place is taken, at considerably less cost, it is stated, by the photographer. The process is not yet completely developed; but if, as *Scientific Opinion* remarks, it can do such good work in its infancy, what may we not expect from it when more matured? The engraving is both elaborate and distinct. Its subject is a magnified representation of those beautiful little organisms, the diatoms of the Arachnoidicæ Japonicæ order, with their concentric-radiate and elaborate structure. The magnified photograph itself, it must be understood (if any such photograph was taken), was not used in the production of the surface block (that final stage of progress, we presume, has not yet been matured): the representation of the diatoms was drawn by the late Mr. Richard Beck; so that this is a phototype direct from a drawing.

The Holborn Valley Viaduct.—At a Court of Common Council, Mr. Deputy Fry, the chairman of the Improvement Committee, in reference to the Holborn Viaduct and the improvements that are proceeding in that locality, stated that there were good grounds for believing that the Holborn Viaduct would be opened to the public in June or July next. The committee had recently examined the works, and they found that one of the principal iron girders had been fixed in its place, and there was every reason to believe that the viaduct would be opened at the time he had stated.

Norfolk and Norwich Archaeological Society.—The annual meeting of the members of this society has been held at the Guildhall, Norwich, the chair being occupied by the Rev. H. Evans Lombe. On the table were some of Mr. Fitch's flints, and some engravings of the Barton turf screen, which was described by the Rev. J. Gunn. The Rev. C. R. Manning (one of the secretaries) read the report, which was adopted. Office bearers were then elected, or rather re-elected; and the skeleton of a paper prepared by the Rev. J. Bulwer and Mr. Rye on the ancient church, and on the port and trade of Cromer, was read. A little discussion took place, the Rev. J. Gunn taking the principal part in it, and afterwards reading a paper on the Barton Turf Road-screen. A letter having been read from Canon Greenwell on the excavations at Grimes Graves, in the parish of Westing, near Brandon, the proceedings closed.

The Rapidity and Cost of the Improvement of Paris.—In a debate of the French Legislative body on a measure by means of which Baron Hansmann wishes the Chambers to legalize what has been done, and is being done, for the improvement of Paris, M. Thiers has been exciting attention by his remarks. According to him, the improvements have been proceeding too fast, and attracting too many of the working classes to Paris; and he predicts that in 1870-71 there must be a crisis.

"Thirty years ago," said M. Thiers, "there was not a shop in Paris which was let at more than 15,000 fr., or 25,000 fr. Now there are some at 80,000 fr., or 90,000 fr. Fifteen years back a square metre of ground cost 500 fr., or 600 fr., now the price is raised to 1,000 fr., or 1,100 fr. And provisions? The increase is enormous. You say that the workman's wages have been augmented. Doubtless; but if he receives more, does he not spend more?" The indebtedness of the city of Paris was pretty generally known before the present debate took place. The *Debats* some time since published a statement of which the summary is, that the sums still due by the city of Paris to the various companies of contractors for the most recent works in opening new streets, and for those still in course of construction, and which payments are to be made out of the proposed loan, amount to 453,033,005 fr. To that sum must be added what has been already paid, which brings the whole up to the end of that year to 74,800,000 fr.

St. James's Tower, Taunton.—At a vestry meeting held for the purpose of considering the state of this tower, it was resolved that, provided funds can be obtained, the tower be taken down and rebuilt, and that a committee be formed to collect subscriptions. Resolutions for the repair of the tower, and for its restoration, were negatived. A committee was then appointed.

A New Fact in the Behaviour of Iron.—Mr. Gore has noticed a new fact in the behaviour of iron under the influence of heat and of strain. A strained iron wire was heated to redness by a current of voltaic electricity, and then, the current being discontinued, was allowed to cool. It was observed that there arrived a moment in the process of cooling at which the wire suddenly elongated, and then gradually shortened, until it became perfectly cold, remaining, however, permanently elongated. No other metal besides iron exhibited this peculiarity, which Mr. Gore attributes to a momentary molecular change, and he points out that this change would probably happen in large masses of wrought iron, and would come into operation in various cases where those matters are subjected to the conjoint influence of heat and strain, as in various engineering operations, the destruction of buildings by fire, and other cases. The phenomenon deserves a further investigation, since every fact relating to iron is of importance to us.—*Mechanics' Magazine.*

Making Mortar.—A correspondent from Syracuse, N.Y., sends us an account of an invention perfected in that city for mixing mortar, which is simply this:—The lime is first slacked in a vat with water enough to make it to a paste, and allowed to retain its heat for about twenty-four hours; it is next run off into a second vat, from which it is pumped by a chain pump to a revolving cylinder that has a large number of spikes on the inside. As it flows from the cylinder, it passes through a sieve of ten meshes to the inch, and every particle that is used has to go through these very fine holes no larger than a pin's head. From this machine it falls into a larger vat, from which it is pumped, as required, to a similar revolving machine, called the mixing machine, into which it flows in a continuous stream; and sand, previously sifted, is added at the rate of about eighty bushels per hour. The mortar made in this way is said to be of a very superior quality.—*Scientific American.*

Green Wood.—A new method for drying green wood in a very short time, it is said, consists in boiling it for some hours in water and leaving it then to cool, by which the soluble substances are removed. It is then boiled in an aqueous solution of borax, by which the insoluble albumen of the wood is rendered soluble, and escapes from the pores. The wood is then placed in drying-chambers, heated by steam, and allowed to remain three days. Wood thus treated is described as being more compact than it would be by ten years of ordinary exposure; as not shrinking, or warping, and as being secure against decay; on account of its greater density more easily polished; and better fitted for articles of furniture and musical instruments.

Restoration of Bath Abbey.—The graining of the nave and aisles has at length been completed, and the money required to pay for it has all been realized with the exception of about 50l. The committee at their last meeting gave directions for concreting the floor of the nave, and for the provision of the warming apparatus for the church. The contractor has been engaged in cleaning down and scraping the walls and pillars, and the other portions of the work will be proceeded with with convenient speed.

Public Works of Board of Works.—The Metropolitan Board of Works have issued a return showing that the following sums had been expended upon the various public works up to the 1st July, 1868:—For the main sewers and ordinary expenses, 3,178,716l.; Covent Garden Approach, 125,400l.; Southwark and Westminster Communication, 597,072l.; Victoria Park Approach, 43,615l.; Finsbury Park, 70,544l.; Southwark Park, 87,954l.; Fire Brigade, 172,482l.; Whitechapel Improvement, 128,520l.; Holborn Improvement, 67,379l.; Kensington Improvement, 112,632l.; Metropolis Main Drainage, 3,957,184l.; Thames Embankment (North), 1,595,052l.; Southern Embankment, 846,010l.; and for Mansion-House-street, 1,254,611l.

Williton Surveyor.—The office of highway surveyor for Williton having become vacant by the resignation of Mr. Williams, the Highway Board received no fewer than fifty applications for the vacancy. Out of that number two were selected, Messrs. A. Durie, surveyor, of Dunster; and Mr. Evans, assistant surveyor, Toldine, Worcester, the former of whom has been elected to fill the situation, at a salary of 200l. per annum.

Now English Church at Hyeres.—A correspondent, writing from Hyeres, says:—"On Wednesday last the new English church at this place was opened for public worship. There was a large congregation, and the Mayor of the town and the Juge de Paix were present. The building just opened is commodious and well-finished, and does great credit to all concerned in its erection."

Another Theatre Burnt.—The theatre of Cologne has been burnt to the ground. The man in charge of the building, with his wife and five children, perished in the flames.

Telegraphic Progress.—A telegram from Cuba states that Sir Charles Bright has succeeded in picking up the submarine cable lost during the last summer in the gulf-stream, between Florida and Havannah.

Timber under Hearth Stones.—Kendal Town-hall narrowly escaped being destroyed by fire a week ago. Under the hearth-stone of the news-room was a piece of timber, and the stone having cracked, the wood became ignited.

The Literary Fund.—Lord Stanley will preside at the ensuing anniversary dinner, Wednesday, May 5th. The general meeting for the election of officers will be held on Wednesday next, March 10th.

Bombay.—A time-ball tower has been erected here from the designs of Mr. W. J. Addis, who is the engineer to the Local Fund Works, Tanna. It has been erected under his superintendance at the cost of 17,000 rupees.

The Somerset Archaeological Society.—The first conversations of this society for the season has been held at Taunton, when several papers were read. There was a large attendance, including ladies. The meeting was held in the Museum, and Mr. J. Hamilton, of Fyne-court, presided.

United Service Institution.—On Friday, the 12th inst., Mr. W. Cave Thomas is to read a paper on County Military Training Schools, a suggestion for improving the recruiting system.

TENDERS.

Accepted for the erection of a chapel in Park-road, Batley, for the Christian Brethren Society. Messrs. Sheard & Hanstock, architects:—

Mason's Work	£120 0 0
Preston & Webster, Joiner's, &c. Work	519 10 0
Iberson, Slater's, &c. Work	47 16 0
Steers & Stocks, Plasterer's Work	78 10 0
Kitchingman, Plumber's Work	20 0 0
Lohley, Painter's Work	24 0 0
Kershaw	24 0 0

Accepted for the erection of a warehouse, houses, offices, &c., at Bulrush Mills, Batley, for Messrs. Talbot, Senior, & Talbot. Messrs. Sheard and Hanstock, architects:—

Mason's Work	£801 0 0
Riley, Joiner's, &c. Work	612 0 0
Jowett, Ironfounder's Work	40 0 0
Bageshaw, Plasterer's Work	28 10 0
Hey, Plumber's Work	26 0 0
Lohley, Slater's Work	120 0 0
Riley	120 0 0

For alterations and additions to Bowater House, Hampton Court. Mr. H. H. Collins, architect:—

Dawes	£1,855 0 0
Stuart & Bennett	1,478 0 0
Albiston	1,880 0 0
Wheatley	1,369 0 0

For St. Philip's Church, Battersea. Mr. T. J. Knowles, jun., architect:—

Total, including Spire	Spire	
Beaver	£13,793 0 0	2794 0 0
Shaines & Son	17,750 0 0	765 0 0
Baker & Constable	12,750 0 0	700 0 0
Nightingale	12,385 0 0	750 0 0
Conder	12,290 0 0	689 0 0
Hopson	12,058 0 0	603 0 0
Cooke & Green	11,975 0 0	676 0 0
Bennett	11,418 0 0	705 0 0
Dave Brothers	11,393 0 0	553 0 0
Windsor	11,296 0 0	675 0 0
Manley & Rogers	10,970 0 0	670 0 0
Sawyer	10,826 0 0	780 0 0
Johnson	10,809 0 0	574 0 0
Carter & Sons	10,470 0 0	619 0 0
Colls & Son	10,340 0 0	570 0 0

Accepted for new infirmary and other additions at the Bedford Union, Nottingham. Mr. S. J. Barber, of East-wood, architect:—

Mr. G. Hopewell	£7,997 0 0
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For the erection of a Wesleyan Chapel at Lewisham. Mr. John Tarring, architect:—

Bishop	£4,945 0 0
Frederic & Son	4,826 0 0
Simpson	4,700 0 0
Higgs	4,658 0 0
Killy	4,638 0 0
Scunders	4,455 0 0
Carter & Sons	4,235 0 0
Newman and Mann	4,100 0 0
Hill & Sons	4,100 0 0

For seven houses and shops in Duke-street, Brighton, forming part of the "Duke-street improvements," for Mr. John Hart. Mr. R. H. Nunn, Architect. Quantities supplied:—

Chappell	£5,984 0 0
Cheesman & Co.	3,950 0 0
Wilson	2,980 10 0
Palchick & Sons	6,750 0 0
S. & W. Daney	5,680 0 0
Druton	5,460 0 0
Lockyer	5,450 0 0
Parsons, jun. (accepted)	5,200 0 0

For building new coffee saloon and shops in Villiers-street, Strand, for Mr. C. Gatti. Mr. Bolton, architect:—

Hill & Son	2,875 0 0
Nixon	2,843 0 0
Sharplington & Cole	2,761 0 0
Carlow	2,788 0 0
Ward	2,297 0 0
Carter & Sons	2,200 0 0

For works at Hanningfield and Blaxton. Mr. R. W. Johnson, architect:—

Herbert	£1,860 0 0
Neale & Sons	1,843 0 0
Clayton	1,838 0 0
Halliday & Cane	1,824 0 0

For villa residences, West Cowes, Isle of Wight. Mr. R. W. Johnson, architect:—

Clinch	£5,400 0 0
Ball	4,780 0 0
Wheeler	4,970 0 0
Thomas	4,597 0 0

For six cottages at Kettering, Northamptonshire. Mr. R. W. Johnson, architect:—

Bellamy	£912 0 0
Wilkinson	883 0 0
Hawthorn	890 0 0
Margetts	683 0 0
Starman	761 0 0
Barlow	651 0 0
J. & G. Henson	644 0 0

For five houses and shops in the Fulham-road, Chelsea, for Mr. H. G. Henshaw, Mr. Lay W. Ridge, architect. Quantities supplied by Mr. L. O. Riddett:—

Gannon & Sons	£7,204 0 0
Richardson	6,985 0 0
Williams & Son	6,967 0 0
Webb & Sons	6,750 0 0
Macey	6,744 0 0
Adams & Bous	6,423 0 0
Foster	6,469 0 0
Servicor & White	6,283 0 0

For new church of Webbhead, Bromsgrove, for the Right Hon. the Baroness Windsor. Stone principally given. Mr. Frederick Preedy, architect. Quantities furnished by Messrs. Goodman & Venn, architects:—

Girdle & Smallwood	£2,825 0 0
Wheatley	2,179 16 0
Espley	2,351 8 8
Jones	2,313 10 0
Field	2,217 0 0
Nelson	2,062 0 0
McCann & Everal (accepted)	2,019 10 0

For rebuilding chancel and restoring the parish church of Keston, Norfolk. Mr. Frederick Preedy, architect:—

Turner & Sons	£1,203 19 0
Brown	1,008 0 0
Cornish	1,008 7 0
Bardell & Son (accepted)	921 10 0

For building four shops, &c., at Hounslow. Mr. J. Holme, architect. Quantities not supplied:—

Westcombe	£2,170 0 0
Peatman	2,300 0 0
Hiscock	2,369 0 0
Brunden (accepted, subject to alterations)	2,265 0 0

For the erection of a house and shop, for Mr. A. Baker, Sudbury, Suffolk. Mr. T. F. Kay, architect. Quantities not supplied:—

Grubbs & Son	£2,720 4 0	£72 0 0
Holland	2,743 6 0	—
Grinwood & Son	2,200 0 0	—
Halls	1,614 0 0	53 0 0

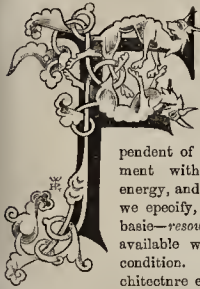
TO CORRESPONDENTS.

G. B. — W. B. — W. J. A. — R. H. N. — C. G. — E. W. J. — S. W. — Z. — T. O. — S. & C. — S. G. — J. — A. G. — B. J. — J. G. — E. J. — Mr. P. — J. T. — J. L. — C. — L. — C. — R. H. — L. W. — R. A. & C. — Mr. L. — W. J. — R. W. K. — S. J. — B. — T. B. — B. & O. — F. M. — A. Schuchler. — L. S. — M. A. B. — R. & R. H. E. — O. F. — W. C. T. — J. T. — Mr. — N. A. H. — J. A. — R. — C. — B. — D. — T. — F. & Co. — J. T. — F. — W. — S. — K. G. B. H. A. — W. C. — R. — A. — M. — J. M. O. — W. L. (under the mark). — C. B. (send particulars of the coal). — S. E. B. (next week). — T. J. H. (next week). We are compelled to decline publishing cut books and giving addresses. All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the tenderer, not necessarily for publication. Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

The Builder.

VOL. XXVII.—No. 1362.

The Conditions of Architectural Achievement.



OR the realization of high architectural as of other artistic achievements, there are conditions which are quite independent of the artist's endowment with original genius, energy, and culture. Of these we specify, first, the material basis—resources; the fund of available wealth is one such condition. Fine art—fine architecture especially—will not easily ever be very cheap. The co-operation of many hands, especially when time presses, is indispensable; and for best works, the best materials,—for largest works, the most ungrudged quantities,—are indispensable. Beauty, indeed, sometimes seems even a spontaneous outgrowth of superfluity; and art has appeared to thrive as by process of nature,—of evolution, in direct consequence of large resources being concentrated in few hands; when the rich and the powerful, after all lower and more vulgar needs have been satisfied to the full, have still found themselves encumbered with wealth, with means of enjoyment, of which they grudged the idleness, and appealed to the ingenuities to invent means of making practically fruitful of pleasurable excitement in some form or other. Such occasional instances of plethoric abundance furnish chances, at least, for abundant experiments, allow room for numerous and extensive failures; and out of the entire harvest of tares, and whatever else, all growing up together, posterity has not infrequently found that something has come down from a generally base, no doubt, but withal a very productive and prolific time, that is worth preserving, and for which the world may be thankful through all time.

The contingency of means being granted, opportunities come, in the second place, among the happy conditions of noble architecture. Inigo Jones fell upon evil days; and Wren, in this respect at least, upon more fortunate. It is not every architect who has a St. Paul's to rebuild, and not every general who has even a chance of a Waterloo reserved to crown his career. Coming at the very contact of transition, Whitehall was but half a chance for Inigo Jones: the half chance was not sufficient. In our own days we have probably nothing to complain of so far in respect of either head or conditions for architectural success—as little of opportunities as of resources. Fire has cleared large areas for an Exchange, a theatre, and for House of Parliament, and the mere growth of the Capital, and of its wealth, has been equivalent to the foundation of a new city, and the movement within the church has opened opportunities that even Wren might have envied.

But besides the occasion and the means, there are yet other conditions to be postulated before the eager energies of the architect can be released to have their full career. In every art the patron will control the artist; it is not only that "the drama's law the drama's patron give,"—such is the condition of the acted drama,—but because

"Those who live to please must please to live."
The predilection of patrons must and will be consulted in every art,—must be dealt with,

considered, conciliated. Only so in many cases can the commission be obtained at all; only so can the competition for employment of wealth be diverted to a fair extent in favour of architecture as against other arts or other artistic employments, as shows, parade, and retinue,—as horse-racing, gambling, and so forth.

It is the condition of truly fine art that we are here considering, and we postulate, therefore, for the happiest form of the condition now in question,—the sufficient taste of the patron,—the patron, who, whether private individual, inspirer of a committee of taste, or minister practically irresponsible, can give or withhold the commission to one art, or to one artist or another.

The good taste, or the sufficient taste exemplified by good sense and good judgment, of the patron is a most cardinal condition; for,—

"That without which a thing is not,
Is causa sine qua non."

It may seem the paradise of an architect that he should be independent of this condition entirely. Much, no doubt, of the worldly wise professional tact of every art is directed to compassing each independence. Lawyers have liked to take the suit out of the hands and control of clients to an end of unlimited detriment and damage; and doctors to stand upon a professional etiquette that will conserve engrossment of the patient even at the risk or the sacrifice of the patient's life. These are abuses that have no affinity to the ascription of worthy self-respect; in many cases, no doubt, the interest of art, and of the patron too—quite apart from the artist,—will be served by his assertion of independence, by daring, by emancipation from control, even control that should be most legitimate. The artist often knows better than the patron what will ultimately please him—even the patron, to say nothing of the rest of the world or posterity,—as the doctor than the patient what will ultimately be the best for him and cure him; but the fallibility of human judgment apart, the arbitrary power that an artist has the chance of grasping is sometimes too much for mortal virtue, and he himself in his best interests may be well pleased to be spared the opportunity of helping himself to any extension he pleases of an original scheme, of committing his employer—national or private—to enterprise that, having been commenced, must be completed; this is a temptation that accrues most alluringly when a work has been entrusted to him on lax or undefined conditions; and on occasion the terms on which it is entrusted may be virtually at his own command,—such being his exclusive power of executing the work,—such the prestige that impose him upon the world.

Well-cultivated taste on the part of the patron is a condition, then, that is most important and indispensable at the first stage of the design. The commission once given, bad taste in the patron may be overruled—ignored—neglected—evaded,—and the able at once and accomplished artist may, by cleverness, daring, energy, nay, impudence, get his own way, to the great advantage of all the world, and of the patron above all. But, then, ill taste on the part of the patron may throw the work at the beginning, by the exercise of his free arbitration, into hands that are quite as dexterous in escaping from control, but will use independence for making bad worse,—for not correcting, but exaggerating mischief.

The taste of the patron is exercised at the preliminary stage, partly upon the executed works of the master, and partly upon the drawings and plans—the designs—for the proposed work. The uncultured patron will always be liable to be misled by drawings—to take the best, the most taking drawing, for the best design—to be least susceptible of influence by expostulation—to be swayed by most transitory fashion. In fact, when patrons are extensively

destitute of culture, they are open to be tempted on by one taking extravagance after another, until a fashion is established, that has no more relation to good taste than crinolines and chignons, and that perpetuates itself by simulating a natural development, a fictitiously imposing harmony with the current of events—the tendency of opinion. How can even genius withstand such false conditions? Commissions must be obtained, and one must be so executed as to lead to others; but how, then, for the chances and the destinies of truly fine art?

Fine taste may pertain to a mere dilettante, if you will—that the most truly artistic genius may most truly and worthily respect. In all the arts, we know that fine appreciation is independent of faculty of original invention or execution; and the musician goes home from the opera-house depressed at the reception of a work, that is the verdict of those who never could invent—of many who could never execute—a har of music,—but that he knows too well is a true finding.

Hence cultured taste in the patron is a condition of fine works of art, by no means simply because it shuts out the chances of selection of wrong artist or wrong design. Sympathy in taste between artist and patron is a very powerful—not incentive alone, but something still more important—factor, let us rather say, in the case. The most ingenious lawyers have been known to admit that they have owed most important revelations of the bearings of a case to the sharpened and concentrated interest of the client, who had no unusual ingenuity or perquacity of mind, and for knowledge of law or equity none at all. It is to the fortuitous concurrence of such elements—of the competent, the accomplished artist, and the worthy patron—that the best triumphs of art are due. What a concurrence of this kind is not implied in the Steine chapel,—in the combined literary knowledge, philosophical and historical insight, and artistic power in the Stanze of the Vatican! It was to such a bond as uniting sculptor, architect, statesman, Phidias, Ictinus, and Pericles, that we owe the Parthenon and Propylæa,—to such concentrated harmony, when laymen, like William of Sens, co-operated with ecclesiastics, that we must owe cathedrals elsewhere besides Canterbury. The buildings on the Acropolis might not have been so perfect but for the interest in architecture, which Pericles may have inherited from the Alcmaeonide, who in their exile rebuilt the temple at Delphi, and with gratuitous liberality, with marble instead of stone. It was probably on account of his knowing so much as he did that he did not interfere more, while still giving the best artist the best aid. Of all the Homeric heroes, it is Paris who rejoices most conspicuously in the ornamental; whose equipment is as decorative in the field as might be expected from his being found polishing his arms in his retirement. We cannot doubt that the poet implies that the same sentiment for the ornate ruled in his palace—the beautiful palace, which was designed—by whom?—"by himself, along with the men who at that time were most excellent among the artificers of Troy." (*Iliad*, vi. 315.)

Finally, on this head, it is not to be dissembled, that artist, no less than scientific investigator, is apt to be encumbered with all the besetting Baconian idolatries. His special predilections—idols of the cave—have to be kept in check by conference, not to say conflict, with others; and his professional tendencies may themselves, as idols of the tribe, require, above all things, the corrective influence of one who, by his exemption from these, as non-professional, is naturally, and in no unimportant particular, in a position of actual advantage. It is a generously emphasized declaration of one who stands in the very front rank of his own intellectual study—of Sir John Herschell—that no art and no science can retain long a healthy condition in

which the professional students are not checked by the concurrent attention of a well-cultivated body of the non-professional.

There is one more most important condition of architectural achievement that still remains to be noted, and this is, the stimulus of *worthy contemporaries in art*, whether as competitive or in sympathy. Fine art will only be achieved when the artist sets value upon, and has a reasonable chance of receiving the finest appreciation. Something—much, no doubt—he will always do beyond the requirements of the moment, and of the general public, for the satisfaction of his own soul. No one can suppose that the best possible success upon the stage, secured by the actual supervision of the author, requires the full development and finish that has been given by Shakspeare to "King Lear." There is always the consciousness, moreover, that the present of the architecture is, after all, not a momentary present. There must, therefore, or there should be, a fund of reflection and a force of feeling embodied in the work,—a potential energy for development during continued contemplation, if only for the currency of a lifetime. Still, human nature is weak. The orator who prepares his invectives in his study, and practises his intonations in solitude, cannot, however much he may desire it, give them the ring that they will carry to the ears of his actually present and attentive rival; can no more do so than a racehorse could stretch over the two-mile course alone, in the same time as when another is straining forwards at his flank. Worthy rivalry is requisite to bring out all the powers; and, under this stimulus, work is put into work that may easily escape the detection of the best criticism of the amateur, but will tell, nevertheless, upon his sentiments more and more as time goes on,—will secure that continued power of pleasing, which is the last test of all excellence in art. Bitter enough has been apt to be the rivalry of artists. How should it be otherwise? How should contemporaries exactly measure themselves against each other? They can scarcely be called upon, how then expected, to do so, in the heat of the battle of life and struggle for existence; human endeavour has its limitation in human weakness. But the difficulty cannot in fairness be recognised as always one merely of candour. The point of view of one artist relatively to another must always be one of disadvantage, and if he can justly estimate his rival, he is often truly disabled from gauging his own qualifications. These are often, by their very nature, as progressive, to as great extent as much a mystery to himself as to others. He has a consciousness of power—of power that has yet to be developed—he may as yet not know quite in what direction; he cannot at all judge to what extent. When the life-work of both draws to a close, he may, having all the field of achievement before him, know, and may then admit, the truth. Even in the mean time, however, generous allowance of merit, if not of relative merit, is the due and the right. The effect of such generosity in emulation goes far to explain the phenomenon of the appearance of great geniuses in groups. The coincidence of a second noble career enhances the development of the first. Raffaele thanked God that he lived at the same time as Michelangelo, and with good reason; his best friends recognized how much his style was modified by observation of that of the Florentine, but emulation may be believed to have had as important an influence upon the development of his proper genius as the more instruction of imitation; telling, as it would, not only on what he derived, but also on all that he had of his own most independent and original. And even more emulation was still further heightened in effect by the confidences that he would be understood, he appreciated, by the very genius he was eager to rival, and who, more than all others, must be competent to appreciate him. That the rival did so there is little doubt, though the admission may have taken too much the form, in his own words or those of his friends, of ascribing excellences too exclusively or in too large proportion to what was borrowed rather than what was learnt,—to what was learnt rather than to what was suggested to a sensibility that was singularly apt to respond to such a stimulus.

As regards our own prospects of art in architecture, when we review these conditions of success, we are not disposed to anticipate,—to recognise a dearth of genius; we may trust to be on a par with, if not better than, our stars. After this main condition, wealth and occasion are not likely to fail us; generous and stimulative emulation we would hope as little. As regards the culture of those with whom rests the con-

ferment of the commissions, and no little of the control of them, this also we may trust, at knowledge, as free discussion, and trained experience are extended, is not doomed to be entirely or for ever inauspicious.

HOW JOHN YE SON OF SMYTH BEAUTIFIED YE HOUSE OF YE LORDE.

It came to pass in old time that there dwelt in the north country a people which was great and powerful, and like them was none other nation under heaven.

And their merchandise was on all seas and in all lands; and they were wont continually to trade in great ships with the people of all kindreds, nations, and languages, in gold and in silver, and in silk and in woollen, and in whatsoever merchandise can be made for money; and they waxed exceedingly, and prospered, and no poor man was seen among them; for they kept them aloof in their cities, in desolate places and in wily streets, where the light of heaven came not, and where no comfort was.

And the people dwelt at ease, and governed their affairs with discretion; for they had in their chief city a talking-house, where chosen men were placed one against another, and they rest not day or night, but did continually talk for the good of the whole nation.

Nevertheless this people loved not that which is beautiful, neither comprehended it; seeing that the men among them wore upon their heads a thing after the likeness of a pot, and their women fashioned their heads like nothing in heaven or in earth; and their chairs and their tables, and whatsoever was for use in their dwellings, were fashioned after no order at all, but in scrolls and in curls, and in every manner of way that was to no good purpose, so as no man ever saw the like, and there was no sense in them.

Likewise, also, their dwellings were a marvel to look upon, for they made them of hurt clay, after the same manner, for many miles, one dwelling like unto his fellow, so that it was a weariness to look upon them; for if one looked this way, behold, clay walls with square holes in them; and if one looked the contrary way, behold clay walls with square holes in them; and they dwelt contentedly behind them.

Now, there arose among this people certain which said, "Behold now, all ye people, and consider the temples which were builded by our fathers aforetime, and which remain unto this day; how they he great and high, and cunningly wrought in all manner of ornament, and strange devices, right pleasant to behold; wherefore build we not them after this manner, that so our name may go forth among the nations, and our fame may endure under the sun among our posterity? For ye see that we he a hyword among the nations touching our buildings, forasmuch as there is no man among us that can build after this sort."

Then they stirred up the people, so that many men of them went forth throughout all the land, with measuring rods, and with tables, and with gravers, and with all manner of implements, to the end that they might measure the buildings of their forefathers; and the land was overrun with them. Also, there were among them that wrote hooks, and they put into the hooks all things whatsoever they had measured, and divers also which they had not measured, and there was no end of their hooks.

And it came to pass when they had measured every stone which was in their own land, that they were at their wits' end; howbeit, they girt up their loins, and went their way, each one with his tablet, and with his graver, and with all manner of implements, till they came unto the south country, and there also they measured all buildings whatsoever they could find, and they left not one stone upon another the which they did not measure. For they said, "Lo! these are fairer than the buildings of our forefathers." And they that were unlearned and ignorant gave credence unto them, and gave them fine gold for to build all manner of buildings such as had been built before. And if any man took upon him to build after his own heart, and so as had not been done aforetime, they said, "Lo! what is this?" And they were offended at him.

Howbeit some of their buildings fell down again. Now, when these things became known to the dwellers in the town that is called Muford, they came together with one consent—that is to say, the chief magistrate and the council, being two sons in all—and said, "Ye see, brethren, how

that, over all the land, there are built new temples, after the manner of our forefathers, and how also that the dwellers in the town of Muford, which are our enemies, have built unto them a temple on this wise, with large money; how also that our own temple is dirty and hattered, and is at the point to fall, and we are in case to be despised in the land; go to, then; let us build a temple even as others, after the manner of our forefathers, and our fame shall be known thereby." The council also spake concerning "the glory of God," but no man hearkened unto him.

Then they gave proclamation unto all such as were cunning to make buildings after the orthodox pattern, and promised to him who should send to them, by the first of the month of Ahih, the device of a temple graven on tablets, even to him whose should please them by his device, ten shekels of silver and two changes of raiment, and furthermore that he should be appointed chief artificer to erect the same. But they lied unto them.

And all the artificers, in the east and in the west, and in the north and in the south, when they heard the proclamation, laboured mightily unto the going down of the sun to deliver themselves of cunning devices for a temple, and all their servants and chief helpmeets sweat night and day over the work. And when the chief magistrate and the council arose in the morning, behold the devices of all the artificers lay upon the floor of the council-chamber, so that there was no room for a man to turn.

Then they hung them up, and they were of all shapes and devices which had ever been imagined by man; and behold they were very costly. And the chief magistrate and the council walked up and down amongst them, and they shook their heads and rent their clothes, and wist not what to do. Then they sent all the devices back to them who had sent them, with small thanks. Then all the artificers cursed the chief magistrate and the council with one voice.

For, moreover, they had also to pay the carriage.

Then there arose up one of the chief men in the town, and said, "Behold now, there is a man whose name is John, which is the son of Smyth, which was the son of Jones, which dwelleth in the chief city in that quarter which is called Myle-ende; seek ye now unto him; even he is cunning to devise such a temple as ye require." Then they went with one accord to the part of the chief city called Myle-ende, and inquired for the said John. And him they found in his habitation, where his name was written up in letters which no man could read, and all things whatsoever that were in his habitation were astonishing, for all his chairs and tables and whatsoever he had were full of angles and juttings and coigus and elbows, so that no man could use them with safety; furthermore, they were all painted with divers colours fit to knock a man down. And John the son of Smyth appeared unto them half-dressed and with his beard hanging down to his waist, and spake roughly unto them. And they told him their business, and covenanted to give him money. Then it came to pass that he knocked off a design in double-quick time; and it pleased them, and they appointed him chief artificer to oversee the work. And this was the fashion of it:—

It was seventy cubits long and forty cubits wide; and the walls were of hurt clay of all manner of colours, in stripes one over the other continually; and it was so. And forty cubits length was for them who worshipped, and thirty cubits length was divided therefrom for the priest; and it was railed off with a railing fearful to look upon, for it was all twisted and knotted and spiked, to the end the worshippers should not climb over into the holy of holies. And the windows were a cubit in width, and they were arched with arches four cubits in depth above. And the great arches were notched at the edge after the semblance of a carpenter's saw, and they rested on marble columns with chapters and hases; and the size of the columns was on this wise, namely, one cubit high and two cubits wide; and it was so. And as for the ceiling, there is no colour that was ever known of man but it was found thereon; and the beams of the ceiling were painted round in rings and stripes, after the likeness of a ring-tailed opossum, so that one knew not what to think. Moreover, John the son of Smyth contrived also a font to stand near the door of the temple, and a pulpit to stand near the opposite end; and they were supported on columns with chapters and hases howbeit, the columns had been for-

gotten, and every chapter stood upon its base; and he saw that it was good. And round about them were cunningly carved figures of apostles and saints after their kind; and their likeness was as the likeness of the small ape which hoppeh upon an instrument of music in the streets of the city, even hoppeh for balpence; in this fashion they were carved. And in the windows be placed also images of saints and angels after their kind, fashioned in coloured glass, and this was the fashion of them; every of them stood upon tip-toe, and each of them held up two fingers after his kind; and their faces were long and thin, and they had no elbows or knees, but were fashioned after a wonderful manner like nothing that was ever seen on earth. And in every part of the building, whether it were in clay, or in stone, or in wood, did John the son of Smyth cause to be cut and sunk many round holes, so as that the whole building was full of round holes; divers of the windows also were of round holes, with lesser ones about them. And on the outer side of the temple he did cause to be carved many beasts and horrible monsters, such as never were seen since the creation of the world unto this day,—no, nor ever shall be; and all the world wondered after the beasts. And on the roofs of it, and at the height of the tower of it, he caused to be placed wonderful erections of iron of fantastic shapes, even as though a grove of plants were sprouting from the roofs; inasmuch that the people wondered.

Also beside the holy of holies he placed an instrument of music, even an organ, embellished after a marvellous manner, and painted about with paintings of angels, and their wings were red on the one side and green on the contrary side, and they bore every one a domestic nitenil in his hand; also the pipes of the organ had suffered from an erysipelas. And over all the temples likewise he caused to be painted what he affirmed to be ancient religious texts; howbeit no soul did fructify by the same, for they were in unknown characters so as no man was able to make so much as a head or a taylor thereof.

And when John the son of Smyth had concluded the temple, all were of diverse minds concerning it. And some said that it was a thing of hearty and a joy for ever, and again some said profanely that it was hideous, and other some that it would not stand. But John the son of Smyth said to the chief magistrate, "Did I not covenant to erect a temple for thee, and have I not accomplished my covenant? If so be that it stand not, or thy people like it not, what is that to me? Pay me that thou owest!" And they gave him paper whereupon was graven "I promise to pay," and he went on his way rejoicing.

ARCHITECTURE AT THE ROYAL SCOTTISH ACADEMY.*

The display of architectural drawings this year is more than usually meagre.

The churches are all of small dimensions, and are thirteenth-century Gothic in style; (it is rarely that we see one designed in any other at the present time,) and they only vary in the mode of applying the well-known features of the style, some of them having more or less of a leaning towards the French variety of it.

Mr. Robert Anderson exhibits an exterior and interior view of St. Andrew's Church, Kelso; it is a decided advance upon his former efforts, which, though correct enough, were heavy and ungraceful. We have here a well-proportioned, carefully-detailed little church, with aisles, chancel, and bell turret of purely English character. There is no effort at originality, but it is more satisfactory than some other designs where a strenuous endeavour has been made to attain that end.

The M'Cheyne Memorial Church at Dundee seems to have been the subject of a competition, the successful competitors being Messrs. Pilkington & Bell. The design is such as would be attractive to a building committee, and looks better on paper than it will do in execution. It has a spiky-looking spire, and the body of the church is broken up into parts in a manner that does not seem to be called for by the requirements of the interior. The doorway, with its square, angular label moulding and cusped pediment, is not in keeping with the other details, and the general effect is somewhat overstrained.

The second design in the competition, by Mr.

H. A. Nisbet, is much more simply treated. The exterior is an echo of the interior arrangements, and suitable for a Presbyterian place of worship, where galleries are required. To carry out the successful design in its entirety would evidently cost more than its rival, and without its spire the result would be lame and impotent.

The Free West Church, Perth, by Mr. J. Honyman, has a well-developed spire, the parts of which are happily combined. So far as appears from the drawing, the body of the church is greatly subordinated to the spire.

The church for the Rev. D. K. Guthrie, by Mr. J. W. Smith, is good in intention, but feeble in execution; it lacks emphasis in the detail, and the side porch and vestry are very unhappily combined.

It hardly requires a reference to the catalogue to ascertain that "Trinity Church, Irvine," is the work of Mr. F. T. Pilkington; his designs possess a peculiar character of their own, and they make effective and striking drawings. On analysing the detail, it will be found unusually large in proportion to the size of the buildings, so that every item of decoration claims attention; there is no reserve, the architect displays his whole forces at once, and thus it is that his designs, though out of the common run, begin to pall the appetite by excess of piquancy. One does not desire to have every dish highly spiced; an admixture of plainer food gives zest to the remainder, and is better for the constitution.

The introduction of railways has given rise to an unprecedented increase in the amount of hotel accommodation in Edinburgh, and that, probably, to a greater degree than in any other city in this country of similar dimensions. The additional accommodation so provided is, however, far from being satisfactory; the expedient adopted has (with one exception) been to extemporise two or three adjoining dwellings into a hotel, and of necessity the internal arrangements are very inconvenient. The one example of an entirely new building having been produced is called "The Edinburgh"; it occupies a convenient and conspicuous position in Princes-street, but it is far from being a model, either as regards internal arrangement or external effect. There are three designs for hotels exhibited; one of them is to be erected towards the west end of Princes-street, and is designed by Mr. Lessels: the ground floor is occupied by shops, presenting a field of glass uninterrupted by any visible supports for the superstructure. Above this are four stories, Italian in style, and the roof is broken into the form of a mansard in the centre. The whole elevation is flat, tame, and commonplace, and the combination of the parts (particularly the horizontal architraves over arched windows) is crude and unsatisfactory.

Mr. Dick Peddie exhibits a design for a hotel in connexion with the North British railway station, and, in the drawing, the space here formed into a market is represented as occupied by a bazaar, of two stories in height, with open court in the centre, and a promenade above on the level of Princes-street. The idea of forming the roofs of the market-stalls into a terrace walk is a happy one, and would go far towards remedying the error of placing the market on the site it now occupies. The hotel is a light and cheerful-looking building, of French character.

Mr. Robert Matheon exhibits a design for a "Grand National Hotel," on the same site, but he does not propose to interfere with the market. The elevation is a repetition of the General Post-office, with slight alterations in the fenestration, and the substitution of louvre for flat roofs on the pavilions.

The building of a hotel or other structure, if possessed of any architectural merit, on the site indicated, would be a manifest improvement to a conspicuous part of the city; it would hide the unsightly back and adjuncts of the northern division of Bridge-street, and produce a more harmonious combination of lines than exists at present.

Glengyle-terrace, now in course of erection, by B. D. McGregor, is an instance of a builder being his own architect, and the result is what might have been expected in the circumstances. The detail is weak and ineffective, and a long line of horizontal cornice breaks abruptly into an efflorescence of octagonal turrets at one end of it.

"Glenmayne House, Galashiels," by Mr. Dick Peddie, is not a very remarkable mansion in the Scottish baronial style.

More worthy of notice is "Craigend, near Liberton," by Messrs. Pilkington & Bell. The general outline is that of a Scotch baronial residence, but the detail has a French Gothic

cast and is sparingly applied. The combination is happily effected, and the mansion is elegant yet homely, and comfortable-looking.

The villa by Mr. W. Richardson is large enough to be styled a mansion. It is one of the best examples of Gothic applied to domestic purposes that has been produced north of the Tweed. There is no exuberance of detail, and the proportion and distribution of the parts are well considered.

"Ballikinran House, Stirlingshire," is a dignified baronial residence, by Mr. David Bryce. The offices attached to it are carried out with such a degree of munificence as to make them as important a group as many a mansion.

"Blair-Drummond House," by Mr. J. C. Walker, is not satisfactory. Having an entirely new mansion, upon a large scale, to design, the architect should have sought for unity and dignity of effect; he has, however, cut up his facade into a multiplicity of parts that suggest the idea of patchwork and alterations upon an old fabric. As usual with most of the large mansions now erected in Scotland, it is in the Baronial style introduced into the country by French architects when it was a separate kingdom.

Mr. Walker also exhibits a view of the "Waverley Hydropathic Institution, near Melrose," which is well arranged and suitable for the purpose intended, and will at the same time be an ornament to the neighbourhood of this favourite summer resort.

BEHAVIOUR OF PORTLAND CEMENT.

Sir,—A Builder* in your last number asks for information as to the behaviour of Portland cement under somewhat vaguely described circumstances.

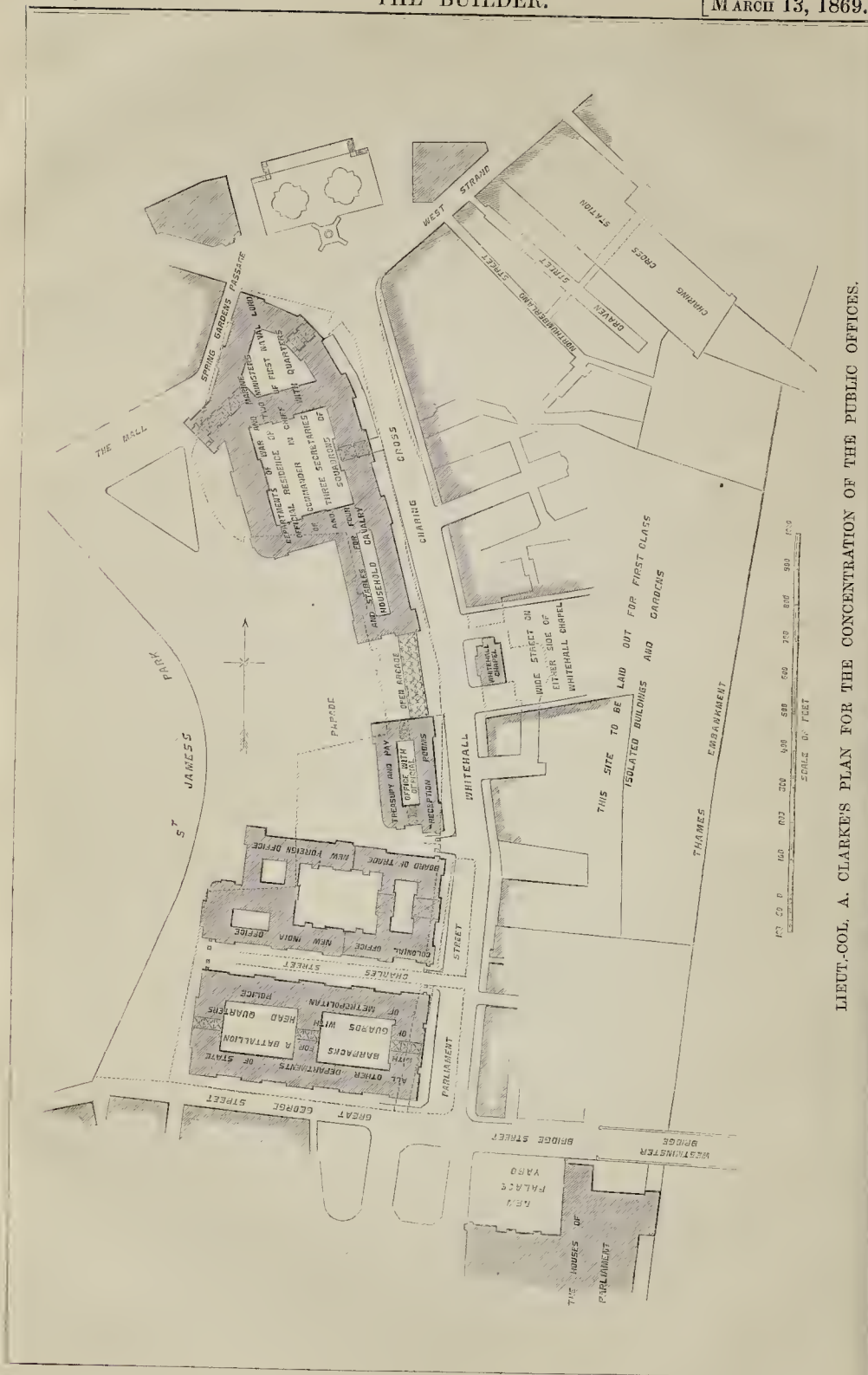
All dangerous developments of that cement arise generally from defective manufacture, the more frequent being that arising from an excess of carbonate of lime, which, when de-carbonized, has a strong affinity for moisture, and in the process of slaking exerts its inherent mechanical force in the displacement of the materials with which it may be in contact; hence cracks and upheavals, or other dislocations in brickwork and plastering. The peculiar effect of being confined to the horizontal joints is doubtless due to their containing a larger undivided amount of mortar than the vertical ones. In this case the cement must have been bad, and would have been rejected under more careful supervision. Although endeavouring thus to explain the course of the evil results in question, I do not wish it to be assumed that all similar defects are due to bad cement. On the contrary, many of a minor degree are brought about by bad or careless workmanship, such as those arising from imperfect wetting of the bricks, and the still more reprehensible practice of plastering a new coat of cement on an old one. In consequence of the former bad reputation of Portland cement many sins of omission and commission were laid to its charge of which it was entirely innocent. A case occurred in my own experience which, without investigation, would have materially increased the doubtful feeling as to its safety. I will shortly describe the circumstances.

Some years ago I was requested to examine a first-class engineering work, in the execution of which alarming results had arisen from the use of Portland cement and Suffolk bricks. The most careful examination failed to discover any cracks or flaws in the cement, notwithstanding the existence in the most aggravated forms of displaced and distorted brickwork. Further investigation proved that the mischief had been caused by the bricks, and from the materials of which they were made having been imperfectly washed; and I convinced those interested that to that cause alone was due the unfortunate waste of labour and materials. The work consisted of several hundred piers, on which were to have been built groined arches; and it was fortunate that the discovery was made before the arches were turned. As it was, the loss amounted to several hundred pounds. I should mention that the cement used was of first-rate quality, and had been severely tested by a system of testing which I had been instrumental in establishing. This lucky discovery led to an increased confidence in using the cement, and establishing the efficiency of the tests.

In my work on Portland cement I have fully described the best mode of testing, so as to avoid the danger of using faulty cement.

HENRY REID.

* See p. 182, ante.



LIEUT.-COL. A. CLARKE'S PLAN FOR THE CONCENTRATION OF THE PUBLIC OFFICES.

ON THE ARRANGEMENT OF THE PUBLIC OFFICES, LONDON.*

THERE is a project by Colonel Clarke, R.E., Director of Works in the Admiralty, which is attached to the report, though it does not appear to have received much discussion from the Commissioners; but it seems to give a prospect of meeting necessary conditions. It occupies the whole of the Western site from Spring-gardens to Great George-street, bounded by the main street on one side, and by the Park on the other; thus affording the most important advantage of concentrating the whole of the public offices into one continuous block, well isolated from any other buildings. It is difficult to overrate the importance of this for the three points of convenience, health, and security; and as this area is greater than what is required for the public offices alone, Colonel Clarke utilizes it by providing accommodation for a regiment of cavalry and a battalion of infantry, thus taking the opportunity of effecting another great public improvement,—namely, the removal of two barracks from two sites confessed to be inconvenient and inappropriate for both civil and military reasons, and placing them in positions peculiarly suitable both for public convenience and for the benefit of the troops. It appears from the evidence of his Royal Highness the Duke of Cambridge, Commander-in-Chief, that if there are to be Guards at the Horse Guards, it is very desirable for the health of the troops that the regiments supplying them should be quartered nearer than they are at present.

The plan in the previous number of the *Builder* is virtually the same as Colonel Clarke's, being modified only in detail and not in principle. In Colonel Clarke's plan (which we now give), although the position of the Horse Guards is made the central feature of the whole, the existing building is proposed to be removed.

In the revised plan, in accordance with the ideas before suggested, it is retained, and raised a story, and otherwise made more important in character, and the square on its west side is completed by two flanking blocks of buildings of similar character, containing official houses for such of the great officers of State as should live on the spot, and for a suite of official reception-rooms common to all. The official houses are thus placed together in a central and agreeable position. The Horse Guards' parade is altogether altered by it, for to make a square at all well proportioned, it is necessary to bring the flanking buildings closer together than the existing flanking block of Kent's original design would allow; and as, moreover, this block interferes with the internal roadway of the whole mass, it is proposed to remove it. But there is plenty of room for the parade outside the square; a space can be formed between the new Foreign Office and the cavalry barracks proposed in this plan, 800 ft. long and 200 ft. broad, which is sufficient for an ordinary battalion to stand in line. The smaller square might thus be reserved as a site for national trophies and monuments.

On the north side of this central part of the whole site it is proposed to place the Admiralty and War-office, and a barrack for a regiment of cavalry, as proposed by Colonel Clarke. The space available is not more than is requisite for providing the accommodation stated in the report to be required for these two departments. The northern boundary is drawn so as to afford, by a street direct into the park, a view from Charing-cross along the Mall towards Buckingham Palace. The triangular space further north is reserved for general refreshment-rooms for the whole of the offices.

On the south side of the Horse Guards it is proposed to place the whole of the buildings connected with the Treasury, Pay, and Audit Offices, and also the Office of Works. South of this, again, that is, in line with the New Foreign and India Offices, are the Colonial Office and Board of Trade.

And at the extreme south of the whole site, abutting on Great George-street, are the Home Office, Poor Law Board, Council Offices, Civil Service, and other Royal Commission Offices; and also space for the head quarters of the metropolitan police, and barracks for a battalion of infantry.

The whole of this general arrangement is quite in accordance with Colonel Clarke's project. There is another plan with the report, bearing the name of the chief commissioner for public works, which proposes to occupy nearly the same

ground, but is wanting in the great characteristic of Colonel Clarke's, that of isolating them from other buildings and grouping them round the Horse Guards' aite, although the Horse Guards itself is retained in it. The details of the arrangement of the various offices in the plan from Colonel Clarke's. In his the Home Office, Poor-law Board, Council Offices—in fact, all those departments connected with the internal administration of Government at home—are grouped together, and placed nearest to the Houses of Parliament; these are the departments into the detail of whose duties Parliament enters more than of any others, and therefore if any are to be nearer Westminster than others, they are the ones.

Then the Colonial Office and the Board of Trade (which deals with the commerce of the country) should naturally be grouped together with the Indian and Foreign Offices. The Treasury (also the office of the Prime Minister), and the Pay Office, and Audit Office, and Office of Works, being more or less common to all the other departments, should naturally be placed together and near the centre of the group. And finally, all parties are agreed that the Commander-in-Chief's Office, the War Office, and the Admiralty should be in contiguous buildings. The troops are placed on the flanks of the whole group, on the Park side, so as to have easy access to the parade ground.

Another point of detail in which the first plan differs from Colonel Clarke's is that the blocks of buildings are placed as far as practicable in a north and south direction, so as to allow the sun to shine on both sides of them; a condition considered by hygienists and architects as essential in the climate of England to the good preservation both of the buildings themselves, as well as of the persons who inhabit them. It is a condition which has passed into a proverb even in Italy, how much more essential is it in the cold dull days of an English spring. It is further advantageous in this plan, that it facilitates the provision of a continuous street from end to end of the whole group of offices, which affords a means of quiet, secure internal communication without dependence upon either the main streets or the Park; and in a still growing country like Great Britain, and in the duties of the respective departments of which must vary and become sometimes interchanged with each other from time to time, it is desirable that the public buildings should be tolerably uniform in arrangement, and capable of such alterations without great difficulty.

The question of the reconstruction of the main street from Charing-cross to Westminster does not necessarily form part of this plan, but as it has been so much discussed in the report, and is projected in Colonel Clarke's plan, it seems necessary to mention it. The difficulty of dealing with it lies chiefly in the fact before mentioned, that it does not lead direct either to the Abbey or to the Houses of Parliament, but just between the two. The endeavour to meet this by a supplementary street leading direct to the Abbey would not do away with the defect in the main street: it would be better to acknowledge and provide for it by removing the Law Courts building, and so opening out the west side of Westminster Hall, and by improving Old Palace Yard.

As the Victoria Tower forms the really prominent termination to the view down the street,—if there was a building of somewhat corresponding bulk and character on the Westminster College side of the Yard, the two together would form a tolerably fitting architectural termination to the main approach to Westminster,—it would thus appear to do what it does in reality,—to lead to the two great national buildings. It will probably not be disputed that in such case the most effective arrangement would be to have one broad street throughout the whole length from Charing-cross to Westminster. Colonel Clarke's plan provides such a street of about 150 ft. in width from house to house. This is wider than necessary, even for the great traffic passing along it, and very wide for the convenience of foot passengers crossing, but it is not too wide for the effect of the proposed buildings on either hand; for the Government buildings on the west side will be at least 60 ft. high, and the buildings on the east side, if private, will not probably be less, considering the value of the ground. It might be practicable to divide it into three distinct roadways separated by lines of trees, which would afford shelter for the foot passengers in crossing and yet would

not interrupt the general view along the street, which it is essential should be preserved.

The mode of dealing with the site on the eastern side of the main street, so as to insure, as far as practicable, that the private buildings abutting on the street shall be of a character tolerably suitable to the site and also for providing suitable openings from it to the river embankment, is a question more for the Commissioners of Public Works and the Metropolitan Commissioners of Works than for the Public Offices project. The site would no doubt be occupied partly by private houses and partly by shops and offices connected with the Public Offices and with Parliament; the part towards the south end is particularly suitable for private offices, lying as it does between two great thoroughfares and close to a station on the Underground Railway.

Upon the whole, then, to the problem put forward in the beginning of this paper:—Given, a certain number of public departments, each requiring a certain area of ground for its accommodation, to provide for them in a manner that shall unite convenience, sentiment, and beauty in the highest practicable degree. The reply to the first point in the question seems to be to do that which would naturally occur to anybody as the first and plainest idea, namely, to extend the area already occupied by the existing Public Offices, utilizing the existing buildings as much as possible. It is what a great manufacturer would do if he were proposing to concentrate several scattered establishments into one whole; he would obtain an area round the most suitable one of them large enough to contain all his establishments artfully arranged, and to isolate them from other buildings. Very considerable sums have been spent by our manufacturers to gain this area and this isolation, and probably the only regret any one has felt in the matter has been at not having spent more money in gaining them more fully at first.

The Government have an area partly occupied by Public Offices, and very suitable for extension to contain all of them, arranged in proper symmetry and isolated. This is Colonel Clarke's proposition. The total cost of it appears more than that of any of the other projects; but besides its intrinsic merits, it provides for more than any of the other projects. It provides for two much-needed barracks, to obtain which independently would cost the country much more than in this manner; and for official houses for certain of the great officers of State which, though acknowledged to be an important part of the reconstruction of the Public Offices, is not definitely provided for in any of the other projects. Furthermore, against the total expense must be set off the occupation by public buildings of the site of King-street, which, though it must be paid for in some shape or other, is left unoccupied in the other projects; it is so much area saved in some other direction. The total area proposed to be occupied is not more than is reasonably necessary to afford sufficient light and air to the great mass of buildings; and the total expenditure may be spread over a great extent of years if desired, because, although new buildings are shown on the sites of the present Treasury and Admiralty Offices, the existing buildings can be occupied without interfering with other parts of the whole project.

In conclusion, we cannot do better than quote Colonel Clarke's own statement about his project, to show how he meets the general question of this great architectural problem.

"At a cost of 4,000,000, it effectually carries out consolidation. No thoroughfare of traffic separates one building from the other, whilst covered inter-communication gives easy access throughout the whole.

It provides for all the departments, with the addition not contemplated in the other proposals of state residences for certain ministers, offices for the head-quarters of the metropolitan police, quarters for detachments of Guards and household cavalry, thus leaving for other appropriation St. George's Barracks, and facilitating the removal of those at Knightsbridge.

Not interfering with the private property on the river side of Parliament-street, it leaves those sites free for occupation by the very large class of persons, such as parliamentary agents, railway engineers, &c., whose employment is in direct and intimate connexion with the business and proceedings of Parliament.

The alternative plans require a large amount to be expended in the purchase of land and demolition of houses previously to the commence-

* See p. 189, ante.

ment of any building operations. According to this plan, building can be at once begun without a material disturbance of the public departments, and a far less immediate outlay is necessary for the acquisition of land.

In the alternative plans the cost of widening Whitehall, &c., will be eventually a direct charge upon the public, while in this plan the State will secure this advantage without making it the subject of exceptional expenditure.

While by this plan a much larger area will be devoted to the public than under the other, the cost per acre will not exceed that of the least expensive of the alternative schemes.

This design interfering little with private property and interests, releases a larger amount of public property for future disposal.

Taken as a general design to be gradually carried out, it offers superior facilities for partial or continuous execution." I. E. C.

STRAINS IN GIRDERS.

The employment of wrought-iron in girders, bridges, and roofs, has increased greatly of late years; and it is, therefore, very desirable that every one who has the designing of such structures should be able to calculate readily the strains on the several parts. In some cases the determination of the strains by analytical methods becomes very laborious, and a method representing to the eye the relative proportions which the various strains on different parts of a structure bear to one another is extremely advantageous, as it enables the designer to see at a glance where the structure may be either too weak or unnecessarily strong.

Mr. Humber, who is the author of many standard books on engineering subjects, has rendered a great service to the architect and engineer by producing a small work,* especially treating on the methods of delineating the strains on iron beams, roofs, and bridges, by means of diagrams. The only figure required to be drawn besides straight lines, is the parabola, for the easy delineation of which several methods are given at the end of the book.

When a beam is subjected to a strain arising from a weight acting at any point, it is generally necessary to consider the effect of that weight upon some other point than the one at which it acts. This effect is proportional to the distance of that other point from the weight itself. Thus, if a beam as AB (fig. 1), is fixed at A, and loaded with W at B, the strain at A is proportional to the length AB, and is represented by the product of W multiplied by the length AB, which is called the moment of W about A.

So also $W \times BD$, is the moment of W about D, and represents the strain produced by W upon the point D. Let AC represent the quantity $W \times AB$; draw BC; then the moment of rupture at any point D is represented to the same scale by the vertical line DE.

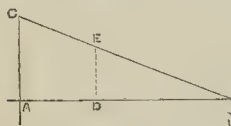


FIG. 1.

When the beam AB (fig. 2) is uniformly loaded along its entire length (l) with a weight, w , for every unit of length, then wl is the total weight supported by the beam. Let AC represent the quantity $\frac{1}{2}wl^2$, which is the moment of rupture at A; draw the parabola CEB; then the moment of rupture at any point D is represented by the vertical ordinate DE.

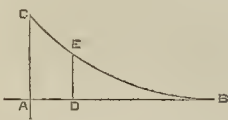


FIG. 2.

When a beam, AB (fig. 3), whose length is l , is supported at each end and loaded in the centre by a weight, W, the moment of rupture at the

middle is $\frac{1}{4}Wl$; let this quantity be represented by the vertical WC; join AC, BC; then the moment of rupture at D is represented by the vertical DE.

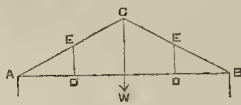


FIG. 3.

When the load is uniformly distributed over the entire beam AB (fig. 4), the moment of rupture at the centre, C, is $\frac{1}{4}wl^2$; let CD represent this quantity, and draw the parabola ADB; then the moment of rupture at D is represented by the ordinate DE.

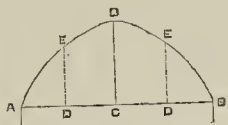


FIG. 4.

These four examples are the simplest that occur in practice, and all others are variations or combinations of them. In the work before us nearly all possible varieties of arrangement of load are discussed and the diagrams worked out. With practice the diagrams can generally be readily drawn for each particular case, although in some cases it would be easier to calculate the algebraical formulae than to construct the diagram.

Besides the moments of rupture there is the "shearing" force which acts upon a loaded beam, and is due to the transmission of the vertical pressure of the load to the points of support, tending to cause contiguous vertical sections in the beam to slide over each other. The resistance to shearing is proportional to the area of section subjected to that force. In the case of a beam fixed at one end and uniformly loaded, the shearing force at A (fig. 1) is wl ; let this be represented by AC; join CB; then the ordinate DE represents the shearing force at any point D.

If a beam, AB, is supported at each end, and loaded in the centre by a weight, W, the shearing force at any point on the beam is equal to $\frac{1}{2}W$. When the beam AB is loaded uniformly throughout, the shearing force is 0 in the centre, and is represented by $\frac{1}{2}wl$ at each end. To show this on a diagram, draw at each end AC and BD vertical, and each equal to $\frac{1}{2}wl$; join C and D with the middle point, E, of the beam; then the ordinate drawn vertically from any point F on the beam to the inclined lines EC or ED will give the value of the shearing force at F.

In the case of a beam supported at both ends, and subject to a distributed load moving from A to B, the shearing force at B is $\frac{1}{2}wl = BD$ (BD being drawn vertical), and for any intermediate points is represented by the ordinates of a parabola drawn through A and D, and having its vertex at A. In the same way the value of this force can be determined in other arrangements of the load.

In applying the method of diagrams to flanged girders, arches, or suspension bridges, an outline sketch must be first drawn to scale; its cross-section and weight must then be determined. The central depth of straight independent girders should be about one-twelfth of the span, in order to secure the greatest economy of material. If they are fixed firmly at the ends the depth may be much less. Girders having curved flanges or "booms," as bowstring girders, arches, or suspension chains, should have their depth proportional to the moments of rupture, which will give them the form of a parabola. In determining the moments of rupture of flanged girders, the resistance of the web being small is generally omitted from the investigation; for those having parallel straight flanges, the strains are equal on the two flanges, at any vertical section, but opposite in their nature, and will vary as the moments of rupture. The amount of the strain at any vertical section is found by dividing the moment of rupture by the distance apart of the centres of gravity of the sections of the two flanges. The strain which the web has to sustain at any vertical section is equal to the shearing force developed at that section.

In girders having curved flanges the strains

vary as the secants of the angles of inclination to the horizontal, and may be determined geometrically in the following manner. Let B be any point on the curved flange, FBE the tangent at B; draw ED horizontal, and of such length as to represent on scale the quantity,—

Moment of rupture at B.
Depth of girder at B.

Draw the vertical line DF, and the line FE will then represent the amount of strain on either flange at B; that is,—

Moment of rupture at B.
Depth of girder at B. \times secant DEF.

Open-webbed or lattice girders are constructed with two flanges or "booms" connected by diagonal braces, which form the web, and divide the booms into bays. When any load is placed on the girder between the two extremities of a bay, that bay becomes a separate girder. The strains on the braces which constitute the web act in the direction of their length; those inclined down to the nearest support being in a state of compression, while those inclined down from the nearest support are in a state of tension; the girder being loaded symmetrically. The strains at the several points of a lattice girder can be shown by drawing the diagram as before described according to the method of distributing the load, when the vertical ordinates drawn from the points where the braces are united to the booms will give the relative values of the strains at those points.

A roof principal is a bent girder in which the lower boom consists of chords of one curve, and the upper boom of chords of another curve having a less radius than the former. The braces are alternately vertical and inclined. The moment of rupture at the centre is obtained from the formula, and gives the ordinate of the parabola at its vertex; and the ordinates drawn from the several points of junction on the girder will give the relative values of the strains.

Iron bridges are generally formed of flat segmental arches, with open spandrel bracing. When the arch is a flat segment of a circle it may be considered as very nearly a parabola; in which case the only strain on the spandrel is the vertical pressure of the load supported by the top horizontal member. If we call w the rise of the arch, or versine, l its span, and w its load per unit of length; the compression at the crown is

$$\frac{wl^2}{8v}$$

and the compression at any other point (at distance y from the centre) is

$$\sqrt{\left(\frac{wl^2}{8v}\right)^2 + (wy)^2}$$

This last expression also gives the value of the thrust at the abutments, where $y = \frac{1}{2}l$. In this case, the load is uniform throughout the entire length of the bridge. For a moving load the calculation is not so simple.

In suspension-bridges, with uniform horizontal load, the main chains will assume a curve which is very nearly a parabola, the tension on which at the centre is the same as that given above for the arch. The tension at any other point is found by multiplying the tension at the middle by the secant of the angle which a tangent to the chain, at that point, makes with the horizontal. The tension on the suspension-rods, if vertical, is of equal amount, and is found by dividing the weight which each chain supports by the number of rods. The pressure on the towers is determined by means of a simple diagram. When the load is a moving one, the chains are liable to disengagement, which may be prevented, either by an auxiliary girder from pier to pier, by fixing the chains to the top of the towers (when there are several spans), or by inserting diagonal bracing between the roadway and chains.

Mr. Humber has not attempted any investigation in his book, but only gives the results obtained in the treatises which have been written on the several subjects referred to; his object having been to facilitate the calculations that must be made, in order to secure the stability of a structure.

Mr. Simpson, C.E.—The death of Mr. Simpson, the engineer of the Carlisle and other Waterworks, is announced.

* "A Handy-book for the Calculation of Strains in Girders and similar Structures, &c." By W. Humber, Assoc. Inst. C. E. Lockwood & Co. London, 1868.

THE (ALBERT) MUSEUM, SOUTH KENSINGTON.

In continuation of my "Notes" on gemmed and enamelled art-objects now on loan at the Museum, I would draw attention to the spirited little harlequin, lent by Mr. Beresford Hope, the body formed of a baroque pearl with enamelled limbs and head, the face bearing a most mirth-provoking grin. The figure, which is enriched with gems, is planted firmly on one foot, the other extended in air, and rests upon a small octagonal base of white carnelian, in a setting of enamel, the whole being mounted on a larger slab of onyx, as if intended to serve as a paper-weight. To Mr. Hope we are also indebted for the Plasma* cup, on gilt metal tripod of terminal figures set with precious stones; the charming vinaigrette, in form of a book, with chain and ring for suspension, having on one side an enamelled Cupid among flowers on a ground of deep blue translucent enamel set round with pearls; and, in the barbaric grandeur style, the silver-gilt scent-bottle of peculiar form, incrustated with turquoises and garnets; the latter of a most rich, ruby-like hue. There is likewise a large ivory cup and cover, or tankard, carved on one side with an equestrian figure of an emperor piercing an enemy, both figures being fully clad in richly-chased armour: the lance entering above the breastplate of the fallen foe, makes one exclaim involuntarily, in the speech of the old Romans, "Habet!" On the other side of the tankard, the arms of Holland and motto, "Je maintiendrai," are carved in a free bold style; on the cover is a plumed helmet by way of decoration, the date is the seventeenth century.

To Mr. J. Heywood Hawkins belong the fingering of Indian manufacture, cut out of red carnelian, the centre set with diamonds and emeralds; the crystal spoon and fork, mounted in gold and set with rubies—another instance that formerly forks were treated merely as luxurious toys. We read in Knight's "Cyclopaedia," "the first mention of table or eating forks is found in the 'Chronicon Placentinum' of John de Mussis, a writer of the early part of the fifteenth century, who, when speaking of the injuries of the people of Piacenza recently introduced, says, 'they use cups and spoons and little forks of silver' . . . Even when Heylin published his 'Cosmography,' in 1652, forks for the table were still a novelty; having spoken of the ivory sticks used by the Chinese, he adds, 'the use of silver forks with us by some of our spruce gallants taken up of late, came from hence to Italy and thence into England.'" Chambers, in an interesting little notice of ancient forks in his "Book of Days," says they were in use in Italy in the seventeenth century, and were introduced into England by Coryate, the strange traveller. They were little forks, usually made of iron or steel, but occasionally also of silver. Coryate says he "thought good to imitate the Italian fashion by this forked cutting of meat," whereas on a facetious English friend, "in his merry humor, doubted not to call me *furcifer*, only for using a fork at feeding." The notice goes on to say that, in 1534, some labourers found at Swington, in North Wiltshire, a number of Saxon pennies and sovereigns ranging from A.D. 795 to 890, and with them lay a spoon and fork, showing that the introduction of the fork into England dates from a very early period, though the use of it may not have been general.

The small oval silver watch, engraved with a flower on the outside, of English work, also belongs to Mr. Heywood Hawkins, and these various articles are to be seen in one of the table glass cases in the centre of the loan department. In another of these central cases is exhibited a rich collection of Hungarian jewelry, lent by the Countess Harley Tótki: rich, as regards the costly stones and enamel with which it is thickly encrusted; but, as works of art, I own myself unable to find much to admire in the various specimens. The mantle-clasp of rubies and diamonds set in enamelled gold, formerly belonging to Francis Rakoczey, Prince of Transylvania, Hungarian seventeenth century, is a grand cluster of rich colours; the cross of precious stones and enamel, Italian sixteenth century,

and a mantle-clasp with pendent pearls, Hungarian eighteenth century, are less "barbaric" in their grandeur; but the necklace, ear-rings, and bracelets of present century work, show so many instances of utter want of taste, that one can but regret the toil and care that have been bestowed upon them to so little good result. The enamelling is, in many portions, extremely delicate and judicious, hobb as to form and colour; but the continually repeated scroll of pearls strung on gold wire, is such a terribly primitive mode of ornamentation, and is quite out of keeping with the careful enamelling. All the pieces of necklace and ear-rings are made alike on both sides; now this is quite correct for the latter, but for the former it would seem to be a great mistake, as rendering it uncomfortable to wear, and preventing it from lying flat on the neck; and can anything be more dreadful in point of taste, than the gold and white-enamel curly little "Agnus Dei," which forms the pendant to the necklace? The lamb is hung up by its back, with the feet unsupported; has three square gems set in its side, a pearl hanging from beneath its body, and a thick curve of gold blood flowing from its chest into a sacrificial cup, which is fixed on to the end of the gold-blood stream. Compare this jewelry with the delicate work of the "enseigne," lent by Miss Wiid, which is placed in the glass case beside the Leicester violin. The centre is a turquoise cameo of Queen Elizabeth, mounted in gold and enamel frame, set with rubies and other stones, and pearl pendants. It hangs in front of a small looking-glass, so that the hack, which is also ornamented with enamel, may be seen likewise. The difference in execution of the two is worth several journeys from case to case to examine minutely. Another collection of jewelry of the barbaric-grandeur type, is that lent by Count Chas. Stuart D'Albanie. It is Hungarian also, and dates from the seventeenth or eighteenth century, and is studded with precious stones. I have heard it admired, but I infinitely prefer the hunting-knife likewise exhibited by the Count, which belonged formerly to the uncle of Frederic the Great. The knife—with six smaller instruments—fits into a sheath covered with crimson velvet, ornamented with hunting scenes in gilt metal,—the handle and mounts being also of gilt metal. Though the workmanship is coarse, there are a boldness and appropriateness in the whole thing that is satisfactory.

In a table glass case close by, lies an amethyst-spar and box given by Pope Pius V. to Mr. J. Cox Hippisley, and lent by Sir J. Hippisley. It has a red jasper cameo head on the lid; and there is another of petrified wood lent by Mr. Martin, which is thought to be French eighteenth century work. Returning to the high glass case near to the one containing Mr. Beresford Hope's art-objects, a steel key, French seventeenth century, merits attention. The head, or handle, is pierced with a cipher and coronet, the stem is fluted and engraved, and even the ward-holes are ornamented with engraving on the flat sides of the key. It is a choice production, and is lent by Mr. T. M. Whitehead. In the same case is a silver horn, such as is worn on the head by the Druse women. It is about 18 in. in height, of modern Syrian work, and is lent by the Messrs. Lambert & Rawlings. The wide end of the horn has three rings attached at a short distance from the edge, as a means, no doubt, of fixing it on to the head. The sight of this strange-looking ornament forcibly calls to mind the numerous allusions to wearing a horn in Scripture, such as "Their horn shall be exalted," "Set not up your horn on high."

I have already mentioned Mr. Farquhar Matheson's choice little octagonal crystal casket. This gentleman exhibits likewise a very fine vase and cover of silver gilt. The howl, which is ornamented with medallions representing the liberal arts, is supported on the bent head and neck of a youth, who holds a small cup in his right hand. The head leans to the left side, not forward, so that the admirable little face can be seen: the expression on it is one of anxiety as to his power of steadying the cup rather than of suffering on account of the distressing weight; so that the idea is not so painful to the beholder as it is usually the case in similar but less judiciously treated subjects. Nevertheless, I question if the effect produced be altogether a pleasing one, although from the beauty of the whole thing in this instance, one cannot fail to admire. The figure of the youth is excellently well modelled, the costume harmonious and appropriate; but the feeling of anxiety in the face communicates itself unpleasantly to the mind of the spectator,

for he appears so dangerously insecure; the right leg is bent and touches the small platform on tiptoe, while the left foot has slipped over the edge on to a lower portion of the cup's base, which is about 3 in. high, round, increasing in size as it descends, and is ornamented with bands of flowers. The cover of the cup bears an old man seated, holding a globe. This work is seventeenth century, and is thought to be Italian.

In a table glass case close by are several rich treasures lent by various owners. A gold and onyx-bead rosary, formed of ten oval heads about an inch long, alternated with eleven round ones, joined together by links of gold wire. The oval heads open in halves, are hollowed out, and each head contains two minute Scripture subjects in gold and enamel. It is lent by Colonel Cumming. Beside it lies a pendant in three strips—*Quere, a châteline?*—of early seventeenth century German work; it is formed of silver gilt openwork set with garnets and turquoises, and on each alternate link some small ornament of bronze or iron is introduced, a tiny head or piece of knot-work; while in the centre of the pendant there is a small figure of the same metal—a man wearing a short cloak, furled cap, and sword. The workmanship of the whole is extremely careful and minute; it is lent by Mrs. Charles Lucy. Below the pendant a pen-case and ink-case from Constantinople, lent by Mr. H. Vaughan, of silver-gilt, and ornamented with niello, are admirable both as to form and execution. Next lies a small mirror, with a frame of silver-gilt, incrustated with large square, polished, but uncut emeralds, rubies, and diamonds. The metal work is open between the pattern of scrolls and other forms in which the stones are set, and above the mirror they rise into a high ornament, the framework of gems occupying as much space as the mirror itself, which is only about 4 in. or 5 in. square. It was made for the Dey of Algiers as a wedding present to his daughter. It is Algerine work, early present century, and is lent by Mr. A. Elmore, R.A. The gold finger-ring, with a balas ruby bearing an Arabic inscription, and lent by M. le Comte B. Yliaski, is stated to have been found in a tomb near Babylon. A curious small scent-bottle, or perhaps vinaigrette, lent by Mr. H. Vaughan, gilt and jewelled, with filigree mount and cover, is ornamented with most singular figures that suggest "Masons' marks." The bottle is barely more than 1 1/4 in. high, and about three-quarters of an inch in diameter; the colour is dark red, or brown, and the figures, which occur three times each, are gilt.

Close to the above lies a white Sevres porcelain box in shape of a sealed letter: being "a sham," not a thing to be altogether admired, but curious in its way. On the outside is inscribed in italics:—

"A Madame,
Madame la Justice,
aux yeux délaivrés."

and on the inside is painted a garden scene with figures. It is lent by Sir W. Fraser, bart. A small medallion in Hono stone, 1 in. square, lent by Sir W. C. Trevelyan, bart., and carved with minute scrolls and arabesque with asty, is excellent.

Very near to Mr. E. W. Cooke's Venetian glass is a case of choice porcelain. In one corner stands a tray of peculiar interest to Englishmen, being painted by the eldest daughter of their Queen as a present to her brother, the Prince of Wales, by whom it is lent. On the reverse, which is turned to the spectator, is the following device:—The feathers of the plume, which are separate, are stuck through a green chaplet bound with ribbons, on the ends of which is the motto, "Ich dien," on a label below is the inscription in large capitals, "FELIX—SIS," and on another hand below, "from Victoria, Nov. 21," below which again, on the rim, is "Michelangelo-Margherita. Caotani. Duca. e. Duchessa. di. Sermoneta. fecero." On the upper side of the tray is painted in Medieval characters, "Albert Edward—Romæ. A. M. DCCC. LXII," surmounted by a crown surrounded by a wreath of oak and acorns.

Near to this are two excellent small white glazed figures of Doccia ware, Ignatius Loyola and Luigi Gonzaga, early eighteenth century, lent by Mr. H. Gillett, who also shows a charming two-handled cup and saucer of Wedgwood-ware, pale form, cream-coloured, with leaf-pattern border in brown with green thread; the handles, which are very delicate, are twisted. This cup stands beside the elegant double pails already mentioned. The quaint little teapot,

* Plasma, sometimes written Prasma, whence the French name of the stone. *Prisme d'Emeraude*, is merely calcareous coloured green by some metallic oxide, probably copper or nickel, and is, in fact, a semi-transparent jasper, and although it often approximates to the finest emerald in colour, yet it is never pure, but always interspersed with black spots, and with patches of the dull yellow of the original species. . . . But of a pale green variety pieces do occur, quite free from flaws and spots; such, however, are probably rather to be considered as varieties of the chryoprase. — King, on *Antique Gems*.

Dresden early eighteenth century, white and painted with Chinese subject, is likewise Mr. Gillett's property.

Mr. J. Bond lends a very fine bowl, cover, and saucer, of old Chelsea porcelain, ornamented with compartments of dark blue and gold alternated with white; on the latter are painted birds and flowers. The somewhat similar-in-design luster-cooler close by, of old Worcester porcelain, looks very coarse in comparison. Bowl, cover, stand, and two trays of Leeds earthenware, late eighteenth-century, lent by Mr. H. Willett, cream-colored ground with birds and plants in dark brown or black, are admirable, as are also another tray and basket with open lattice border. There is a choice cup and saucer of Sèvres porcelain, painted with grisaille landscapes in medallions, by Rosset; on blue ground, the gilding and garlands by Prevost; lent by Mrs. Yorke. A fine pair of Chelsea porcelain candlesticks are lent by Mrs. Powke; the fables of "the jackdaw in peacock's feathers"—form the one, while the other is composed of domestic fowls in a cluster of hawthorn and daisies, representing the fable of "the cock and the jewel." What a pity it is that these fine Chelsea specimens always have such coarse, ugly "rococo" stands.

A coffee-like box of white porcelain, eighteenth century, thought to be Plymouth manufacture, painted with landscapes and birds, the handle on the cover formed of a cornucopia filled with flowers, is lent by Mrs. Freake; as is also a tureen and cover of earthenware, shaped like a double shell, on a foot of leaves, part openwork; on the cover, which has leaf forms impressed all over it, is painted a "Lent Lily" on one side, and it has for handle a bunch of most original green grapes in relief. The tureen is called "Modern British," but it looks anything but modern.

ART-LOVER.

ART WORKMANSHIP COMPETITION,
SOCIETY OF ARTS.

The following is the report of the three gentlemen, to whom the Council referred the various works that were submitted:—

"In spite of the individual specimens of excellence, to which we shall presently allude, we are bound to confess that the response made by art-workmen to the Society's liberal invitation to compete for prizes offered during the last session, cannot, in our opinion, be regarded as satisfactory.

It will be remembered that the list of subjects proposed differed materially from those of previous years—it having been considered well, as an experiment, to test the workmen's powers in the combination of original design with skillful workmanship, and in novel directions, rather than to keep them in the groove of the reproduction of the best works of the past.

We deemed some change of this nature requisite, from our observation that, while a fair level of mechanical perfection had been attained by the workmen generally, no such marked progress was realized from season to season as to justify the continued application of the large annual outlay made by the Society, in the attempt to foster and effect the improvement desired, but which could scarcely be said to have manifested itself.

Whether it is that the task recently set to the art-workmen has been beyond their present powers, or, as is more probable, that they look with anxiety only to what affects their regular employment, possibly, in some cases, apprehending notoriety as a fault rather than merit in their masters' eyes, certain it is that the results of their labor, taken as a whole, are not such as we had hoped for, nor such, by any means, as we think would have been made by French, or even Belgian workmen, had a similar invitation been addressed to them.

We do not necessarily attribute this to incapacity on the part of our art-workmen as executors, but ascribe it rather to their want, in this case, of the directing and sustaining power which is supplied to them, in the course of ordinary business, by the superior education and attainments of their masters and the artists and designers, from whose drawings, models, or suggestions they may habitually work.

That it would be a national gain for British workmen to acquire that measure of facility in the application of skilled workmanship which distinguishes so highly the best class of foreign workmen no one would probably deny. It was to encourage development in this direction that

the modification, to which allusion has been made, was introduced into last year's programme.

Thereupon being, in our judgment, so cheering, we feel bound to recommend the Society of Arts either a return to former programmes, or such a change in the conditions of their invitation as should recognize and reward not only the skilled workmen, but the talent and energies also of the masters, through whose application of capital and knowledge such workmen might be brought to the production of the real excellence and novelty we had hoped to have seen united in the present exhibition. We are emboldened to make the above suggestion in the full conviction that no such radical change is likely to be adopted without receiving that careful consideration at the hands of the Council of the Society of Arts, possibly after conference with us, which its importance may justify.

In the first division, 'Specimens of Art-Workmanship in Prescribed Processes,' we have recommended such rewards to be given as we considered right under the circumstances, but we do not feel justified in dwelling at length upon any of the specimens so rewarded.

Mr. Thomas Godfrey's panel for a cabinet, consisting of six different woods, is skillfully carved in delicate relief, in a manner familiar enough to French, Italian, and Spanish workmen, but not, as yet, common in this country.

In the second division, 'Specimens of the Application to Ordinary Industry of Prescribed Art Processes,' we regard as by far the most hopeful product, 'the slah for insertion in the frieze of a chimney-piece, painted on a red tile, by Mr. J. B. Evans.

Considering the almost universal application of the process of enamelling on metal in France, and the strides made at Birmingham in the industrial application of the process, we had certainly expected more important contributions than those forwarded by Mr. Frederick Lowe. They being the best and—the ring-try in particular—being satisfactory both in design and execution, we have considered him entitled to a reward of 10*l.*, but we are certainly unable to regard either specimen as 'most beautiful.'

Some of the clock-dials exhibited by Mr. J. Thwaites are agreeable in design and pleasing in execution; the collection is, however, of singular inequality in point of merit in design.

Mr. W. H. Slater's blackware slah, painted with the subject of 'Pluto,' is of good average execution.

Among the subjects sent in for exhibition, but not wrought in accordance with prescribed processes, the most to be commended, by far, is the painting on china, 'Giving a Bite,' after W. Mulready, R.A., by Mr. W. P. Simpson. It is an admirable specimen, although not a very important one as to size, of painting on porcelain, and we have awarded to it 'The North London Exhibition' prize, in addition to a sum of 5*l.* from the Society of Arts.

We were particularly pleased with the delicacy of the modelling of the subjects 'St. Cecilia,' and the 'Virgin and Child,' after Donatello, by 'W. W.': we considered these to be admirable specimens of cabinet modelling.

We were much pleased with the steel die sunk by G. Morgan after the head of a female modelled from life by himself; we regarded this as a work of great promise in a branch of art too little practised or considered at the present date.

Mr. John Barker's bracket, carved in Caen stone, and his flowers, and some carvings in marble, executed by 'W. X. D.,' were satisfactory.

Mr. Robert Taw's embossing in copper of a yacht in full sail, showed both taste and skill, although we regarded the form in which they had been brought to bear on the present occasion to be rather a misapplication of both.

Mr. Thomas Will's alto-relief in boxwood, with an ebony border, of 'Venus Genitrix,' Mr. Deere's renaissance ornament in copper; Mr. Eyre's painting on porcelain of the 'Death of Goliath,' and Mr. Emme's wrought-iron-work for cabinet, were also commendable.

GEORGE GODWIN,
RICHARD REDGRAVE,
M. DIGBY WYATT.

The following is a list of the prizes awarded:

Works sent in in accordance with the Prescribed Processes.

FIRST DIVISION.

Earthenware vase, with painted ornament in enamel colours. By J. B. Evans, Shelton, Staffordshire Potteries. Price 5*l.* ss. Prize of 2*l.*

Clock case, in amboyna and purplewood, with inlay of ivory. By Thomas Jacob, 4, Upper Charlton-street, Fitzroy-square, W. Price 5*l.* Prize of 1*l.*
Marquetrie panel. Designed and inlaid by F. Braun, 12, Star-street, Edgware-road, W. Price 9*l.* Prize of 2*l.*
Centre of a chimney-piece, a combination of mosaic and inlay with carved stone. By John E. Daly, 93, Meckway-street, Westminster, S.W. Prize of 5*l.*
Panel for a cabinet, consisting of six different woods. Designed, carved, and inlaid by Thomas Godfrey, 21, Chatham-road, Wandsworth-common, S.W. Prize of 5*l.*
Panel for a cabinet. By Charles Lane, 41, Prince of Wales's-crescent, N.W. Price 12*l.* Prize of 4*l.*

SECOND DIVISION.

Cases of specimen clock dials. Nos. 1 to 6 enamel painted; Nos. 7 and 8 dead surface suitable for public buildings; as not reflecting the light; Nos. 9 to 11 glass dials in imitation of engraved dials, and superior to them for durability in consequence of the work being at the back. By J. Thwaites, 35, Spencer-street, Clerkenwell, E.C. Prize of 5*l.*

Frame for a miniature, of strongly gilt gilding-metal and enamelled; solder of 18 carat gold. Designed and engraved, and enamelled by Frederick Lowe, 13, Wilder-new-row, E.C. Prize of 10*l.* for the exhibit of this and ring try, similar in material and process to the above.

Slah, for insertion in the frieze of a chimney-piece. By J. B. Evans, Wandsworth-common, Shelton, Staffordshire Potteries. Price 10*l.* Prize of 10*l.*

'Pluto.' Painted on blackware, after the style of the Chinese. By Mr. W. H. Slater, of Jamess-street, London-road, Stoke-on-Trent. Prize of 5*l.*

Tablet for monumental or commemorative purposes (unpublished, but lent to show design). By James Griffiths, Field-place, Stoke-on-Trent. Price of 2*l.*

Book cover, enrichment in gold upon coloured ground. By C. Pander, 28, Bayham-street, N.W. Valued at 3*l.* 10*s.* Prize of 3*l.* for the exhibit of this and enrichment in cance this upon black and gold grounds.

Subjects sent in for Exhibition, but not in accordance with the Prescribed Processes.

CARVING IN STONE.

Bracket, carved in Caen stone. By John Barker, 2, Paradise-street, Lambeth, S.E. Prize of 5*l.* for the exhibit of this and other carvings.

CARVING IN MARBLE.

Boy's head, in relief, a portrait. By W. X. D. Price 2*l.* Prize of 5*l.* for the exhibit of this and medallion head of Michelangelo.

Carving in relief. By Owen Thomas, 66, Hatfield-street, N.W. Prize of 1*l.*

MODELLING IN PLASTER.

Modellings, after Donatello, of St. Cecilia, and the Virgin and Child. By W. W. Price 10*l.* Prize of 5*l.*
Head of a female, modelled from life. By G. Morgan, 41, Pelham-street, Brompton, S.W. Prize of 5*l.* for this in combination with the following:—

METAL WORK.

Reduced copy in steel of the above. By the same exhibitor.

Embossing in copper of a yacht in full sail. By Robert Taw, 8, Prince of Wales's-crescent, N.W. Prize of 2*l.*
Tough-iron work for cabinet. Designed by E. T. Talbot. Executed by G. Emme, 5, King-street, Old Kent-road, S.E. Prize of 1*l.*

Renaissance ornament in copper. By G. Deere, 23, Weston-street, Pentonville, N. Price 10*l.* Prize of 2*l.*

CARVING IN WOOD.

Alto-relief in boxwood with ebony border. 'Venus Genitrix.' By Thomas Will, New-road, Hammersmith, W. Price 15*l.* Prize of 3*l.*

PAINTING ON PORCELAIN.

'The Death of Goliath.' By John Eyre, 16, Newman-street, Oxford-street, W. Price 5*l.* Prize of 2*l.*
'Giving a Bite,' after W. Mulready, R.A. By W. P. Simpson, 6, Queen's-road, Baywater, W. Price 26*l.* 5*s.* Prize of 5*l.* Also the 'North London Exhibition Prize.'
Head of Our Saviour, from an engraving by Sharp, after Guido. By A. D. Price of 2*l.*

SCHOOLS OF ART.

The Halifax School.—The report of Mr. W. H. Stopford, the head master of this school, states that the classes, which were at a very low ebb from successive changes of masters, when he undertook the duties eighteen months ago, are now getting on successfully. The ladies' morning class, which numbered about four or five students, has increased to seventeen or eighteen, and will form (as it should) one of the most important classes in the school. The result of the examinations last year of the students in this school, and of their works, is as follows:—1 national prize of hooks; 13 second grade prizes; 10 third grade prizes; 8 free studentships; 11 certificates in free-hand; 10 ditto in model drawing; 1 ditto in perspective; 8 ditto in geometry; 2 ditto in mechanical; 4 full certificates. The committee's report, read at the annual meeting by Mr. C. J. Fox, the hon. secretary, points attention to the fact that the Science and Art Department have awarded a honours of 1*l.* to Mr. Stopford on account of the general results of the last examination. The prizes have been distributed by Lieut.-colonel Arkroyd.

The Nottingham School.—Mr. H. W. Foster (a student of this school) has been awarded a "Government Art Scholarship," and proceeds at once to South Kensington Museum to pursue his studies. The scholarships are granted for two years, at the rate of 52*l.* per annum for the first six months, and then increased to 104*l.* they are granted to decorators, designers, and others.

THE RAILWAY SYSTEM AND ITS EFFECTS.

At the ordinary general meeting of the Institution of Surveyors on the 22nd ult., the president in the chair, the discussion on Mr. J. Bailey Denton's paper, to which we have already referred, was resumed by

Mr. Edward Ryde, member, who said that although extravagant claims had frequently been made against railway companies, and extravagant compensations had sometimes been paid, it did not follow that all landowners were extortionate. It was equally true that they had sometimes been awarded sums which were not compensations at all, while there were instances even in which railway companies had taken land and made their line, yet to this day the landowner had not been paid a farthing. He felt some anxiety that it should go forth to the world that, as a body of men, they would not look at the subject of view only; and that, while admitting fully the benefits conferred by railways upon land in common with other interests, they did not subscribe to the notion that, in future, railways should be formed, so to speak, at the expense of the landowners, who were to give up their land just where it was wanted, at an arbitrary price, without their convenience in the matter being consulted in any way. He thought Mr. Denton had overlooked the fact that land had in itself a large element of improvement; that, whether there were railways or not, the land of this country must of necessity become more valuable. The supply was absolutely limited, while the demand was daily increasing. They must, therefore, not attribute all the additional value to railways. No doubt, a large increased value was given to all kinds of agricultural land within reach of a railway station, by facilities for transport of produce, manure, and machinery; besides the development of its dormant or building value. Mr. Denton had given authorities for putting the increase in value of agricultural land at from 5 to 10 per cent., but he (Mr. Ryde) confessed he did not know what the per-centage really amounted to. He knew a light land farm, formerly, as arable land, worth 30s. per acre, which, since the making of railways, had become a dairy farm, and sent every gallon of milk proceed to the London market. That had increased the value of the land at least 40 per cent. He thought, taking the general average, the increase was in rental value, not in years' purchase; because that land at 30s. an acre would have fetched the same number of years' purchase as it would now at 50s. per acre. The development of the dormant building or accommodation value of land was in some instances enormous. Land at Redhill, purchased thirty years ago for 50l. an acre, had since been sold at 700l. per acre. At Tunbridge they did not find any remarkable increase; Tunbridge Wells gave a higher rate, but at Hastings, land that cost 300l. per acre twenty years ago had since been sold, some for 10,000l., some for 5,000l. per acre, and a considerable number of acres had realized 1,000l. per acre, or six times its former price. At Surbiton, on the South-Western, thirty years ago the whole of the land on which that place stands was in the office in which he was brought up for sale, at 50l. per acre, as farming land; now he was afraid to say what the value was. At Weybridge, land for which 15l. to 20l. per acre was considered a good price now fetched that sum per annum in ground-rent. But, granting that agricultural land could be so increased in value, and building land also, it did not follow that all landowners wanted railways to run through their property. Such, for instance, would be the case with a man through whose land the railway cut, but who was still left remote from a station. Again, it was no satisfaction to the purchaser of an estate for residential purposes to tell him the land was enhanced in value. He did not want to sell; he had bought the estate, and wished to keep it as it was. Matters of this sort must not be overlooked. Hard things had been said of solicitors and surveyors concerned in building estates taken by railways, but he thought they had some ground of grievance on their part. The solicitor would get a profit on every lease he granted and every mortgage he prepared if the land were not taken, and he sustained an injury by a railway going through that estate for which he obtained no compensation. It might be said he could take his skill and energy elsewhere; but his client might not be inclined to

invest his money in another estate. It was no wonder such a man should advise his client to oppose the railway Bill at every stage. He thought, again, that a case like that of the Surrey and Sussex Junction Railway, where some of the land had never been paid in an unfinished state, did not much commend itself to landowners, who, he snid, would be certainly in a state of "aboriginal innocence" if they did not oppose such a scheme to the best of their ability. Passing on to the cost of the land, and sinking railways altogether for the moment, let them think how much more than the value had been given for five or six acres of adjoining land, for the mere purpose of adding them to an estate. Three times as much as the value he had known to be given. The cost of land for railways ought to be compared with such examples as that. Then, again, looking at what was to be the fair and proper cost of land for future railways, they must just consider that a railway might be laid out through two or three estates, and very near to the boundaries of others equally benefited. Now, it was said, a man should give his land; but there was this anomaly—that those who did not give the land would derive the same amount of benefit as those who did. A hector scheme must therefore be devised than that of asking landowners to give their land for nothing. They must pay the particular landowners for the land, and then have a contribution from all in respect of the benefits which they all derived. While on the question of the cost of land, he would say that the verdicts given by juries, and in some cases he might say the awards made by arbitrators, gave encouragement to many of the heavy claims which were subsequently made. It was a hard thing, they must admit, for one landowner to meet the railway company in the fair and equitable spirit Mr. Bailey Denton wished, and then to see the next landowner, by employing a "smart" man to make a claim before a jury, get double the amount for his land. Assuming the average price of land for railways, as set out in Mr. Denton's table, to be 240l. per acre, he thought one moiety of that sum might fairly be put as the cost of the land itself, and the other as due to severance and other causes. That left the price of the land at 120l. per acre, which he thought, looking at the forced sale, was not such an extravagant price after all, and he did not think the landowners had got so much the best of it.

Mr. W. R. Galbraith (visitor) said, that being a good deal concerned in railways made through agricultural districts, he had read Mr. Denton's paper with great interest, and he thought its discussion and treatment of the country would do good, not only for railways, but for landed interest generally. He thought landowners could hope for nothing better, as far as his experience went, than having a railway brought near them. He agreed with Mr. Denton that the parliamentary expenses of railways had been far too much, but he thought he did not quite fairly reflect the cases of railways in agricultural localities. The North Staffordshire and Manchester, Sheffield, and Lincolnshire could scarcely be placed in that category, as the estimate of 1,500l. per mile for Parliamentary expenses, was far beyond what they would see now for railways in agricultural districts. As an extreme case the reverse way, they found the Parliamentary expenses of the Great Central and Kentish line were only 124l. per mile. If that included the preparation of Parliamentary plans and legal expenses, it was probably the cheapest Bill that was ever carried. Then there was another matter which, he thought, required amendment; that was the Standing Orders, inasmuch as they were frequently an instrument in the hands of large companies for oppressing small projectors. He had himself assisted in throwing out schemes upon some very trivial points indeed; and he thought the policy of the House of Lords especially seemed to be rather to check railway enterprise than to encourage it. Two or three years ago, perhaps, a whole country was required, but at the present they required encouragement rather than opposition. It was, however, no use for engineers to talk about that. If they were to do any good in respect of future railways, they must undoubtedly be taken up by the landowners themselves, and this body of surveyors, who mainly represented the landed interest, must also take it up, and press it upon the landowners. As to the cost of land, he would mention one or two cases on a line constructed by him, which passed through a property for a length of 3½ miles. The plan was very poor indeed; he (Mr. Galbraith) should have thought 10l. per acre was about the proper price, but that surveyor valued it at 20l. The price actually paid for that land was 123l. per acre, or four times and a half its agricultural value. The tenants told him they had received no abatement of rent. The company bought about 33 acres of this land, and the result was, the owner put about 5,000l. into his pocket. In the centre of this property the company had to construct a station. He believed he was within the mark when he said that this property was raised in value by two years' purchase; if so, the rental value of the property being about 4,000l. a year, he would have paid for the land, the property itself being improved to the extent of 8,000l. After squandering this money out of the company, the gentleman took them before the justices in reference to accommodation works, the result of which was, in the 3½ miles, they constructed no less than fourteen crossings, or about one in every quarter of a mile, so that there could not be said to be much severance there. He was glad to say, for the much advantage there. He was glad to say, for the honour of this Institution, that the extortion was perpetrated by a solicitor, and not by a surveyor. He

(thought too much had been said about contractors' lines by those who did not understand the question. The very fact that the large majority of contractors who had dabbled in so-called contractors' lines had come to grief, showed that, as far as they were concerned, they had gained nothing by the business, and the state of the finance companies showed that the profits had not gone into their pockets. It might be that the small sum subscribed in the district was lost, but the landowners had the benefit of the railway, and they were amply repaid. Therefore, if more railways were to be made, they must be carried out in some such mode as Mr. Denton had suggested; and he was glad to hear Mr. Ryde, to a great extent, coincided with him. He would, in conclusion, give them a case in point, showing that lines could not be carried out now without some assistance other than they had. He was the engineer of a line called the Bude and Torrington, which ran forty miles through an agricultural district, but with a fair traffic. The railway could be made for 7,000l. per mile. There was a working agreement with the South-Western Company to work the line at 4½ per cent. of the receipts, and the Bude Company were to receive a rebate of 3,000l. a year for the traffic they threw upon the South-Western line. He had put the cost of the line at 200,000l.; he took the traffic at 10l. per mile per week, and adding the rebate of 3,000l., the net returns would be 15,000l. a year, which would pay 5 per cent. upon the capital expended. What had they got from the district itself? About half the landowners had given their land, and the district had subscribed about 20,000l. out of the 200,000l. The result was, if some further effort was not made, the Act would be lost, and that agreement would never be renewed by the South-Western Company.

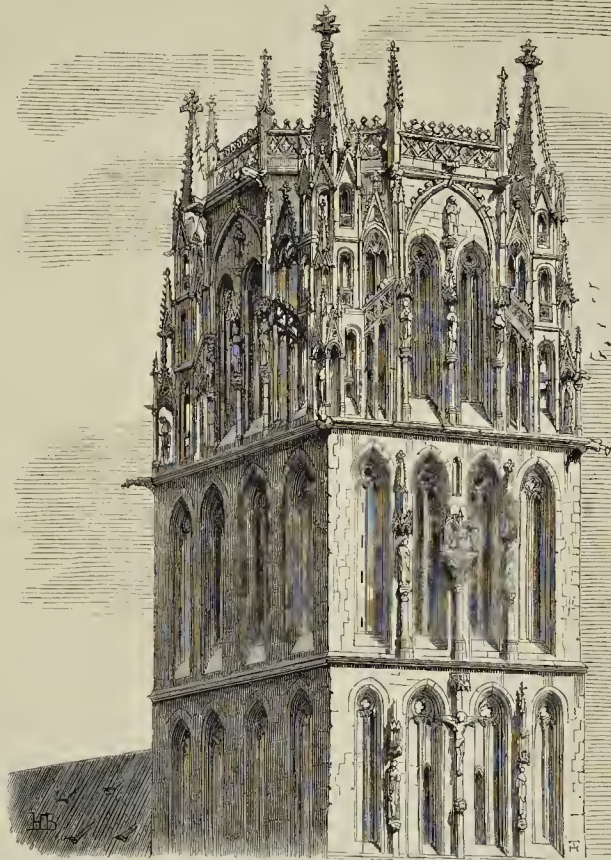
Mr. Charles Douglas Fox (visitor) would confirm the remarks of his brother engineer (Mr. Galbraith) with reference to the great importance, if railways were to be made economically, of obtaining some fresh powers for dealing with level crossings. A line to be not only economical, but serviceable to the land, must be a surface line, and it is very strong to take the ordinary rolling stock of the main line, except the locomotives, and to be worked at a speed of twenty or twenty-five miles an hour. If it was intended to serve farming interests, deep cuttings must be avoided, so that stopping-places may be put in for each large estate. He quite agreed with Mr. Ryde, that the value of a railway to a landowner was not much when his land was at a great distance from a station. As an example of the saving to be effected by a lighter form of construction, he would give the cost of an ordinary branch line, constructed by himself, through a purely agricultural country. The Act of Parliament was applied for in the usual way. The line was made by a contractor, part payment being in paper. The total cost of the line was 8,619l. per mile, of which Parliamentary expenses were 341l.; land, 930l.; works, 5,834l.; law expenses, 325l.; engineering, 370l.; management, interest on loans, &c., 940l.—making a total of 8,989l. The same description of railway could now be constructed for about 4,000l. per mile, made up in the following manner:—Preliminary expenses, 90l., including cost of application to the Board of Trade under the Railway Facilities Act; land, 600l. (the quantity of land per mile not exceeding five acres, at 120l. per acre); works, 3,910l.; law expenses, engineering, and management, 500l.—total, 4,100l. The result was this:—The gross revenue was 11l. per mile per week. The line was worked by the parent line at 50 per cent., and, deducting their expenses, it did not receive more than 2½ per cent.; but three-fourths of the money being borrowed at 5 per cent., the dividend was almost absorbed, and the shareholders got no returns. But if, on the other hand, the line had been made for 4,000l. per mile, the net receipts would, on the same traffic, be 5½ per cent. on the capital; and if three-sevenths of the money had, as before, been obtained at 5 per cent., the dividend on the ordinary stock would have been over 6 per cent. That, he repeated, was a fair average line, and he had taken the same prices for works in both cases. What they wanted was a similar plan to that which they had in America—in it, surface lines, worked by accommodation trains; in it, rather wide branch lines with more frequent stations than there were now or, what would be better, stopping-places or sidings for the more important farms or estates situate on the line; and this did not of necessity involve facing points. He brought this forward because he felt the members of this Institution, and those of the Institution of Civil Engineers, should combine together to carry out a necessity of the country; and, as they had already made the great trunk railways, they should now, upon a new system, make the branch lines, and not allow a large quantity of land to be comparatively unproductive. He believed the money would be readily obtained for the purpose, if only proper facilities for the making of these branch lines were afforded.

Mr. Charles Fox (visitor) called attention to what he considered a difficulty in "The Improvement of Land Act, 1861," viz., that the land could not be charged with the rate till the works were completed, and the funds necessary for carrying on works in progress could not, therefore, be readily collected.

Mr. J. H. Lloyd would just mention, that the provisions in "The Improvement of Land Act, 1861," referred to by the last speaker, originated with the Lands Improvement Company, who sought to introduce them into their own private Act. Lord Redesdale, who had a great objection to private Bills, suggested, that if such a measure was proposed for the Lands Improvement Company, it would be good for the country generally; and he (Mr. Lloyd) was, accordingly, instructed to prepare, and did prepare, the public Bill. He did not believe there was any difficulty in the working of the Act, and that it had not been availed of he thought must be chiefly owing to a want of combination on the part of the landowners.

After some other speeches, the discussion was adjourned, and was resumed on the 8th inst.

The London Labourers' Dwelling Society (Limited).—This society has just held its fifteenth half-yearly general meeting, Mr. Richard Foster in the chair, at which the report for the six months ending 31st December was presented. From this it appeared that the capital had increased to 347,000l.; and that the net revenue for the half-year was sufficient to pay the members a dividend at the rate of 5 per cent. per annum free of income-tax, which dividend was accordingly declared. The sinking fund of the society now amounts to 1,131l., and the reserve fund to 4,000l.



TOWER OF ST. MARY'S CHURCH, MÜNSTER, GERMANY.

Completed A.D. 1374.

THE CHURCHES OF MÜNSTER,
GERMANY.

In former numbers of the *Builder* we have had occasion to describe different buildings in the very ancient and interesting town of Münster, in Westphalia, and we have given illustrations of the Rood-screen in the Cathedral, and of the Rath-haus. We propose now to say a few words upon the churches of that city. The first which claims our attention, on account of its remarkable size and importance, is the church of St. Lambert. This very beautiful edifice is situated at the north end of the great market, and is a rich and noble example of late German Gothic. The plan is exceedingly simple, consisting of a nave and aisles under one external roof, a long chancel or choir, and an octagonal lady-chapel leading out of the east end of the south aisle. At the west end is a tower, the lower portions of which are Romanesque, and form the sole remains of a former church. The present building dates from the end of the fourteenth century. What is particularly striking in this church is its grand scale. Each bay of the nave is 28 ft. from centre to centre; the height to the vaulting is nearly 100 ft.; and the nave is over 40 ft. wide without the aisles. The tracery of the windows is very remarkable, and more wild than beautiful. There are three very rich doorways, one of which is ornamented with a "Jesse tree," carved in stone in its tympanum.

The church of St. Mary, or as it is more commonly called, the "Überwasser" Church, is a beautiful Gothic building, consisting of a nave

and aisles under one external roof, a spacious chancel, and a noble tower at the west end (of which we give a drawing). This church was erected between the years 1340 and 1348, but the tower was not completed until 1374. Like the chancel of St. Lambert, the dimensions of this building are grand for a mere parochial church. The nave and aisles are 120 ft. long, the choir 45 ft. long, and the tower 50 ft. square at the base. The internal width of the nave and aisles is 73 ft., and the height of the tower 180 ft. The style is simple geometric. Two side altars of remarkably good design have just been erected at the end of the south aisle.

The next church in point of size and importance is that of St. Ludgeri. It consists of a low Romanesque nave, aisles, and transepts, with an octagon central tower, the lower portion of which is Romanesque, and the upper forms a beautiful open lantern of Decorated work. The choir is very large and magnificent; its walls continue at right angles to the transepts, and in a line with the nave for two bays, but the third bay widens outwards in an oblique direction, the fourth bay is again straight, and then the apse starts, so that the eastern portion of the choir forms a large polygon. The choir was begun in 1383. This church has been well restored, and a new stone high altar of good design erected.

The church of St. Martin is in general plan similar to St. Mary's; it is, however, smaller, and not so rich in detail: like the latter church, it possesses a fine tower.

St. Servatius is a small but singular Romanesque church. It consists of a short nave and

aisles, and a small chancel. The vaulting of the nave is quadripartite, and each bay incloses two arches of the aisles.

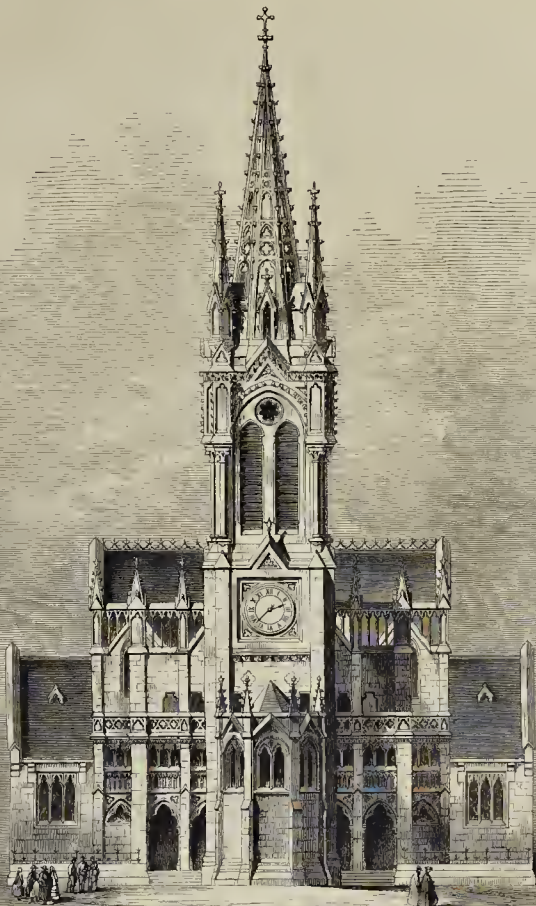
The Protestant church (originally the Minorite church) was built in the year 1270, but nearly rebuilt in the fourteenth century. It has a nave and aisles the same height, and a very long chancel. Over the chancel arch is a simple metal flèche.

St. Clement's and St. Giles's are modern Italian churches of no architectural interest. The latter has been charmingly decorated by Steinle and his pupils.

The Alnwersty church, formerly belonging to the Jesuits, was built in the year 1615, and is one of the latest Gothic churches built in Germany. It has galleries over the aisles, and the whole building is well vaulted in stone.

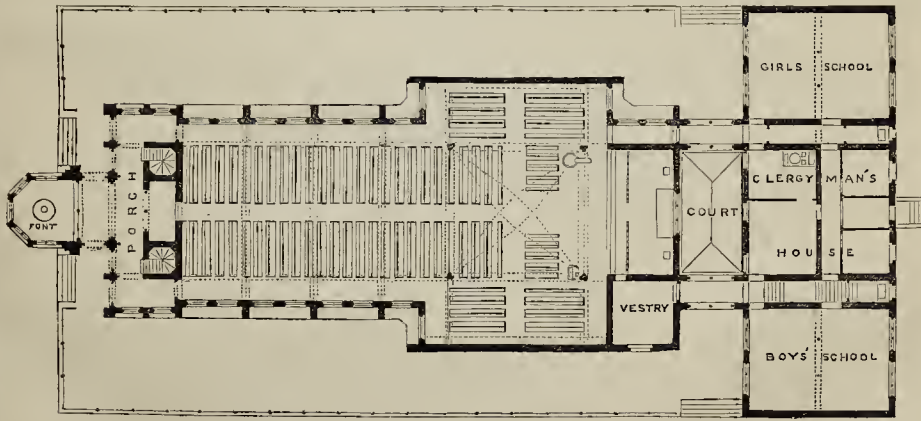
There are two new churches in Münster: one built for the Jesuits, and the other for the Franciscans. The former is rather too thin and wiry, but the latter is commendable.

The church of St. Maurice, in the suburb, is a most interesting building. It consists of a nave and aisles, and a long choir. There is a very solid tower at the west end, and, a kind of forehall or antechapel. There are two other towers flanking the chancel. The whole of the church is Romanesque, except the chancel, which is Decorated. The nave and towers were erected between the years 1084 and 1118, and the chancel in the year 1451. The church has been restored and decorated in a very costly manner. The high altar and choir fittings are worthy of notice.



B SLY DEL. 10 20 30 SPANISH FEET T WEDGWOOD.

SPANISH EVANGELICAL CHURCH, PROPOSED TO BE BUILT IN MADRID, SPAIN.
M. JUAN MADRAZO, ARCHITECT.



SCALE OF FEET

Plan.

**SPANISH EVANGELICAL CHURCH
PROPOSED TO BE BUILT IN MADRID.**

The ecclesiastical movements in Spain, a country heretofore so intolerant that half a dozen Protestants did not dare say their prayers together on a Sunday morning, must interest many of our readers, and they will doubtless be glad to know that a Protestant church is about to be built in Madrid. We engrave a view of the west end, and the plan of the intended building, which has been designed by M. Juan de Madrazo, architect, who has obligingly enabled us to give these illustrations.

Since the last revolution of September, several Protestant rooms for preaching the Gospel have been opened, and committees for promoting the Protestant religion have been organized in various provinces. To the Madrid committee the municipal corporation have granted gratuitously a piece of ground 17,000 square feet in extent, for the purpose of building this church.

The entrance to the building will be at the west front, through a sort of cloister or narthex, separating the baptistery from the body of the church, above which the clock and bell tower, with a perforated stone spire, will rise about 155 ft. high. Entering the church, there will be found accommodation for 500 persons in open seats. A small court will separate the chancel from the schools and organist's house, which both form a rear wing. These buildings will be of stone (a kind of Bath stone). Both nave and chancel will have an open timber roof, supported by arches built of brick, spanned across. In the centre of the transept a louvre in the roof will be provided for ventilation, taking externally the appearance of a spire. This and the roofs will be covered with slates and lead. The cost of the whole is estimated at 10,000*l.*

RAILINGS A PAINFUL NECESSITY.

I AM no advocate for having things railed in, but there are cases in which this undesirable treatment is absolutely necessary, however disagreeable it may be; and, I take it, the pretty sunk garden in Hyde Park, formed on the site of the old reservoir, is a case in point.

As I passed this afternoon, I was distressed to see how worn and shabby the grass on the sloping banks looks, although it has just been enjoying its winter reprieve from being trampled upon. If it is thus at the beginning of "the season," what will it be at the end! I was, I say, distressed; surprised I could not be when I saw the numbers of rough boys and girls who were amusing themselves by running up and down these slopes. Surely there are plenty of grassy stretches in Hyde Park where mischievous children may disport themselves, without allowing them to injure their neighbors, by wilfully damaging a spot that has been so tastefully laid out for the public delight, and paid for by the public money?

I am afraid there is no help for it, Mr. Commissioner Layard, but by ordering these pretty slopes to be railed in all round, even to the sides of the steps, and thus preserving them green and fresh for the visual enjoyment of the general loungers, as well as for that of

ONE OF THE PUBLIC.

BRICKWORK.

A CORRESPONDENT, E. Grimes, writes thus:—"While superintending the carrying out of an important building contract, in which the face of the walls is built of red pressed brick, set in Flemish bond, I have found that, just to save the difference of cost between the half of a pressed brick, and the half of a common brick, the headers have been broken in the middle, with only here and there one whole for bond, so that the facing has been only a 4-in. veneer, instead of an integral part of the wall.

I have taken counsel with other clerks of works and architects, and find it to be a common practice in these scamping times, and the thing is treated as a matter of course. I do not like this, and mean to prevent it as far as I am able, and in thinking the matter over, I have, I believe, hit upon a plan which will circumvent the evil. It will give us half bond, too, which is an advantage over either old English bond or Flemish bond, and it will also be a saving of the facing material. The plan is to lay all face bricks as stretchers, but to make the bricks in each alternate course, 3 in. and 4 in. wide, so that we always get 3 in. bond in the direction of the

thickness of the wall. I should like to hear how you and others like it.

I have heard it objected to the 5-in. bricks, that the bricklayers would find them too wide for their hand. I know that the old Italian workmen need such bricks, and what they could do we can do. An attempt to remedy this evil, as well as to be original, has been made by our American brethren, by uniting the bricks together, and goes by the name of 'Yankee bond.'"

Our correspondent is quite correct as to the scamping way in which much brickwork is done; no thought whatever is taken as to the result; the sole endeavour is to give it such an appearance as will deceive and pass. The utter disregard for truth on the part of a large number of operatives which has been induced by the system is painfully distressing to those who are thrown officially amongst them. As to the mode of building proposed, if the writer find it difficult to get ordinary bricks laid properly he would find the difficulty increased when bricks of different sizes were to be used. Many attempts have been made to introduce bricks that might be doweled, dovetailed, mitred, and so forth, but they have never been persevered in, such has been the difficulty of getting the work done, except by special men at increased cost. The bricks proposed by our present correspondent would not make such sound work as ordinary bricks properly laid.

**THE FIRE-PROOF PROPERTIES OF
ASPHALTE.**

APPRECIATING the importance of proper knowledge of the subject, we lately gave the pit in English of a communication recently addressed to the French Société des Ingénieurs Civils, by MM. Flachet and Noisetie.* This has brought to us other communications upon the same subject, the substance of which may be usefully noticed. One correspondent, however, cites a case in Norfolk, of a large rainwater tank that was lined with asphalt, and leaked. A workman, with a view to discover the defect, entered the manhole with a lighted candle, when an explosion immediately followed, causing much injury to him. This circumstance occurred some years since, and was recorded by us at the time, not as concerning an asphalt lining, but one of gas tar. From this material there escapes more or less at all times an unpleasant odour, especially noticeable when the tar has been recently applied. This odour is that of the highly combustible hydro-carbon gas, and it was this which, remaining without the means of escape from the tank, produced the explosion.

The memoir above referred to does not embrace artificial compounds, but rock asphaltic mastics, such as Sycsell,† and the following other cases, where asphalt has been exposed to the action of fire, seem to corroborate the opinion as to the value of this particular material as one applicable to all fire-proof constructions.

So long back as 1835 a fire took place at Bordeaux, when the burning materials fell upon a roof of asphalt, causing no material damage to it. The certificate of which we give a translation records the particulars.

TRANSLATION.

"We, the undersigned inhabitants of the city of Bordeaux, hereby certify and attest that, at the time of the conflagration of the Bazaar Bordelais, situated in the St. Catherine and Great and Little Canera streets, which happened on the night of the 28th December, 1835, a number of burning beams, rafters, and other bodies, in flames, fell on that part of the building covered with asphalt without causing it to melt; and we further attest that the said roof, so covered, has not been injured to any material degree."

Of the great fire in Hamburg in 1842, which destroyed, with other buildings, the Church of St. Nicolas, the *Times* of the 28th of May, 1842, said,—

"It was remarked as a singular circumstance during the conflagration, that roofs covered with asphalt, of which there are some here, opposed rather than encouraged the progress of the flames. It was imagined, on account of the substance of which these roofs were composed, that they would easily catch fire, and be the cause of great mischief; such, however, was not the case, for it appeared that the fire had little or no effect on them, and

* See p. 125, ante.

† Mr. F. W. Simms, C.E., in 1839, gave the analysis of this rock:—

Carbonate of lime pure	92
Dry bitumen	8
And Dr. Phipson, F.C.S., quite recently gives the analysis:—	
Bitumen	7.50
Carbonate of lime	92.50
To which when brought to a fine powder, from 2 to 6 per cent. of grit is added, and from 5 to 6 per cent. of bitumen, to reduce the whole to a state of mastic.	

when the roofs of the houses fell in, the asphalt, in which a sort of rubble is mixed up, was found to have resisted the effects of the heat, and, like a mass of dirt, served rather to smother the flames than to give them increased vitality."

A similar instance of extinguishing a fire is noticed in our first article, where an upper floor was covered with asphalt,—"fill at last the beams of the floor carbonized, gave way, and the floor sank, carrying with it the bed of asphalt, which extinguished the fire instantly."

Some few years back an extensive fire occurred at Messrs. Baker & Son's premises at Stangate. An engine-house, with a flat roof of Claridge's asphalt was exposed to the full force of the fire from the surrounding buildings; upon examination it seemed to have melted or softened only, as the surface of it was marked with corrugations, but these in no way affected the imperviousness of the asphalt.

We have already spoken of fires where the asphalt hardened again, and returned to its original condition, as in the instance of the engine-house roof. It may be as well to add to these notes a record of what was done at the time of the erection of the new reading-room at the British Museum:—

"Mr. Henry Fielder, the managing partner of the firm, arranged for an experiment, which was made on November 6th, 1855; there were present Sir Henry Ellis, Mr. Sydney Smirke, Mr. A. Panizzi, Mr. G. W. Baker, Mr. G. Baker, Mr. H. Fielder, Mr. Superintendent Braidwood, and two clerks of works.

A mass of fire, 3 ft. in diameter, formed by the combustion of thirty-four faggots of wood, with coal and coke, was maintained for the space of one hour upon a portion of the asphalt that had been laid down to form the roofing portion of the snow gutters. At the expiration of the above period the soffit of the arch beneath became too hot for the hand to be held upon it. It was observed that the fire did not spread further than the space above mentioned, and beyond fusing that part of the asphalt no damage was done to the adjoining portions of it, thereby satisfactorily proving to the minds of all present its perfect incomcombustibility."

The details of this experiment were taken by Mr. Farrell, from Mr. Fielder's notes made at the time.

**THE BELLS AND CHIMES OF ST. GILES'S,
CRIPPLEGATE.**

THE ancient and venerable church of St. Giles, Cripplegate, in which rest the remains of our immortal poet, John Milton, and several other distinguished worthies, possesses a peal of twelve bells in the key of D flat, weight of tenor 35 cwt. The tower of the church also contains a clock, put up by Langley Bradley, maker of the great clock at St. Paul's, in 1722, and a set of chimes constructed by George Harman, of High Wycombe, in the year 1792.

The bells are respectively inscribed as below:—

1. "John Briant, fecit, Hertford, 1732. Thomas Willats and Thomas Smith, churchwardens; William Staines, deputy; Robert Clark, Nathaniel Browning, and John Knight, common councilmen."
2. Same as the above.
3. The same.
4. "Pack & Chapman, fecit, London, 1772."
5. "Pack & Chapman, fecit, London, 1772."
6. "YE PEOPLE ALL WHO HEAR ME RING, BE FAITHFUL TO YOUR GOD AND KING. Pack & Chapman, fecit, London, 1772."
7. "WHAT THUS WE JOIN IN CHEERFUL SOUND, MAY LOVE AND LOYALTY ABOUND. Pack & Chapman, fecit, London, 1772."
8. "PEACE AND GOOD NEIGHBOURHOOD. Pack & Chapman, fecit, London, 1772."
9. "OUR VOICES SHALL IN CONCERT RING, TO HONOUR BOTH OF GOD AND KING. Pack & Chapman, fecit, London, 1772."
10. "IN WEDLOCK'S BANDS, ALL YE WHO JOIN WITH HANDS, YOUR HEARTS UNITE; SO SHALL OUR TUNEFUL TONGUES COME TO LAUD THE ACTUAL RITE. Pack & Chapman, fecit, London, 1772."
11. "YE RINGERS ALL THAT PRAISE YOUR HEALER AND FATHER, BE SOBER, MERRY, WISE, AND YOU'LL THE SAME POSSESS. Pack & Chapman, fecit, London, 1772."
12. "Robert Patrick, founder, London, 1737; John Warner, contractor; William Godfrey Bown and Richard Gouge, churchwardens; Sir James Esdaile, knight, alderman; John Bunner, deputy; William Staines, Robert Clark, and Robert French, common councilmen."

Robert Patrick, who recast the tenor in the year 1787, made but very few bells on his own account. He, like Pack & Chapman, resided in Whitechapel.

The present ringers are members of the "Cripplegate Society" and meet in the belfry for practice every alternate Tuesday evening.

It should be mentioned that the clock strikes the hours upon a small bell of wretched quality of tone, suspended in a wooden turret surmounting the tower. I undertake to say, however, as a hint for some worthy parishioner, that it could be at once replaced by a truly musical bell, the cost of which would be very moderate.

The chimes play daily at 3, 6, 9, and 12 o'clock in the following order:—

Sunday.—"Easter Hymn."
Monday.—"God Save the Queen."
Tuesday.—"See the Conquering Hero comes."
Wednesday.—"Martin's Lane."
Thursday.—"And Lang Synn."
Friday.—"Sicilian Hymn."
Saturday.—"Old 104th Psalm."

The tune is generally changed at noon, so that two different melodies may be heard every day.

Of the manner in which the tunes are performed I cannot speak in terms of praise. Possibly the machinery may have suffered from the wear and tear it has undergone.

A few years ago the interior of the church was in a lamentable condition, being disfigured by high pews and ponderous galleries, among other unsightly things. These have, however, all disappeared, while, by the liberality of many of the parishioners and others, the sanctuary has lately been restored and adorned with memorial windows of stained glass, Mr. Edmund Woodthorpe being the architect.

The best historical account of the parish, the ward, and the time-honoured edifice, brought down to the present time, will be found in a little work compiled by the respected organist of the church, Mr. William Miller, of H. M. India Office, THOMAS WALLEBY.

SEWERS IN LINE OF RIVER.

A CORRESPONDENT writes.—In the *Builder* of Feb. 6, "Engineer" requires to know "where a main sewer is carried down the bank of a river; or rather, where an embankment has been formed by a river side to contain the sewer."

No answer as yet appearing, I venture to submit one, through your kindness. Not, however, one that relates to a town of any magnitude; yet, in other respects, such as your correspondent is seeking to find. One, moreover, if he has time to spare, he may readily see for himself.

Bedford, about an hour's ride from London (or Leicester), is the town to which I would refer him. It is a place of progress and improvement, containing between three and four thousand houses. It has now (thanks to Mr. James Howard, M.P., and others) a complete system of modern sewers, which can be flushed from the water supply above the town, and which terminate at a pumping-station for "irrigating" purposes.

A CHEAP AND EFFICIENT MODE OF HEATING FUTURE HOUSES, WHETHER ON A LARGE OR SMALL SCALE.

SIR,—The plan I propose has been submitted to architects and builders, and, albeit it is but a theory to be tested by practical experiments, they all coincide in the likelihood of its proving a perfect success.

It is very simple and inexpensive. In constructing the building, allow a space of 4 in. or 5 in. between the outer and inner walls. This will be no source of weakness to the structure, if at suitable intervals building stones or bricks connect and stay the outer and inner shell. The same interval should be allowed between the floors. This is the chief extra expense. It will necessitate a light set of joists and lath and plaster for the ceiling of the rooms, as well as "densifying" for the floors. In the basement of the building there is a furnace precisely of the construction of those of the best Turkish baths in this country, i.e., the hot air passes over fire-brick, and therefore, if it should be let into the rooms in very cold weather, it is free of the injurious effects arising from air heated from iron fires. [The day, I predict, is not far distant when every gentleman's house will contain a Turkish bath in the basement.] The proposition I venture to lay before builders and architects is this, viz., that the heat from the furnace in question will circulate through the space between the walls and the floors, and may be increased to any extent, and let in, or shut off, at will. A house heated in this way (if the ventilation is perfectly attended to) will give us a Madeira

climate in our coldest and most ungenial weather, and at perhaps a 6d. per day for a house of a dozen rooms.

I have no doubt but that architects and builders will not upon the hint I give. It commends itself to common sense at least, and if found in effect what I predict it will be found, this simple warming expedient will revolutionize house building, from the model lodging-house and the almshouse, and the gentleman's villa, and the hospital, and asylum, up to the club-house, museum, picture-gallery, library, Government offices, law-courts, and palatial residences of whatever sort and size. If it be objected that there will be some difficulty in circulating this hot air through certain walls and floors, I reply that a Howarth's Ventilator, placed here and there on the roof in connexion with these cavities, will create a perfect draught through them.

I am, sir, one of your subscribers and readers, but neither an architect nor a builder.

J. BALBRINE, A.M., M.D.

MANUFACTURING STEEL.

A PAPER on this important subject was read on Thursday last week, at the Inventors' Institute, by Dr. B. H. Paul. After describing the characteristics of steel as compared with ordinary malleable iron and cast iron, the author pointed out that all the known methods of producing steel were referable to one or other of three classes:—1. Carburization of malleable iron; 2. Decarburization of cast iron; and 3. The direct production of steel from iron ore by one operation. He showed, in describing the several new methods, that they involved the same principles as the older methods, and that the novelties which constituted the importance of these, like other improvements, consisted chiefly in the mode of applying those principles, suggested and rendered possible by a more thorough scientific knowledge of the subject to which they referred. Thus in one of the oldest methods of producing steel with the Syrian forge the principle is precisely the same as that of the Bessemer method,—burning out the surplus carbon of cast iron by atmospheric air. But while only a few hundredweight of iron could be worked at one time with the forge, and the product was obtained in small lumps, requiring much subsequent labour to bring it into a compact state, the Bessemer converter would turn out at once from five to ten tons of pure melted steel, which could be run into moulds as an ingot, a cannon, or any other form desired, this difference being entirely owing to the different mode of applying the principle involved. In speaking of the influence exercised upon the quality of steel by various impurities originating from the ore or the fuel used in smelting, the author dwelt upon the defective state of chemical knowledge in reference to this subject, and urged the necessity of scientific investigation of a nature commensurate with its importance, bearing on a manufacture which was first developed on a large scale in this kingdom, and in that respect has been until recently almost peculiarly British.

THE ROMAN ARUM.

It may interest some of your readers to know that a plant very similar to the gigantic arum from Nicaragua, described in your last number, exists in the Campagna of Rome. In the spring of 1852, a medical friend of mine, since deceased, found this plant growing among the roots of the canes (*Arundo Donax*), which are commonly planted as hedges round the few cultivated patches of that barren soil. It differs from the American plant, which latter would seem to show only one leaf. The Roman arum, on the contrary, bears deeply serrated leaves, about the size of a large human hand with the fingers spread out, somewhat similar to a horse-chestnut-leaf. But the lofty stem, the large purple spathe and pistil, and the carrion-like odour of the flower are all exactly similar to the Nicaraguan plant, as described by you. The *habitat* of the plant is, so far as I am aware, restricted to the immediate neighbourhood in which it was found, a gloomy lane of no good repute, called the Via Cupa, about five miles beyond the Porta Pia. My friend, who brought his fragrant burden to my house in the city, knowing how glad I should be to get a sketch of it, was almost overpowered by the stench. He found the Roman professors to

whom he spoke quite unaware of its existence the peasants to whom it was known stated that it had received its colour and odour from growing at the foot of the cross, and being drenched in the blood of the Saviour,—not a very complimentary legend.

The size of the flower was less than the one mentioned in your pages, the length of the spathe in my specimen not exceeding 18 in. My friend planted one of these weird monsters in a garden at Leghorn, where I saw it in flower a year or two later.

Possibly, indeed most probably, this plant is well known to our hotanists; but, as I have already stated, it was a novelty not only to our British community, but also to such learned Romans as my friend, a long resident, was able to consult. I remember that a young Scottish artist made good use of it in a fairy picture from the "Midsummer Night's Dream." S. F. D.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the meeting of this society on the 10th inst., the discussion of the proposed form of building contract, adjourned from a former meeting, was resumed. The several clauses of the proposed form of contract (which was printed at length in the *Builder* for February 6th) having been separately gone through, the following resolution was finally carried unanimously:—

"That this meeting approves of and recommends for adoption among the members of this Society the form of building contract drawn up by the sub-committee chosen from this society and from the Liverpool Master Builders' Association, as amended at this meeting, and at the meeting held on the 10th of February, 1868."

CHURCH RESTORATION.

SIR,—Will one of your enlightened readers tell a poor parishioner the best plan for preventing the repair of a gallery across the east end of the parish church of Braunton, North Devon?

A proposal to restore the church has produced no more money than would fairly pay for the plans and estimates.

This interesting relic of antiquity has escaped entire peeing owing to the noble carved seats; but some of the pews hide a large number of handsome bench-ends. By bringing these to light, and by sweeping away the east and west galleries, and those in the north transept, and the opposite tower arch, the number of seats would be materially reduced.

"Kick out all pews and galleries, and the seats would be reduced one half." This always sounds very heartless and wicked, and meets with the opposition of those who think that what was good enough for their respected and immediate ancestors is good enough for them. Is this a hopeless case? BRAUNTONIAN.

BRITISH ARCHAEOLOGICAL SOCIETY OF ROME.

SINCE our last notice they have had an excursion to the French part of the Palatine to see the ruins of the Palace of Therius and Caligula, with the subterranean passage made by Vespasian for the Emperor and his suite to go from the private apartments at the north end of the hill to the public State apartments in the centre. The day being open to the public by a general order, Signor Rosa could not have prevented the Society from going on that day had he wished to do so. He did not make his appearance nor send any apology for having shut his door in their faces on the previous Thursday. M. Lanciani, a young architect, was the guide, but as he did not speak English, Mr. Parker walked with him and interpreted. Mr. Parker was obliged in some instances to express dissent from his opinions, especially on the subject of the Intercolumnium, or valley across from east to west, dividing the hill into two parts, the southern part of which, according to Signor Rosa, is the Velia. M. Lanciani said that the proof of this was that there are houses of the time of the Republic in this valley hurried by the holdings of the Cæsars, and he pointed out the pit in which those houses were to be seen: but as there was room for not more than half a dozen persons at a time, and the party amounted to upwards of a hundred, he requested them to examine this detail afterwards.

After the lecture, Mr. Parker, with Mr. W. Cotton and others, went to examine the alleged remains of "houses of the Republic in the

valley." Instead of these remains, they found some small brick chambers of the third century without windows, and with fresco-painting on the vaults. These chambers are built in the great subterranean passage from the Palace of Augustus at the south end of the hill to the Public Chambers in the centre, in the same manner as that of Vespasian from the northern palace. The passage is vaulted and has no windows in it, having evidently always been subterranean, and this great passage runs north and south across the alleged valley. The small chambers were for the use of the Emperor in the hot summer months, as in the palaces.

SMOKY CHIMNEYS.

Your correspondent, "R. J.," asks if any of your readers can suggest a cause, or a cure, for the smoky chimneys in his house.

I have just completed the building of such a house as that named by "R. J.," and for some weeks after we moved into ours it was in quite as bad a condition with regard to smoke and down-draught as that with which your correspondent is troubled.

With your permission I will give, very briefly, the means I employed to ascertain the cause of the mischiefs, and say what was done to remedy the evil.

My object was to ascertain if the heated air and smoke were able to make their way into adjoining flues in which no fires were burning; because, if I found this to be the case, I felt sure that the contrary would also occur,—viz., that the cold air would enter the flue through which the heated air was ascending, and thus cause a down-draught whenever the wind was high, or when the fires were allowed to get low.

I first had a plate of lead out to fit on to the top of the chimney-pot (a bishop's cap), so that when the former was put into position, the smoke was completely prevented from issuing in the usual way. A fire was then made in one of the grates, so as to cause a dense volume of smoke to ascend, and a man was sent on to the roof to place the lead plate on the chimney-pot from which the smoke was issuing. Under these circumstances only one of two things could happen,—either that the smoke would pass into an adjoining flue, or come down into the room. In fourteen of the flues the smoke passed easily from one to the other, and the openings were found to be caused by an entire absence of pargeing, or, in some cases, to the fact of bricks having been left out here and there in the "midfothers."

The flues were laid open from the outside, one by one, and well pargeit with good hair mortar, and were then built up again.

The remedy has, on the whole, been very successful. Except during high winds, such as we have had for the last few days, we are not troubled with smoke in the rooms, and when it does come it is easily controlled. Of down-draught, when the fires get low, we have scarcely any at all. M. R. C. S. ENG.

SUN DIALS.

Sir,—As your correspondent, "E. L. G.," has taken upon himself to pronounce judgment upon the Highgate dial, which was projected by me for Mr. Cockerell, may I ask of him ("E. L. G.,"), how any shadow can be projected upon a sun-dial, parallel to the equator at the time of equinox? and still move, how when the sun is beyond the equator?

Quoting some of "E. L. G.'s" own words, I would suggest that, "In fact, the most natural, most obvious, and best thing to do," is to examine, carefully, our own work before venturing to criticize that of others. W. SCARBOLL.

CLOSED DOORS AT SOUTH KENSINGTON.

Sir,—A letter under the above heading in the last number of the *Builder*, p. 193, seemed to me to call for comment, as it is calculated to mislead. Your correspondent writes, "May I urge the hardship—and it really amounts to this—of closing the South Kensington Museum at four o'clock on Saturdays?"

Now, the museum proper is open until ten o'clock on Saturdays, as on Mondays and Tuesdays; but there is a portion of it, a sort of annex, where the models of ships are exhibited, that closes at four, and possibly there may be other outlying departments which, being under temporary regulations, are of necessity closed likewise; as the days lengthen, probably the time for keeping them open may be extended also, as was the case at the embryo museum, known as "the Brompton Boilers." It is a pity your correspondent did not inquire of one of the numerous policemen who are on duty whether there was anything else to be seen: he would then have received every information. It is impossible to find a more civil, well-behaved, intelligent, and obliging set of men anywhere in the public service, than are the policemen on duty in the Museum;

and I am quite glad to have this opportunity of recording my estimation of the manner in which they conduct themselves. My visits to the Museum have been neither few nor far between, so that I have had good experience of their great civility and patient attention: always at hand, never in the way; and so, I repeat, it was a pity your correspondent did not apply to one of the policemen and inquire if there was anything else to be seen; he would not then have had occasion to conclude his letter by saying, "It seems simply absurd for a popular institution to close its doors at" four o'clock on Saturdays. Undoubtedly it does, and therefore the Museum at South Kensington keeps its doors open until ten.

We are barely entered into March, and are only just emerging from dark evenings: so it is scarcely fair to begin grumbling yet; and, really, when we contemplate the amount of art-treasures collected at South Kensington in so few years, I think Mr. Cole deserves the highest commendation, not condemnation, for what he has done. I was myself at the Museum last Saturday until after 5 o'clock, and on the previous Saturday until 6:30; so I can vouch for the doors not being closed at 4. ART-LOVER.

INSECURITY OF SECURITIES.

Sir,—For the possessors of property in the stock of large companies and in other securities, a new danger has arisen separate even from the misvaluation of funds, of which the public has heard of late so much.

By a decision of the Judicial Committee of the Privy Council, given on the 13th ult., it appears that bankers are not answerable for such securities as debentures left in their care. Mr. Richard Lewis had left in the care of his bankers, debentures to the value of 10,450*l.*, which were stolen by one of the bank clerks; and it is now shown to the law of the land that bankers are not liable for the safe custody of such documents, unless through the grossest negligence; and that the public are consequently at the mercy of any trick on a pitiful scale of a salary who may be in the banker's employment, and, having a taste for the extravagant living of the period, may be reduced into an ultimate indistinct appreciation of the difference between *men and laws*.

Moreover, documents duly secured in apparently safe boxes are deposited with bankers and left there for years, from which, under the present state of the law, there is no security that the most valuable documents may not be abstracted,—and years before such frauds may be discovered; and, consequently, detection of the criminal nearly impossible. It, therefore, appears essential that the public at large should take care of their own securities,—a step to which they are now driven.

In the interest of lock and safe engineers, we should be obliged by your giving publicity to this fact, which, if properly considered, must lead to the improvement of the trade, and the more general adoption of the approved safest methods of security for documents of this nature and other valuables. H. H. & Co.

CHILDS-HILL DRAINAGE.

Sir,—In the *Builder* of January 25, 1869, appeared an advertisement addressed "to Engineers," in which the Childs-hill Drainage Committee invited schemes for the best mode of draining the district of Childs-hill, Hendon (close to Hampstead). It stated that the engineer whose scheme was selected would be employed "upon terms to be arranged between the committee and such engineer."

The following talented engineers competed:—

Name	Estimate.	Commission.
J. Blenkarn	£5,308	£252
C. H. Bright	3,987	(not stated).
J. A. Ruge	3,927	203
J. P. Brossy	2,730	5 per cent.
Lucas & Wilkinson	2,490	10 "
P. Black	1,788	4 "
H. H. Fulton	1,730	140 "

A host of other gentlemen took a great deal of trouble in the matter; but the above seven, at considerable outlay and toil, surveyed the whole district, and prepared most elaborate plans, estimates, and specifications. Although Mr. Ruge was nominally selected, a year has elapsed, and the drainage has neither been done nor begun; and if it ever will seem doubtful, Mr. Ruge cannot yet set to work, nor has he received a shilling. Surely this is not quite fair and right! Would a private individual do so? Why does "a public body" thus act? Is it (to partly paraphrase a well-known quotation) because it has no soul to be saved, and no corporal part to be lost? FAIR PLAX.

CHURCH-BUILDING NEWS.

Lowestoft.—Christ Church, Lowestoft, has been opened for divine service. The edifice is in the Early English style, and consists of nave, aisles, chancel, organ chapel, tower, and spire, with porch and vestry. The nave is lighted by four double-light windows in the sides, and a fan-light window in the gable; also by a three-light window in the chancel. An arcade of moulded arches divides the nave from the aisles, supported upon ornamental cast-iron columns. The aisles are lighted by three double-light windows, and a three-light window in the gable. The tower is placed at the south-east angle of the nave, terminating in a spire, rising to a height of about 80 ft. There are two principal entrances, one under the tower into the nave, forming a porch, and the other into the aisle. The porch and chancel are paved with Maw's mosaic tiles, and the aisles with blue and red tiles to pattern. The roofs of nave and aisle are all open, and boarded on the upper side of the rafters; that of the chancel is divided by moulded ribs into panels. All the wood fittings and roofs are stained and varnished. The windows are glazed with cathedral glass, in lead quarries, and stained-glass margins. The walls

are faced with white brick, and relieved with light red bands and Bath stone dressings. The roofs are covered with blue and green slate, in alternate bands. The building is planned to seat about 500 persons, and was designed by Mr. H. Oldham Chambers, architect, Lowestoft. The contractors were Messrs. Jackson & Monno, of Blandstone; and the sub-contractors, Messrs. J. G. Balls, Lay, and Skyles, of Lowestoft.

Reading.—The new reredos of St. Mary's Church is now complete. The centre group represents our Lord surrounded by his Apostles, addressing to the listening multitude the words, "Come unto Me, all ye that labour and are heavy laden, and I will give you rest." Mr. Earp, of London, was the carver. The arcade to the north of the centre group contains three figures in mosaic, signifying, "The Old Testament," viz., Moses—the Law; David—the Psalms; Daniel—the Prophets. The arcade on the South side also contains three figures signifying "The New Testament," viz., St. Luke—the Gospels and Acts; St. Paul—the Epistles; St. John—the Revelation.

Dis.—A reredos has been placed in the chancel of the parish church, at the expense of the Rev. C. R. Manning, the Rector. It is about 8 ft. 6 in. in length at the back of the communion table, and rises a few inches above the sill of the east window; the rest of the east wall on either side, and of the north and south walls, as far as the rails, being panelled in oak, with diapered patters in colour. Its material is Caen stone, of a uniform cream-white colour, inlaid with marble, and bosses of spar, gold, and crystal. A large panel forms the main design, and is filled with four quatrefoils sunk in the stone, each containing one of the well-known emblems of the four Evangelists, carved in alabaster, on a background of black marble. In the centre is a cross of black marble, and gold mosaic, the arms terminating in crystal bosses, and the front resting on a slab of red Devonshire marble. Between the evangelist symbols are floral patterns, in green and red marbles, gold mosaic, and bosses of Derbyshire spar. A band of grey marble, inlaid with black, runs below the panel, and a cornice of pierced trefoils and sculptured leaves extends along the whole length of the top, projecting in the centre, to form a three-sided canopy, which also is ornamented with marble and gold bosses. The whole design is supported at each end by a double buttress, rising from the ground, and inlaid like the rest. This part of the work was executed in London, by Messrs. Field. The oak panelling was executed in Dis, by Messrs. C. Bishop & Son. On the south side the panels form three "sedilia," or seats for clergy. Above the reredos, except where the line is broken by the windows, is carried a coved cornice, painted in the hollow part with a flowing pattern, the end next the windows being finished with a carved elbow, and those at the rails with a lofty standard, each surmounted by a figure of an angel, with uplifted wings. A plinth of oak supports the panels all round from the floor, in which are devices in sunk circles, but without any colour. All the painting has been executed, under the superintendance of the architect, by Mr. Herbert Orshourne, Stowmarket. The whole of this work was designed, after suggestions from the rector, by Mr. Augustus E. Browne, of Dis.

Lincoln.—The new church for the combined parishes of St. Peter-in-Eastgate and St. Margaret will, in all probability, be shortly commenced. At a recent meeting of the committee Mr. Blomfield, of London, architect (son of the late Bishop Blomfield), was selected to prepare the designs. The cost of the building is estimated at 2,500*l.*, and 2,120*l.* have been already subscribed.

Wickham Market.—Efforts are now being made to restore the church, which dates back to the year 1310, and has of late years been falling into decay. The tower, which is octagonal, is surmounted by a leaden spire, rising to a height of 135 ft., and is a conspicuous landmark for sea-going vessels. Plans for the complete restoration of the fabric, with the addition of a new aisle on the north side, and the substitution of benches for the present old-fashioned pews, have been made by Mr. E. C. Hakewell, and submitted to the bishop, who has expressed his approval. The total cost is estimated at 1,300*l.* The subscriptions in the town already amount to upwards of 185*l.*; the Rev. W. T. Image, the vicar, has in addition to this a sum of 57*l.* promised to him, and it is hoped that the neighbouring landowners, and all who have an interest in the town, will

liberally assist. At a vestry meeting a committee has been formed to co-operate with the vicar in soliciting subscriptions.

Warrington.—A new church at Warrington, dedicated to St. Ana, has been consecrated by the Bishop of Chester. The church is situated in a district taken out of that of St. Paul's, Warrington. An endowment has been provided by Mr. W. E. A. Beamoat, of Orford Hall, who has also given 2,500*l.* of the total cost of 5,200*l.*, the remainder having been contributed by the public.

Webbhead.—The plans of the new church have been prepared by Mr. Preedy. Messrs. McCann & Everal, of Malvern, are the contractors. The site is at the corner where the road from Foxlydiate to Bentley intersects the one running eastward to Hill Top, and was given by Mr. R. Hemming. The building is to be of stone externally, and internally from the gray and the red beds of the Waterstone formation, at Hewell and at Finstall. Bath stone is to be used for the decorations and dressings, and at the entrance of the porch a pair of polished marble shafts. The roof will be of Broseley tiles; inside roof, open timbered; seats, pine, stained and varnished. The style is Early English. The chief east window is a three-light one, surmounted by a wheel heading; with trefoil windows on each side. The plan is simply nave and chancel, with a south porch at the western end, a bell gable at the intersection of nave and chancel, and a vestry, and organ arch between it and the choir. The accommodation is for 200—164 adults and 24 children, with 12 in the choir. The total length, inside, is 88 ft.; width of nave, 22 ft.; width of chancel, 18 ft.; length of chancel, 24 ft.

DISSENTING CHURCH-BUILDING NEWS.

Halifax.—A new Congregational or Independent chapel has been opened here for divine service. The style of architecture is the Early Geometrical, and the chapel is built of North-west ramp-pitch-faced wallstones, with freestone dressings. The edifice is 113 ft. 6 in. long by 53 ft. wide, and 53 ft. high externally, exclusive of minister's and other vestries at the back. It is divided into nave and side aisles by cast-iron pillars supporting the galleries and roof, and five bays in length, the bay next the organ recess being much wider than the others, so as to allow of the church being enlarged at some future time by the addition of transepts, which are prepared for in the erection. At the north end of the building there is an octagonal recess for the organ, 22 ft. wide, and 6 ft. 6 in. deep, divided from the nave by a deeply moulded and enriched arch springing from granite columns, with carved freestone capitals. Over the pillars dividing the bays are moulded arches in brick-work and cement, between which and in the centre over each pillar are granite columns with carved capitals and moulded bases, supported upon carved corbels, upon which the roof principally rests. The internal wood-work, where exposed, is of pitch pine. The pews are 2 ft. 10 in. wide, and allow 20 in. for each person. On the ground floor there is accommodation for 568 persons, and in the gallery 364, making a total of 932 sittings. In Hopwood, the south front, are the entrance vestibules and staircases, and at the south-west angle there is a tower and spirelet 120 ft. high. The principal entrance is in the centre of the front, through a deeply-moulded and enriched doorway, with deeply-moulded windows on each side, over which there is a large five-light traceried window. On each side of the principal entrance, and in the same point, are the entrances to the galleries. On the side elevations, in each bay of building, the windows under the galleries are arranged in complets, over which are three-light traceried windows to light the galleries, with gables and ornamental finials over each. In the transept gables there are large four-light traceried windows, with column-d mullions and carved capitals. All the windows are glazed with tinted glass in quarries, and with ornamental borders. The grounds are inclosed with wrought-iron railings and gates. The masonry work has been executed by Messrs. Michael Firth & Co.; carpenters and joiners, by Messrs. John Dyson & Son; slating and plastering, by Messrs. Joseph Bancroft & Son; plumbing and glazing, Mr. George Walsh; ironfounders' work, Mr. James Farrar; and painters', Messrs. W. Lee & Sons. The works have been carried out under the directions of the architects, Messrs.

Roger, Ires, & Son, of Halifax; Mr. Powell being clerk of the works. The estimates amounted to 6,638*l.* 2s. 5d., and, with the lighting and heating apparatus, boundary rails, and cost of land, the whole cost will be about 9,000*l.*, exclusive of the cost of schools, which it is proposed to erect at some future time. The ohuroh is lighted by corona gaseliers, suspended above the galleri-s, and also by ornamental brackets affixed to the walls. The heating apparatus has been supplied by Mr. E. Lambay, of Halifax. No organ has yet been erected.

STAINED GLASS.

West Church, Stirling.—A stained glass window has just been set up in this church. It forms the central window on the south side, nearly opposite to the terrace of the bowling-green, and consists of nine divisions. The three principal designs, with the texts above of which they are illustrative, occupy the lower six compartments. The whole are Scriptural subjects—the representation of Christ being the principal in each of them. In the first illustration of the words "Come unto me, all ye that labour," &c., are the figures of a negro, fettered, and in the attitude of supplication, and also of a woman in the attitude of reverential homage. The second is "Christ with Martha and Mary at the tomb of Lazarus." The third, in which there are six figures—that of Christ, as in the others, being in the centre,—it is illustrative of the words "Him that cometh to me I will in nowise cast out." The window is in memory of the late Mr. John Dick, of Craigenfell, Provost of Stirling, who died 22nd April, 1865. Messrs. Ballantine, of Edinburgh, were the artists. It cost upwards of 100*l.* The glass is rough and crystalline in texture; none of the colours are ased, but all pot metal, and made in the glass. On the faces there is little or no shading, and the light and shadow in the draperies and accessories are mainly produced by the unequal thicknesses of the coloured pot metals. In this best specimens of early glass have been followed, and the brilliancy throughout is equal, and purely mosaic. There is no obscurity or semi-transparency. The groundworks are all broken up by little bits of glass of different intensities of colour. We understand Messrs. Ballantine have in this instance followed the advice and directions of the president of the Royal Scottish Academy, Sir George Hervey. While in this window the strongest colours predominate, the light which passes through and falls around is colourless. This was stated by Sir George Hervey, in a letter some time ago, to be characteristic of the best specimen of coloured glass.

Church of Westbury-upon-Trym.—The great east window in the Canyuge chapel of this church has just been filled in, as a memorial, with painted glass, by Messrs. Heaton, Butler, & Bayne, of London. The window is filled in with Perpendicular tracery, and is divided into six subjects taken from the miracles of our Lord, and forms a continuation of the story of His Life, illustrated in the four windows of the chancel apse. The first compartment of the new window represents the Marriage of Cana; the second, the Pool of Bethesda; the third, the Raising of Lazarus; the fourth, the Widow's Son restored to Life; the fifth, the Raising of Jarius's Daughter; the sixth, the two Blind Men receiving their Sight. Each subject occupies two lights, and the window is divided into two parts by ornamental canopy work, which is repeated again above the subjects in each light. These canopies give character to the window. The upper part of the tracery is filled in with figures of angels playing on various instruments.

Mariborough College Chapel.—A stained glass window has been erected in this chapel, to the memory of Dr. Cotton, the late bishop of Calcutta. The cost of the window will be defrayed by voluntary contributions. The artists are Messrs. Clayton & Bell, who were desired to erect the best window possible regardless of cost. The window is a two-light, each light being divided into two compartments. The subjects are:—Agabus binding the hands of Paul, symbolical of his going "bound in the spirit" to Jerusalem. Beneath is a north-east view of the College Chapel. The other light represents Paul preaching at Athens, with the Parthenon in the background; and, on the panel, the cathedral at Calcutta.

Durham Cathedral.—In the presence of the Dean and a considerable number of ladies and gentlemen, a stained glass window, in memory

of the late Archbishop Thorp, Warden of Durham University, has been uncovered in this cathedral. In the two centre lights are represented the chief events of our Lord's life. In the next light, on the left, are groups of the "Apostles;" on the right the "Prophets;" while on the extreme left are the "Martyrs;" and on the extreme right the "Holy Church." Above, in the tracery, are saints, angels, Cherubim, and Seraphim, and the Holy Spirit. Above each group is the legend, "Te Deum Laudamus," and the angels bear scrolls with "Alleluia, Alleluia."

Mossley Church.—The east end of this church has just been ornamented with a stained glass window, which has been erected as a memorial of the late Rev. John Hextall, who was incumbent of Mossley for thirty-three years. The space over the communion table has been divided into three compartments: the centre light contains a full-length figure of our Lord as the Good Shepherd, hearing on his right shoulder a lamb, and holding the pastoral crook in his left hand. To the right of the Good Shepherd stands Moses, with the tablets of the law. To the left, St. John the Baptist. Under the centre figure is the text, "I am the good Shepherd and know my sheep, and an know of mine," under the figure of Moses, "By the deeds of the law shall no man be justified," and under that of St. John the Baptist, "Repent ye, for the kingdom of Heaven is at hand." The figures stand out from a ground of parti-coloured quarries, which are again relieved by a coloured border. Messrs. Cox & Co., of London, supplied the work.

COMPETITIONS.

South Metropolitan Schools, Sutton.—The three premiums of 40*l.* each, offered in this competition, have been awarded to Mr. Wallen, London; Messrs. Wilson & Wilcox, Bath; and Messrs. C. J. Phipps & F. M. Harvey, London. There were thirty-eight competitors.

Public Hall, Exeter.—The committee have selected the plans of Mr. C. J. Phipps, London, who is appointed to carry out the works. There were twenty competitors.

Books Received.

The Elements of Plane Geometry for the use of Schools and Colleges. By RICHARD P. WRIGHT. With a Preface by T. ARCHER HIRST, F.R.S. London: Longmans & Co. 1868.

Outlines of Geometry; or, the Motion of a Point. An introductory Treatise. By W. MARSHAM ADAMS, B.A. Longmans & Co.

Cassell's Technical Manuals: Orthographic and Isometrical Projection; Development of Surfaces and Penetration of Solids. By ELLIS A. DAVIDSON, Cassell, Pater, & Galdip.

Right Lines in their Right Places; or, the First Principles of Drawing and Design without Instruments. By ELLIS A. DAVIDSON, Cassell & Co.

The geometrical basis of technical education is now being applied, in a variety of forms and degrees of simplicity or progress. "Right Lines in their Right Places" is the most primitive of those under notice. Wright's "Elements" is a volume on a larger scale than the others named above, and more thoroughly geometrical in its nature and scope: it is a sound and useful work. Adams's "Treatise" relates to the difficulties of elementary geometry, and the general principles of the higher plane curves, with special reference to Euclid's elements. Davidson's "Treatise on Projection" professes to contain the simplest methods of projecting solids, the curves formed where one solid penetrates another, and the shape metal must be cut so that on being rolled, bent, or folded, it may give the required form. The work also contains 100 questions for examination.

Miscellaneous.

Robbing a Foundation Stone.—The foundation stone of a Primitive Methodist chapel has been laid near Huddersfield; and since the ceremony some person has lifted the stone and taken from the cavity beneath a bottle containing a shilling, a sixpence, a penny, and a half-penny piece, all new coins, and a number of documents and papers.

Mr. Henry Leslie's Concerts.—At the concert on March 4th, which was mainly orchestral, the soloists were Madlle. Liebhart and Herr Joachim, who both delighted their audience beyond measure. The great event of the evening was the performance of Samuel Wesley's motet for double choir, "In exitu Israel." Mr. Leslie deserves well of the public for the admirable entertainment he provides. On the 18th Miss Edith Wynne and Mr. Sims Reeves will take part in the concert, and some fine things are promised.

Equalization of the Metropolitan Poor-rates.—Meeting of Parochial Delegates.—With a view of sifting the question of equalizing poor-rates all over the metropolis, and to gain as much information as could be furnished, a central meeting of delegates from the majority of the metropolitan vestries was held in the vestry of St. George the Martyr, Southwark, on Thursday in last week. About fifty gentlemen attended to state the special grievances which had befallen their respective parishes under the unequal and unjust system of rating. The chair was occupied by Mr. E. Collinson, of St. George the Martyr vestry, who called upon the vestry clerk to read a report furnished by the House of Commons a few years ago, showing that even at that time it was considered desirable to extend the area of rating. A table of extracts from returns ordered by the House of Commons showed the total area of the metropolis to be 77,944 acres, and the population in 1861 to have been 2,802,367. The average pauperism (indoor) was said to be 35,972, and the outdoor 100,397. The total cost of the relief given to the poor amounted to 1,316,089*l.*, out of a total rateable value of 16,818,768*l.*, the average rating being 1*s.* 6*d.* in the pound. Several speeches were made in support of the following resolution, proposed by Mr. Fowler (of Lambeth), and carried unanimously:—"That a deputation, consisting of representatives from all the parishes of the metropolis, should lay a memorial before the Right Hon. J. G. Goschen at the earliest possible period, and that a sub-committee be at once formed to prepare the memorial."

Edinburgh Workmen's Houses Improvement Company (Limited).—The seventh annual general meeting of this company has been held; Admiral Ramsay in the chair. The report stated that the affairs of the company continued in a sound condition. Although the directors were disappointed in their expectations of selling the houses to the extent they anticipated—only one of the houses having been sold during the past year, making a total of nine houses sold out of 132 houses built by the company at Dumbiedykes—yet they were gratified to find that a fair return on the capital invested was derived from letting them. The report stated that there was a great and increasing demand for the houses, and there was no loss what ever arising from vacant houses. The net revenue for the year enabled the directors to declare the usual dividend of 5 per cent. on the subscribed capital, and to add 8*l.* 9*s.* to the reserved fund. The report was unanimously adopted.

The Condition of Leicester-square.—Judgment was given on Saturday last in the case of Webb v. Wyld and Talk, in which the owner of a house in Leicester-square sought to compel Mr. Wyld and Mr. Talk to restore the garden of the square, and to put the railings in repair. The Master of the Rolls found he was unable to give any relief to the plaintiff, because a court of equity could not enforce specific performance of an agreement to repair; he, however, dismissed the bill without costs, as he considered the defendants were morally bound to do what Mr. Webb had required of them.

Hammersmith Bridge.—In the Commons, Lord Bury has directed the attention of the Home Secretary to a letter in a morning paper, signed by Mr. Lambton Young, secretary of the Royal Humane Society, which had been dictated by the fear that there might be an accident on Hammersmith Bridge in the forthcoming boat-race between the Universities of Oxford and Cambridge. This bridge was built fifty-two years ago, and was constructed rather with a view to lightness and elegance than to strength and durability. There is reason to believe that the iron has become weakened from the pressure put upon it. Mr. Bruce promised to communicate with the Board of Trade, and ask them to send an engineer to examine the bridge, who might report to the Board, and the report would be made public.

The Association for Prevention of Steam Boiler Explosions.—The following are portions of the report to the annual meeting of the members of this association. Number of members, 573; works, 747; boilers, 1,930; subscriptions, special service fees, &c., 3,944*l.* The committee have again the pleasure of submitting to the subscribers a satisfactory financial statement. The revenue of the association for the past year has attained to a higher point than during any previous one, and there is a balance in favour of the year's working of 305*l.* There were 59 boilers more under inspection at the close of 1868 than there were at the close of 1867, and a greater number upon the books of the association on the former date than ever before. The committee have again to note the increase in the number of entire examinations, 1,856 having been made during the past year, or, including the internal and the flue examinations, 2,060. This is the highest number ever made in one year. No explosion has happened to any boiler under the care of the association during the year, neither has any guaranteed boiler ever exploded. During the past year, 45 explosions have come to the knowledge of the association's officers as having occurred to boilers in the United Kingdom not under its inspection, by which 57 lives have been sacrificed, and 60 other persons injured. Almost every explosion is attributed to shortness of water through neglect of the attendants, and the verdict usually is accidental death.

The New Town Clock, Liverpool.—The finance committee of the town council accepted the tender of Messrs. Penlington & Hutton, for the supply of a clock for the new Municipal Buildings, at a cost of 575*l.* The clock has now been put up. Messrs. Warner, of London, furnished the bells for the sum of 51*l.* 10*s.* The hour-bell weighs 40 cwt. (and is in C)—two of the quarter bells are eight (G), and thirteen cwt. (C) respectively, and the other two 6 cwt. each (D and E),—and the Cambridge chimes are those which will be sounded. The clock goes eight days. It is of sufficient power to strike a bell of 40 cwt., and also to chime the quarters on four bells. The clock is made with a dead-beat escapement and adjusting pallets; all the wheels are made of hard gun-metal; the striking and quarter main-wheel are 28 in. in diameter, and 1½ in. thick; the watch or going main-wheel, 24 in. in diameter, and 1½ in. thick; the rest of the wheels in due proportion. From its elevated position the clock can be distinctly seen from a great distance in various directions.

Improvement of the State of the Agricultural Labourer.—A conference, attended by many influential gentlemen—Canon Girdlestone, Mr. Fawcett, Mr. Godfrey Lushington, Lord Lyttelton, the Earl of Shaftesbury, the Hon. Abernethy, and Sir John Bowring among the number—has been held at the Society of Arts, under the presidency of Earl Ducie, to consider the question of establishing a society for the improvement of the condition of the agricultural labourer. A long discussion took place, in which most things in turn were recommended as good for the labourer, except the proposed society, which it was resolved should not, for the present, at least, be called into existence.

Destruction of a Parish Church by Fire.—On Sunday week, during the celebration of divine service in Herringswell Church, the thatched roof was seen to be on fire. The congregation quickly dispersed. The flames, fanned by a strong wind, made rapid progress, and at length nothing but the bare walls of the church and tower remained. The fire is believed to have been caused by the stove-pipe getting red hot, in consequence of an accumulation of soot in that portion which came in contact with the roof. The church was not insured.

How to Prevent Fires.—The following is extracted from the *Japan Gazette*:—"One edict of the new Government, recently promulgated in Yedo, is of a character so extraordinary that we are not surprised to find all the Japanese thoroughly alarmed by it, especially as it has already had its penal clause carried into effect in one instance, and more are expecting the extreme vigour of the law. It is to the effect that 'every one with whom, or in whose house a fire originates, whether accidentally or not, shall be decapitated without any appeal.' (One man has been already beheaded under the statute. Few large fires occur in Japan in which some lives are not sacrificed."

South Kensington Museum.—The visitors during the week ending 6th March, numbered:—On Monday, Tuesday, and Saturday (free), from 10 a.m. to 10 p.m.—Museum, 12,598; Meyrick and other Galleries, 2,734. On Wednesday, Thursday, and Friday (admission 6*d.*), from 10 a.m. till 5 p.m.—Museum, 2,209; Meyrick and other Galleries, 205. Total, 17,736.

Manchester Academy of Fine Arts.—Supported by a large assembly of friends and those favourably disposed to local art, the annual exhibition of the Manchester Academy of Fine Arts, held in the rooms of the Royal Institution, on Tuesday, may be stated to have passed off with every success. Occupying two commodious and well-adapted rooms, the productions of the members completely covered all available wall space and the contributions were in every respect superior to any similar gathering.

The River Nene Improvement.—The principal portions of the work for the improvement of the navigation of the Nene from the sea to Peterborough are nearly complete, and it is only now necessary to carry out certain other works, which it is said could be executed at a comparatively small expense, but which would have the effect of improving the river to such an extent as would permit vessels drawing fourteen feet of water to reach Peterborough. It is understood that a careful survey of the present condition of the river has been in course of preparation, under the direction of Mr. Hamilton Fulton, Birmingham, Leicester, Nottingham, Northampton, Market Harborough, and other places, are all anxious, it appears, to have a seaport so near to them as Peterborough.

St. Andrew's, Hertford.—The committee for the rebuilding of this church have been obliged, from want of funds for rebuilding the whole edifice, to inform Messrs. Dove of their inability to accept their tender; and to pass the following resolution, proposed by the Right Hon. W. Cowper, M.P.:—"That the opinion of the architect, Mr. Johnson, be requested as to the feasibility and expediency of erecting the chancel and transepts at once, and postponing the erection of the remainder of the proposed church till the requisite funds have been collected; and also as to what increase of expenditure would be likely to be incurred by erecting the new church in two parts." The sum total collected and promised is between 2,000*l.* and 3,000*l.*

Proposed International Exhibition in Sydney, Australia.—A proposal for a Grand International Exhibition, to be held in Sydney in 1870, to celebrate the centenary of the discovery and taking possession of Australia in 1770, by Captain Cook, has been made in a letter, by Mr. Joseph Dyer, to the *Sydney Morning Herald*, of October 27th, 1868. Mr. Dyer proposes that the Exhibition should be held in a new central railway terminus which is said to be much wanted in Sydney, and which might as well be built now as in a year or two hence. He suggests Hyde Park, facing Elizabeth-street, as the site, but wherever placed in Sydney, of course the Exhibition could be held in it by way of inauguration.

"For three or four months of 1870," he remarks, "Sydney ought to be the Paris of the Southern Hemisphere." The first object of attraction would be the Grand Intercolonial Exhibition, to celebrate the 100th anniversary of the discovery of the colony. Here would be shown the highest efforts we are capable of in art and manufacture, in competition with the productions of the other colonies. Our engineers would show locomotive engines and railway carriages; our carriage builders, boat builders, tweed makers, boot and shoe makers, paper manufacturers, kerosene oil, glass, saddlery, tobacco, arrowroot, mairzens, wine, and a vast variety of other arts, in which we can hold our own against foreign competition."

As the subject of a statue to Captain Cook, the discoverer of the colony, is now being agitated, the proposed Exhibition would form an excellent opportunity for its inauguration.

Closing Uninhabitable Houses in Liverpool.—Two houses in Brick-street have been ordered by the local authorities to be shut up till they be rendered habitable by the conversion of privies in them into water-closets, the provision of water supply to them, &c. They are inhabited by squatters, the proprietor being in a lunatic asylum.

South London Working Classes Industrial Exhibition.—This exposition has been crowded every night since its opening, the doors having to be closed frequently to allow of anything like a free passage for the people. The awards will be made known early in next week.

The Sanitary Condition of Birkenhead. The usual report of Dr. Baylis, the medical officer of health for Birkenhead, has just been published. According to this report, the number of deaths in Birkenhead from all causes registered during the year was 1,074, which, computing the population at 52,233, gives the death-rate at 20.56 per 1,000, or but very slightly above 2 per cent. Since 1864 the death-rate has decreased from 24.39 per 1,000, being relatively a far greater improvement than has taken place in the health of the country generally. After referring to the moderate decrease in the deaths from zymotic diseases, Dr. Baylis alludes to the "main poisoners of the atmosphere," upon which subject he says:—"The persistent abatement of the gigantic midden nuisance by conversion of the remaining privies into water-closets; the adoption of some scheme for the daily or weekly removal of ashes and other house refuse; the abolition of dung-pits; a more effectual surface cleansing, especially in hot weather, and the complete removal of street sweepings, which always contain much animal and organic refuse, are the remedies clearly indicated by the mortality lessons of the year." Dr. Baylis further recommends the entire discontinuance of cellar dwellings. The number of births during the year amounted to 1,903, of which 953 were males, and 950 females; the natural increase of the population, i.e., the excess of births over deaths, was therefore 856. The usual majority of male births over females seems to have been very small.

Mr. Mark Firth's Almshouses, Sheffield. The corner stone of the almshouses at Ranmoor, the gift of the Master Cutler of Sheffield (Mr. Mark Firth) has been laid by the Earl of Shaftesbury, amidst a great concourse of people. The buildings are in course of erection, under the superintendance of Messrs. Hill & Swan, of Sheffield and Leeds, architects; and the structure is to be of such a character as will accord with the picturesqueness of the landscape skirting the romantic Porter Brook, near which it is placed.

Workmen and their Employers.—A conference has been held at Darlington between the ironmasters of the north of England and representatives of the workmen, to discuss the desirability of establishing courts of arbitration in the northern iron-trade district, and so prevent the periodical disputes and strikes which have been so disastrous to both masters and men. A joint committee of masters and men was appointed to draw up rules for establishing courts of arbitration and conciliation, and to report to a future meeting.

The Royal Academy Library.—Mr. John Leighton has addressed a printed letter to the Royal Academy of Arts upon the condition and future of their Library, in which he points out the extent to which it has been neglected, and the importance of now forming in the new building a special Library of Art that should be worthy of the Institution. The advice is well timed.

Local Government Act, 1858.—A parish which includes within its area a corporate borough, is a place "having a known or defined boundary," within the meaning of the Local Government Act, 1858, and may adopt the Act by resolution of the owners and ratepayers, although it is itself included in a Parliamentary borough. This was the holding of the Court of Queen's Bench, in the case of the Queen v. Hardy.

Big Sticks.—The vast timber resources to be found in the forests around the Cape Otway ranges, in Australia, are daily attracting more attention and likely soon to be publicly utilised. Mr. Barber, the *Geelong Advertiser*, has created a fine saw-mill in the vicinity of Gosling's Marsh, amongst giants of the forest, rising to a height of from 200 ft. to 225 ft., and promising a splendid supply, sufficient to keep the mill employed in its present position for three or four years.

Lichfield Cathedral.—There have lately been placed in three of the bays between the pillars near the reredos, metal screens, designed by Mr. G. Scott, and which have been manufactured by Mr. Atterton, of Lichfield. The screens are of wrought iron, and each is a separate floral design of a light and airy nature.

An English Brick House in America.—There is a house in the town of Greenland, New Hampshire, the bricks for which were brought from England in 1638. It is still in good repair.

Lowestoft.—A public hall capable of accommodating some 1,500 or 2,000 persons on public occasions, is about to be erected on the west side of Clapham-road, facing Surrey-street and the London-road. The ground, some 60 ft. by 157 ft., has been purchased of Mr. W. H. Thirle for the purpose. A company is forming, and the shares, 1l. each, are being taken up.

The Charterhouse.—We hear from the *City Press* that the ground, nearly two acres in extent, which was formerly the Charterhouse playground, has been let on a building lease, and tenders being now out, there is every prospect of its being shortly covered with warehouses and shops.

New Town-hall, Rochdale.—Several engineers having been invited to submit plans and tenders for warming and ventilating this Town-hall, we learn that the plans of Mr. Wilson W. Phipson, C.E., London, have been selected by the corporation.

TENDERS.

For residence near Kettering. Mr. R. W. Johnson, architect:—	
Barlow & Butlin	£237 0 0
Margetts	919 0 0
Sharman	833 0 0
Wilson	880 10 0
Hawthorn	880 0 0
Henson	885 0 0
Briggs	853 0 0
For cottages near Kettering. Mr. R. W. Johnson, architect:—	
Briggs	£1,370 0 0
Hawthorn	1,300 0 0
Haycock	1,289 0 0
Henson	1,207 0 0
Margetts	1,280 0 0
Wilson	1,274 0 0
Barlow & Butlin	1,160 0 0
Sharman	1,140 0 0

Accepted for pulling down and rebuilding a shop and warehouses, No. 130, High-street, Sunderland, for Mr. John Forster. Mr. John Tillman, architect:—

Mason's and Bricklayer's Work	£369 0 0
Hodgson	324 0 0
Pearl & Humble	324 0 0
Preston	£38 0 0

Plumber's and Ironfounder's Work.

Tonkinson & Panton	£215 0 0
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Painter's and Glazier's Work.

Halflight	£63 0 0
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Accepted for building a school at Pallion, for Messrs. Webster & Oswald. Mr. John Tillman, architect:—

Hutchinson	£375 0 0
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Accepted for building a house in Park-terrace, Toward-road, Sunderland, for Mr. John Forster. Mr. John Tillman, architect:—

Mason's and Bricklayer's Work.

James Young	£430 0 0
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Joiner's and Carpenter's Work.

John Young	£430 0 0
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Plumber's and Gasfitter's Work.

Tonkinson	£100 10 0
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Painter's and Glazier's Work.

Kirkup	£19 13 0
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Slater's Work.

Preston	£31 0 0
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For residence at Woodbridge, Suffolk. Messrs. A. & W. H. Lockwood, architects:—

Lawrence (accepted)	£1,063 5 5
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For alterations and additions to 21, Coventry-street, Haymarket, for Messrs. C. Lloyd & Son. Mr. W. P. Griffith, architect:—

Lawrence (accepted)	£485 0 0
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For new shop and dwelling-house in the Whitechapel-road, for Mr. W. H. Dean. Mr. G. A. Dean, architect. Quantities by Mr. Albert Vicars:—

Jacobs	£1,690 0 0
Ferry & Co.	1,655 0 0
Read & Son	1,628 0 0
Wood, Brothers	1,607 0 0
Masters	993 0 0
Hivet	973 0 0
Esnor (accepted)	914 0 0

For new shop and dwelling-house in the Whitechapel-road, for Mr. D. Mounro. Mr. G. A. Dean, architect. Quantities by Mr. Albert Vicars:—

Perry & Co.	£130 0 0
Jacobs	469 0 0
Read & Son	428 0 0
Wood, Brothers	409 0 0
Hivet	393 0 0
Esnor	374 0 0
Masters (accepted)	300 0 0

For cemetery chapel and lodge at East Dereham. Messrs. Brown & Pearce, architects:—

Lacey	£1,375 0 0
Hawes	1,335 0 0
Larner	1,208 0 0
Perkins	1,270 0 0
Hubbard (accepted)	989 0 0
Skippier	951 0 0

For alterations to 65, St. Martin's-lane, for Mr. Muroott. Mr. W. E. Williams, architect:—

Anley	£400 0 0
Hyde	365 0 0
Marr (accepted)	333 0 0

For two chapels, lodge, boundary walls, and entrance-gates, to new cemetery, Pembroke Dock. Mr. K. W. Ladd, architect:—

G. Thomas	£1,410 0 0
Jones & Johns	1,238 0 0
Hughes	1,134 0 0
T. Thomas	1,114 0 0
Allen (accepted)	1,089 0 0

For alterations and improvements to Milton House, Pembroke-shire, for Mr. Jas. Summers. Mr. K. W. Ladd, architect:—

Griffith (accepted)	£330 0 0
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For erecting proposed Primitive Methodist Chapel at Ashford, Kent. Mr. John R. Collett, architect:—

Osborn	£470 0 0
Elgar	449 0 0
Steddy, Son, & Steddy	417 0 0
Clifford	410 0 0
Dryland & Mills	400 0 0
Fowler	397 0 0

For reconstruction of premises, 15, Newgate-street, City, for Mr. John Wheeler. Mr. William Smith, architect:—

Nightingale	£1,961 0 0
Nutt & Co.	1,950 0 0
Wigmore	1,777 0 0
Webb & Sons	1,750 0 0
Cooke & Green	1,677 0 0
Warr	1,658 0 0
Eaton & Chapman	1,649 0 0
Baker & Constable	1,570 0 0
Crabb & Vaughan (accepted)	1,548 0 0
Wicks, Bangs, & Co.	1,530 0 0
Sabey & Son	1,500 0 0
Blackmore & Morley	1,473 0 0
Foale	1,470 0 0
Ball & Russell	1,463 0 0
Rowe & Co.	1,393 0 0

For building St. Paul's Church, Upper Holloway. Messrs. Henry Jarvis & Son, architects:—

Gibson, Brothers	£5,749 0 0
Hill, Keddell, & Waldram	5,290 0 0
Higgs	5,274 0 0
Hendshaw	5,243 0 0
Colls, Brothers	5,075 0 0
Longmire & Burge	4,970 0 0
Myers & Son	4,965 0 0
Deys, Brothers	4,965 0 0
Richardson	4,880 0 0
Thompson	4,880 0 0

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We are compelled to decline putting out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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BUENOS AYRES GOVERNMENT CERTIFICATE.—TRANSLATION.—We, the undersigned, at the request of Messrs. Jas. C. Thompson & Co., certify that the IRON SAFES of Messrs. CHUBB & SONS, London, of which these gentlemen are agents, were exposed for several hours to the fire that took place in the offices of the National Government on the evening of the 26th inst.; that in our presence they were easily opened with their respective keys; that the moneys and important documents they contained were found in perfect order; and that these safes are now in use in the National Treasury Office.—(Signed) J. M. DRAGO (Treasurer of the National Government), JOSE TOMAS ROJO, JOAN M. ALVAREZ. A true copy.—A. M. BELL.—Buenos Ayres, July 31, 1867.—A. M. BELL & SON, makers to the Queen and the Bank of England, 57, St. Paul's-church-yard, London; 68, Cross-street, Manchester; 28, Lord-street, Liverpool; and Horsley-fields, Wolverhampton.

The Builder.

VOL. XXVII.—No. 1363.

Islington of Old.*

THE northern suburbs of London, as Mr. Howitt remarks, are amongst the richest in historical and biographical reminiscences. Before the aristocratic class acquired the tendency to spread itself over the western flats, the higher grounds on the north, as well as the City itself, were the chief abodes of the nobles, as well as of the wealthy merchants of London. Hampstead and Highgate bear, even now, amid all the changes of the last two centuries, the traces of this former predilection of the affluent dwellers in, and frequenters of, the metropolis; and Islington, if possessing fewer of the residences

of the nobles of secular rank, is still more abounding in the memories of the intellectual heads of society. Its easy approach at all times from the City had made it at once the resort and the abode of a great number and a great variety of those who lived and worked there.

Many names and many derivations of name have been assigned to Islington. Iseldune, Isendone, Iseltone, Hisselton, Hyseldone, Yseldon, and Eyseldon, are the various forms of the name which present themselves for Islington at various periods. Till almost a recent date it was a village standing isolated in open fields. Lysons says the parish is three miles one furlong in length, two miles one furlong in breadth, ten miles and one half in circumference, and contains, exclusive of houses, gardens, and wastes, 2,639 acres 37 perches of land, of which 22 acres only were arable, and about 10 acres nursery-grounds. When Doomsday Book was compiled, part of the parish was arable, part common pasture, and the rest consisted of woodland, oak, and beech, affording pannage for sixty swine. The population then consisted of only twenty-seven persons and their families, who were chiefly shepherds, herdsmen, and tillers of the ground.

From the earliest times Islington seems to have been amidst extensive open fields, the resort of shepherds and graziers. The church stood in a field on the highest part of the town, and not far from the woods. It was dedicated to St. Mary, and was considered to be of very ancient date; some imagining that there had been a church there from the Saxon times. When the old structure was pulled down to erect the present one, in 1751, it was in a very ruinous state, but the tower was so strongly cemented as to require gunpowder to rend it to pieces. We are enabled to reproduce a view of it given in Mr. Howitt's book.†

The fields about Islington have, from the earliest times, been a favourite resort of the Londoners for open-air exercise and sport. Distinguished archers here won the game-title of Marquis of Islington, as in other parts they won that of Earl of Pancras, or Duke of Shoreditch. King Henry VIII. himself conferred the title of Duke of Archers, or Duke of Shoreditch, on one of his guards, named Barlo. The distance at which a skilful archer could hit a mark is something wonderful. The longest distances between the marks in these fields were nineteen score, or 380 yards; the shortest nine score, or 180 yards. A curious fact is related of Topham, "the strong man of Islington," who could bend a stout poker round his neck, and do greater feats. He ridiculed the long-how in a public-house amongst archers as a plaything only fit for children. The archers waged him a howl of punch that he could not draw the arrow two-thirds of its length, and on trial he lamentably failed. Such are the marvels of practice. And though archery died out, pleasure continued to live, and sought its aliment at Islington. Thornton, in his "Conciseur," has described the Sunday excursions of the citizens to this village, to drink ale and smoke their pipes; and Goldsmith has celebrated the tea-parties, and the hot rolls and butter at White Conduit House. Nobody enjoyed such holiday trips into the country near London more than Goldsmith. In what he called his "Shoemaker's Holidays," he often turned his steps towards Islington. Three or four of his intimate friends, says the "European Magazine," rendezvoused at his chambers to breakfast about ten o'clock in the morning. At eleven they proceeded up the City-road, and through the fields to Highbury Barn to dinner. About six in the evening they adjourned to White Conduit House to drink tea; and they concluded the evening by supping at the Grecian or Temple Exchange Coffee-house, or at the Globe in Fleet-street.

The parish of Islington contains six districts, or liberties, named from the manner in which they are situated.—St. John of Jerusalem, Upper Barnshury, Lower Barnshury, Canonbury, The Prehend, and Highbury, or Nowington Barrow. It contains also the hamlets of Upper and Lower Holloway, Ball's Pond, Battle-bridge, the City Gardens, Kingsland-green, and the greater part of Nowington-green. It is also divided into eight ecclesiastical districts, namely,—St. Mary's, St. John's, St. Paul's, Holy Trinity, St. Peter's, St. James's, All Saints', and St. Stephen's.

One of the oldest establishments at the foot of Highgate-hill, just above Holloway, and near to where Whittington's stone is placed, was a Lazar-house, or hospital for lepers. This was one of four such hospitals erected at some distance out of London for the reception of people afflicted with the leprosy, or, as it was called, "the linenless disease."

Mr. Tomlin thinks that the old Whittington Stone was merely the basement of a cross once standing there, of which he gives a woodcut, and that this part of the story of Whittington is a myth. But why so? asks Mr. Howitt; the basement of a cross by the wayside, from which the cross itself was broken, is just the sort of seat of which a wayfarer would avail himself.

In Nelson's time there were some old houses which appeared to have belonged to persons of eminence on the north side of the road at Upper Holloway. In one of them, which became the Crown public-house, and which has long disappeared, there was a tradition that Cromwell had lived. Nelson doubts Cromwell ever having a house here, but thinks he might have visited his friend, Sir Arthur Haselrigge, who had a residence in Islington.

Highbury, famous for springs and conduits which used to supply part of the city before the making of the New River, has always been

noted for its elevated situation and its fine views over Stamford-hill, Epping Forest, Hornsey-wood, Muswell-hill, Crouch-end, Highgate, Caen-wood, Hampstead, and Primrose-hill. The water from the Highbury springs was conveyed as far as the White Conduit and St. Giles's, Cripplegate, and carried from the conduit to the private houses by men called water-bearers, in vessels called tankards, holding about three gallons each.

Of the New River we have often spoken, and we need not recur to its origin here; nor to the life and doings of Sir Hugh Middleton.

The dangers of the road between London and such suburban villages as Islington were extraordinary in old times. Nelson says that as late as 1770, and later, the roads were so dangerous betwixt London and Islington, that few ventured back to London in the evening, they stayed in the village all night at the Angel, the Lion, or the Pied Bull. Even in the heart of the villages robberies were committed; both carriages and foot passengers were frequently stopped in the most daring manner; and it was usual for people walking from the City in the evening to wait at the end of St. John-street till a sufficient party were collected, who were escorted to Islington by an armed patrol appointed for that purpose. The precincts of Islington were the haunts of such notorious robbers as Duval and Tarpin.

Canonbury Tower, or Hone, the chief part of which still remains, was possessed in the sixteenth century by Sir John Spencer, who was Lord Mayor of London in 1594, and was reputed to be the richest commoner of his time; his town residence was Croshy Hall, and Canonbury House was therefore a sort of country residence at that time. The greatness of Sir John drew upon him dangerous eyes, and a plot was laid by a Dunkirk pirate to waylay and kidnap him for the purpose of obtaining a ransom for him, which it was said would not have been less than 50,000*l.* Sir John, however, escaped accidentally by remaining in London all the selected night, and the pirate and his men had to fly and embark for Dunkirk in the morning. But a more successful pirate turned up in the lover of Sir John's daughter, who stole her away in a baker's basket. Sir John resolved to disinherit her in consequence, and on Queen Elizabeth asking him to stand sponsor along with herself to the first child of a young couple who had been abandoned by their father, he resolved to make this child his heir, but to his astonishment discovered that it was his own grandchild whom he had adopted. This is one of the best anecdotes extant of "good Queen Bess."

As London, under the names of Canonbury and Islington, came crowding up about Canonbury Tower and its ample gardens and fair lakes, the proprietors began to desert it for more distant resorts; it became the house of the steward, and the chambers were let as lodgings to gentlemen from London who sought suburban quiet. Newbery, the publisher, had rooms in it, and Goldsmith used to visit him there. As difficulties pressed on Goldsmith, he would remain hidden there for weeks, giving out that he was away in Yorkshire, or elsewhere. He came to like Canonbury House so much, that he had summer lodgings in it, and his literary friends used to visit him there. Sam. Johnson, no doubt, showed his ponderous figure there frequently. He and his associates would adjourn to the Crown Tavern in the Lower-road, and be very jolly. It is said that Goldsmith wrote the "Deserted Village," the "Traveller," and part of the "Vicar of Wakefield," in Canonbury Tower.

Washington Irving visited Canonbury Tower because Goldsmith had inhabited it. He says: "I was shown the very apartment. It was a relic of the original style of the castle, with panell'd wainscot and Gothic windows. I was pleased with its air of antiquity and its having been the residence of poor Goldy."

* "The Northern Heights of London; or, Historical Associations of Hampstead, Highgate, Muswell-hill, Hornsey, and Islington." By William Howitt. London: Longmans & Co. 1859.

† See p. 236.

Irving located his "Poor Devil Author" there, and described what he himself, no doubt, saw. The view given* is from a print in Mr. Gardner's Collection. The "tower" is now surrounded with houses. Within the last ten years some thousands of houses (we speak from personal knowledge) have been erected in Islington.

The Pied Bull, to which allusion has just been made, stands not far from Islington-green, and is said to have been the residence of Sir Walter Raleigh. It is now a public-house, as the name implies. It has undergone many alterations. The Queen's Head, another public-house, in Lower-street, is traditionally said to have been the residence of Lord Treasurer Burleigh, and to have even been occupied by the Queen herself occasionally. When Brower compiled his "Beauties of England and Wales," in 1816, the "Queen's Head" was one of the most perfect specimens of ancient domestic architecture remaining in the environs of London. It was a strong wood-and-plaster building of three stories, projecting over each other, and forming bay windows in front, supported by brackets and corved figures. The centre protruded several feet beyond the rest of the front, and formed a commodious porch, to which there was a descent of several steps. The superstructure was supported by figures of carved oak, crowned with Ionic scrolls, standing on each side of the entrance.† The interior was in the ancient style of oak panelled wainscot, stuccoed ceilings, and carved chimneypieces. The stone slab over the fireplace of a front room on the ground-floor had a classical design of Diana and Actæon in relief, with mutilated figures of Bacchus, Venus, &c. This ancient building was pulled down in 1829, and a new house, still called the old "Queen's Head," erected on the site. We may add to what Mr. Howitt says, that the bas-relief mentioned—a coarse work—and some other of the fittings, including one of the ceilings, are set up in the present house.

The ancient Angel Inn, which was pulled down in 1819 to make way for the present one, exhibited the usual features of a large old country inn, having a long front, with an overhanging tiled roof, and two rows of windows, twelve in each row, independent of those in the basement story. The principal entrance was beneath a projection, which extended along a portion of the front, and had a wooden gallery at the top. The inn yard (of which also we are enabled to give a view), approached by a gateway in the centre, was nearly a quadrangle, having double galleries, supported by plain columns and carved pilasters, with caryatides and other figures. These galleries had, doubtless, been often thronged with spectators of dramatic entertainments, at the period when inns were customarily employed for such purposes.

In Copenhagen-fields, where the Londoners sought amusement and the graver exercise of political agitation, is now placed the extensive New Cattle Market. The enormous inconvenience, cruelty, and public danger occasioned by driving the weekly hosts of cattle and sheep through the crowded streets of the metropolis, had long been a subject of discussion and serious reflection amongst the metropolitan public. A Mr. Perkins, of Bletchingley, in Surrey, seized the opportunity to remove the public difficulty by a bold speculation. He projected and built a new cattle market near Ball's-pond, at a cost of 100,000*l.* It was commenced in 1833, by sanction of an Act of Parliament, and completed in 1836. The object of Mr. Perkins was good, but it was destined not to be profitable, for he received determined opposition from the City authorities, and the site was too near London to obviate, for any considerable period, the mischief it was intended to remedy. It was soon surrounded by a dense population. It was extinguished by an Act of Parliament, to make way for the City scheme of a market in Copenhagen-fields. For this purpose, Copenhagen House and fields, to the extent of seventy-five acres, were purchased by the Corporation of London, and converted into the present New Cattle Market, which was opened June 13th, 1855. Commodions as is this site, it has also the fault of being too near London. It is already envied by houses, and must become more and more so. Eventually, the London abattoirs must be placed away in the country, and the meat sent up by railway.

Pentonville Prison was commenced in 1840,

as an experiment of a model prison, in which an improved discipline could be carried out. The first stone was laid on April 10th of that year by Lord Lansdowne, attended by several members of Parliament, and other gentlemen interested in the improvement of prison discipline. He also laid the foundation stone of the New City Prison, which superseded the Compter, at Hollo-way, and which was opened October 6, 1832.

In respect to the comparative substantiality of many old buildings, there is but too much truth in Mr. Howitt's remarks while describing those in the northern outskirts of London, but some allowance may perhaps be made for the influence of time in hardening and consolidating cements and mortar: he says:—

"The bricks and brickwork of hundreds of old mansions in town and country, show how far, in this burring and money-scraping age, we have gone backward in the quality of brick and bricklaying. And yet this is scarcely a correct expression, for we can go back to no period of our history in which the brick and bricklaying are not far superior to ours. Look at the fineness, the solid smoothness of the brick; at the nice and compact manner in which it is laid; and then turn to the coarse, often very unequally burnt brick of to-day, and the coarse mortar in which it is set, often in rude layers of nearly an inch thick, and the contrast is disgraceful to this age of boasted progress in the arts, but an age in which strength and beauty of building are sacrificed to the sordid calculations of the builder's profits. This was the case in the decline of Rome. No people in their best days built more magnificently than the Romans; none in their decline so shabbily and unsubstantially. Juvenal, describing the buildings of Rome, as well as its luxury and vices, astonishes us by his actual descriptions of London in Rome. In his third Satire he says, you were always having the houses tumbling about your ears, and burring to escape from fires:—

— incensis, lapsus
Tor-torum assiduos, ac mille periculis aere
Urbs.
And again,—
"Nos urbem colimus tenui tibicine fultam
Magnæ parte sui, &c."

The builders ran up their slim walls and daubed them with stucco to make them look decent, as ours do. Hence," says Juvenal, "the greater part of the houses are kept standing by frail props, which the agent erects to prevent their instant fall. He stops up the old cracks, and assures you you may sleep in peace! But next, your neighbour shouts for water—he is running to save his moveables—the flames are already in the third story, and we to them who live in the garrets!"

Mr. Howitt's volume is a very entertaining one; of course, it must needs be to some extent a compilation; but it is skilfully done, by one who well knows how to give old facts a fresh interest by presenting them in words of his own.

WHAT IS "CLASSIC"?

We owe to our Post-Laureate the recommendation not to

"Deal in watch-words overmuch;"

and perhaps the advice is no less applicable to those engaged in the practice of any important branch of art than it is in the wider sphere of political or social life. Many of the misapprehensions, misunderstandings, and cross-purposes which interfere so seriously with real intellectual or artistic progress, arise from imperfect apprehensions of the definite meaning of words, or from the current use of the same word under different significations, constituting what logicians designate as the fallacy of an "ambiguous middle term," through which different parties may arrive at nearly opposite conclusions from apparently the same premises. And such words especially as have been laid hold of as the watch-words and badges of a party, are apt to lose sometimes all trace of their genuine origin and meaning, or at least to be made to include meanings which do not rightly fall under them. And though the terms "Classic" and "Gothic" may be, as has been remarked, little better than a kind of "slang," their constant use as representing two schools of architectural art, supposed to be radically opposed to each other, has had considerable influence in narrowing and restricting the theory and practice of the most conscientious and earnest workers in each of said schools. Each of these words forms a concrete term under which an architect of one school may include all the defects as well as all the merits of the other; and in this manner the word "classic" is especially used by the adherents of the Gothic persuasion. The Classicists are mostly lenient towards Gothic, except to certain modern deformations parading under that name, referred to in a recent article in our columns; but the genuine Goth takes up his song against all buildings of the Classic school, shortly defining a Classic design as "a design with all the life taken

out of it," or in some such complimentary language. The Gothic man, however, is not in reality so bigoted in comparison with his Classic brother, as may seem at first sight; he has some reason for his "good hating;" but that reason is in fact mainly based on the ambiguous use of the word Classic, which has most unfairly been made to stand for two schools of architecture, which have in fact very little in common, so far at least as principles are concerned, although in some details they approximate. With the view of promoting the cause of catholicity in our Art, let us endeavour to discriminate between what we may call the true and the spurious application of the word Classic to architecture.

When the revived attention to, and recovery of, the ancient literature of Greece and Rome occupied the attention of the first minds of the period, afterwards to be known as that of the Renaissance, those newly-found treasures became naturally, by contrast with the Medieval literature which they supplanted, the select or "Classic" models (as in most revivals) to such an extent as to render the whole of the new literature of the period but a weak and artificial imitation of the peculiar turns of thought and phrase of the originals; not, be it observed, of the spirit and feeling, but only of the details of the latter. Hence it is that the original literature of this period in Italy, and the productions of the corresponding era at a later date in our own country, have for the most part lost so much of their interest for any but professed students of literature. They are not the expression of genuine feeling; or if they are it is so hidden under a veil of artificial form as to be scarcely recognizable; and when we speak of "Classical literature," we pass over in our minds the reproductions of the antique style; we think, not of Pope or Politian, but of Homer or Horace. But it has not been sufficiently recognized that the architectural history of the period is precisely analogous to its literary history. The revived interest in Greek and Roman literature suggested also the return to the study of their architectural remains, when the fierce flame of Medieval inspiration had well-nigh burnt itself out; and this return, so far as it bore fruit in actual architectural reproduction, was marked by exactly the same character as distinguished the literary works of the Renaissance. Like the adopted and affected Ciceronian correspondence of the period, wherein the attention to minutiae of style completely superseded the free and heartfelt expression of genuine sentiments, the architecture of the day, and for a long time after, became a kind of artificial shell consisting of an agglomeration of details from various ancient buildings, of sections of antique architecture superimposed one upon another; the Roman corruption of Greek architecture being here made the starting-point for a still more unlicensed treatment,

whereby the external design became divorced from the internal plan, and from the actual construction, and was in fact in many instances an elaborate piece of scenery erected as a mask to the actualities of the building which it concealed rather than illustrated. Hence it was that the Renaissance architecture lost so much, we may perhaps say lost almost entirely, the architectonic expression, and assumed a sort of decorated furniture or cabinet appearance, endeavoring to compensate for the falsity and superficiality of the general treatment by the elegance of window-dressing, balustrades, terminal vases, and such like adjuncts. It is not surprising that the earnest minded architects, who initiated the Gothic revival, and who, from diligent study of Medieval remains, had become penetrated with the love for genuine building art, as distinguished from what Professor Kerr has well termed the "superficiality" of the Renaissance, should have learned to look with contempt on the latter as a false treatment of architecture, entirely degrading the art from its true form of expression. The same feeling has now spread from the professional ranks to those of educated people generally. Whilst writing this, we have an instance brought before us of the expression of this feeling, in the course of a story in the current number of the *Cornhill Magazine*: the heroine is sitting in a cathedral,—

"At the foot of one of the enormous stone masses of clustered columns, which looked almost as large as a house in itself, and she gazed up into the mighty labyrinth of arches and roofs above her head. Each part in a Gothic structure seems to grow out of each by a natural and ever-varying sequence,—there is something so living in it; while a Palladian or Italian building obtains height by simply piling a repetition of column and architrave and cornice, one upon the other, again and again, in a more awkward and unartificial manner of accomplishing it."

* See p. 226.

† See p. 236.

By "inartificial" we presume the writer means "inartistic;" but the remark is a perfectly just one, and shows a better perception of what constitutes architecture than we commonly meet with in the popular works of fiction of the day. But to represent the Renaissance type of architecture as the emodiment of the Classic school, as the only alternative and opposing school to Gothic, shows a most strange misapprehension of the real relation of the Renaissance to the Antique. To lay claim for the Medieval style, as its votaries are wont to do, to be considered the constructively truthful and Architectonic style *par excellence*, as opposed to the constructively false and superficial Classic style, is perfectly unreasonable. If we are to admit, as the characteristic principle of Gothic, the genuine and truthful exhibition of construction and the correspondence of external design to internal plan, the Parthenon is on that view as Gothic a building as ever was erected: and to charge the vices of the Renaissance (compensated as they were by much beauty and elegance of detail) upon the Classic school generally as its recognised and inseparable characteristics, is about as reasonable as it would be to decry the value and truthfulness of Greek and Roman literature because pedantic scholars in the present day amuse themselves by the manufacture of half and coldly correct Greek and Latin verses—the shadow without the substance.

If, then, we take away the distinction between Gothic and Classic, vulgarly accepted by the adherents of the Gothic school, as representing respectively the truthful and the "sham" in architecture; if we refuse to identify "Classic" with wreathed and trussed window-dressings and interrupted pediments whose two halves flank the inevitable vase; if we cannot even consider that a building is properly "classicked" by the presence around it of rows of columns, "engaged" or otherwise, where do we draw the broad distinction between the two schools? Taking the widest view of the matter, and leaving details for a moment out of consideration, it may be said that Classic and Gothic are in architecture the representation of the two widely opposite spirits which in literature would be called the Classical and Romantic. And what these two schools, whose respective influence can be traced through all the productions of art and literature, really represent, is this:—the Classical is the spirit of repose in feeling and of self-restraint in execution; the Romantic (or Gothic, for we may just now use the terms interchangeably) is that of restlessness and aspiration in feeling, and of licence and freedom in execution. In the first, the thought and soul of the work, though always present, is to a great extent in subordination to the form and execution; or, at least, the conception and execution are precisely adjusted to one another, and there is no attempt to express more in the work than the form in which it is to be embodied will admit of—no attempt to hint at a meaning and feeling imaginable though inexpressible. In the romantic school, on the other hand, there is always manifest a struggle on the part of the artist to convey some indefinable feeling to the reader or spectator, something which he cannot adequately express, and for which all the materials at his command are insufficient. Consequent upon this comes an indifference to form and unity in art, and an attempt to get as near as possible to the feeling desired to be conveyed, by the aggregation of a multiplicity of expressions and forms, crowded one upon another, as Milton says of the verdure of Eden—

"Wild without rule or art, enormous bliss,"

the expressive word "enormous" being of course used in its original Latin sense. The first school expresses most clearly all that it is intended to express, but leaves little for the imagination; the second is more mysterious and suggestive, more stimulating to the imagination, but fails in unity, concentration, and distinctness. The first is pre-eminently the art of high civilization and of positive philosophy; the second, that of imperfect civilization and of metaphysical theology.

Not to theorise beyond the patience of our readers, however, and to return to our own branch of art, we cannot see this better exemplified than in contrasting two such buildings as St. Paul's Cathedral and York Minster, both being disposed in the same manner as to general mass, each having the principal and prominent feature in the centre of the composition. Of course in detail St. Paul's has a great deal of

what we have called the "spurious Classic" about it, and it suffers, moreover, from having no advantageous point of view near it. The best idea we have had of the real beauty of the dome was from a photograph taken from the roof of some one of the neighbouring buildings. But, without entering into the question of the intrinsic beauty of the two cathedrals, what strikes us in the aspect of St. Paul's dome along with its western towers, as seen from the most advantageous point of view, is the completeness and unity of the whole composition. As we look at it, the architect's whole idea is before us, carefully studied and worked out; we want nothing further to tell us his intention. In York Minster, on the other hand, there is by no means this finished appearance. Not only are there, as in nearly all Gothic cathedrals, divers irregularities and freaks of treatment in parts, but the central object itself,—the main tower,—conveys to us less the notion of a thoroughly conceived and finished design than the idea that the architect had here done all he could. Thus far he had got in expressing his feeling, when the shortcomings of material and means obliged him to leave the rest to our imagination. It is this uncompleted aspect of a great Gothic work, this hinting of we know not what remaining still to be expressed, which probably suggested to Coleridge the remark that a Medieval cathedral was "infinitely made conceivable." Perhaps there is no more striking instance of the Gothic spirit in its purity than is shown in the west front of Peterborough, called by a well-known eminent critic, "the finest portico in Europe." It may be admitted to be so; but there can be no doubt that it is in fact quite out of proportion to the building, and, if done on a small scale, would be condemned on that ground by every one. But the architect of Peterborough troubled not his mind about proportions; he would have as grand, as lofty a portico over his principal entrance as could possibly be obtained. If practical difficulties prevented his carrying up the rest of his building to a proportionate height, he must submit; but here, at least, was one element of grandeur secured, and there it will remain to be a joy for ever. The same theory explains, if it does not altogether justify, the disproportionate height of the French cathedrals, which rendered it impossible to crown them by a tower adequately proportioned to the substructure, and in which we trace the same effort to give the utmost possible effect to the part of the building which was first worked upon, leaving it an after-consideration whether it would be possible to carry out a complete design on the same scale.

From our present point of view, the rival constructive systems of trabeation and arcuation must be regarded rather as auxiliary than essential to the expression of the Classic and Gothic schools respectively; the latter constructive system growing up naturally when the romantic conceptions of the post-Christian architects went beyond what could be accomplished by the simpler trabeated construction. But it may be doubted whether the characteristics of horizontality and verticality of general design, so long identified with the Classic and Gothic schools respectively, are not in reality of the essence of the two schools. The spirit of repose, which we identified with the Classic school, finds its most natural expression in horizontal composition upon a widely-extended base, and carried to no such heights as render its construction or its permanence a mystery to the spectator. The spirit of unrest and aspiration which belongs peculiarly to the Romantic school, on the other hand, can only be fully embodied in those ascending lines and that restless, soaring growth of vault, and turret, and pinnacle, which the Medieval builders sent up into mid-air, and poised there by a *tour-de-force* of masonry. Then the distinction between the use of ornament in the Classic and Gothic school must not be passed over. The pure Classic school, whether in literature or art, is always sparing of ornament, and would prefer to sacrifice the most beautiful and elegant of detail rather than for a moment obscure or draw attention from the main composition. The Romantic school has always loved ornament for ornament's sake, and scattered it in very profusion over poem and cathedral, without caring to consider too curiously whether such profusion might not defeat its own end.

In endeavoring to draw a marked distinction between the true Classic school in architecture and its supposed antitype the Renaissance, we shall have done a good work if we may have

thereby suggested the removal from the former of the stigma which has been attached to it by so many Gothic practitioners, who have confounded it with the spirit of the Renaissance, and passed one sweeping judgment on both; a judgment partially just, no doubt, from their view of the subject, but founded (unless we are much mistaken) upon false premises. If the leaders of the modern Gothic faction (we take no account of the manufacturers of coloured-brick fireworks) claim that in all truthful architecture the constructive and æsthetic design should go hand-in-hand and illustrate one another, and that the external design should exhibit and grow out of the exigencies and requirements of the internal plan, and of the objects and ends of the building, they may see their principles illustrated in the noblest remains of the pure Classic school. Nor ought the great qualities which specially distinguish the Classic school of architecture to be ignored or disesteemed as they are at present. Granting all the elevating tendency of the aspiring vertical style, it may be doubted whether in the long run the horizontal style does not lend itself better to what can most rightly be termed architectural composition, and whether it is not in fact susceptible of the grander treatment of the two. The qualities of repose and majesty, which belong peculiarly to this style, have always been recognised by the best critics as the highest qualities which a work of art can boast; and in respect of architecture, we may add to these the invaluable attribute of stability, real and apparent, which unquestionably belongs more to buildings in the trabeated horizontal style than to any others; though a horizontal composition is by no means incompatible with the employment of arcuation in the subordinate features of a building, or even with domical roofing. Nor is it in the least to be supposed that a Classical style of design necessarily involves inconsistency between plan and design, and the halving a building into two corresponding sides, like the parterres of a Dutch garden. This misapprehension is unfortunately fostered by the practice of many of those who have called themselves Classical architects, and whose tame and weary productions have gone far to make the word Classic synonymous with Hamlet's three adjectives, "flat, stale, and unprofitable." But the notion of building a town-hall, for instance, with two wings identical in design, although one may be occupied by a grand public room and the other by small offices, belongs not to the Classic, but to the Renaissance. That which really gives the Classic tone to a building, viz., unity and completeness of design, horizontality and consequent repose and stability, and the sparing use of ornament refined and well-studied in character and carefully subordinated to the total effect—all this is just as compatible with the free treatment of ground-plan and grouping according to the dictates of convenience, as is the Gothic style which is supposed to monopolise all freedom of planning to itself. And those who think that to renounce the revived Gothic style in favour of one based on such principles of treatment as we have shown to belong peculiarly to the Classic school, would be to give up the opportunity for the greatest triumphs of their profession, may be reminded that when Martin, in his grand scenes illustrative of the Bible and of Milton, drew so largely on architecture in aid of his efforts, he obtained all his grandeur of effect by the employment of horizontal perspective in his imaginary buildings, without a single exception which we can call to mind. What might be made of such commissions as the Law Courts, were a sober and stately style of the Classic model substituted for the piquant and variegated groupings of towers and turrets which always form the main features in such designs at present, we should be curious to see. Our strong impression is that both in these and in smaller and more ordinary buildings, a return to Classic principles, as distinguished from Renaissance, and with due regard paid to peculiarities of climate, and so forth, in the treatment of detail, would result in a style far more suited to the real wants and feelings of the present day than the revived Gothic can be said to be; more especially as we hold that, whatever be the attraction of Gothic for those who love the romantic and picturesque in art beyond all other qualities, the Classic always has been, and when treated in its true spirit always will be, the style which pre-eminently recommends itself to intellectual minds, whether it be embodied in long-resounding verse, or in the silent outstretched perspective of cornice and colonnade.

HOW SHALL WE KEEP OUR HOUSES CLEAN?

WHEN we come to reap the fruits of an extended system of education,—say, in the next generation,—we shall find many matters in our houses will require alteration or re-adjustment, to suit the new order of things. When our domestic servants are sufficiently educated to know somewhat of the structure of the human frame, they will probably object to do very rough work that exposes them to the certainty of present colds and aches, and future rheumatism. We shall have to look thoughtfully at the various appliances and means with which domestic labours are effected, and consider whether they can be improved; whether different materials could be substituted in some cases, or plans contrived in others, by which much of the drudgery of house-cleaning could be done away with. We propose to briefly point out some of the existing domestic tasks that are unnecessarily oppressive upon such of the daughters of men as are maidservants. Just as some other occupations have their peculiar diseases, so are these persons especially liable to colds, sprains, and the complaint known as “the housemaid’s knee;” and when they come to be educated and able to choose employment, it is not likely they will prefer one that has the disadvantages of domestic service. And then how shall we keep our houses clean?

The first task of many maidservants after rising is to light fires, and remove the ashes left from those of the previous day. This is a dirty, sunnily operation. But it might be shorn of half its discomfort by the application to all fireplaces of the contrivance already used in some kitchens, viz.—a grated well sunk in the hearth for the ashes to fall into. It is, indeed, a matter of surprise that this plan is not in universal use, most especially in drawing-rooms, where the furniture is covered with velvet and satin, and articles of virtu are displayed, which must materially suffer from the multitudinal coating of fine ashes. A fireproof well, a few inches deep, furnished with a tray having sides to it as high as the depth of the well would permit, and handles, so that it could be drawn up and carried away conveniently, would very materially lessen the dirt of the fire-lighting business. The next disagreeable is the black-leading process. We are full of sympathy for the inconveniences suffered by the painter in the use of white-lead, but we only laugh at the victim of black-lead when a maid-servant answers a hell with a smudge of it on her brow. Nostrils, mouth, and throat get clothed with the fine powder flying from this soot-faced article. Can we not think of some pleasant-looking, suitable, and economical material for our fireplaces that would supersede the use of it?

Then look at the immense number of houses which have a flight of stone steps, and a huge landing-stone in front of them, in the streets and squares of London; in the crescents and terraces of fair, bright, inland watering-places, as Leamington and Cheltenham; in quiet country towns; in fine, in every direction. The beauty of these approaches, and, indeed, the character of the head of the horse, are supposed to depend on their whiteness; to secure which quality they must be daily scoured and hearth-stoned, in all weathers and all seasons. Surely here is a waste of time and service, which the choice of some other material for an approach to the street-door might diminish. But, besides the steps, there are the brass bell-handles and the brass knocker to polish. Unless these are well rubbed with some polishing paste or powder every morning, they have a dismal, slovenly appearance. Some ten minutes must, therefore, be wasted in thousands of houses by one of their most able-bodied inmates in this frivolous piece of labour, after the still longer process of “doing” the steps is accomplished. It will be seen that future improvements in choice of materials for the items enumerated may considerably alter for the better the nature of the toil demanded of the young working-woman. The scores of kneeling figures in blue gowns and tiny white caps scouring their masters’ door-steps, to be seen in the course of a morning’s walk, are not now above the task; but will they like it when they are as educated as our morning governesses? But we have not yet done. Inside the street-door there is another item open to improvement. This is the door-mat. Lift it up, and beneath it there is usually to be found a thick deposit of dust that has filtered through it, whether it be made of india-rubber, cocoa-nut fibre, oakum, or

matting. Those who carry it away to heat it are speedily lost to sight from more causes than one. The door-mat is evidently one of the principal deposits of dirt in a house, and requires a masterly management. Would not a well (sometimes now formed) the dirt of the mat only) similar to that we have described for the ashes, and of the same size as the mat, be of service here? Again, would not a couple of coats of paint on every floor of wood considerably lessen the labour of scouring it, and facilitate the sweeping of it free from the dust that filters through even the best carpets? And should not every wash-house in private houses, as in institutions, be furnished with an open-work wooden floor that would permit of the laundresses’ feet being kept dry?

The next difficult indoor operation is window cleaning. Owing to the exact division of sash windows into two equal portions it is next to impossible to clean parts of the panes in some large windows without standing outside; and to be able to sit on the window-sills and bring the process to a successful issue is considered such an improvement on this fearful danger, that we shall be probably thought to be over-particular when we find fault with this alternative. But we do find fault with it, and believe that we shall yet contrive for windows to be cleaned as comfortably as swing-looking-glasses.

This generation has already done somewhat in our houses for the next. We have introduced self-acting cooking apparatus, lifts, washing, wringing, and drying machines, extended house-drainage, water supply on our upper floors, and in various other ways lessened indoor labour. But we must not forget that there are those coming after us, and for whom it is in a great measure our duty to provide, as it should be our pleasure, who will look upon some of our appliances as we look upon the cumbersome mangle of our forefathers, or upon the spit that required turning, or upon the bucket of water that had to be lifted from the well and carried from the basement of the house to the topmost bedroom. We, as well as educating our successors, are not to forget to improve the appliances we are to put into their hands.

REMARKS UPON MILITARY REMAINS IN WALES.

THE country west of the Severn and the Dee, which, in a military point of view, may be regarded as Wales, is peculiarly rich in military remains, British, Roman, Saxon, Danish, and Norman. It would seem that in remote times, before the invader had stained the sacred soil, the several tribes were, as they long continued to be, at war with one another, and in consequence each had its own camps and strongholds. At least, this seems to be the only way of accounting for an almost infinite number of earthworks, of no great size and of irregular form, which are found in positions where they never could have been intended for the general security of the country. These are evidently of early date, and no doubt antecedent to any general invasion, either from England or from the sea.

Besides all these, are found a series of larger though less numerous earthworks, which crown the high grounds along the sea-coast, and those inland to the west of the Severn; and occur also along the straths and passes by which the country is laid open; such, for example, as the vale of Clwyd on the north, of the Yrnyw in Mid-Wales, and of the Wye and Usk in South Wales. These are probably of later date, and certainly intended for defence against a more general enemy. On the east they are opposed to that long chain of camps of large area, and constructed with immense labour, which crown the heights and spurs of the Cotswold from the Bristol Avon northwards to Evesham, and which are generally regarded as the works of the advancing Saxons, who, having traversed the plains of England, looked down with delighted and greedy eyes upon the “virgin daughter of Lochness,” and her rich pastures of Gloucester, Hereford, and Worcester.

Some of these earthworks are known to be British, and others to be Saxon and Danish; but no certain rules of distinction between them have been established. They are either round or oval, or more commonly of irregular outline, and governed by the character of the ground. They are usually on the tops of hills or the crests of an encampment, so as to command a view, and be tolerably secure against surprise. The defences are commonly a succession of banks and

ditches, the earth from the latter being thrown inwards; and these defences are deeper and in greater number on the more accessible sides. There are seldom more than two entrances; often but one; and these wind obliquely through the defences, so as to check the force of a rush of men, and thus guard against a surprise. There is but seldom a supply of water. They seem to have been intended rather to resist a sudden attack than to hold out against a blockade. The banks are in some instances of broken stone, and occasionally, though very rarely, of rude dry stone walling. Some of these camps are of very large size. Dolebury, on the Mendips, is above 1,000 yards in length; and its banks, of broken stone, are from 10 ft. to 15 ft. high.

These camps, however extensive, all appear to be the work of barbarous or unscientific nations; but mixed up with them are found other works, commonly indeed of earth, but placed and designed by men who were evidently no novices in civilized wars, and were proficient in the arts of camouflaging. These were the Romans, whose camps are usually placed, not on the tops of hills or in inaccessible places, but in the plain and near a stream or source of water. They moved with wheel-carriages and cavalry in their train, and trusted to their discipline to guard against surprise, the favourite tactic of the savage.

The Roman camps, instead of being round or oval or of irregular form, are usually rectangular, constructed with great regularity, and provided with several openings, whence an assailant could be outflanked. They were also divided within, according to certain well-ascertained rules.

The Romans, moreover, coming not merely as invaders, but as future colonists, insisted themselves in making lines of high road, upon which their camps are posted, and by means of which their communications were kept open. At certain intervals they converted their camps into fixed stations, regularly walled in, many of which, like Caerwent, Caerleon, Neath, Cardiff, Gloucester, and Chester, became the nuclei of large villages, towns, and cities.

These earthworks, with occasional Roman defences in masonry, were the only military works that preceded the invasions of the Normans in the eleventh and twelfth centuries. There is no existing evidence that either Celt or Saxon in Wales ever built a military structure in brick or stone and mortar. The instances cited on Penmaen-maar, Carn-Goch, and elsewhere, only prove the poverty of the evidence adduced. These are enclosed with loose dry stone walling, of considerable thickness, and which at Carn-Goch contain certain cists or cavities in which the natives probably hid their valuables and possibly themselves. Of a regular wall still left of a tower or castle, no trace has been recognised.

The influence of the Norman conquest was speedily felt on the Welsh border. With the activity of all great generals, William at once saw the importance of securing the Severn and the Dee, with a view to the occupation of the marches in strength, and the conquest at some future time, of the rocky and impregnable country beyond.

He at once took possession of Gloucester, Hereford, Worcester, Ludlow, Bridgenorth, Shrewsbury, and Chester, and directly, or by the agency of his greater barons, fortified these Saxon towns, and placed a strong castle in each.

At the same time he,—and the policy was pursued by his son,—encouraged these barons to invade Wales, selecting the more open and weaker parts to the south and west, and the broad strath or vale of Clwyd, which forms a sort of approach to the great strongholds of Snowdon and Anglesea. Thus the Earls Palatine of Chester, second only to their sovereigns in rank, and sometimes their superior in force, established castles at Mold, Flint, Rhuddlan, and Diganwy, extending up to the Conwy river, and securing access from the north by sea. In like manner the De Clares, of the race of Strongbow, in the south, placed the base of their operations in their impregnable castle of Chepstow, upon the mouth of the Wye, and having married the heiress of Fitzhamon the conqueror of Glamorgan, established their power along the plain and fertile country between the hills and the Bristol Channel, and advancing along the old Roman *via maritima*, maintained a chain of fortresses, of which Newport, Cardiff, Neath, Kidwelly, Llanstephan, Caermarthen, and Llanharmer, each commanded the mouth or passage of some considerable river or inlet, while Tenby, Pembroke,

Manorbear, Orew, and Haverford, secured the peninsula of Pembroke and the baven of Milford, and thus not only commanded all the approaches by the Bristol Channel, but laid the foundation of a secure connexion with Ireland.

Ludlow and Shrewsbury, like Chester and Gloucester, also served as bases for further conquests. Ludlow was the head-quarters of the lords of the Middle March, the Mortimers, De Lacys, Talbots, Dinans, and Fitz-Warines. Shrewsbury was the fortress of Robert de Belesme, of the great house of Montgomery, to whom belonged the proud distinction of giving name to a Welsh county, instead of, like other lords, deriving a title from it. From Shrewsbury issued those warriors who founded Pool Castle, Aberystwith and Cardigan, Kilgaran, Newport, and, indeed Pembroke, although that magnificent fortress owes its chief illustrations to its later lords of the houses of De Clare and Marchal.

In addition to these main lines of occupation, the open valleys of the Usk and the Middle Wye were occupied by the great barons Fitz-Osbert and Newmarch, who established their power about Brecknock, Abergavenny, and Usk, and whose estates ultimately vested in, and were augmented by, the Bohuns, whose earldoms of Hereford and Essex balanced even the enormous influence and royal connexion of their rivals, the De Clares, with their earldoms of Gloucester and Hertford.

The grasp thus taken upon Wales was held with variable strength, according as the Marchers were supported by or at variance with their sovereign; but, with some intervals, it was retained during the reigns of the two first Henrys, and was, on the whole, strengthened during that of Henry III. The castles, often taken, and sometimes ruined, by the Welsh, were regained and strengthened, and in South Wales one new castle of great magnitude (Caerphilly) was erected by the De Clares in the last year of the king.

But under Edward I. the English power was not only consolidated, but extended, and was wielded far more by the king than by the Marcher lords. North Wales and Anglesia were conquered, and the conquests were secured by the great castles of Bere, Harlech, Caernarvon, Beaumaris, and Conway, the ruins of which still attest the wealth and generosity of Edward, and the skill of the military engineers and masons of his day.

With these great works of Edward I., the military history of Wales is brought to a close. The Welsh fought valiantly in the English ranks at Agincourt, and, under the house of Tudor, became gradually incorporated into the British Empire, of which they have ever approved themselves, both in peace and war, very loyal and valuable constituents.

Such, then, very briefly related, are the circumstances under which the great fortresses of Wales were constructed. I now arrive at the consideration of the works themselves.

English, or rather Mediaeval, architecture, has only been scientifically studied during the last thirty years, and military architecture for a much shorter period. Rickman altogether declined to notice castles, and they have by no means shared in the flood of light which has been directed upon our cathedrals. What is wanted are good ground-plans, and scientific elevations and details. Gross gives few plans, and his plates are poor. Buck, though better, is out of perspective and inaccurate in detail. The plates in King's "Munimenta" are as excellent as his letterpress is worthless. The plates published by the Society of Antiquaries are also excellent; and recently Mr. Parker's valuable volumes have supplied much towards a complete study of the subject, and it is difficult to speak too highly of the abstract of the great work of Viollet-le-Duc, which has appeared under his care.

Much, however, remains to be done. Castles are usually in a ruined state. They are but seldom ornamented; and very commonly all the ashlar work has been removed, and nothing remains but the rubble and concrete of the interior of the walls, without regular form, and affording but little information as to age. A castle is essentially a defensive work. Its uses are to enable a small number of men to resist or beat off the attacks of a larger number, and to secure a safe place from under cover of which an army may retire, or from which it may advance.

The great point in the design of these works, is so to arrange them that those who are ap-

proaching a wall to breach it shall be open to the fire of as large an extent of rampart as possible; and as they reach the wall shall be exposed, not merely from the top of the point attacked, but from each side of it. In other words, the besiegers should be unable to attack without being exposed to a superior and concentrated fire from the besieged; and the besieged should be sheltered.

Now a round tower—supposed to be a very old form of castle—least of all forms fulfils these conditions; for it is clear that the besiegers, while approaching, can only be fired at from that part of the wall exactly in front of them; and when they reach its foot they are safe from all missiles except those thrown down from its top, while their supporters could, by a steady and sustained flight of arrows, prevent any one from appearing on the battlements.

The only advantage of the round tower is its passive strength and absence of all angles, so that it is not easily breached; and when mined, does not readily crack and fall.

The square tower is rather more defensible, since a broader part, that is a greater length of rampart, could be manned for the annoyance of the assailants; but the defendants, it will be observed, are quite unprotected from arrows from without; also, when the attacking party have reached the foot of the wall, they are safe from all but missiles from above.

From these considerations it will be evident—and it was evident to all the military nations even of remote antiquity—that every wall should have flanking defences, that is, towers or bastions projecting from the face of the wall, and capping its angles. In such an arrangement the curtain or wall intermediate between the flanking towers, which, being the weakest, would naturally be selected for breaching, is so protected as to be almost unapproachable; and even when reached, the assailants are exposed to the near and direct fires of the defenders, one on each side; and these defenders, as they shoot from a flank, are not at all exposed to arrows coming from the front. This is the system of flanking defences, well understood indeed by the Romans, and from them adopted by the Normans, but far more extensively put in practice by their descendants in the twelfth and thirteenth centuries, and only brought to perfection after the introduction of gunpowder.

The Norman castle usually consisted of a walled enclosure, the wall being flanked with towers, generally square, and in the enclosure a building of far greater strength than the outer part, and known as the keep. The Norman keep, from its great height and size, towered above and gave character to the whole fortress; and, from the immense thickness of its walls, it has in many cases descended to the present day entire or nearly so. Most commonly these keeps were quadrangular, with a door on the first story, and outside they are strengthened by pilaster strips, while all the angles become square turrets, though of very slight projection. The first-floor is generally a hall. There is often a chapel, and the access to the different floors is by winding stairs at the angles, and by galleries and small chambers in the thickness of the walls. The well is usually carried up through the wall, having an opening for the drawing of water, in each story. I need only name as generally known the keeps of Dover, London, Canterbury, Rochester, Guildford, Winchester, Colchester, Kenilworth, Richmond, Banborough, Prudhoe, Newcastle, and Carlisle. There are about thirty of them in England, and many in Normandy.

In Wales and the Marches they are rare. Those of Bristol and Gloucester have long been destroyed, as has that of Haverford. At Chester there is a square keep, and at Ludlow, though this latter is mixed up with later buildings. There are square Norman keeps at Goodrich and Chepstow, on the Wye, and a small one at Ogmere, on the river of that name. At Penlline, also in Glamorgan, is a fragment with herring-bone masonry.

The Normans did not, however, always build square keeps. Sometimes, within the enclosure, is a circular mound of earth, and upon this they placed a circular, or, more commonly, a polygonal shell of wall, of considerable thickness, against which, in the side, buildings were erected, leaving an open court in the centre. Where these mounds are seen it is unusual to find a square keep. Their origin is doubtful. Had the Normans thrown them up they could scarcely have built upon them, and yet most of the masonry they carry is Norman, of a very solid character. In Normandy there are about forty of these mottes

or mounds within seventy miles of Caen, and they are not uncommon in England. There is one at Arundel, carrying a polygonal shell of wall, and they occur at Oxford, York, Totnes, Bedford, Marlborough, Hincley, Tamworth, Warwick, and Christchurch, and there is a very fine one at Wallingford. It is now supposed that they were thrown up by the Saxons, and were intended to be fortified with palisades. In Wales they are very rare. There was one at Hereford, there is one at Caerleon; but the grandest military mound in Wales proper is at Cardiff, where, though crowned by a Norman wall, it is connected with earthworks of a Roman character.

There are, however, in many parts of Wales detached mounds, surrounded by a ditch, and which seem to have been thrown up to enable a small body of men to hold out with certainty for a limited period. They were, no doubt, stoutly palisaded at the summit, and probably outside the ditch. There is one at Gelligaer in Glamorgan, a fine one near Towyn, and one near Newport in Cardigan; but they are rather liable to be confounded with sepulchral mounds or barrows.

The north Welsh castles rarely present anything of the Norman type; and those in South Wales, though generally earlier, seldom, in their present form, are older than the times of Henry III. Some of the earliest, as, for example, Kenmore, and, to judge from its foundations, Sully, contain a variety of the square keep; but the general tendency of the Early English period in Wales was in favour of a large and often irregular enclosure with high curtains and round flanking towers, in which the peasants and the cattle could be received and sheltered during any sudden incursion of the Welsh. Manorbear and Dynevor, Penmark, Whitecastle, and Kilgaran, seem to have been such places, and Morlais, though of the reign of Edward I., illustrates this type.

During the post-Norman, or Early English, period, at the end of the twelfth or early in the thirteenth century, there seems to have been a tendency to build detached round towers, and sometimes castles with circular keeps, such as Conisborough. Without touching upon the vexed question of the Cornish keeps, I may mention the fine circular keep of Pembroke, the towers of Penrice and Caldecote, and that of Tretower, near Abergavenny. There are also the foundations of a large round tower, decidedly Early English, at Whitochurch, near Cardiff, and the tower of Bronllys, in Brecknockshire, has recently been illustrated in the pages of the "Archæologia Cambrensis."

This circular style, though employed largely in France, and long continued in the flanking towers of castles, and on town walls, was not much affected for detached castles in England, but the reign of Henry III. witnessed a great improvement in castle building, which was carried on and perfected in that of Edward I.

This new style, now known as the concentric or Edwardian type of castle, exhibits a great advance in military knowledge, no less than in architectural skill. Although the structures are more extensive, and on a far larger scale than in the Norman period, the walls are not so massive, and there is far more economy of material.

The keep, whether square or round, disappears, and in its stead is found a large central court, usually rectangular, with drum towers capping the angles, a hall and offices on one side, and at each end a gatehouse. Outside this inner ward or bailey is usually a second enclosure, also rectangular, capped with round towers at the angles, and sometimes with intermediate towers on the curtain wall, and also, like the inner ward, having two gatehouses. This is the middle ward.

The outer ward is seldom if ever complete. It usually consists of a sort of outwork, sometimes of earth, and often includes one or more barbicans, or defences outside the moat. The smaller specimens of these castles have only a tendency towards the concentric arrangement, but the larger examples, such as are found both in North and South Wales, exhibit it very strongly.

Moreover, most of these castles were intended to lodge some very great lord, the sovereign's deputy, and occasionally the sovereign himself, and although security was their first object, it was by no means, as formerly, their only one, and was combined with great architectural splendour, and with arrangements for the display of hospitality on a large scale.

Many of these concentric castles are not

original works, but are formed by the addition of exterior walls to an older keep. At Porechester is a large rectangular space, still enclosed within what are usually regarded as Roman walls and buttresses. In this stands a fine Norman church, probably on the site of the Roman *aeolium*; and at one angle is a very fine Norman rectangular keep, of unusual size and height. In the Edwardian times this keep has been isolated from the great court by a wall and buildings, converting the structure into a sort of concentric castle.

Chepstow in like manner has had Early English and Decorated wards added above and below the Norman keep. The castles of London and Dover are still finer and more perfect examples of the conversion of a Norman keep into a perfect concentric fortress.

Kidwelly, a very curious Welsh castle, is, in its present form, concentric. It is in plan almost a semicircle, the river *Gwendraeth* forming the chord, and a deep artificial fosse the arc. It has a celebrated chapel.

Perhaps, having regard to its area, its architectural detail, and the number and completeness of its defences, *Caerphilly* is the first concentric castle in Britain, as *Beaumaris* is the second.

Caerphilly covers about 30 acres of ground. It has three distinct wards, seven gatehouses, of which five are of large size, and about thirty portcullises in different parts of the work. Its hall and kitchen are on a grand scale, there is a grand guard-chamber or governor's hall in each of the two interior gatehouses, and within the walls are fish-stews and a water-mill. The north and west sides are covered by large earthworks, skilfully designed and placed; and the south side was protected, as at *Kenilworth* and *Leeds*, by a spacious lake, now drained, but which once filled the moats, and flooded also the low ground on the north. The grand front towards the *Rhymny* is 250 yards in length, and from 20 ft. to 60 ft. in height, with a grand central gatehouse, and large postern gatehouses at the end of each flank. The pier and foundations of the barbican of the grand entrance remain, and show that the drawbridges defending it must have been of unusual span and breadth.

Caerphilly was constructed towards the end of the reign of *Henry III.*, by one of the *De Clares*, Earls of *Gloucester* and *Hertford*, and large additions were made to it by *Hugh le Despenser* the younger, who garrisoned it for *Edward II.* in the last year of his reign.

Caerphilly is especially remarkable for the jealous care with which it is guarded against surprise. Each tower and each gatehouse is isolated both from the court and from the walls by regularly porticuled doorways.

Beaumaris is rather more regular in form than *Caerphilly*, though of less magnitude. Here the hall is in one of the gatehouses, and the chapel occupies, as at *Kidwelly*, a mural tower. The inner walls are of unusual height and thickness, and contain two very curious tiers of triforial galleries, of which the lower covers a magnificent series of sewers. There are but two concentric lines of wall. The outer line is represented by a sort of spur work, which extends towards the sea, and commanded the whole port. *Beaumaris* was built by *Edward I.*, and marked the establishment of his power in North Wales when he turned the flank of *Snowdon*.

Harlech is of the same class. *Caernarvon* and *Conway*, both works of great size and beauty, and also the work of *Edward*, are scarcely in plan concentric, but are rather grand examples of the curtained and towered inclosure introduced by *Henry III.*, and both combine the accommodations of a palace with the defences of a castle.

With the conquest of Wales by *Edward I.* terminates the history of Welsh military architecture. Many of the castles were subsequently altered, and some converted into dwelling-houses; but, with the brilliant exceptions of *Raglan* and *St. Donat's*, we have not much of purely military work of later date than the middle of the reign of *Edward I.*

To recapitulate, we have to observe, in Wales, the Norman castle of *Cardiff*, with its earlier mound; the rectangular keeps of *Goodrich*, *Chepstow*, *Landow*, *Ogmore*, and *Pentllyn*, and, rather later, of *Fomon*. The circular keep of *Pembroke*, and the towers of *Tretower*, *Caldecot*, *Bronllys*, and *Whitchurch*.

Next we have the fortified enclosures of *Kilgeran*, *Bere*, *Caldecot*, *Dynover*, *Whitecastle*, *Llanstephan*, *Tenby*, *Dinas-Bran*, *Manorbeer*, and some others.

Finally, and chiefly, we have the grand concentric structures of *Caerphilly*, *Beaumaris*, *Kidwelly*, *Harlech*, and their contemporary structures of *Caernarvon* and *Conway*, and in South Wales of *Morlais* and *Dinas* by *Talgarth*.

Besides those well-marked and, more or less, well-known examples, there are scores of castles in Wales of which parts, usually gatehouses, remain, and many of which having been originally founded by the alter Normans, and afterwards burned and destroyed, exhibit what the skilled antiquary will recognise as traces of the Early English, Decorated, and Perpendicular periods, down to the partial restoration in the Tabor manner, which followed upon the extensive devastations of *Owen Glendower*.

In the grand divisions of British military architecture, to Wales must be allotted, as peculiarly her own, the Edwardian period. The Norman keep, whether square or as a shell upon mounds, must be studied in England or in Normandy, and the circular tower keeps chiefly in France; but even *Windsor*, *Warwick*, *Dover*, and the Tower of *London*, though rich in historical association, and possessing individual parts of surpassing grandeur, can by no means, in military completeness and simplicity of plan, be compared to those noble fortresses which girdle the skirts of *Snowdon*, or rise out of the velvet meads of *Glamorgan*. C.

PROPOSED INFIRMARY FOR LAMBETH.

The guardians of *St. Mary's*, *Lambeth*, invited some twenty-two architects to send designs for the infirmary proposed to be erected near *Kennington-road*, offering three premiums, 150*l.*, 100*l.*, and 50*l.*, for the best, second best, and third best respectively: the successful competitor, if required, to carry out the works for 1,200*l.*, less the amount of premium, but not to be entitled to any premium or payment, unless a contractor would undertake the work at a sum not being more than 10 per cent. above the architect's estimate. The accommodation required is for 600 patients,—250 males and 350 females. In addition to the infirmary, the guardians asked for a block plan of a workhouse for 1,500 inmates, in order to show that the infirmary, as planned, would not render it impracticable to provide a workhouse on the site hereafter, and they offered a separate premium of 50*l.* for the block plan which should seem to them to be the best.

Twelve of the twenty-two, as we mentioned recently, have responded, and their designs have been hung for some time in *Lambeth* workhouse. The injurious farce has been played of covering up the names of the designers affixed to the various drawings, and substituting in each case a letter, from A. to K.; neither of the two under those letters, by the way, being without merit. One of the least important results of resorting to the pseudo-anonymity appears to be that the descriptive particulars sent by the architects are not appended to the designs, probably because the name of the designer in each case appears in them.

The architects have been left in doubt as to the desired mode of approach, and some (of which L. is a compact plan, may be taken as type) have thought it necessary to have the entrance front of their buildings on the narrow width of the land, next *Pleasant-place*; while others, of which we will point to G as an example (a plan well deserving attention), have availed themselves of a roadway newly acquired by the guardians, leading from *Renfrew-road* to the long side of the land, and placed their main front there.

The guardians unfortunately say in their Instructions, "Some of the wards may be provided to contain four rows of beds;" and this has betrayed many of the architects into submitting plans which ought on no account to be adopted. For bedridden patients and convalescents a double ward may be endured; but now to erect a double ward to the teaching of experience and to the public opinion on the subject which we have aided to form, that we cannot for a moment suppose the *Lambeth* guardians contemplate such a step. Should they do so, an over-ruling power should be appealed to. In design H, as in some others, the double wards are confined to the bedridden cases; and in design K, on which much pains have been bestowed, an alternative plan avoids double wards altogether, and is commendable accordingly.

It may be noticed that some of the competitors have submitted complete designs for a workhouse, though asked for only a block plan.

ST. JAMES'S CHURCH, BOLTON.

St. James's Church, *Bolton*, has been opened by licence of the Bishop of *Manchester*. In 1864, the charitable trustees under the will of the late *John Barrow*, having at their disposal a considerable sum of money left by *Mr. Barrow*, towards the building fund, advertised for designs. A very large number were sent in under cipher. From amongst them, two were selected for consideration, which were found to be by the same architect, and ultimately one of them, with a central steeple (as now carried out), was adopted. In the first instance, it was proposed to build, at the cost of 5,000*l.*, a church to seat 1,000 people. But afterwards, in consequence of subscriptions not coming in as liberally as was hoped, it was decided to reduce the cost somewhat, and the accommodation to 800. However, before the builder's estimates were asked for the plans were again enlarged in various ways, so that the church as now built will accommodate nearly 900 persons on the ground floor, there being no galleries. The contract was taken by *Messrs. H. & S. Warburton*, of *Harpurhey*, *Manchester*. The ground plan is cruciform. There is a western porch, rather longer than the width of the nave, and so arranged as that one door may serve for entrance, while there are three to allow of speedy exit. At the north end of this western porch is the baptistery, which opens into the church with a couple of narrow arches resting on a central pillar. The nave is of more than ordinary breadth, and is marked off from the aisles by four arches on either side. The chancel, which terminates towards the east, with a semicircular apse, is 43 ft. long by 20 ft. wide, the steeple being built over the western half of it. The choir seats are under the steeple, and the flat boarded ceiling of this part is considered to be well adapted for sound. To the north of the choir is the transept, 34 ft. long, affording space for the organ as well as for large vestries. The south transept is not quite so long, but has an aisle on its east side opening out of it by a double arcade, and is also provided with a separate door. Here the school children will sit. The seats are low and open benches, the choir stalls being somewhat more ornate. The floors of the passages and chancel are all laid with red and black tiles, in pattern. There are wood floors under the pews. The heating apparatus is by *Haden & Co.*, of *Trowbridge*. The windows are all fitted with thick granulated glass of a warm amber tint. The tracery of the windows has the lead-work arranged in various devices. The apse windows, made by *Lavers & Barrand*, are filled with glass, having a floral ornament. The capitals of the two pillars of the nave nearest to the east have been carved by *Mr. Green*, of *Manchester*, with the rose of *Sharon* and the lily of the valley. The gas-fittings have been supplied by *Mr. Thomson*, of *Birmingham*, and consist of wall-brackets. The west end of the church has three arches in the lower part, the central one containing a doorway; the others will, it is hoped, ere long be occupied by medallions and other decorations. Above these arches is a four-light traceried window, about 20 ft. high. There are nineteen clerestory windows, arranged in pairs of alternate design. The style of the church is Early Geometric Decorated. The tower and spire rise from the centre of the building to a height of about 150 ft. The belfry is octagonal in shape, and each side has a window, fitted with slate louvres. It is capable of containing a full peal of eight large bells. The spire is also octagonal, but an angle comes over the centre of each face of the octagon below. There are traceried windows in the south aisle. The architects are *Messrs. Medland & Henry Taylor*, of *Manchester*.

GLASS IN BLANK SASHES.

Sir,—During the past six months I have removed a large number of old wood sashes from freestone window frames, and substituted the best British plate-glass in their stead. In the windows are a large proportion of "blanks." Some of these have been glazed with black enamelled glass and others with transparent glass, the plaster painted black behind it.

I shall be glad if any of your readers can inform me why these blank squares, both enamelled and transparent, are frequently "flying"? As it occurs only on the south side of the house, I can only attribute it to the great heat absorbed from the sun's rays. It is not caused by expansion of the heated air behind the glass, provision having been made for this by leaving small openings at the top edge of glass. The squares are all very carefully bedded, without wedges or pins, in elastic putty, made by mixing about half a pint of best olive oil with about 12 or 15 lb. of linseed oil putty. The transparent glass in the same windows, so bedded, never breaks. W. B.

THE NEED OF A NATIONAL ARMOURY.

At a time when so much money is about to be expended on public buildings of a character not underserving of the name Imperial, it may for a moment seem to be a step of questionable propriety to advocate the establishment of a new kind of public exhibition, that would demand either the large extension of existing, and even of projected edifices, or the erection of an entirely new structure.

But it must be borne in mind that occasions often occur, in the history of nations, no less than in that of individuals, which, once lost, never return. The lesson of the Sybilline books is one which no wise statesman can forget. Nor are we now so much entering into the purely architectural question of the erection of an armoury, worthy of the nation and of the age, as anxious to insist upon the importance of not allowing a present opportunity to escape. But, in seizing that opportunity, it will be perilous merely to grasp at the materials of a fine collection without at the same time resolving to make a consistent and worthy use of the acquisition. The question of the purchase of the Meyrick collection of arms involves the more important question of the establishment of a national armoury worthy of the name.

The purchase of the nation of the finest private collection of arms in Europe, and one of the finest in existence, is one entitled to receive the support of all advocates of artistic education. It is precisely one of those occasions which occur rarely, and which, when once neglected, still more rarely return.

But this purchase can be justified only upon the ground of its being made really available for educational purposes. It is not with the same object as that with which a country friend is taken to visit the famous chamber of horrors, that visitors should repair to a national armoury. It is as an illustration of the history of the last eight hundred years, the change in social habits, the advance in mechanical skill, the application of decorative embellishment to warlike defences, that such an addition to our Art Museum is valuable. For this purpose the Meyrick collection forms but a single chapter, although a splendid and voluminous one, in the illustrated history of armoury.

It will, no doubt, unavoidably happen, that in any series of illustrations of a long period of artistic labour, certain portions will afford fuller materials for the collector than he can hope to find for the remainder of his work. Of certain periods, and notably of the earliest periods, his specimens are likely to be few. But it is none the less true that to give the full value to these more richly illustrated portions, a general idea of the whole outline of the subject must be presented to the student. An admirably arranged display, for example, of the armour of the time of the Tudor dynasty, giving such abundant specimens as shall show the general changes of fashion that occurred, reign after reign, can only convey a distinctive lesson, either to the observer already acquainted with the general history of the weapons of offence and of defence, or to the special student of the events of the Tudor times.

But if a general collection be framed, showing by few, but well-selected examples, the transformation which the defensive array of the nobleman underwent, from the date of the Battle of Hastings to that of Marston Moor, the fuller details of that portion of the change which occurred between the Battle of Bosworth and the defeat of the Armada, will have a twofold significance.

For an armorial gallery, then, of which the Meyrick collection should form the fullest and most brilliant division, we must ransack other stores to obtain the requisite complementary information. In many instances it may be difficult to obtain actual arms. We shall be driven to have recourse to monuments, to illuminated tapestry, to brass rubbings, even to ancient missals and books of devotion. No period should be omitted from the historic series, however inadequate may be our present means of representing that period. In each we should distribute the best positive information at present within our reach. The mere fact of the existence of such a national collection, however bald and poor might be the outline which certain portions were in the first instance present, would be a great historic and artistic advantage. Contributions would flow in from all sides. New specimens would be collected by purchase, by gift, by exchange, by electro-type reproduction. Anomalous and ill understood weapons, or portions of armorial defence, would find their

natural places as illustrative of one another, and the gallery, thus organised, would have a growth almost like that of Nature herself.

Nor should our investigation be confined to English armour, or to the armour of the period of chivalry. The general progress of human skill as applied to offensive and defensive weapons should not be left out of sight. We may trace the regular development, for example, of the resistless thunder-bolts of our present warlike array, from the missapen stones with which the giants were said to have assailed Olympus, to the Armstrong shell, and to the Whitworth bolt. The progress of mankind in the use of missiles had been long and rapid before the invention of gunpowder. Two thousand nine hundred years ago the use of the sling in battle appears to have been a novelty. Within a quarter of a century from that date we find reference to a national, or, at all events, to a military, practice in the use of the bow. In Egypt we find that weapon represented from the times of the earlier dynasties. The projection of large stones from the ballista, for purposes of battering, as well as for personal offences, was a marked feature of Roman warfare. The two methods of missile annoyance were long employed side by side, the powerful cross-bows, for which the Genoese were famous, being the last form of machine for the mechanical discharge of a bolt, while the cloth yard shafts which the English archers were taught to send, with such accurate aim, from their 6-ft. yew bows, made their trajectory on the principle of the rifled bullet of the present day; a rotatory motion being communicated to the arrow by a slight twist, or rather screw, in the insertion of the feather.

The relation between offence and defence is almost as close as the mechanical relation between action and reaction. A new missile, or a new weapon, rendered useless an old form of defence, or rendered advantageous a new one. An improvement in mail, suggested the employment of a new offensive weapon; such, for instance, as the long narrow pick designed for penetrating the joints of the armour, or the apertures in the visor, which one of the Meyrick horsemen holds in his hand. The same controversy that now rages between increasingly heavy ordnance, and increasingly solid armatures, for ships or for forts, has been constantly brought to the arbitrament of the open field. The progress is distinctly intelligible. It has continually been that of the gradual perfection, or at all events increase in solidity and in weight, of the defensive panoply. Parallel with that increase has been the increase in the violence of the attack. So long as manual encounters decided the fate of battle, this increased force in the shock was partly due to that very increase in the weight of armour that was intended for resistance. The impact of the lance in the lists became so tremendous, towards the time when the accidental slaughter of King Henry II. of France gave the first grand discouragement to the practice of the tourney, that tilting armour was made of a solidity, and a peculiar one-sided form, altogether inappropriate for actual warfare. The pauldron that was forged to receive the blow of those ponderous lances, that always look so impossible in pictorial representations, weighted the left side of the corslet in a manner inconsistent with the activity of the *milite*; and the unprotected freedom left to the right arm, in suits of armour of this description, would have been equally disastrous in any combat not regulated by strict chivalrous rules.

The earliest European armour with which we are acquainted—that of the Roman soldier—was made of boiled leather. It took, in many instances, the form and the muscular markings of the body, being a simple, solid, hard tunic, with a square hole, protected by metal straps, through which the head was thrust. Recent discoveries at Pompeii have disintombed the Roman soldier from his repose. He died on his post, and the thickly drifting volcanic ashes closed around his form, and his arms, with the accuracy of a plaster mould. Thus the minutest detail of his armour, even to the ligaments of his sandals, has been accurately preserved by the fatal tufa, which formed around him almost before life was extinct; and what appeared to be mere conventional representation, on ancient bas-relief, or coin, or statue, has now become distinctly intelligible.

The leathern tunic was first adorned and strengthened by straps, or plates of metal. Then parallel plates or scales were attached. By degrees these metal joints were framed so as to depend more on each other than on the leathern sub-structure. Rings were substituted

for plates or scales. The old tunic was replaced by the softer material of wash-leather, and the coat of mail became entirely distinct from the buff jerkin worn beneath it.

At the period of the Norman Conquest, when what may be called the armour of feudalism or of chivalry first becomes familiar to our knowledge, the use of mail had grown very prevalent. Mail shirts, greaves, shoes, gauntlets, hoods, appear on the Bayeux tapestry. A solid steel cap, at one period, seems to have been the only portion of the defence that was made of plate; and a mail hood was thrown over the steel cap. Play was given to the neck by a mail shirt or gorget, long after plate had spread over the rest of the person. This mail appears in distinct small pieces, to protect the arms, the elbows, the breast, the thighs; and then gradually displaces, or rather supplants, the mail fittings, until the whole figure is seen to be clad in one solid riveted panoply of plate-iron. The gradual disappearance of mail in certain parts of the figure dates the period of armour with considerable accuracy; the last improvement being that of the protection of the throat by overlapping plate-joints, and the total disappearance of mail.

What ultimate revolution might have occurred in the armature of the noble, it is now impossible to guess. The armour at the Tower of London, badly looked after as that collection has been, here offers a mute, but most instructive lesson. We have a long period in English history, during which no armed sovereign of our island took the field. Thus the armour made for Edward VI. crosses the series of royal panoplies. Elizabeth Tudor bore the heart of a king to the inspection of her troops at Tilbury, but not the iron clothing to which kings had long been accustomed to trust. With her unwearied successor the heavy weight of the plate panoply was thrown aside as useless. For the armour of the tilting field would not resist the bullet projected by gunpowder. The weapon of Guy Faux was more irresistible than that of the Comte de Montgommery.

Connected with this general transformation from the Norman mail to the plate of the Valois and the Tudor reigns, was a change in one portion of the defensive armour so gradual and so steady, that it might be reduced to definite metrical rule. An accurate study of a well-groomed series of armour would bring out very prominently the gradual diminution of the shield. We know that in Sparta the true military instinct of a people who were not only quarrelsome, but warlike, placed the point of military honour in the preservation of the shield. With mail armour was associated the use of a large, long shield, capable of protecting the person from head to foot from the flight of arrows. As plate superseded mail the size of the shield diminished, partly to save the weight which was added to the immovable parts of the defensive array, partly because the plate would resist the arrow which might penetrate the mail. Thus reign after reign, with the increase of the plated portions of the armour, the shield lost inch after inch of its size. At length it remained merely as the target intended to catch the blow of the tilting spear; and the curious form assumed by the heavy pauldrons leads to the speculation that, even had gunpowder not been invented, the shield might have ultimately disappeared. A scale of antiquity might be constructed from an accurate measurement of the successive forms and sizes of the shield. This subject assumes extreme interest in connexion with the authenticity and the date of monuments. In regarding questions of anachronism in this respect we should bear in mind that a genuine monument may represent costumes later than that worn by the person represented on the effigy; but earlier, never.

While the steady change of fashion which has taken place in the form of defensive armour, whether we regard the protection of the trunk and limbs, the helmet, or the shield, has thus followed a certain intelligible course, every freak of the most fantastic imagination seems to have been embodied in some quaint shape of offensive weapon. Halberds and hooks, and pikes and maces; swords, from the ponderous 6-ft. blade to the lady's stiletto; engines for discharging projectiles, which took in time the generic name of artillery, are represented by so many specimens as almost to resemble the creations of night-mare. The diabolical ingenuity attributed to the mysterious "Companion of Sintram," has been emulated by the armour smiths of the Tudor times. There is hardly one of the impossibly grotesque armed figures of the "Contes drolatiques," who might not have equipped himself at Goodrich Court. The different aspect

of a line of battle in which the soldiers are armed with regulation weapons, whether lance, or rifle, or bayoneted carbine, and of one in which each weapon suited the skill or the fancy of its possessor, must have been as wide as that between the fish of the old red sandstone and those of our present waters.

It is unworthy of our national dignity that we should be without a fit museum for the display and the preservation of these curious relics of the past. The citizen of Madrid, of Vienna, of St. Petersburg, even of gallant little Turin, would shrug his shoulders at the reply elicited by the question, which was our historic armoury?

We have, indeed, in the Tower of London a collection of arms which, if added to those now at South Kensington, and properly arranged, would form the basis for a very noble museum. The removal of artistic or archaeological objects from their local places of deposit, is not always a desirable proceeding. The axe, and the hook, of fatal memory, now exhibited in the Tower, would lose their associations of terror if put under a glass case at Bloomsbury or at Kensington. But it is otherwise with the suits of armour. They are at the Tower accidentally. An ancient place of strength has been converted, in failure of its old military and political importance, into a depot of arms. Among these weapons have been kept some that have gone out of use. There can be no good reason against removing such of these as possess historic value from an inaccessible place, in no way adapted for their proper preservation or exhibition, to a well-ordered national armoury. With them should be associated, in honourable safe-keeping and tendance, such famous relics of some of the noblest of our historic chieftains as now ignominiously moulder in neglected solitude. The helmet of the Black Prince, shorn of its Bohemian plume, gathers dust, and is gradually devoured by rust in Canterbury Cathedral. That of Harry V., the terror of France, lurks (or lurked) in similar disregard in Westminster Abbey. Our deans and chapters have not made it a part of their duty to tend reverently either the effigies of the great or the relics of the mighty.

Feudal armoury thus historically treated, would be well illustrated by specimens of the weapons, and of the defences, of other nations. In social phenomena, as in natural history, an acquaintance with widely-lying districts illustrates the succession of the most advanced condition of life. The British Museum could contribute specimens of savage clubs, and tomahawks, and poisoned arrows. South Kensington could contribute rich and curious Oriental arms. By bringing all our stores, from the flint knife or the bone arrow-head, of the times when our ancestors had to struggle with the cave bear and the woolly-haired rhinoceros, down to the small explosive shelled which a semi-barbaric power has suddenly discovered to be inhuman, into one focus, we shall add a most instructive and intelligible chapter, not only to the records of modern Europe, but to the physical history of mankind.

The idea has been suggested by some of those who are in the best position for forming an opinion on the subject, that the national armoury should form, not a mere portion of the museum of art, but a separate and independent institution. In that case it has been further suggested, there would be good reasons for building the edifice necessary for the reception and exhibition of the arms, in the vicinity of the Tower of London. That densely populated part of London is far removed from any museum or educational exhibition. There would thus be a local benefit conferred on a large district of the metropolis; while at the same time those historic associations, which the architect ever studies to maintain in active vigour, would be acknowledged and to some extent revived. The subject is one deserving careful attention. It is a detail, but an essential detail. The first thing to be regarded is, the removal of the national reproach that rests upon us in the matter. We have a history of which any people may be justly proud; but while even so small a state as Savoy was before it became merged in an Italian kingdom, had an armorial gallery of a description to which we could lay no claim, our only public armoury exists *pro accidens*. Nor is it a matter of decent self-respect alone. The knowledge of the actual history of defensive armour is essential to the education of the historian, the archaeologist, the sculptor, the painter, and the decorator. It is a subject on which no good architect, either, can afford to be ignorant.

EDUCATE; BUT RIGHTLY.

If we consider that of all the various subjects which at different times have occupied the minds of men, there is, perhaps, none which possesses a wider interest, a more universal importance, than education—none that has a more immediate and direct bearing, or is capable of exerting a more powerful influence, upon the moral and physical welfare of society at large—we shall not be surprised at the large share of public attention it still continues to attract, though so much has already been said and written about it from almost every possible point of view.

Various and conflicting have been the opinions enunciated, some of them obstinately defended and pertinaciously maintained, more especially those relating to religious, as against secular, instruction; but upon one part of the question the concord of opinions has been wonderfully unanimous, viz., the necessity of raising the standard of education, and of extending its benefits to all classes of the community. Yet this question, like every other, has two sides to it; and it is a point of policy, no less than a maxim of justice, to hear both of them: a course which would seem, in the present instance, in some danger of being lost sight of.

Into the religious part of the subject it is not proposed to enter here; our present business being merely with that portion of it which appertains to secular instruction, and especially with the inquiry in what direction is education to be extended?

There is no doubt that elementary education should be universal,—that every man, woman, and child in the kingdom should be taught reading, writing, and some knowledge of arithmetic and of common things. And not less emphatically I contend that means should be afforded to all who have to earn a living, to acquire a special technical knowledge of the subjects required for the calling, profession, or occupation which they may intend to embrace.

In speaking of the sort of education, termed here, simply from its principal characteristic, "classical," it is intended to refer to that kind which for centuries has been, and to this day still is, imparted at most of our public schools, and continued at our two chief universities, and which consists mainly of the dead languages, with more or less of mathematics, and, quite recently, a very small modicum of natural science; but the encouragement given to this study is so small and inadequate, that it is evidently considered of no importance as compared with that of the classics.

It is proposed here to consider this kind of education from a more general and less partial point of view than that of the schoolmaster, who naturally thinks there is nothing like Latin and Greek, just as the cobbler thought there was "nothing like leather;" and so considered, it will be found, I think, with comparatively few exceptions, so negative in its effects, so barren of useful or practical results, so unproductive of anything but disappointment to thousands of those who have made the greatest sacrifices of time and money to acquire it, that it is a question whether its use should not be confined within much narrower limits than it has hitherto been.

The object which we all more or less directly seek in life I take to be success—such success as leads to fame or fortune, or both. Now, let us examine to what extent this is likely to be furthered by the possession of a thorough classical and mathematical education. If in any considerable degree such an education were essential to the attainment of this object, should we not naturally expect to find that the most highly accomplished men would be those who draw the greatest prizes in life? Should we not have a right to suppose that university men in general, and especially the most erudite of them, would almost invariably succeed in attaining the very highest positions in their respective careers, and that, at all events in such as demand a high intellectual capacity, men who have not enjoyed the same advantages, would be totally unable to compete with them?

But is this the case? With the single exception of the Church, the natural and faithful ally of the University, is there any one calling in which success is to any appreciable extent dependent upon, or in any calculable ratio proportioned to, classical knowledge?

Let us first consider those careers, for emolument in which the very highest rewards of the State are usually reserved. Are our most skillful diplomatists, our most successful gene-

ral, our greatest admirals invariably classical scholars or first-rate mathematicians? Or if we look elsewhere, shall we not find numerous instances of men who have become eminent in physio, in the law—who have even attained to the woollenack—without being university men or classical scholars? Are there not many who have even risen to the highest distinction in the senate, and have left their mark in the history of their country, with no aid from Latin or from Greek? Look next at those who have achieved success in the pursuits of commerce, of finance, and of speculation—at our merchant princes, our wealthy bankers, our city magnates, our millionaire contractors! Are they usually remarkable for classical knowledge? If we turn even to the regions of science—the peculiar province, as one might imagine, of the schools—and look at the grand modern discoveries in chemistry, in electricity, in light, optics, physics, and mechanics—

"In the railway, in the steamship, in the thoughts that shake mankind,"—

what shall we find that the Universities have done for us there? Is it to them that we owe those magnificent inventions and improvements which have wrought more wondrous transformations than the wave of wizard's wand, annihilating Time and Space, and leading Master hand, like a captive of old, to the triumphal orb of Mind? No! their systems did not produce, nor their teachings foster, the Franklins, the Davys, the Watts, the Stephensons, the Fultons, the Faradays, the Wheatstones—those great thinkers and workers who are the boast and glory of these recent ages and the benefactors of all succeeding ones.

Let us turn lastly to literature; there surely, if anywhere, one might expect to find the triumph of scholarship assured, and its influence invincible. But is it so? As for the poet, he must be born, we are told, not made; which is at once a confession that for him, at all events, classical learning, and indeed book-learning in general, is by no means indispensable. And accordingly, although the universities have from their very foundation fostered and encouraged the study of the ancient poets, how small a proportion, among all the thousands who have spent years within their precincts in poring over the masterpieces of Homer, Virgil, and Horace, have produced poems which can compare with the works of those who, like Shakspeare, Burns, Hogg, and Keats, drew their inspiration not from books, but from Nature!

Nor, if we come to reflect upon the matter, will this result appear surprising or unexpected. The very essence of the true poet is originality; the most polished diction, the most elegant turns of expression, the nicest skill in the management of rhythm and rhyme can never atone for hackneyed ideas and horrowed thoughts. Now, can originality be taught in the schools, or acquired by study? Is it not actually more difficult for the man who is steeped in the soul in the thoughts of others to be original, than for him who has thought only his own thoughts, not those of other people? Are we not more likely to tread in the footmarks of others if we travel a road which has been frequented for ages, than if we wander without a guide in the primeval forest, or over the trackless prairie? Will not the student of books be perpetually finding that the ancients have "stolen all his best thoughts" from him? While if once in a way an idea should occur to the unlettered poet which has already been used, it will be but a chance similarity, not a direct plagiarism; and at the worst it will be, in all probability, seen from a new point of view, and clothed in fresh colours.

And what has been said of the poet is almost equally applicable to writers in other branches of literature. Are not some of our very best modern works of prose fiction written by women, who certainly are not graduates of any university, and are for the most part entirely ignorant of the languages and the literature of the ancients?

Were it worth while to pursue the inquiry, I believe we should still arrive at the same results, and find that there is scarcely any branch of literature in which the greatest names will be found the highest on the list of Classics or Wranglers of the universities.

It is not necessary now to seek to account for these facts, or to ascertain why it is not among the most profound scholars that we must look for the most brilliant conversationalists, the most able writers, the greatest discoverers; why those who possess to a high degree the faculty of

acquiring knowledge, are, in so many instances, extremely deficient in that of imparting it to the world; but certain it is that very generally those who have most profoundly studied and most thoroughly mastered a subject, are less successful in teaching it than some who are less perfectly versed in it, yet have in a greater degree the gift of enabling others to understand it. It may be either that those faculties are by nature diverse and almost antagonistic, and therefore rarely combined in the same individual; or it may simply be that the undue encouragement and constant exercise of the one dwarfs the growth, and ultimately saps the very existence of the other. Probably it is with the mind as with the body, that an inordinate appetite by no means implies a good digestion, and that the habit of taking in food with great rapidity and in large quantities, prevents its assimilation, without which the food does no good, but, on the contrary, considerable mischief.

However this may be, it is certainly the case that it is one thing to absorb knowledge, and another to give it out; so that the lives of the most profound scholars have, more frequently than otherwise, been completely barren of useful results. They have locked up within their own brains the enormous stores of learning they have spent a lifetime in hoarding, and—worse even than other misers—have carried their treasures with them to the grave, instead of leaving them behind for the benefit of their immediate heirs and the enrichment of all future generations. Examples innumerable might be accumulated in proof of these assertions; but the names of Porson and Mezzofanti must be familiar to every one as instances of the most extraordinary acquirements and the most insignificant results.

But if we take a more extended horizon and a lower range, we shall perceive still more clearly the defects of the present system of considering a classical education the best possible preparation for nearly every one of the various pursuits of life. Let us look at the results in a few instances.

A young man of my acquaintance, who has lately taken his B.A. degree, is an excellent Latin scholar and a very fair Grecian; yet he cannot hold a conversation in French, or write a Spanish letter for his father, the merchant. Another is well up in mathematics; he has the integral and the differential calculus at his fingers' ends, but it is ten to one he cannot calculate a sum in compound interest half as quickly as the junior clerk in his uncle's bank, whose entire schooling was comprised in four years at a cheap commercial academy in Peckham. A third actually knows something of Hebrew; yet the Civil Service examiners would not pass him for a junior clerkship in the Customs or the Post-office, because his English composition was slovenly, and his handwriting barely legible.

What, then, shall the young graduate do with his classical knowledge? To what market shall he carry his Homer and Horace, his Toldhunter and Newton? Of course he may get a fellowship or a college living, or even, if his luck be good and his connexions high, a bishopric; but these prizes are necessarily for the few;—and what of the many? What will society give them for their Greek and mathematics? Why, a curacy in Wales with 80*l.* a year, or an usher-ship at a school with 60*l.*

When a lad, then, is not born to independence, but has to earn his living in a lawyer's or merchant's office, in the army or navy, the civil service, or any other of the ordinary occupations and professions, is it, I ask, absolutely indispensable—nay, is it even desirable—that he should devote several years of his life to the acquisition of the dead languages? Does it not warp his ideas from a more practical and profitable channel, and waste precious time that might be employed in mastering such special branches of knowledge as would fit him not merely to preene creditably, but to excel and rise in his future career? If a lad is to become a merchant, why not rather teach him modern languages and book-keeping? If a sailor, let him study navigation and steam; if a farmer, agricultural chemistry. If he is to be an architect or builder, would it not be better for him to employ his time in acquiring the art of construction than in learning the Greek particles? Would not Tredgold's "Carpentry" be a more useful text-book for him than Ovid's *Metamorphoses*? If he is to earn his living as a telegraph clerk, should he not study telegraphy rather than Terence? Will Conic Sections make a clever contractor, or the writings of Euripides an engineer? Is the Binomial Theorem essential to a barrister, or Surds to a solicitor?

Some will reply that these studies are intended merely as the groundwork of a complete education—as the best substructure for technical instruction. But the length of time employed in them at once disposes of this objection; for in this busy, hand-to-mouth age, when time is money, and the struggle for existence is daily becoming fiercer and more desperate, we cannot afford to spend a third of our probable span of life in merely laying the foundation of education. No; when a youth passes from Eton or Westminster, Merchant Taylors' or Charterhouse, to the university, and comes away at the age of 22 or 23, he is practically presumed to be fit to make his way in the world in any capacity whatever. It is clear, therefore, that the studies which are commenced at a public school, and continued at the university, are intended as the sum-total—the be-all and end-all of education; and it is, I think, equally clear that in this sense they are woefully insufficient, and lamentably unserviceable, at least for nine out of ten of the various walks of life; and I would therefore ask whether a considerable portion of them might not with advantage be reinitiated in favour of other branches of knowledge which would exert a more direct and practical influence upon the active pursuits and real business of after-life.

Of course, it is not always true that "the real worth of anything is just as much as it will bring;" and no doubt learning has uses and advantages which cannot be precisely measured by the metre of £ s. d. Perhaps the most plausible mode of defending a classical training is that of considering it as synonymous and identical with the cultivation of the intellect; as if there were no other means possible of effecting that object, or, at least, none other worthy of consideration. But no satisfactory reason is ever vouchsafed why the dead languages should tend, more than natural science or any other branch of knowledge, to promote *thought*, which, after all, is a far higher exercise of the intellect than the mere mechanical one of memory, which alone is necessary for the acquirement of languages. Nor, on the other hand, can facts be more successfully appealed to in support of the assumption; since, as we have already seen, the chief positions in diplomacy, finance, literature, science, and all those careers which require the very highest intellectual qualifications, are occupied by men devoid of classical training, at the very least as frequently as by those who have most enjoyed its advantages.

L.

TREE WORSHIP AND CONIFEROUS TREES.

It is very difficult to draw the line between the actual worship and the mere reverence of trees and plants. Incredible and romantic tales innumerable might be cited, similar to the legend attached to the Roman Arum (*Dracunculus communis*) referred to in last week's *Builder*. If some competent person would publish a catalogue of all plants that have been, or are, worshipped as gods, or that have sacred legends attached to them, it would prove a most instructive piece of work.

That trees were ever worshipped in consideration of their value to man, as suggested by Mr. Fergusson in his recent lecture, reported in your columns, or on account of their long life or imposing aspect, is quite fallacious; for amongst sacred plants we have objects the most worthless, insignificant, and short-lived. Mr. Fergusson also tells us that very few traces of tree worship are left in this country, and these traces are on the borders of Wales; but he omits altogether to say what the traces are, and what trees he refers to. Traces of tree-worship pure and simple may be very few, or they may be many, according to the views of the writer on the subject; traces of the reverence of trees as possessing sacred, occult, or mystical properties are common enough,—witness the singular beliefs regarding the mountain ash and the poplar. The foliage of the latter tree exactly resembles in shape the heart-like foliage of the sacred fig of the East (*Ficus religiosa*) and other hallowed plants; the poplar itself is even said, on good authority, to be worshipped by certain savages at the present day; and in this country we have the curious legend that the Cross of Christ was made from its wood.

But omitting for the present all reference to other trees but the fir tribe, the heliefs and legends connected with the *Conifera*, or cone-bearing trees, are most remarkable. In ancient writings, it is difficult always to precisely deter-

mine the special trees referred to, but under the term *Conifera* are understood the fir, cedar, yew, &c. The references to the cedar in the Bible, to the groves of "sacred pines" in Ovid, the representations of the mystic in the hands of the mystic figures on either side of the sacred trees in the Assyrian sculptures, the pine splints used in torches during sacred ceremonies, cedar ashes used as a purification from sin, the fir-cone fixed on the staff or thyrsus of Bacchus, and the fir-chaplets of the Isthmian games, are pretty familiar to us all. That conifers were worshipped for their value to man, but that cones were significant of "fire," as suggested by Lyard, or were merely used to flavour the wine of Bacchus, are thoughts quite unworthy of the subject; the real origin of the sacred attributes of trees has yet to be written.

Through the middle ages we find the *Conifera* regarded with the same reverence; pilgrimages were made to the ancient cedar-groves, with fasting, singing, dancing, and the celebration of religious rites. How far these notions have varied and been brought down to the present day it is not easy to say, but in ancient sculptures we find representations of these sacred trees, adorned with ribbons, medallions, statuettes, and neck-nacks, apparently as offerings to the gods on special occasions, just as in this nineteenth century at the greatest festival of the year we have one of the coniferous trees brought into our houses, illuminated and garnished with the same ribbons, medallions, toys, and neck-nacks, apparently in honour of the birth of Christ. Is it too much to say that the Christmas tree of northern nations is a mere relic of Pagan tree-worship (so called), or is it only a curious and meaningless coincidence? Any reference to the veneration of the sacred bean (*Nelumbium*), the sacred fig (*Ficus*), the sacred cotton (*Gossypium*), the meaning of the sacred tree of the Assyrians, the thyrsus of Bacchus, trees held sacred by savages, sacred water-plants, the remarkable and well-known fungus (*Polyporus sacer*), worshipped as a god in West Africa, the plants grown upon roofs and eaves of houses as the houseleek (*Sempervivum*) in the most ancient times, and at the present day, to repel evil spirits and avert lightning, would prove too long for the present number of the *Builder*. W. G. S.

THE FALL OF ROADWAY, GREAT EASTERN RAILWAY.

On the 19th, Mr. Humphreys resumed the inquiry respecting the death of the four men who lost their lives through the fall of arches at the goods station of the Great Eastern Railway. Various witnesses said they had seen a crack in the stone early in February. Mr. Charles Provis, engineering agent in the employ of Messrs. Lucas, said three weeks before the accident his attention was called to the crack, and he had it filled with cement. He afterwards directed the girders to be shored. There was no other way to set things right but by putting up struts and removing the pillar and the stone. Mr. J. Tinkham, inspector of works to the Great Eastern Railway Company, said he had seen the stone since the accident. The bottom of it was hollow. The cause of the cracks in the stone was due to that. It could have been ascertained that the stone was hollow before it was placed in position.

Mr. James Edmeston, architect, produced a written report of an examination which he had made. He attributed the accident to the cracks in the stone. There was a hollow underneath the stone, in the stone itself. The weight which the iron pillar supported was 200 tons. The stone was from Bromley Moor, near Leeds, and was of a kind extensively used, and considered good.

The jury, after a long consultation in private, returned a verdict:—"That the deceased persons were killed accidentally by the falling in of a certain roadway, which was supported by an iron pillar, which rested on a hollow stone, and that fissures in the said stone caused the fall; and the jurors say that when the said fissures were first noticed the girders should have been shored up and a perfect stone substituted for the imperfect one."

Society of Engineers.—At the ordinary meeting of the Society of Engineers, held on the 15th instant, Mr. F. W. Bryant, president, in the chair, a paper was read "On Joints for the Prevention of Leakage in Gas and Water Mains," by Mr. C. M. Barker.

ISLINGTON OF OLD.



The Old Church.



Old Queen's Head.



Canonbury Tower.



Old Angel Inn.

[See pp. 217 and 218, ante.]

THE SITE FOR THE LAW COURTS.

EVIDENCE and opinion accumulate in favour of retaining the site already obtained. Mr. F. W. Shields, C.E., in a report to the Chancellor of the Exchequer, just now printed by order of the House of Commons, arrives at the opinion we have already expressed, viz., that the Strand and Carey-street site has the advantage of the Embankment site in important particulars.

"Its adoption," the reporter says, "as appears from the estimate of Mr. Ryde, would save a further expenditure of 725,000*l.* of public money. Its level is better suited for external access. Its position is much more central and convenient, being midway between the Temple and Lincoln's-inn, and also midway between the great thoroughfares of Holborn and the Strand. Its great defect, which turns the balance against it, is the want of a leading thoroughfare on its northern or Holborn side. It appears to me, therefore, that if this deficiency were provided for, the Carey-street site would be the more advantageous both for the legal profession and for the public."

His plan for effecting this object is to carry a wide street, in continuation of Piccadilly and Long Acre, through Carey-street to Cheapside. This new street would be continued from Long Acre by Covent Garden and Drury-lane theatres, to pass along the northern front of the Carey-street site, and thence it would be extended (crossing the Farringdon-street valley by a viaduct) to the end of Cheapside at St. Paul's. It is proposed also to widen the passage called "The Turnstile," at the eastern end of Lincoln's-inn-fields, so as to give a direct communication for carriage traffic between the Law Courts and Holborn.

To meet part of the cost of the new street, Mr. Shields proposes that a company should be authorized to make an underground railway from the junction of the Fulham and Cromwell roads, near the South Kensington Museum, to the Mansion House, terminating in the new street now in course of construction from that point to Blackfriars Bridge. The tunnel could be formed without interference with private property; and the company, having no property to purchase and no compensations to pay, would be able to contribute a considerable sum towards the new street in return for the privilege. The remainder of the cost, he suggests, ought to be shared between the Government and the metropolis.

ST. PAUL'S CHURCH, ST. LEONARDS-ON-SEA.

The church, of which we here give a view, has been recently built at St. Leonards-on-Sea, adjoining Hastings, at the sole cost of the late Mr. William Gilliat, of East Hoathley, Sussex, from the designs of Mr. John Newton, of Salisbury-street, London. It has a commanding situation over the entrance to the Hastings tunnel, on the hill immediately above Warrior-square, and will have cost, when the spire is finished, about 16,000*l.* The contractors were Messrs. Jackson & Shaw, of Westminster, and Mr. George Walters was clerk of works.

The church, which will accommodate about

700 persons, is built of Local Blue stone, with Bath stone dressings, and is lined internally with Fareham bricks, tiles, and Bath stone hands. It consists, on plan, of nave and two side aisles, with north and south porches. The chancel terminates in a horse-shoe apse. South of the chancel is an aisle, and on the north the tower, containing a fine organ by Holdich. It was originally intended to place the tower on the south side, but the difficulties of foundation rendered an alteration desirable.

There are five arches on either side of the nave, supported by shafts, and clustered responds of Devonshire and Greek green marble. The clearstory consists of a succession of narrow lights surmounted by a roof of good proportions, covered with Broseley tiles. The chancel is groined, as also the apse, with incised stone and brick.

The pulpit and reredos are of Alabaster, the font is of Sienna marble, and the sedilia of Caen stone, all inlaid with panels of marble. Messrs. Field & Co. supplied the marble, and Messrs. Farmer & Brindley executed the carving.

Messrs. Minton & Co. executed the tiles for the pavement, which is elaborate, having subjects incised in marble. The working cartoons for these, as also those for the incised subject of the Lord's supper, in the reredos, were made by Messrs. Burlison & Grylls.

Messrs. Clayton & Bell executed the stained glass windows; Mr. Robinson, of Holborn, the stalls; and Mr. Leaver, the gas standards.



ST. PAUL'S CHURCH, ST. LEONARDS-ON-SEA, SUSSEX.—MR. JOHN NEWTON, ARCHITECT.

THE "SEPARATE SYSTEM" OF DRAINAGE.

"SIR,—Now that the natural streams and rivers in and near to towns are seen to be polluted, and their beds to hoisting up, through being used as runfalls for sewage; and that large sewers, by receiving sewage as well as rainfall, cause filth to deposit and noxious gases to generate within them, which gases escape into and contaminate the atmosphere, people begin to perceive that a great mistake has been made in draining the metropolis and towns throughout the country by this "combined system." It is now, therefore, very evident that what is aply termed the "separate system" should have been adopted instead of it, so far as circumstances would have permitted. The "separate system" consists in collecting the natural or subsoil and surface drainage of towns into channels separate from the artificial, or house and soil drainage, and discharging it into the natural streams and rivers, and in receiving the artificial drainage into channels separate from the natural drainage, and carrying it to convenient places for profitable distribution on the land. The growth of the "combined system" has been altogether accidental. It arose out of the necessity to rid ourselves of the foul drainage of our houses; and, without thinking or troubling ourselves about the error or mischief we might be doing, we must, forsooth, turn it into the nearest watercourse; or, if that was not at hand, we must carry a sewer or a drain up from it for that purpose. In this way the "combined system" came gradually into operation, without pre-arrangement of plan or principle, until it grew into the system as we see it developed in the works of the Metropolitan Board, and also, taking their cue from it, of the Local Boards throughout the country; and the inevitable result is the continual pollution, by the foul liquid, of every natural stream and river on the one hand, and by the noxious gases engendered of the atmosphere on the other. This great error in the drainage of towns cannot be gainsaid. It is palpable, not only in the foul state of the streams and rivers and the atmosphere, but in the high death-rate returns of the Registrar-General. Had the "separate system" been adopted twenty years ago, when it was first promulgated, it is fair to presume that the people living in towns would now be breathing a purer atmosphere, and that the death-rates would be much less than they are. It is not complimentary to the sagacity of those to whom the serious question of the drainage of the metropolis was referred at the time that they should have utterly ignored this system without due and calm inquiry into its merits. No doubt they acted according to their light, and that is all that can be said in mitigation of the monstrous evil that has been perpetuated in the drainage of towns. The "separate system" however, is beginning to be understood, and is gradually coming into action, as doubtless it is the proper principle to be adopted; and not only the present, but all future works of drainage should be made to conform to it as much as circumstances will permit. The following is an abridgement of the preliminary report of Mr. John Phillips on the drainage of the metropolis, July, 1849, wherein the "separate system" is advocated. Mr. Phillips, who was chief surveyor to the Metropolitan Commission of Sewers at the time, was led to recommend this principle for adoption from his thorough acquaintance with the working of the sewers under his care, and it is to be deplored that it was not then put into practice. The Metropolitan sewers are nearly as had now in regard to cleansing and ventilation as they were twenty years ago, when they were examined, and remedies were proposed embodying the "separate system." This yet remains to be done. The main drainage that has been carried out has in no way improved the general ramification of the sewers in these respects, but simply removed the foul condition of the river from one place to another.

"It is impossible to provide a perfectly innocuous system of town drainage while combining in one channel the house and surface drainage. They must be kept separate. Sewers which receive both kinds of drainage accumulate soil, and generate noxious gases, which escape into the houses and streets. The necessity for flushing to remove the soil, and for trapping to prevent the smell from escaping, proves that the combined system is eminently at fault. A general trapping would not remedy the evil, since foul air would be generated as freely, and would

pass up the drains into the houses instead of into the streets. The evil arising from house drains discharging into sewers which receive surface drainage, is not confined to the houses and streets, for such sewers constantly pour floods of filth into the river, which is polluted in consequence. It is impossible, therefore, to preserve the purity of the air we breathe, and of the river, on the banks of which we live, while the filth from the houses is allowed to pass into the sewers which communicate with the surface and empty into the river; and, therefore, it is a necessary condition of perfect drainage that separate channels should be provided for the house drainage having no connexion with the river.

In order to restore the atmosphere of the metropolis, and also the natural watercourses and the river, to their original purity, the following principles must be conformed to:—

1st. That two systems of sewers and outfalls, independently of each other, should be provided; one for the discharge of natural or surface drainage, and the other for the discharge of artificial or house drainage.

2nd. That as outfalls are already provided for natural drainage, it is only necessary to provide separate outfalls for artificial drainage, which should be conveyed to convenient depôts below the town.

3rd. That, in order to perfectly drain the subsoil and the surface, a system of permeable sewers should be provided to discharge into the natural watercourses and the river.

4th. That, in order to carry off the house drainage, without the escape of effluvia, a system of impermeable sewers should be provided separate from the permeable sewers, to discharge without intermixture into artificial outfalls, independently of the river.

5th. That on these outfalls depôts should be formed and works established for raising the sewage and distributing it for agricultural purposes.

As the river is the natural outfall for the drainage of the subsoil and the surface, it is proposed to lay down permeable sewers where none now exist, and to lower and improve those sewers which are inefficient. One of the evils of the combined system is that the sewers in the low districts are filled part of each tide with the drainage which comes chiefly from the high districts. By intercepting the island waters and conveying them into the streams and river, above the influence of the tide, this defect would be remedied, and the sewers in the low districts would be sufficient to accommodate the quantity of water falling thereon. In these arrangements the present sewers would be deepened and made efficient, and lines of catch-sewers would be constructed to serve as conduits for the surface water.

Having provided for the discharge of the subsoil and the surface drainage, the next consideration is to provide an outfall as a substitute for the river in respect of the sewage in the low districts. The extent of this outfall will depend on the quantity of sewers. This will consist chiefly of the water supplied to the houses for domestic use, and such rain falling thereon as cannot be conveniently carried into the sewers provided for the surface drainage. In this case only an exception must be made to the general principle of keeping the house and surface drainage separate.

The Thames is the common sewer of London. Its tributaries, both open and covered, should be purified the same as itself, namely, by providing separate channels for the reception of the sewage. The best method of doing this would be to lay pipes upon or under the inverts of the existing branch and main sewers, and to connect all the house drains with these pipes. Then the house drainage would be diverted from the sewers, which would only receive and carry off the surface drainage, and thus the metropolis would be perfectly drained.

It is not intended to discuss here the merits of liquid and solid manure, but to show how the metropolis and the river may be relieved of the sewage, which may be led and raised into reservoirs and filtering tanks in the Essex and Kentish marshes below London, and there disposed of for agricultural purposes. The sewage of the high grounds could be intercepted, and distributed over distant agricultural districts on a lower level by gravitation, and fitted for distribution on higher levels by mechanical power. To suffer the sewage to flow into the river when it cannot be put upon the land would be to pollute the river, and thus the first principles of sanitary improvement would be vitiated.

Main outfalls therefore should be provided to receive and discharge the house drainage of the metropolis at such times, independently of the river. By this system the metropolis and the river would be permanently relieved from sewage. Towns can only be properly drained by the adoption of these principles.

AN ENGINEER.

THE RAILWAY SYSTEM.

At the ordinary meeting of the Institution of Surveyors, held on Monday, March 8th, Mr. John Clutton, president, in the chair, the discussion on Mr. J. Bailey Denton's paper was resumed by Mr. J. W. Barry, who thought it could not be anticipated that owners would give their land for railways, or subscribe for the shares, as expected by Mr. Galbraith. He thought if expensive accommodation works were demanded the district should contribute in some way towards the cost. Light railways following the contour of the country would be impracticable in hilly districts, which would entail heavy gradients, and consequently heavy engines and costly permanent way.

Mr. J. H. Lloyd did not agree in the strictures passed on the landowners. No doubt, in earlier days the invasion of estates by railways was considered as something horrible, and large amounts were paid as compensation; but he thought Mr. Denton had gone a little too far, and no inflexible rule could be laid down. There would be a great deal of practical difficulty in applying the principles of the Land Drainage and Improvement Acts to such cases as these. He instanced the Land Clauses Consolidation Act for Ireland, under which an arbitrator was appointed by the Government, to whom was referred every question of accommodation works and compensation, as being a very convenient Act, and capable of easy application. Mr. Lloyd suggested that a committee might be usefully appointed to consider the whole question in conjunction with the Institution of Civil Engineers.

Mr. Francis Vigors thought something might be gained if the surveyor, in conjunction with the engineer, advised on the course of the line before the plans were made public, and thus be enabled to negotiate the compensation on better terms.

Mr. E. J. Smith thought the landowners and the existing railway companies should combine to make branch railways, the landowners undertaking to guarantee a certain moderate percentage on the capital.

Mr. T. Marr Johnson said that in laying out the Metropolitan Railway they were greatly indebted to surveyors for their assistance. He thought something must be conceded by the public if branch railways were to be constructed economically, and the first thing to be given up must be high speed, which involved heavy engines, costly permanent way, and excessive wear and tear. The branch lines must be of the same gauge as the main lines, and would probably resolve themselves into two classes; one adapted to flat countries, where the rolling stock of the main line could travel; and another for hilly countries with steep gradients, which would require special working plant, carriages as well as engines.

Mr. J. C. Driver mentioned an instance in which a proprietor, having received a large sum for damage to his estate, and the property afterwards realizing more than it was thought originally to be worth, returned the amount received to the railway company.

Mr. J. Bailey Denton expressed himself satisfied with the course the discussion had taken, and said the whole question resolved itself into this, that if railways were to be made at something like 5,000l. per mile some way of paying less than 240l. per acre for land must be devised; for with eight or ten acres per mile that would absorb at least 2,000l., and practically put a stop to further proceedings.

The President mentioned that on the purchase of land for a certain railway he had to pay 300l. per acre for land not worth 30l., because it was alleged the railway would frighten the night-gales out of the wood. Landowners were not the only plunderers. He had sold 2½ acres to a railway company for 900l. One acre was used for the railway, and the company demanded 1,250l. for the remaining 1½ acre, so that those who complained the loudest, when they became landowners themselves were equally exorbitant in their demands. He thought the question of giving land for railways depended in a great

measure on the size of the estate and a variety of circumstances which would prevent a general rule being laid down; besides, this sacrifice should not be expected exclusively of the land-owners, as every class of society was benefited by their construction. He was sorry to hear so high an authority as Mr. Lloyd say that proceedings similar to those under the Inclosure and Drainage Acts could not well be applied to railways, and he quite agreed with the proposition to appoint a committee to consider the whole question.

After some further conversation on the subject, it was resolved—

"That it be left to the Council to nominate a Committee for the purpose of considering what steps, if any, can be taken to promote the extension of the railway system, especially in agricultural districts; and that the Council of the Institution of Civil Engineers be invited to co-operate in any way that may be thought desirable."

DRAWING AND PAINTING IN RELATION TO MATERIAL AND IDEAL ART.

At a meeting of the Society for the Encouragement of the Fine Arts, on the 11th, Mr. T. R. S. Temple, the honorary secretary, in the chair, a paper was read by Mr. Henry Tidy on "Drawing and Painting in Relation to Material and Ideal Art." He said,—With the differences of opinion about art, it was necessary to revert to nature. Man was a compound of spirit, mind, and matter, and became, as one or the other predominated, the man of genius, as the poet; the man of talent, as the scientific man; and the man of ordinary ability, who was inevitably subject to the other two. The vitality of works of genius was remarkable, Shakespeare himself being to us but a dream compared with the reality of his Falstaff. Poetry, music, and sculpture were in advance of painting; for in the word-pictures of Shakespeare or Shelley, in sound-pictures of Beethoven, and in the stone-pictures of the ancient Greeks, is to be found a more thorough realization of the ideal, a more complete supremacy of spirit and mind, than is presented in the works of any painter with whom we are acquainted.

The commonest of the commonplace in Rembrandt is redeemed only by the marvellous chiaro scuro and textural power. Rubens is gorgeous, but decorative, rather than spiritual. Raffaello, if spiritual, is often grotesque in drawing, hard in outline, and crude in colour. Murillo never attained the divine, at which he aimed. Mr. Tidy next turning to the consideration of colour, remarked that the pigments in use at present represented but imperfectly primitive colour—a defect that was not to be remedied, however, by the very common mistake of putting vermilion in the place of primitive red. He then, with the help of several diagrams, explained, first, Mr. Benson's system of the science of colour, and afterwards the ingenious theory of Mr. Hay, of Edinburgh, pointing out the close connexion as shown by him to exist between form, colour, and musical sounds; form being exemplified in the circle, triangle, and square; colour in the prismatic rays; and harmony in the different chords of music. He entered also into a minute examination, illustrated by diagrams of the perspective of the pre-Raphaelites, and into other technical matters, such as the agreeable effects produced by engraving, from black, comprising the three primitive colours, the balance of colour in pictures, &c. Ary Scheffer's he characterized as in a minor key of colour, and concluded a paper, which was greatly applauded, with the remark that the schoolboy now had more facilities for acquiring the true principles of art than artists formerly enjoyed.

The chairman said,—At a time when it was the custom to refer everything in art and science to first principles, it was most important that the practical as well as the theoretical man, as on the present occasion, should give as the result of his experience. The love of reality was a characteristic of the age, yet the imitation of material substance was but the first stepping-stone to fine art, the beautiful thought and expression being the life and soul of it. With respect to Greek art, it was no wonder that it flourished under the threefold influence of religion, climate, and the applause of a people who thoroughly appreciated and rewarded art. Mr. Fahey, whilst defending the pre-Raphaelite school of painting, remarked that a great authority had said an artist ought to be able to paint down as well as up to his public. Dr. Heinemann said such a principle as that suggested by Mr. Fahey could

not be too strongly condemned. Messrs. Sadler, Dutton, Postlethwaite, and others addressed the meeting on the various topics of interest that had been raised. After a cordial vote of thanks proposed by Mr. Gilks to Mr. Tidy, who replied to some of the objections, and with a vote of thanks proposed by Capt. Brittan to the chairman, the proceedings terminated.

PARK LANE.

Will you grant a small space in the *Builder* to suggest a plan for the improvement of Park-lane, which, I think, has not yet been duly considered.

The Board of Works have announced their intention of purchasing the two houses at the north-east corner of Hamilton-place; if they also purchase the house at the corner of Piccadilly they will be able to continue Park-lane to Piccadilly at the same width throughout, and it will be possible to give up a narrow strip of ground in front of the houses on the west side of Hamilton-place, to be used, not as a garden, but for a private carriage-way. If this be done, the inhabitants of Hamilton-place will be in a great measure compensated for the loss of the privacy which they now enjoy; and as the carriages at their doors will not be in a crowded street the public will gain much.

A RATEPAYER.

THE MANAGEMENT OF ENGLAND'S ROADS.

REGARDING the management of England's roads, much interest has of late been manifested. Improvement being sought for, about four or five years ago an Act was passed for the amalgamation of parishes. Under its provisions the representatives of each parish in a petty sessional or union division form a district highway board, the board appointing a surveyor and clerk as its officers. Strange to say, these boards, though made up of such rude elements as compose boards of guardians (and, goodness knows, we have heard enough of boards of guardians lately to judge as to their capability for transacting business), are virtually irresponsible; they spend what money they wish, as they wish; their accounts may chance to be audited by a zealous member of their own board, or, as in other instances, the accounts may be regarded as a nuisance, interfering with the delight of fault-finding, and they may be never audited. As a vice-chairman of a highway board once said, when some one thought it was well that the accounts should be examined, "Augh! d— the items, it's the totals we want,—aw, aw, aw!" A mistake was made even in the Act itself, by making it permissive. The onus of introducing the Act was made to rest with the Court of Quarter Sessions, thus casting thereon unnecessary odium.

As was prognosticated from the first, those disorderly gatherings called highway boards are now found to be utterly incapable of the management of the duties thrown on them, and indeed the Legislature must have been sanguine to have otherwise anticipated. They began their errors by giving small salaries to their surveyors and by comparatively large salaries to their clerks. Now, the whole well-being of a highway district depends upon the surveyor; yet the office was in many cases put up by tender, to be obtained by him who bid the lowest sum, regardless of all qualifications for the office. Always accusing the magistrates of jobbery, they themselves have been guilty of the grossest jobbery; they have introduced as surveyors of England's roads farmers who could not make their farms pay, the son of an eating-house keeper, horse jobbers, tax collectors, and men of the like standing; but who or what the man, he has a salary which an educated gentleman, educated as an engineer, would not submit to, even supposing such a one allowing himself to serve a district highway board. The surveyor (some parts get better), people using the roads complain; the rates get higher, all complain; then the boards, not finding fault with themselves, do as they are now doing so markedly in Yorkshire, or out there, that the Legislature, through the magistrates, has hurt them,—not seeing that the hurt has been caused by their own short-sighted policy. But, supposing the surveyor chances to be a man who is capable of doing the work of the highway board, even then the Act does not work well: the board is ever seeking some cause of com-

plaint against him (not working with him): as one surveyor said some time ago, "Ob, I was told a farmer said, 'We don't want fine gentlemen as surveyors, who come into our parish with fine gold chains.'" He happened to wear a gold chain to his watch. Or, as in the case of another surveyor, who at last resigned his office in disgust,—"My dear! he goes about the roads with a silver-handled whip, big as life, d—n his eyes."

All this takes the spirit out of the very best officer, and at last he finds a clerkship in a merchant's office infinitely preferable. But though the Government may be aware of the ill-working of the Act, of the incapability of highway boards, they are, as rapidly as possible, giving them more work to do.

As fast as the debt is paid, the turnpikes throughout the kingdom are being abolished, and put under the care of these boards. They are not simultaneously abolished, but only as they pay off their liabilities.

Now, in every way, this is a great injustice. Adam Smith says, in his "Wealth of Nations," that a "fairer way of raising a tax than the present toll system cannot be conceived." But, admitting the inconvenience and injustice of the toll system, surely the parish through which the turnpike-road happens to run should not be made to maintain it.

Turnpike-roads are the main arteries of commerce (subsidiary, of course, to railways); they run from one town to another, being fed in a measure on their way by the parish roads. Turnpikes are as much for the accommodation of the town as of the country; and therefore it is a hardship of the country as against the town to maintain them. The parish, for its own benefit, maintains roads that thread through its most important parts, connecting those parts with the through turnpike-road. The town, for its own benefit, maintains a network of roads in connexion with the turnpike-roads branching from its borders.

Now for the remedy, for which a great cry is being made. The points to be held in view are the existing debts on the different trusts, and the incapacity of the highway Boards.

Is not the following suggestion worthy of thought? The highway boards should not have the care of the turnpike-roads.

The turnpikes should be regarded as imperial roads, and maintained as such by an imperial tax (whether on horses or carriages). They should be amalgamated; two, three, or four trusts, according to their size, should be collected under one management; the present trustees of the two, three, or four to be the trustees of the new one. There should be one staff for the amalgamated trusts, thus at once materially reducing the cost of management.* The cost of maintenance of these amalgamated trusts should be defrayed by an imperial tax; and in case one or more of the trusts should be in debt, the toll-gates on that part should be allowed to remain, until the whole of the debt was discharged, the entire receipts from the tolls being devoted to that purpose. As it is an injustice that these highway boards, who do not fairly represent the ratepayers (inasmuch as business-men really cannot afford the time; and even if they could, would decline to associate with such people), should have an irresponsible control, they should (as also the amalgamated trusts) be subject to a central government board of control, possessing similar powers to the Poor-Law Board. Each county, or two or three counties combined (dependent on their size), should have a surveyor-in-chief, who should also act as auditor. As it would be well that the chief surveyor should know something of the personal characteristics of the county or counties to be under his care, the Court of Quarter Sessions (or combined courts, as the case may be), should be directed to nominate the gentleman for the office, such nomination to be subject to the approval of the Secretary of State. But such chief surveyor should alone be responsible to the central board, who should name their salaries, and in fact be with the foregoing proviso, and under reference always to the Secretary of State, the servant of the central board. Thus the district under the chief surveyor would have all its accounts audited, it would have a gentleman at hand to direct and advise; it would have one system of roadmaking, and one system of account-keeping; unnecessary expense would be checked, a power

* It would not reduce the cost of management but a very little more by making the highway boards accept the management; as with increase of work, their officers would expect increase of pay.

to keep the district up to the work would be at hand (for again and again has been heard the remark from members of highway boards,—“We are not bound to make gentlemen’s carriage-roads of the parish roads”), the highway surveyors would be able to breathe, and would then perhaps find it unnecessary to touch their hats as much as they do now; and the clerks would find themselves simply clerks, and not clerks and the board too.

It has been suggested in influential quarters that the turnpikes should be abolished, thrown on the highway boards, and the whole maintained by an imperial tax; but that would be fair only when the town roads are allowed to join in the benefits of an imperial tax. The town maintains its own roads, the country should maintain its own roads—the roads joining the towns,—by the imperial tax.

As for the metropolitan roads, they should be treated something in the same way, one surveyor-in-chief acting also as auditor, subject to the central Board of Control; and dividing London into four or five districts, the representatives of each parish in a district should form a board, it appointing its staff. Pro.

FOUNDATIONS IN RIVERS.

THE INSTITUTION OF CIVIL ENGINEERS.

At the meeting on March 2nd, Mr. C. Hutton Gregory, president, in the chair, the first paper read was “On Sinking Wells for the Foundations of the Piers of the Bridge over the river Jumna, Delhi Railway,” by Mr. Imrie Bell.

After alluding to the native plans of sinking wells, built of masonry or brickwork, by excavating the sand from the interior, at first by means of a spade called a “phacra,” and after the first 5 ft. by an implement called a “jham,” reference was made to a modification in the use of the jham in constructing the railway bridge over the Jumna at Allahabad, where, instead of sending down a diver to force the spade into the ground, a pole was employed to strike the butt end of the jham, and so to drive it into the ground. This was, in the author’s opinion, a decided improvement; but the process was still tedious and slow, especially where clay or hard strata were met with.

The author then proceeded to describe the mode of forming the foundations of the bridge over the river Jumna, near Siranwa, on the Delhi Railway. It appeared that the bed of the river at this point consisted of coarse and fine gravel and sand, interspersed with layers of blue clay 3 ft. and 4 ft. thick, and covered with silt; but, during the rainy season, large boulders, weighing 14 lb. each and upwards, were brought down, and deposited by the scour of the river 30 ft. below the level of the bed. The bridge comprised twenty-four openings, each 99 ft. in the clear, and the superstructure was composed of two lines of lattice girders, resting on brick columns, or wells, each 12 ft. 6 in. external diameter, and 5 ft. 10 in. internal diameter; so that the wall of the well was 3 ft. 4 in. thick. In some instances the sites of the piers were got clear of water by diverting the river at different points during the dry season, while in other cases islands were formed, by driving a half-circle of piles on the up-stream side, then lowering sand-hags on the down-stream side, to the height of 4 ft. or 5 ft., and afterwards filling up with sand to 5 ft. above low water. The curb on which the steining of the well rested was formed of wrought-iron plates and angle-irons riveted together; and in cross section the curb was like an inverted right-angled triangle, of which the height was 4 ft., and the base 3 ft. 4 in. When each curb was complete, it was moved into position, and the compartments were then filled in with concrete. The curb was next sunk by men working with the phacra and basket, till the upper edge was within 3 in. of the level of the water, when a ring of brickwork was carried up for a height of 6 ft. The excavation of the interior was again proceeded with, by means of the jham and divers, in the old native style; afterwards a further height of 10 ft. of brickwork was added, but the material was now removed by a sand-pump (to be hereafter described) worked by a steam-hoist of four-horse power, as was the case after two additional lengths, each of 15 ft., were built, when the well was carried down to its full depth. In operations of this nature great care was necessary, especially at first, to insure the well, or cylinder, descending vertically. For this purpose the curb should invariably be sunk alone without any

building. The first height of brickwork should not exceed 5 ft. or 6 ft., the next 10 ft., and it was never advisable to build more than 15 ft. at a time. Before commencing any additional height, the top course of the brickwork already built ought to be removed, to insure a thoroughly clean surface for the mortar.

The well-sinking for the foundations of the piers and the abutments of this bridge was completed in little more than two years, which, without deducting any time for building up the brickwork, or for that unavoidably lost by the rise in the river during rains, gave an average rate of 159 ft. per month. The time occupied in the building of the steining of the wells, erecting, taking down, and re-erecting scaffolding and staging for sand pump, weighting the wells, &c., was equal to that employed in sinking. This would give the rate of sinking as a little over 300 ft. per month. If cast-iron cylinders had been used, the work could have been performed much more quickly, as the portions of the cylinders could have been put together more rapidly, and owing to the slight bearing surface exposed by the thickness of the iron, compared to the breadth of brickwork in the walls of the well. The total weight of the foundations and of the iron girder superstructure on each well was 420 tons, and the area of the bottom of each well was 117 ft., so that the weight was less than 4 tons per square foot.

The novelty in the sinking of the wells of this bridge was in the use of the Sand Pump. This was described to consist of a wrought-iron cylinder having a pump riveted to it at the top, in which was a piston fitting loosely, and pierced with small holes to allow of the escape of water. The piston rod terminated in an eye at the upper end, to which a chain could be attached. The bottom of the cylinder was movable, and in the centre there was an upright section-pipe, projecting outwards for a distance equal to its own diameter, and inwards nearly to the top of the cylinder. When the pump was lowered to the bottom of the well, the chain attached to the piston rod was worked up and down like a ringing engine. In this way water was first drawn through the upright pipe, followed by sand or other material, which fell over the pipe into the cylinder. This operation was continued until the cylinder was quite full, which was known by the piston working stiffly, when the machine was raised to the surface; the bottom of the cylinder was then detached, with the column of sand resting on it, and another cylinder bottom which had been cleared of its sand was substituted.

COMPETITIONS.

Newport.—Church of Scotland Chapel.—The committee of this chapel have selected the design of Mr. Alexander Johnston, architect, Dundee. There were five competitors. The design of Mr. Mackenzie, of Dundee, was second.

Yorkshire Investment Company, Leeds.—In the sale of sites forming part of the corporation scheme for the widening and improvement of Boar-lane, an important plot of ground was acquired by the Leeds and Yorkshire Land, Building, and Investment Company (Limited). It consists of the space occupied by the Railway Hotel and adjoining premises. To secure a structure worthy of the site, the directors invited architects to send in competing plans. Out of a number sent in they have selected the elevations and plans of Messrs. Mallinson & Bakewell, architects, East Parade, Leeds, the premium for the second best set of plans having been awarded to Mr. Harris, architect, East Parade, Leeds. The plans of Messrs. Mallinson & Bakewell provide for the erection of a hotel, embracing a restaurant, luncheon bar, &c., and two first-class shops. The new building is Renaissance in style. The main entrance to the hotel will be in Boar-lane. In each of the three stories above the doorway are oriel windows.

Rotherham Hospital and Dispensary.—About eighty designs had been received on Monday evening last, March 15th, by the hon. secretary of the building committee, in answer to his advertisement inviting architects to submit plans in competition for this hospital. The designs will be hung at once in the Mechanics’ Hall, and the sub-committee meet this week to decide on the further steps to be taken in order to secure a fair selection.

Baptist Chapel, Glossop-road, Sheffield.—Some time ago a movement was made amongst the members of the Townhead-street Baptist Chapel

for the erection of an additional chapel in another part of the town. A suitable site was found in Glossop-road, at the junction of Northumberland-road, and the new building was projected to cost from 5,000l. to 6,000l. The tender of designs for a suitable edifice was invited, and plans submitted by the following architects were exhibited in the Cutlers’ Hall. The mottoes attached with each design are subjoined with the name:—Messrs. Hill & Swan, “*Experientia docet*,” Messrs. Flockton & Abbott, “*Two triangles*,” Messrs. Blackmoor & Mitchell-Withers, “*Excelsior*,” Mr. J. P. Pritchett, Darlington, “*Labor et spes*,” Messrs. Lockwood & Mawson, Bradford, “*Experientia docet*,” Mr. J. C. Hine, Nottingham, “*Omnibus clectus*,” Messrs. Pavell & Robinson, Manchester, “*Q*,” Messrs. Innocent & Brown, Sheffield, “*Nota Bene*.” The last named were the successful competitors. The style of the building is Gothic. The spire is placed so that its full height of 140 ft. is seen. The school adjoining is 5½ ft. long, 24 ft. wide, and 17 ft. high, with accommodation for 250 children.

The Infant Schools at Sutton.—There were thirty-five designs sent in, and after consideration of their merits, the managers made the following selections for the prizes of 40l. each:—

1. Mr. W. Wallen, Greenwich £15,973 0 0
2. Messrs. Wilson & Willocks, King William-street, Strand 11,000 0 0
3. Mr. Chas. J. Phipps, and Mr. F. M. Harvey, Mecklenburg-square ... 14,500 0 0

SCHOOL-BUILDING NEWS.

Chester.—The foundation-stone of new Sunday schools for the Methodist new connexion has been laid. They are to be built at the rear of, and immediately behind, the chapel, a small space intervening. On the basement there will be two class-rooms, 11 ft. 6 in. by 22 ft. 10 in., and one larger, 20 ft. by 22 ft. 10 in., each room being entered by a separate door. Above these will be one large schoolroom, 44 ft. 6 in. by 22 ft. 10 in., lighted by five windows; each of the class-rooms being lighted by one window. These rooms it is expected will accommodate 300 scholars. Below the class-rooms there are boilers for heating water at tea-parties, store-rooms, &c. The building will be of brick, with stone facings, and will cost, when completed, about 350l. Mr. Walter Bodon, of Chester, is the architect; Mr. H. Pearson, the builder; Mr. J. Duckers doing the stonework.

Bilston.—The Wesleyan new schoolrooms, erected at a cost of 1,000l., have been opened. The school is a brick building, composed of a central room 58 ft. 6 in. long by 45 ft. wide, with a range of four class-rooms on each side 8 ft. square, and two class-rooms 15 ft. 6 in. by 8 ft. each. There is also a gallery for infants at the entrance. The walls are wainscoted to about 5 ft. high. A platform pulpit is erected on the east side of the schoolroom, which may be easily partitioned off to divide the boys from the girls. The school will accommodate about 600, and it is decided to have a day and infants’ as well as a Sunday school. Almost the entire cost of the erection has been already raised.

Birkenhead.—The new boys’ school, in connexion with St. Ann’s Church, Birkenhead, has been formally opened. The new buildings are erected from the designs of Mr. David Walker, of Liverpool, and provide accommodation for about 200 scholars, the plans being in accordance with the Committee of Council regulations, from whom a grant in aid is obtained. The schoolroom is 77 ft. long by 20 ft. in width, and there are two class-rooms, each 25 ft. 6 in. by 15 ft. in width, together with a cloak-room, lavatory, entrance porches, and all usual conveniences, a large playground being likewise provided. The roof timbers of the schoolroom are exposed to view, and varnished; and the walls are coloured a warm tint on the brickwork, finished with a skirting 4 ft. high, in oil paint, and capped with a stencil border. The class-rooms are fitted up with galleries. The style is Gothic, of an early character, and the building is constructed almost entirely of brick. The site of the new buildings, which adjoins the old, was presented by Mr. Thomas Brassey, who also gave a liberal donation towards the building fund. The cost of the works will be above 1,200l. Messrs. Booth & Richards, of Rock Ferry, were the contractors.

Doncaster.—The new building which has just been completed for the Doncaster Grammar-school, at a cost of something like 7,000l., was to

have been formally opened on Friday before last. At the last moment, however, circumstances arose which led to a difference of opinion between the charity trustees and the head master, and it was resolved that the pupils should re-assemble in the old building.

Carlton (Notes).—New day and Sunday schools have been opened at Carlton, in connexion with the church there. The schools are erected on a site which had been presented for the purpose by the Earl of Chesterfield, and are in the Tudor style of architecture. The cost incurred was about 1,900*l.*, including the site and alterations at Gedling Schools. The schoolrooms are sufficient to seat about 400 persons. The playgrounds for the children are asphalted, and provided with swings and other appurtenances.

Great Horton.—In addition to the large Sunday day schools which are being carried on by the friends of the Church, the Wesleyans, and the Primitive Methodists, the services in connexion with the opening of large and extensive school premises, which have recently been completed by the Congregationalists, have just been held. When the sum of nearly 2,000*l.* was raised, plans were prepared by Messrs. Paul & Robinson, of Manchester, and the different works were let to Messrs. Booth, Illingworth, & Son, contractors, Bradford, and the erection is now completed. The site is in a prominent position fronting the main road. A level street separates the building on the south-west side from the chapel premises, and the north-east side is also flanked by a street, but the ground here falls to the extent of 12 ft. Advantage has been taken of the difference of level, the class-rooms for infants and weak night scholars being placed on a lower ground story, with separate external entrances from the side street. The area of ground covered by the building is about 550 superficial yards, the dimensions being 120 ft. by 41 ft. The height from the floor to the ridge of the roof is 52 ft. On the ground-floor there is an assembly-room, which is 65 ft. by 38 ft. and 16 ft. high, having separate entrances from the front street, and communicating directly with the lobby at another entrance on the north-west side. This room is lighted with gas by means of six pendants suspended from the ceiling. In the rear of the assembly-room there is a lecture-hall, which is 36 ft. by 26 ft.; and the same height between the assembly-room and the lecture-hall, and ascending from the side entrance lobby, there is a staircase leading up to sixteen class-rooms above, which extend in double row with vertically lighted passage between them, the entire length of the building, and at the end of the passage a room is provided for the superintendent, who will have a view of the entire range. On the lower ground-floor and underneath the lecture-hall there is a class-room 25 ft. by 20 ft. and 14 ft. high, containing a raised gallery, which will accommodate 100 infants. This room is lighted by large windows from the street on the lower side. On the same level there are two class-rooms for adults, specially adapted for weak evening purposes.

Newmarket.—Much-needed school and church accommodation for All Saints parish will, through the exertions of the vicar, be probably very shortly provided. The site given by the Duke of Rutland for the new school is near the vicarage. The principal inhabitants of the town are contributing liberally towards the building funds. The school will be commenced early in April, and the enlargement of the church as soon after as convenient.

FROM AUSTRALIA.

Melbourne.—THE new bridge at Keilor, erected across the Saltwater River, has been opened. Messrs. Brown & Son, of Camberwell, were the engineers. The bridge was constructed on the site of the former one, which was a wooden frame bridge of the American style, and was erected at great cost in 1853. The contract for the present bridge was let in October, 1867, to Mr. Enoch Chambers, for 4,664*l.*, which included the masonry of the towers, the raising of the old piers 3 ft. 11 in., and the bits and platform of the bridge. Two new piers, however, have occasioned an additional outlay of from 900*l.* to 1,000*l.* The masonry was commenced in December last; the iron for the construction of the tubes arrived from England in June, and their erection commenced in July, and the whole of the work, excepting the approaches, was completed in October, without accident to life or limb. The cost of the entire work, including the service

bridge and the approaches, is upwards of 6,000*l.* The weight of each iron girder is about 50 tons, and the platform also about 50 tons, making a total weight of 150 tons. The bridge is 142 ft. in length, and 136 ft. between the points of support, and 20 ft. wide. 41,000 rivets have been used in its construction. It has been tested with a load of 142 tons placed equally on the girders, and with this weight it deflected 1 inch, and on the removal of the testing weight the girders rose to their original camber. The actual strength of the bridge, exclusive of its iron weight, is 980 tons, and the working power 326 tons.

Competitive designs are invited by the executive committee of the projected Prince Alfred Hospital. A premium of 50*l.* is offered for the first, and 25*l.* for the second best design.

The Victoria School of Design, in connexion with the Gallery of Art, has from thirty to forty students, but no master. One result is that not more than six or eight students attend with any steadiness or regularity. If the school (if we can call it a school) is to become useful, it must be provided with a competent master.

Sydney.—The new General Post Office, now in course of erection in Sydney, has a frontage to George-street of about 80 ft. and 170 ft. to a proposed lane which will connect George-street with Pitt-street. The business of the Money Order and Telegraph Departments will be transacted in the building as well as that of the Post Office. Sydney freestone is being used in the erection of the building principally, with the exception of such portions as the base-course, the columns, and capitals of the arcades, &c., requiring additional strength, where granite will be employed to resist the pressure. Of this an abundant supply of excellent quality and various colours can be obtained at several places along the coast between Sydney and Cape Howe. Internally, brickwork and wrought-iron will be used as far as practicable. The design is Italian, by Mr. James Barnett, Colonial Architect of N.S. Wales, and the contractor is Mr. John Young, of Melbourne.

DISSENTING CHURCH-BUILDING NEWS.

Bredgar.—The new Wesleyan chapel here has been opened for divine worship. Mr. R. Carey, of Coxheath, gave the bricks and the land, the cost of the labour and woodwork being about 1,000*l.* The building was designed by Mr. Carey, jun., of London, and carried out under the direction of Mr. C. Pillow, of Milton. Mr. Beaumont, of Milton, was the builder; the candleabrae were supplied by Mr. A. Buley, of Sittingbourne, who likewise did the staining and the glazing. The size of the chapel is 50 ft. by 30 ft. in the clear, and it will seat 300 persons. The style is Gothic. There are a school-room and vestry at the end. As the land upon which the chapel is built is at a considerable elevation, it is a prominent feature in the landscape for some distance.

Yeovil.—The foundation stone of a Wesleyan chapel has been laid here. The new edifice is intended to accommodate 700 people, the cost being 3,000*l.*, including site. The architect is Mr. Lander, of Barnstaple; and the builders are Messrs. Bartlett, of Coker.

Stratford.—The foundation-stone of a new Unitarian chapel has been laid here. The site is in Ham-lane, near the new Townhall, Stratford. The cost of the site and building is estimated at 1,200*l.* It is expected the building will be completed in June. Mr. Clark is the architect, and Mr. Thomas Horkon contractor.

Dundee.—A new Wesleyan chapel is being erected in Wellington-street, from the designs of Mr. Alexander Johnston, of Dundee.

METROPOLITAN ASSESSMENT BILL.

Sir,—Allow me to call attention to one provision in Mr. Goschen's Bill, which appears to me to perpetuate a fallacy which has long existed relative to deductions to be made from the gross estimated rental in respect of repairs and insurance.

For the purpose of this communication I have this morning inspected the rate-book of one of the city parishes, and subsequently a house, the gross estimated rental of which was there stated to be 500*l.*, and the rateable value 29 per cent. less, viz. 300*l.*; of this amount I venture to say the structural value is only 100*l.*, the remainder being the value of the land; 29 per cent. from the gross amount would therefore equal the total annual value of the structure to be repaired.

I would suggest the following plan, which I am adopting in the valuation of a union for poor-rate assessment, viz., to make the deduction a per-centage of the structural value only, and for this purpose discarding altogether the value of the land.

A carefully-prepared table on this basis, though working some inequalities, would, I venture to think, be far more just than the plan now adopted.

WM. EYR.

STAINED GLASS.

All Saints' Church, Souldrop, Bedfordshire.—Another window has just been filled with stained glass, by Messrs. O'Connor, of London, for the chancel of the church in this village. The window consists of one large circle and six small openings, and being above the organ, subjects from the Te Deum were thought to be suitable. Thus the centre light represents our Lord in majesty, with two angels in adoration, and the six other lights are filled with various subjects, such as the angels Michael, Gabriel, Raphael, and Uriel, with their respective emblems; the apostles Peter, John, James, and Paul; the prophets Isaiah, Jeremiah, Ezekiel, and Daniel; and the martyrs, John Baptist, Stephen, Matthew, and Andrew.

St. Peter's Collegiate Church, Wolverhampton. The three main lights of the Lonsdale window are intended to recall to the mind Bishop Lonsdale, as Bishop, Father in God, and Church Restorer, by the following figures:—Melchisedec, priest and king, bearing the bread and wine; St. John at Ephesus, with a long white beard, and having in his right hand a writing style, his left hand resting on the head of a child standing at his side; Ezra, the priest, holding three scrolls, representing the Law, Prophets, and Sacred Writings. In the panels beneath these figures are three scenes from the history of St. Chad, first Bishop of Lichfield, A.D. 659. 1st. His consecration. 2nd. St. Chad, as Bishop of Lichfield and founder of the Mother Church of the diocese. 3rd. The death of St. Chad announced to him. The tracery is a flowing Decorated composition, and contains emblems of the Sacramental Cup, with serpent issuing from it, the Seven-Branched Candlestick, the Seven Stars (Rev. i. 16), St. Chad's Branch, &c. Along the base of the window, on a brass, is the inscription, "John, Bishop of Lichfield; consecrated 1843; died 1867." The artists were Messrs. O'Connor, of London.

PORTLAND CEMENT.

Sir,—Your correspondent, Henry Bird, in answer as to behaviour of Portland cement, gives causes and effects, but he does not point to the remedy, which, in my humble opinion, lies with the manufacturers, as they grind and sieve too coarse, and send it out too fresh, more so in a busy time. These coarsely-ground particles of hard carbonate of lime take time to absorb the moisture, and, having done so, it swells; hence the upheaving of the joints in the brickwork, and what is termed, in plastering, the fire-cracking. Now the remedy would be for the manufacturer to grind and sift it finer,—pass it through a sieve, say twenty bolts to the inch,—and let it lie in a dry place or bin exposed to the air for twenty-one days before use. Some of your readers may probably say it would take a great time to set: I find by experience the longer it takes to set the harder it gets.

WILLIAM PULHAM.

THE "BUILDER'S" LAW NOTES.

Pollution of a River by Sewage.—A Local Board of Health directed that the sewage of a certain town should be by means of drainage conveyed to a river. The sewage, not having been completely deodorised before coming into contact with the river, polluted the stream passing through certain lands so much that the fish were killed, and a nuisance was caused. It was held by the Court of Chancery that the owner of the lands through which the river passed was entitled to an injunction to restrain the continuation of the pollution of the water.—*Biddler v. The Croydon Board of Health.*

Railway Works diverting subterranean Water.—A Railway Company having constructed a tunnel on their own land, thereby diverted the subterranean water from plaintiff's land contiguous to the tunnel. Proceedings having been taken against the company for such diversion of the underground water, it was decided that they were not liable, as the act had been in the exercise of the ownership of their own land.—*Galgoy v. The Great Southern and Western Railway Company of Ireland.*

Use of Public Fountain Water.—The Darlington Board of Health was empowered by statute to supply that town with water at certain rates for domestic purposes, and for other than domestic purposes upon such terms as might be agreed

upon between the Board and those desirous of having such supply. A public fountain having been presented to the town, the Board supplied it with water on market-days for the use of the cattle in the market, and for yoked horses passing to and fro. A person who kept horses, and was desirous to evade payment of the rate for the supply of water to his stable, took his horses to the fountain to drink. An information was laid against him under the Waterworks Clauses Act of 1847; but the magistrates, being of opinion that the Board had no right to limit the gratuitous use of the water at the fountain, refused to convict. The Court of Common Pleas set aside the decision of the magistrates, on the ground that it was quite competent for the Board to limit (as they had done) the supply of water to the fountain.—*Hildreth v. Adamson.*

Injury to a Stream by a Manufacture.—Certain calico-printers were for some years in the habit of using the water of a stream for the purposes of their works. Arsenite of soda is one of the substances used in the process of dying calico, and it was found that arsenic from the works above mentioned was traced in the mud of the reservoir of the Stockport Waterworks Company (some miles below the works), and also in the water supplied by that company to the town of Stockport. Proceedings were taken against the owners of the calico-printing works, and it was contended that the defendants might have prevented the arsenic from escaping, if they had constructed a large settling reservoir below the works. In defence it was alleged that such a course would have been very expensive; but no evidence was given as to the mode in which the works were carried on; but it was decided by the full Court that the verdict was not in pursuance of evidence; and also that, even if it were admitted that the trade were lawful, useful, and properly carried on, that would be no answer to the legal proceedings for being the cause of poison becoming mixed with the water.—*Stockport Waterworks Company v. Potter.*

DRAINAGE WORKS AT ARCAN, ROSS-SHIRE.

SOME improvements deserving of notice have just been completed on the Seafirth estate. The lands in question lie in the valley of the Conon, a few miles from the Muir of Ord Station on the Highland Railway. At this place the river Conon was sometimes so high for weeks, or even for months together, as to flood the fields to such an extent that they presented more the appearance of a loch than the fertile lands they really were. In order to remedy this state of matters, Mr. G. Cadell Bruce, C.E., of Edinburgh, was applied to, and he undertook to carry a tunnel all the way through the lands, passing below the river Orrin through part of the Highfield property, and discharging the water into the river on the Conon estate, immediately below the march between the Seafirth and Highfield properties. This work has been successfully accomplished, the result being that the flat of Arcan, extending over 800 acres, is now entirely free from water. From the surface of the ground at the inlet to the outlet there is about 14 ft. of fall. The tunnel is 2,142 yards in length—solid brick building—and there are also 500 yards of a large open watercourse, besides other drainage works. The work was begun in May last, and has been accomplished in the face of many difficulties, arising from the nature of the ground and the large gathering of water. The tunnel is constructed of radiating bricks, built with hydraulic lime, and partly laid in concrete. It is boxed in with piles of timber, and considerable difficulty was often experienced in conducting this work, owing to the shifting nature of the sand and gravel. The quantity of water which the tunnel will discharge, running half full, is about 100,000,000 gallons in twenty-four hours. The tunnel under the Orrin is 10 ft. below the bed of the river. These improvement works were carried out to a large extent on the lands of two proprietors, under the "Outfall Act" of 1847—one of the first instances, we believe, in which the conditions of this Act have been conformed to. One of the proprietors was averse to the execution of the drainage operations; but the Act was expressly intended to meet such a case. The contractor for the undertaking was Mr. George Hunter, Edinburgh.

THE VALUATION OF PROPERTY IN THE METROPOLIS.

THE text of the Bill to provide for uniformity in the assessment of rateable property in the metropolis, prepared by Mr. Goschen, Mr. Arthur Peel, and Mr. Ayrton, has been published. This measure provides for the establishment in the metropolis of a valuation board for the purpose of determining the per-centage of the rate of deductions to be made from the gross value in calculating the rateable value of hereditaments. The Board is to be composed of one representative from each assessment committee, and its proceedings are to be conducted in such manner and according to such regulations as the Poor-law Board may from time to time prescribe. The clerk of the Board is to be the clerk for the time being of the Metropolitan Asylum district. The right of appeal is to be given to any ratepayer and any surveyor of taxes who may feel aggrieved by the decision of the assessment committee. The same right is also accorded to the assessment committees, overseers, and any body of persons legally empowered to levy rates, if they feel aggrieved by reason of the gross or rateable value being too high or too low, or of there being no approved valuation list. The Poor-law Board is to be authorised to appoint commissioners for hearing appeals, subject to the consent of the Commissioners of the Treasury. One-half the remuneration of those officers and of their clerks is to be paid out of the Treasury funds, and the other half by the managers of the Metropolitan Asylum district, who are to be recouped out of the Common Poor Fund. If a commissioner should find, on appeal, that there is no approved valuation list in any parish, he may appoint a person to prepare one, the costs to be paid by the assessment committee failing to approve the list. The Bill contains seventy-three clauses and five schedules.

THE WORKS OF THE LATE E. H. WEHNER.

THE Institute of Painters in Water Colours have opened an exhibition in their Gallery, Pall-mall, of pictures and sketches by the late Mr. Wehner, "with the sole object of doing honour to the memory of an early and much-esteemed member,"—and a very praiseworthy and honourable step it is. The collection, including 150 works, is one of great interest, and shows the industry as well as the genius of the artist, who struggled against ill health in the latter part of his career, and was prematurely cut off. The earliest picture, of which the date is given in the catalogue, is 14, "The Dinner at Pegg's House, from the 'Merry Wives of Windsor,'" the property of Mr. James Godwin; and the last is 127, "Recantation by Galileo of his Heresies before the Tribunal of the Inquisition," on which Mr. Wehner was engaged at the time of his lamented death. The sketches and studies for pictures exhibited show well his manner of working, and the carefulness with which he prepared himself for the finished work.

ARCHITECTS' ACTIONS.

BREACH OF CONTRACT.
An action was brought by Mr. E. H. Lingen Barker, against the Rev. J. Ormiston, as chairman of the St. David's (Slington) Church Building Committee, for a breach of contract, in wrongfully dismissing him from the position of architect, to which he had been appointed by a resolution of the committee. There were also special claims for plans prepared and other services rendered, and for the use of the said plans after his dismissal.
The case had been referred, by agreement, to the decision of Mr. Johnson, one of the Masters of the Court of Exchequer.
The defendant paid 70*l.* into court, and submitted pleas denying the contract; alleging that the contract (if any) was conditional; that the plaintiff had failed to fulfil the condition; and that the amount paid into court was sufficient for the work done.
The following is an outline of the chief facts, as disclosed by the correspondence:—
In June, 1866, plaintiff received instructions from defendant to prepare plans for the above church, to seat 1,200 persons, the cost not being named. Ultimately the accommodation was reduced to 1,007, when plaintiff stated he thought the cost would exceed 4,800*l.* (afterwards increased to 4,800*l.*), paying strict attention to economy in matters of detail, and using inexpensive materials only.

No guarantee, however, on this point was either asked for or given, and in November the plans were adopted by resolution, subject only to any future desired modifications. Funds having come in but slowly, it was decided, about October, 1867, to erect the nave of the church first; and plaintiff sent his plans to defendant, at his request, with the object, with estimates, showing the superior advantage of building the side aisles at the same time. Instead of noticing this suggestion, defendant showed the plans to Messrs. Dove, builders, who estimated the complete cost at 6,000*l.*; they, however, in answer to plaintiff's subsequent inquiries, admitted that this price was only approximate, as they had had no specifications, and only a casual glance at the plans; they further said, that should the details might be simplified, so as to bring the cost down to about 5,000*l.*; and that, on receiving the plans and specifications, they should be able to say the lowest they could carry them out for. Plaintiff fully explained all this to defendant (who had himself previously stated to the secretary of the Bishop of London's fund that the cost would not doubt be 5,000*l.*), adding that his original estimate would now have to be raised to about that sum, owing to the increased cost of building since it was given, and for other reasons duly specified; he also alluded to the wide difference often existing between competition tenders, pointing out that defendant's mode of proceeding was such as to tempt the builders to name a high figure. And he finally reminded him of the original understanding, which was, that tenders were to be procured in competition; and that if the lowest was then found to exceed the available funds, the cost should be reduced by the omission of certain details principally ornamental. Notwithstanding these and further explanations, and an offer to modify the plans to suit the reduced state of the funds; and though he warned the defendant against involving his committee in the expense of two architects, plaintiff received, in April, 1868, a formal resolution terminating the engagement; and shortly afterwards a letter from defendant, referring him to his solicitor. An arbitration was then proposed, and acceded to at first by plaintiff, but afterwards declined, on hearing that, pending these negotiations, defendant had been using his plans and employing another architect, Mr. E. L. Blackburne. Indeed, under this gentleman's direction, plaintiff's repeated advice of building nave with side aisles has since been carried out by Messrs. Dove. After hearing the (admitted) correspondence, the Master stated that his impression was decidedly in favour of the plaintiff, and also that the amount paid into court was inadequate. He thought, however, a compromise might be effected at that stage, so as to spare funds collected for a charitable purpose; this hope being grounded upon the good feeling and moderation exhibited in plaintiff's letters. Ultimately it was arranged that the Master should certify for the defendant to pay the plaintiff's costs, and 80*l.* beyond the 70*l.* paid into court, and to return the plans.

HOUSE PAINTING.

Sir,—Can any of your readers inform me the reason why plain oil painting upon old work, when dry, has a flat and smeary appearance? If a light grey (for instance), the first coat will dry with a uniform gloss, but the second coat will be sure to be flat and smeary. I have inquired of many painters, but can get no satisfactory explanation. I use American turpentine, and have tried linseed oil from different houses, but with the same result each time; for the past few years it has been impossible, after the first coat, to make plain paint look well, with a decent gloss. Can the cause be in the white lead?
H. L. D.

FRENCH WORKMEN FOR THE TRINITY BOARD.

Sir,—I find this paragraph in the *Daily News*, and would call your attention to it:—
"New English Lighthouse.—The Trinity Board have entered into a contract with a French firm to supply and work the granite of a lighthouse, to be constructed on a rock near the present Longships, off Land's End. The new lighthouse will embrace all the modern improvements, and will, when completed, supersede the Longships. The Elder Brethren, it is said, have gone to France with the contract, in consequence of the high price asked by English firms. The work will be commenced immediately."
We have a very old proverb about carrying coals to Newcastle, but here is a job to be done in Cornwall, and the material is Cornish granite, and workmen there are as much unemployed as they are at this moment in other parts of England and as badly paid,—ay, and worse, for there is no district in England where wages rules as low as they do there; and yet, when a little job like the foundation of a lighthouse has to be done, our rulers must, forsooth, send the order to France. I must confess my disgust at the transaction. But I am told that the price asked by the English contractors who were applied to was too high, and the French asked less. I leave out altogether any question of patriotism. My reply is, take a wider circle. We English go abroad and compete there with all nations, and on their own soil, and shall it be said that we are beaten at home? These things are done in a corner, as the recent magisterial investigations prove. Let every job of this kind be well advertised in the journals devoted to the trade, so that contractors generally may be made aware that such work has to be done; and I am sure that, after that, they need not go to France or any other country for tenders of any kind of building.
A CLERK OF WORKS.

PERPETUAL MOTION.

In the *Gentleman's Magazine* for 1818, p. 156, vol. ii., appears the following curious account:—"John Spence, an ingenious individual, residing at Linnlithgow, in Scotland, has applied the magnetic power to the production of a perpetual motion. This person was in early life apprenticed to a shoemaker, but the natural bent of his genius for mechanics overcame every obstacle. He got to be keeper of a steam-engine, in a spinning factory at Glasgow, and after two years' study in this school, retired to his native place to pursue the shoemaking for bread; and wheels, levers, &c., for the gratification of his own taste. The perpetual motion was an object worthy of such a devotee, and we find that he has invented a piece of mechanism which is doubly curious, from its own powers, and from the extraordinary difficulties in whose despite it has been accomplished. It is not easy to convey an idea of it without plates. A wooden beam, poised by the centre, has a piece of steel attached to one end of it, which is alternately drawn up by a piece of magnet placed above it, and down by another placed below it: as the end of the beam approaches the magnet either above or below, the machine interjects a non-conducting substance, which suspends the attraction of the magnet approached, and allows the other to exert its powers. Thus the end of the beam continually ascends and descends betwixt the two magnets, without ever coming into contact with either, the attractive power of each being suspended precisely at the moment of nearest approach. And as the magnetic attraction is a permanently operating power, there appears to be no limit to the continuance of the motion but the endurance of the materials of the machine. The first machine made by Mr. Spence is very rude, and fashioned by his own hands; but he intends applying the principle to the motion of a timepiece. We trust this ingenious man will meet the encouragement he deserves; if not as the reward of his talents and perseverance, at least for the benefit of the community, for it is from such sources that great national improvements are often derived."

Such is the article *verbatim*, and an old correspondent would wish to ask, can the force of the magnet be made so strong as to be applied to a sewing-machine or to locomotion? and if you could procure an outline drawing, and give in the *Builder* a small wood engraving of this curious machine, no doubt it would much oblige your readers.

A BIG HAMMER.

A SEVENTY-TON cast-iron block being required for a steam hammer, and being undertaken with other works by Mr. Wm. Williams, ironfounder, St. Helen's Works, Swansea, was successfully cast on the 11th inst. Two ovens were specially erected at a suitable distance to enable the metal to run directly into the mould. Operations commenced at an early hour, and by a quarter to ten a.m. the first set of charges were ready and tapped. Successive charges followed each other at regular intervals of three-quarters of an hour up to nine p.m., at which time the block containing the full weight of 70 tons of solid iron was finished, thus successfully completing the largest casting ever made in Wales.

The dimensions are 11 ft. 6 in. by 9 ft. 6 in. at base, and 7 ft. 6 in. high. It will occupy from two to three weeks to cool sufficiently to allow it to be reversed, it having been cast base uppermost.

THE NEW EXCHANGE BUILDINGS, LIVERPOOL.

This extensive and important fabric is now far advanced towards completion. The present works, contract No. 2, include the whole of the east wing and the central portion, and are being carried out by Messrs. John Parker & Son. Mr. Wyatt is the architect. A portion of the quadrangle will very shortly be completed. The excavation through the hard red rock has proved a tedious and arduous process, but with the aid of Taylor's steam-hoist the labour has been materially reduced and the work expedited, as it has enabled Mr. Abraham Thomas, the contractor for this portion of the work, to remove blocks weighing from three to five tons each. This excavation has proved an exceedingly interesting and important portion of the whole work, and will provide for the construction of two tiers of vaults, well ventilated

The space at present left open in the centre of the north side of the quadrangle is for the central tower, the building of which will be proceeded with as soon as the temporary Stock Exchange and Telegraph-office have been removed. The upper part of this tower will be made available for a grand picture-gallery, lighted from the roof. It will be 62 ft. long by 34 ft. wide, and access to it will be afforded by a large passenger-lift. The circular tower at the north-east angle of the building will add to the apparent height of the edifice at this point. When completed, which it nearly is already, this tower will form a feature in the general aspect of the building. The whole of the fabric is under the superintendence of Mr. Jonathan Parsons.

CABINET-MAKERS IN LONDON.

I AM very glad to hear that there are now a great number of respectable firms who procure good drawings of cabinet-work and get the designs executed. That they look less to the quality of the work than to their full profit is, I think, a very bad sign; but permit me to ask, who supplies the designs,—architects or artists? and are they paid for? Are they not rather furnished by the workman as a condition on getting the order to execute, and that, too, without other fee or reward? And if a workman once gives evidence of his ability to devise something new, either in style or material, is he not continually pestered with, "So-and-so, can't you give us something fresh?" Sir, the present race of mere dealers must die out. The motto the public should adopt is "Buy of the maker." Let the man who wants a piece of furniture, or anything else, I care not what, if it is to be satisfactory either artistically or constructively, bring his mind in direct contact with the mind of the producer, and an advantage would ensue which is not to be measured by any money value.

E. G.

EQUATORIAL DIALS.

SIR,—As I said "the most natural, most obvious, and best" way to treat sun-dials was the ancient one of making all their surfaces "parallel or perpendicular to the equator." I do not see why it should be necessary to answer Mr. Scargill's inquiry about a "sun-dial parallel to the equator," a thing I never mentioned, but if he takes the trouble to make one on the "surfaces,"—I never said surface,—parallel thereto, he will find that not only does the southern face act exactly as well all the time the "sun is beyond the equator," as the northern while he is on this side, but "at the equinox," or any time within several hours thereof, both faces will receive shadows at once, half way, a quarter or a sixth of the sun's affording ample light for this purpose; just as the east and west walls of a building are, for two minutes, both shone upon, or as both poles of the earth may be proved, at the same equinox time, to be in sunshine for some three days together, in this case, indeed, not merely having half his disc, but (owing to refraction) the whole of it, well lifted above both their horizons. For the same reason, at our sunrise or sunset, there are at least four minutes, and often many more, during which we and our antipodes can both see his entire disc.

And this leads me to remark, it is a mistake to place dials where they can be shone upon till sunset, for refraction most greatly vitiates their time-keeping whenever the sun is no higher than a few times the degrees. Nor does this admit of any selecting correction like the other inequalities. Hence it is useless to graduate a dial beyond 16 hours for any part even of Scotland, or up to 16 for the south of England.

E. L. O.

"ROYD."

SIR,—The word "Royd" is of frequent occurrence in names of places in this district (Bradford, Yorkshire), as Abbot Royd, Brook Royd, Clay Royd, Hood Royd, How Royd, Raw Royd, Swan Royd, Lady Royd, Nun Royd, Stony Royd, and many others. Will you be so kind as to give me its meaning?

R. C.

LOCAL BOARDS OF HEALTH AND THEIR CHOICE OF SURVEYORS.

SIR,—A friend of mine, a duly qualified civil engineer and surveyor of considerable practical experience, has, with great assiduity, for some time applied himself in trying to obtain an appointment above.

Strange to say, with respectability of character and excellent credentials as to ability, &c., no success has ever been made to his numerous attempts. This has led me to the inquiry, upon what principles do these bodies gauge the qualifications of their applicants?

It is within my knowledge that parties have been selected and sent for who know as little of the use of the level, taking and drawing a section, making a road, and other professional duties necessary to their efficiency, as a school-boy might be expected to do.

Are there no means that can be devised by which the competent and orthodox surveyor can be properly recognized, and have some guarantee against this haphazard election of one and the rejection of others with as little respect to their fitness as to their feelings?

I shall be glad if my brother professionals would give the subject consideration, and point out for the benefit of electing bodies means calculated to protect the interests of our fraternity.

OUT OF ADJUSTMENT.

A NICE LITTLE BILL.

SIR,—You are so frequently requested to give some portion of your space to inquiries as to the best mode of preventing damp penetrating through the walls of newly-built houses, that you will probably extend your good nature to this communication which will afford a certain cure, although many of your readers may fancy it has its drawbacks. Briefly, the method of proceeding, in a certain case, was as follows.—Miss J. requested a plumber to remedy a portion of a damp wall over a bay window in one of her lodges. The work was done, the damp stopped, and the account sent in; but as it was more than she thought such a thing ought to have cost, she sent for an architect, giving him an idea of the affected place in the lodge, and asking him what he supposed the cost of such work. His idea was from 3*l.* to 4*l.*; the bill was produced of 5*l.*. The ingenious tradesman had fixed a framework of wood over the gable down to the bay window. On this he fixed his lead, one strip weathering the other. A small window in the gable, with stone jambs and mullion, did not escape, as the jambs and mullion were carefully caulked with lead, the poor little building presenting a most woe-begone aspect. Should any of your non-professional readers be troubled with such damp walls, I should advise them to try your mixture of alum and soap before giving instructions to a plumber, or they may have to pay dearly for their whistle through his pipes. I enclose a copy of the bill.

A. S.

CLOSED DOORS, SOUTH KENSINGTON.

SIR,—I thank your correspondent "Art-Lover" for his explanation that the "museum in proper" is not closed at four o'clock on Saturdays; but—like an apologist often—he goes too far, and proves too much for his own purpose. First, he speaks slightly of "a portion of it" as "a mere amuse where the models of ships are exhibited." Would any one imagine that this meant the wonderful collection of armour so admirably arranged, and so interesting to the public, that when the doors were closed upon me and hundreds of others at four o'clock, there was a general undertone of disappointment? Again, would one suppose that the doors to the Museum "proper" in Exhibition-road were closed at the same time? I thank him for his advice to ask the very civil policeman; but I venture to think that I know at least as much as they do of what the Museum contains, and have visited it sufficiently often not to require to be told if there is anything more to be seen.

Your correspondent supposes I am condemning Mr. C. on the other side of the distinguished street; but that gentleman on behalf of the public, and his sympathy with all public works, that I felt sure—had he been there at the time to see—he would have regretted at the regulation to be closing this Armour Gallery on Saturday afternoons at four o'clock (even in March) as much as your correspondent, and would have altered them at once.

ONE DISAPPOINTED.

THE NEW STEAMBOAT PIERS.

SIR,—Great improvements are undoubtedly being made to the river side between Westminster Bridge and the Temple by the substitution of the new steamboat piers for the old rickety broken-down dummies of bygone times; but these piers lack one thing. They were going up the river the other day from London Bridge to Westminster by boat, and during the passage was required by several people which was this pier and which was that. It struck me at the time what an advantage it would be for strangers and the public generally if the Thames Conservancy, or whoever have the management of these piers, would have the names of them painted on a board as at railway stations, and placed in positions where they may be seen by everybody on the arrival of the boats.

J. C. D.

Books Received.

"THE Year Book of Facts in Science and Art." By John Timbs. London: Lookwood & Co.—The present issue of this long-established and interesting annual is illustrated with an engraved likeness of Mr. Whitworth, the gun inventor, and scholar-ship founder. There is also a brief memoir of Mr. Whitworth.—"Thames Valley Drainage Outfall." Plan proposed by Sidney J. Hervon Herbage, C.E. Mr. Herbage is surveyor to the Surbiton Improvement Commissioners. He proposes to deal with the sewage of the following towns and villages:—Richmond, Petersham, Twickenham, Ham, Teddington, Kingston, Hampton, Long Ditton, Thames Ditton, Hampton Wick, Hampton Court, Hampton, Sunbury, Walton, Weybridge, Halford, Shepperton, Chertsey, Addlestone. This he would do by carrying the sewage back from Richmond, along the course of the river, or nearly so, by the aid of two lifts, one at Kingston and the other opposite Walton, to a pumping station near Chertsey, where it would be lifted 150 ft. from a reservoir containing six hours' flow of sewage and rainfall, and forced through a 36-inch cast-iron main under the Thames, to irrigation farms, which it appears would be available between Chertsey, Woking, and Egham. The total estimate for all the works comprised in this plan is, in round numbers, 167,000*l.*

"British Railways as they are and as they might be: Suggestions as to Cheap and Uniform Fares, with Increased and Guaranteed Dividends." By John Imray, M.A., C.E. London: Spon. This is a modification of Mr. Raphael Brandon's plan. Mr. Imray proposes a division into short and long fares,—the short, for say twenty-five

miles less or more, at 1s. first class, 6d. second, and 3d. third; and the long, all above that distance, at 16s., 8s., and 4s.; luggage tickets for any distance, 1s. The management of railways to be in the hands of a Government department, and tickets to be issued, like postage-stamps, at any stamp or post office. Mr. Inray calculates that even on the present number of passengers there would by this system be a gain of more than 2,000,000l., exclusive of luggage and parcels. Travellers for short distances beyond twenty-five miles, he calculates, would take short-distance jorneys, and so save their money, as indeed they might do by repeating their short distances again and again. One defect of Mr. Brandon's plan, he urges, would be, that in jorneys of any considerable length, passengers generally would become first-class, preferring soft and comfortable seats for 1s. to inferior ones for 3d.; so that the distinctions of class would be negatory. The author's plan is further elaborated in the pamphlet under notice. "Engineering Facts and Figures for 1868." London and Edinburgh: Fullerton & Co.—The present issue of this annual compilation chiefly relates to boilers and boiler explosions, furnaces, engines, naval construction, &c.

Miscellaneous.

Hydrogenium—a Metal.—At the Royal Society's *conversazione*, Mr. W. C. Roberts (for Mr. Graham, the Master of the Mint), exhibited a curious example of the absorption of hydrogen by palladium, and consequent alloy and expansion of the metal. A coiled ribbon of palladium was attached to each pole of a small battery in a water bath. The current being turned on, the ribbon absorbs hydrogen, expands, uncoils, and stretches itself across the bath; then, on reversal of the current, shrinks, and reforms its coil, while the opposite ribbon goes through the opposite process. The appearance is that of two worms wriggling alternately to and fro across the bath. In another instance the expansion was shown by a red-tipped arrow making bold sweeps half round a circle. These experiments demonstrate the enormous capacity of palladium for absorption of hydrogen, and verify Mr. Graham's conclusions. It is a singular fact, that the true alchemists appear to have been aware not only of the existence, but of the metallic nature, of hydrogen, which they called their celestial mercury, and prime matter of metals. They speak, for example, of rotting or corrupting a "metallic sulphur," by means of distilled water, till the "mercury" enters into "companionship" with the sulphur, leaving the "stony crassitude" in the fumes; which, translated into modern chemical language, obviously just refers to the decomposition of a metallic sulphuret, such for example as sulphuret of iron, into sulphuretted hydrogen, on the one hand, and iron oxide, on the other; and it also clearly shows that they were well acquainted with oxygen as well as with hydrogen, and with the fact that water is composed of these two elements, the separation of which, by means of a metallic sulphuret, into sulphuretted hydrogen and metallic oxide, they thus distinctly although quaintly indicated.

Burlington House.—In the House of Commons on Monday, Lord R. Gower asked the Secretary of State for the Home Department whether the structure connecting Burlington House with Piccadilly was a temporary erection; also what was the proposed destination of the colonnade recently removed from the front of Burlington House. Mr. Knatchbull-Hugessen (in the absence of the Home Secretary) said that the structure referred to in the first part of the question was purely temporary; and with regard to the colonnade, its final destination, he believed, had not yet been determined upon.

The Asylum for Idiots.—The asylum at Earlswood was designed originally for 400 inmates. At present some additions have been made, and it is desired to enlarge the asylum so as to enable it to receive 800 inmates. This addition would cost 10,000l., and between 9,000l. and 10,000l. have been already subscribed, and about 1,500l. more promised. The Prince of Wales has consented to lay the first stone of the new building on his return from Egypt. A lady has also offered to give 100 guineas, provided nineteen others will give a similar sum each. She offers to consider any two gifts of 50 guineas as one of 100. Four sums of 100 guineas and five of 50 guineas have already been promised.

Royal Horticultural Society.—The first spring show of the Royal Horticultural Society of the present year was held in the Gardens on Saturday last, when there was a wonderful collection of hyacinths, cyclamens, roses, and other spring flowers. The Dutch growers gave supplemental prizes amounting to 45l., which caused a very keen competition among the various exhibitors. The attendance was large, and the whole affair a success.

Gas.—The Hastings Gas Company have declared a dividend at the rate of 8 per cent. per annum for the last half-year on old shares, and 7 on new, as at the two preceding half-yearly meetings, leaving a balance. There is a duty of 2s. 4d. a ton on coal at Hastings, which duty costs the company about 1,000l. a year.—The Minster Gas Company have declared a dividend of 5 per cent. for the last year. A dividend of 6 per cent. was proposed, but the chairman said he preferred reducing the price of gas.—Some alterations are about to be made at Carlisle Gas Works. The engine-house is to be enlarged; two new engines substituted for that which is now in use; and a new "washer-house" (in which the gas undergoes a purifying process) erected. The erection of a new chimney 150 ft. high is also in contemplation. The present chimney, which serves Messrs. T. & J. Nelson, Mr. Brockbank, and the Gas works, stands in the middle of the street, and is found to be inconvenient in that position. The corporation have the right to pull this chimney down, upon giving certain notice to the joint-proprietors, and paying them 200l.

Industrial Employment of Criminals.—The Howard Association has issued a printed note of desiderata in criminal treatment, with illustrations and suggestions. One especial point urged is the industrial training of criminals. It is a shame to the Legislature, and a gross injustice to tax-payers, that nothing is done in this respect. Criminals ought, for their own sakes, as well as for the sake of the public, to be trained in industrial employment while in prison. Tread-mills, which "grind the wind," are like a lunatic invention than one of sane origin. The objects of the Howard Association ought to be supported by the tax-paying public at large, and by all who have anything to lose or to suffer by the misconduct of criminals. The office of the Association is at 5, Bishopsgate-street Without, and the secretary is Mr. W. Tallack. Earl Russell and other influential persons are patrons of the Association.

Eton College.—On the 13th inst. the Provost of Eton delivered a lecture in the College Audit-chamber on the "Archæology of Eton." On the table of the apartment in which the assembly was held there was laid a collection of the most ancient and noteworthy documents relating to the foundation. Taking these for his subject, the Provost commenced by showing how amply they witnessed to the munificent intentions of the founder. In the handwriting of Henry VI. there were directions as to the dimensions of the chapel, which in all respects he desired should be superior to those of his Winchester rival, New College, Oxford. The misfortune of the King, however, frustrated the accomplishment of his designs, and his successor, Edward IV., so far from inheriting his partiality for the new creation, was anxious to transfer the entire property of Eton to the Dean and Canons of Windsor. One of the most remarkable, as one of the most tattered among the papers lying before the audience, was an inventory of the property which was ordered to be surrendered in this way. An appeal, however, was made to Rome, the hearing of which was remitted to England, and the result was that the College retained all that belonged to it, without giving any permanent annoyance to Edward, who subsequently appears as a benefactor. The Provost concluded at the date of Oliver Cromwell, who, he remarked, was the last to contribute the royal gifts of game and wine, which had previously been annual,—a neat hint.

A "Steeple Jack."—For some days Mr. Jason Goodchild, alias Steeple Jack, from Dundee, has been attaching lightning conductors to the tower and gables of the hydropathic establishment at Clief. The tower is about 100 ft. high, and the flags aff thereon is 40 ft. At this height—some 140 ft.—Jack thought proper to balance himself with one foot resting on the top of the flagstaff. Here he stood till his photograph was taken, and thereafter waved his cap while the flagstaff was swinging in the breeze.

The Durometer.—An instrument for testing the hardness of metals, by drilling, has been invented by M. Behrens, an engineer of Tarbes, in France. It is said that it has been thoroughly tried, and that many French contracts for rails now contain a condition that they are to be tested by this apparatus. It consists of an upright cast-iron standard with a table for supporting the rail or other article to be tested. The spindle of the drilling tool is capable of being raised and lowered in its bearings by turning a handle for that purpose, and the drill is held down to its mark by a weight fitted to the upper end of the drilling spindle. Its rotary motion is derived, through a pair of mitre wheels, from a driving shaft carrying the usual fast and loose pulleys. This shaft has a worm upon it which moves a train of mechanism, in connexion with a signal gong, for the purpose of indicating the number of revolutions made by the drill. The apparatus is exceedingly compact. Its use by French manufacturers has led to a gradual increase in the hardness of the rails they produce.

Royal Italian Opera, Covent-Garden.—Any doubt that existed as to the union of the two managements and the two companies, those of Covent-Garden and Her Majesty's, has been dispelled by the published programme, which sets forth the double company wonderfully strong on the lady side, but wanting on the other a great tenor, aside of Mongini and the return of Tamberik. But where is he to be found? Signor Arditi will be conductor, with a colleague not yet named, and the Covent-Garden orchestra remains intact. Only one opera new to London is spoken of, Ambroise Thomas's "Hamlet," with Mlle. Christine Nilson as Ophelia; but, on the other hand, some promising conjunctions in stock operas are promised; such, for example, as "Le Nozze di Figaro," with Patti as Susannah, Lucca as Cherubino, and Titiens, La Contessa. The subscription list can scarcely fail to be very large.

"Cleopatra's Needle."—The prostrate obelisk in Egypt that belongs to us has again turned up, and one more suggestion is made, that we ought to bring it to England. Our readers will remember the agitation of the question in our pages some years ago, when one of our correspondents, the late Mr. Nathaniel Gould, offered to fetch it to England for a certain stipulated sum. Nothing came of the proposition, then, however; nor will it now. Under ordinary circumstances we are not advocates for the removal of historical monuments from their original site.

Transplanting a Large Tree.—At Elveden Hall, the seat of the Maharajah Duleep Singh, considerable interest has been excited by the successful removal of a very large tree, under the superintendence of Mr. Barron, of the Elvaston Nurseries, Derby. The remarkably fine specimen of purple beech thus transplanted is nearly 50 ft. high, the diameter of the branches 58 ft., and the circumference of the stem at about a foot from the ground, 7 ft. 8 in. The mass of soil and undisturbed roots measured 16 ft. by 14 ft., the roots extending 6 ft. beyond, and the whole weighed considerably over twenty tons. A platform of strong timber was constructed underneath, and the tree was raised upon rollers laid on planks by means of powerful screw-jacks. This being done, the tree was drawn on to its new site with the aid of pulleys of unusual size, being maintained throughout in an upright position.

Frightful Explosion at Oldbury.—An explosion, by which two men instantly lost their lives and several others sustained serious if not fatal injuries, has occurred at the works of Messrs. Demuth & Co., at Oldbury, manufacturers of naphtha and other chemicals from gas tar, including, amongst other things, the celebrated aniline dyes. The cause of the accident does not appear. The retort is of enormous weight, and was blown through the air to a distance of about forty yards, "like a balloon." The amount of damage will amount, it is said, to 3,000l. or 4,000l.

Earthquake in Lancashire.—A shock of earthquake was felt on Monday evening in Manchester and the neighbourhood. At Newchurch a factory chimney was destroyed, and the shock was severely felt at Todmorden, Rawtenstall, and Haslingden. The wall of the railway station there was cracked.

The Drainage of Reading.—At a meeting of the Local Board it has been unanimously resolved, that a drainage scheme, involving an expense of 40,000l. shall be carried out. Mr. Lawson, C.E., and Mr. Woodman, the borough surveyor, have, for some time past, been engaged in maturing the plans for the work, and these plans will now be forwarded to the Home Secretary for approval before the money can be borrowed. According to a statement made by Mr. Simonds, a 6d. rate spread over a period of thirty years will pay both principal and interest. As the Thames Conservancy Board have determined to enforce the powers they possess by Act of Parliament, of compelling all towns in the valley of the Thames to divert their sewage from the river, no option is left but to convey the sewage to the land, and this plan will be adopted at Reading. Owners of property will be compelled to connect their drainage with the main sewer, but time will be given for payment for the work, which must be executed subject to the supervision of the borough surveyor.

Election of a Surveyor for Leominster. The town council, sitting as a Board of Health, met recently for the purposes of receiving applications, and of electing a person to fill the office of surveyor, at a salary of a "pound a week," the person undertaking the duties to be allowed to execute certain other work not to the detriment of his office. There were eleven applications, including seven local names, and the Board, having opened all the applications, ostensibly formed themselves into a committee, and proceeded to the election with closed doors, the result of their labours being the selection of Mr. John Edwards, of Stonebridge.

The Southampton Statue of Lord Palmerston.—A difference of opinion has arisen between the local Palmerston Memorial Committee and the Town Council as to the site for the statue. The Town Council, by a majority of 19 to 9, have refused to allow it to be put up on the place recommended by the committee, in the High-street, near Holy Rood Church. The editor of the local *Independent* says he regrets this decision, because he knows of no better place. As to any interested motives on either side, he discards the idea.

Destruction of Durham Theatre by Fire.—The Theatre Royal, in Saddler-street, Durham, has been totally destroyed by fire. The building had been used for some time as a music-hall. It contained a large quantity of dried timber. The cause of the fire is unknown. It appears that smoking was allowed in many parts of the house. The building has been in existence over 100 years.

Chatham.—The contract for the erection of the new Lock Hospital intended to be built by the Government, in Chatham, has been taken by Mr. P. Stiff, builder, of Dover, for the sum of 7,749l. The hospital will be built on the Government land adjoining the Maidstone-road.

The Adelaide Gallery, Strand, Destroyed by Fire.—The Adelaide Gallery, once known to fame, like the Polytechnic, as a seat of popular science, but latterly occupied by Messrs. Agostino Gatti & Monico as a *caf *, has been destroyed by fire. Adjoining houses were somewhat injured.

The Wages Question.—This question has presented itself at Preston in a somewhat singular form. A number of spinners, who have enjoyed parochial relief, have been deprived of that privilege on the ground that they could obtain work in the town. Their answer is, that they can only do so by accepting reduced wages. The guardians allege that this is not a point with which they have anything to do; while the employers justify the lower rates on the ground that the depressed condition of the cotton trade prevents them from giving more.

Railway Traffic Returns.—The traffic receipts of railways in the United Kingdom for the week ending February 29th amounted on 13,420 miles, to 703,183l., and for the corresponding week in 1868, on 13,216 miles, to 679,364l., showing an increase of 204 miles and of 23,819l.

The Thames Embankment Approaches. A petition has been presented to the House of Commons, by Mr. W. H. Smith, from the vestry of St. Paul, Covent-garden, for the provision of suitable approaches to the Embankment from the Strand, between Norfolk-street and Villiers-street.

The South Staffordshire Industrial and Fine Arts' Exhibition.—The various preliminary works, for the opening of this exhibition in May next, are rapidly approaching a state of completeness, and the matter is being now taken up by the manufacturers generally throughout the district with heartiness and zeal. The timber framework of the special building is completed, and a large portion of it covered in; the ground floor is laid, the galleries are erected, and the contractor (Mr. F. N. Clarke) expected to have the whole building completed by the time specified, the 15th instant. Notwithstanding the large dimensions of the building—150 ft. long by 80 ft. broad, and 43 ft. high, the committee will experience some difficulty to satisfy all the demands that are now being made upon them, and a suggestion has been generally agreed to that another temporary structure should be erected in the lower part of the grounds in which to exhibit machinery in motion: the exhibits in this department will include ribbon looms from Coventry, nailmaking machines, &c. The dimensions of the structure will be about 100 ft. by 90 ft. The arrangements for the fine art department, which are under the special management of the Earl of Darmouth, are likewise being carried out with success. Instructions have been given to Mr. Walsworth, of Manchester, for the erection of a grand orchestral organ, which is to be fixed in the gallery at the end of the main building.

National Educational League.—A league, having for object the establishment of a system which shall secure the education of every child in England and Wales (and why not Ireland also?), is in course of formation in Birmingham. Mr. George Dixon, M.P., is the chairman of the provisional committee.

For alterations to No. 24, Piccadilly, for Messrs. Unwin & Albert. Mr. Frederick Sullivan, architect:—

Cock	232 0 0
Drew	27 0 0
Saunders (accepted)	194 0 0

For alterations at 687 and 689, Old Kent-road, for Mr. W. Stark. Mr. E. Aidous, architect:—

Spelling	2385 19 0
Stark	285 0 0
Dennis	281 9 6
Croaker & Son (accepted)	239 0 0

For two houses, Keynsham, exclusive of boundaries, &c. Mr. E. A. Lansdowne, architect:—

Eastbrook & Son (accepted)	£1,691 0 0
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For alterations and additions at West End, Hampstead, for Mr. T. E. Ripley. Messrs. Parr & Strong, architects:—

Cox	£870 14 11
Simpson	747 0 0
Yanson	734 0 0
Keansey	735 0 0
Tracey	733 0 0
Wheeler	720 0 0
Robinson	568 0 0

For new wing to the Baker and Basket Taverns, St. James's-street, Old Kent-road, for Mr. Langford. Mr. E. Aidous, architect:—

Morris (accepted)	£230 0 0
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TO CORRESPONDENTS.

W. O. S. C. P. H. A. S. E. W. F. A. M. O. Z. T. R. S. T. J. H. P. D. I. W. P. W. H. G. W. S. W. W. P. S. E. D. T. O. S. R. C. T. R. J. T. D. H. T. B. J. E. G. O. One whose Chimney Smokes.—W. B. P. B.—M. F. R. W. B. R. S.—E. R.—W. R. S.—Capt. P.—L. & Co.—C. W.—E. L. G.—K. & Son.—One who has been a Rough Boy.—G. P.—J. W.—W. S.—O. P. (shall appear first opportunity).—A. C. H. (we had notes journey).—Lustrous next week.

We are compelled to decline paying out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

TENDERS.

For engine-sheds, &c., New Cross, for The London, Brighton, and South Coast Railway. Mr. F. D. Bannister, engineer:—

Blackmore	£17,500 0 0
Myers & Sons	16,363 0 0
Pickering	16,310 0 0
Firbank	16,300 0 0
Chappell	15,950 0 0
Jackson & Co.	15,827 0 0
Sherlata	15,000 0 0
Dickinson & Oliver	14,468 0 0
Perry, jun.	14,347 0 0

For finishing a house at Cremorne New-road, including additional rooms and vaults, for Mr. Cowley. Mr. J. S. Moye, architect. Quantities not supplied:—

Reed	£1,018 17 0
Sapwell	637 0 0
Stocks	567 14 0
Hoviet	351 0 0

[Who will explain this?]

For extensions to the Roman Catholic Institution for Deaf and Dumb Boys, Calus, near Dublin. Mr. Charles Geoghegan, architect:—

Murphy	£3,625 0 0
Nolan	4,568 0 0
Hammond	4,361 0 0

For the erection of house and shop, Peckham-grove, Camberwell. Mr. J. Coe, architect:—

Richardson	£779 10 0
Turner	759 0 0
King & Sons	751 10 0
Morier	746 10 0
Smith	733 0 0

For various works to premises, 107, Lendenhall-street. Mr. W. Eyo, architect:—

Lowe	£928 0 0
Le T.	861 0 0
Brown & Robinson	847 0 0
Brass	846 0 0
Newman & Mason	816 0 0
King & Sons	694 0 0
Turner	639 0 0
Turner, jun.	630 0 0

For a villa residence at Harbledown, near Canterbury, for Mr. J. Callaway. Mr. M. C. W. Horne, architect:—

Langford & Way	£2,510 0 0
Macey	2,639 0 0
Gaskin & Godden	2,750 0 0
Wilson	2,498 0 0
Cosans, Brothers	2,345 0 0

For erecting New Southern Hospital, Liverpool, to contain 300 beds. Messrs. Culshaw & Summers, architects. Quantities supplied:—

Callie	£3,059 0 0
Farker & Son	29,500 0 0
Black & Readley	27,835 0 0
Burroughs & Son	27,546 0 0
Tomkinson	27,373 0 0
Hughes	27,200 0 0
Hugh & Co.	26,991 0 0
Holmes & Nicol	26,463 0 0
Jones & Son	26,123 0 0
Arnson	25,539 0 0
Nicholant & Ayr	25,700 0 0
Roma (recommended to the general committee for acceptance)	25,154 0 0

GOOD FRIDAY.

NOTICE.—"THE BUILDER," for the week ending MARCH 27th, will be published at TWO p.m. on THURSDAY, 25th inst. Advertisements for insertion in that Number must therefore reach the Office before THREE p.m. on WEDNESDAY, 24th.

TO SUBSCRIBERS.

The Publisher cannot be responsible for ORIGINAL TESTIMONIALS left at the Office in reply to Advertisements, and strongly recommends that COPIES ONLY should be sent.

NOTICE.—All Communications respecting Advertisements, Subscriptions, &c., should be addressed to "The Publisher of the Builder," No. 1, York-street, Covent Garden. All other Communications should be addressed to the "Editor," and NOT to the "Publisher."

BUENOS AYRES GOVERNMENT CERTIFICATE.—TRANSLATION.—We, the undersigned, at the request of Messrs. Jas. C. Thompson & Co., certify that the IRON SAFES of Messrs. CHUBB & SONS, London, of which these gentlemen are agents, were exposed for several hours to the fire that took place in the offices of the National Government on the evening of the 26th inst.; that in our presence they were easily opened with their respective keys; that the moneys and important documents they contained were found in perfect order; and that these safes are now in use in the National Treasury Office.—(Signed) J. M. DRAGO (Treasurer of the National Government), JOSE TOMAS ROJO, JUAN M. ALVAREZ. A true copy—A. M. BELL.—Buenos Ayres, July 31, 1867. CHUBB & SONS, makers to the Queen and the Bank of England, 57, St. Paul's-churchyard, London; 63, Cross-street, Manchester; 28, Lord-street, Liverpool; and Horsley-fields, Wolverhampton.

IMPROVED MACHINERY, combined with STEAM POWER, is employed by J. W. BENSON in the Manufacture of Church, Turret, Stable, and Tall-tale Clocks, Sun and Wind Dials, Perpetual Calendars, and every description of Clock and Watch Work. Architects, Builders, Committees, &c. can be promptly supplied with estimates. A descriptive Pamphlet on Church and other Clocks, post-free, 2d. J. W. BENSON, by special appointment, Watch and Clock Maker to His Royal Highness the Prince of Wales. Steam Factory for Clocks and Watches, 58 and 60, Ludgate-hill; Showrooms, 25, Old Bond-street, London.

The Builder.

VOL. XXVII.—No. 1364.



Something about Masons' Marks in Various Countries.*

IN early days I noticed the fact, now well known, but not so then, that the stones of many old churches bore peculiar marks, the work of the original builders; and, so long ago as 1841, I submitted a communication on the subject to the Society of Antiquaries. This, with a second memoir on the same subject, and transcripts of 158 of the marks from England, France, and Germany, was printed in the *Archæologia*, vol. xxx., p. 113. I believe I may take the credit, such as it is, of having first brought these signs under public observation, and for several years I never met any person who had independently noticed them. It is curious how long a thing may remain unseen until it has been pointed out. I remember the observation of an old French priest to whom I had shown the marks with which the walls of his church in Poitiers were literally strewn:—"I have walked through this church four times a day, twenty-eight times a week, for nearly forty years, and never noticed one of them; and now I cannot look anywhere but they fit into my eyes." Since that time I have made very large collections in various quarters, and when at a recent meeting of the Institute a memoir was presented by the Chevalier J. P. N. da Silva, "Sur la véritable signification des Signes qu'on voit gravés sur les anciens Monuments du Portugal," it occurred to me that some account of that memoir, with such additional matter concerning masons' marks generally as I had collected, might not be uninteresting. I am sorry I cannot carry out this intention completely, and as I should desire. The mass of matter in my hands is so large that I find it impossible to do more than bring together a few disjointed observations, and a selection from the marks in my possession. These are now before you, and range over many countries.†

In the great Pyramid of Gizeh many of the stones present symbols, either quarry marks or masons' marks, in red ochre, apparently made before the stones were placed. Some of these are published in Vyse's book. Masons' marks have been found, too, on ancient buildings in Lycia and Mesopotamia, and in various parts of India. In 1846 some marks were accidentally discovered in St. Mary's Church, Leicester (on removing the great west window), one of which is almost identical with a mark found by Colonel Vyse on the walls of Lady Arbuthnot's Chamber in the Great Pyramid.

No. 1 shows marks found in Campbell's Chamber at Gizeh.


The accompanying diagram represents the marks on stones recently discovered by Lieut.

FROM THE HARAM AREA JERUSALEM



Warren in an excavation at the south-east angle of the Haram area in Jerusalem. The H form, and the mark below it, and a cross + on an upper stone, are deeply cut in; the rest of the marks are in red paint.

No. 2 gives other marks from churches in the Holy Land,—Sehustiyeh (or Samaria), Bireh, Jerusalem, and elsewhere. These are unquestionable masons' marks of the Christian period, probably of the eleventh or twelfth century, (although I have no precise knowledge of the buildings from which they were taken), and, with two exceptions, have been widely used, as may be seen on reference to the other illustrations. These exceptions are, one at Samaria, somewhat like the Arabic numeral 3 (though it is not a numeral), and one at Kuryet el Enah, which is apparently the double of the last alluded to. The mark at Jerusalem like the broad arrow (the present mark of our own Govern-

ment)  occurs in St. Anselm's crypt (the earliest portion of), Canterbury Cathedral, in Furness Abbey, Bosworth Church, Lincoln Cathedral, and many other places.

Through the kindness of Miss Mary Eliza Rogers, I have obtained from the ruined buildings of deserted cities in the Bedouin-haunted districts beyond the river Jordan, a number of marks scratched on the stones (No. 1). Mr. E. T. Rogers, our Consul at Cairo, has copied many of these signs, and connects them with the Bedouin wanderers, who pitch their tents from time to time in the neighbourhood of these ruins. Each tribe has, he says, its distinctive mark; and tents and cloaks are embroidered, and camels are branded accordingly. Some of these forms, collected by Mr. Rogers from tents and camels, are like those on the ancient walls of which I have given representations; but I am inclined to consider the latter quarry or masons' marks.

In Price's "Journal of the British Embassy to Persia," with a Dissertation upon the antiquities of Persepolis (published by Kingsbury & Co., 1825), the author gives specimens of what he considers to be the Antediluvian character, and adds—"It is rather remarkable that signs resembling these should be used by stone masons, as distinguishing marks, in every part of the globe where I have had opportunities of observing; which signs, in all likelihood, have been used by stone-cutters ever since the confusion of tongues."—Vol. I., p. 32, of the Dissertation.

The trident-like mark on the stones of the wall in Pompeii is very curious (No. 3). Nearly every stone bears it. Dr. Barlow, who made the sketch for me, says, "The wall, if I remember rightly, is not very far distant from the Porta Romana, or the gate of Pompeii towards Rome. I have since drawn and measured much masonry of ancient structure, both in Greece and Italy, but have never noticed any marks on the stones like these, or indeed any marks at all."

No. 3 shows other marks from Pompeii, chiefly from the inner face of the town walls. With reference to marks found on these walls, there are half a dozen lines in the work on Pompeii, published by Chas. Knight, which may be worth quoting. The author says, "On many of the stones certain characters are found, intended, apparently, as directions to the workmen, which are said by M. Mazois to be either Oscan, or the

most ancient forms of the Greek alphabet." Various theories are propounded on this, very much antedating the build of the walls, which probably have not a very high antiquity. The characters are evidently masons' marks, carrying on the early forms which Mazois recognised. The Etruscan alphabet includes forms used as masons' marks to this day. So, too, the Lycian alphabet, as given by Sir Charles Fellows in his "Lycia," p. 442. Some of the letters will be found at No. 6. While speaking of Lycia, I may point to No. 5, which shows the marks on the stones of a Turkish ruin, called the Old Khan, not far from Adalia, on the road to the Gulelook Pass.* These marks are precisely similar to those found on Mediaeval buildings in other countries. Before quitting Italy, reference may be made to marks from the Doge's Palace, Venice (No. 4). These were found on the spandrels of the lower arcade (at the end nearest St. Mark's), usually dated about 1350.

No. 7 represents marks from some Roman altars found in England. The mark known as the Fylfot, seen on one now in Alnwick Castle, has been pointed to by Lord Brougham as denoting the hammer or mace of the Scandinavian god Thor. It is seen with Thor on various medals and on Runic monuments. It also occurs in the minster at Basle. With reference to the connexion of the Scandinavians with Italy, Sir William Betham ("Etruria Celioa") shows an Etruscan coin with this symbol on it. No. 7 includes also the cuttings, resembling masons' marks, which occasionally occur on the stones of the Roman wall in Northumberland (second century). Sometimes they consist of a single or double stroke; sometimes of a diagonal cross; sometimes a rectangular cross. The other marks which are represented are less frequently met with.† Search has been made on the Saxon portions of Monkwearmouth, Jarrow, Saumpton, Worth, and some other churches of that period, but no masons' marks were detected.

No. 8 shows a mark on a stone containing an Anglo-Saxon inscription, Aldborough Church, Holderness, Yorkshire.

- No. 9 gives marks from Kenilworth.
- | | | |
|-----|---|---|
| 10. | " | Sussex. |
| 11. | " | Lincoln Cathedral. |
| 12. | " | Leicester, Gaddesby, York Minster (early English basement, now in crypt). |
| 13. | " | Canterbury Cathedral (earliest, Anselm's crypt). |
| 14. | " | Haddon Hall. |

15. These marks, from the Church of St. Nicholas, Yarmouth, are from the stones of the pinnacles of the two outer turrets at the west front. The Rev. R. M. Musgrave, who sent them to me, says, "These pinnacles, erected about 1230, were taken down in consequence of being unsafe. The proportion of marked stones seems to be about one in four." As to the use of outlines of limbs and other objects of that kind, Mr. Musgrave suggests that they may be "referable to a lower class of labourers not entitled to use the more strictly masonic characters." I found the outline of a leg used as a mark in the spire tower of Strasburg Cathedral.

No. 16 shows some of the latest marks that I have met with in England on the face of stones. Goddard's Almshouses, Bray, 1625 to 1628; and Brambletye House, Sussex, 1631.

No. 17. Before dining with the Court of the Bricklayers' and Tylers' Company, some years ago, I was enabled by the then Master to glance through some of their old minute-books. In the year 1580, nearly all who attended and signed the book used a mark or initial, the name

* By George Golvin. Read at the Royal Institute of British Architects, March 1st.

† See pp. 245 and 246.


* Spratt & Forbes's Travels in Lycia, 1847. Vol. I., p. 227.

† See Dr. Bruce's Book on the Roman Wall.


being written at the side of it. I give a few of these characters; some of them are known masons' marks.

- No. 18. England: Yorkshire.
 19. Scotland: Glasgow Cathedral, crypt, 1175 to 1233; Zetland Isles.
 20. Ireland: St. Mary's, Youghal, thirteenth century.
 21. France: Strasburg Cathedral.
 22. St. Michael's, Dijon.
 23. Notre Dame, Paris; Danish Island, Bornholm.
 24. The Tyrol: Botzen.
 25. Switzerland: Cathedral, Lansanne; and Cathedral, Geneva (part eleventh century).
 26. Sweden: Upsala Cathedral.
 27. Germany: Cathedral, Münster; and St. Lambert's, Münster.
 28. Austria: St. Stephen's, Vienna.
 29. Spain: San Ysidoro, Leon; Santiago de Compostella.
 30 & 31. Spain: Sta. Maria, Benavente, Segovia.
 32. Portugal: Church of St. Francis, Santarem.
 33. Portugal: St. Cross, Coimbra.
 34. Convent of Batalha.

I have drawn up with more pains, perhaps, than the end repays, lists of various places in different countries whereat the same mark, selecting those most widely used, may be found. I must content myself, however, with placing only a few of them before you.

 The hour-glass form has been found on stones on the site of Carthage. Postern, Hastings Castle, eleventh century. Cathedral, Geneva, eleventh and twelfth centuries. Lansanne Cathedral, eleventh to thirteenth century. Turkish ruin, "The Old Khan," not far from Adalia, in Lycia. Kirkstall Abbey, Roche Abbey, Furness Abbey (twelfth century, part). Gloucester Cathedral (inside nave). Malmesbury Abbey Church. The Church du Bon Dieu, Setubal, Portugal, 1489. Church of St. Francois, Santarem, Portugal, 1242. Lincoln Cathedral, thirteenth century. Kenilworth Gateway. York Cathedral, thirteenth century. Canterbury Cathedral, columns in nave. Salamanca, Old Cathedral (Spain), before twelfth century. Cathedral, Lérida, Spain, fourteenth century. Manresa Church, Spain, screen round coro, fifteenth century.

The **N** form, in Anselm's crypt, Canterbury Cathedral, end of the eleventh century. North aisle of nave, ditto. Church, Samaria, Holy Land. Norman Tower, Bury St. Edmunds. Crypt, York Minster. St. Mary's Abbey, York. Chapter House, twelfth century. Maison Dieu Brechin, Scotland, founded 1264. St. Pierre, Poitiers. Cathedral, Geneva, eleventh and twelfth centuries. Old Cathedral, Salamanca, Spain, before twelfth century. Kirkstall Abbey, Roche Abbey, twelfth century. Lincoln Cathedral, twelfth century. Fountains Abbey, twelfth century. Strasburg Cathedral, twelfth century part. Leon Cathedral, Spain, thirteenth century. Cathedral at Santiago de Compostella, Spain, before 1200. Eriburg Cathedral, fourteenth century. Sir John de Creke's Monastery, Westley Waterless, Cambridgeshire, about 1325.


 The pentacle, at Kuryet el Enab, Holy Land. Church in Jerusalem. Malmesbury Abbey Church. Furness Abbey (twelfth century part, and thirteenth century). Dunstable Church (twelfth century). Steyning Church, Sussex, twelfth century. (A suit of armour in the Museum at Turin is powdered with this sign, coronet and letter F.) Cathedral, Geneva, eleventh and twelfth centuries. Gloucester Cathedral, eleventh and fourteenth centuries. Lincoln Cathedral, choir, twelfth century. St. Mary's Abbey, York (north aisle, nave), 1270. Ditto, Chapter House, eleventh century. Fountains Abbey. Strasburg Cathedral, twelfth century (portion). York Cathedral, twelfth and thirteenth centuries. Glasgow Cathedral. Brechin, Cathedral Tower, Scotland (supposed 1354 to 1373). Canterbury Cathedral, north transept, choir. Church of San Ysidoro, Leon, Spain, choir, fifteenth century. Santiago de Compostella Cathedral, Spain, before 1200. Lérida Cathedral, Spain, fourteenth century. (On a Saxon fibula, found at Harnham-hill, near Salisbury, date supposed 646 to 672.)

The topped **A** at Church in Samaria, Holy Land. Gloucester Cathedral, eleventh and twelfth centuries; also on later part. Fountains Abbey, twelfth century. York Cathedral, twelfth and thirteenth centuries. Church of St. Martin, Cintra, Portugal, 1147. Church of

St. Croix, Coimbra, Portugal, 1238. Church of the Convent of Belem, Lisbon, 1500. Cathedral, Leon, Spain, thirteenth century. Lérida Cathedral, Spain, fourteenth century. Cathedral, Segovia, Spain, fifteenth and sixteenth centuries.

The horizontal **W** form at—Canterbury Cathedral, north transept, choir. Fountains Abbey, Chapter House, 1165. Gloucester Cathedral, inside nave. St. Pierre Poitiers, outside. Freiro da Espada, Cintra, Portugal, 1214. The Convent at Thomas, Portugal, 1323. Several churches in Spain.

The **W** at—Church Samaria, Holy Land. Cathedral, Münster, Germany (south transept), 1500. Glasgow Cathedral. Canterbury Cathedral. Kenilworth, Caesar's Tower, York Cathedral, choir. Fountains Abbey, twelfth and fifteenth centuries. Bolton Abbey. Lincoln Cathedral, twelfth century. Roche Abbey. Soulbury Church, near Woburn (perpendicular nave).

The cross with stopped ends, at Furness Abbey, twelfth century.  Gloucester Cathedral, eleventh and fourteenth centuries. Fountains Abbey, cloisters, thirteenth century, and Chapter House, twelfth century. York Cathedral, twelfth and thirteenth centuries. Church du Bon Dieu, Setubal, Portugal, 1489. Freiro de Espada, Cintra, Portugal, 1214.

The length of the marks, it may be as well to mention, ranges from 1 in. to 5 in. or 6 in. The greater number, however, are from 2 in. to 3 in. long.

The majority of the marks I have given from Spain are taken from Mr. Street's "Account of Gothic Architecture in Spain." Speaking of the ancient buildings there, the author says:—"The masons seem to have worked together in large bodies, and the walls are marked in all directions with the signs which, then as now, distinguished the work of each mason from that of his neighbour; but I have been unable (save in one or two cases) to detect the mark of the same mason in more than one work; and from this it would seem to be probable that the masons were stationary rather than nomadic in their habits, a deduction which is fortified by the difference of general character which may, I think, be detected between the groups of marks in different buildings. Occasionally the number of men employed on one building seems to have been unusually large, and it is clear, therefore, that there were great numbers of masons in the country. In the small church of Sta. Maria, Benavente, there are the marks of at least 31 masons on the eastern wall; as many as 35 were at work on the lower part of the steeple at Lérida; whilst in one portion of Santiago Cathedral there appears to have been as many as 60."

Looking through the marks given in Mr. Street's excellent book, I find the same mark repeated a little oftener than might perhaps be inferred from the writer's observation. Thus the universal **N** form occurs in Lérida Cathedral, Leon Cathedral, the Cathedral of Santiago de Compostella, and the old Cathedral of Salamanca. The pentacle appears in Lérida Cathedral, the Cathedral of Santiago de Compostella, and the Church of San Ysidora at Leon. The hour-glass form is in San Ysidora, Leon; Lérida Cathedral, and elsewhere. The same form, without the bottom line, occurs in Lérida Cathedral, Cathedral of Santiago de Compostella, San Marcos at Salamanca, Tarragona Cathedral, Segovia Cathedral. The horizontal **W** form is in Lérida Cathedral and Segovia Cathedral. The topped **A** is in Lérida Cathedral, and the Cathedral of Segovia, and so with some others. I mention my impression in this respect, not by any means as seeking to contradict Mr. Street, but because the inference drawn, namely, that "the masons were stationary rather than nomadic in their habits" is of consequence, and it is desirable that those who may have to discuss it should be agreed as to the premises.

The marks from Portugal, to which reference has been made, are chiefly taken from the Chev. da Silva's Memoir, to which I will now briefly allude. It gives 508 marks from ancient buildings in Portugal, besides a supplementary plate containing fourteen marks from the great Aqueduct of Lisbon, built in 1738, and twenty-two "ancient Masonic Hieroglyphics" where used is not stated. They are, in fact, nothing more than a "secret alphabet" of our school days; and so transparent that no one would think of trusting a secret to it. The marks in Portugal are feebler and coarser than those of some other countries, but include many of the latter, as I have already pointed out, such as the

hour-glass form, the topped **A**, the **N** form, and many others. The earliest given are dated A.D. 1102.

In my second letter to the Society of Antiquaries on the subject, I said, "The marks, of which we are speaking, it can perhaps hardly be doubted, were made chiefly to distinguish the work of different individuals. At the present time the man who works a stone (being different from the man who sets it) makes his mark on the bed or other internal face of it, so that it may be identified. The fact, however, that in the ancient buildings it is only a certain number of the stones which bear symbols, and that the marks found in different countries (although the variety is great) are in many cases identical, and in all have a singular accordance in character, seems to show that the men who employed them did so by system, and that the system, if not the same, was closely analogous in one country to that of the others."

In Portugal, however, going farther than this, it would seem to have been urged that these signs were symbolical, and were used as means of recognition by the Freemasons, who, as some believe, travelled over central Europe exercising their art. The principal object of the Chevalier's Memoir is to show that the opinion of those who have believed that these marks have a Masonic signification, cannot, for a moment be admitted. Although English archaeologists may not need any argument to convince them that the marks are not symbolical, they may be willing to hear what he has to say on the point.

"Why should the Freemasons," he writes, "who travelled to execute their labours in a body, each accompanied by his family, have placed these signs upon the stones, since each one knew the other for his partner? For none but those initiated or affiliated to their lodges, were permitted to help in the construction of those beautiful edifices; thus enabling them to protect each other reciprocally as loyal brothers, and above all to keep amongst themselves the secrets of their art. Why then show these marks to all the world, if (as it was said) they were simply used with the intention of making themselves known as Freemasons, when every workman knew the other as a brother? And, besides, would they have been permitted to make public these signs, if they were really those of the order into which they had been admitted? Again, if these signs were really characteristic of the Masonic order, they ought, without doubt, to be identical on all buildings, because the hieroglyphic alphabet, or scale, being composed of a limited number of figures, and masonry having at the commencement but a single tier, the sign would have been reserved for the most urgent cases for recognition or correspondence, and never employed needlessly or exposed to the observation of the profane."

"An attentive consideration of these objections," the writer proceeds, "and the great diversity of the signs seem to us to afford tolerably convincing proof that they are by no means symbolical, and can have no perfect meaning; for, in order to attain this, it would have been necessary to use them with something like order, whilst in none of the buildings that we have examined, and of which we annex the marks, has this been observed. On the contrary, the marks are found on stones at various heights, totally void of connexion one with another, and many are placed in inverted positions, although similar in form."

After speaking of the religious feeling that prevailed during the Middle Ages, and the spirit that animated the builders, the writer goes on to say:—

"In order to execute such important works, it was necessary to have large numbers of workmen, the more so as similar buildings were in course of construction in more than one country, and even at the same time, for the execution of which preference was given to the cleverest workmen, and these, being always of the Society of Freemasons, were much sought after everywhere.

Although the number of adepts on the spot was considerable, still more were needed to complete the numerous structures then in course of execution, and they were therefore summoned from all parts to work at the buildings in Portugal before and during the construction of the church and convent of Batalha.

There is still another and stronger reason to confirm the opinion we are about to give on this question; which is, that the works progressed but slowly, not only on account of the enormous size of the edifices, but more especially because

cut stones of small dimensions were employed, and all buildings being constructed with stones faced on every side, the hand labour was greatly increased; the only means available to avoid this inconvenience, and hasten the works, and at the same time to benefit the workmen, was to make them cut the stones as *piecework*, according to dimensions given and designs drawn by the architect. To enable payments to be made to so large a number of workmen without mistake, to know exactly those who had done the various duties assigned to them, the workmen shaped their locks one after another, and, to avoid confusion in their work, were in the habit of marking each block with a given sign as representing their signaturæ, so as to show how much was due to them. This, in our opinion, is the reason why we find so many different marks, not only on the same building, but on others which exist in different provinces in Portugal, and why they are met with in different parts of the building.

"The use of these signs," continues M. da Silva, "passed from father to son; and as it was nasal (then, as in many families of the present day) for sons to follow the same profession as their fathers, from the similarity of marks seen on buildings in the provinces of Portugal, we may learn that the stone-cutters of a certain locality took part in the construction of other buildings in the same style in different places, and by the date of the construction we may even find out where the workman was first employed."

"Our supposition on this point carries us still farther, for it shows us how many workmen of the same family,—that is to say, hearing the same surname,—have worked together on the same building at the same time. To find this out, it is sufficient to observe, the second mark, added to the special sign used by them, which will always be the same for the whole family; those marks are usually a zero 0, a triangle Δ, a disc O, or a small +."

In the examples given from Portugal, this second mark is chiefly a circle (see 32 and 33); so it is also in Spain. In England, I have generally found the N form and the acute angle < so used (see No. 13, Canterbury; also Dijon, 22). My own opinion, expressed long ago, is, that the second mark probably belonged to the overseer; and I see no reason to change it; although this, like other points in connexion with the marks, is by no means certain. I have met with four stones in one wall, nearly close together, each bearing two marks, and the whole eight marks different. In the south transept of York Cathedral there is a stone with three marks on it, and so there is in Strasburg Cathedral (see 21).

M. da Silva finally asks how it can be that these signs are those of Freemasons, when we find them on the stones of several monuments erected before the organization of these fraternities. Here, however, he assumes two things; first, that the marks found on the earliest buildings are precisely similar in description to those of the Middle Ages; and, secondly, that the date of the initial organization of such fraternities is really known. Moreover, he leaves out of consideration the probability, or, I should rather say, the fact, that the guilds adopted existing forms and symbols. Without considering the marks symbolical, we may yet believe they owe their wide diffusion to the existence of associated guilds. The general similarity which they present all over Europe from, at any rate, the eleventh century to the sixteenth, and indeed to the present day, point to a common origin and continued transmission.

M. da Silva fully admits the existence of the building guilds, and his quotations go to affirm that they were maintained as an opposition to the monastic associations, which were depositaries of old theological traditions, and could he met only by other associations organized with sufficient strength to endure, and in time to become themselves guardians of traditions, and with enough mystery to avoid rousing dangerous resistance.

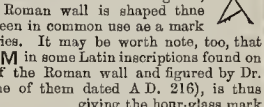
"Towards the end of the twelfth century, when their numbers had become considerable, a special corporation of intelligent architects, stone-cutters, and labourers was instituted, who, uniting together, formed a secular body, which acknowledged royal authority alone. Notwithstanding the absence of written proofs and historical documents, it is probable that societies of lay builders existed in Germany as far back as the thirteenth century. In the year 1275, the Emperor Rodolph granted a special charter to builders established in Strasburg, and in 1278,

the Pope Nicholas III, delivered them a brief of indulgence, renewed from time to time by his successors.*"

The precedence of the Freemasons of Strasburg came to be recognized by neighbouring states, and at a meeting of various lodges held in itation in 1459, the head of the lodge at the cathedral was acknowledged the head of the Freemasons in Germany. The statutes of this date of the Strasburg Lodge, from which lodges branched to many places, have been published. Two boards whereon are delineated the marks of the masons who were engaged are still preserved, or were so a few years ago, in the cathedral.

As to the earlier guilds, in classic countries, of which there are traces, I cannot now pretend to speak; nor will I do more, with reference to our own country, than briefly remind you that a College of Masons is mentioned in a Latin dedicatory inscription, dating from about A.D. 52, and which was found in Chichester, in 1725. A hull was issued prior to 1200, giving authority to heads of churches to build churches, and attaching to them a certain number of "liber mactores," or freemasons, to direct and execute the ornamental parts of the structure.†

Much might be, and something has been written on the actual origin of many of the marks. I have already pointed to some of them in the Lycian alphabet. Others are apparently Runic letters. In the later works several of the Roman capitals are used, and may or may not be the initial letter of the user's name. The alpha on some Greek altars found in England, near the Roman wall is shaped thus Δ and has been in common use as a mark for centuries. It may be worth note, too, that the letter M in some Latin inscriptions found on the site of the Roman wall and figured by Dr. Bruce (one of them dated A.D. 216), is thus shaped



giving the hour-glass mark when set upright. The two side lines in \times the letter are curved instead of straight, and I have seen the mark in more places than one (Malmshury Abbey Church, for example, as figured by me in the *Archæologia*), with the ends thus rounded.

The hour-glass form, however, has been found on stones much more ancient than the inscription referred to. I simply mention the similarity. The hexagonal, or double triangle, was a mystic mark in India centuries ago. The N formed symbol appears on the coins of the Artarathes, a series of Persian kings who lived before Christ; also on a coin of Amyntas, king of Galatia in the time of Strabo, 50 years B.C. The topped A, as I have shown, has been very widely used. Dr. Clarke mentions that in the walls of the Castle at Paris, butt ends of columns are seen marked with the letter A near the Lewis hole, and suggests that it may be a mark to adjust by, or the initial of the architect, not to be discovered until the building was in ruins.‡

Mr. J. E. Dove, in a series of papers published in the *Builder* some time ago,§ attributed recondite meanings originally to many of the forms used as marks, and supported his views with erudition and ingenuity. Some of them were in use amongst the Egyptians, and then, doubtless, had signification. The circle and triangle, later taken to symbolise eternity and the Trinity, had earlier a different significance. The acute angle or V form, as used by the Egyptians, he found reason to believe was a feminine symbol, and that the same form reversed A was a male symbol. Into this part of the inquiry, however, I am not now entering. Whatever may have been the original signification of the forms adopted, I find no evidence to lead me to believe they were viewed by masons other than as signatures, given to them, in some cases, on joining a lodge, or otherwise regulated. The Scottish lodges gave marks till very recently, if they do not do so now. In St. Nivina's Lodge, at Brechin, every member had to register his mark in a book kept for the purpose, and he could not change it without certain formalities.

I must now end. The subject is probably more curious than useful; but I hope you will consider it sufficiently interesting to justify me in again bringing it before you. In my first communication on the matter to the Society of Antiquaries, and afterwards to the Institute, I ventured to express my belief that "no circumstance

which promises to throw even the smallest additional light on the early history of these wonderful men to whom we are indebted for so many magnificent buildings can be deemed insignificant or unworthy of consideration," and I think so still.

THE LATER DISCOVERIES AT JERUSALEM.

THERE have been but few instances of lost cities so remarkable as that of the loss of Jerusalem. A city of which we have the most minute accounts from the earliest times of its history till the period of its capture by the Romans, and the size, magnificence, and beauty of which are familiar to all, has disappeared from the face of the earth, and left nothing to mark its site but a collection of gigantic mounds, on which a small, ill-built, and irregular modern town is perched.

Although the destruction which the city underwent was in its completeness and vindictiveness unparalleled in the history of the world, and, indeed, almost incredible, still the gigantic proportions of the masonry were such that it was only where the works were raised above the surface that they could be in any way disturbed, at a time when blasting and mines were unknown, and when a clumsy hammering with the huge rams in use was the greatest force to be resisted.

Thus, the appearance which we should naturally have expected the ruins of Jerusalem to have presented would have resembled that of the ruined cities of Greece, or of Central America, though there might have been less remaining of buildings, still standing, on their original sites. We should have expected to find the foundations of walls, towers, gates, palaces, and especially of the Temple, while gigantic piles of stones tumbled in heaps at the spots where they once stood, broken columns, friezes, and pediments, would show the characteristics of the architecture of the times, and enable us to restore, at least, the outline of the city; and not only above the ground would such ruins exist, but the entrances would be found to that extensive system of subterranean passages, and the temple and city, which was the refuge of so many after the taking by Titus, and in the time of Hadrian's oppression of the Jews.

Of the condition in which the city was left by the Romans we have a full description from Josephus; and although he states that "the buildings were razed to the foundations, so that no man should know that any had inhabited it," still, his general description gives the same impression that would naturally have been expected, and of the fortification he makes Titus to have said, that they were such, that without the special aid of God no human efforts could have effected their destruction.

From the doings of Time till the time of Constantine but little is known of the history of the city; but after that time descriptions are numerous and detailed.

In the fourth century we have Eusebius; in the seventh, Saint Arculphus; in the twelfth and later centuries, the Bordeaux Pilgrim, John of Wurtzburg, Widebraud of Oldenberg, Sæwulf, Antony of Piacenza, Guibert of Nogent, William of Tyre, Foucher of Chartres, James of Vitry, Albert of Aix, and a host of devout anonymous pilgrims who visited and described the Holy City. It is they, or at least their informers, who have to answer for the impenetrable forest of ill-founded and even absurd traditions through which later explorers have had to cut their way to the truth.

There is, perhaps, no instance in which the theories and prejudices of early writers have done so much to hinder and divert the progress of discovery as has been the case at Jerusalem. These writers laying down the true sites of ancient remains at spots where not a vestige of them appeared, according, it would seem, to their own fancies, or on the not more trustworthy authority of the monks and inhabitants of the then existing Jerusalem, content to take the condition of the city as it was in their time as having been the only one it ever knew, and being alike ignorant of history and architecture, conjured up for themselves and their successors a false notion of ancient Jerusalem, which being improved on by later writers according to theories of their own, has been generally received on all hands until quite of late years. Commenced in the time of Hadrian; added to and enlarged by Constantine, Julian, and Justinian; fortified and restored by the Crusaders and the Christian kings; and still more beautified by the

* M. Daniel Ramée, "Histoire Générale de l'Architecture," quoted by M. da Silva.
 † Sir R. Westmacott, "Archæological Journal," vol. III, p. 189.
 ‡ Travels, part 2, sec. 2, ch. 10.
 § See vol. for 1863, April 4th, April 18th, June 6th, and July 11th.

noble works of the Moslems, which in their turn have been patched and repaired by the Arab-Turks, Franks, and Jews, modern Jerusalem with all its traditions, Christian and Mahomedan, has risen over the Jerusalem of the Jews, which, in consequence of the bigoted ignorance of earlier writers, it was fully believed to represent.

The Medieval chroniclers were followed by later travellers, who found the sites (though they were principally those interesting in the Christian history of the city) ready fixed, and accepted them as the true ones. Among these we may notice Sir John Maundeville, Irvy and Mangles, Richardson, Pococke, Brown, and Buckingham. These were in turn succeeded by those who established theories of their own, but took little or no trouble in verifying them; and these again are at last followed by real explorers, who are content to leave theory on one side, and to endeavor to restore, by excavation or otherwise, sufficient relics of the ancient city to make its restoration really possible.

Of the work of those who have preceded Lieut. Warren a *resumé* has been before given in these columns,* and it is needless to do more than mention them here. Tipping, Pierotti, and Barclay, have explored what remained above ground of the Temple; Mr. Catherwood furnished the first correct plan of the Haram; and M. De Vogüé describes what remains in the city itself, above the surface of the ground. But all these investigations were superficial, and it is to the Palestine Exploration Committee that we are indebted, for the opening up of an entirely new branch of the investigation, and the true rediscovery of the lost city buried under modern Jerusalem.

The great scarcity of the superficial remains which the careful investigations of many authors succeeded in discovering had given rise to a supposition that very little of the old city would be found, and indeed it was apparently supposed that not only was Jerusalem razed to the ground, but also that it had been cleared away from its site, and that no vestiges of it had been left.

A fact which has never been touched perhaps be considered to point to the existence beneath the surface of the foundations of the city, and this is that, whilst as far as can be compared with existing circumstances, the description given by Josephus of the masonry of the city, and of the disposition of the valleys, pools, and streams, is most correct and free from exaggeration; yet the appearance and comparative heights of the hills, and especially the height of the temple wall is totally different, and the last specially has often been quoted as showing the unreliability of Josephus's statements, whereas it might have pointed to the fact that only a portion of the temple wall was apparent above the surface, a fact which is now ascertained by Lieut. Warren.

The few and disconnected letters which have appeared from time to time in the papers have failed to give any idea of the magnitude or importance of the discoveries now made, and even the reports issued to the subscribers to the Palestine Exploration Society have been little noticed by the public.

The success that has attended these efforts, which have been cramped by want of time, money, and materials, as well as by opposition, passive or even active, of the authorities and inhabitants of the town, is considerable, and is the result of untiring energy and great skill, deserving to be better seconded than they have as yet been.

Lieut. Warren arrived at Jerusalem in the middle of February, 1867, and his work has been reported to the October of the same year by himself in his report, and up to February, 1869, in his letters.

The shafts sunk by his direction may be summed up as below.

For the investigation of the Temple,—

1. The south wall:—
 - A. South-east angle.
 - B. South-west angle.
 - C. Single gate (so called by Lieut. Warren), two shafts.
 - D. Between El Aksah and the Triple gate.
2. On the east wall:—
 - A. Gallery between south-east corner and Kedron, three shafts.
 - B. Golden gateway, 100 ft. to east of it.

For the investigation of the remainder of the city:—

1. Damascus gate, three shafts.

2. Marietan or Hospital of St. John, three shafts.

3. The Pool of the Virgin.
4. Shafts in the Tyropean, six.
5. Wall on Ophel, three shafts.
6. Ancient aqueduct.
7. Rock cleared at Siloam, stopped for want of wood.
8. Excavations at the Pool of Bethesda.

These are arranged in order of interest and importance, and not according to the time of their execution.

The first excavation was at the south-east corner of the Haram enclosure, a spot familiar to all who know Jerusalem, remarkable for the size of the stones in the wall, and the height of the same, which is about 70 ft. above the present surface.

The wall was first bared to a depth of 20 ft. below the present level, when the work, which was close to the wall, was stopped by the Pacha. The stones here found were small compared with the largest above ground. A second shaft was then commenced, 40 ft. to the south of the Haram, at the south-east corner, and a wall was struck, and a shaft driven 53 ft. Thus, in endeavouring to drive a gallery northward to the south-east corner, a wall was found running south from the Haram, but not flush with it, being set back 12½ ft. Further, a wall parallel to the south Haram wall, 15 ft. south of it, 4 ft. thick, was discovered with large stones, and had to be mined through. On reaching the Haram wall, large stones, rebated, and similar to those above the surface, were found, the faces being, however, left rusticated, and not dressed. The course of the wall joining the Temple will be described later.

In October another shaft was begun, 5 ft. south-east of the south-east corner, to bare the east face of the Temple wall, and of that joining it. This struck on the top of the wall of Ophel (that is the wall running south from the Temple) which was found to terminate within 5 ft. of the south Temple wall, but no signs of any gate were found, the wall simply abutting on the Haram.

The result is, therefore, the discovery of the true surface of the rock on which the Temple wall stands here, at a depth of 90 ft. below the present surface, or 133 ft. below the interior level of the platform of the Haram.

This discovery, when coupled with that of the true bed of the Kedron (not yet finished in a satisfactory manner) will at once vindicate Josephus from the charge of exaggeration in describing the dizzy height from the top of the southern cloister to the bottom of the Kedron valley; for, the wall being 133 ft. to the level of the floor of this cloister, which was according to the account in the "Antiquities," 90 ft. in height, and the present surface of the Kedron being more than 100 ft. below the base of the wall as now discovered, it requires only about 100 ft. (the depth of the bottom, according to Lieut. Warren, below the present surface) to make a total of 450 ft., or the greatest estimation of the height of 300 cubits given by Josephus.

The discovery at the opposite end of the south wall is hardly less interesting, though it does not clinch any fact as the other does. A shaft was sunk in September, 1867, about 40 ft. from the corner to a depth of 18 ft. At 12 ft. a rough pavement was found, the stones of the Haram proved to be like those above, but no rebating was found on them. This excavation was continued in October, and proved productive of important results. The depth was increased to 45 ft. without reaching rock, and the wall was exposed to its whole height, the pavement was then found to consist of stone about 1 ft. square, and polished by wear. Below the pavement was a concrete of stone, bricks, and mortar (16 ft.); beneath this, loose stone or shingles (5 ft.); then large stones 3 ft. by 2 ft., and a rubble wall running north and south, and abutting on the Haram.

The appearance of the whole Haram wall, when thus cleared, so as to make its total height more than 100 ft., was most interesting. The lower courses of stonework were rusticated, but those above are finished on the face, though the uppermost courses are much worn. The rebating is about 4 in. to 6 in. wide, and set back about 3 in. in the upper or dressed stones, and 18 in. in those not dressed. The joints are beautifully worked, and hardly visible.

The work was continued by further sinking of the shaft to a depth of 79 ft., when the ground gave way, and a ledge remaining, the workmen looked down into a dark abyss of unknown depth.

It was, however, only a depth of 6 ft., and at the bottom was a passage running north and south, 4 ft. high and 8 ft. wide. It was of rubble, with flat stones at the top, instead of arches. The mud made it impossible to explore this far; but, under the impression that it might have been the examining passage of the Temple aqueduct, Lieut. Warren caused the floor to be removed.

The foundation of the wall at the south-west corner is thus ascertained to be about 280 ft.

The gallery was explored for 380 ft., where a branch going east and west was found; but here the want of materials, and the mud, stopped the prosecution of the work.

The Single Gate, as Lieut. Warren has called it, though this name has never been given to a half-hidden gate on the west, discovered by Dr. Barclay, is situated at a distance of 83 ft. from the south-east corner of the south wall.

A complication in the investigation of this part of the wall exists in the appearance, above the level of the vaults discovered by Lieut. Warren, of a large series of vaults which have been, till of late, supposed ancient, and were known as the "Stables of Solomon." These are supported on piers of rebated stone, but only one face of each stone is properly rebated, the rest being rusticated; and there can be little doubt that these vaults, which occupy a space of about 12,000 square feet, were built by the Saracens from the stones of the east wall after a part of it had been destroyed by earthquake in the time of the building of the Kubbet es Saerah.

The first shaft was begun in September, at a distance of 37 ft. from the wall, and driven to a depth of 22 ft. (for the last 8 ft. through the kind of shingle formed by the disintegration of the ancient masonry, which is found in all parts of the excavations, and which runs, as Lieut. Warren informs us, like water) when the top stones of a supposed passage were found. This shaft was soon filled up, the supposed top being found to rest on pebbles, and the stones to be rebated on the lower side while a wall existed to the east. In October the whole wall was driven, the few frames so long waited for having arrived; it was 14 ft. to the south, and sunk upwards of 30 ft., at first through rubbish and stones which had to be broken, when the shingle began immediately to run. Lower down a firm soil is found, and finally, a letter on the 17th of the month announces the discovery of the entrance into a series of vaults under the stables of Solomon. These probably have some connexion with the Cradle of Christ, a chamber described by M. De Vogüé at the south-east corner. The shaft had been covered up for some time, owing to the illness of the Lieutenant, and on being reopened after several accidents a passage was found running north, directly at right angles to the line of the wall. It is 3 ft. wide at its top, which is 13 ft. below the present surface of the ground; the floor has not been reached as yet, but there are, according to Lieut. Warren, two entrances, one at a depth of 25 ft. from the surface, the other at a depth of 16 ft. or 17 ft., and as the lowest of these two may be part of the real entrance, it is not improbable that the floor of the passage may be at the level at which the rock was found, namely, 30 ft. below the present surface. The interior is filled with rubbish, and is at present only about 5 ft. or 6 ft. high, but may, as is then shown, be from 12 ft. to 18 ft. The passage is choked up at the further end, and was explored to a distance of 70 ft.

At a distance of 45 ft. from the entrance is another passage unexplored running east, seeming to point to a connexion with the Cradle of Christ before mentioned.

The masonry of this passage is of the first order of Megalithic masonry, with stones upwards of 15 ft. in length, beautifully worked, and with the characteristic rebating. The roof is most interesting, consisting of large stones, many of which are rebated and laid flat across the passage, a construction similar to the flat lintels on some of the gates discovered above the surface of the ground, and to those of Mycenæ and Etruria, as also to the passage near the south-west corner. The upper course of stones in the wall is 4 ft. in height, and a small channel for water runs on each side of the passage at this height, made of dark cement, and projecting from the wall. At a distance of 6 ft. or 7 ft. within the wall, a check 10 in. cube is cut in the roof, and a mark made apparently by the grinding of a metal door, 13 in. swing, is visible. The passage runs concentric with one of the colonnades of the vaults above.

The next point explored is between El Aksah and the Triple gate,—the entrance to the stables

* See vol. xxvii, p. 105.

of Solomon,—here, however, the shaft has brought to light nothing of importance, although the rock is found immediately beneath the surface.

The excavations on the east wall are not of equal importance as yet, though they tend to clear up one of the most disputed points in the topography of Jerusalem, namely, the appearance of the eastern side of the city, and the existence or non-existence of a stream in the Kedron valley, now dry, and supposed by Robinson and other writers never to have been otherwise.

It has been previously noticed that the Kedron is supposed by Lieut. Warren, to have originally run upwards of 100 ft. below its present level. In order to ascertain this, and following out the indication given by the sound of running water heard beneath the surface at several points, three shafts were sunk near the south-east corner of the Haram wall, and one 100 ft. east of the Golden Gate, an entrance of the time of Julian, about two-thirds of the length of the east wall from the southern corner. The galleries at the south-east corner were driven under great difficulties, with little result. They were all sunk in the early part of 1867. The first was closed, in consequence of the danger caused by the running of the shingle, after being driven at a depth of 70 ft. The second was an oblique gallery at an angle of 60° (the shingle lying at 30° natural level), it only reached a length of 14 ft. The third was a perpendicular shaft not connected with the southern shaft as the first gallery was. This was sunk about 14 ft., but was again stopped by the running shingle.

Having failed to find rock in this part of the valley, the Golden Gateway shaft was next explored; though in November, 1867, a shaft was again sunk, 40 ft. deep, 70 ft. west of the present bed of the Kedron, and rock found, thus determining the slope of the valley here to be upwards of 30°. At this second point a shaft was sunk 27 ft. On first starting some large stones were found, and the shaft, unless closed for want of money, is still being driven to find the river bed.

On the west wall a shaft was attempted, at the arch known as Wilson's Arch,—a second bridge connecting the city and Temple, of which little is known, but which should be thoroughly investigated, as being a place most likely to yield discoveries. This was closed by the interference of the authorities.

Such, then, are the discoveries and explorations made on the Temple itself, and the results to be gathered from them are interesting. They show that the height of the temple wall was more than twice its present height at the south-east and south-west corners, and further that there was a natural slope of the ground down from the centre of the south wall, while four passages led from the priests' quarter to the vaults of the Temple, as mentioned in the Talmud, these being found at the level of the rock—1st, near the south-west corner; 2nd, at the Double gate, now shown to rest at the level of the rocky surface; 3rd, the so-called Triple gate, near the south-east corner; 4th, at the Single gate just described. Further, the existence of a deep valley on the east and west is proved, and the fact that the upper courses of masonry are still *in situ*, and are not, as some have supposed, the patchwork of later builders using the old materials, is clearly proved.

The discoveries in the city itself are quite as interesting, and have been more numerous; for though Lieut. Warren complains that in some places nothing but a confused mass of intersecting walls is found, still this and the discovery of a paved street in one part of the city only seem the more to point to the existence of the old under the modern Jerusalem. Of this, however, in our next.

SOMETHING ABOUT MELROSE.

MELROSE, as we have before now said, is one of the loveliest valleys of the Tweed. We have also explained that this quality is due, next to the value it derives from the beautiful river, to its curious geological structure. In point of fact, it is composed of the basin of an ancient lake, timbered with fine oaks and silver birches, with the River Tweed, now sadly polluted, and at the time of our visit much diminished in volume, flowing in its own placid and meandering way through its winding channel. Supposing the traveller to get his first view from the south, as he traverses the ridge, or rather the south-eastern skirt, of the Eildon Hills, crossing

the Bowden-burn, and passing under the land arches of the splendid railway viaduct, he will come suddenly upon a panorama such as we have seldom seen equalled. The grey ruins of the fine old abbey embowered in beautiful foliage, the noble sweep of the river, the spires of the parish churches, the undulating ground, the picturesque-looking villas in the suburbs, and, lastly, the irregular outlines of the ancient town itself, constitute a landscape which every painter of genius, from Turner to D. O. Hill, has loved to paint, and every poet from Scott to Leyden has loved to sing. One ceases, indeed, to be astonished at the wonderful web of enchantment which the great northern minstrel has contrived to throw over the district whenever we come in full sight of the valley of Melrose.

Such a romantic district has been the means of drawing together some of the oldest aristocracy of Scotland, and of evolving their highest efforts with regard to the architecture and embellishment of their country seats. At the foot of the southern slope of the Eildon Hills, for example, stands Eildon Hall, a large and rather heavy specimen of Scotch Baronial, the newly-acquired residence of Lord Henry Scott, son of his Grace the Duke of Buccleuch, who is of course the feudal superior of the whole country side. Eildon Hall was long the seat of the Honourable Major Baillie. Upon the slopes of the north-eastern hill, and nearest the town of Melrose, is a large and tasteful specimen of a country seat, the residence of Lady Russell. Sir George Leith has a very neat cottage at Drygrange; and, in fact, there are more of the ancient and hereditary aristocracy of Scotland domiciled in this beautiful neighbourhood than in any equal area we can call to memory in the whole of Scotland. Most of the architectural labour and expenditure has obviously been done by their immediate forefathers. At the same time, while acknowledging their efforts, we are bound to add that the present race of inhabitants near Melrose have not done their best to improve the natural beauty of their situation. The town itself—that is to say, the earlier portion of it—is poor and uninteresting, consisting mainly of two leading thoroughfares, the High-street and the Abbey Wynd, set at right angles, like a joiner's square. The modern suburb, on the Weir Hill, is rather more tastefully laid out; but we cannot speak in very high praise of the villa architecture. With the exception of one rather tasteful cottage on the Darnick-road, by Peddie & Kinnear, we saw nothing to lead us to suppose, even with Mr. Rhind's new Established Church manse in our eye, that the spirit of modern improvement had penetrated into the colony of retired merchants and half-pay officers who go to make up the west end of this ancient ecclesiastical borough. As to the modern churches, the less we say about them the better. There is, we must admit, a tolerably good specimen of an Early English design in the Free Church, which stands in proud defiance to its original Presbyterian mother, on a rising knoll on the opposite side of the Weir Hill-road. This is due, we believe, to the good taste of Mr. Charles Heath Wilson; and the proportions and details are good, although the stunted chancel somewhat spoils the design. There is also in Melrose a very small but rather neat and tasteful Early English Episcopal chapel, nearly opposite to the U. P. Church, erected from the design, we believe, of Mr. Gilbert Scott, but carried out under the direction of the clerk of works to the Duke of Buccleuch. The interior is very plainly finished, the pews awkwardly constructed, and the ventilation, as we found, defective; but the window above the altar and the stone pulpit are in excellent taste.

As to the ancient town of Melrose, which still clusters round the abbey, it is delightfully situated at the northern base of the Eildon Hills. On a closely contiguous elevation, near the grounds of Priorbank, stands the Melrose station of the Edinburgh and Hawick Railway, which is beyond question the best elevation it possesses. Melrose has partly the character of an antique diggy place, with narrow thoroughfares and ancient houses; and partly, as we have indicated, the appearance of a modern watering-place, with its suburban villas; and in both respects it looks somewhat out of harmony with the grand ecclesiastical antiquity beside it, which still asserts its original connexion and relation to the magnificent landscape around it. It has recently, we are told, undergone much improvement, in consequence of strangers being attracted to it for occasional or permanent residence. The body of the town consists of three

careful lines of houses arranged along the sides of a triangular open area. That leading to the abbey is obviously the more ancient of the two, as the low dingy thatched cottages will testify; but a modern little High-street leads out at the west corner towards Galashiels, in which are situated the principal inns and shops, and there are narrow short thoroughfares which lead off at the other corners toward Gattonside and Jedburgh. Some of the houses still display on their lintels, amid the general plainness and poverty of their walls, numerous sculptured stones, carved with the sacred monogram "I.H.S.," and other ecclesiastical devices,—all affording clear indications that at the time when these houses were erected building materials were largely and remorselessly abstracted from the pile of the adjacent abbey! In the centre of the open triangular town area stands the market-cross, a structure which has been already described in the *Builder* (see vol. xvi.). This cross bears marks of some antiquity. It is about 20 ft. high, and has on its apex a carving of the unicorn which pertains to the arms of Scotland. A Latin cross anciently surmounted the structure, and, according to the usage of the period, received homage from all pilgrims before entering the precincts of the monastery; but this was destroyed in the year 1604. The old-fashioned flight of steps was also removed, and an octagonal base substituted, which is anything but tasteful or appropriate. It is curious that about a road of land, called "the Corse-rig," in a field near the town, is still held by the proprietor on the condition of his keeping the cross in repair.*

We must now say a few words with regard to the social statistics and local Government. The population of the parish of Melrose has risen from about 4,300 in 1831, to about 7,700 in 1861; but, of the town proper, the population at last census was only 1,341. Many causes, we believe, have operated to retard the growth of the population of Melrose. In the first place, it is a purely agricultural and pastoral district, not distinguished in any way for manufactures like its neighbours, Galashiels or Selkirk; in fact, the only manufactory we could discover, and the only steam-engine in the valley of Melrose was that of a bobbin manufactory, which, however, had its *locus standi* on the opposite side of the Tweed at Gattonside, close to the northern terminus of the suspension-bridge, and within a few hundred yards of Allery, the classic retreat of the late Sir David Brewster. In the second place, it has no traders of any sort, if we except the hotels and the local purveyors of food and clothing. The attractions of Melrose are of that character which attract chiefly residents of the upper and middle classes who are retired from business and active life, and whose object is for the most part to combine as much outward show as possible with their limited means of independence. Thus there has been going on unperceived for a number of years an influx of the richer, and an efflux of the poorer classes, the latter of which it need not be mentioned, are at all times, and under any circumstances, the most prolific in producing population. For example, within the memory of the present generation of inhabitants, there existed a row of cottages where the present wall of St. Cathbert's garden extends. A similar line of houses extended down the east line of Abbey-street, where the wall of Priorbank Nursery is built; and a considerable street, known as Dingleton-wynd, occupied the site of the present railway-station and its approaches. Of course, these improvements necessitated clearings; and clearings in their turn have compelled many of the inhabitants to resort to the neighbouring villages to procure suitable house-accommodation. The villages of Darnick and Newstead are in this manner quite overstocked with a poor and disorderly population, which has been driven out of Melrose,—much to the annoyance and disgust of the original villagers.

There can be no doubt that Melrose is bound to provide for her poorer population; and although we are glad to understand that some

* There is a stone still preserved of the old gaol on which the arms of Melrose are sculptured. These are a *maid*, or *malet*, and a *rose*,—*maid*,—*rose*. This, however, is well understood to be a mere pun, or at least a hieroglyphic version of the name of the town. The learned and accurate Irvine (v. "Nomenclature," p. 161), distinguishes the vocable into two epithets, *viz.*, *maid* and *rose*; *i.e.*, a bare promontory. Other etymologies have been given; but, speaking from recollection, we think the geological character of the Eildon Hills and the archaeological traditions of the district bear out this.—Comp. "A Description of the Parish of Melrose," by the Rev. A. Milne, Edinburgh: 1743.

steps have been taken in the proper direction, it seems to us that the authorities are something too indifferent to their true interests. They have permitted the land speculators to purchase too much of the only good fit for fencing; and accordingly plots for working-class houses are very difficult to procure at a price that would make this class of property remunerative.

We have mentioned the local authorities. These bodies, as far as we can find out, appear to be, first, the parochial board; second, the Kirk session; third, the road trustees; fourth, the county police; fifth, the trustees under the Act for conserving the river Tweed; and, lastly, the district justices of peace of the quorum of Roxburghshire, who hold a court when necessary in the burgh of Melrose. But all these legally constituted bodies would seem to be subordinate to a functionary known as the Baron Ballie, a gentleman of the name of Erskine, who bears the same relation to the present Duke of Buccleuch, that a certain Duncan of Knockdunder did to his grace and glory, John Duke of Argyll. That is to say, he is in a certain fashion the absolute sovereign, and the tutelary deity of the place. He lives in the duke's house; he occupies the duke's pew in the parish church; he collects the duke's rents, fees, tolls, mulctures, arriages, and carriages; he received her Majesty in the duke's name when she visited Melrose; and in general he conducts himself as the prior of the monastery might have done four or five hundred years ago. He has no constitutional check, that we could hear of, upon his doings. For he it is known to an incredulous public, that Melrose possesses neither burgh property, burgh revenues, nor burgh expenditure. No public meetings are held in this primitive place; no burgh courts dare sit within the jurisdiction of this Roxburghshire potentate; and we need hardly add there are no accounts published under his supervision or discharge, to show the arbitrary character of his administration, or the degree of skill with which it is conducted! Much as we dislike, and have on more than one occasion expressed our dislike to, the multifarious systems of police legislation which prevail in Scotland, we cannot help pointing out that the worst of those systems are constitutional and proper as compared with this. For let us just look for a moment at its results; always remembering that Melrose is a fashionable place of residence, as well as a shrine of modern pilgrimage. Let us ask how is it off in the matter of sanitary improvements and social reformation?

In the first place, the drainage is perceptibly defective. Although we understand that Melrose is, to a certain extent, properly enough drained with large clay drain-pipes—a process, by the way, which was curiously enough the result of a voluntary assessment on the part of the proprietors themselves—we cannot admit that it is thoroughly drained. The poorer quarters of the town, where it is by far the most desirable and necessary, do not seem to have been included in the system. And we speak from experience when we say that the best houses on the rising grounds are, during hot and dry weather especially, sometimes uninhabitable owing to the poisonous smella proceeding from the soil pipes. In fact, there seems to be no proper method of trapping the drains in use. All the heavy portion of the soil is retained in a cesspool in the very centre of the town, in connexion with which, it is proper to state, a sluice is so constructed as to admit what volume there is of a small watercourse, called Dingleton Burn, that flows past the town, and which is thus regularly applied to flush the sewers. But the soil which is suffered to collect in the cesspool is only cleared out twice a year! And considering that the whole domestic soil-pipe act as an escape vents to this receptacle, our readers may judge of its probable influence. After leaving this point, the drainage is carried partially by an iron pipe through the Mill Lade, and is finally discharged in a pure state, as it is supposed to be, the Tweed, near Friars' Hall, about half a mile below the abbey; and there its fertilising influence may be traced on the bed of the stream by the luxuriant growth of those slimy, rank river grasses which the geese so greedily gobble up, but which are so fatal to the health of the trout and to the spawning beds of the salmon.

Let us add that we have no wish to say anything against the mechanical construction and design of the Melrose drainage, for which, it is worth stating, clay pipes were for the first time introduced into Scotland. The main sewer is 15 in. diameter; and the arrangement of the

sluice, and of the cast-iron conduit through the mill dam, reflect much credit on the county surveyor, Mr. Mitchell, C.E., of Melrose. The cost was only about 400*l*. The sewage matter removed from the cesspool every six months amounts to about twenty cart-loads; and is sold for 2*s*. a load.

We have less grounds for criticising the water supply, although even that might suffer improvement. Melrose ought to possess a plentiful supply of water; for this is derived from a number of natural springs, which rise at the base of the Eldon Hills, and are collected in cast-iron pipes and accumulated in a reservoir capable of containing between 30,000 and 40,000 gallons. This reservoir is placed at an elevation above the highest levels of the town and suburbs, and accordingly the service is managed by simple gravitation. The water is very pure, containing only a very minute proportion of carbonates of lime and silicates, and is therefore not the least hard; indeed, if we except the Glasgow water, which is derived from Loch Katrine, we do not remember a softer water in Scotland. The assessment is 6*d*. in the pound on the rental, and the works are the property of a joint-stock company, under a free concession of the springs by the Duke of Buccleuch. The company's stock pays 5 per cent. interest. The superintendent is Mr. Walter Hogg, who is also manager of the gas-works.

We are sorry to have to speak about the gas-works, although it is unquestionably our duty; for there can be no mistake as to the fact that they are the most intolerable nuisance in the whole valley of Melrose. Of course, gasworks are at no time a savoury subject, and we do not say that these little gasworks are not as well managed as any others we have had occasion to inspect; but the sad mistake was in the selection of their site. If our readers have properly apprehended our brief topographical description, they will see that the older and newer districts of the town are separated by half a mile of the Abbotsford, or rather Galashiels, road. In the very centre of this otherwise agreeable valley the wise authorities have planted the gasworks on one side and the sludge-pool on the other; it is therefore impossible to avoid either of them excepting by going into the town by a back roundabout road, which, nevertheless, we most heartily recommend all strangers to pursue. Of course we were told that the modern town had chiefly sprung up since the gas-works were erected; but surely this might have been foreseen. As it is, the best houses of Melrose are invaded during certain hours of the day, and what is still worse, certain hours of the night, with that abominable compound of unconsumed carburated hydrogen, carbonic acid, and hydro-sulphuret of ammonia which plain people denominate coal gas! We need not dilate on the aerial evils which may spring from this cause. Some gas engineers, indeed, assert that the manufacture of gas is not unhealthy, but rather the opposite. We will not stay to enter on a technical dispute on the subject in this article. But we may again express the opinion we have long held that all bad smells had better be avoided; anything, in fact, which prevents the due quantity of fresh air entering the lungs must be bad; and we will not exclude coal-gas from the category on its real or supposed antiseptic properties. We cannot estimate the effects of these gas-works on the health of the boarding-schools with which they are surrounded; but we were informed of one significant fact, that the very strong and robust young men of the county constabulary who live in the station close beside them constantly complain of languor and depression of spirits, unrefreshing sleep, and other symptoms of nausea and low nervous fever. As in our previous remarks with regard to drainage, we must acquit the manager of all blame; since we can cheerfully hear testimony to his extreme care in the process of manufacture. But, on the whole, we must say that the quicker the Melrose gas-works are removed from their present site the better for the health of the community, including those strangers who every year come to pay devotion to its shrine.

One creditable feature of modern improvement Melrose possesses which we must not in fairness overlook: that is a small and secluded suburban cemetery. Up to a recent period the burial-ground of Melrose consisted of the greensward which surrounds the ancient abbey; and here we had pointed out to us a spot under the beautiful windows of the south aisle which contains the mortal remains of Sir David Brewster.

Such a distinguished philosopher had no doubt a clear title, irrespective of territorial right, to a final resting-place under the shadow of so magnificent a shrine; but this right, we understood, was equally shared by persons of a less deserving name. Accordingly, the cemetery in Melrose, as it appears to us, has provided at once for the extinction of two intolerable nuisances,—that is to say, the overcrowding of the abbey churchyard to the injury of the public health; and the blocking up of the foreground of that splendid historical pile by the commonplace gravestones of men who had no concern in its construction.*

All we wish to add, and we do so most emphatically, is, that some experience of this beautiful village as a place of residence leads us to desire much improvement and reform, both in a social and a sanitary point of view. We do not, of course, profess to interfere with local politics, nor are we the special advocates of this or that form of county or burgh police. But the time has come, we think, that the inhabitants of Melrose might with propriety adopt the sanitary clauses of the General Police Act for Scotland, even although this might have the apparent effect of transferring their allegiance from the seigniorial jurisdiction of the Duke of Buccleuch and his baron ballie to the statutory enactments of Mr. Provost Lindsay and the sheriff of the county.

THE (ALBERT) MUSEUM, SOUTH KENSINGTON.

HAVING closed my last "Notes" among the cases of porcelain in the east department of the Museum, I will resume my descriptive account in the same locality. In the corner of this department adjoining the centre alley, stands a small case of beautiful specimens of Wedgwood ware. Crowning the whole is a large vase 16 in. high, an oviform amphora, with Cupids and a car drawn by swans in the clouds, white on pale blue ground, serpents twisting round the handles. As no owner's name is attached, and from the similarity of the label to those used in the "Ceramic Gallery," I conclude this fine vase is the property of the Museum. Mr. Archibald Hume lends a small vase of old Wedgwood, twelve cups and saucers, sugar-basin and cover, a vase on pedestal, and a small teapot and cover; also a tall milking and cover, especially charming: subject, a female with feathers in her hair, seated, and teaching, from a book on her knee, a child who stands beside her. The design is kept low down on the jug, while a delicate, airy butterfly floats in the azure space above. Mr. Hume likewise lends two small vases with covers, ornamented with white festoons, medallions, and a border of conventional leaves alternated with large flowers, quaintly bent to one side, reminding one of the illustration to Christian Andersen's pretty tale called "Little Ida's Flowers," in which the flowers become animated in the night-time, and assemble at a grand flower-ball.

Sir John Hippisley lends a fine bowl of pale blue, ornamented with Cupids and festoons, and having on the under part a beautiful pattern of flame-like leaves; an amphora, white on black ground, with a frieze of figures of the Muses; two balloon-shaped vases and covers, on tripod of goats' heads and legs, ornamented with festoons and leaves; a tall cup, cover, and stand, white on blue ground; a pair of bottles, or small-necked vases with handles, white on lilac ground, having very delicate and graceful detached subjects ornamenting the sides: on one, a youth and young girl seem to have, for the first time, entered the presence of Cupid, who, as the god of Love, stands on a pedestal, and to him the pair are making a burnt offering, while a second winged Cupid urges the girl on; in another design the youth kisses the girl on the face of the girl, while he crowns Love with a wreath, and behind them Hymen, holding his flaming torch, stands with his finger on his lip; and in a third, a kneeling girl bathes, or anoints, the foot of a seated female, who covers her face with her drapery, which also envelops in graceful folds her whole figure. Sir John Hippisley likewise lends a pair of amphora, ornamented

* This new cemetery of Melrose, we may mention, contains a striking mortuary monument, a rectangular plinth in three stages of marble, resting upon a base of granite, the whole capped by a sculptured arch, also of marble, pointing to heaven. The whole was designed and executed by Mr. Currie, sculptor, of Edinburg, and was, we believe, erected to the memory of a young Australian lady who had died at one of the neighbouring boarding-schools two or three years ago.

with white honeysuckle on blue ground, and a band of scrollwork broken in the centre by the introduction of small medallion with mythological subject; they have handles terminating in masks.

A candlestick, lent by Dr. J. Braxton Hicks, pale blue and white jasper ware, by Turner, in imitation of Wedgwood, late eighteenth century, is admirable as to delicacy of execution; but there is a want of exactness in the manner in which the white ornamentation is placed on the blue ground, the intervals between the various members being irregular, and in some portions the leaf designs do not stand perfectly upright. Mr. Willott lends a square vase, with perforated cover for cut flowers, white figures of Shaksperian characters on blue ground, with side ornament of vases and foliage; it was made by Neale & Co., late in the eighteenth century, and is very charming; also a jardinière of old Wedgwood, white on chocolate ground, the corners being formed by terminal female figures, the exquisite little faces bent downwards, and the heads hooded by scallop-shells.

Two admirable statuettes of early Wedgwood, coloured like life, are lent by Mr. J. J. Swinson. One is a draped female figure, holding in the left hand what looks like the socket for a candlestick, and grasping a serpent in the right; the other represents an elderly man in the attitude of earnest declamation. He wears a loose robe, coloured green, fringed with yellow, and lined with ermine, which he confines with his left hand, while in the right he grasps a rolled-up scroll; he stands beside a square pedestal, on the top of which lies a closely-written scroll partly unrolled, and on the front is a bas-relief of Mercury flying in the clouds.

Close by this case of Wedgwood, going out into the centre alley, standing one on each side of the double archway that leads into the North Court, are the two noble vases made by Minton for the Paris Exhibition of 1867. I was much delighted with them at the Exhibition, and I think mentioned them in some notices that appeared in the *Builder* during the summer of that year; but as the picture-galleries were then my especial object, I could not enter so fully into the detail of these two exceedingly fine art works as their merits demand. They are called "A Modern Adaptation of Maiolica." The modelling is alike in both, the variations in the appearance of the vases—which are very great—being due to the difference in colouring, and to the design of the painted subject which encircles the body of each. These vases stand about 4 ft. high; on the cover, is Prometheus chained to the rock on Mount Caucasus, with the devouring vulture carrying on his perpetual torment. The handles are tall, straight up to the top, where they curl over, and they have a chain running down each, and terminating in three large balls; two shields bearing each a bas-relief and a plumed helmet, decorate the lower portion of the handles; while to the upper part two prisoners of war are tied up by the raised arms and hands: they rest on the top of the body of the vase, and are chained together by one foot. They wear buskins and body armour of chain, and a leaf-like mail. All these figures, with their earnest faces, are most admirable. The design round the body of one of the vases is in deep blue colour only, the subject, "The rape of the Sabine women;" on the foot is a wreath of green leaves and white berries, twined around by four excellently-well-modelled serpents, whose heads creep up the blue-purple stem; the neck and cover of the vase are purple-blue also, relieved by stone-colour and yellow. In the companion vase the stem is green, with berries, yellow; the foot, yellow-brown; cover and neck, green and brown, to correspond. The design on the body in this case is a very spirited hour-bunt, richly coloured like life, and very carefully painted. The chained warriors here have the eyes painted, which adds greatly to the effectiveness of the most excellently-modelled faces.

Immediately at the back of these vases, but not belonging to the loan department, are two admirable cast-iron gates, or rather doors, of Prussian manufacture, bought at the Paris Exhibition of 1867, and already mentioned in the *Builder*; they are nearly alike, having only a slight variation in the niched standing figure and in the seated receding angel.

Returning into the South Court, in the glass-case next beyond that containing the Wedgwood, is a large plateau of brass, damascened with steel made in Corfu, dated 1565, and lent by Mr. James Woodhouse; a tablet of Florentine

mosaic in relief of the seventeenth or eighteenth century; a plateau of earthenware, painted in oil, with the Virgin and Child, sixteenth century; several oval bronze medallions of Roman Emperors, Italian sixteenth century; a larger one, Pius V., inscribed "BEAT. PIVS V. P. O. M. GREATVS DIE I JANVAR 1565," with rays like glory around the head; and all this fuses for a poor toothless old man—with a good profile, nevertheless. There is, too, a silver pomander, Dutch, seventeenth century, with only six compartments for scent; unlike Mr. J. Webb's, which has eight and a little sliding-lid to each, whereas in this one all the lids are "conspicuous by their absence." Mr. J. Webb has in this collection a large piece of early Majolica, a harrel-shaped vase drawn into a neck at the top, ornamented with Scripture subjects on ground of dark blue, divided horizontally by narrow bands of yellow; subjects, "The Adoration of the Magi," and "The Murder of the Innocents," and a row of masks and garlands. It is German (Nürnberg) early sixteenth century. Below this is a large plateau lent by Lady Havelock, of Iustred Maiolica, Italian (Dernta), about 1500 to 1520; it bears the profile bust of a lady with her hair inclosed in an ornamental bag which nearly covers her head, and hangs down the back of her neck. She has before her face a long twisted scroll bearing an inscription; and from her left hand, which is not seen, rises a large spray of huge single carnations and huds. On each side of this plateau stands a large vase, the two being very similar, but not seemingly intended for a pair. Each bears a design in grey tints, the one being Neptune in his car, attended by mermen, mermaids, and children; on this vase there is a strange ornamentation under the edge, of pairs of spouting dolphins resting on their heads; on the other, Minerva in her chariot drawn by winged horses, is accompanied by figures representing the arts and manufactures. Both vases have white and gilded handles, stems, and bases; are Dresden porcelain, eighteenth century; and are lent by Mr. H. Wagner.

On the shelf below are two charming "small plates," in broad gilt frames, Maiolica of Castelli in the Abruzzi; each is painted with a landscape in delicate colours, heightened with gold, and on the rim is a border composed of four pretty little Cupids with flowers, foliage, and two masks. They are in date about 1660 to 1670, and are lent by Sir Woodhine Parish. The bowl placed between these two plates, of silver—German, seventeenth century—is of excellent workmanship; the bowl part is small, and has a broad rim on which are twelve long, raised, pointed medallions,—they and the flat part between them being covered with richly and deeply-chased work of vases, scrolls, birds, and lions; it is lent by Mr. J. Woodhouse, to whom we are also indebted for the rich cup and stand of dark blue enamel on copper, ornamented with coloured flowers and leaves. To this is put "Italian, seventeenth century;" but some of the flower-forms are extremely Oriental in their design. On the same shelf is a pretty little bowl of silver-gilt, with figures in beaten-work, thought to be Portuguese sixteenth century; also several rings, Etruscan, Roman, and Mediæval, and one earring formed of a bunch of grapes made of seed pearls; an inkstand of crystal, with gilt-metal mounts and large crystal foot, on metal stand, but by no means beautiful as to form, thought to be Italian sixteenth-century; and a cup covered with filigree foliage and scrolls, interspersed with birds and small animals in coloured enamel. It is of sixteenth or seventeenth century German work, and is very rich-looking. There is likewise an elegant bottle of white porcelain, with silver-gilt mounts, Venetian seventeenth-century, with ingenious knot ornament hinged to make it fit the shape of the bottle; also a long pipe of boxwood, richly carved and ornamented with groups of musicians, huntmen, warriors, and a battle-field; an elegantly-shaped cross of carved boxwood, Russo-Greek; and one leaf of a stained ivory triptych, carved with two sacred subjects in quatrefoil enclosures,—the Nativity and the Crucifixion,—German fourteenth-century.

The large plateau of Maiolica, painted in pale blue, with a masquerade supper scene, is chiefly remarkable for the original manner in which a woman, standing up, is aiming a thick stream of wine from the large flask she holds aloft into a shallow tazza at least 5 ft. distant from the mouth of the flask; and, for the deformed smallness of head of the lady who sits at the top of the table in the seat of honour, and who, from

having two attendants standing behind her high-backed chair, would seem to be the principal guest, or else the giver of the feast. This plateau is called Venetian eighteenth-century work; let us hope that in the nineteenth century, and with her chosen king to foster her art, Venice will now produce something more worthy of her former name and glorious antecedents.

The heterogeneous glass case contains the beautiful modern specimens from the Worcester Porcelain Works, already noticed in the *Builder*; but since that notice was printed, the case has been crowded up with small articles in glazed porcelain, from the manufactory at Belleek, county Fermanagh, lent by Mr. Kerr. This is much to be regretted, for the specimens spoil each other, being utterly incongruous. Elsewhere the Irish porcelain might look very well; here it has a most paltry appearance, and its presence also detracts from the excellent artwork of the Worcester porcelain.

On my way out of the Museum, I must stop for a few minutes at the last upright glass case on the left hand. Here is to be seen a very excellent cabinet, inlaid with various woods and ivory, and enriched with numerous plaques of Wedgwood ware, of different sizes and sage-green ground. The cabinet has incised and gilded ornamentation, which, when on a black or dark ground, is very elegant; but when applied to the portions in white wood, it reminds one unpleasantly of stamped white leather blotting-pads and book-covers. The top of the cabinet is in three slabs of marble, the centre of red being raised above the end pieces, which are black, polished, and have an incised dull pattern on them. The cabinet was designed by W. J. Eastall, for Mr. J. Lamb, of Manchester, by whom it is lent: it is British manufacture, and was in the Paris Exhibition of 1867. To the left of the above stands a delicately-made steel chair, dated 1610, lent by Mr. H. G. Bohn. The seat and back are of red velvet, on which the arms of Anne of Denmark are embroidered; and above, on the back, is a round plaque of dark blue enamel, bearing a large H in white, intertwined by gilt laurel branches. To the right of the cabinet stands a Highland claymore, lent by Mr. Baden, the blade marked "Anrea Ferrara." It has a steel basket-hilt, in pattern of ovals, enclosing a double fleur-de-lis, and a sheath covered with black leather; the hilt is probably Scottish seventeenth-century work. A rapier, lent by Sir W. Fraser, stands beside the claymore; it has a long narrow blade, inscribed "Tomas Atala," and a cup-hilt, ornamented with engraved scrolls in steel, on gilt ground; the sheath is covered with purple velvet, and has steel rings and mounts.

ART-LOVER.

THE KING OF METALS.

A MANUFACTURER of "ring-taws" or "marble alleys," who suddenly glatted the market with an extraordinary supply of these necessities for the development of the youthful mind, would incline to the belief that their price in commercial circles would decline; but it seems that the excess of supply does not always produce this effect. That remarkable pyramid shown us in the 1851 Exhibition as the result of the "diggins" in Australia has had but a small effect on the marketable value of gold. The learned disciple of Galen still gets his antiquated fee, and a pound gets its twenty shillings in exchange. It will take a great commercial convulsion to upset to any extent this state of things; but it has been re-arranged many times and may be again. His majesty, the "sovereign," has not always been in the same position: in the old time he was a greater personage and of more "weight" in society than now; in Edward III.'s time (A.D. 1327), a pound weight (Troy) was made into but fifteen current pounds; now a pound is transformed into forty-six and three-quarters at the Mint; it has remained thus since George I. In the former reign, the reign of Edward II., gold had just been honoured with the patronage of the head of the nation, *i.e.*, a gold currency was enacted, with the king's head on it: in a previous reign, Edward I., it was discovered that some cunning craftsmen had been making gold "a little farther" in manufactures by mixing it with base metals; he (the cunning craftsman) was engaged in the manufacture of drinking-cups, ornaments, &c., hitherto made of virgin gold; but now its purity was sacrificed at the shrine of self, and a "villainous" compound substituted: so the king enacted a law that, "Because of rogues who, &c." (*sic*), all vessels and articles purporting to be of gold should be

marked. Thus our Hall mark became established, and gold fixed at its present standard,—that is, twenty-two parts, called in this instance carats, to two of alloy, put to harden it, it was named at the time king's gold; lower qualities are now marked, but until a recent date England kept up "her standard" higher than her Continental neighbours.

Gold is with many reasons styled the king of metals. One was its great scarcity; in this it is now "topped" by some other metals, but fortunately it has more claim than one to the title. It is the most ductile and malleable of metals. One grain of gold beaten out may be extended to 75½ square inches of surface, the thickness of which will be $\frac{1}{100,000}$ of an inch. One ounce of gold, placed on a piece of copper and afterwards drawn into fine wire, can be extended 1,200 miles, being the gold wire used in lace-making; typifying the length to which a king's authority may extend. Another most kindly quality is that it shows a marked disinclination to mix as an equal with its inferiors, as those employed in gold-beating will testify. There is but one acid that it will yield to (Encyclo. Brit.), viz, selenic, and that a scarce one. It may be dissolved by boiling with hydro sulphate of potash and water, and chemists have proposed that this was the method adopted by Moses of dissolving the golden calf of the Israelites. The great have their weaknesses, and we cannot expect the greatest of metals to be without. These are the means by which it can be brought low. The most noble qualification it has is that it will not tarnish in common usage. Can a king have a fairer thing said of his name than that it is untarnished? although, if we are to be guided by one of our most respected poets, there are not many kings who leave an untarnished name behind them:—

"Quarado, as he tells his sober tale,
Ask'd, when in hell, to see the royal jail,
Approved their method in all other things;
"But where, good sir, do you confine your kings?"
"There," said his guide, "the group is full in view,"
"Indeed," replied the Don, "there are but few."
His black interpreter the charge disdain'd;
"Few, fellow? They are all that ever reign'd!"

In illustration of this we point to the ball and cross of St. Paul's Cathedral: this is double gilt with what is called fine gold, or gold with only a particle of alloy scarcely worth consideration; it has been done many years, but when the sun shines on it after a shower of rain it looks as bright as when first done, reminding one of the Temple that "within" and "without" Solomon caused to be "laid over with pure gold." This gold leaf, so wonderful in its tissue-like substance that it can be distinctly seen through, yet is of so independent a nature that when used for external purposes it seems to be protected by any varnish or size over it, braving the elements uncovered, and, like a British boxer, "comes no smiling" after severe punishment.

The art of gold-beating is a very ancient one. There seems great probability that, like some other arts, it has been known and practised and forgotten. Homer refers to it; Piny, more practical, states that gold can be beaten, 1 oz. making 550 leaves, each four fingers square,—about four times the thickness of the gold now used. This is most probably such gold as was used in the decoration of the Temple,—"it was covered with plates of burnished gold." The Peruvians had thin plates nailed together. It is possible that if decorations of this character were used in these parts their insecurity would so trouble some folk that they would have no rest until they were effectually "nailed." The Thebans have in their wall histories some gold characters done with leaf said to be as thin as the gold of the present day. Coming down with a jump from the long past to the present age, we find our country celebrated for its gold-leaf. Italy used to excel us; but Italy has been in a long sleep, and is only just awakened. It is one of the last things our over-grown offspring undertook to make for herself. Until very recently she imported all the gold-leaf she required from this country. The gold-beaters' skin made here is still the admiration of the world (of gold-beaters). This skin is gut-skin, stretched and dried on frames; after which each surface is very carefully levelled, a labour entrusted to the delicate hands of young girls. A mould (as the number of square pieces of skin beaten at one time in the gold-beating process is called) is an expensive article, costing from 8l. to 10l., and when needless for gold-beating is still of some value. Fifty or sixty years back a workman made 2,000 leaves of gold from 15 or 19 dwts. of gold; now by better skin and skill

he is enabled to produce the same number from 14 or 15 dwts., showing a considerable reduction in the cost of produce, and, as may be expected, a deterioration in the quality of the article. One grain of gold beaten between this skin can be extended to some 75 square inches of surface, the thickness of which will be $\frac{1}{100,000}$ part of an inch. These figures represent what may be done. What is done for the purposes of trade is somewhat less, viz., 56½ square inches per grain, $\frac{1}{200,000}$ of an inch in thickness. To give an idea of its thinness, it would take 120 to make the thickness of common printing paper; 367,650 sheets of which would make a column half as high as the Monument. An economist who strives to make a little money go a long way might have seen two sovereigns so extended that they would have decorated the '51 Exhibition Building with a gold border 1 in. in width all the way round. Gold in this form is transparent, with the peculiarity that when looked through it is green. Science does not seem to have accounted for this, unless it is that the blue of the atmosphere and the yellow of the metal produce the green. But silver, if beaten very thin, transmits a purple; and that upsets the theory. Gold, when beaten to extreme tenuity, has a very bad appearance on decorative work. The gold, as if indignant at being driven to such extremities, turns red, or blushes at being reduced to so poor a condition. Now this is another mystery: the thinner gold is beaten the redder it becomes; and plain surfaces that are gilt with poor gold show every leaf of gold as a distinct blot, instead of an unvaried and even-toned surface, the poor gold being usually yellow in the centre and red at the outside of the leaf. Gold leaf can be made absolutely pure, but is not, for this reason, that it has a strong tendency to solidify itself, so that when it gets creased or lapped over it will not flatten out, entailing a loss of labour in the beating. There are occasions when fine or pure gold is used. The noble reading-room at the British Museum is decorated with fine gold; the result being, that that rich yellow tone of the metal so much admired on all antique decoration is obtained, very durable, and easily restored, when covered by London smoke, to its first appearance. The popular substitute for gold, the washable gilding, is a delusion, inasmuch that whatever other recommendations it may have, it has not a particle of gold in its composition. The variations in the colour of gold leaf extend to twelve (more generally limited to three), deep, middling, and pale. The first has 12 to 16 grains of copper to 1 oz. of gold. When this quantity of copper is put, no silver can be added; it would destroy the malleability of the gold, it would heat into powder; with less copper a little silver may be added, producing a middle colour. Thus gold will only unite to a very limited extent. With silver alone it is more kindly disposed to unite, amalgamating with it to any extent, choosing it for its colour, and placing it on equality with itself. Should its consort not be pure, have any copper with it to heighten the colour of this pale gold to take the place of the deeper and more expensive colour, his majesty declares off the union, and ceases to be malleable. The gold is first melted in a crucible at an intense heat, cast into an ingot, and flattened at a flattening mill. First it becomes a brassy looking ribbon about 10 ft. long by 2½ in. wide; it is then annealed and cut into small squares, 6 grains each; these are placed between the leaves of what is termed a catch—160 leaves of tough paper made in France. Formerly vellum was used. It is then beaten with a 17 lb. hammer. This appears very laborious, and probably is so; but it must be remembered that the bulk operated on is very elastic, consequently the weight rebounds. In 20 minutes it is taken out, the gold is spread, and is cut into four parts, and put in what is called a shodder, or worn-out mould. The great difficulty is, that the alloy will not spread equally with the gold. Now it is beaten for two hours with a 9 lb. hammer. Should an inexperienced workman imagine he can, by putting more power and a heavier hammer on, produce his work quicker, he finds the leaves crumbled to dust at the edges. The gold is again opened and cut into four, and put into the "mould," about 900 leaves of the prepared skin. In each of these cuttings it must be remembered that there is a large amount of "waste" off the edges, called shuff, that is not wasted. This is the last and most delicate process, and the quality of the leaf depends on the judgment and skill of the workman. It must be beaten for four long hours

with a 7 lb. hammer: dull work, one would think but needing great care. The first hour the beating is done mainly in the centre, causing gaping cracks in the margins, which fill in without any trace, coalesce, and unite thoroughly. At the second hour the leaf is $\frac{1}{100,000}$ of an inch in thickness, and light passes through it. If pure, or nearly so, green,—if much silver, violet,—rays pass through. It is now opened, and cut rather over 3 in. square, and placed in the red books we often see in manufacturers'. The greatest care is necessary in dry and hot pressing the things used, except in frosty weather; and then they become too dry, and take off the brightness of the leaf. "But where is the giant steam that it does not step in and do the hammering for them?" exclaims young Archimedes. True, it looks as though it could be done, and that it would be worth while, seeing that a gold-beater spends one-third of his time hammering; but it cannot be done. In the year 1850, an American inventor brought out a steam hammer for the purpose in New York, by which he undertook to do it better and cheaper; it consisted of a small well (to hold the beat) in a square table, having an eccentric circle at each side, which gave it a peculiar rotary motion. The writer saw it in motion; but it did not provide for turning the beat so as to operate on both sides; neither for the continual opening of the mould that has to be done: consequently a man would have to attend to the heat all the time, and the hammer dare not come down heavier or quicker, or the leaf would be spoiled. The inventor sold his right for 300l. to a New York gold-beater, who sent it to the first great Exhibition; but the sure judgment, and what may be called the "intense" carefulness required, could not be supplied by steam, and so the gold-beater paid dearly for his "whistle."

THE WINDSOR THEATRE.

The old theatre here, scarcely worthy of the name, has been entirely remodelled under the direction of Mr. Somers Clarke, architect. The pit has been arranged so as to be available for use either as a pit or as stalls; and two entrances to the pit have been made to meet this arrangement. The old entrance to the boxes has from necessity been retained, though much improved, and it is now made into a small corridor, paved with encaustic tiles. A Royal box has been provided. The whole of the new approaches have been made fireproof as nearly as possible. The original proscenium being contracted in size and of the commonest character, a new proscenium front, with wings, has been executed. A new stage, too, has been laid down, the old one being totally unsuited to modern requirements for spectacle.

The decorations of the interior, based on Pompeian models, have been undertaken by Messrs. Harland & Fisher, whose representative, Mr. Campbell, has executed the whole of the figures and polychromy throughout under the supervision of the architect. The greater part of the decorative painting is in positive colour. Gold is sparingly used, and only to the frame of the proscenium next the act-drop, and to the iron columns carrying the front of the boxes. The building works have been executed by Messrs. Holden & Gray, of Windsor. The auditorium is lighted by a sunburner of sixty-three jets. The whole of the gas arrangements have been executed by Messrs. Verity & Son. New scenery is being painted by Mr. William Calcott, who also has painted a view of Windsor Long Walk from the George III. statue as an act-drop. Mr. W. Baker has been clerk of the works in charge during the whole of the alterations.

It is intended to open this theatre on Wednesday, the 31st instant, and on Friday, the 2nd of April, with performances by the "Windsor Strollers."

Fall of a Bridge near Edinburgh.—The inhabitants of Coatbridge were alarmed on Monday by the sudden fall of the iron girder bridge which spanned the Whifflet branch of the North British Railway, and formed a road way from Gray's Land to Sunnyside. A cart laden with manure was being driven across the bridge, when the whole affair came away, and driver, horse, cart, and bridge fell to the line of rails below. It is remarkable that neither the lad nor the horse seemed much the worse for the fall. The accident, it is supposed, was caused by the subsidence of the earth under a wall on which the iron girders of the bridge rested.

THE LATE MR. JAMES SIMPSON, ENGINEER.

At the Institution of Civil Engineers on March 9, Mr. C. Hatton Gregory, the president, before commencing the ordinary business, referred to the recent decease of one of the oldest members, Mr. James Simpson, past president of the Institution. The president observed that Mr. Simpson had left a name which would long be remembered with honour; by the world as a man of the most upright character, and a distinguished hydraulic engineer; by the Institution of Civil Engineers as one who for many years was a most regular and valued attendant at the meetings; and by those who enjoyed his intimacy as a faithful and devoted friend. We add a few particulars

of Mr. Simpson's career. He was the son of Mr. Thomas Simpson, engineer of the old Chelsea water-works, on the banks of the Thames, and at his father's death succeeded to his post. About 1827 he was instructed by his company to examine into the various methods of filtering water on a large scale, after which he designed and executed his first filter-bed in 1828. It was so complete that no material alteration has been made in the system of filtration since that time, similar filters being now in operation in almost every town artificially supplied with water. Mr. Simpson was also engineer to the Lambeth Waterworks Company. By his advice the works were removed above Kingston, and made, to a certain extent, superior to the Thames tidal influences by filters and pumping works. Early in life Mr. Simpson

became the engineering adviser of the Government on many subjects. He constructed waterworks for the supply of Windsor Castle during the reign of George IV. About the year 1845 Mr. Simpson was engaged by a new company formed at Bristol for the supply of water, and designed the works for bringing to that city springs and streams of water from the Mendip Hills. He designed and carried out, as consulting engineer, the present extensive works at Copenhagen, and was employed in many of the most important towns in the kingdom. The town of Aberdeen, too, owes to him the design and execution of the very comprehensive and complete works for supplying that town with water taken from the river Dee, about twenty miles above the city.

MASONS' MARKS FROM VARIOUS PARTS OF THE WORLD.

Collected by Mr. Godwin.

[See pp. 237, 238, and 239, ante.

1. GIZEH.		CHAMPELLE CHAMBER	RUINED CITIES BEYOND RIVER JORDAN
2. HOLYLAND.		KORYET ABU GOSH	JERUSALEM
3. ITALY.		POMPEII	POMPEII PART OF THE CITY WALL
4. ITALY.		DOGE'S PALACE	VENICE
5. FROM A TURKISH RUIN NEAR ADALIA. LYCIA, CALLED THE OLD KHAN.			
6. FROM THE LYCIAN ALPHABET			
7. ANGLO-ROMAN.		HADRIAN'S WALL	2 ^d CENT ^y ALTAR BIRMINGHAM ALTAR ALNWICK CASTLE
8. ENGLAND.		ALBOROUGH CHURCH	KENILWORTH
10. ENGLAND.		LINGFIELD CHURCH AND AT EAST BRINSTEAD CHURCH	STEVNING CHURCH BALCOMBE CHURCH ARUNDEL CHURCH
11. ENGLAND.			LINCOLN CATHEDRAL
12. ENGLAND.		S ^t MARY DE CASTRO LEICESTER DECORATED	CADDISBY DECORATED
		MARKET BOSWORTH NORMAN HINCKLEY DECORATED S ^t MARGARETS PERPENDICULAR	YORK MINSTER
13. ENGLAND.			ANSELMO'S CRYPT
			CANTERBURY CATHEDRAL
14. ENGLAND.			HADDON HALL
15. ENGLAND.		S ^t NICOLAS YARMOUTH	

16. ENGLAND.
LATE BRITANNIC



EDDARD'S
COMPLETED 1213



ALMS-HOUSES
FINISHED 1218



BRAY
1218



DRAMBLYE HOUSE
SUSSEX, 1412?

17. BOOKS OF BRICKLAYER AND TYLER'S COMPANY ABOUT 1250

18. FROM RUINS OF UPSAL CASTLE NEAR THIRSK YORKSHIRE

19. SCOTLAND. GLASGOW CATHEDRAL CRYPT

ON A STONE FOUND IN A TUMULUS, ISLAND OF BRASSAY ZEELAND

20. IRELAND. ST MARY'S YOUGHAL 13TH CENTURY PORTICE

21. FRANCE. STRASSBURG CATHEDRAL

STRASSBURG CATHEDRAL 22. CHURCH OF ST MICHAEL, DIJON

23. NOTRE DAME PARIS SVANIK, DANISH ISLAND OF BORNHOLM

24. THE TYROL. OUTSIDE INSIDE 1072 EN

25. SWITZERLAND. CATHEDRAL LAUSANNE CATHEDRAL GENEVA

CATHEDRAL GENEVA

26. SWEDEN. UPSALA CATHEDRAL 12TH CENT

27. GERMANY. MÜNSTER. ABOUT 1200 CATHEDRAL

ST LAMBERTS ABOUT 1250

28. AUSTRIA. ST STEPHEN VIENNA 14TH CENT

29. SPAIN. SAN YSIDORO, LEON

SAN YSIDORO, LEON SANTIAGO DE COMPOSTELLA

SANTIAGO DE COMPOSTELLA

SANTIAGO DE COMPOSTELLA

30. SPAIN. SANTIAGO DE COMPOSTELLA STA MARIA BENAVENTE, SEGOVIA

31. STA MARIA BENAVENTE, SEGOVIA

32. PORTUGAL. CHURCH OF ST FRANCIS, SANTAREM. 1229

CHURCH OF ST CROSS, COIMBRA, 1529

34. CHURCH OF THE CONVENT OF BATALHA - 1285

MASONS' MARKS FROM VARIOUS PARTS OF THE WORLD.

Collected by Mr. Godwin.

[See pp. 237, 238, and 239, ante.



CHURCH, SCHOOLS, AND PARSONAGE, ST. ANDREWS, PERTH, SCOTLAND.—Mr. Joseph Peacock, Architect.

CHURCH, SCHOOLS, AND PARSONAGE, PERTH, SCOTLAND.

The new group of Episcopal buildings recently commenced at Perth, in the diocese of St. Andrew's, will consist of the church, dedicated to St. Andrew, the parsonage-house, schools for boys, girls, and infants, with residence for master. The schools only are yet erected, and were opened in October last, the large room, 75 ft. in length and 21 ft. in width, being used for service until the church can be built. The east end is fitted as a chancel, with table, prayer-desk, credence, and pulpit, with dorsal hangings. Bishop Wordsworth's residence being at Perth, which is the most central and accessible town of importance in the united dioceses of St. Andrew's, Dunkeld, and Daubhane, the buildings are promoted by the bishop for the benefit of the inhabitants and visitors, and as a church at which to meet his clergy. The site is close to the railway-station, in a fine position. The buildings are from the design of Mr. Joseph Peacock, architect, of London, and are built of Huntingtower and Danmore stone, and faced internally with malm bricks, laced with black and red bricks in courses, the roofs, of open timber, being of pine, stained and varnished, and are covered with Ballahulish slates.

MAIN DRAINAGE AND DIARRHŒA.

The remarkable inequalities in the fatality of diarrhœa during the unusually hot summer of 1868 in the different large English towns naturally attracted considerable local interest in various places. Leicester was one of the towns which suffered most severely. Diarrhœa was very fatal in London, and caused 3,145 deaths; but it was pointed out at the time that if the disease had been fatal to the same extent in the metropolis as in Leicester, instead of 3,145 deaths, 11,012 would have resulted. In short, diarrhœa was nearly four times more fatal in Leicester than in London. This statement led the Highway and Sewerage Committee of Leicester to form a sub-committee to inquire into the cause of this excessive mortality. This sub-committee has recently made its report, which in a great measure traces the extraordinary death-rate from diarrhœa to radical defects in the main sewer of the town.

The main drainage of Leicester was carried out at a very large outlay many years ago, when sanitary engineering was little understood. The sewers were laid down by contract, were brick built, and the lower courses of bricks were laid without cement or mortar. The report in question offers the choice of two explanations of this defect in the sewers. The first is a simple one, namely, that the contractor, finding his bargain unprofitable, adopted this method in order to lighten his loss; it is hard to believe that such a course, if not in accordance with his contract, should have escaped detection at the time. We are more inclined towards the second explanation, although one which offers a curious commentary upon the state of sanitary intelligence, at all events in Leicester, at the time the works were carried out. At the commencement of the sewerage contract there was, it appears, a growing deficiency in the water supply. Water-works were not in existence, and were scarcely contemplated; but the wells were failing, and manufacturers were engaged in deepening many. It is suggested that these prevailed a pretty general conviction that if a solid, water-tight sewer were constructed, a still more serious and continued scarcity of water might ensue, and that the main sewers of Leicester were, therefore, in the lower courses laid without mortar or cement, to prevent the wells from being robbed of that portion of their supply which they might derive therefrom through percolation. At the time sewage was little understood, and was looked upon merely as a system of drainage and a means of carrying off rain-floods. But the introduction of water-works and the pretty general substitution of water-closets for cesspools, has considerably altered the character of the contents of the sewers. The percolation, however, still goes on for the benefit of the wells; and as a large portion of the inhabitants of Leicester still use well-water for all purposes, we need scarcely look further for the cause of the fatality of diarrhœa last summer in that town.

The use of well-water in all large towns for drinking purposes should at once be discontinued: its fatal result last summer was conclusively shown in Birmingham and many other large towns; for, where the same radical defects

of sewerage do not exist as in Leicester, the drainage from cesspools and pits, and the inevitable defilement of the surface of the ground by decaying vegetable and animal matter produces its effect upon well-water to a dangerous extent, without mentioning the drainage from churchyards, although probably long since disused. Leicester will, it is hoped, not hesitate to remedy, as soon as possible, the evils of her present sewerage system, which have been conclusively shown to have caused a fatality from diarrhœa last year so far in excess of that in most of the large towns. In the meantime it may be expected that the now annual infantile mortality from this cause may in future be considerably reduced by the increasing intelligence of mothers in the treatment of their children; by a decrease of the too frequent neglect on the part of mothers, especially in those towns largely employing female labour in factories, or otherwise; and by a more general effort to preserve the air we breathe and the water we drink from becoming tainted by exhalations and percolations of noxious organic matters.

"MANAGEMENT" ON THE METROPOLITAN DISTRICT RAILWAY.

In the interest of the working man, I beg to point out a system which seems acted on by the Metropolitan District Railway. Accident it cannot be, having with my own eyes seen the result occur often; besides, a somewhat similar case appeared in a police-court a few days ago.

Tickets are given for a station, sometimes two stations, short of that asked for, and full fare is taken. Upon arriving at one's destination, the extra fare between that and the station named on the ticket is demanded, sometimes with force. On March 20th, sixpence was paid for my second-class return ticket. Upon delivering up half, I was suddenly stopped on account of the ticket—unknown to me—being for two stations short, and I had to pay sevenpence extra before I again reached my starting-point. I must in justice say that, upon investigation, the ticket-clerk acknowledged a mistake. Still, many working men could not spare the time for inquiry, and to them such extras are of consequence. If public confidence is desired, such a system must be altered. No doubt, you will have many letters to confirm the above. S.

NEW TILE WORKS, STOKE-UPON-TRENT.

Last year Mr. M. D. Hollins retired from the firm of Messrs. Minton & Co., retaining for his establishment the old title of "Minton, Hollins, & Co." At that time three distinct works—the Church-street, the Cliffe-hank, and the Boothon-lane—were occupied in the production of the Minton tiles, but Mr. Hollins resolved upon the erection of an entirely new site of works. To this end he purchased a plot of land having an area of between three and four acres, and lying between the Roman Catholic Convent and the Foulhay Brook, and employed Mr. Charles Lynam, architect, of Stoke, to prepare the plans and superintend the erection of the new establishment. The ground lying low and being exposed to floods after heavy rains, it was necessary in the first instance to erect a substantial boundary wall as a barrier to the inroads of the water, and then to raise the level of the entire area 6 ft. This latter would have been in almost any other part of the country a slow and expensive proceeding, but the extraordinary amount of waste material (technically called "schraf") produced in the manufacture of pottery enabled the proprietor to effect this elevation rapidly, and at a comparatively trifling cost. The plans having been prepared and the specifications issued, the tender of Messrs. Kirk & Parry, of London, was accepted for the erection of the major portion of the new buildings, their contract being 14,500*l.*; but this did not include the mill block, which has been erected by Mr. W. Sutton, of Newcastle, whose contract was 4,000*l.*, nor the sliphouse, which has been built independently, at a cost of 500*l.* The manufactory as a whole stands due north and south, and the various blocks of buildings are so arranged that, commencing with the mill and terminating with the packing-house, every part corresponds in order with the successive processes undergone in the production of the tiles. The mill block comes first: its machinery alone will cost 6,000*l.* Contiguous to this is the sliphouse, and next in

order the damping-places, two buildings in which a slight degree of dampness is imparted to the powdered clay from which tiles and tesserae are made by pressure, and having one an area of 80 ft. by 33 ft., and the other of 85 ft. by 33 ft. Then come the workshops, a pile of buildings three stories high, and measuring 176 ft. by 27 ft. The ground floor will be occupied by the makers of pressed tiles and mosaics, and the second floor by those engaged in the production of encaustic tiles, while under the ground floor are spacious cellars for the storage of plastic and powdered clay. The workshops are notable for height, light, and ventilation. They will be fitted with drying stoves heated by steam pipes and running down the centre of each room. In the "green" state the tiles will be taken from these workshops to the hothouse, and having been dried they will be placed in saggars in sheds adjoining, and thence removed to the ovens. Of these there are four, with one kiln for finishing purposes. The hovels inclosing the ovens are 60 ft. high, and each rests upon a layer of waterproof concrete composed of Barrow lime. The hothouses (with storage blockrooms over), the saggars-houses, and the ovens, form two separate blocks, each 180 ft. by 69 ft. The tiles having been drawn from the oven will be removed to the sorting-houses, and those which have to be decorated to the painters' shops above, whence the latter will pass to the finishing kiln adjoining. Lastly comes the front block, which is 300 ft. long by 48 ft. wide, and in some parts three stories high. It includes warehouses (there are several of these, of which one has a considerably larger area than Stoke Town-hall), packing and straw rooms, a platform room for the arrangement of tesserae; offices, studios, museum, lodges, and a spacious entrance. The architect, by arranging the various portions of the works in blocks, has secured external ventilation; and the roads thus formed will be kerbed, paved, and channelled, giving the entire establishment an air of neatness and finish. The material used is red brick, with blue brick dressings, and in two or three cases floors are supported by wrought-iron girders. The whole of the machinery, with the exception of the patent clay-presses of Messrs. Needham & Kite, has been designed and executed by Mr. George Kirk, of Rruria Ironworks. In addition to the buildings and machinery, a large outlay will be required for heating and lighting apparatus, fixtures, furniture, &c., so that the total cost of the works will not be much less than 30,000*l.*

CLOSING OF THE SOUTH LONDON WORKING CLASSES INDUSTRIAL EXHIBITION.

The closing meeting was held on Saturday last, when Sir M. D. Wyatt, presided. The Rev. G. M. Murphy read a statement, which showed that about 50,000 persons had visited the building on payment. The receipts for the same have been about 370*l.* The expenses cannot as yet be precisely ascertained, but it is believed that somewhere about 200*l.* will meet all costs, the residue will then be devoted for the payment of prizes in proportionate amounts.

"The committee regret that no one article exhibited was deemed worthy of the higher class of reward they were prepared to bestow—viz., 10*l.*; and they are also bound to state that, while there is an improvement visible when the exhibition is compared with the former enterprises, the advance is by far less marked than they would like to have seen; under these circumstances they readily fell in with the views of the exhibitors in giving many rather than few prizes."

The Chairman having addressed the meeting, Mr. Godwin moved, and Mr. S. C. Hall seconded, the first resolution:—

"That this meeting, while rejoicing in the success of the present exhibition as shown by the statement just made, urge upon exhibitors and those who desire to become such in future displays, the determination to seek to excel in their own departments of labour; or, that, in having their attention drawn to amateur productions, they should, so far as possible, copy the best models, use the best materials, and work with the best tools it is in their power to obtain; seeking to excel in the quality rather than in the size or quantity of the objects produced."

Mr. Passmore Edwards moved, and Mr. George Potter seconded, the second resolution:—

"That it is highly desirable to further the interests of the people, and eliminate their desire for technical studies, by the forming of museums supplied with the best models more accessible to them than the national institutions are; and that, pending this desirable change, the week ensuing opening of the National Gallery, British Museum, &c., should be arranged for. It is also the opinion of this meeting that the South Kensington Museum, the Schools of Art, and classes connected therewith, as well as all chartered institutions founded for educational purposes, should be popularized to the utmost extent possible."

Mr. T. B. Smithies (of the *British Workman*) then moved, and the Rev. R. Berry seconded, a further resolution:—

“That the best thanks of the committee and exhibitors are due, and are hereby given, to Sir Digby Wyatt and the adjudicators of the various classes for the time and attention bestowed in making the awards; and they would express the hope that the many labours put forth on behalf of the enterprise now so near its close, may result in true and lasting benefit to many who have been engaged in it, as well as to the honour and glory of Almighty God.”

The whole of these were carried unanimously. The following is a list of the exhibitors to whom 1st and 2nd class prizes have been awarded:—

1st CLASS.
 CLASS 1.—(Artistic).—J. Long, J. Taylor, C. Mescham, T. Hinchcliff, C. Atkins, W. Drake, and J. Boys.
 CLASS 2.—(Mechanical).—R. C. D. Davies, C. Rowlett, R. L. Foster, W. Baxter, J. Bartlett, J. Bailey, R. Carpenter, J. Steer, J. M. Gregor, J. Smith, J. Moseck, and T. Gilling.

CLASS 3.—(General).—G. Hodden, W. Archer, Mrs. A. Muggenidge, and C. Willis.
 CLASS 4.—(Fabrics).—W. Laxton, Mrs. E. Costall, and N. A. Law.

2nd CLASS.
 CLASS 1.—(Artistic).—C. Hine, W. F. Poole, E. Pearson, J. S. Gill, R. W. Martin, H. Ferry, J. W. Narraway, C. L. Green, J. Hampson, G. Sandell, J. Dodds, J. A. Pitt, W. Care, R. Pembury, J. Mitchell, D. A. Winter, W. Morley, C. E. Jones, J. S. Gill, G. F. Thompson, F. G. Longhurst, C. T. Brasier, J. R. Harper, J. R. Thompson, A. F. W. Ebel, H. Bright, T. Byers, J. Morpeth, and A. W. Gregory.

CLASS 2.—(Mechanical).—J. Crook, C. Luckhurst, T. J. Satchell, W. Ford, P. Callier, H. C. Symons, J. Holmes, T. Winton, W. W. Crawford, C. Anderson, J. G. Calkin, K. Fuller, W. Mynot, T. Paice, G. W. Leeworthy, W. Marsh, H. Field, R. Kendrick, C. Driver, E. Horton, and F. Scott.

CLASS 3.—(General).—T. Sutton, J. Newill, J. P. Norris, and E. J. Broughton.

CLASS 4.—(Fabrics).—E. Foster, W. Wilson, M. Williams, H. Layan, M. A. Tetlow, E. Hadden, Mrs. Duff, Miss Duff, A. L. Lathrop, Z. A. Norris, and M. Shider.

The speaking was for the most part excellent, and might be usefully reported in full.

DOUBLE WARDS IN INFIRMARIES.

I AM glad to notice your remarks with respect to the construction of wards to contain four rows of beds. It is not generally known, however, that the fault does not in any instance lie with the architects, but that four-bedded wards are recommended and enforced by the Poor-law Board.

The plans of the Poplar and Stepney Sick Asylum have been altered under the direction of Dr. Markham, and Mr. Savage, the architect to the Poor-law Board; so that two-thirds of the beds will be in wards of this description; and I have reason to believe that the designs for all the infirmaries not actually commenced have been served in a similar manner. This is for the purpose of reducing the cost. AN ARCHITECT.

HOW KEEP THE BUILDINGS CLEAN.

Sir,—Artists, and especially architects, have long complained that the most elaborate products of their skill and genius are, in the course of a very few years, veiled and practically spoilt by the effects of the smoke-laden atmosphere of London. The complaint is forcibly urged by a correspondent of an evening contemporary in a recent number, who remarks, *apropos* of the memorial of the Prince Consort in Hyde Park, that in the lapse of a few seasons “the spire and all its elaborate tracery will have become obsolete and effaced for all artistic purposes. The atmosphere of London will have performed its inevitable function. Every ‘scroll work’ and ‘pinnacle’ will be a mere clot of soot” &c. And he concludes with the deduction that “all expenditure on highly decorated architecture is absolutely misapplied for out-of-door purposes in London. The result can only be in a few years a shapeless black frontage, reminding the observer at first of a heauty which has perished, and afterwards appealing to no taste or association at all.”

That this is only a melancholy truth no one can doubt. And it says little for our boasted “progress” that science, even when stimulated by Acts of Parliament, has effected little, if anything, towards curing the evil. The metropolitan public, though very willing to learn the lesson, have not been taught as yet how to consume their own smoke. But there is more than this. If to remove the cause of injury presents a problem too difficult for solution, it ought, at all events, to be possible to efface its effects;—in other words, to discover some detergent which shall cleanse the soot-deposit away from our metropolitan edifices. The result is attained in other departments, under much more difficult

circumstances. The most delicate textures of silk, of linen, or of leather, are cleansed over and over again. And surely it ought to be easy for the rising generation of Faradays to find some means of doing for the grimy surfaces of marble and granite, of oilite or bronze, which may be almost measured by acres in London alone, what soap and benzoin, and “scouring drops” of all sorts, accomplish for our curtains, carpets, and kid gloves,—viz., remove the dirt without damaging the material.

The problem ought not to be difficult to solve, and is worth any trouble in solution. Fancy the result, when our metropolitan edifices—public and private, ecclesiastical and lay—could pass through a process of illustration and emerge therefrom clean and tidy—spick and span—as on the day when the scaffolding first came down! The oldest Londoner would not know his own city again with all its features disclosed. Many of these features, as we know, would be artistically beautifully. And if many others would be much the reverse, at any rate it is better that they should be seen, such as they are. The neglect figure looks more comely when clean than when dirty.

THE BELLS AND CHIMES OF ST. CLEMENT DANES', IN THE STRAND.

The steeple of the church of St. Clement Danes is furnished with a peal of ten bells in the key of E, the tenor weighing 24 cwt.; a clock, and a set of chimes. There is also a saints' bell in the steeple.

As the bells have no epigraphs, I give a copy of the inscription on a brass plate, which may be seen in the porch under the tower:—

THE STEEPLE OF THIS CHURCH WAS THOROUGHLY REPAIRED IN THE YEAR 1859.
 W.^o MASON: T. BOULTON, CHURCHWARDENS.
 D
 S [Archer] C
 THE EIGHT BELLS IN THIS STEEPLE WERE CAST BY WILK & PHILLIPS WIGMORE MAN THEIR MASTERS FOUNDERS. ANO. DOMI. 1853. IN THE TIME OF W.^o DAVIS & CHURCH EDW.^o CLARKE AND CHURCH AND FINISHED WHEN EDW.^o CLARKE WARDENS: HUGH MILLS WARDENS T O L
 WEIGHT TOTAL: 4:13:2:8. THE GIFT OF EDW.^o CLARKE.

The first of the above peal of eight was re-cast in 1843, by Charles Oliver, who added two new trebles in 1845, made a new frame, and thus completed the present peal of ten bells; which the parochial ringers opened by ringing an excellent peal of Grandsire Caters, consisting of 5,093 changes, in three hours and thirty minutes, on Easter Monday in the same year. The peal was conducted by Mr. George Stockham, who has been steeple-keeper at this church upwards of thirty years.

Philip Wightman, whose name appears on the brass plate, was the founder who re-cast “Great Tom of Westminster.” See my notes on the Great Bell of St. Paul's Cathedral in the *Builder* of December 14th, 1867, and April 4th, 1868.

Charles Oliver, mentioned above, was employed for some years at the foundry of Messrs. Mears, in Whitechapel. He was a very skillful bell-hanger.

The Saints' Bell is inscribed “Roberts made me, 1588.”

In the belfry are fourteen tablets, on which are recorded certain remarkable performances of change-ringers from 1829 to 1869.

The present ringers are members of the St. James's Society, which was established about the year 1822, in the parish of St. James, Clerkenwell, and re-established A.D. 1827.

The clock was made by Langley Bradley in 1721, and now strikes the quarters on the first, second, third, and sixth bells, the hour being struck twice; first on the tenor, and then on the Saints' Bell.

“During the seventeenth century,” says Mr. A. Thomson, in his ‘Time and Time-keepers, 1842,’ many clocks struck the hours twice; so that had the first been miscounted, the second might be more correctly observed.”

The chimes play daily, at five, nine, and twelve o'clock, either the “Easter Hymn” or the “Old 104th Psalm.” But as to the setting of the tunes in the barrel, and the manner in which they are executed by the crazy old machine, the less said the better. I may, however, take occasion to say that it is to be hoped a fund may shortly be raised by subscription, for the purpose of procuring new and improved machinery, so that the music of the chimes of one of our most conspicuous metropolitan churches may be always pleasing to the ear. THOMAS WALESBY.

THE EDINBURGH ROYAL INFIRMARY.

SOME of our readers will be glad to learn that the subscribers to this medical charity have at length taken the proper view of the site—the one which we six weeks ago recommended,—and have resolved that the new hospital shall be built on the more healthful, spacious, and salubrious grounds of George Watson's Hospital. A meeting of the contributors was held last week, for the purpose of deciding the question, and the Lord Provost presided. Professor Syme moved that, (1) The new infirmary shall afford accommodation for surgical as well as medical patients; and (2) That the new infirmary shall be built on the grounds of George Watson's Hospital.” Mr. James Arnot, late surgeon of Middlesex Hospital, and President of the Royal College of Surgeons of England, seconded the motion. An amendment was then proposed by Councillor Millar, and seconded by Professor Spence, “That the present site be adhered to.” After a long discussion the motion was carried by a majority of 94, the numbers being, for Professor Syme's motion, 144; for Councillor Millar's, 50. The announcement of the vote was received with loud cheers.

Professor Syme then said it was very necessary for the meeting to consider what steps should be taken to carry out the resolution. His opinion was that they should have competitive plans from three or four eminent architects. These plans could be submitted to the public, and the contributors could thereafter decide which should be adopted.

After some conversation it was agreed that another meeting of the contributors should be called to receive the report of the scrutiny of the votes, and to consider what steps should be taken to carry the resolution into effect.

STREET AND OTHER IMPROVEMENTS IN LONDON.

THE report of works executed by the City Sewers Commission in 1868 has been made by Mr. Haywood, engineer and surveyor to the Commission, and printed for circulation.

The length of sewer constructed during the year was 1,507 ft. The deepening and extension of the sewerage, and the increasing volume of ground, are leading to the construction of double basements, one under the other, and these of a superior character to those heretofore constructed. These basements are frequently used as offices, and as warehouses for valuable goods.

Various improvements in the widening of streets have been made, as in Newgate-street, the whole line of which has now been widened, except at the west end, where fifteen houses, scheduled under the Holborn Valley Act, still stand. Widening of streets has also been going on in Ludgate-hill, Mansion-house-street, Paternoster-row, Fenchurch-street, &c.; and negotiations are still in hand for widening St. Paul's Churchyard at the west end, and for other and similar improvements.

In Duke-street, Smithfield, an experiment in paving has been made by laying a portion of the carriage-way with granite from Carnarvon, filling the joints with small pebbles and running in a composition of pitch and oil when in a heated state, instead of filling the joints with the ordinary grouting. This mode of grouting the joints is adopted at Manchester, and has been also employed at other towns in the North of England.

An experiment with Cooper's patent for watering the streets has been made, but the Commission have resolved to postpone adopting it till its value has been further demonstrated elsewhere.

Under the head of “Dangerous Structures,” Mr. Haywood says:—

“The business transacted by the Commission under the Metropolitan Buildings Act may be gathered from the following summary of cases:—

Number of structures reported on by the surveyors appointed by the commission	122
Buildings shored up	7
Number of cases heard before the magistrates	29
Number of cases certified by the district surveyors as being completed	82

The total shows a very large increase over previous years; in fact, so large a number of cases have not been dealt with since the year 1862.”

The arrangements entered into with the London, Chatham, and Dover Railway Company in 1866, were completed by widening Ludgate-hill

on its southern side, between New Bridge-street and the railway, so as to make that thoroughfare 60 ft. wide, and by forming half of the circus at the junction of Ludgate-hill, New Bridge-street, and Farringdon-street; this improvement has been of great advantage to the public, and shows the necessity for its completion by forming the western half of the circus.

Nothing is said in the report as to the foot bridge across Ludgate, which was arranged for with the railway company, but of the completion of which there was no sign last time we passed that way.

NOTES ON NORTHCOTE, THE PAINTER, BY BROCKEDON.

THESE notes respecting Northcote were written by the late William Brockedon, author of "The Passes of the Alps," and are now first printed.

Northcote was one day speaking in severe terms of reprobation of an artist as well known for his improvidence as for his perpetually trusting his pretensions and claims to patronage before the public. "And what are his merits as a painter?" said Northcote. "What has he done to justify his claims? Why, certainly, painted some fine pictures. Not three pictures in four times the number of years; and those with some catching qualities full of defects. They were overrated by himself, and the world was hulled by the papers into the belief that his own estimation of them was just. He received and spent thousands more of money than any other artist in the same time; yet swore he was left to starve by an ungrateful world." "Why, sir, you cannot deny that such a picture," naming that artist's finest production, "possessed great merit." "At first it did, perhaps; but it got worse and worse from his busy idleness over it; and though at one time some fine ideas were seen in the work, he seemed to be the only person insensible of them, for they were rubbed out before the picture was finished; though he was not singular in not knowing how to appreciate the chief merit of his work. I remember Opie's doing the same thing. But, oh! what a different man was Opie. He was a painter. I will tell you the instance of Opie's mistake about his picture. When he was engaged to paint the Murder of James I. of Scotland, now in the Guildhall, I heard a good deal of his proceedings, and that he had begun what would be the finest picture ever painted in England. I did not like to hear this, and I got fidgety when anybody who came in spoke of it. At last they worried me so that I determined to go up to Hampstead, where he was painting it, and judge for myself; for I thought it might be a bit of spite to vex me. Well, I went up, and when I saw it I was astounded. The effect was the finest and most striking I ever saw. He had introduced the light from a trap-door in the chamber, and it gleamed up upon the murderers in the most appalling way. 'Oh!' said I to myself, 'it is all true; it is all over with you. Go home; go home! I did go home, where I was perfectly haunted by the fine effect. I could not paint; I was always thinking of Opie's picture; and I worried myself so that at the end of the week I was obliged to go, like an animal fascinated. Well, I went up, dreading to do what I could not help; but when I entered his room it was quite a relief to me; for I saw, to my great comfort, that he had rubbed all the glorious effect out."

This singular avowal of his feelings by Northcote has been thought a mistake in the relation of them as to the picture, and that the subject was the Murder of David Rizzio; but Northcote was right: the murderers of Rizzio entered by a private passage of the queen's chamber, and nothing is said about a vault; but in the murder of James, he escaped into a vault, to which there was a secret entrance from the floor of his chamber. The assassin, having discovered the place of the king's retreat, pursued him there, and slew him. It is highly probable that Opie began his picture from the mistaken impression that the murderers entered the chamber by that vault, and subsequently discarding his historical error, sacrificed his fine effect to truth, not from ignorance of its value. Northcote, advertising again to the artist whose censure led to this anecdote of Opie, said,—"What has he done since? The picture you praise so was done many years ago, and was his best. He has painted worse and worse every year, and shown that a bad man cannot be a good painter, for his mind is too much occupied in

contriving to get out of scrapes to be bent with a becoming energy and power to his art. There is the thing which the king thought the other day. To be sure, it was a subject worthy of a king to buy, and an historical painter to execute. Lord bless us, why the world's gone mad, if either fancied that it was like Hogarth; it was the fable of the Frog and the Bull." But that picture was recommended to his majesty under peculiar circumstances. By whom? By Lawrence, who good-naturedly tried to serve the painter by hinting to his majesty that he was an unfortunate though an improvident man, and that the sale of the picture would probably restore him. Upon this the king ordered it to be sent to Windsor, and the picture was paid for. Northcote here burst out indignantly with—"Did Lawrence do this? Why a worthier man and a better painter might have been left to starve. I wish to Christ the king had knighted 'em."

It is not improbable that Northcote had had some affair of the heart in his earlier days: all his females bear the impress of some favourite image; it is a pretty English face of common life, but it is pretty, and all his ideal female heads are alike; and Northcote had been heard to say that nothing commanded happiness like personal beauty: and if he had to live again, with the choice of being distinguished for wisdom or hearty, he would choose the latter. A sensible man like Northcote could not have said this without some powerful recollections, probably of some love disappointment, which thus warped his judgment. His ideas of female purity and excellence were very high, and he always thought that Sir Joshua was the only painter of his time who treated it with the delicacy and dignity due to it. Lawrence's female portraits, he said, shocked him. Did you ever see one of Lawrence's females whom you would wish to be your wife? Not being immediately answered, he said,—"Ah! you would not have paused if the question had been put upon Sir Joshua's—his was so pure that you wished to love them. Of Lawrence's, you would ask yourself whether it would be prudent, for they looked as if they wished to love you. You would be afraid to do anything wrong before a female of Sir Joshua's; you thought only of wrong before a portrait by Lawrence—you only thought of her as a mistress." More cynicism has been charged to Northcote than he deserved. Sometimes his remarks were excited by his hearers, who flattered him with approbation when he said a cross thing, and forgot its severity in the smile of his listeners. Once Northcote lost a valued friend by a remark that had less of heartlessness in it than his friend supposed. Soon after the death of Miss Ann Plumtre, between whom and Northcote a warm friendship existed for many years, an estimable lady and a mutual friend called to condole with Northcote. The meeting was a painful and evidently an embarrassing one; for, after a long pause, Northcote said, with a sigh, "Ah! poor Miss Plumtre!" The friend, with painful suspense, awaited his further remarks, as he had introduced her name. A pause followed, which was at last broken by Northcote with the exclamation, "How ugly she was!" The lady, perfectly shocked, got away as soon as she could, and was so displeased that she broke a friendship of fifteen years, and never called upon Northcote after. Her conclusions were too hasty that Northcote was unfeeling. It was not an occasion in which Northcote's conversational powers were likely to be displayed, and the embarrassment which arose from his evidently not knowing what to say whilst there appeared to be a necessity for saying something, produced a true but thoughtless remark which cost him a friend.

SMOKY CHIMNEYS.

ONE of the greatest causes of smoke nuisance in a house is the manner in which coals are thrown on to the fire. Large and small coal and dust, mixed together and thrown on by the shoveller, merely to save five seconds of time, will form a sort of concrete from which the fire underneath will distil the smoke, keeping the room cold, wasting inflammable gas, and depositing soot in the chimney, and sometimes issuing from the top, spoiling furniture and making every one cough.

In the early part of the day the coals should be put on, one piece at a time, with the tongs. An upright coal-sieve is the best, so that the largest pieces keep nearest and the dust falls to the bottom. When the coals have run, they should be turned in one piece with the tongs, and not smashed with the poker. When the fire has acquired its ordinary fierceness, as it will towards evening, the dust and very small coal can be thrown on, and will be consumed readily.

By attending to these trifling matters, time will be saved, fuel economized, and but little smoke produced, and that little consumed, and the chimney require sweeping about once in five years. W. S.

BRICKWORK.

SIR,—Your correspondent "E. G." hits rather hard on the present building age when he says "these scamping times." The kind of scamping he particularly alludes to is not peculiar to our time, for if he ever had anything to do with many old buildings in London especially, he would be aware that our fathers and grandfathers knew how to veneer equally well, if not better than ourselves. I have heard, more than thirty years ago, of facing bricks being sawn down the middle lengthways, and so making two out of one. As to his 6 in. and 9 in. bricks, he forgets that his remedy is worse than the evil, as he might be treated to a 3 in. veneer instead of a 4 1/2 in., for the 6 in. being double the size, would be nearly double the cost; consequently a greater inducement to use the 3 in. I challenge him or any one else to find a better plan than the English bond, if it is carried out in its strict simplicity. Nothing is so simple or so perfect in brickwork, as old English bond; and yet in the inner sections of a true or walls nothing is so much neglected; it is the only true and perfect bond for bricks 9 by 4, and as long as walls are built of baked earth, no size or form is so convenient, or so uniform and pleasing to the eye, as the 9 by 4 by 2 1/2. As to the difficulty of 6 in. bricks being too wide for the bricklayer's hand, that is easily got over. He could have them made with holes through them to insert the fingers, and by a corresponding hole in the 3 in. he could skewer his courses together with a dowel as long as he pleased.

A word about scamping in brickwork. In my opinion the best plan to prevent it is first to be the most liberal in the estimates on that head, for the cost of brickwork, through so much competition, is got to be thought so lightly of, and employers expect it done at no price; and secondly, a thoroughly practical bricklayer to be carried out. It is truly lamentable to see the manner brickwork is done on many an important job through that very neglect. The idea of a carpenter from the bench, a mason from the banker, or perhaps an architect's clerk—albeit, clever men in their own branch—to superintend brickwork! Not a great while ago I heard of a broken-down draper acting as an inspector of brickwork on one of the recent large and important works of the metropolis, and he was spoken of by men who had worked under him as the best fellow on the whole length of the work, as they could scamp as much as they liked.

A BRICKLAYER.

CLOSED DOORS AT SOUTH KENSINGTON

SIR,—I beg to apologise to your "Disappointed" correspondent for having ventured to suppose there was any matter connected with the Museum at South Kensington upon which it was possible for him to receive information from the policemen on duty. In addition to his knowledge of the Museum, I presume he also lays claim to a knowledge of the meaning of English words, and therefore I think he must be willing to admit that the two following statements are not synonymous:—"Closing the South Kensington against the public at four o'clock on Saturdays," and "the regulations as to closing this Armour Gallery on Saturday afternoons at four o'clock." Had the latter sentence appeared in your correspondent's former letter, I should not have troubled you or him on the subject; but, as I said, the original statement "seems to me to call for comment as being calculated to mislead."

Allow me also to add that my words in reference to that portion of the Museum "where the models of ships are exhibited" were "a sort of annex," not "a mere annex," as quoted by "One Disappointed."

ART-LOVER.

* * With this the correspondence may end.

RE-BUILDING AND ENLARGEMENT OF POPLAR UNION WORKHOUSE.

AT a special committee meeting of the Poplar Union Board of Guardians, Mr. Barringer in the chair, tenders were opened for re-building and enlarging Poplar Workhouse. As far back as 1857, Mr. Farrall, Poor-law Inspector of Workhouses, reported this workhouse to the Poor-law Board, as "inadequate in size and inefficient in arrangement." At the present time it is overcrowded by 800 inmates, and for many months the guardians have been compelled to "farm out" more than 500 people, who, in addition to the first-mentioned, claimed admission to the house. The greater portion of the old workhouse is to be demolished, and the guardian having acquired additional land at the rear, a new house is to be erected, capable of accommodating 808 persons. It was originally intended by the Board to provide accommodation for 1,000 paupers, and plans were prepared in accordance with this intention; but upon the drawings being submitted for the Poor-law Board's approval, those gentlemen refused to sanction the carrying of them out, and suggesting certain modifications, which brought the number to be accommodated down to 818, recommended the Poplar Board to prepare fresh drawings, embodying the views of the Poor-law Board. There was considerable dissatisfaction expressed by the guardians at this, but it was eventually resolved to accept the upper Board's dictum, and the architect, Mr. John W. Morris, was instructed to prepare a fresh set of drawings. Having done so, the Poor-law Board immediately approved them. The local Board then issued invitations to builders to send in tenders for the works. The architect's estimate for the cost of the works, as originally determined upon by the guardians (viz., for 1,000 paupers), was 47,700, but the extensive modification suggested by the Poor-law Board reduced this sum by 12,700; the estimate, therefore, for the building to accommodate 808 persons, stood at 35,000.

There were fifteen tenders for the work sent in, as follows:—

G. J. Watts	£36,689
Kilbey	36,118
John Kirk	36,993
Cooper & Callum	34,080
Serviner & White	34,854
Emor	34,793
Myers & Sons	34,694
Henshaw	34,350
Wicks, Bangs, & Co.	34,200
Atherton & Latta	33,835
Alraham	33,490
Sheffield	33,267
Webb & Son	33,203
Hill, Keddell, & Waldram ..	32,460
Ansonbe	32,200

The special meeting having discussed the tenders, and conferred with the architect in reference thereto, decided

to recommend to the Board's consideration the two lowest tenders, namely, Mr. Anson's and Messrs. Hill, Keddell, & Waldram's.

At the ordinary business meeting of the Board, held on Friday afternoon, the committee's recommendation was read by the clerk, and a very lengthy and animated discussion ensued. Numerous resolutions, counter resolutions, and amendments were proposed, some of which were seconded and put to the vote, while others could find no supporters, and consequently "fell through." One proposal advocated the addition of Mr. Sheffield's name to the recommended two, on the score that that gentleman was resident in the district, and would employ labour from the district; Messrs. Webb's tender was then proposed on the same grounds; a third proposition suggested that the committee's recommendations should be thrown over, and the fifteen tenders submitted to vote. After more than two hours had thus been spent, Mr. W. Nielson, superintendent of the West-India Dock Company, moved, and Mr. J. R. Ravenhill, engineer, seconded, "That Messrs. Hill, Keddell, & Waldram's tender be accepted, as Mr. Anson's whose tender is the lowest, has not complied with the Board's condition in regard to the provision of sureties." (It appeared that Mr. Anson had not supplied the addresses of the parties proposed as his sureties.) This resolution was carried by a majority of 6, and Mr. Waldram's tender was the contract. The Board's seal was then affixed to the contract, and the Guardians proceeded to the general business of the day.

BREACH OF CONTRACT WITH ARCHITECT IN CONNECTION WITH ST. DAVID'S CHURCH, ISLINGTON.

Sir,—Permit me to state, in reference to the above case reported in your columns of last week, that I was prepared with the evidence of several well-known contractors in confirmation of the accuracy of my estimate, in the event (probable, of course) of Messrs. Dove's remarkable admission on that point not being deemed sufficient; and that I was also prepared to show from a published statement that the fall cost of carrying out Mr. Blackburne's design as approved would have been actually far greater than mine.

I should thus have been able to dispose quickly of both the grounds alleged for my dismissal, viz., that my estimate was incorrect, and that my design was too expensive to carry out either wholly or in part.

I consented to a compromise solely from a desire to spare charitable funds, upon which it is unnecessary to expound the expense of a protracted suit would fall, and not from the slightest fear as to the result.

Trusting to your sense of justice to insert this explanation in your next impression,—
E. H. LINGEN BARBER.

"ROD," "RODE," "ROYD."

In local name-formation "Royd" means a clearing in a forest. Its derivation is probably rather from the Northern than the Saxon *Tentonic*, as in *Isl. rod*; *Dax. rod*; *SWR. rod*; *Eng. rood*, *radix*; and the verbs formed from them—*rota*, *oproder*, *roden*, to rot up, grub up, rake up, and, more remotely, to trench the ground. The combination of *rod*, *kode*, *royd* is common in Yorkshire, Lancashire, and parts of the northern counties, where the Norsemen settled, sometimes with the name of a man, perhaps the original settler, as Ormrod, Ormroyd, Martinroyd, Margatroyd; or with an office, as Munkroyd, Bishoproyd, Nunroyd; or a descriptive word, as Blackeroyd, Osteroyd, Stonyroyd; or a tree, as the oak in Akeroyd, Oakenroyd, the holly in Hollinroyd, the rush in Holroyd.

In legal phrase, *terra rodata*, rode land, means land in tillage from immemorial times,—in contradistinction to *terra bovata*, pasture land.

There is a word used in a similar sense in the woody marches of Wales,—*moot* means a root. This may possibly be a dialectic change from the Anglo-Saxon *ort*, wort; and *mooted* land in Dean and Gwentwood means disforested land, cleared of the stumps. In heraldry *mooted* means plucked up by the roots. W. C. C.

In answer to the query of "R. C.," in your issue of the 20th inst., I beg to inform him that the word "Royd," in local names in England, as Abbotroyd, denotes land lately reclaimed and thrown into cultivation, and is derived from the provincial verb *rod*, to clear or grub up. *Terra rodata*, rode land, was so called in opposition to *terra bovata*, an ancient enclosure which had been from time immemorial under the plough, and was measured by the quantity which one ox could plough in a season. (Charnock's "Local Etymology.")

EDWARD J. WOOD.

SCHOOLS OF ART.

The Sheffield School.—The annual convocations of this school has been held at the school buildings, Arundel-street. There was a company numbering between 500 and 600 persons. The pictures and artistic objects with which the rooms were filled were inspected with much interest. The prizes were distributed by Mr. Roebuck, who delivered a speech in exposition of art, showing its effects on the happiness of the individual and of the community, and the necessity for meeting the rivalry of other nations, especially by improvements in design.

CHURCH-BUILDING NEWS.

Mansfield.—At a vestry meeting of the inhabitants to consider as to the restoration and enlargement of St. Peter's church, the following and other resolutions were passed:—"That for the seamliness of the House of God, and the comfort of worshippers, it is important that the fabric of St. Peter's Church should be restored, the galleries removed, and the interior reseated with open sittings;" "that as the area of St. Peter's Church is insufficient for the spiritual wants of the parish, it is expedient, provided it can be done without sacrificing what is valuable in the present building, that the church be enlarged as well as restored;" "that Mr. William Smith, of the Adelphi Chambers, London, be instructed to prepare two reports, with estimates—one for the restoration of the church on its present scale; the other for enlargement as well as restoration, provided that the expenses of such advice of Mr. Smith, in case the parish is unable to accept his plans, do not exceed the sum of 20l.;" and "that the vicar and churchwardens be empowered to forward the resolutions of this meeting to the architect; and on receiving his reports to convene a public meeting of the inhabitants of Mansfield, to consider what action shall be taken on them."

Ipswich.—A vestry meeting has been held for the purpose of considering the plans of Mr. Phipson for enclosing the churchyard of St. Mary Tower Church, and making certain alterations in the west entrance. Mr. Bacon (who has already been very liberal in his expenditure upon this church) intimated that he was prepared to carry out the whole of the proposed plans at his own expense, and the works will be proceeded with forthwith.

Worth Matravers.—The parish church here has been renovated and repaired under the direction of Mr. R. Salvin, of London.

SCHOOL-BUILDING NEWS.

Stockport.—The new Wesleyan Schools, Wellington-road South, intended to supersede the old Brentnall-street Sunday school, approaches completion. Mr. T. H. Allen, of Stockport, is the architect; and Messrs. T. & W. Meadows, also of this town, are the contractors. The workmen employed in its erection, together with a number engaged, under Messrs. Meadows, in the erection of two first-class houses in Heaton Norris, numbering altogether about sixty, recently assembled at the Railway Hotel, opposite Heaton Norris Station, where they partook of a "rearing supper."

Wolstanton.—Following the erection of their new chapel in 1866, the Wesleyan body in this district have now completed their original plan of providing new schools. The schools are in architectural keeping with the Gothic chapel, and have been erected from the plans of Mr. T. Roberts, of Trentham, who rendered his gratuitous services. The contractor for the building was Mr. W. Sutton, of Newcastle. The premises are situated at the rear of the chapel, and contain a room 70 ft. by 50 ft., and capable of accommodating between 300 and 400 children. The building will also contain an infant school, several class rooms, and a room for the school library. The total cost of the schools, including the land (70l. 10s. 6d.), and the heating, furniture, &c., will amount to about 1,080l.

Tunbridge.—New schools are about to be built by the Wesleyans here, in Swan-lane, at a cost of 1,000l., including site, near the South-Eastern railway. The chief stone has been laid. The architect is Mr. Baker, of London; and Mr. Dove, of Tunbridge, is the builder.

MONUMENTAL.

A MEMBER of the Council of the Workmen's Club and Institute Union suggests that a fitting national memorial to Henry Brougham should be now set about. A monument in Westminster Abbey would be a matter of course; but he suggests the erection of a Central Hall and Free Library in London, with reading-rooms and meeting-places open at all times to all classes of men. Such an institution is much needed. The boon of a free library has been appreciated in some of our great cities already. Why should not London follow, though late, so good example? We know that attempts have already been made to induce the Londoners to do so, but it is only by reiterated endeavours that many good things are realized.

A meeting of London Scotchmen interested in the monument in course of erection to Sir William Wallace on the Abbey Craig, Stirling, has been held in the hall of the Scottish Corporation, Crane-court, Fleet-street; Dr. Ramsay, president of the Caledonian Society of London, in the chair. There was a very full attendance, and the proceedings were very enthusiastic and unanimous. Mr. Burns, of Glasgow, attended as a delegate from the building committee, and stated that the total amount subscribed up to the present time has been 12,120l., and the total expenditure has been 12,670l., so that the deficiency still existing is about 550l. Mr. Burns urged upon the meeting the necessity which existed for completing the monument. A resolution was carried to the effect that immediate action should be taken to finish the small remaining portion of the work necessary to complete the monument, and that in order to do this the Scotchmen in England should be appealed to for funds to aid in the good national cause. A committee was appointed to further the end in view.

At Bolton it has been determined to erect the statue of Dr. Chadwick in Nelson-square, immediately in front of the infirmary. A committee, consisting of the Mayor (Mr. Alderman Barlow), chairman of the committee; Mr. G. L. Taylor, vice-chairman; Mr. W. C. Williamson, hon. treasurer; Mr. R. G. Hinnall, town clerk, and Mr. J. Nightingale, hon. secretaries; together with Mr. John Hall and Mr. James Fogg, was appointed to procure designs from some half-dozen of the leading sculptors of the country, as well as an estimate of the cost of the statue, and submit the same to a future meeting.

PORTLAND CEMENT.

Your correspondents, William Pullam and Henry Reid, the author of a valuable work on the subject, have both given good and valid reasons for the behaviour of Portland cement as described by "A Builder" in your impression of the 6th inst. To show the great ignorance that exists amongst builders and others at the present time, we will give an instance that occurred only last week. We were requested to send some good cement by a large ship-building firm in Liverpool, and accordingly sent some that we had tested and found to break at 700 lb., being 200 lb. more than the Government test. The next day a complaint was lodged saying that the cement had been condemned because it would not set quick. We are constantly asked to send out the cement *fresh* as possible. As manufacturers who have experimented a great deal, we have always found the strongest cement to be the slowest in setting. It is very important for all users of this cement to be particular in ordering, to state whether it is wanted quick setting, which is more useful for plasterers or ship-cementers; or for *strength*, as most necessary for concrete building, or sea-work, or flooring purposes.

There is no doubt that all cement should be ground fine, and never used until it has been made over six weeks; and when used care should be taken that the sand or gravel used is well washed and sharp, and free from dirt.

MANUFACTURERS.

COMPETITIONS.

St. Philip's, Heigham, near Norwich.—The following gentlemen were invited to compete for this church, which is to seat 800 persons;—Messrs. Brown, Phipson, Bonest, Christopher, Warren, Hawkesley, and Power. The designs of Mr. Edward Power, of London, have been selected.

GLASS IN SHAM WINDOWS.

I SEE from a letter on the above subject in your last that one of your correspondents has, or supposes he has, experienced the results of a peculiar tendency of glass to break when placed in blank windows with a well behind, especially when exposed to the sun. If it be so, I can only regard with peculiar satisfaction such an indication of an opposition in Nature herself to the existence of such absurdities. The statement may be taken to be, as Sam Slick would have said, "a beautiful allegory;" but perhaps it never occurred to your correspondent that glass so placed may be broken by a blow from a stone or other missile, without those in the house

ing any the wiser, until a walk round the milling may reveal the fact of the glass having flown" under this very simple treatment.

Whether this be the explanation of the mystery, however, or whether it be due to more occult causes, natural or supernatural, I do not undertake to say; but I hope that any one who does know the reason will keep it to himself, and that all glass in blank windows may exhibit the same alarming propensity, until jerry-architects shall no more dare to employ them to the disfigurement of all who love honest building, including yours,
H. H. S.

HOUSE PAINTING.

SIR,—If your correspondent "H. S. D." mix in the first coat of paint half turps and linseed-oil, or other more turps than oil, and in the second or at least nearly all linseed-oil, he will find it dry a nice glossy and even manner. Of course the above is for inside work.
S. GOCHER.

THE FRENCH WORKMEN IN CORNWALL.

SIR,—I hope that some one more learned than I am in granite matters, may think it worth while to say something in reply to "Clerk of the works" in your number of the 20th. I do not suppose there can be any doubt about the quantity or quality of the Cornish granite, the skill and powers of Cornish quarrymen, the capital and energy of quarry owners and contractors for granite work. Are there any unions among Cornish quarrymen? If so, do these unions compel their members to demand a certain rate of wage, to work by day-work and not piecework, to strike for lower wages whenever they think their employer has got a remunerative contract, or is pressed for time? and thus force their employers in ordering for work to put on an extra price, to meet these too probable contingencies. If these unions do exist, they may be one reason why Cornish men will see the foreigner trying their work, and at their own doors.
A LAYMAN.

Miscellaneous.

New British Telegraph direct to India and Australia.—A "Direct English, Indian, and Australian Submarine Telegraph Company, limited" is being formed; capital, 2,500,000l., 500,000 shares of 5l. each. The first issue of shares will be for the lines from Suez to Bombay and the Malta lines. The consulting electrician, Sir William Thomson, F.R.S., and the electrician and electrical engineer, Mr. Cromwell F. Harley, M.L.C.E. The object of the company is to lay and work submarine telegraphs between England, Gibraltar, Malta, Egypt, India, China, and Australia, which shall be in English hands in end to end. The telegraph will work by submarine cables, and will therefore be more accurate, reliable, and speedy than by land lines.

The Leeds Brigade Improvements.—In course of these improvements some landmarks are being removed, such as the old Corn Exchange. The demolition of buildings in widening Upperhead-row has commenced. They are amongst the oldest in the town, having stood nearly 400 years. One, a shop, once the entry of St. Mary Magdalen, is traditionally said to have had a subterranean communication with Kirkstall Abbey; and in the cellars of the house and Trumpet there are some curious bones, which must at one time have been connected with an underground passage. The Commercial Buildings are to be cut into, a wedge-shaped portion having to come off the south side. Drawings have been prepared by Messrs. S. & A. J. Nelson, architects, for the reconstruction and rearrangement of the structure on reduced site at a cost of 11,000l. to 12,000l.

Swimming-baths and Notting-hill Baths.—Swimming-baths, Notting-hill, and Shepherd's-bush are shortly to be provided, by means of a Limited Company, with public baths, similar to those which have so largely assisted the progress of sanitary reforms in other parts of the metropolis. It is estimated by the architect, Mr. E. Hewett, that the outlay upon the buildings and fittings will be fully met for 6,000l. There will be a total of swimming-baths, respectively 67 ft. by 44 ft., and 44 ft. 6 in. by 22 ft. 6 in.

Testing a New Assembly-Room.—The new assembly-room at Ryde has been tested by forming and drilling about forty volunteers in it. The quick march, says our authority, made it shiver, but the "double" made the floor wave like a sheet of tissue-paper in the wind. Something, it is thought, must be done to make it more stable and firm, and the only effective means, some of the examiners considered, would be to place stout timber or iron pillars under the middle part of the long beams. This would mar the drill-place for the volunteers, and is to be avoided if possible.

Ecclesiastical Dilapidations.—After the lapse of several sessions, the Archbishop of York has laid before the House of Lords another Bill upon this subject. The Bill proposes, like its predecessors, the appointment of official surveyors; they are to be chosen, not for a diocese, but for an archdeaconry, and by the archdeacon and rural deans, subject to the approval of the bishop. The surveyors are to be paid, not by salary, but according to a rate of charges to be fixed in each diocese by the bishop, the archdeacon, and the chancellor. An incumbent of a benefice may at any time, at his own expense, have the buildings belonging to his benefice inspected by an official surveyor; his report is to be subject to appeal to the bishop or archdeacon. On the incumbent executing the works, he and his estate are to be free for five years from all claims for dilapidations, unless the bishop, on a vacancy occurring within the five years, shall consider that wilful waste committed makes a fresh inspection proper. If the surveyor certifies that, in consideration of the antiquity of the premises, or for other reason to be specified, the cost of the repairs ought to be spread over several years, then with the consent of the bishop Queen Anne's Bounty Board may lend money for the execution of the repairs, to be repayable by instalments out of the proceeds of the living. On the avoidance of any benefice, the incumbent not being free from liability as above mentioned, the archdeacon is to order an inspection of the buildings. If the surveyor's report of dilapidations is objected to, the archdeacon may direct a fresh survey; and the order eventually made by the archdeacon will be subject to appeal to the bishop.

Cost of Garrick-street, Covent Garden.—The Metropolitan Board of Works having completed the sale of all the property in Garrick-street, formed under the Covent Garden Approach Act, 1857, have made out an account of the payments and receipts connected with the improvement, as follows:—Expenditure—Parliamentary expenses, 269l. 19s. 3d.; cost of freehold and other property, 105,940l. 2s. 2d.; professional and law charges, 4,912l. 4s. 3d.; works, 6,095l. 19s. 7d.; stamps and incidentals, 875l. 0s. 10d.; clerk of works' wages, 68l. 5s.; land-tax and redemption, 1,088l. 10s. 2d.; insurance, rent, &c., of houses, 751l. 1s. 4d.; proportion of expenses, salaries, &c., 3,200l.; interest on actual payments beyond receipts of each year from 1858 to date of sale of ground-rents, 19,086l. 4s. 8d.; total, 142,091l. 7s. 3d. Receipts—Advances from London Bridges Approaches Fund, 62,352l. 6s. 2d.; contribution from the Duke of Bedford (15,000l. less repurchase of property), 6,766l. 9s.; proceeds of sales of old materials, 2,436l. 18s. 2d.; rents, 10,895l. 18s. 5d.; received in respect of vaults, 1,229l.; interest on cash balances, 5,576l. 3s. 6d.; sale of ground-rents, 52,715l. 4s. 10d. There was a balance of 14,210l. 13s., which has been handed over to the Thames Embankment and Metropolitan Improvement Fund.

The recent Inflow of Water into a Coal-pit.—Extraordinary attempts have been persistently made to get at the men who have been buried alive by the inflow of water into the workings of the Nine Locks Pit at Brierley-hill, and these attempts have at last been crowned with unanticipated success. After 25,000 tons of water had been lifted from a depth of 200 yards, access to some part of the interior became possible, but was for a time delayed by the prevalence of carbonic acid gas. After ventilation had been improved, a party of picked men descended and succeeded in bringing to the surface four men and a boy, who, although they had been immured for four days and as many nights, and had nothing but candles to supply the place of food, were still alive. The other poor fellows who were in workings at a greater depth were soon reached, and all got out alive.

St. Peter's, Rome.—The Pope visited, on the 6th inst., the works now in progress in the transept of St. Peter's, according to the *Tablet*. His Holiness was accompanied by the four architects of the church, and by other officials. Some modifications have been made in the original plan for accommodating the General Council. There will be fourteen rows of stalls, arranged *en amphithéâtre*. Each bishop will have a desk before him. To prevent the dispersion of sound which would be caused by the great elevation of the roof of the transept, a thick curtain will be suspended above the assembly, stretching from one cornice to the other. The arcades, which form a communication between the transept and the two chapels adjoining it, will be entirely closed. The interior surface of the enclosure through which the prelates will enter the transept will be adorned with portraits of all the Popes who have held Oecumenical Councils.

New Central Branch Synagogue in St. Marylebone.—The first stone of a building henceforth to be known as the Central Branch Synagogue has been laid by Baron Lionel de Rothschild, on a piece of ground reaching from Great Portland-street westward to Charlotte-street. This will be occupied by a Moresque edifice of stately elevation and ample interior space, the ground area measuring 70 ft. by 60 ft., and the galleries, according to the plans, giving a considerable addition of space. The proposed building will cost 24,000l. The stone bears inscriptions in Hebrew and English, stating that it was laid in the year of the world 5629 and the 32nd year of the reign of Queen Victoria, and giving also the names of the principal officers.

Time Light with Gas and Air.—A brilliant and steady light, it is said, has been obtained by the Messrs. Darker from a mixture of common gas and atmospheric air. The air and gas are either mixed (which is a dangerous arrangement, and has already given rise to explosions), or are emitted singly, as in some forms of the oxy-hydrogen burner. Instead, however, of the intense heat thus obtained being employed to raise to a white heat a platinum gauze cap, as proposed two years ago by M. Bourhanze, Messrs. Darker cause the flame to impinge upon lime or magnesia, either singly or in combination with asbestos.

The Crystal Palace.—Amongst the Easter attractions, which are numerous, will be the exhibition in the concert-hall of a scene specially designed by Mr. Matt Morgan representing St. Peter's at Rome, as illuminated for Easter. This has been painted from drawings and designs taken specially for the company at Easter last year; and, considering the interest now taken by the many English who visit Rome annually at this period, it will no doubt prove attractive.

Lambeth School of Art.—The gold medal has been awarded to Edwin Mullins, for a model from the antique. Silver medals have been awarded to Cyrus Johnson, for a head from life; and Alexander Booker, for a design for wall decoration. Bronze medals were awarded to Richard Gates, for design for lace; and Walter Stacey, for a drawing from the antique.

Metropolitan Association of Medical Officers of Health.—At the last meeting, held on the 20th instant, Mr. Liddle introduced the subject of the class of houses desirable to place under the provisions of the Artisans' and Labourers' Dwellings Act; and Mr. Sharpe exhibited models of improved sanitary dwellings.

Royal Gallery of Illustration.—Mr. and Mrs. German Reed on Easter Monday will produce two novelties—one from the pen of W. S. Gilbert, entitled "No Cards;" and the other a triumpvretta, a musical adaptation, entitled "Cox and Box, or the Long Lost Brothers," by F. C. Burnand and Arthur Sullivan;—heretofore only heard in private.

Technical Education.—The Government have decided not to establish schools of technical education throughout the country, as the expense would be enormous. They have resolved, however, to give liberal support to local efforts made for this purpose.

An Ice Fire.—An American paper informs its readers it has been ascertained that the cause of a fire in a Western brewery was that "the ice heated in consequence of being packed too damp."

Discovery of Roman Remains at Snodland.—Some labourers engaged at Mr. Peter's lime and cement works, on the banks of the Medway at Snodland, whilst digging out the foundations for some new buildings on the river banks, have come upon a well-preserved piece of Roman tessellated pavement, formed of bright red bricks about an inch square. The extent of the pavement is probably about 6 ft. by 3 ft., and it is tolerably level throughout. Some fragments of Roman pottery and an ancient coin were also turned up. On the opposite side of the river bricks laid in regular order have been traced for some distance along the bank.

The Thames Bank at Wapping.—A public meeting was held last week in Wapping, to consider the propriety of petitioning Parliament to provide an embankment to prevent the frequent overflows of the Thames into the property in the district. Mr. W. Creighton, who occupied the chair, in opening the proceedings, said that at present, whenever there was a high tide, the river overflowed, entered the houses, and but a very short time ago the whole of the inhabitants of one street were compelled to remove from their tenements. When the water subsided the floors and furniture of the inhabitants were coated with mud, which emitted a most disgusting odour. A number of statements were then made by sufferers. A committee having been formed to collect information, the proceedings were adjourned.

Proposed Foundation of a Gladstone Hospital in Liverpool.—The money which has been recently collected (for the most part in penny subscriptions) in Liverpool and the district, for the "Gladstone Testimonial," is to be expended, in compliance with the Premier's expressed wish, upon a convalescent hospital, the foundation stone of which will shortly be laid by Mrs. Gladstone.

Memorial Picture for the New Town-hall, Manchester.—A picture has been done for the new town-hall, by Mr. George E. Tason. It is of large dimensions, and represents the presentation of addresses by the corporation and the Cotton Supply Association of Manchester to the Sultan, when he visited this country some two years ago. The scene is laid in a room in Enckingham Palace. Altogether there are thirty-one persons represented. The portrait of the Sultan has been painted from a full-length forwarded to Mr. Tason by direction of the Sultan.

Strike of Plasterers in Sheffield.—The operative plasterers in Sheffield, a body of about a hundred men, are now on strike to enforce a demand for a reduction of hours. Their demand is for an alteration of the present arrangement—which is, from six a.m. to half-past five p.m., four days a week, from seven to half-past five on Monday, and from six to one on Saturday,—so as to make the hour for beginning work seven o'clock every morning. The masters refused to grant this demand, and estimate that the loss to them of agreeing to it would be 3s. per week per plasterer, and 2s. per week per laborer, making 5s. per week for every plasterer employed. The local trade-union gave six months' notice to the employers, according to rule, of their desire for an alteration of hours, and the association of employers refused to accede to the desire. The refusal was communicated to the trade about two months after the notice was given. One of the rules provides that questions in dispute shall be discussed by three delegates from each side, with an ultimate appeal to an umpire.

Laying Foundation Stone of Middle Class Schools of Whitgift's Hospital at Croydon.—The foundation or memorial stone of the intended Commercial or Middle Class Schools, at North-end, Croydon, has been laid by the Archbishop of Canterbury. The architect is Mr. Arthur William Blomfield. The position, in the building, of the memorial stone is over the centre of the arched doorway which will be the principal entrance on the west front of the school building. The doorway will be in the centre of the base of the tower, which will rise to the height of nearly 80 ft., and as this is the highest part of the town, the tower will be a conspicuous and ornamental object from every part of the town and immediate neighbourhood.

Nazareth.—A Christian ohnrch is about to be erected at Nazareth. The estimated cost is 2,000*l.*, and towards that amount 1,320*l.* have been received.

Uppingham.—It is proposed to hold the next summer meeting of the Northamptonshire and Leicestershire Architectural and Archaeological Societies at this place, which is the centre of a very interesting district.

TENDERS.

For Wesleyan schools, Hightown-Crewe. Mr. George B. Ford, architect:—
 Bridley & Critchlow £1,240 0 0
 Elson 1,090 0 0
 Cotterill (accepted) 1,090 10 0

For Dover Harbour offices and shops. Mr. Rowland Rees, C.E., architect:—
 Reid 6972 10 0
 Eagd 968 0 0
 Pickford 895 0 0
 Nightingale & Bushell 879 11 0
 Tambridge & Deems 675 0 0
 Woodcock 869 0 0
 Lawson 882 0 0
 Ayers & Son 855 0 0
 Adcock 848 0 0
 Richardson 818 0 0
 Stiff & Co. 836 0 0
 Mathews (accepted) 828 10 0

For seven houses, Cliff-terrace, Southend. Mr. W. A. Dixon, architect. Quantities supplied:—
 Mann 49,234 0 0
 Mansley & Rogers 9,973 0 0
 Wilkins & Son 9,963 0 0
 Eaton & Chapman 8,934 0 0
 Thomas 8,773 0 0
 Withers 8,770 0 0
 Staines & Son 8,003 0 0
 Wicks, Bangs, & Co. 8,270 0 0

For new galleries, entrance porches, and other additions to the Lewisham High-road Congregational Church. Mr. John Tarring, architect. Quantities supplied:—
 Pittman & Fotheringham 1,492 0 0
 Richards 1,485 0 0
 Hill & Sons 1,485 0 0
 Sharnur 1,297 0 0
 Shepherd 1,233 7 6

For completion of St. Saviour's Church, Kensal New Town. Mr. B. White, architect. Quantities supplied:—
 Hill, Keddell, & Waldram 3,259 0 0
 Emor 3,158 0 0
 Earle 3,100 0 0
 Serizette & White 2,871 0 0

For new reservoir, pumping station, and sundry works, at Madgate Park, for the Leicester Waterworks Company. Mr. Hawkesley, engineer.

	No. 1 Contract, Reservoir, &c.	No. 2 Contract, Pumping Station, &c.
Watson	266,919 9 5	—
Dookney	62,000 0 0	—
Turner & Sayer ..	60,530 0 0	—
Pickering	60,313 14 1	—
Neale & Sons	59,450 0 0	£10,739 0 0
Kirk & Parry	58,460 0 0	10,025 2 3
Sharp, Brothers ..	58,071 18 11	9,436 10 9
Oborne, Brothers ..	57,530 0 0	10,968 0 0
Webster	57,530 0 0	—
Matthewson	55,875 0 0	—
Neave & Fry	55,154 8 6	11,338 16 2
Yosell	54,07 8 0	—
Pearseys	53,759 18 10	9,968 19 11
Adams	52,027 0 0	9,155 1 3
Hill, Keddell, & Co.	51,313 0 0	9,343 0 0
Kirk	49,059 14 4	8,968 17 6
Waine	—	8,567 0 0
Maxfield	47,780 0 0	8,475 0 0
Kille & Wink	47,654 9 0	9,218 6 3
Hilton	46,363 4 1	8,779 15 8
Treadwell	45,465 0 0	9,532 0 0
Herbert	—	7,778 0 0
Tomlinson	44,783 19 7	—
Past	42,246 7 1	7,553 0 2
Dixon	42,243 19 5	9,819 13 1/2
Benton & Co.	41,514 6 11	8,300 15 4

For the erection of Warehouse, Gun-square, Houndsditch, Messrs. John Young & Son, architects:—
 Jacobs & Son £1,490 0 0
 Newman & Mann 1,346 0 0
 Henshaw 1,340 0 0
 Comford 1,211 0 0
 King & Sons 1,210 0 0
 Hart 1,225 0 0
 Merritt & Ashby 1,209 0 0
 Ashby & Horner 1,150 0 0
 Cohen 1,130 0 0

For alterations to the children's establishment at Limehouse, for the guardians of the Stepney Union:—
 Heiser 850 0 0
 Kirby 779 0 0
 Izard 779 0 0
 Cook & Green 740 0 0
 Crockett 700 0 0
 Harris 694 0 0
 Knight & Son 683 0 0
 Tull 689 0 0
 Hughesden 683 0 0
 Sheffield 678 0 0
 Gilling 671 0 0
 Wicks, Bangs, & Co. 670 0 0

For alterations, repairs, painting, &c., at Messrs. Phillips, Brothers' ale stores, Swan-walk, Chelsea. Mr. W. S. Witherington, architect:—
 Staines & Son (accepted) £508 0 0

For alterations to the Panther Tavern, Bethnal green, for Mr. Kynaston. Mr. Joseph Harris, jun., architect:—
 Steed £379 0 0
 Hearle 255 0 0
 Forrest (accepted) 240 0 0

For building offices, fermenting-room, and ale-tort at the Faversham Brewery, for Messrs. Shepherd, Neave & Co. Mr. B. Adkins, architect. Quantities supplied:—
 Mr. T. M. Rickards:—

Brasier & Son	23,778 0 0
Ansten	3,424 0 0
Lawsen	3,422 0 0
Judges	3,301 18 0
Stiff	3,279 0 0
Sollitt	2,833 0 0
Shrubsole	2,773 0 0
Naylor (accepted) ..	2,637 0 0

For the erection of three warehouses, Dewgate-hill, E.C. Messrs. H. J. & D. Mathews, architects:—
 Browne & Robinson £3,670 0 0
 Colls & Sons 9,469 0 0
 Tansley 8,385 0 0
 Horner 9,170 0 0
 King & Sons 9,028 0 0
 Brass 8,989 0 0
 Sewell 8,706 0 0
 Webb & Sons 8,348 0 0

For new mission house premises, Castle-street, Holbo for the Baptist Missionary Society. Messrs. C. G. Sea & Son, architects. Quantities supplied by Mr. Jas. Barnes:—

Larrant	£10,034 0 0
Dove, Brothers	9,475 0 0
Macey	9,301 0 0
Mansfield & Co.	9,375 0 0
Patman & Fotheringham	9,243 0 0
Higgs	9,141 0 0
Coleman	9,069 0 0
Brown & Robinson ..	8,385 0 0
Ashby & Horner	8,970 0 0
Myers & Sons	8,461 0 0
Brass & Co. (accepted)	8,437 0 0

For first portion of proposed extension of Messrs. R. G. & Co.'s premises, Tottenham-court-road. Mr. G. Widdows, architect:—

Pozley	£4,203 0 0
Chesnum	3,735 0 0
Threlk	3,773 0 0
Hill	3,773 0 0
Clarke & Manoch	3,719 0 0
Emor	3,669 0 0
Mansley & Rogers	3,577 0 0
Scribner & White	3,437 0 0
Cooke & Green (too late)	3,314 0 0

TO CORRESPONDENTS.

J. H.—V.—P.—D.—G.—Mr. K.—G.—H.—P.—R.—R.—A. Reader. W. C. C.—W. B. W.—R. & Co.—W. A. D.—J. C. H.—N. A. J. G. C. B.—F. R. C.—J. R. T.—Liverpool Cement Company.—S. & F. E. & Son.—W. C. C.—J. P.—S.—G. A. M.—T.—E. J. W.—R. V. G. A.—A Bricklayer (the longest measurement).—T. A. H. (plans labourer's cottages will be found in previous volumes of the Builder). We are compelled to decline printing out books and giving addresses.

All statements of facts, lists of Tenders, &c. must be accompanied by the name and address of the sender, not necessarily publication. The responsibility of signed articles, and papers read public meetings, rests, of course, with the authors.

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ADVERTISEMENTS.

THE QUARTERLY JOURNAL OF SCIENCE. No. XXII. APRIL, 1869. Price 6s. The Quaterly Archipelago. With two Woodcuts. II. The Projected Mercury Tunnel, and Railway from Liverpool to Birkenhead. By Sir Charles Fox. With Page Plate. III. Vesuvius. IV. The Artificial Production of Ice and Cold. By Dr. B. H. P. With four Woodcuts. V. On some Recent Spectroscopic Researches. By William Huggins, F.R.S. With Page Plate and three Woodcuts. VI. The Future Water Supply of London. By W. C. Houston, F.R.C.S. Charles Cross Hospital.

CIRONICLES OF SCIENCE; including the Proceedings of Learned Societies at Home and Abroad, &c. Notices of Recent Scientific Literature.

DOORS REVIEWED (amongst others):—Wallace's Malay Archipelago. Lobley's Vesuvius. Birkbeck's East Indian Archipelago. Simpson's Underground Life of the Alps. Jordan's Via Inieris in the Alps. Phillips's Vesuvius. Lang's Agate-Industry. London: J. LONGMANS, GREEN, & CO. PATERNOSTERROW.

New Edition, crown 8vo, cloth, 3s. **HISTOIRE DE CHARLES XII.** I. Voltair, with copious notes and Introduction. By LE CHEVALIER DE CHATELAIN, Translator of Chateaubriand's Tales, Shakespeare's Orestes, &c. * School supplied with this Edition on liberal terms. London: WILLIAM TEGG, Paternoster-row, Chancery.

The Builder.

VOL. XXVII.—No. 1365.

Masterpieces of the Industrial Arts.



I have just closed a volume we are sure most of our readers will open with pleasure. It is a translation of M. Burty's book, entitled "Chefs-d'œuvre de l'Industrie des Arts," edited by Mr. Chaffers.* With a graceful array of illustrations of some of the most delicate and elegant objects ever made, it gives us most of the leading facts in the history of ceramic wares, and some account of many of the artists who produced the choicest specimens; also valuable information relating to glass, enamels, jewelry, plate, and tapestry: not after a dry fashion, or with stilted talk, but with life, vigour, colour, and surprises thrown in with as much freedom as Palissy exhibited when he placed odd starting creatures on his most magnificent pieces. The originality and ardour of the author are not diluted with attempts at literary finish. Ceramic art evidently fills his heart, and in glowing praise and particularization of it he has poured out his soul, thinking more of need than manner. Something of his enthusiasm must grow upon those who turn over his pages. His palette is spread with such lustrous variegated colours, blue-greens, grey-blues, red-browns, milky whites, and delicate violets, prominently, that it must charm them. Those who are not concerned in the details of the various manufactures will find themselves brought to an enjoyable appreciation of many treasures in our museums that before had but little meaning for them: the circle of producers will find much more significance in Mr. Chaffers's labours.

The work is opened with an account of terra-cotta. Two specimens of ancient Gaelic pottery, found in La Vondée, precede a notice of the subjects and styles of the antifixes and bas-reliefs displayed on the façades of Roman houses. From the frequent repetition of the same subject, we may see that the old artists, when the power of choice was not strong in them, contented themselves with doing over again what had been done before, showing their individuality only in a modification of the details. Two specimens of Greek terra-cotta are given; the head of a shepherd from the cabinet of M. Thiers, and a girl at her toilet from the Pontalès collection. More is made of the Italian Renaissance, where we first come in contact with the bane of collectors, sham antiques. One of the chefs-d'œuvre of the Renaissance period mentioned in the original work by M. Burty has been suppressed in this translation, because, in the interval, the sculptor who was the author of it has come forward and owned the counterfeit. An illustration is given of a figure of this period which is pleasing. It is supposed to represent a

Florentine princess. She stands upright, in a robe of brocaded satin, singing from a sheet of music she holds in her hand. At this period, the Della Robbias step in; but as their process of applying enamel to the terra-cotta removed it from the category of works executed simply in this material, their works are not mentioned under this heading. The large medallions at Hampton Court, and in the Hôtel Scipio Sardini in Paris, are mentioned with delight as harmonizing better than anything else possibly could with brickwork; and modern architects are blamed for not introducing similar features more frequently than they are just now timidly beginning to do. The eighteenth century saw the result of an extravagant use of terra-cotta, when gentlemen's grounds presented the appearance that old-fashioned tea-gardens have handed down to us. Earthenware figures, life-size, met the eye at every turn. In France this absurdity seems to have been carried farther than with us. But the base use to which the material has been put should not blind us as to its value. Its moist and malleable qualities permit an artist to retouch it after it has come from the mould, and thus give every specimen a mark of originality. As M. Burty says, it has less rigidity than bronze, less uniformity than marble, and is in every way well fitted for the representation of objects of a familiar character. He continues, "Let our artists use bronze for heroic, marble for ideal statues, but take the clay and the modelling-tool more often in hand to reproduce the features of their contemporaries, or embody some pleasing fantasy." After this, we turn over a page as though it were a veil, and find ourselves in the beauteous presence of enamelled *faïence*.

In old times, in Italy, it was a general custom to make presents of plates and dishes; even lovers presented their mistresses with small dishes in preference to other objects; and on their own cups and bowls were inscribed the names of the dear ones with expressions of praise and affection. Hence it is, perhaps, that so many of the ancient specimens of this branch of industrial art seem to shine again with fire, tenderness, devotion, and self-abandonment. Pieces of ware in some hands were like pieces of music or poems in others,—the vehicles of great feeling. One of the princesses of the house of Medici is said to have spent ten years in perfecting a method of making porcelain, spoiling thousands of pieces before he was able to make the examples now so precious in the eyes of collectors. In France, in later times, a particular kind of ware, manufactured at Nevers, reflected the politics of the day. M. Champfleury, a French collector, has accumulated a series of plates and salad-bowls made during the storms that ushered in and succeeded the French Revolution, on which may be read most of the popular cries of those days. M. Burty says of this "speaking ware," that it is more eloquent than "the prose writings of many authors who contemptuously pass over these naive and robust records of French history." A collection of Roman ware reads, too, like a chapter on French heraldry. The old German families highly appreciated the artistic capabilities of their ceramic stoneware. On the occasions of a wedding or a birth they appear to have ordered vessels to be made recording those events, and these heirlooms placed on their sideboards, with their gourds and jugs bearing coats of arms, mottoes, and sacred subjects, must have largely contributed to the calm, substantial, stately cheer of the interior of their houses. Ceramic ware, both foreign and that of native manufacture, has long been held in esteem in cultivated circles in our own country. The *Spectator* tells us, when Sir Roger de Coverley sent him with a letter to the beautiful widow, he found her library to be nearly half full of chinaware; the folios were separated from the quartos by great jars, and a pile of smaller

vessels rose in a pyramid between these and the octavos; the last-mentioned were bonded by tea-dishes of various forms and hues, arranged on a wooden frame to look like a pillar, and the plays and pamphlets were enclosed in a square of grotesque works made up of scaramouches, lions, mandarins, trees, and shells, all in china; in other words, her library had more ceramic treasure in it than books. M. Burty ascribes the present revival of taste in this art in France to the reaction arising from the raptures of fashion over the so-called Etruscan vases in the days of the first empire. This classic terra-cotta at that time was the only kind that was tolerated by the learned; but after a season artists wandering in Normandy or in the forest of Fontainebleau for their holidays, possessed themselves of the radiant Roman dishes and Nevers plates then in the hands of the peasant, and bringing them home triumphantly, eventually reinstated them in the degree of estimation in which they had originally been held. A sixpenny *assiette à coq* rose in value to sixty francs. The further course of the revival is thus traced:—

"In the meanwhile, amateurs and traders of taste had brought from Italy dishes to which the potters of Majorca and Urbino had given the grand style of Oriental art, or of the fine periods of Italian art. People began to admire the changing hues of the metallic lustres, the free and bold attitudes of the figures, and became at last so enthusiastic as to pillage even the apothecaries' shops. Closer relations with China, Japan, and Persia brought into the market new food for the ever-increasing curiosity of the public. The success of these printed vessels with expressive outlines, those vases with long-clawed dragons twisting round their sides, those deep dishes with plains and carnations blowing in the hollow of them, began to disturb the souls of the disciples of the old Classic school, and it is from this return of taste to the Oriental porcelain that we may date all serious discussion concerning the principles of decorative art. At last, the eighteenth century having reconquered the ground it had lost, Dresden figures and Sèvres services were appreciated for their refined gallantry and elegance."

The history of the Oiron pottery well illustrates the enthusiasm expended upon articles of ceramic ware in these latter days. In 1839, attention was called by Willemain to a splendid ewer then in the collection of the Baron de Monville. It, with twenty-four pieces of similar ware, was supposed to form part of a service belonging to Henry II., on account, principally, of the initials C and II occurring upon it, placed back to back, and interlaced. Three of the pieces then ornamenting the Pontalès and Prémant collections were published by M. de Sommerard, when the public interest became intensified. We are told "The imagination of amateurs and critics became excited; much speculation went abroad on the subject; romances were composed with these for their theme; some insisted that they came from the studio of a sculptor named Ascanio, the pupil of Benvenuto Cellini; others that they were modelled by Girolamo della Robbia, whom Francis I. summoned over from Italy to decorate the terra-cottas of the Château de Madrid; later on it was believed that the artist-printer Geoffrey Tory, whose sign was, 'The Broken Vessel,' had printed on the sides of the flagon some typographic ornaments which resembled niello; then that some Florentine prince had sent them as a present to the husband of Catharine de Medici." The prices the different pieces commanded were enormous. A bowl that Sanvaget left to the Louvre was bought by him for 200 francs. But after curiosity had been thus stimulated the prices ran up. The ewer of the Baron de Monville was sold, in 1835, for 2,500 francs; a salt-cellar, at the Rattier sale, 1859, sold for 12,500 francs; a candlestick at the sale of Lassayette, 1862, the ornamentation of which, we are told, was of the meanest kind; went for 16,000 francs, and was afterwards sold again in England for 18,000 francs before it was placed in the South Kensington Museum; and a biberon, at the Pontalès sale, brought 27,500 francs. The ware was analysed by M. Brongniart, and its mode of manufacture made out sufficiently well to admit of its reproduction by an able hand in the factory. He found that

* Chefs-d'œuvre de l'Industrie des Arts. By Philippe Burty. Pottery and Porcelain, Glass, Enamel, Metal, Goldsmiths' Work, Jewelry, and Tapestry. Illustrated, Edited by W. Chaffers, F.S.A. London: Chapman & Hall, Piccadilly, 1869.

the groundwork of the piece was first made without any relief or ornament, not turned, but thinly moulded and pressed, and this was afterwards covered with a thin coating of the same material, on which were placed the ornaments, and finally the glaze. The number of the pieces known to be in existence amounted to fifty-four. At last M. Benjamin Fillon found out the secret. An antiquary showed him two fly-leaves of an old Prayer Book that had been illuminated by Claude Gouffier, the grand equerry and friend of Henry II. In one of the miniatures in the ornamentation M. Fillon saw a gourd identical in its character to the mysterious ware, with the armorial bearings of Gouffier on it. With this clue he visited Oiron, the castle of the grand equerry, now in ruins, and in the architecture, ornament, and further pieces of the ware, he found confirmation of his belief that he had found the author of the much-admired pottery. He published his discovery, and it is now generally agreed that during the long widowhood of the mother of Claude Gouffier, she spent some of her time in presiding over the manufacture of this ware at her castle of Oiron. Francis I. entrusted her with the education of his second son, afterwards Henry II.; hence we may be assured she was a person of cultivated taste. Associated with her were Francis Charpentier, potter, and John Bonnat, her secretary; and, as death removed the members of this gifted triplet, a decline can be traced in the objects manufactured. The pieces are believed now never to have formed a set, but to have been made singly for the decoration of sideboards for presents, as some of them bear the arms of neighbouring families. The castle of the grand equerry was devastated in 1568, when we may presume the manufacture ceased. Though M. Burty quotes it that "Bernart bestowed on it his talent for ornamentation, Charpentier his neatness of touch in handling the clay, and Helen her exquisite but somewhat sadly-toned refinement of taste," he seems to think the Oiron faience has been overrated; but his editor thinks that hitherto it has proved inimitable.

We are next shown a Hispano-Moorish dish, on which is depicted a heraldic beast. This ware, with that of Persia, is considered the richest that can be displayed on a dining-room sideboard. Of it our author vaunts, "These basins of huge dimensions, which are flashed by metallic oxides with lightning like the jet of incandescent gas in a fire, and whereon are blazoned animals treading notices and labelled war-ories under their feet as they would, the brains of a heraldic forest; these rude and

delicate witnesses of war, and of the art and industry of the fifteenth century of Spain, open with unequalled force and gracefulness a wide world to the study of enamelled plates and dishes of enamelled faience." The chief seat of its production was Malaga, and the secrets of its metallic lustres are supposed to have been imported there either by Arabs or Moors. The Alhambra glitters with it. A vase from this storehouse, of white earthenware with ornaments of two shades of blue and a prismatic copper colour, interlaced knots of Arabic characters and a medallion, formed like a Moorish arcade, on which are two autoloops, has been imitated by a French firm often mentioned in the course of the work for their clever reproductions. Architects are recommended to turn to this Hispano-Moorish majolica as to a mine in which they may find the materials to build places outshining those of the "Arabian Nights." That the composition of metallic lustres is not lost we may be assured by the sight of it on modern productions at the exhibitions. The authorities of South Kensington, however, are in possession of a work on the process of metallic lustre which has never yet been published, which may throw some additional light on the subject. M. Burty remarks that it is curious such a liberal museum has not transcribed and edited this document.

When Italy commenced the manufacture of enamelled ware, her success surprised herself. Her chief craftsman, Luca della Robbia, was first a goldsmith, then a carver, before he was a modeller in clay. In endeavouring to trace his development from one to the other, our author thinks he may have been actuated by a desire to produce a work entirely with his own hands. Before his first work in this material was accomplished, he had been employed, in conjunction with Michelozzo and Mazo di Bartolomeo, in casting and chiselling the gates of the vestry of the church of San Maria del Fiore, for which his first Ascension in terra cotta was produced; and it is supposed that it may have been from a desire to be reassisted that he chose this new vehicle. The effect of his coloured bas-reliefs upon the black and white backgrounds of Florentine architecture was magical. His large medallions, lighted up the sombre façades, and his friezes gave life and youth. It is almost a wonder that, with these examples in existence, polychromy should have passed into the stage of disuse and ridicule in which the commencement of this century found it. One of the great Parisian attempts at a revival was a failure. It occurred at the theatres on the Place du Cha-

telet, where the architect introduced it in medallions of Music and Poetry, inserted in the walls; but as no continuation of the ornamentation was made, these isolated objects stood out too glaringly, and had to be removed. Italy, as we have said, rejoiced in the happy colouring and pleasing forms taken by the new ware. "Sideboards were weighted down with gleaming sirens, or of twisted and knotted serpents." The Siege of Troy was depicted on plates, the Metamorphosis of Ovid on dinner-sets; even Raffaele did not disdain to make designs and colour cartoons for the workmen's guidance. Some idea of the amount manufactured comes to us when we read of the quantity destroyed. At a banquet given by Cardinal du Birague, Pierre de l'Estoile relates, "There were two large tables covered with 1,100 or 1,200 pieces of faience, full of dried fruits, sugar-plums, and confections of all kinds, built up into castles, pyramids, platforms, and other magnificent fashions, most of which were thrown down and broken by the pages and servants of the Court, who were of a wanton and insolent nature. And great was the loss, for all the service was excellently beautiful." Eighteen Italian manufactories are mentioned. That at Faenza is placed foremost, probably on account of its name being applied by the French to every kind of terra cotta and enamelled ware. The particular produce of Faenza is called an archaïa style. It is decorated with minutely-drawn grotesque figures, which stand out upon blue and yellow grounds. We must refer the reader to the work for the list of factories, and descriptions of their chefs-d'œuvre. Bernard Palissy now appears on the scene.

This irrepressible, irritable, versatile genius is allowed to tell much of his own story in quotations from his works. The author is proud of his countryman, and lingers over the details of his experiments, failures, perseverance, and success, from the day he was shown the enamelled cup of milky and brilliant white made after the process known only to the Dukes of Ferrara, so that, when after years of pounding and haking various materials in kiln after kiln made with his own hands, in the face of hardships and discouragements, he was at last rewarded by the ascertainment of the secret, and his ware, with its green lizards, brown serpents, marvellous cray-fish, tortoises, and crabs, became the wonder of the day. An illustration of one of the grotesques designed by him is given, besides specimens of his goblets, dishes, and plates. Around the walls of the grotto were niches, and between



THE WORKSHOP OF ÉTIENNE DELAULNE, A FRENCH GOLDSMITH OF THE YEAR 1576

them were medallions, with busts of heroes; in its centre was a fountain playing into a basin, in which disported fish and reptiles, all in ornate ware. This rustic retreat was to be planted with trees, shrubs bearing berries, and mosses, and every inducement held out to the songsters of the grove to frequent it. Such a grotto as this he is known to have made for Catharine de Medici; and some moulds, two furnaces, and vitrified bricks, found in building the new State apartments adjoining the gallery of the Louvre, are believed to be the very ovens and moulds he used in its production. M. Burty suggests that portions of the grotto itself may yet be found in the gardens of the Tuileries, or it may have been filled in when it went out of fashion, and not altogether destroyed. As in the case of the Hispano-Moorish ware, a French potter has succeeded in reproducing the Palissy dishes so exactly as to perplex amateurs. Only when taken into the hand, and their lightness is observed, can any difference be perceived.

The Nevers ware was originated by Domenique Courade, whom Louis of Gouzaga summoned from Italy to his duchy when he took possession of it as his wife's wedding portion. An early specimen of it, a large basin for a fountain, with twisted serpents and maritime goods for decorations, is in the Hôtel de Cluny. It is considered to be more interesting after it began to imitate the Venetian ware that was founded upon Oriental models, and then proceeded to trace Chinese figures in manganese violet colour; but it never attained any great elegance. It was essentially a popular ware, as its reproduction of the songs and sayings of the day testified. The illustrations given of it consist of an enamelled square from the ruined castle of the Dukes of Nevers, one of the popular plates bearing patriotic emblems, date 1780, and a somewhat gaudy bannier, date 1764. We quote a recommendation to architects:—

"At the present day there is still one manufactory of great commercial importance at Nevers, that of Monsieur Signoret. Although but little of decorative art is baked there—for notwithstanding great encouragement from all sides, the architects but dare use it but very moderately—it was in that factory, which employs a considerable number of hands, that the entire ornamentation of a house at Bernay, in Normandy, was made of late years. We have seen and been over it, and we can assure the reader that nothing could be more cheerful or agreeable to the eye than those pavements bearing the initials or names of their owner; those encaustic plates on the frontages, the coloured balustrades and balconies which look out on the court-yard and gardens."

The chefs-d'œuvre of Persian ware are magnificent, telling, appealing, and satisfying. Though we do not see the colour in the examples given, it is impossible not to feel it. The graceful outlines and rich ornamentation suggest as much beauty and wealth in the hues, for those who could make the first could give the other. We read of fawn colour, brown, and bright blue, for the grounds of their porcelain, with manganese blue, bright yellow, green, turquoise-blue, bright red like unpolished jasper, for the decorations. Tulips, roses, hyacinths, honeysuckle, and Indian and dove pinks, are the favourite flowers depicted, and these are arranged with consummate taste. Birds and animals are also placed on Persian ware. The author calls upon French potters to study the forms and details of the flowers of the West, and taking those with brown and green enamels already in use on the "more vulgar pottery of the South," invent and produce original designs of like beauty. Chinese porcelain, although inexpressibly clever, does not convey to us so much of the poetical sentiment as the ware of Iran. Our classical education is blamed as having unfitted us for recognizing the purity and truth in Chinese figures. M. Burty, however, who is a ceramist of the world rather than of France, can see more than Greek beauty in many of the Chinese productions, more especially in the early examples. He has tired of the interminable variations upon the Medici vase, and the persistency of French artists in introducing the human figure either as a support or a relief, and sees much freshness and power in Chinese work. He finds excuse for the tendency of this ancient meditative people, whom he also characterizes as melancholy, towards the monstrous, in the suggestion that their winged dragons and other unknown beasts are probably traditions of extinct animals. Their sacred horse, Fou-hi, their regal bird Fong-hoang, the branched-headed Ki-hin, depicted so frequently in Chinese ornamentation, he thinks, are not less likely to be preservations of a knowledge of pre-historic creatures, than was the mention of the great roo in the "Arabian Nights," which bird was at one time judged to

have lived in the imagination, but is now known to have actually existed. Their love of nature prompting them to their superb colouring making them dissatisfied with less than the melongena violet, the scarlet-cranes red, the thick creamy white of the camellia; their attention to details; their faculty of imitation; and their patience, are all dwelt upon with appreciation. Like the Western barbarians, the mandarins have begun to be collectors, and the soldiers who sacked the incomparable Summer Palace are stated to have found in them rich and ready customers for even fragments of old porcelain. On the other hand, when the Japanese ambassadors who visited Europe a short time ago were shown the treasures of the Ceramic Museum of Sevres, they were unable to identify their own ware, or point out any distinction between it and that of China; and they declared that no one in their country troubled himself about the subject. But to this quick, fervent, artistic people is ascribed that family of designs in which a rose tint predominates on a field of black, and those gorgeous dishes on which peonies and chrysanthemums are blooming either after the natural manner or in squares. But the artists of Japan are in course of degradation to manufacturers. A merchant captain gives them an order for 10,000 vases of No. 12 pattern, and 15,000 dinner services of No. 25 pattern, to be executed in the shortest time at the lowest price; and asks our author, what is the result? "Modern Japan gives us nothing but flimsy decorations, and China trashy copies."

We are enabled to reproduce some of the samples of ceramic treasures of which Mr. Chaffers has thus extended the fame. Beautiful as are the Oiron faience, and that from some of the Italian manufactories, it will be seen that the Persian has not less charm.

In the chapter on table-glass there are three illustrations,—one of a Persian bottle and lamp from an Arah mosque, a group of Venetian glass, and another of German glass, all startlingly bright and beautiful to see. Persian glass is enriched with precious stones, enamel, and gilt. Two of the chefs-d'œuvre preserved in the Treasury at Vienna are described. "The first is a bottle, on the neck of which are two small handles; it is decorated with interlaced zones, alternated with a groundwork of little rosettes of gold, edged with red, and blue enamel. The other, which is still more singular, had a frieze composed of little draped figures, four separate medallions, and a cypress tree, which, for Zerolaster and his disciples, was an emblem of the soul's flight into heaven." These were in the Treasury when a catalogue of its contents was compiled in 1873, when they are called "duse amphore ex Damesco." A Byzantine bottle, now in the possession of M. Gustave de Rothschild, was sold at the Soltikoff sale for 5,500 francs. On this highly-valued specimen are medallions, on which are displayed the three-petaled flower that first gave the idea of the fleur-de-lis, a device found on some of the most ancient monuments of Asia. M. Burty keenly feels the sea and sun-like heauty of Murano glass, its tints of Mediterranean blue, milky white, veined sea-green, and delicate pinks, and calls special attention to a goblet now in the British Museum, on which early Murano glass-workers painted in the medallions the portraits of two affianced lovers, with the legend, "Amor vol exarctis fideliter." The German glass is heavy, quaint, and generally charged with heraldic devices, enamelled. Wheel-engraving on the surface of glass was much practised in France, especially in the days of Louis XVI., when some very delicate work was produced. Our modern discovery of the power of hydrofluoric acid to produce the effect known to us as ground-glass is treated at length, both as to the process and the purposes to which it can be advantageously applied. England is accredited with the first use of oxide of lead as a basis for glass. More than a hundred years elapsed before it was adopted in France, and then the glass made with it was called "the Queen's Crystals." Among the chefs-d'œuvre of stained window-glass, we are reminded of those in the Abbey of Tegernsee, in Bavaria, painted in the tenth century by the monk Werner (the most ancient known); those of the thirteenth in the apse of the Cathedral at Bourges; the three rose windows on the portals of the transepts of Notre Dame de Paris; the windows of the Sainte Chapelle; the fourteenth-century work at Chartres, full-length figures of apostles and propheta; and of the round window at Beau-

mont-le-Roger, Normandy, as a sample of the Renaissance. There are illustrations of the different periods as well as short accounts of the process of painting on glass, its revival, and modern workmanship.

The three kinds of enamel are also fully described; cloisonné is the oldest, *champlevé* being but a development of the Oriental art, though painted enamels, the third variety, are not so new but that they were known to the Greeks and Etruscans. An Egyptian bracelet, Etruscan ear-rings, Chinese and Romano-Gaulish vases, illustrate ancient enamels; and ewers, plaques, medallions of Limoges manufacture those of the Renaissance. This is an exceedingly ample chapter. Besides the processes, the styles of different masters are discussed, and brief biographies of the leading artists furnished; sufficient information, in fine, is grouped together to give both artists and ordinary readers much to think over. The tomb of William of Valence, in Westminster Abbey, is rightly mentioned as a chef-d'œuvre. The enamels of Léonard Limosin are highly valued, both for their brilliancy and harmonious colouring, and for their exposition of the style of furniture and decoration in the time of the Valois. Then come those of Pierre Raymond, who wrought, in the middle of the sixteenth century, dinner and dessert services, for the leading noble families in England, Germany, and Holland. Jean Cour is another artist whose enamels are in great esteem. He made the beautiful cup presented by Francis II. to his affianced bride, Mary Stuart, which was sold at the Pontfaute sale for 35,000 francs. The cover of this love-gift is one of the chefs-d'œuvre illustrated. With the Valois passed away the taste for enamels. Bernard Palissy deplures that enamel buttons made for three francs a dozen were selling in his time for a halfpenny a dozen. In later days we read of Jean Petitot's enamels being pounded in the jeweller's mortar, for the sake of their gold plate, just as some of Jacques Callot's copperplates were bought by ironmongers to be made into awcepans. Nevertheless their time has come round again, and they are now held in the highest estimation. Petitot's portraits are scarcely larger than sixpence. It was he who painted under the superintendence of Van Dyck a portrait of Charles I., and afterwards, on the death of this patron, portraits of Louis XIV., the Queen-mother, and many members of the French court. The Chinese likewise excel in this art. Reviewing its career and prospects, our author, whose mind is eminently receptive, expansive, and longing for progress, says,—

"All, therefore, that enamel now has to do is to follow the lead of the modern world. It ornamented the reliquaries and apert-airs at a time when church furniture was of all importance in the mind of the age. Later on it produced the handsomest possible description of ware next to plates and dishes of embossed gold and silver. Later still it has endowed woman's ornaments and jewelry with an ever-varying charm and novelty of design. Now it must enter into the ornamentation of the furniture of palaces and great houses. It combines especially well with dark red, black, or dark brown, such as oak, ebony, and hard foreign woods, which modern good taste has consented to leave unvarnished."

We are enabled to give from the book a view* and description of an enameller's oven. The description is by M. Popelin, a distinguished enameller of our day, and we quote his own words:—

"The oven is composed of three principal compartments, placed one over another, but each one quite independent of the other: these are the laboratory, the dome or conical cover, and the chimney."

The laboratory, A, is a rectangular vessel, with a semi-circular aperture in front; a door, P, also in clay, with a perpendicular handle; a projecting horizontal tablet, D, little more than 2 in. thick, but extending the whole width of the laboratory, on which the earthen door rests; beneath it, I, the place for the reception of cinders, in which there is an opening, which may be closed by a movable button, to regulate the current of air; a grate of clay, Z, pierced like a skimmer, is placed inside the oven immediately above the cinder-box, and a stopper to fit it is placed on the perforated plate. This compartment contains the fuel, which, when set alight, quickly burns up, owing to the draught from the two circular air-holes situated at the sides of the oven. The chimney, C, needs no explanation. The dome or conical ceiling, B, which is the receptacle for the enamel, is simply a trapezoidal roof, without a base, perforated with holes at the top. It fits on to the laboratory, which it exactly resembles externally. The stand on which the enamel is placed is introduced by the door. The numbers 5 and 9 answer to the tongs and poker, the use of which is well known; No. 10 is a kind of iron puncher, or scissors, made flat, which are used to take hold of the plates 1 and 2 when in the oven and hot. These plates are of thin hard earth, on which the plate of enamel is placed."

The working of bronze and iron is treated in the same manner as is each art in succession. First is traced its infancy in the hands of Tubal Cain, and then its gradual Oriental perfection.

* See p. 266.

A chef-d'œuvre, of which early mention is made, is a dagger from the collection of Prince Soltikoff, now in the possession of the Marquis of Hertford, on the steel blade of which is engraved a hollow line, on the flattened sides of which is a number of small rubies, which give all the appearance of a streak of blood upon it. The handles of Oriental weapons are usually enriched with rubies, sapphires, pearls, and diamonds, but this illusion of blood on the blade is a rarity. Greek armour, the work of the gods, must have been exquisite. The account on the Iliad of Agamemnon's armour is quoted to show its perfection, but no relics of this period can be pointed out. The first specimen illustrated is an Italian sword of the sixteenth century. M. Burty is fired with ardour as he contemplates arms:—"Nothing is nobler than collections of arms," he declares. And then he enumerates the chefs-d'œuvre in the cabinets of the Count of Neuwackerke and the Marquis of Saint-Seine. Instead of a bronze statue to celebrate the bravery of a person of second-rate distinction, he would bestow upon him a sword of honour, which he could transmit to his descendants. We are shown, after the jewelled weapons, a series of bronze statuettes, medals, vases, candlesticks of the manufacture of different countries and all ages. We can do no more than indicate that those interested in this branch of the arts will find much to gratify them on the diversified pages to which we are referring. An iron gate of the twelfth century, of scroll-work branching right and left and clasped together with infinite grace (see p. 263), keys with open-work and entwined handles, a clasp and key of a fifteenth-century purse, a frame for a signboard, a knocker ornamented with interlaced crescents and monograms of the date of Henry II. of France, contrasted with specimens of modern work, such as the iron gates of the Parc Monceaux and Candelabra made in England, elaborate this chapter. There is a prophetic announcement that the electro process is sure to triumph over the ancient one of casting. Already it has been applied, we are told, to the outer covering of the Pope's wagon, the locksmith's work of the Empress's apartments at the Tuileries, and the doors of the church of St. Augustine.

In the next section there is this distinction made between the goldsmith and the jeweller:—"The goldsmith is the jeweller of the dressoir; and the jeweller is the goldsmith of the jewel-case." There is something very touching about old jewelry. It seems almost profane to examine lightly, for the mere curiosity of their workmanship, trinkets that were worn, and prized, and carefully guarded by beautiful women, who loved and were loved; even though it was ages ago men went down to their graves blessing them, and, perhaps, raving about them with their last breaths. Here we have the ear-rings, jewelled pins, and pendants that may have been worn by the "beautiful Shalambé," King Solomon's wife; and here is a bracelet that once decked the sleek olive-coloured arm of a slanting-faced Egyptian. Or, perhaps, we take from a tomb a trinket that has laid upon a faithful heart till it mouldered away, or was placed round the neck of a dead beauty with a burst of passionate grief by those who never smiled more; and we hold it up to the light, and only say the jewellers of those times must have used some process to fix these exquisitely minute intertwistings that we cannot trace. But in the present case there is too much sympathy for all human conditions, as well as for art, to admit of coldness. Phœnician, Greek, Byzantine, Jewish, Early French, and German work are all spread out in dazzling array. Of course, the contents of the jewel-rooms of the French monarchs furnish many examples. Froissart has recorded the presents made by the gentry of Paris on the coronation of Queen Isabeau, and carried to her on litters by men dressed as Moors with their faces blackened, and others disguised as a bear and unicorn, consisting of gold pots, ladles, and dishes; scent-bottles, bonbon-boxes, salt-cellars, pots, lamps, silver dishes and trays. The regal accumulations would have been enormous by this time if it had not been for rainy days when wars had to be paid for and prisoners ransomed, on which occasions heaps of such treasure was obliged to be melted down. The author quotes M. Léon de Lahorde:—"If children had to be settled in life and a dowry given them, it was the jewel-room which furnished the required sum. And more, in every day life scarcely a day passed without a die being made into one's treasure to make a present of jewelry, a golden drinking-cup, or a simple gilt dish, to some

favourite or relation, a foreign ambassador, a messenger bearing the tidings of some victory or defeat, or to the modest outsider, who came as fast as his horse would carry him to announce the birth of a son or a nephew." Drageoirs, bowls on which preserved fruits and sweetmeats were placed upon the dressoir, or handed round at table; agnières, or ewers for water, of fantastic forms, sometimes in the shape of men, sirens, lions, birds; hanaps, or drinking-cups; the small repository for spices, drinking-cups and spoons, intended to be placed on the table, and first made in the form of a ship and called a "nef," and salt-cellars with serpents entwined about them, to give warning of poison; are some of the articles upon which the goldsmith lavished his resources.

We reproduce a view of a reliquary of the thirteenth century brought from Basle (see p. 263). There are many noble names in the list of Italian goldsmiths; for most of the great sculptors and painters were first versed in the use of the hand-vice. They are all enumerated in their turn; and Benvenuto Cellini, like Bernard Palissy, is allowed to tell again his oft-told tale. Some of the papal coins and medals by this last-mentioned celebrity are illustrated. His gold enamelled salt-cellar, representing earth and ocean, described by him at great length; his bronze nymph of Fontainebleau; his Perseus, the casting of which he relates so minutely; a vase and cup of Oriental jasper, attributed to him, are also given. Etienne Delauné is another celebrated goldsmith, whose biography is entered into. He has left a view of the interior of his workshop (1575) here reproduced (p. 255). His busy workmen, hammering and blowing bellows, and grinding away in their slashed doublets and trunk hose, present a very picturesque appearance. Diamonds are touched upon. A pendant, after Gilles Légaré, seventeenth century, is illustrated, of which M. Paul Mantz has said, "This is the most reasonable, solid, and soberly French sort of jewel ever worn by the Montespans and Fontanges." M. Burty, too, gives the palm to precious stones over any other kind of jewels. The small enamelled figures of virtues and vices, or horses on ovals no bigger than nutshells, produce no effect at a little distance, he thinks; they become but as a blot; these should be left to the sculptor or statuary. On the other hand, he says, nothing can be more telling and beautiful than the intense brilliancy of a well-cut and well-mounted diamond. Here, as in other departments, he thinks much of English progress.

"Nowadays jewelry is still doing marvels. The English, who daily import workmen from us at enormous rates, the English, and the English only—can compete with our Parisian jewellers. They have the same superiority with regard to the freshness of polish and brightness of colour of their metals; ours, however, have pre-eminence in chasteness of mounting, lightness, and strength; producing twice as much effect with half the number of stones. Workmanship is now more perfect than ever it was."

When Louis XIV. sent all his plate, jewelry, and silver furniture to the mint—a sacrifice M. Burty compares to that a captain is obliged to make when he throws his cargo overboard—we read there were huge orange-tree boxes and coils of solid silver, besides an immense heap of still more sumptuous articles of less startling dimensions. It is in this tragic melting-down that all Cellini's work is supposed to have disappeared. There have been imitations of these made even recently. The author refers to the sale of some shields made by a goldsmith of the present day to the King of Prussia as works by Cellini, who placed them in his museum, and enjoyed his possessions exceedingly till the fraud was discovered. In reference to the cups and vases now given as prizes at races and other competitions, our author declines to name their artists, and says sensibly:—

"Unfortunately, these chefs-d'œuvre are, for the most part, signed not by the artist who designed them, but by the maker who fabricated them; and we will not once establish a series of mistakes over which the future will not have spare time enough to hold an inquest. If, therefore, we hear that a trinket or statuette, a ring or a cup, comes from such and such a shop, well and good; but let not be said that it is the work of this or that master, for that is equivalent to saying that a particular book was written by the publisher or bookseller of whom one may chance to purchase it."

Concerning tapestry and carpets, the author says ever since man forfeited his natural liberty he has been endeavouring to disguise the walls of his prison-house, and these are but items in the sequence of his inventions. First there was mural painting, then mosaic ornamentation, then tapestry; this was supplanted successively by gilt leather, painted wood, and painted paper. He gives India the credit of the invention of tapestry in remote ages, before Homer made

I Hector desire his mother to bring out the specimen of it she loved best, and spread it on the knees of glorious-haired Minerva. The way the Smyrna maidens began to make carpets for their wedding dowry, whilst they are yet children, with the warp stretched between two trees, which gradually grow under their hands as the months and years elapse, is told. But the body of information consists of a notice of existing chefs-d'œuvre and a history of the Gobelin's manufactory. We have a representation of a falcon chase on a piece of arras tapestry at the Castle of Aroné; the history of David and Bathsheba, worked in Flemish tapestry of the reign of Louis XII.; and a sporting specimen of the tapestry of Neuilly; but more beautiful than either of these is an illustration of a Persian carpet of the sixteenth century on silk, the dominating colour of which is a brilliant yellow, described as being as intense as the core of a ripe apricot, on which groundwork is a graceful variegated design worked in black, white, green, and grey, and different shades of blue and red. This is, of course, pointed out as the style which should have occupied the designers and colourists of our day, instead of the bouquets and scroll-work they have produced. For the future, it is thought likely the Jacquard loom will yield a carpet that will supply that first sought-for quality, cheapness. Some such appliances is already at work at Neuilly, where models are set out as if for enormous shawls on several thousand sheets of cardboard pierced with cylindrical holes. This is called "a democratic and social loom," for after the pattern is once set out on the pasteboards the groundwork rapidly decreases in value, and what was worth ten thousand francs at first, by the time it is reproduced for the tenth time is only worth a thousand. The subject of hand-tapestry is not gone into except so far as the gallant insertion of a pattern for hand-needlework, for the encouragement of fair renders, taken from a Venetian work by Giovanni Ortaui, 1567.

To look carefully over this work brings an impression into the mind exactly like that which occupies it after a long day spent in the South Kensington Museum, or in the Louvre, or in the Vatican. And it also brings a desire to visit these courts and salons again, to see the lordly dishes and other triumphal specimens of the great ceramists, the clever, dainty, cunning enamels, the bronze and ironwork of departed countries, the sumptuous goldsmith's work and sparkling jewelry, with the now lights its pearly has conferred.

ART GLIMMERINGS.

AMONGST those who are considered the most barbarous people, when even the art of house-building was, and is now, but little practised or understood, there is a wish shown to produce certain kinds of ornamentation, which, although of a simple and rude character, still indicate the natural desire which exists in human nature for more than mere utility. The forms were made to assume something like geometrical symmetry, such as the zig-zag and other patterns. Then there is an intermingling of various kinds of lines which has produced the knotted work which is to be seen in the productions of the Anglo-Saxons and the Scandinavians. In this way parts of the weapons and implements of the New Zealanders are adorned, and also many of the intricate and often beautiful patterns which are made in India at the present day. In Lapland, where the people burrow in the snow, or live in the most miserable kind of huts, there is to be found on vessels, lamps, and implements an elaborate and well-executed kind of ornament.

When examining the earliest productions of ancient people, and of those who are now in a comparative state of barbarism, it is remarkable to notice the general resemblance which these bear to each other, and how, as progress is made, the varied lines in the first examples, as if it were by accident, assume a rude resemblance to the form of the human figure, animals, and flowers.

In primitive nations, not only is the desire shown to decorate arms, articles for general use, war vessels and other objects, but even amongst the most uncivilised people there is the wish shown to decorate the person,—the unthoughtful process of tattooing, the crowns of feathers, the teeth of wild beasts, choice skins, and furs, all indicate this natural instinct; and there can be no doubt that this feeling has been

to a considerable extent the means of advancing progress. Many instances might be given, but it may be sufficient to mention that this is to be especially marked in the history of the Anglo-Saxons, who, with the aid of the distaff, and quaintly-fashioned looms, assisted by various dyes, were enabled to manufacture articles of both male and female costume, which seem to have been remarkable for fineness of quality and picturesque elegance of appearance; and at a very remote date we learn that the Anglo-Saxon ladies were remarkable for their skill in embroidering parts of dresses and in making the tapestry hangings of beds and apartments. In this way they were important pioneers of English art.

As we have before said, it is curious to note when the power of drawing figures, as we see them in ancient illuminations, on the walls of churches, and the oldest examples of tapestry and embroidery, was acquired, how long a period elapsed before what we may call the elevational style of drawing became exchanged for works which exhibited the faintest indication of the knowledge of perspective; and the same result may be noticed in the efforts of children, who, by an instinctive feeling for pictorial art, are led to the attempt to make drawings of objects which they have constantly before their view. In these cases there is the same difficulty to be overcome which for so long puzzled the early limners.

The writer has frequently noticed the sketches of very young children which have been remarkable for a degree of feeling and a power of expression which would seem to show promise of future excellence; but great is the difficulty, and long the patience, required, to cause those drawings to assume a more finished and refined stage, to indicate the delicacies of outline, and the niceties and varieties of distance, which are needed for a complete picture or the representation of natural objects on a flat surface. How best, during early years, to teach the practice and principles of art, when there is shown to be a natural facility for it, is not an easy matter to determine, especially when it has to be carried on in connexion with the usual school education. The practice of writing is an impediment to the teaching of drawing, and we have often noticed that it has required long care to get boys and girls who have been under the training of the writing-master to make a firm upright or horizontal line. In order to prevent the sloping of all perpendicular lines to the angle which is commonly used in writing, we have seen various means tried.

It would be interesting if we had more examples of the very earliest works of our most celebrated painters, and it would also be worth while to preserve with care the sketches made by men who have risen to literary eminence. Amongst those who have shown ability in this way may be mentioned the late Thomas Hood, some of whose pen-and-ink sketches were remarkable for both humour and intense feeling. They are, however, for the most part so slight that they are not likely to be rightly understood by those who have not had the advantage of art training or knowledge. Some of those designs are generally known in consequence of their having been engraved and printed with Hood's writings; but several of them were drawn on the wood from the sketches by an artist who was well practised in his description of work. And although this may have been the means of making the engravings more presentable to the public, in some instances the spirit and freedom of the originals have suffered. There are also some remarkable sketches by Thackeray, and others of much merit by Mr. G. A. Sala. The sketches of the two last-named writers are carried much further than those by Hood. We believe that there are some pen-and-ink scraps by Charles Lamb still left, and some of our readers will be reminded by these remarks of other works of a similar description.

It is a question on which there has been much difference of opinion as to whether or not men like Thackeray who have shown not only a certain degree of ability for art, would in that direction have arrived at the same extent of eminence that they have done in others. We think not; for it is requisite in addition to the teaching to have peculiar facilities to enable any one to become a great painter, a great sculptor or musician, or a famous architect or engineer. It has been urged that by industrious application success may be achieved in any of those professions. It is not, however, likely that Peter Nicholson, clever as he was as a

mathematician, and noted as he also was for constructive skill, would ever have become celebrated as an architect; or that Thackeray, or those others to whom we have referred, would, notwithstanding their marvellous skill in making wood pictures, have been able to produce finished delineations on the canvas.

We have briefly noticed the difficulties which there are in acquiring the right practice and mechanical practice of art; but when some progress has been made, it is pleasant to watch the results of fitting genius, aided by industry and right training. It is with proportionate pain that the decline of skill in artists who had risen to eminence is noticed. No more distressing instance of this is to be met with than that of the late Mr. Ewbank, whose picture of Edinburgh and other fine works are the pride of several collections, and which, when now occasionally offered for sale, produce large prices. In the prime years of his life the works of this artist, owing to his intemperate habits, declined in merit; and towards the end, the paintings produced were more dabs, and his sketches became utterly worthless.

Luke Clennell was another sad instance of the decline of artistic power, and a lapse into original conditions, after this artist had produced many water-colour drawings and oil paintings, which raised him to a foremost position. One of these was the picture of the famous charge of the "Horse Guards at the Battle of Waterloo." The success of this and other works was the means of obtaining for the artist the commission to paint a large picture of the meeting of the allied sovereigns, after the long European war, and it is believed that such was the extent of the worry and trouble in obtaining the needful sittings from various illustrious persons, that he was driven into a state of mind which rendered confinement in a lunatic asylum necessary. When there, notwithstanding the cloud which had come over the intellect, the hand was kept busy in the production of sketches and slight drawings; but few persons would have thought that those productions were by the master who had previously shown its cunning, and delineated in an excellent way the old Border castles, the animated scenes of country fairs, and the terrible rush and the strife of contending hosts.*

Ten or fifteen years ago the boys in the general schools for the middle classes, and even those of a higher rank, had less opportunity for producing any work of an artistic nature than even the young ladies; but few boys in the middle schools, and even persons who had received a very liberal education were able to delineate the most simple object in nature; some by rule and compass learned to draw geometrical figures; and there was also the ornamental penmanship, executed in the pieces which were shown at Christmas time, in which there were flourishing ornaments which imitated the forms of birds, fishes, and other creatures, which had some pretensions to artistic design; but beyond the matters mentioned there were but few opportunities of acquiring a knowledge of the principles of art or of forming that kind of taste which would be likely to produce a better description of articles required for general use, or to lead (even if they were made) to a proper demand for them.

As regards the girls, they had the advantage of the practice of embroidery and various kinds of hand-wrought lace, some of it very beautiful; we have also seen very creditable copies of pictures of a superior class, done with coloured lamb's wool upon white silk. The effect of some of those needlework pictures is good. The manner of executing those needlework illustrations, was to strain the silk and prepare it in a peculiar way, and an artist accustomed to the work drew in water-colours, and with all the needful tints, and light and shade, a good representation of the picture to be imitated. Then the young lady matched the colours of the drapery, foliage, rocks, foreground, and so on; the faces, hands, and limbs left without the wool, just as the artist had coloured them; the light tints of the sky were also kept in this way. There were also the samplers; an elaborate performance, one or more of which most young girls executed in their youthful days. Those once familiar objects are getting scarce, and the custom of working them has almost gone out of use. They are, however, interesting,

* The composition of the picture of the Charge of the Guards is worthy of study. Besides the excellence of the drawing, the effect of the motion or rush of the troops is wonderfully shown by the arrangement of the lines.

inasmuch as they are examples of a particular kind of art-work, and also show the gradual way in which the old style of ornament gives way to the new; and it may be observed that this is to be noticed not only in needlework, but also in ironwork, wood-carving, the fashion of earthenware vessels, and many other matters. For instance, in some rural districts there may be seen ale-mugs, and other implements of modern manufacture, which in colour, shape, and quality of material could not be readily distinguished by a practised antiquary from those of Elizabethan date; we may, in illustration of our meaning, mention the fashion of coffin-furnishing, which is still in partial use. The bright white devices, some of them grouped together; others bearing crowns, heraldic shields, &c., put together in a way similar to those which are so often to be met with on tombs of the reign of Charles II., and up to about the time of George I. Good examples of these are to be met with on the monument to the memory of the daughter of Sir Christopher Wren in the crypt of St. Paul's Cathedral, and in many other places. The devices are arranged in imitation panels (formed with nails) of lozenge, square, and oblong shapes. On referring to drawings of the coffin of Charles II., and comparing it with those at present in use, it is easily to be seen that the general shape has been altered for the worse; but, as regards the ornamentation, this will be found, especially on the coffins provided by the old-fashioned undertakers of London, to have an appearance of considerable antiquity. Some of the heads of the winged cherubs are worth attention in consequence of the artistic expression which has been given to them. These have probably been struck from moulds which have been in use about two centuries, or are facsimiles of such works. Even the shrouds provided by the undertakers are of such an antique appearance that the fashion may have remained unchanged since Queen Elizabeth's reign, and even from before that time.

MIRFIELD, YORKSHIRE.

The foundation-stone of the new parish church here was laid on the 23rd ult. by the Rev. R. Maude, M.A., vicar. The old church is not to be taken down until the new one, which will be situated on an adjoining site, is complete.

The style is Early English, and it was designed by Mr. G. C. Scott, R.A., under whose direction the works will be carried out. The plan consists of nave, aisles, chancel, and tower, with open porch on the south side, and two vestries at the north-east end of the north aisle, one of these being for the use of the choir. The apparatus room and coal-vault will be under these, and approached by steps from the outside.

The church will be entered westward through the tower, which will add considerably to the length of the building, it being 153 ft. long clear of the walls. The nave is 82 ft. long, divided into five bays, is 27 ft. across, and 64 ft. from the floor-line to the ridge of the roof. The aisles are each 13 ft. 6 in. wide in the clear, and the chancel, including the sanctuary, is 40 ft. long by 27 ft. wide. The tower at its base is 30 ft. square, exclusive of the buttresses, and rises 139 ft. from the ground-line to the top of the pinnacles, and will contain a clock and ten bells, the clock to be supplied by Mr. W. Potts, of Leeds, and the bells by Messrs. Taylor, of Loughborough.

Externally the church is to be built with Yorkshire stone, from St. Michael's Mount Quarry, the face to be diagonally toolled. Internally, the stone from a neighbouring quarry, having a light brown tint, will be rubbed to a smooth surface.

Mr. H. Roome is the clerk of the works, and Messrs. W. & J. Milners, of Miffield, are the contractors. Messrs. Banke & Clough are engaged to do the carpenters' and joiners' work. The cost will be about 20,000*l.*

Window-cleaning.—Glass panes, constantly exposed to the action of the sun and rain, are soon deteriorated, as the potash or soda they contain combines with the carbonic acid of the air. A whitish opaqueness is the consequence of this action; and in order to make the pane return to its pristine transparency, rubbing it with dilute hydrochloric acid is recommended, and then cleaning with moistened whiting. By this means, it is said, glass in an extreme state of decomposition may be completely restored.

ST. MATTHEW'S CHURCH, MOUNT PLEASANT LANE, UPPER CLAPTON.

This important church, a plan and south-east view of which we give,* has been during the last two years in progress of erection from the designs and under the superintendence throughout of the architect, Mr. F. T. Dollman, and will be consecrated on Monday next, the 5th of April, by the Lord Bishop of London. It occupies a very elevated site, overlooking the meadows of the river Lea, and will form a conspicuous landmark in every direction.

The plan consists of a nave and aisles; north and south porches; chancel, with north aisle; organ chamber on south side of chancel; tower, and lofty spire.

The nave has five bays longitudinally; the shafts supporting the arches being of red Mansfield stone, with foliated capitals in Bath stone, and moulded haes. Over the nave arches is a range of two-light clearstory windows, the bearing shafts of the roof trusses being of blue Pennant stone. At the west end of the church is a continuous arcading, over which are two lofty windows, of two lights each. At the west end of the south aisle of the nave stands an octangular font in Caen stone, with marble shafts at the angles. The chief panels are filled with the following subjects, referring to Holy Baptism, executed in high relief:—1. The entry into the Ark; 2. The Presentation of our Lord in the Temple; 3. The Baptism of our Lord; 4. Our Lord blessing little Children. The four angle panels are filled with varieties of sculptured lilies. The stem is of alabaster, surrounded by four coloured marble shafts; and the font is surmounted by an elaborate oak cover, on the top of which is the figure of an angel (the emblem of the patron saint of the church), with outspread wings.

The windows of the north and south aisles of the nave are eight in number—four two-light and four three-light, in which the design of the tracery differs in each instance. The whole of the seats in the nave and aisles are of oak.

* See p. 267.

On the north side of the chancel arch stands the pulpit, executed in Caen stone, the design of which consists of a series of arches, with coloured marble shafts and carved capitals and haes, the panels being left open to the floor. The stem is of red Mansfield stone, with four detached shafts in alabaster, and moulded caps and haes. Under the cornice around the pulpit are inscribed the words, "We preach Christ crucified."

The nave and aisles are paved with red and black tiles, laid diagonally, with figured tiles at the intersections of the pattern. Across the chancel arch is a richly-ornamented metal screen, with gates; and over the arch is the text, "I am He that liveth and was dead; and behold, I am alive for evermore. Amen." On the south side of the chancel arch stands the lectern, in oak and brass, the gift of the architect.

The west end of the chancel is elevated three steps above the floor of the nave, and towards the east end, including the foot-pace, are five more steps. The stalls are all of oak and richly carved, and the floor throughout the chancel is paved with encaustic tiles. The arch on the north side of the chancel has an ornamental metal screen, and over the arch is the text, "Thou art the King of Glory, O Christ." Over the corresponding arch on the south side are the words, "Thou art the Everlasting Son of the Father." The whole of this arch is filled with the organ front. At the east end of the chancel, the sanctuary, which is apsidal, has five lofty two-light windows, the whole filled with stained glass, the gifts of residents in the vicinity, the subjects illustrated in which are the principal incidents of interest recorded in the Old and New Testaments. Under the centre window is a reredos, canopied, with the Institution of the Eucharist sculptured in high relief. On the north side of the apse there is a credence, and on the south side three canopied sedilia, forming part of the arcading which is continued round the apse, the plain surfaces of which are filled with red and black diaper work.

On the south side of the chancel, and between it and the tower, is an entrance vestibule for the

clergy and choir. Above this is the organ chamber. The ground-floor of the tower is appropriated to a choristers' vestry, above it is the incumbent's vestry, over this the ringers' floor, and higher still the belfry, in which is a full peal of eight very melodious bells by Meare & Stainbank.

The style of architecture adopted throughout the church is that of the end of the thirteenth century. The core of the walls is of brick, faced externally with Kentish rag, and internally with Bath stone ashlar, the whole of the work being bonded together in cement. The spire is of Kentish rag, with Bath stone spire-lights, hands, quoins, and apex.

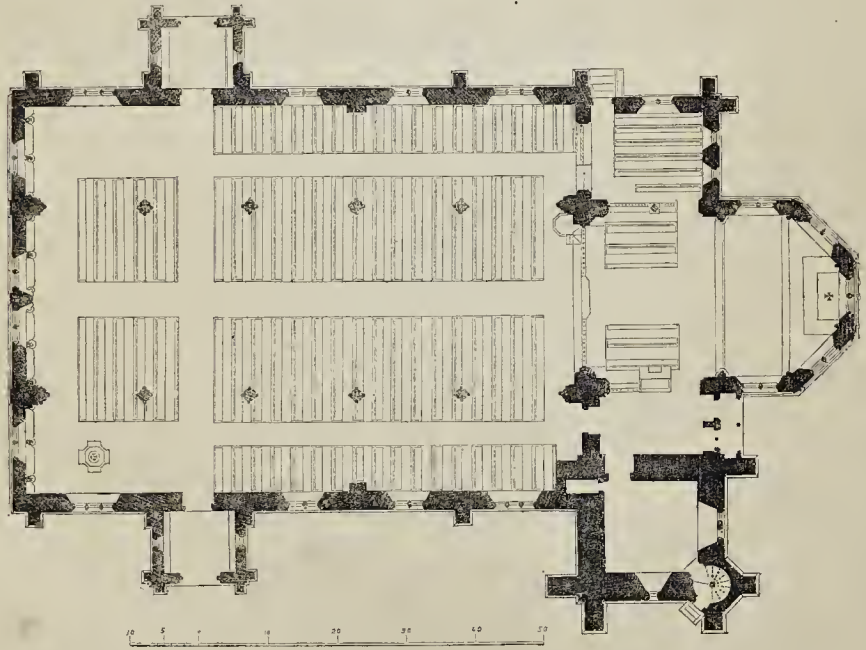
The contractors were Messrs. Myers & Sons. The ornamental sculpture of the nave and chancel, font, font-cover, pulpit, and reredos was executed, from the architect's designs, by Mr. James Forsyth; the metal work by Skidmore, of Coventry; the gas standards and communion railing by Messrs. Johnston, of Holborn; the tiles by Godwin, of Longwardine, near Hereford; the stained glass by Powell, of Whitefriars; the warming with hot water by Messrs. Weeks; and the organ by Messrs. Gray & Davison. The cost of the entire structure will be not less than 15,000.

The church has been erected entirely by subscription, aided by the personal munificence of residents in the immediate neighbourhood, and has been, from first to last entirely independent of pecuniary aid from any of the church societies, fortunately for the architect and the parish. The church will contain about 750 worshippers, and the whole of the seats will be entirely free and unappropriated.

The principal dimensions are as follow:—

	Ft. In.
Width of nave between columns	25 1
Width of aisles (each)	13 4
Total width of church	59 3
Length of nave	80 0
Height of do.	60 0
Height of aisles	33 0
Length of chancel	38 0
Height of do.	45 0
Square of tower on ground-floor	21 6
Height of tower to top of cornice	50 0
Total height of tower and spire	180 0

ST. MATTHEW'S CHURCH, UPPER CLAPTON, MIDDLESEX.



Plan.

THE LATER DISCOVERIES IN
JERUSALEM.*

THE Damascus Gate is situate in the present north wall of the city, about 1,400 ft. from the north-west corner of the Temple, and is a Sarcenic structure flanked by two square towers. Three shafts were sunk here without the gate, near which Dr. Barclay had discovered the superficial remains of a tower which have been previously described in these columns.

Two of the shafts were east, and the third west of the road, and without the gate. The result was the discovery of an ancient arch, to the north of this a flight of steps, north of this again the remains of a wall of related masonry of large size. These stones do not, however, appear to be *in situ*, as more modern masonry is visible.

The principal interest attaching to this investigation is the discovery that the ground is here at its ancient level, thus accounting for the finding of superficial remains; and this is proved by the foundations being about 3 ft. below the present surface.

The excavation at the Maristan or Hospital of St. John, on the west side of the city, south of the Church of the Holy Sepulchre, is a continuation of M. De Vogüé's discovery of a wall here, above the level of the ground, forming the east wall of part of the church. Three shafts were sunk in September, one 80 ft. west of the portion of wall above ground, where masonry was found 14 ft. below ground; the second 180 ft. west of same point, masonry found at the same depth; the third, 26 ft. north of the second, masonry being found at a depth of 8 ft. When investigated by trenches joining the shafts, two vaulted chambers were found, the vaults being rough, but the piers of apparently ancient masonry, with large stones and voussoirs. A large tank, 40 ft. by 17 ft., with twenty-five steps, was also found near, 28 ft. below the surface, connected with two other tanks,—the one 68 ft. by 17 ft., and containing a little water; the other not excavated, but in good preservation. These are the largest cisterns yet found outside the temple enclosure, and might be conjectured to belong to the foundations of one of the three towers on this side of the city, where cisterns are described by Josephus as being of large extent.

It is perhaps rather to be regretted that instead of endeavouring to trace the wall at this point to the west, it should not have been explored north or south, as the direction of the part above ground would seem to intimate that it ran in that direction.

The next discovery is one of great interest, being entirely unlooked for, and in a quarter where no previous discoveries have been made. It consists of an underground excavation near the Pool of the Virgin, well situated on the west side of the Kedron valley, to the south of the Haram enclosure, and at the bottom of the slope of the Temple Hill. Here there has been no trace above ground of ancient work, the wall being a late structure, and very rude, forming an entrance to a rock-hewn cave in which the water rises.

The existence of a communication between this Pool and the larger reservoir of the Pool of Siloam to the south, by means of a channel hewn in the rock, was made known by Dr. Barclay, who explored it from both ends, and it is supposed to explain the intermittent rising of the water in the lower pool, as being caused by the syphon-shaped termination of this passage. Lieut. Warren has now added to this discovery that of a larger and more important excavation.

The exploration was commenced under the lowest step of the pool, and with great difficulty, as the rising of the water threatened to drown the workmen already up to the neck in water. Another attempt was then made to explore the passage already mentioned, and at length, leading out of it towards the north-west, two passages were found, the largest being about 50 ft. south of the pool.

This was gradually cleared out to a distance of 17 ft., when a cave was reached, and a shaft, which proved to be 40 ft. in depth, leading upwards from this point.

On exploring this rock-hewn shaft, which has smooth sides, and cross section, of 6 ft. by 4 ft., to a height of 40 ft., a piece of loose masonry was discovered directly over the heads of the explorers, weighing about 8 cwt. The ascent was made by scaffolding, and at the heights of 20 ft., 27 ft., and 38 ft., landings were made

with frames, checks being cut in the rock on which they rested.

At the height of 44 ft. the shaft opened into a covering, with a sloping ascent, covered by small stones; being pursued about 30 ft. towards the west, it reached a landing, and the cave went from this point in two directions, one which was impassable towards the south-west, and the other north-west still sloping, following which at a distance of 15 ft. a level plateau was reached, and a passage 8 ft. high by 3 ft. broad. Still pursuing this, a wall was reached, and on creeping through it, the passage was found to rise again at an angle of 45°, for a distance of 50 ft., and as it was very low, it was easy to ascend. At the end of this was a vaulted chamber, 20 ft. long, still running north-west, having a well-cut arch, of semicircular form, the crown being 20 ft. from the ground, and built with large voussoirs. This terminated in a pit about 20 ft. deep, and at this point the passage was hocked up. Two or three curious glass lamps, and two of red pottery, were found here; an iron ring overhung the shaft, and a small pile of charcoal, near which was a dish for cooking food, was also found in the chamber last mentioned. This passage appears to have had some connexion with the ancient aqueduct, but owing to the unfortunate blocking up of the western end, this communication was not traced.

A good deal of importance has been given to the investigations which have been here placed next in order, namely, those in the Tyropean valley; and although the spot was one where exploration was difficult, as being within the city, still one discovery of extreme interest has here been made, although no one has as yet expressed an opinion as to the real name or use of the building explored.

Six shafts were sunk in this exploration, being all in a line running west from the arch on the west Temple wall. These number in order from the first to the sixth, the first being the most westerly. The sixth is situated between the fourth and fifth. Their object was to find the continuation of the bridge, of which only a fragment of one arch exists, and their result was the discovery that it consisted apparently of one great arch, to which an ascent from the city led with a gentle slope.

Each of the shafts led to the discovery of some ancient work. The first was sunk 21 ft., when the rock was reached, and a polished slab of marble, forming the top of a drain in which a current of water was flowing through the sewage with which it was filled. The sewer was 6 ft. deep by 3 ft. broad, and the stone 21 ft. by 6 ft. The second shaft, 250 ft. from the Temple wall and 35 ft. east of the first, was sunk about 5 ft. to a masonry pier, measuring 3 ft. by 4 ft., in which was discovered the entrance to a cistern beneath, which is, according to Lieut. Warren, of greater antiquity than the pier, and has its bottom on a level with the top of the first sewer. Passages were driven east and west from this shaft, and resulted in the discovery of similar piers at an interval of 12 ft. 6 in., the whole forming a colonnade. The stone was sandstone, well cut and dressed. The cistern is plastered, and has a slightly domed roof. The rock was here found at a depth of 18 ft. below the surface. The third shaft disclosed another portion of the colonnade, and the rock at a depth of 32 ft. Its distance was 216 ft. from the Temple wall. The fourth shaft, 182 ft. from the same, disclosed at a depth of 22 ft. a square rock-cut cistern, 7 ft. below the surface of the rock, as well as a pillar, 1 ft. diameter, and various fragments apparently belonging to the colonnade. The fifth shaft, at a distance of 82 ft. from Robinson's arch, and the sixth, 132 ft. from the same, were investigated with great eagerness, as tending to show the original width and depth of the Tyropean valley, and the form of the bridge. The fifth shaft discovered a large cistern, but was abandoned at the depth of 25 ft., and a second was sunk close to it, 87 ft. from the wall, which discovered a tank at the depth of 9 ft., measuring 18 ft. by 12 ft. The rock was here only found at a depth of 41 ft. It was proposed to run a gallery from this point to the wall, which would probably throw much light on the appearance of the valley. The sixth shaft disclosed rock at a depth of 30 ft., and an ancient wall of hammer-dressed stones running north and south, and another running east and west, of massive stones, the top at a depth of 26 ft. below the surface.

It is difficult to give an idea of the whole result of these isolated explorations, but it is well explained on paper by Lieut. Warren, and shows that the hill must have been crowded

with ancient buildings of large size, including the colonnade, which ran gradually from the west to the level of the great bridge. There can be surely but little doubt that in this we have the remains of the great Xystus, or covered gymnasium, which is distinctly stated by Josephus to have stood here, and the dimensions will fit with the scale to which the entrance to the Temple on this side was constructed.

The next exploration is a continuation of that at the south-east corner of the Temple wall, and is of extreme interest, as showing that the ancient city wall joined the Temple here, and not, as it is often supposed, at the south-west corner. There is as yet no connexion between the exploration in this part and that on the west of the Temple; but wherever a shaft has been commenced, ruins of some kind have been found throughout the whole space immediately south and south-west of the Temple; and there seems reason to suppose that a large amount of ancient building lies hidden beneath the ground in this part.

The city wall, which is here exposed, consists of large stones partly related, and runs in a line with that of the Temple for a distance of twenty yards, and afterwards bends towards the west, at an angle of about 45° with its first direction. Close to the Temple wall there appears to have been an entrance. Three shafts were sunk for this exploration, and at the corner of the wall a tower was found, having a face 23 ft. 6 in. in length, and projecting about 8 ft. beyond the wall. This was, no doubt, one of those towers which, according to Josephus, were placed along the wall. There were also discovered, 15 ft. south of the Temple, the remains of a wall running east and west, abutting on the city wall. Of these walls the courses remained entire to the height of some 40 ft.

It was in this investigation that the Lieutenant found the only remains of ancient writing yet discovered. On the corner stone of the second course (south-east corner of the Temple wall) three letters or marks were found painted in vermilion, apparently with a brush, and the largest some 5 in. in height. The paint when wetted rubs off easily.

There was also found a horseshoe mark on the east wall, about 2 ft. broad at the base of the shoe, and 2 ft. 8 in. deep (supposed to be used in working the tackle in the lowering of the stone) cut in the rock at the foot of the wall. A small earthenware jug was found in a hole in the rock further south.

On the north wall also a deeply engraved letter H was found, and splashes of both red and black paint. These are supposed to be only masons' marks. The H may be a Phœnician "Cheth." A diagram of the stone with the markings will be found in our last number.

The explorations of the ancient aqueduct conveying water to Jerusalem from the sealed fountain and pools of Solomon at Bethlehem, are also of great interest.

A shaft was discovered, south-east of the south-east corner of the "Cœnaculum," in the convent of Mount Zion on the southern slope of that hill, 50 ft. above the present aqueduct. The shaft was of a square section, 2 ft. wide, and at a depth of 16 ft. opened into the ancient aqueduct, which was traced north-east for 300 ft. and 200 ft. west; its appearance was similar to the rock-cut passages of the Triple gate. It was traced to the English school, near which it crossed the modern aqueduct, where it was lost. The course is extremely zigzag. An attempt was made to find the other end of the line at Bethlehem, but without success, though there is little doubt that it led thence probably to the Temple area, which derived the greater part of its water supply from it.

There now only remains one other exploration to describe, that near the Pool of Bethesda or Birket Israel, a large tank to the north of the Haram enclosure, and immediately below the wall, measuring some 350 ft. from east to west, and 100 ft. from north to south.

The tank discovered was entered from a small garden, forming part of the northern end of the Haram enclosure, and entered by a narrow shaft leading into a little chamber 6 ft. square, through which it descends to the bottom of the so-called tank, a depth of 45 ft. in all.

This tank is situated under the Haram enclosure, and proved to be of large size, 63 ft. from north to south, and 57 ft. east and west; the interior of its north wall 24 ft. within the exterior of the north Haram wall, its height 28 ft. It is described by Lieut. Warren as consisting of nine rectangular basins, formed by

* See p. 238, ante.

four piers; those arches springing from the northern piers are stilted, but the form of those from the southern is not ascertained. The dimensions are irregular. The piers and arches covered thickly with plaster. The arches support nothing, and are 14 ft. to the crown from the floor. The roof is vaulted, and intersects the piers with the sides of the vault have cut stone surface ribs. The appearance of the whole is dissimilar to any other of the Haram vaults, and this discovery is most interesting as being the first attempt at subterranean exploration on the north, hitherto entirely unexplored.

The construction is said to be similar to that of many Roman tanks at Naples and Bajæ, as well as at Constantinople.

Such, briefly described, are the discoveries which, in the two last years, with great perseverance and patience, under the most difficult circumstances, in want of men, materials, and money, aided by any European, except one sergeant of the Engineer corps, and with unskilled and stupid natives, Lieutenant Warren has made. They include the explanation of the true appearance and arrangement of the Temple enclosure. The discovery of a building outside its wall entirely lost, the probable rediscovery of one of the ancient towers, and of a large portion of the city wall, besides the exploration of the aqueduct, and of innumerable tanks, passages, vaults, and subterranean communications.

The work, instead of being regarded as scanty and desultory, thus appears, when summed up, to be as satisfactory as could have been expected when the circumstances of time and place are taken into account, and is interesting on its own account as well as in showing the immense amount of hitherto unsuspected and most valuable information which lies buried beneath modern Jerusalem.

It may not be out of place here to hint in what quarter the researches might with great advantage be pursued, and especially as it has never before been pointed out.

There can be no doubt, when we take into account the description by Josephus and other historians, that Jerusalem, in the time of its greatest prosperity, occupied a space nearly three times as great as that on which the modern town stands; and, as natural features prevented its growth east and west, this space must have extended north and south of the present city. Hence there must be, on Mount Zion, to the south of the present city wall, and on the broad plateau on which the New Jerusalem or Russian town stands, a large field for exploration hitherto untouched.

The depth of *débris* on Zion, which is greater than that in any other part of the city, would seem to favour this supposition, as it extends far south of the modern wall. And to the north, remains have been discovered by the Russian consulate, which also intimates that much is here to be found. The advantage of exploration in these parts is, that as they are free of houses and other obstructions, there would be less difficulty and expense in conducting it in these parts; while there can be little doubt that some of the principal buildings of ancient Jerusalem lay without the walls of the city now existing.

It would be most interesting also, and most instructive, to follow the course of the city wall discovered at Ophel, and to trace its course on Zion, for the position and extent of the walls of the ancient city (a subject on which, owing to the entire absence of landmarks of any kind, much needless controversy has arisen) is one of the first and most important points in the rediscovery of Jerusalem, a fact which has been already noticed in these columns.

It is curious also, that while on the south and north so much has been done at the Haram enclosure by Lieut. Warren, still on the west he has not yet attempted any investigation besides that of the Tyropean bridge; but this is no doubt owing to the great difficulties arising from the number of houses and bazaars which lie against the wall. There was, however, discovered on this side by Dr. Barclay an ancient gateway, almost buried below the present level of the street, which was explored by M. De Vogüé, and has already been described, together with the passage walled up at its eastern end which leads from it. Would it not be possible to investigate this more fully, and even to pass that wall, behind which it is possible a communication with the southern vaults may exist, and perhaps a system of passages and halls buried in the heart of the mountain, of which we have at present no information? It may be remarked

that the line of this passage, the entrance to which was known as the Single Gate, before that name was given by the Lieutenant to the entrance discovered by him on the south, abuts on the end of the gallery from the Double Gate.

There is also another point which demands attention,—the discovery of the towers of Jerusalem. Of the great fortresses, Hippicus, Phasaelus, Mariamme, and Psephius, not a vestige remains above ground. It has been supposed that a small tower of utterly different and inferior dimensions, on the west side of Jerusalem, near the gate of Bethlehem, or Bab el Khalil, known as the Tower of David, is the ancient Hippicus; but of this there is no proof whatever, and the rebated stones of which it is built are greatly inferior in size to any found in any of the really ancient masonry, and perfectly different in character. To discover, therefore, the foundations at least, and probably more, of these great buildings is a work to which we look forward with interest. The towers stood on the west wall, where the ground was lowest, and one at least (Psephius) must have been considerably north of the present town.

In conclusion, it is to be hoped that the work left untouched for ages, and now at length commenced, will not be allowed to come to a stop, when so much has been done, and the promise of so much more been given, through the want of funds, and that thus the credit of this great discovery will be reserved for Englishmen. It is to be hoped that, while no time or money has been spared in bringing the small Roman city, which occupied no place in the history of its time, from under the ashes of Vesuvius to the light of day, a no less active interest and energetic support will be felt in, and given to, the re-discovery of a great city, which holds so unrivalled a position among the ancient capitals of the world.

ON THE ART OF VALUING AGRICULTURAL LAND, AND ON THE INDICATIONS OF THE VARIOUS QUALITIES OF SOILS.*

THERE are probably few subjects within the whole range of the profession which oblige the surveyor to rely so entirely upon his own judgment and knowledge, as the determination of the rental value of agricultural land.

When an estate is to be sold, it may be observed that almost every probable purchaser has his own opinion as to the number of years' purchase it is worth, whilst, for the great body of the public, the actual existing rental must necessarily be taken as the only available basis, until professional advice is obtained to test it.

Again, in valuing house property, it is often possible for those who have little previous acquaintance with a locality to form something like a fair estimate of the rental value of a house, by comparing it with other houses of which the rents can be ascertained; and similar comparisons can often be instituted in the case of building or accommodation land, or almost any description of property depending for its value mainly on position, whilst it is seldom difficult roughly to calculate the cost of any building.

Such aids to the judgment are not to be had when walking over a farm; for, as we all know, the variations in the qualities of the soil are far too sudden and uncertain in most districts, for the rental value of one estate or farm, or even field, to be deduced from that of those near it, whilst the indications of fertility or barrenness, though plain and reliable enough to those who know how to read them, are not usually apparent to the ordinary eye.

The principles on which the amount of rent should be arrived at, and the indications of rental value afforded by land, form therefore, I venture to think, one of the most interesting subjects for discussion by the members of our institution.

The rent of land, we are taught by Ricardo and the political economists, consists of the difference between its "net produce" and the net produce of the worst land which it is worth while to cultivate at all; the term "net produce" indicating what is left after deducting the tenant's interest on his capital, and remuneration for his own labour and superintendence, as well as the actual working expenses. That is to say, that if the produce of a piece of land will

barely cover such interest and tenant's profit and expenses, it is just worth cultivating, but only at a nominal rent; whilst, for a more fertile piece of land, the tenant can afford to pay the value of the whole of the increased net produce, though in estimating this it must be borne in mind that the more productive land will involve a larger deduction for interest on capital as well as for heavier rates and taxes, and some increase of expenses consequent on larger crops.

The late Robert Baker, in his edition of "Bayldon on Rents and Tillages," suggests that the rent is to be calculated by estimating the expenses incurred and the profits arising during the whole course of one rotation of crops on different soils; and he very justly observes, that the land valuer must be constantly alive to the changes in the market price of the various articles of produce, and, he might now have added, to the supply of agricultural labour in the various localities. He also remarks, that the cost of cultivating various soils differs so greatly in proportion to the gross produce obtained (especially in these days when, by high farming, the increase of the gross produce depends so greatly on the skill of the farmer and on the investment of capital), that the notion which seems to have formerly prevailed that a fourth or fifth of the money value of the produce will represent the rent, is fallacious in the highest degree. There can be no doubt of the truth of this last remark; the calculations suggested by Mr. Baker are, theoretically, the only sound basis for determining rent, although he has to admit that experienced valuers do not, in practice, rely entirely or even principally upon them. The truth is, that such calculations are liable to be seriously altered by such comparatively slight variations in the estimated produce and expenses, that although many intelligent farmers could apply them to their own farm or even parish, comparatively few men are able to carry them much farther, and the possession of accurate data for their general application implies a degree of experience which renders them almost superfluous.

I think the sound plan is to go carefully into these calculations as to the best and worst qualities of both light and heavy arable and pasture land, so as to form and keep a well settled scale of values, to be filled up on going over each estate.

An actual knowledge of the rates at which the various classes of land are freely hired by good tenants is also, I need hardly say, a most important practical test of the accuracy of such individual calculations, and is gradually acquired by the negotiations incident to the practice of a land agent; but whatever the method by which the valuer fixes in his mind his scale of rental value, what he has to do, in looking at any particular field or estate, is to obtain such indications of its quality as will enable him unhesitatingly to give it its true place in this scale.

The great majority of farmers, I believe, judge entirely, or almost entirely, by the crops, and they usually give surveyors the credit for doing the same. I have often been amused, in walking over a farm in company with the occupier, at being told incidentally, that he did not know what sort of field such a one was, because he had only had it four or five years, and he did not know yet what sort of crops it would bear. The same notion probably has something to do, along with many other causes, with the circumstance that instructions for such a large proportion of valuations are given about the time of year when the land begins to be so covered with crops that it is increasingly difficult and laborious to examine it. If the object be to advise a tenant whether to hire a farm or not, it may be very desirable to judge from the crops what condition it is in; but it may be safely asserted, that the valuer who allows them to influence his judgment in determining the permanent rental value, is very liable to fall into serious error—over-valuing poor land which has been highly farmed, but under some new tenant will some day return to its poverty, under-valuing mismanaged land, which possesses the power of producing good crops with proper treatment. The local knowledge, which is thought so much of in some quarters, and which is founded on the reputation of different farms according to their former crops, is not an affair of judgment at all, but of traditional knowledge, and is totally different in its very nature from the judgment of a surveyor founded on his own observation. The one is useless directly it passes out of its accustomed locality; the other is of general application. The one cramps the mind by accustoming it to trust to traditional reputa-

* By Mr. Philip D. Tuckett, read at the Ordinary General Meeting of the Institution of Surveyors, March 22nd. Mr. Henry Arthur Hunt, Vice-President, in the chair.

tion, which is only the general opinions of the casual observer; the other strengthens his judgment and prepares it for dealing with new subjects as they arise. Few things are so easily acquired with a little inquiry and trouble as such local information on any given point—few things are more difficult to obtain than a good sound independent judgment upon it.

But to return from this digression. Although it is exceedingly dangerous to attempt to judge of the quality of a soil from the crops grown upon it in one particular year only, still many most useful indications may be obtained from its more permanent products, especially from the trees and grasses. Most of our ordinary forest-trees have special proclivities for the various soils on which they flourish, and a careful observation of their growth, and of the hedge-row, affords information which will seldom mislead. A really thriving elm-tree or hazel cannot be found where there is not a good mixed soil; whilst an abundance of oak and blackthorn are indications of heavy land, and the growth of the trees will generally correspond with the depth and quality of the soil. The alder and the willow are only found in wet places, chiefly by the waterside, and the poplar usually in wet places. On the other hand, coniferous trees prefer the lighter soils, and the Scotch fir grows on thin lands which will produce nothing else except heather; and the beech, though it will grow elsewhere on good land, is usually indicative of a calcareous soil. The sycamore is partial to light or sandy soils, whilst the walnut, and I believe I may say the maple also, usually grow on good mixed loams. The ash is scarcely a sign of any particular kind of land; if it is rapid growth, it indicates good land; if in poor stiff clay it is constantly met with, but is of slower growth and often stunted. The white thorn, if it grows rapidly, is a sure indication of good land; and one never sees a stinging-grown quick-fence on inferior soils.

The various permanent grasses which make up the swards of an old pasture, and even the weeds found in the land, and the character of the growth of both, form most valuable indications of the quality of the land.

This part of the subject is treated in great detail in a long and admirable essay by Mr. Bravender, published in the fifth volume of the "Royal Agricultural Society's Journal," to which I would refer those who desire a greater amount of botanical detail than I can afford space for in this paper.

It is estimated that the distinct species of natural grasses, natives of this country, are in number about 150 or 160, whilst those which are recognised as covering the surface of good old pasture land, number, I believe, only about 18. It is said that a square foot of old pasture or meadow land contains about 1,100 plants, a square foot of water meadow about 1,800, and a square foot of a crop of grass seeds on arable land only about 80. The species of the best permanent grasses being so moderate in number, it is worth while to learn their names, and also to recognize them at sight when in flower.

They are as follows:—

Daactylis Glomerata	Cook's-foot Grass
Allopecurus Pratensis	Meadow Fox-tail
Festuca Pratensis	Meadow Fescue
Festuca Durtuscula	Hard Fescue Grass
Phleum Pratense	{ Greater Meadow Cat's Tail Grass
Anthoxanthum Odoratum	{ Sweet-scented Vernal Grass (which gives its scent to Hay)
Avena Pratensis	Meadow Oat Grass
Avena Flavescens	Yellow Oat Grass
Cynosurus Cristatus	Crested Dog's Tail Grass
Holcus Avenaceus, or Arrhenatherum Avena- scum	Tall Oat-like Soft Grass
Hordeum Pratense	Meadow Barley Grass
Lolium Perenne	Rye Grass
Poa Annua	{ Annual Meadow or Suffolk Grass
Poa Trivialis	{ Rough Stalked Meadow Grass
Poa Pratensis	{ Smooth Stalked Meadow Grass
Trifolium Pratense Perenne	Perennial Red Clover
Trifolium Repens	White or Dutch Clover
Vicia Sepium	Creeeping Vetch.

All really good pastures are composed chiefly or almost entirely of the above grasses; leafy plants take up so much space in proportion to their produce, that they are necessarily wasteful, even when not otherwise injurious. The proportion in which these best grasses occupy the surface is a pretty sure indication of quality.

Mr. Bravender, in the paper above mentioned, gives several lists of flowering plants and natural grasses, with their several indications; but, with a view to condensation, I shall confine myself to

selecting only a few specimens and arranging them into two very important divisions—a few of the principal plants indicating cold wet land, and a few of those found on very dry soils; because, as the valuer visits the land in all sorts of weather and at different seasons, he may be principally dependent on vegetation to tell him whether a field is injured by excessive wet in its ordinary condition, or, on the other hand, whether light land is excessively dry and likely to burn, whilst of almost everything else he can always judge by other means; and because, if one attempts to extend such lists too far, the indications intended to be derived from them become less clear and simple. It is a very curious fact that the herbage of a wet grass field almost entirely changes when it is drained: this is the reason why people used to say that grass land could be easily over-drained, and was often injured by draining. The fact is, wet grass land is injured by draining for two or three years, the old grasses dying off and the better ones not having yet fully taken their place.

PLANTS INDICATING COLD WET LAND.

Agrostis Palustris	Marsh Bent Grass
Aira Aquatica	Water Hair Grass
Aira Cuspidata	Tufted Hair Grass
Allopecurus Geniculatus	Floating Fox-tail Grass
Carex	Carpet Grass
Centaurea Calcitrapa	{ Blue Bottle, or Star Tribble
Colpus Palustris	Marsh Plum Thistle
Hippuris Vulgaris	Marsh Tail
Potentilla Anserina	Srifer Weed
Primula Veris	Cowslip
Rhinanthus Cristif Gallii	Yellow Rattle
Scabiosa Succisa	{ Devil's Bit Scabious, or Blue Button
Tussilago Farfara	Coltsfoot.

PLANTS INDICATING VERY DRY LIGHT SOILS.

Agrostis Vulgaris	{ Common or Fine Bent Grass
Aira Flexuosa	{ Wavy Mountain Hair Grass
Aira Cristata	Crested Hair Grass
Campanula Glomerata	Canterbury Bells
Campanula Rotundifolia	Heath Bell Flower
Erica Vulgaris	{ Common Heath, Ling, or Heather
Festuca Grina	Sheep's Fescue Grass
Galium Verum	Yellow Ladies' Bed Straw
Onobrychis Sativa	Wild Sainfoin
Thymus Serpyllum	Wild Thyme.

In addition to the species of grasses, a good deal may be learned by the character of their growth. On good land the blade grows full and broad; on poor wet land it often looks stunted; whilst on thin sandy soils it is apt to be thin and wiry.*

NOTES AND CIPHERS.

THE other day, for want of something better to do, or for the reason why a well-known young man in the poem "whistled as he went," namely, "for want of thought," we looked over a couple of hundred ordinary replies to an ordinary invitation, "So-and-so solicits the honour of So-and-so's company," and "So-and-so will be happy to come," or he won't be, according to circumstances, or she won't be, according to gender. Lazily turning over the glossy sheets, and almost sent into dreamland by the constantly-recurring formula, two things struck us, and one of these things was this thing,—that amongst the respondents there were forty educated men and women who said, "we will have the pleasure of accepting the polite invitation." Speaking from knowledge of those who thus write, one would say there surely must be some way of defending this mode of expression (a parson, a painter, a poet, a peer, and a parliament-man are amongst those who use it; and it is even printed on cards and sheets of paper in blank, to save the time of the overwhelmed, and sought for); but, for the life of us, we cannot find it. They do accept, they are accepting; invitation is the present act of inviting, and that present act they accept; they do not intend to do it to-morrow, they do it when they write. Quite properly they "will avail themselves of" an invite, "will have the pleasure of coming," or "will accept your hospitality;" but as to the invitation, they do then and there accept it; there is no "will" in the case; so, to misapply Longfellow's line,—

"Trust no future, however pleasant."

The other thought that forced itself upon us was one adverse to the present universal adoption, even by those who have historic crests, of what are called Monograms, but which are for the most part nothing more than idiotic and contorted groups of letters, often illegible, and oftener still wholly unsuggestive of the information intended to be conveyed. What

* To be continued.

is really a monogram? A *monotheist* believes in one God; a *monologue* is a speech uttered by one person; a *monodrama* is a dramatic performance by one actor only; a *monosyllable* is one syllable; and a *monogram* is one letter or a character done at one writing; that is, with a continuous line, though compounded of several letters—*monos*, one, and *gramma*, a letter. One might as well call three or four stones leaning against each other a *monolith* (*monos*, one, and *lithos*, a stone), as three or four distinct letters, because gloriously jumbled, a monogram. Still, what's in a name? A nose by any other name would smell as well; so pass by the name and look at the thing itself. The great majority of these ciphers are altogether unintelligible. There is a proper system which, if followed, would make them always understandable, at any rate, by those who know the system. But in practice, as a rule, there is no rule, and confusion worse confounded results.

Thus, on pious Mary Anne Dickon's envelope we get three letters, very blue (suggestive of "deep read"), lovingly entwined, but whether they are meant to suggest M. A. D., or say D. A. M., is no more easily to be divined without extraneous knowledge than you can understand from the so-called monogram of our wild friend Trimmer, christened Richard Andrew, whether he means it to convey R. A. T. or T. A. R. An astute doctor of our acquaintance, a strict monogramist, has twisted his R. and his T. and his D. about till they resemble nothing so much as the cipher of the Grand Turk; and one of the most refined and dignified of ladies, high in the social scale, assures every one at the top of her notes, and in violent tones (of colour), that she is L. O. W.

However, this is but a fashion, and we have the comfort, if it be one, of believing that long before people have left off saying they will have the pleasure of accepting what by that saying they do accept, they will return to their proper crest if they have one, and make their cipher intelligible if they have not.

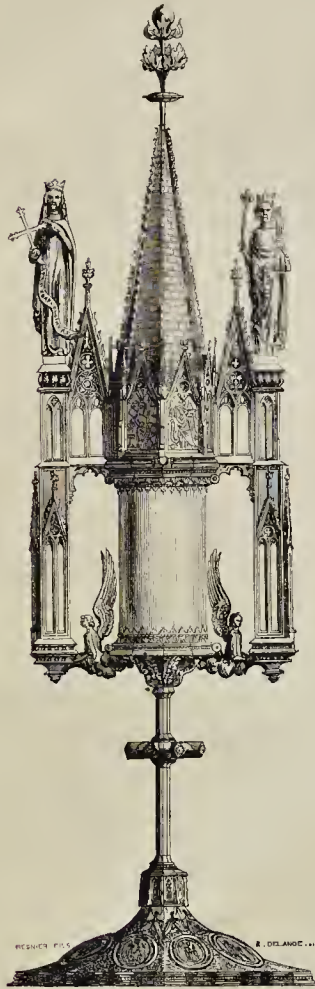
DEMOLITION OF HOUSES UNFIT FOR HUMAN HABITATION.

AT a meeting of the City Commissioners of Sewers a report was brought up from the Sanitary Committee condemning the premises Nos. 1, 2, 3, 5, 6, 9, 10, and 11, Sun-court, Golden-lane, as unfit for human habitation, and recommending that it be referred back to the committee to take steps under the "Artisans and Labourers' Dwellings Act, 1863," for their demolition. A discussion of some length took place upon the subject, and, in reply to Mr. Bedford, it was stated that the commissioners had no authority to erect new buildings in place of those proposed to be taken down, although that appeared to have been originally contemplated by the Act referred to in the report of the committee. The chairman stated that the materials of which the houses were composed would not cover the cost of demolition. The commissioners, however, had power to make a rate of 2d. in the pound for the purposes of the Act; but that would be equivalent to such a large sum that, unless they were engaged in very extensive alterations, it would be unnecessary. Mr. Baylis, the solicitor to the commissioners, stated that there was power given to charge the land with the expense incurred, and in reference to some observations made by hon. members that they could not understand the provisions of the Act, remarked that the measure had been so much altered in committee as to make it a jumble, and some local authorities had given up all idea of putting it in operation. Mr. Gower asked, "What was the meaning of a house being unfit for habitation—whether it was dangerous to the public, or simply in a filthy state owing to the habits of the inmates?" Replying to the question, Mr. Hayward, the surveyor, read his report upon the state of one of the houses. Its general condition was as follows:—

"The floors and ceilings throughout were considerably out of level. Some of the walls were saturated with filth and water, and others were broken and fallen down. The doors, window-sashes, and frames were mostly rotten and in a very dilapidated state; the stairs were also dilapidated and dangerous, and if a person were to jump upon them they would very probably give way; the fastenings to the doors were in nearly all cases broken or torn away. The roof was leaky, and admitted the rain. There was a closet used in common by the inmates of this and of seven other houses in the court, and it appeared by the report that it was in a bad state, owing to the drippings from the cistern. The only water supply was from this cistern above the closet."

In the result the report was adopted, and the houses will accordingly be demolished.

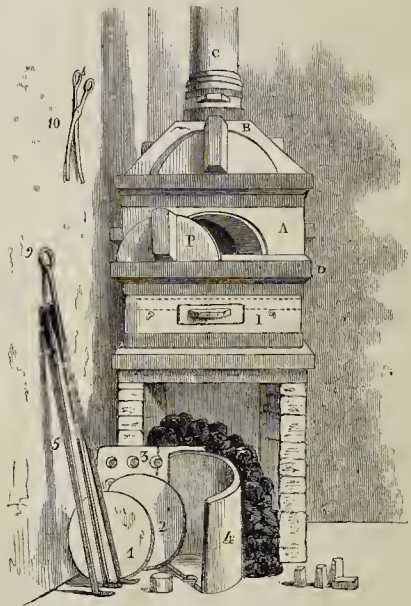
THE INDUSTRIAL ARTS.



Reliquary of the Treasures of Basle, Thirteenth Century.



Iron Gate of the Twelfth Century.



An Enameller's Oven.

SCULPTURE IN FLORENCE.

"DEATH AND HONOUR," a group commemorative of those who fell in the late American war, recently executed in Florence by a young artist, Mr. Pierce Connelly, announces such talent and power of imagination as certainly should not pass unnoticed. Setting aside the accidental and local in his subject, the sculptor treats it in the purely abstract and moral aspect, or, we may say, as an allegory illustrative of an enduring truth. It is "Honour arresting the Triumph of Death," which is, in fact, the subject here presented in a group of five figures, Death, himself, being mounted on a horse, and with masterly skill in the treatment of a composition so difficult; the number of figures and serenity of action demanding so much both of inventive power and technical science. Besides Death and Honour, the other personages introduced are also allegorical representations of abstract forces, namely, Courage, Perseverance,

and Strength, who are all cast down before the career of that king of terrors, but not alike subjected to him. Strength, who seems to have first fallen, still holds his broken sword in his hand; Perseverance desperately grasps the scythe with which Death is mowing down his victims; Courage, though prostrate and actually beneath the lifted hoof of the conqueror's steed, rears himself with gallant effort, and aims a blow with his battleaxe at the enemy about to ride over him; Honour alone, the figure whose heroic grace and expressive action at once arrest attention, with helmeted head, but otherwise unarmed, and calmly triumphant, "severe in youthful beauty," opposes the headlong career of that shadowy king, and tears down the banner which, as well as the scythe, are the symbols of conquest borne by him. As for this personified Death, so rarely represented in Christian art save in forms that are grotesque and revolting, we see here an aged warrior, of wiry and sinewy frame, terrible, not hideous, in

aspect, with crowned head, and body partly clad in close-fitting chain-armor, his actions indicating the sudden check of an onward impetuous career, and the indignant astonishment excited by unlooked for opposition, strikingly expressive and dramatic.

This group has not yet been executed on a large scale, but is intended, as theme and composition obviously require, for the colossal. It seems to us to fulfil the high conditions of sculpture in illustrating the inner and moral reality of things, the principle that abides permanent amidst the shifting varieties of time and place.

Proposed Infirmary at Rotherham.—The building committee of the proposed new Infirmary at Rotherham have work before them, upwards of ninety sets of plans having been forwarded to the honorary secretary in reply to the advertisement offering prizes for the best designs.



ST. MATTHEW'S CHURCH, UPPER CLAPTON, MIDDLESEX.—MR. FRANCIS T. DOLLMAN, ARCHITECT.
[See p. 262, ante.]

ROYAL COMMISSIONERS' REPORT ON THE BUILDING TRADE-UNIONS.

THE eleventh and final report of the Royal Commissioners, who were appointed to report on the working of trade-unions, is now in the hands of the public. The Commissioners seem to have paid especial attention to the unions connected with building trades. With the officers of these societies they commenced their investigations, and examined no fewer than thirteen of the officers connected with the carpenters', joiners', masons', plasterers', bricklayers', and painters' societies. They also examined thirteen gentlemen connected with the various branches of the trade, but who had no connexion with the union except so far as the working of them on the trade are concerned. The Commissioners in their report say under this heading—

"EFFECT OF UNIONS ON TRADE.

(51). The effect which unions have had in impeding the development of trade, whether by simply raising prices, or by diverting trade from certain districts, or from this country abroad, is a matter excessively difficult to determine. (52). There are many rules and practices of which the effect must necessarily be to enhance the price of commodities by raising the cost of production. But whether such rules and practices are not far less effectual than is commonly supposed, is a question incapable of solution without an investigation extending to a great variety of subjects besides that directly submitted to us. (53). The industries on which trades' unions may be supposed to have had an effect must be divided into two classes—those in which foreign competition cannot, and those in which it can, materially interfere with the productive industry of the country. (54). In the first case, there is nothing *a priori* to prevent the operation of trade-unions from raising the cost of commodities until the rise is checked by the diminution of consumption. Such an instance is afforded by the various trades in building. We are disposed to think that the operation of trade-unions may have tended to enhance in these trades of late years the cost of production, and that houses and other buildings might have been somewhat better and cheaper at the present time had not trade-unions interfered so extensively and so vexatiously with the proceedings of the employers. It does not necessarily follow that they have raised wages in those trades, and improved thereby the condition of the workmen; the contrary, in the long run, is more probable. (55). The other class of trades—that class in which production may be interfered with by foreign competition—is far more important. But we are compelled to admit that we have been unable to arrive at any very definite solution of the problem whether or not trade-unions have had of late years a mischievous operation in this direction."

They frequently single out the evidence given in connexion with the building trades as worthy of remark as well as to show the working of the unions. We give a few of the many examples. Speaking of the monopoly of the work of a district, the Commissioners say:—"A society of brickmakers claim an extent around Manchester in every direction equal to an area of 120 square miles as their peculiar district, within the limits of which they permit no bricks to be made except by Manchester union men, nor any bricks to be used except those made within the district. They accomplish the latter object by means of an alliance with the Manchester Bricklayers' Union, the members of which will not set any bricks not made within the above-named district."

Referring to the interference of trade-unions with the employers, the Commissioners say, "A union of bricklayers at Manchester interfered to insist that a Manchester builder, constructing a railway station at Bryn, should take at least half the men from Manchester; whilst the National Association of Operative Plasterers interfered to require an employer whose head office was at Manchester (although he had a branch office at Bolton) to pay Manchester wages for a job at Bolton." Again, the Commissioners are told by Mr. Conolly, who is a member of the Operative Stone Masons' Society, that the rules

"Are made for men, not for masters. We do not take masters into the account at all in the arrangement of the matter; we merely look upon them as men who step in with their capital, and who want to get the greatest profit they can out of their capital, whilst we want to get the greatest profit we can out of our labour; and we find that by an arrangement of this sort, without depriving society of the advantage of the skill of its members, we can gain our object."

Mr. Hughes and Mr. Harrison sign a dissent which they term "conclusions from evidence." They point to the great extent and increase of unionism, and to the improved character of unions of late years. Well-established unions, they urge, rather diminish the frequency and disorder of strikes, and are, on the whole, beneficial in their operation. It is affirmed that the workmen generally are not opposed to the use of machinery. State interference in the matter of apprentices is deprecated. It is difficult to estimate the effect of unions on foreign trade, but it is admitted that it is sometimes mischievous. Masters' associations are held to be

open to the same objections as those of the men. They recommend that unions should be capable of suing and recovering at law contributions, arrears, and fines against their own members. Unions ought not to be capable of being sued or dissolved. It is not deemed expedient to change the position of trade-unions as clubs. It is also deemed inexpedient to give a legislative character to Courts of Conciliation or Arbitration, but to give facilities for their establishment and for enforcing the agreements made under them.

ANTIQUITIES AT WEYMOUTH.

THERE has been lately exposed by the action of the sea encroaching on the land, about one mile and a half south-west of Weymouth, a circular construction of very ancient date, made of well-puddled clay, about 6 ft. or 7 ft. in diameter, and about 2 ft. deep, having two rectangular openings about 1 ft. wide, one to the south-east and another to the south-west. These openings were lined with slabs of Kimmeridge shale, about 2 in. thick on edge, and across these was laid a smaller slab. The south-eastern opening, however, had a third slab on edge midway between the two others, either to divide the outlet into two, or assist in supporting the top or covering slab. The clay forming the outer edge of the pan was sloped from the rim about 2 ft. outwards, till it reached the level of the ground. May it not have been an ancient salt-pan? About fifty yards off are remains of Saxon masonry, also a number of fragments of ancient British and Roman pottery, and articles used by the ancient Britons.

R. T. SMITH.

THE PROPOSED LAW COURTS' SITE.

AT the second meeting of the Thames Embankment Committee appointed by the Society of Arts, Lord Elcho being in the chair, Sir Charles Trevelyan brought forward, as a written statement under six heads, his views on the advantages of the Thames Embankment site for the Law Courts. Mr. Edwin Field combated each of them *seriatim* with his usual vigour. Mr. Street took the view that we have felt compelled to adopt, that the change would not be a wise step. In the course of replies to Sir Charles Trevelyan, he said it must be remembered that on the Embankment site there was a fall of about 32 ft. from the Strand, which was a very serious difficulty; whereas, on the Carey-street site, by a slight alteration in the level of Carey-street the whole fall from front to back had been reduced to about 12 ft. From an architectural point of view he did not conceive that the building itself, or London in general, would be improved by the Embankment site being selected in preference to the higher one in Carey-street. They all knew the great effect which was produced by the upper part of St. Paul's standing up from the surrounding buildings; and his own opinion was that, looking only to his own reputation in time to come, it would be quite as much consulted by putting the Law Courts on the Carey-street site as on the bank of the river. He believed that the general impression as to the grandeur of Somerset House was derived much more from the view of the quadrangle from the Strand than from the river front. He was convinced that it would be damaged by any higher building adjoining it, which would be necessary in the case of courts of justice. There were one or two points which he had hoped would have been touched upon, one being the question of the railway-station, which, as sanctioned by the Act of Parliament, would be right across Surrey, Norfolk, and Arundel streets. It would be necessary to make the station a part of the building, in order to preserve anything like a good architectural effect; and there would be the danger of inconvenience arising from the smell of the burning coke, and from vibration. Then, if a rising road were constructed under the building, as was suggested, a great deal of valuable space would be wasted. His own opinion was, that the proper way of making an access to the building itself and to the Strand from the railway-station would be to have an open thoroughfare at the end, and that would at once get rid of about half the additional space. If they built close up to the Temple, they would have to pay for interfering with the ancient lights. He arrived altogether at the conclusion that the superior height of the Carey-street site gave it the advantage, and the fact of the building being slightly encumbered by other erections

he did not consider at all a drawback. On the contrary, it rather tended to make the perspective more picturesque, and to increase the apparent scale of the building. He would further only say at present that the Carey-street site gave a much better and wider opening towards the Strand than the other site; and also that it had the advantage of wide thoroughfares all round its four sides, so as to allow of all traffic to the offices being kept out of the building; whereas Sir C. Trevelyan's plan, by doing away with roads on the east and west points, would necessitate all the carriage traffic coming into the internal quadrangles, and so increasing the noise very greatly.

THE VOLUNTARY ARCHITECTURAL EXAMINATION.

AT the last meeting of the Institute of Architects the chairman announced that no application had been received from any candidate for the Voluntary Architectural Examination of 1869. In reference to this subject, the following resolutions of the council will be submitted to a special general meeting, to be held on the 6th of April next:—

1. That passing the Voluntary Examination ought to be followed by advantages such as will promote the advancement in life and in the profession of the Student.
2. That each Candidate who passes the Examination should receive a formal acknowledgment of his having passed.
3. That passed Students in the Class of Proficiency should become, *ipso facto*, Students of the Institute, without further payment, for as many years as they have paid guineas.
4. That the names of Candidates who have passed in the Class of Distinction be notified to the Board of Examiners for District Surveyorship Certificates, when such Candidates present themselves for Examination before that Board; and that their Examination Papers be also forwarded, if the Board requires to see them.

AN ENGINEER FOR CALCUTTA.

THE Justices of the Peace for Calcutta are seeking to obtain from England a properly qualified Engineer, and propose to offer these terms:—

1. Salary to be Rs. 600 per mensem, with an annual increase of Rs. 100 per month annually, up to a maximum of Rs. 1,000 per mensem.
2. His passage to India to be paid by the Justices.
3. That he be not engaged for any definite period, but that, in the event of his services being dispensed with before the expiration of three years, he receive three months' notice of the termination of his engagement, and that in that case his passage back to England be paid by the Justices.
4. That the engineer have the option of throwing up his appointment by giving three months' previous notice.
5. That, in the event of his doing so, he shall not be at liberty to accept any other employment in India."

The Calcutta *Engineers' Journal* combats the propriety of the last condition, urging that the return of his passage-money is as much as the Justices should require.

THE NEW NORTH-EASTERN AND THE LONDON AND NORTH-WESTERN RAILWAY STATION AT LEEDS.

FROM plans and specifications which were designed by Mr. T. Prosser, of Newcastle, the architect to the North-Eastern Railway Company, a new station has been erected in Leeds for the joint use of the North-Eastern and the London and North-Western Railway Companies. The station has been raised on arches, which cover about seven acres and a half of ground, and are computed, including the station itself, to have consumed about 18 millions of bricks. The building is situate near to Wellington-street, and is for the most part composed of iron and glass. In the mid-space are two elongated buildings, which provide waiting and refreshment rooms, looking-offices, &c., which will be used jointly by both companies. Facing the entrance from the street an oval-shaped building has been raised; to the left of which will be the looking-left-luggage, and parcel offices. These departments are separated by a passage 14 ft. wide and 75 ft. in length. There are two docks for passenger traffic, one belonging to each company. That set apart for the London and North-Western contains four lines of rails, with platforms on each side 25 ft. wide. The platforms are 630 ft. in length, and are covered for a distance of 302 ft. The dock owned by the North-Eastern Company has also four lines of rails, with platform accommodation to the extent of 940 ft. in length, the roofing over which extends to a distance of 513 ft. There are also several lines laid down, which will be used for goods

traffic. The wide spans and the altitude of the various ridges give the structure an imposing appearance. The greatest span is to be found on the side set apart for the London and North-Western Company at a point near to the hooking-off offices, where it is not less than 92 ft. across. Over that part of the station used by the other company there is a span of 68 ft.

The contractors for the whole of the roof-work were Messrs. Butler & Pitts, of Stanningley; whilst Messrs. Thompson & Co. contracted for the other work.

INDUSTRIAL PARTNERSHIPS FOR CABINETMAKERS.

Sir,—Returning to the position of the English cabinet-makers, in support of my hypothesis of industrial partnerships producing a great and beneficial change, one much desired by art patrons and all philosophic minds, there are numerous proofs of its success, and in businesses where there is not one tithing of the incentive necessary for its adoption as there is in the cabinet trade, where the workman is intrusted with material that is expensive, and if not used judiciously causes enormous waste, and also if not conscientious he can escape a great amount of physical labour by leaving it to others. It is necessary to do a sound, good work, but which cannot be discovered when put together except by some accident. And there is another thing which should be considered, the workman has to invest his capital in tools, which are very expensive, and when he has got the stock he has to keep that stock up, in doing which there is scarcely a week elapses that it is not necessary to replace some art tools or broken. They cost, in the first instance, about 25*l.*, and he must insure them,—the employer will not do it for him. Every expense in the manufacture of an article of furniture, except the material and the wages, falls upon the workman. There is no wonder he is anxious to be on his own account as soon as possible. It recurs to the reflective mind that the profits of business, either as employer of labour or as dealer, would be more usefully and beneficially employed if more equitably distributed. There are too many drosses. I consider the idea fallacious that education, as it is often expressed and generally understood, will be the harbinger of that happy millennium when no protests or complaints will be heard, and they will be only connected with history. Education awakens the faculties to perceive the anomalous position the worker of that intelligence holds, if he is a worker, relative to the capitalist, and creates the desire of greater equality, greater according to intelligence. There is proof in abundance in the many commercial houses, where their ablest assistants to a share in the profits; it simply sinks into an act of expediency, to prevent them commencing on an independent basis. Selfishness is an inherent principle in man; it grows with his growth; but physical science teaches us that we can make use of Nature's irrevocable laws, and wield her powers to our every requirement and happiness. Social science, if properly understood, would lead to the same goal. My views may appear utopian to some of your readers, but a case in point will not be out of place, which came under my notice a short time ago, and which carries conviction with its statement. Mr. Charles Goodall, printer and lithographer, of Leeds, entertained his workpeople at a repast, and he took occasion to express his opinion in the respect to industrial partnerships, which he adopted two years ago, giving 12*½* per cent. of net profits amongst all workpeople employed on the works, the sole proprietary and management remaining in his own hands. He stated his high opinion of the principle, where much care and skill was required of the operatives; he unhesitatingly said increased prosperity had manifested itself as the result of increased attention from the *employer*. They had also the fact that there was not an unsteady man in the whole place, nor any person who was not a credit to them; and he believed the more was above the average. Now this is a fact, and not theoretical. We enact laws to prevent our fellow-man from injuring us physically, and bind ourselves by the same to him. Why not socially? The neglected apprentice is a social wrong done at the expense of the community, and of the man individually. There are years of labour lost, as often he has to learn his trade when a man, and often never does learn it. Why should not the State step in and look to this evil?

WM. WARREN.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the last meeting of this society, March 24th, Mr. J. Bunell occupied the chair (in the absence of the president), and Mr. Picton exhibited a number of pencil sketches of various churches and other buildings taken during a tour in the South of England, and of buildings in Norwich, Lincoln, and other towns. He also offered to give a prize of two guineas for the best sketches from existing buildings made by any of the students during the summer recess.

The chairman drew attention to the fact that the time for sending in contributions to the Architectural Exhibition in London was drawing to a close, and hoped that the members of the society would endeavour to contribute largely.

Mr. G. F. Deacon, C.E., then read a paper "On the Aesthetics of Construction," of considerable importance and interest. Referring to diagrams illustrative of the various systems of iron bridge construction in use, he argued that those forms which indicated most obviously the lines of equilibrium of pressure, and showed most clearly the manner in which the structure performed the work intrusted to it, were also those in which the lines were most pleasing to the eye. The box and plate girder, where these lines were not obvious at all to the ordinary

spectator, he characterized as completely devoid of beauty. The straight lattice girder was not in reality much superior, but had a lighter effect to the eye. The bowstring girder, and the principle of two inverted parabolic ribs, adopted by M. Ruppert in his proposed designs for bridges for the Austrian and Asia Minor Railway, showed the visible lines almost coincident with the actual lines of compression and tension; and in the most beautiful of all forms, the suspension-bridge formed by the simple catenary curve, the coincidence was complete. By a table giving the relative weight of material, &c., required in these various forms of construction, he showed that in general the aesthetic beauty of lines of construction was in direct ratio to the economy and stability of the structure. From these premises he proceeded to apply the same considerations to more strictly architectural structures, representing especially that the Gothic style of architecture above all others carried constructive and artistic beauty hand in hand. A lengthened discussion followed, in which Mr. Picton, Mr. Beloe, Mr. Statham, and the chairman took part.

ARCHITECTS' ACTIONS.

LAMBTON v. ELLIOTT.

THIS case was heard at the Newcastle County Court, before Judge Birchard. Mr. T. Forster appeared for the plaintiff, Mr. George Lambton, architect, Newcastle; and Mr. Joel appeared for the defendant, Mr. Elliott, grocer and draper, Choppington. In September last, the defendant engaged the plaintiff to prepare plans, &c., for a house, shop, and warehouse he proposed building at Choppington. Plans were prepared, tenders advertised for, and the lowest, amounting to 1,213*l.*, was accepted. The defendant, however, did not wish to expend so much money, and the plaintiff, at his request, altered the plans so as to reduce the cost to 940*l.*, and he made other alterations, reducing the cost to 560*l.* Ultimately the defendant wrote to the plaintiff stating that he did not require any further services from him. The plaintiff then sent in his bill for 47*l.* 7*s.* Mr. Charles Francis Johnson, engineer, who had been in the employment of Mr. Lambton, gave evidence as to the drawing of the plans and justice of the claim. On the part of the defendant, Mr. Joel pointed out that the defendant gave plaintiff instructions to prepare plans for a building the cost of which was not to exceed 600*l.*; but the plaintiff prepared plans for a building to cost twice that amount; and the defendant came to the conclusion that the sooner he got rid of Mr. Lambton the better. He contended that the plaintiff had caused the expense, and brought the loss upon himself. His Honor said there was no doubt the plaintiff had been put to a great deal of trouble and expense. Both parties were to suffer in the action; and, after a great deal of difficulty, he had come to the conclusion that the plaintiff was entitled to recover. He gave a verdict for the plaintiff for 25*l.*

RECENT EXCAVATIONS IN ROME.

THE last pit dug for the British Archaeological Society of Rome on the line of the wall of Servius Tullius between the Coelian and the Aventine, is close under the cliff of the Aventine, and in this pit are now visible two of the subterranean chambers of the *Piscina Publica*, with the *Specus* or conduit of the *Aqua Appia* (made about three hundred years before the Christian era) quite perfect. It is 6 ft. high, with a triangular head, and 2 ft. or rather more wide. The earth has been cleared out of it for some yards, and several English gentlemen have been into it. This remarkable *Specus* had not been found perfect in any of the previous pits; the lower part of it only had been found, and those not accustomed to the subject could not well understand it, but now it is perfectly clear and distinct. This *Specus* is carried upon the Wall of Servius Tullius, built of large blocks of tuff as usual, and is partly cut out of the wall itself, which is now plainly visible and in a cleaner state here than it was found in the other pits across this valley. The most recent excavation is considered by all who have seen it a demonstration of the truth of Mr. Parker's observations. Two years ago he said that this wall and this aqueduct must have crossed the valley at this point; he was ridiculed by the head Roman antiquaries, and their German and French allies. Visconti the Roman, Dr. Hinzow the German, and Rosa the employé of the French Emperor, all agreed that Mr. Parker was entirely wrong, and called by the name of "impudent conjectures" his observations, which were in reality the result of long experience in the modern science of archaeology, which is the opposite of the old school of local antiquaries such as we had in England in the days of good King George III., and such as still are the antiquaries of Rome, few of whom have ever been twenty miles from the place in which they were born. Whereas the modern science of archaeology is grounded on comparison, like comparative anatomy. An experienced archaeologist can

compare the small remains in one place with more perfect remains of the same kind and of the same period elsewhere. He can describe a whole building or an entire ancient fortification from some small remains only, just as an experienced comparative anatomist can describe a whole bird or a whole animal from a single bone. It was in this manner that Mr. Parker was able to see what the primitive fortifications of Rome must have been, and to find remains of them everywhere as soon as he could obtain permission to dig and search for them.

THE PRIZE WORKS AT THE INSTITUTE OF ARCHITECTS.

IN March last the Council offered the silver medal of the Institute to the authors of the best essays on certain subjects; a Special Prize of 10*l.* for the best essay on the application to modern architecture of moulded, shaped, and coloured bricks, and terra-cotta; the Soane medallion (and a possible 50*l.*) for the best design for either a town hospital or a club-house; Mr. Hope's prize of ten guineas for a design for a theatre in accordance with modern requirements throughout, and in harmony with the style of architecture which prevailed during the thirteenth or fourteenth century; and Mr. Tite's prize of forty guineas for a design for the treatment of the river front and existing terrace of Somerset House, in connexion with the embankment road. They further offered the medal of the Institute, with five guineas, for the best illustrations of any building at home or abroad erected before the year 1700; besides book-prizes for students only. Here surely were strong inducements for study and work. Such offers are open doorways through which the student may walk early to a certain amount of distinction, which, though it may operate in only a small circle, will unquestionably help him on his upward way. The response is not adequate, still it is superior to that made on some previous occasions. Thus, for the Institute medal and five guineas there are four exceedingly creditable sets of illustrations of old buildings: Hatfield Hall, marked with a ring; the Abbey d'Or, Herefordshire, marked "Faith;" Wingfield Manor House, "Truth;" and the church of St. Mary Overy, Southwark, "Nemo." For the first, a ring, the Council recommend the prize; for the other three a Medal of Merit each. The set of drawings which they recommend for the Soane medallion and 50*l.* under conditions, is a design for a club-house, French-Italian in style, very cleverly set forth in a mode of drawing that is recognizable, and marked "Faith." The design is disfigured by broken pediments, and the inevitable urn, but is in other respects very praiseworthy and deserves the prize. A set of designs marked "Austerne" has a tower that, considering the period and purpose, is simply ridiculous. The set marked "Hope,"—"Scotty" in character,—is Geometric in style, and not had of its kind. The gentleman who marks his design for a hospital "Ah!" must have made the exclamation when he saw how completely he had spoiled the work by his tower and over-hanging turrets. Mr. Tite's magnificent offer meets with no response. For Mr. Hope's prize the Council recommend the drawings for a Gothic theatre, marked "As you like it." It has a high wooden roof, a lofty tower, the main entrance close to the doors to pit and stalls, and is otherwise altogether unsuitable and useless. To set students striving to design Gothic theatres is not the best way to improve our vernacular architecture. An essay on the Revival of Italian Architecture, marked "Madio tutissima istis" is recommended for the Institute medal; and one on Terra-cotta, with the motto "Wait and Hope," for the 10*l.* premium. The author of the gateway signed "Per vias rectas" well deserves the Student's Prize of hooks.

The Proposed Restoration of New Shoreham Church.—The project for restoring the parish church of New Shoreham has been abandoned by the parishioners, the funds promised and collected (about 2,500*l.*) being insufficient to warrant the General Restoration Committee in commencing the work. In consequence of this, the whole of the funds in the hands of the County Committee has been returned to the several subscribers. It is much feared that this old church will shortly fall into utter ruin.

THE TRADES MOVEMENT.

Bricklayers in the Potteries.—Some weeks ago the bricklayers of the Staffordshire Potteries and Newcastle made an application to the builders for an increase of wages, to the amount of a farthing an hour, and a reduction of working hours to the extent of half an hour a day. The demand for increased pay was rejected, and, a reference to arbitration failing to effect the settlement of the difficulty, it became necessary to call in the services of an umpire. Mr. Davis, the stipendiary magistrate, who has before done good service to the building trade by acting as umpire, was again unanimously chosen as final referee. Mr. Davis heard the statements of the representatives of both the men and the masters, and put a number of questions for the purpose of informing himself thoroughly upon the subject in hand. At the close of a prolonged inquiry he intimated that he did not think he should be disposed to make any change in the hours, as preferred the present hours to a change such as the employers proposed, and the latter seemed to have no strong desire for a change. With respect to the question of wages, he would give it careful consideration.

Strikes of Masons.—Two hundred masons in the employ of the Duke of Portland, at Welbeck, have just struck work. A large number of dependent labourers have, consequently, been thrown out of work. The masons seek an increase of wages.

Amalgamated Society of Carpenters and Joiners.—The annual tea, *soirée*, and hall of this society has taken place at the Freemasons' Tavern, under the presidency of Mr. Thomas Hughes, M.P., who was supported by Mr. Edmond Beales, Mr. Mundella, M.P., Mr. Harrison, Professor Beesly, Mr. Baxter Langley, and other gentlemen. Upwards of 400 ladies and gentlemen sat down to tea. The chairman, in his opening address, said he heartily congratulated the society upon the progress it had made during the past year. He heard that the society's funds had increased upwards of 2,000*l.*, that 700 new members had been gained, and that fifteen or sixteen new branches of the society had been established during the past year. That was a very remarkable result. Those present knew that a Royal Commission had been inquiring into the conduct of trade societies. He himself was a member of that Commission, and there was another member (Mr. Harrison) in the room. The general result of the Commission was that the whole of the Commissioners came to the conclusion that the law of this country was unfair to trade societies, and must be altered. He would earnestly impress on these societies the paramount importance of taking care that their members produced the best work it was possible for them to produce. They ought to insist upon the establishment of arbitration courts for the settlement of questions between employers and their workmen. Until such courts were established the great labour question could never be solved. Mr. Applegarth, the secretary, then gave a report of the society's proceedings during the past year, and referred to the report of the Royal Commission, of which he strongly complained. He did not believe that any Parliament would sanction the four conditions which the Commission recommended should be imposed upon trade societies. What those societies wanted was the protection of their funds. They had a right to have their hard-earned savings properly invested. Let arbitration do its work, but as to the rest, let the working men alone. Other gentlemen addressed the meeting.

A HINT TO HOUSEHOLDERS.

OWING to the present custom of shooting the domestic coals into house-cellar through holes in the pavement, we Londoners—and I presume the inhabitants of other towns are fellow-sufferers with ourselves,—have to endure a considerable inconvenience and annoyance which might as well be spared us.

I am not about to complain of the coalheavers; on the contrary, I look to them as my especial helpers in the project of amendment I contemplate. My notion is, that any householder who allows the pavement in front of his house to remain disfigured and soiled by the dust that has fallen from his coals during the process of delivery, commits an act of injustice on every passer-by,—on men, through the outrage done to their sense of propriety and cleanliness; on

women, by the same, and the addition of damage done to their dress. Now, for years past I have adopted a very simple plan, by which I save my own feeling of self-respect, and also all risk of annoying other people. Over and above the little *honorarium* the men who deliver coals at my house receive for their trouble, I give them 6*d.*, and a couple of buckets of water, and get them to wash down the pavement before they drive away. They are very glad of the job, and I and my household are equally well satisfied.

Do try to persuade some, if not all, of your readers to consult their neighbours' convenience by following the example of

ONE OF THE PUBLIC.

ANALYSTS' DIFFERENCES.

I SHOULD be glad to obtain, through the *Builder*, information on the following matter:—I observe in the *Builder* of some months back, it is stated that the epidemic which broke out at Terling, in Essex, had been traced to originate in the contamination of the well-water by sewage, and that analyses showed this water to have contained sewage. A similar account of sewage contamination to water supply and epidemical outbreak is also given of Guildford. I want to know where such analyses, together with Government inspector's report, can be obtained, supposing such to have been made, which I understand to have been done.

In looking over a number of analyses of water and of sewage, each by a different analyst, I find that scarcely any two of them agree. I do not mean that where two analysts each test the same water or sewage, or water and sewage drawn from the same source and at the same time, the result given by each is not correct; but I refer to the different modes of expressing such result: for instance, the standard quantity for analysis is taken at one gallon of 70,000 grains by one analyst; another takes 100,000 lb. or parts, and so expresses the result of analysis. So much for the quantity of substance operated upon.

In stating the actual analyses, one operator gives the quantity of earthy and alkaline salts, &c., and organic matter, simply as organic matter, and without any information as to its nature: this is usually expressed in grains.

Another gives the quantity of alkaline and earthy salts, &c., and instead of organic matter simply, he shows it as organic carbon, as organic nitrogen, and as ammonia, or nitrate: this would be in parts of the whole instead of grains per gallon.

Perhaps another would add the quantity of oxygen absorbed from permanganate of potash; and so on with each analyst. I cannot call to mind more than one or two who express the results similarly. I sometimes observe that another chemist will maintain that the process of analysis by incineration and permanganate for determining organic matter, the process of analysis by other chemists, is quite erroneous, and that a small quantity per gallon of one kind of organic matter—nitrogenous,—is detrimental to health; whereas a comparatively large quantity of another kind of organic matter—carbonaceous, or non-nitrogenous,—may be taken in water without hurt!

I have some knowledge of chemistry, but must confess I frequently cannot understand, and can draw no useful inference from analyses as frequently given, especially when two chemists operate upon the same water!

Can you give me any information why this is so, and how the public are to judge of results? And can you further inform me (or how such information may be obtained) the maximum amount of organic impurity,—whether as carbon, as nitrogen, or as ammonia,—that should be permitted in water for domestic purposes.

W. R.

THE CHANGES IN ST. SWITHIN'S CHURCH, LONDON.

THE restoration (as I suppose it will be called) of St. Swithin's Church, in Cannon-street, is so extreme an instance of the treatment which some of our City churches have met with at the hands of modern architects, that it would be well if public attention could be directed to it.

The St. Swithin's of a few months ago was a building in the style of the Roman Renaissance. The St. Swithin's of to-day is a building in no particular style, reminding one of the mongrel Gothic of the earlier years of James I., examples

of which may be seen in certain colleges at Oxford; buildings which are only redeemed from ugliness by the venerable aspect which the blackness and decay of the stone they are built of has impressed upon them in a degree to which their age does not entitle them. If the parishioners of St. Swithin and their architect are such purists in Gothic that the sight of a Classic church is intolerable to them, let them pull their church down and rebuild it in the Gothic style. To convert a Classic church into a Gothic one by any other means is impossible, as their recent attempt helps to prove.

But before we resolve either to destroy or convert our old Classic buildings, let us consider whether (even if it were possible) either one or the other measure is desirable. The architecture of the Roman Renaissance in England has an historical interest of its own, apart from its artistic character. Whether it be of itself admirable or not, it forms the subject of a very important chapter in the history of our national taste; and it performs one of the main functions of art, by reflecting the moral aspect of the period during which it prevailed.

Although, therefore, we may not wish to see Classic churches built at the present day, we ought not to wish to obliterate the memory of the Renaissance by destroying or disfiguring all that it has left us. We may think it wrong to imitate these buildings, but it requires no sacrifice of principle on our part to let them alone. We may prefer Wordsworth and Tennyson to the poets of the last age, but there is a place in our library for Pope notwithstanding, and our library would be imperfect without him.

The experiment of Gothicizing Classic churches has been tried elsewhere in London, and in one case with great splendour, and with a degree of taste and refinement which are wanting at St. Swithin's; but even there it is not successful, because it has attempted an impossibility.

There is a great danger of this fashion becoming prevalent, unless it is checked at once by public remonstrance. It is rumoured that the parish authorities of the principal church in the City are thinking of filling with tracery the windows which were built for their predecessors by Sir Christopher Wren.

I, for one, confess that I can contemplate with equanimity the idea of a window without tracery, although I sign myself

A GOTHIC ARCHITECT.

VALUATION OF RATEABLE PROPERTY.

A BRIEF summary of the contents of the Government Bill to provide for uniformity in the assessment of rateable property in the metropolis has been given in our pages: the other Bill of the Government, applying the same system to the rest of England, has now been issued. The County Valuation Boards, which are to determine the percentage or rate of deductions to be made from gross value in calculating rateable value, are to consist of representatives of the assessment committees of the county, two to be elected by each committee from its own body, one to be a justice if there is a justice on the committee, and where a borough has a separate court of quarter sessions, or contains a population at the then last census, of not less than 10,000, the town council may elect one of their number or one of the borough justices to be on the Valuation Board. The members of the Valuation Board are to hold office for three years and be re-eligible. The Board is to have power to form committees of its own members, and may delegate to a committee all or any of the powers conferred on the Board by this Bill. The Bill provides that where the overseers of a parish, in making their valuation list, raise the gross or rateable value of a hereditament or insert one not previously assessed, or where the assessment committee do so (otherwise than in determining an objection), notice shall be sent to the person rated. Appeals against decisions of assessment committees are to be heard before the County Court Judge, an appeal lying to a superior court on a point of law. The valuation list subject to annual revision for alterations, new buildings, or reduction in value, is to be, during its three years' existence, conclusive for county rate, poor rate, &c., and every rate levied on the basis of value; for house-tax and income-tax; and for determining the qualification of jurors and guardians, and under the Acts relating to the sale of excisable liquors. The overseers are to make a new valuation list every third

year, and the Valuation Board may then revise the table of deductions to be made from gross value in determining the rateable value, but the stated maximum is not to be exceeded.

LETTERS PATENT FOR 1868.

MR. GEORGE SHAW has drawn up a condensed analytical list of letters patent for inventions granted and provisional protections applied for during the year 1868. From this summary of inventive effort we subjoin an indication of the progress discernible in materials and appliances connected with building trades. In all, there were 3,991 applications. Of this large number 11 related to improvements or inventions connected with sewers, drains, and cesspools; 13 with making and sweeping roads; 38 appertained to wheels for railways and other carriages; 4 to docks, breakwaters, and submerged works; 84 to funnels and consuming fuel; 116 to railways, locomotives, and railway carriages; 185 to steam engines and steam boilers; 33 to artificial fuel, matches, and splints; 6 to hats; 4 to bells and bell-hanging; 2 to castors for furniture; 32 belonged to latches, hinges, and springs for doors; 5 to fenders, fire-irons, and fire-guards; 39 to nails, bolts, screw-nuts, and rivets, and machinery for manufacturing the same; 21 related to the processes of sawing, planing, boring, &c., stone and slate; 54 to sawing, planing, and turning metals, wood, &c.; 79 to telegraphs, signals, and intercommunication in railway trains; 4 to surveying instruments; 14 to drawing, painting, and exhibiting pictures and photographs; 31 to windows, sashes, shutters, doors, and fencing; 3 to floors and flooring machinery; 52 to tunnels, bridges, arches, and portable and other buildings; 21 to lime, brick, and other kilns and coke ovens; 10 to artificial stone, plaster, and cements; 90 to bricks, tiles, and clay-pipes; 13 to glass manufacture; 19 to blinds, curtains, and shades; 43 to stoves, grates, fire-places, kitchen ranges, and culinary apparatus; 30 to warming and ventilating buildings; 11 to gas-burners; 33 to gas and water meters and regulators; 43 to cocks, taps, and valves; 31 concerned pipes and tubes for steam, water, and gas, and joints for the same; 21 related to water-closets and urinals; 16 to hydraulic machinery for raising and distributing water; 5 treated of the preservation and preparation of timber; and 2 appertained to coffins, hearses, and preservation of the dead. Satisfactory as this amount of activity thus indicated may be, it appears trifling to that fermenting in men's brains on the other side of the Atlantic.

ACCIDENTS.

At Leeds the wall of a railway hotel in process of demolition has fallen upon a number of workmen, crushing one of them to death, and seriously injuring others.

During a furious storm in Devon and Cornwall numerous trees have been rooted up and chimneys blown down, and the pinnacle of Totnes Church, Devon, was blown down and fell through the roof. Several narrow escapes were reported, but fortunately no lives were lost. All the trains upon the South Devon and Cornwall line were delayed, and telegraphic communication by the United Kingdom Company was entirely suspended.

At Dudley, a large engine stack, recently erected upon the works of Mr. Thomas Jones, at the Bnffry, has fallen. The catastrophe was, however, expected, and care was taken that no person should be within reach of the falling debris. It appears that most of the mine had been gotten before Mr. Jones commenced his tenancy, and the stack was built under the impression that the portion near the furnaces had, as is the general rule, been undisturbed. When the stack, which contained at least 100,000 bricks, began to show symptoms of falling, mining operations were commenced on the opposite side to the works, so that it might not fall across the boiler or works, and this end was accomplished before it was too late.

News of a serious accident come from Norfolk. In consequence of an unusually high tide, nearly 50 ft. of the east bank of the Ouse has subsided into the river. This took place about half a mile from the parish church of St. Germans, King's Lynn. It was feared that the prevailing rough weather might cause the tide to flow through the breach and inundate the surrounding country; but the bank was secured in time.

The new extension of the Midland Railway from Cudworth to Barnsley, which is near its completion, it is thought will not be opened so early as was intended, owing to a portion of the embankment giving way. The line crosses the main outlet which carries away the sewerage from the town to the river Dearne, which, at the time the branch was being constructed, was washed over by an inverted culvert. This appears to have given way, and caused the embankment to slip in several places for a distance of twenty yards.

On Wednesday morning, an accident occurred at the New Palace Club-house, King-street, St. James's, by which several persons were injured. It appears that the club-house in question is to be repaired, and while the workmen were pulling up a ladder over the balcony, a height of 20 ft., the stone balustrade suddenly gave way, and fell with a crash, hinging the workmen with it. They were picked up and placed in a cab, and conveyed to St. George's Hospital, where one, Patrick Quin, was found to be most seriously injured. The others were sent home.

THE ARCHITECTURAL EXHIBITION.

It should be remembered that the annual exhibition will be opened on Wednesday, May 5th next, and that all drawings must be sent to the galleries on Monday or Tuesday, the 5th and 6th days of April, after which days no drawings will be received.

The council, in their last report, say:—

"The council have regarded with great interest the improvement that they hope will be effected by the Royal Academy in regard to the space proposed to be given to architectural subjects in their exhibitions; they do not forget that the Architectural Exhibition was originated in a great measure on account of the inefficient and unworthy manner in which architecture was represented on the walls of the Academy; and should the Academy agree to give to architecture a fair and equitable proportion of their walls, they would gladly enter into an arrangement by which the present Architectural Exhibition might be merged into the annual one of the Academy; but until such arrangement is made they feel bound, in the interest of the profession, to do their best to continue the present exhibition."

PORTLAND CEMENT.

HAD the ship-builders at Liverpool been conversant with the properties of Portland cement, or informed as to the best mode of using it, they would not have rejected that of the quality described by "Manufacturers." In using cement of a high specific gravity, in contact with iron, great care is necessary. A slow-setting cement is not absolutely required for coating the inside of iron vessels, as the conditions under which it must be used are most unfavorable. Iron is obviously an unsuitable material for receiving a covering of cement; and the difficulty in using it increased by the interposition of a coat of red lead, with which it is usually painted. At this season, and in the necessarily confined hold of a ship, the process of cement-setting must be slow; in summer weather, or with a more favourable atmospheric temperature, the difficulty in question might not have arisen.

To apply Portland cement to the inside of an iron ship, in the most successful manner, it is necessary to mix up the cement with the smallest possible quantity of water, and to allow the mixture to remain for several hours before applying it with the trowel. It is difficult to prescribe any exact time it should be so left, but it must be used before the initial set has begun, so as not to prejudice its ultimate adhesion.

Heavy Portland cement—when obtained by an excess of fuel and not from a preponderance of clay—is naturally slow-setting, and in a ratio with its weight will be its final hardness. It is not present at least—practically impossible to combine in Portland cement the two qualities of quick-setting and maximum strength. Where protection to heavy cement joints is necessary, from water or other disturbing causes, careful engineers usually apply an internal facing of one of the quick-setting Roman cements.

Before the introduction of these cements Smeaton used plaster of Paris to protect the composite mortar (Aberthaw lime and puzzolana) joints of the Eddystone Lighthouse. That eminent engineer considered good mortar indispensable, and insured its quality by strict personal attention to its preparation. Eddystone Lighthouse mortar cost 3s. 8d. per cubic foot.

Heavy cement should be submitted to the greatest amount of mechanical pulverization, and should be rejected unless it will pass through a No. 40 (1,600 meshes to the square inch) gauze wire sieve. In America the engineers impose

the No. 80 gauge for the natural cements of that country; but to subject a heavy Portland cement to that test would add greatly to its cost. There can be no question of the impolicy of using imperfectly-ground heavy cement; to do so is sheer waste. HENRY REID.

SEWAGE IRRIGATION.

Banbury.—The experiment of applying the sewage of Banbury to the land succeeded so well last year that a large portion of the farm in the occupation of the local board has been laid down for irrigation in the course of the winter; and at a recent meeting it was resolved to prepare still more; in fact, the whole of the land to which the sewage can be applied is to be made ready to receive it. Mr. Hawkes, a successful practical farmer, and member of the board, said they would not be doing their duty to the ratepayers if they left a foot of their land without the benefit of the sewage. A large field is to be appropriated this year to the growth of root crops—mangold, turnips, and parsnips—to test the powers of the sewage in the production of these esculents.

Leamington.—The Leamington Local Board have accepted an offer from the Earl of Warwick to take the whole of the sewage of the town, for a term of thirty years, and dispose of it by irrigation on his lordship's estate, at a distance of from two to three miles south of Leamington. The Local Board are to lay down the requisite mains, construct the necessary works, and pump the sewage to a given point on the estate, and in return the Earl will pay the Board 450*l.* annually for the sewage.

CHESTER CATHEDRAL.

THE TENDERS for the restoration of a certain portion of the cathedral have been sent, and are as follow; the quantities were taken out by Mr. J. S. Lee, Mr. G. Gilbert Scott, R.A., as our readers know, is the architect:—

Barnsley (Birmingham)	£24,548	0	0
Hughes (Chester)	23,871	0	0
Holme & Nichol (Liverpool)	22,965	9	0
J. & W. Beaman (Bradford)	22,360	0	0
Wood (Worcester)	21,933	0	0
Thompson (Peterborough), accepted ..	21,293	0	0

THE ROMAN WALLS OF DAX.

WE understand that the fine Roman walls of Dax are again in danger. Some ten years ago Mr. C. Roach Smith exerted himself against a threatened injury to them, and contributed towards preventing it. The Emperor formerly interposed; but now the Prefect, to carry votes among the little shopkeepers, has consented that the walls shall be broken through. They are, or were, the most perfect in the North of Europe. Surely some of the numerous antiquarian societies of which England now boasts will bestir themselves to prevent the destruction of so important a monument.

PLYMOUTH GUILDHALL COMPETITION.

SIR,—Knowing that you are always ready to lend a helping hand to the correction of abuses, I venture to call your attention to the terms of the above competition advertised in your two last issues, with the hope that a few remarks from you may induce the committee to reconsider their instructions. The premiums offered appear, at first sight, liberal, but, on perusing the "instructions," we actually find that architects are requested to furnish designs and estimates for buildings intended to cost about 25,000*l.*, in return for which they have a chance of obtaining one of the three premiums; and it is stated in the "instructions" that "competitors must look solely to the premiums for their remuneration, as the Town Council will not engage to employ any of the architects whose plans may be accepted." I think this requires no comment, but I should hope that no member of the profession will compete under such conditions. PROVINCIAL.

DOINGS ON THE METROPOLITAN DISTRICT RAILWAY.

SIR,—In your last issue I observe your correspondent "S" gives a true statement of the shortcomings of the Metropolitan Railway.

I am an unfortunate instance,—as follows. On the 25th of March a ticket was given me one station short of the one asked for, full fare having been taken. On arrival at my destination I was seized by the authorities for an excess fare, and detained some time; then taken before the station master, in consequence of my refusal to pay the excess, having already paid full fare for the distance travelled; however, after all this bother, seeing I was determined not to pay, I was then liberated upon giving my address. N. W.

DISSENTING CHURCH-BUILDING NEWS.

Camden-road, London.—A memorial stone of a Presbyterian church which has been built in the Camden-road, and which is called after the name of its locality, has been laid by the Duke of Argyll. It was not a foundation-stone, for the building is entirely completed: it was only the last stone on the outer basement, which was laid in its place to commemorate the completion of the work. The new church is in the Italian Gothic style. The interior, with its centre nave and small side aisles, has rows of short, though massive, stone columns. The church in which the congregation formerly met used to be in the Caledonian-road, but a site having been obtained from the Marquis of Camden, it was determined to build the present structure. The schools were first erected and for a time used as a church till the completion of the edifice adjoining.

Northampton.—The Grafton-street new Baptist chapel has been opened for divine service. Mr. Ighian was the architect, and Messrs. Clark & Heap were the builders. The new structure stands on the site of the old chapel; but its breadth, from north to south, is considerably larger, the waste ground at the back being included. The building consists of the chapel, an adjoining vestry, lower and upper school-rooms, the latter of which being also used as a lecture-room, haptistry, two schoolrooms, and a basement or cellar, with fire-place and every convenience for providing tea. The chapel is 45 ft. by 45 ft. The lower school-room is 25 ft. by 29 ft.; and the upper school-room or lecture-room is 45 ft. by 25 ft. On the south side of the chapel is a commodious gallery, in which provision is made for a harmonium and choir. Whilst attached to the chapel, the school-rooms are externally of a different character, being much plainer, and without any marked design. The entrance to the school-room is from Harding-street. The chapel fronts Grafton-square. It will seat nearly 500 persons, and the total cost will be 2,000*l.*, including the purchase of the ground and similar items.

Bradford.—The new Wesleyan chapel now being erected in the Gillington-road, is intended to afford sittings for 810 persons, and to cost about 4,000*l.* Five class-rooms are obtained in the basement upon the south or Willow-street side, which, owing to the fall of the ground, admits of light and ventilation; the basement-floor also contains a room for the heating apparatus, and an entrance, lobby, lavatories, &c. The ground-floor has in front three entrances and vestibules which can be used conjointly for the body of the chapel and the galleries, or for each part independently. In the rear are vestries for the minister and deacons, and staircases leading downward to the class-rooms, and upward to the organ-loft and galleries. Separate entrances are also provided to the minister's vestry and the class-rooms. The fronts of the galleries are curved in a semi-circular shape at each end, and the ceiling of the chapel is also curved and divided by ribs into panels, which will be further enriched by moulding and plaster decorations. Amongst a limited number of local architects, Messrs. Andrews, Son, & Pepper were the successful competitors.

Chesterfield.—The foundation-stone of the United Methodist Free Church, Chesterfield, has been laid. The church is in course of erection in Marsden-street, and when completed will be capable of seating about 850 people. The church will be a brick building, and will cost 2,500*l.* Mr. Simpson, of Nottingham, is the architect; and Mr. R. Maw and Mr. J. Glossop, of Ambergate, are the contractors—the former for the building, and the latter for the woodwork.

Burscough.—A new Wesleyan chapel has been opened for divine service at Burscough Bridge. The building is calculated to seat about 500 persons. It has been erected by Mr. T. Bridge, builder, Burscough, from plans drawn by his son, Mr. T. Bridge, jun., architect. The chapel is built in the Early Pointed style of architecture, the material being brickwork, of different colours, in ornamental bands, &c., and coloured arches to be the various windows and doors; other ornamental brick and stone work being used throughout the building. The windows are chiefly uncoupled lancets, excepting in the various gables of nave, transepts, and chancel, where triplet windows are used; that to the nave being more decorated. The chief entrance to the chapel is by a porch of ornamental timber construction, surmounted by a gilded wrought-iron finial. At the junction of the roofs of nave and transepts

rises a spirelet to the height of 50 ft. from the ground, terminating in a gilded wrought-iron finial, and the several gables have also finials. The ceiling is divided into bays by arched principals, with pierced tracery work in the spandrels, and terminating on wood carved corbels. The nave measures 46 ft. by 30 ft.; transepts, 42 ft. 6 in. by 18 ft.; and chancel, 16 ft. by 8 ft. The entire cost of the building is about 950*l.*, about 600*l.* of which have already been raised.

Darlington.—The church in Northgate, erected by the United Presbyterians of Darlington, has been formally opened. The edifice consists internally of nave and aisles, with an apse at the east end. The entrance is by a double doorway in the west gable, leading into a vestibule. Over this vestibule is an end gallery. At the southwest angle of the building is placed the tower and spire. The upper stage of the tower is octagonal, having the cardinal faces occupied with the belfry windows, and the intermediate faces with buttresses, terminating in carved capitals and pinnacles. The spire, which is approaching completion, will have one tier of spire lights, and be terminated with a carved finial and ornamental vane. The total height of tower and spire will be 120 ft. Over the entrance doors in the west gable is a four-light window, consisting of a two-light and two single-light windows, enclosed under one hood mould. The window is filled with stained glass, by Mr. Tait, of Sirling, the gift of a member of the congregation. The north and south flanks are occupied by two-light windows, finished each with a small gablet rising above the eaves. The walling is of blocking course from Haughton Bank quarry, and the Ashlar dressings, window tracery, &c., are from the same quarry. Internally, the roof is divided into three spans, and supported by cast-iron columns. The nave roof is wagon-headed. The principal timbers are exposed to view, and stained and varnished, and the panels between are plastered and coloured a light blue. The pews are of deal, with burch ends and sloping backs, and are, together with all exposed woodwork about the building, stained and varnished. At the east end are placed vestries, and stairs to basement. In the basement are placed a large school-room, session-house, class-room, heating-place, &c. The style is Geometrical. The contractors for the various works are Messrs. Duck, Todd, Atkinson & Son, Hope, Johnson, and Harrow, all of Darlington. The heating apparatus has been supplied by Messrs. Lewis & Adams, of Middlesborough. The cost of the building, including site, &c., will be about 3,600*l.*; and it has been erected from the designs and under the superintendance of Mr. John Ross, of Darlington, architect.

SCHOOL-BUILDING NEWS.

Birmingham.—The memorial stone of the new Workhouse Schools for boys, about to be erected on land adjoining the workhouse at Birmingham Heath, has been laid by the chairman of the Board, Messrs. Martin & Chamberlain are the architects, and Messrs. Jeffery & Pritchard the contractors.

STAINED GLASS.

Hastington Crane Church, (Lancashire).—A series of three windows have been placed in the apical chancel of this church. The style of the edifice is Early English, and the windows are severally composed of two lights and quatrefoil in tracing. The centre window contains figures of St. Peter and St. Paul, with their usual accessories, beneath floriate canopies, the quatrefoils being filled with sacred emblems and figures of angels with inscribed scrolls. The two side windows contain, in each opening, two medallions, in which are pictured several subjects. A fourth window, being a memorial, is occupied by one subject extended over two lights, "Christ blessing little Children." These windows are from the works of Messrs. R. B. Edmundson & Son, of Manchester.

Lichfield Cathedral.—For more than twelve months past, the large window at the west entrance has been entirely blocked up by a screen of boarding, which has been fixed there during the time the alterations to the window have been in progress. The old window has been removed, the architectural design entirely altered by Mr. G. G. Scott, and a new one of stained glass, manufactured by Messrs. Clayton & Bell, of London, has been fixed. The chief features

are six large figures in the six divisions of the window, representing St. Michael, St. Joseph, the Virgin and Child, and, in the three others, the Magi. At the extreme top of the window is the representation of the Holy Trinity, and underneath the Virgin Mary and St. Simeon and Child. Beneath the six large figures above referred to are six separate Scriptural subjects, the other portions of the window being filled with designs of a floral and architectural character. The window is erected as a memorial of the late Rev. Canon Hutchinson.

COMPETITIONS.

Alexandra Park, Manchester.—Thirty-seven designs were sent in for the new public park for the Hulme district, at Moss-side, to be named after the Princess of Wales. The two premiums offered by the City Corporation for the best designs have both been gained by London artists; the former by Mr. A. G. Hennell, Southampton-buildings, Chancery-lane, and the latter by Mr. Fred. A. Klein, Cannon-street. Openness and breadth are the main features of the chosen design. There are no mazes, and only few retreats; the centre of the park is an open lawn, broken by no prominence, shadowed by no trees or shrub, but a wide, free expanse of green grass, inclosed by wooded banks and thereby also sheltered from the outside world, but on which the sun may shine and the winds blow freely. The second prize design very closely resembles the first, the chief exception to this statement being that the lawn and cricket-ground in Mr. Klein's design are made perfect circles, while in Mr. Hennell's the spaces are oval.

FROM IRELAND.

Portadown.—The newly-erected Presbyterian church—the second in Portadown—has been formally opened for public worship. The site chosen for the new building is but a short distance from the town, on the Armagh road, in the centre of a largely extended building district, the property of the Duke of Manchester, which will ere long be principally devoted to private dwelling-houses, a large number having already been erected and occupied. The building is Gothic in style, from the designs of Messrs. Body & Batt, of Belfast; and the contractor was Mr. John Collier. The frontage is of limestone, with freestone dressings, and ornamented by a large central window, filled in with cathedral glass and stained-glass margins, having moulded jambs, arch, and bosses, carved, likewise in freestone, from the Dungannon quarries of Mr. Kennedy, the pointed gable being surmounted by a pinnacle with carved finial. Accommodation has been provided for 350 of a congregation, and the pews are of pine, varnished, this portion of the work having been performed by Mr. Joseph Wright, jun.

BROKEN GLASS IN BLANK WINDOWS.

Sir,—Your correspondent "H. H. S." in his humorous letter of last week, has not introduced a single ray of light to my "blank" windows. If broken by a stone or other missile, such fracture could readily be distinguished from those already broken; in which case the glass is not "starred," as it would be if caused by a blow, but exhibits a sort of network of fractures.

The same day on which I wrote my former letter, a member of the establishment was on the scaffold with the workmen, and hearing a slight cracking noise, turned, and saw one of the blank squares break. He describes it as occupying several seconds from the time he heard the noise to the completion of the fracture. This is nothing supernatural, but what is it? Scientific men, including the manufacturers of the glass, have been consulted without at present ascertaining the true cause.

I heartily agree with "H. H. S." in condemning the use of "blanks." I would under no circumstances insert them in new buildings, and, where practicable, would abolish them in old buildings; but in the present instance it would require the skill of something more than a jerry-architect to dispense with them where their number about 100, the house being 300 years old.

W. B.
Longleaf.

Books Received.

The Handbook of the Year 1868: a Register of Facts, Dates, and Events, at Home and Abroad. With Appendices. By G. H. TOWNSEND. London: Wyman & Sons, Great Queen-street, 1869.

This volume is a well-compiled repository of interesting and important facts bearing upon religion, commerce, legislation, politics, literature, science, and art, forming an encyclopaedia of facts, dates, and events. The chronological

division does not profess to record everything of any public importance that may have occurred in course of the year, or to be an exhaustive summary of facts and occurrences, but is intended as an occasional aid to those who consult the alphabetically-arranged "register," which is the main portion of the work. As the original editor, Mr. Townend, remarks in the preface, it is

"Designed to supply a trustworthy record, within reasonable limits and upon a well-defined plan, of the principal changes, transactions, and events that have occurred in all parts of the globe during the past twelve months. It contains an epitome of the results of human action and endeavour in numerous directions, recording failure as well as success, disaster as well as triumph, and is in every respect 'an abstract and brief chronicle of the time.' In its pages will be found records of both persons and things; and though specially devoted to the illustration of 1868, it supplies the necessary links to connect the Past with the Present, and to bring clearly before the reader the events and the characters that have appeared upon the scene."

There is a large and well-selected and condensed mass of useful matter for reference throughout its even to eight hundred pages; and the appendices contain copies of diplomatic and state papers, Acts of Parliament, official documents, &c., and statistical and other tables. Amongst them are lists of the Houses of Lords and Commons. It would be an improvement in next year's issue were an alphabetical list of members' names appended to the Commons list of borough names. The editor of this work, Mr. Townend, the author of "The Manual of Dates," had nearly completed it, we learn, when his brain gave way, and he has since died.

British Rainfall, 1868. On the Distribution of Rain over the British Isles, during the year 1868; with Remarks and Illustrations. Compiled by G. J. SYMONS, F.R.S. London: Stanford, 1869.

The results of observations at about 1,500 stations in Great Britain and Ireland are here given; and that result is that in England the rainfall of 1868 was 2 per cent. in excess, and in Ireland 6 per cent.; but that in Scotland the excess was really bewildering, being no less than 10 per cent. No doubt, the mountainous nature of much of the surface of Scotland had something to do with this excess.

The volume is illustrated, for frontispiece, with an engraving, showing the arrangement of rain gages, &c., on the grounds of Strathfield Turgis rotary, Reading, the management of the records of rainfall there, and of the various experimental and other apparatus by which it is indicated, being under the care of the rotor, the Rev. G. H. Griffith, who has written an elaborate and able paper on the subject, included in the volume under notice; which may be regarded as the authorized record of rainfall; Mr. Symons being the Rainfall Secretary to the British Association. The experimental committee of the Royal Society, however, pay the expenses of the thermometrical work undertaken by the Rev. Mr. Griffith, which has met with their approbation.

Verse Foster's Drawing Copy-Books. London: Simpkin, Marshall, & Co.; Marcus Ward & Co. These very cheap books are intended mainly for self-instruction in schools which have not the advantage of a drawing-master. Each number contains both examples and paper for the pupil's copy. They have been adopted by the Commissioners of National Education in Ireland, and are well suited for the purpose for which they are required. Each book contains a distinct series of subjects, such as flowers, trees, boats, and ships, the human figure, animals, &c.

The following list of artists who are occupied on this series shows how earnest the projector is in his endeavours to provide the best copies obtainable. Each part costs 1d., or, on better paper, 3d. **The Human Figure**—Thomas D. Scott. **Animals**—Harrison Weir. **Landscapes**—R. P. Leitch, E. M. Wimperley, &c. **Marine Subjects**—E. Weedon, J. Callow, G. Whitaker. **Flowers**—W. H. Fitch, W. French, F. E. Hulme, W. G. Smith, W. S. Coleman, &c. **Architecture, Ornament, and Perspective**—W. G. Smith. **Geometry and Mechanics**—J. Mangnall.

A Practical Course of Military Surveying; including the Principles of Topographical Drawing. By Captain LENDY, F.G.S., &c. With an Atlas, mostly by Major PETLEY. New Edition. London: Atchley & Co. 1869.

That this able work has reached a second edition is a practical and well-merited testimony in its favour. We reviewed the work at considerable length some years ago. The author, it

may be recollected, is director of the Practical Military College at Sandhurst; and Major Petley is Professor of Military Surveying at the Royal Military College, Sandhurst. This edition contains many additional plates, &c. The practical part of the work has not been altered, and remains quite elementary, though deemed efficient for all field purposes. A brief sketch of the operations necessary for a trigonometrical survey has been added.

Street's Indian and Colonial Mercantile Directory for 1869. London: Street, Cornhill.

In this edition of the work under notice various additions and other improvements have been effected. It is not intended to supersede local directories, but to give a concise book of reference to every English, foreign, and colonial merchant. If reliable, and so far as we can we have tested it and found it so, this must be a very useful book to mercantile men, and indeed, to many others interested in India and the colonies. It is not only a directory, or series of directories, but gives much other valuable information as to trade returns and lists of trades, tariffs, populations, rates and times of steam and other transit, London agents of banks, principal products and articles of trade, tables of local weights and measures, &c. There is also a series of directories of shipping-agents, manufacturers, &c., more or less connected with India and the Colonies, in London and the principal towns throughout England, and at Glasgow.

Appley's Illustrated Hand-book of Machinery and Ironwork. By APPLEY BROTHERS, Engineers. London: Spou.

Although this is in truth a trade book of articles manufactured or sold by Messrs. Appley, of Southwark, relating as it does to cranes, engines, pumps, contractors' machinery and tools, colonial and agricultural and other machinery and plant, &c., it contains a large mass of useful matter, and is profusely illustrated. It gives the cost, working expenses, and reults obtained in the use of the various machines, with weights, measurements, &c.; and prices of tools, stores, &c., required by civil and mechanical engineers, merchants, and others, with numerous tables and memoranda.

VARIORUM.

"Power without Fuel: an Investigation of the Means by which it may be obtained from the Heat of Natural Sources." By James S. Baldwin. New York: Wileys & Co., Gold-street, 1869. This pamphlet contains an account of certain improvements on the carbonic acid engine to fit it for work by means of waste heat, as of blast furnaces, kilns, and ironworks, as well as the heat of the sea, of artesian wells, &c.—Voltaire's "Histoire de Charles XII." has been long recognized as one of the best French reading-books for students of the language, and Mr. Tegg has done wisely in issuing a new edition. It is edited by the Chevalier de Chatelain, and is very neatly got up.—An elaborate paper "On the Relative Demand for Labour in the Agricultural and Manufacturing Districts, its Causes and Effects," in *Frazer's Magazine* of this month, with maps and diagrams, merits careful consideration. The same number contains a good account of Mr. Ferguson's book, "Tree and Serpent Worship."—"Debreit's House of Commons and the Judicial Bench" (edited by R. H. Mair, and published by Dean & Son) is uniform with the "Peerage" and "Baronetage," already mentioned, and gives a brief biographical sketch of each member and his "arms." A list of "Parliamentary Expressions and Practices" supplies particulars that may be useful to general readers. It is altogether the best hook of its class.

Miscellaneous.

The Royal Birmingham Society of Artists.—The Spring Exhibition of this Society has been opened, with a collection of water-colour drawings and oil sketches (the latter not very numerous). This year's collection is considered to be very nearly, if not quite, equal to that which opened the series.

Honour to English Architects.—We have great pleasure in mentioning that Professor G. G. Scott, R.A., and Mr. G. E. Street, A.R.A., have been elected honorary members of the Imperial Academy of the Fine Arts at Vienna.

Worcester Diocesan Architectural Society.—The fifteenth annual meeting of this Society has been held at the Natural History Society's council-room, Worcester; Mr. G. J. A. Walker presiding. The report referred chiefly to the restoration of old and building of new churches in the diocese, and to the Cathedral restoration. Referring to the Grammar School in the Tything, the report says:—

"A handsome new building was opened in the Tything last summer, for the Grammar School founded at Worcester by Queen Elizabeth. It was designed by Mr. Perkins, in the picturesque but debased style of architecture which prevailed in England during that monarch's reign; having large mullioned windows, carved gables, and other characteristics of the Elizabethan period. The large schoolroom has a fine open-timbered roof, but is somewhat disproportionately lofty for its length. Indeed, the whole design would have been much more effective had the same amount of detail been distributed over a building half as long again; the principal facade, with its three large windows, each surmounted by an ornamental gable (the middle one containing a statue of Queen Elizabeth), and the tall tower rising from the centre of the high roof, having rather a crowded and overdone appearance. There is a class-room at the north end, also a porch and commonplace iron railings in front; but the structure altogether forns by far the most important and satisfactory architectural feature in this part of the city."

The Orphan Asylum at Henwick is thus noticed:—

"The Orphan Asylum at Henwick is approaching towards completion, and promises to form another example of the failure of public competition to secure the erection of buildings of even tolerably good architectural design. In this instance a most eccentric version of Gothic has been adopted. The front is cut up by all kinds of projections and irregularities, such as queer-shaped bay windows, stepped gables, over-hanging dormer windows, spiky pinnacles, &c.; there being an entire absence of any simplicity and repose which should especially characterize structures of this description. The internal arrangements may be good, but if so, there could be no reason why they might not have been combined with a well-proportioned and consistent facade."

A Copying Ink that Needs no Press.—Dr. Rud. Boetger, of Frankfurt, according to the *Scientific Review*, prepares thus a black copying ink, which flows easily from the pen, and will enable any one to obtain very sharp copies without the aid of a press.—One ounce of coarsely broken extract of logwood and two drachms of crystallized carbonate of soda are placed in a porcelain capsule with eight ounces of distilled water, and heated until the solution is of a deep red colour, and all the extract is dissolved. I then take the capsule from the fire, and stir well into the mixture one ounce of glycerine of a specific gravity of 1.25, fifteen grains of neutral chromate of potash dissolved in a little water, and two drachms of finely pulverized gum arabic, which may be previously dissolved in a little hot water so as to produce a mucilaginous solution. The ink is now complete and ready for use. In well-closed bottles it may be kept for a long time without getting mouldy, and, however old it may be, will allow copies of writing to be taken without aid of a press. It does not attack steel pens. This ink cannot be used with a copying press. Its impression is taken on thin moistened copying paper, at the back of which is placed a sheet of writing-paper.

Earthquake-proof Architecture.—The *New York Times*, following in the *Builder's* wake, says:—"The recent earthquakes on the Pacific coast have necessitated the adoption of some new style of building in that section of the country. More brick shells will not stand many heavy land shocks, and the architects of San Francisco are now busy over earthquake-proof plans of architecture. One of the new plans proposed is to build a compact wooden frame structure, and anchor it with brick walls. The frame would secure it against falling, and the wall would render it fire-proof. A large publishing-house in San Francisco is soon to erect a store upon this plan. Another method proposed is to build thick walls with iron girders inserted in them, and riveted at the angles. There has been considerable discussion among builders on this subject, and a new field is open for the ingenuity of architects. Anybody who will guarantee to put up a house that will stand an ordinary earthquake without damage, whether it be built of wood, stone, iron, paper, or rubber, can make his fortune on the Pacific coast."

Increase of Mortality in Whitehaven.—According to Dr. Robert Lumb's return, the mortality in Whitehaven for the month ending February 23 was at the rate of 33 per 1,000 per annum. This is a rate of mortality higher than the average of thirteen large towns. In the week ending March 6 the mortality in London was 24 per thousand, and in thirteen other large towns it was 26.

The Model Dwellings, Worcester.—An addition has just been made to the pile of buildings known as the Model Dwellings, Copenhagen-street, by the completion of the quadrangle on the west side. The experiment made by the company formed to promote the erection of these buildings has so far been successful. The new portion consists of eight dwellings arranged in two flats one above the other. Each habitation comprises a living-room with fire-grate and oven, cupboards, and other necessary conveniences, two bed-rooms, water-closet, sink-stone, meat-safe, plate-rack, and table. The rooms are lofty and ventilated, colour-washed, and woodwork painted. The average rental of these dwellings is 3s. 6d. per week, including all payments.

Fall of a Grand-stand.—An accident has happened at the Rotherham steeplechases. Whilst one of these steeplechases was being run, several hundred persons viewed the race from the grand-stand, when suddenly the structure collapsed. Those on the lower tiers saved themselves by jumping to the earth as soon as they felt the vibration, but those above them on the fourth and fifth tiers fell from a height of about 6 ft., tumbling upon the heads of their neighbours. As soon as they gained their feet, it was found that two women were covered with part of the woodwork, and had each a broken leg. Others were rather seriously injured. Many persons had narrow escapes, and it is surprising that—looking at the extent, 176 ft. in length—no loss of life took place. It appears that the erection had been considered capable of bearing more weight than was upon it, but the earth being soft on account of recent rain, the supports were gradually buried in the ground. Mr. Joseph Blackmoor, of Rotherham, erected the stand.

Opening of a Sailors' Home at Rotherhithe.—For some time past an effort has been made to establish a sailors' home on the south bank of the Thames by the Society for the Promotion of Sailors' Homes. That effort has at length been successful, and a home at Rotherhithe has just been formally opened by Admiral Sir W. Hall, K.C.B., chairman and honorary managing director of the society. The new home is fitted up in a simple, unpretending style. It contains sleeping accommodation for about thirty men, each man having a little cot to himself; a convalescent room in which sick and desolate seamen will be taken care of gratis; dining, refreshment, and reading rooms; and there are also a lavatory, skittle-alley, quit-ground, &c. It is hoped that when the institution is fairly started it will be self-supporting.

Masonic Literature.—An American gentleman, Mr. Morris, of Kentucky, who has recently been travelling in Syria and Palestine, is now preparing for publication in the United States his observations on the Holy Land from a Masonic point of view. The book will be called "Handmarks of Solomon's Builders." Mr. Morris wishes to dedicate it to Raschid Pasha, the present Governor of Syria, who is a Turk and a Moslem, but, nevertheless,—like the chivalrous Abd-el-Kader, too, the ex-Emir of Algeria,—a Freemason and an enlightened man. The book will be illustrated with portraits of these and other Oriental Freemasons. It is to be hoped that Mr. Morris, during his travels, had his eyes open for Masons' Marks.

Nottingham School of Art.—In the Government examinations held last month as many as 178 candidates presented themselves for examination, and 314 papers were worked and forwarded to the Department of Science and Art, London, for the prizes, &c., to be adjudged. In free-hand drawing 100 papers, in worked, in practical geometry 66 papers, in perspective 55 papers, in model drawing 83 papers, and in mechanical drawing 10 papers—total, 314 papers.

Ulverstone (Lancashire).—A system of new sewers, embracing upwards of six miles in length, is being laid down at this place by the sewer authority. Mr. James Young, of Sunderland, is the contractor; Mr. Brierley, of Blackburn, the engineer. The works are to be completed in seven months.

St. George's Church, Queen's-square, Bloomsbury.—The restoration (2) of St. George the Martyr Church, Queen's-square, is now complete, and it was to be opened on Tuesday by the Bishop of London. Mr. S. S. Teulon is architect. Mr. M. Bromfield, sculptor, executed the figures and wood and stone carving.

Royal Institute of the Architects of Ireland.—At the last ordinary general meeting, Mr. Charles Geoghegan, Fellow, in the chair, Mr. Thomas Early, Associate, read a paper on "Stained Glass," in which he traced the history of the art, from the examples of the twelfth century, as at York, until recent times, dealing with the revival of some thirty years past, and his own experience in connexion with the Royal Commission for the decoration of the Houses of Parliament, and calling special attention to the effects of colour, the result of unequal thickness, and irregularity of surface in the old glass, which is lost by the smoothness of surface and equal density of most modern work. His paper was referred to the council for publication. Mr. Geoghegan's patent regulator for water under high pressure was exhibited at work in the rooms, and explained by the patentee. Dr. Kidd also explained, by diagrams, his invention having similar objects.

Institution of Civil Engineers.—At a recent meeting of this institution, an elaborate paper "On American Locomotives and Rolling Stock," by Mr. Zerah Colburn, was read. It was remarked that, in construction and working, the American railways represented little more than a modified application of English practice. When the systems of the railway machinery of the two countries were compared, many of the differences which first struck the eye were found to be external rather than fundamental; and so, too, many of the peculiarities of construction now retained in America were due to the initiative of English engineers. A discussion of Mr. Colburn's paper took place on the 18th ult.

Rating of the New Meat Market, Smithfield.—The report of the Finance and Improvement Committee recommends that the several premises situate within the New Metropolitan Meat and Poultry Market be respectively assessed to the rates made by authority of the commissioners, on rentals recommended by Mr. Hudson, in his valuation submitted to the last court, amounting to between 17,000l. and 18,000l. The City Commissioners of Sewers have adopted the report.

Valuation of Property.—There has just been published the text of a Bill which provides for a common basis of value for the purposes of Government and local taxation, and for uniformity in the assessment of rateable property in England. It is the measure prepared and brought in by Mr. Goschen, Mr. Arthur Peel, and Mr. Ayrton. It is proposed by this Bill to apply the principle of the measure framed by the Government for the assessment of property in the metropolis to the provinces, and the end is to be obtained by the creation of a similar kind of machinery. In the provinces a valuation board is to be elected in every county for the purpose of determining the percentage or rate of deductions to be made from the gross value in calculating the rateable value of hereditaments: the board to consist of representatives of the various assessment committees in the county, two from each. The bill contains 77 clauses, and there are various schedules attached.

Working Men's College Building Fund.—From a statement by the Council it appears that the ground in the rear of the house in Great Ormond-street (12,000 square feet in area) being the freehold property of the College, they are advised that such a building as is wanted can be well and substantially built, in a plain but good style, for about 2,000l. or 2,500l. Of this amount they have 1,000l. in hand and 200l. promised. Plans prepared by Mr. W. Webbe have been accepted, and the building will be commenced immediately. Financially the college is self-supporting. They have never yet asked money of the general public, and think they are justified in doing so now. Professor Maurice, the principal, signs the statement. Contributions may be sent (amongst others) to the London and County Bank, Oxford-street branch ("Working Men's College Account").

Fire at South London Music-hall.—The Music-hall in London-road, Blackfriars-road, has been gutted by fire. The walls, it appears, remain uninjured, and part of the premises are only damaged a little by water. The cause of the fire is believed to have been the dropping of a lighted fusee or some lighted tobacco through chimneys in the flooring into a cellar beneath. Plans are being prepared for restoring the hall on an enlarged scale.

Royal Microscopical Society.—The annual *soirée* of this Society was held at King's College, on Wednesday evening last; none of the objects exhibited surpassed in interest the produce of Dr. Carpenter's deep-sea dredgings: some of these objects were recently fished up by him from a depth of two thousand fathoms in the North seas.

The Public Health.—In the week ending Saturday, the 20th, the annual rate of mortality was very high. It was 25 per 1,000 in London, 34 in Edinburgh, and 27 in Dublin; 24 in Bristol, 22 in Birmingham, 32 in Liverpool, 34 in Manchester, 28 in Salford, 36 in Sheffield, 28 in Bradford, 33 in Leeds, 26 in Hull, 22 in Newcastle-upon-Tyne, and 47 in Glasgow.

Building in Brighton.—The Brighton papers speak well of a new building erected by Mr. Hudson, in Station-street, for storing valuable furniture. With a view to the easy removal of heavy packages, as also to the preservation of them from damp, dust, and vermin, the entire area of the stores has been floored with Pyrimont asphalt.

TENDERS.

For the erection of new shop and dwelling-house and other premises in the Irongate, Derby (exclusive of basement), for Mr. S. Evans. Messrs. Thompson & Young, architects.

E. Thompson	1,990 0 0
Gadaby	1,975 0 0
J. W. Thompson, jun.	1,484 0 0
Fryer (accepted)	1,740 0 0

For the erection of a new Congregational Chapel, Danmore, Essex. Mr. Charles Ferriew, architect, Chelmsford.

	Gross Tender	Deduction for old materials.
Thorn	£2,387 0 0	2,100 0 0
Glassecock	2,182 0 0	195 0 0
Gozzett	2,159 0 0	165 0 0
Brown	2,055 0 0	180 0 0
Johnson	2,000 0 0	200 0 0
Crabb & Letch	2,050 0 0	200 0 0
Cole, Bros. (accepted)	1,844 11 0	210 0 0

For rebuilding the Huntingdon Grammar School-house. Mr. R. Hutchinson, Huntingdon, architect:—

T. C. Smith	£1,438 17 0
W. Balmer	1,450 0 0
Cennell & Balmer	1,402 16 0
G. Thackray (accepted)	1,387 0 0

For the erection of a farm residence at Sawtry, Hunt., on the estate of the Right Hon. the Baron Chesham. Mr. Robert Hutchinson, architect, Huntingdon:—

Andrews, Brothers	£2,557 0 0
Cade & Son	1,681 0 0
Coates	1,623 18 0
Richardson & Spriggs	1,588 0 0
Richardson & Maile	1,596 0 0
Machin	1,491 3 2
Thackray	1,465 0 0
Richardson & Tyers	1,459 0 0
Hobson & Taylor	1,439 0 0
Heythorpe	1,398 0 0
Bridge & Whitson	1,365 0 0

For repairs and alterations at 31, Cheapside, E.C., for Messrs. Russell & Son. Messrs. Haywood & Bisshill, architects:—

Mansfield & Price	£486 0 0
Ramsay	475 0 0
Nind	450 0 0
Cole & Son	441 0 0

For the erection of a private residence at Blampton, Hunts. Mr. Robert Hutchinson, Huntingdon, architect:—

Allen	£438 0 0
Maile & Richardson	435 0 0
T. C. Smith	429 0 0
Cennell & Balmer	404 0 0
Francis	400 0 0
Thackray	399 0 0

For the erection of villa residence, with stable, coach-house, &c., for Mr. Charles Cannon. Mr. William Smith, architect:—

Deacon	£3,510 0 0
Kilby	2,527 0 0
Henshaw	2,778 0 0
Brown & Robinson	2,780 0 0
Webb & Son	2,550 0 0
Dove, Brothers	2,945 0 0
Crabb & Vaughan	2,504 0 0
Eaton & Chapman	2,509 0 0
Wicks, Bangs, & Co.	2,487 0 0
Hill & Son	2,450 0 0
Carter & Son	2,430 0 0
Hughesden	2,400 0 0

For addition to Messrs. Johnson & Son's warehouse, in Hatton-garden. Mr. Lewis H. Isaacs, architect. Quantities supplied by Mr. Ruddett:—

Smith & Son	£934 0 0
Saxell & Son	598 0 0
Walker	561 0 0
Bamford	515 0 0
Foxley (accepted)	519 5 0

New wing to almshouses, at Seaford, Sussex. Messrs. Wm. G. Habershon & Pite, architects:—

Kempster	£1,361 0 0
Davey	1,300 0 0
Burgess	1,266 0 0
Kirk	1,249 0 0
Morling	1,253 0 0
Fisher & Longley	1,111 0 0
Nash	1,069 0 0

The Builder.

VOL. XXVII.—No. 1366.

The Promenades of Paris.

VERY fine work under this title, by M. Alphand, director of the Promenades of Paris, is now in course of publication in that city; M. Davioud, architect, M. Hochereau, architect, and others, making the drawings to illustrate it.* It is of large size, printed in clear type on beautiful paper, and, of course, costs money. Judging, however, from the list of subscribers already entered, the publication promises to be remunerative, which probably would not be the case with any similar work in England. The number of books of equally costly character published in France, as compared



with such ventures in England, is very remarkable. It may be partly accounted for by the fact that while in France the Government often gives material aid to such undertakings, in England it taxes them heavily by requirements for public libraries. By all means, let copies be supplied to public libraries; but let the State, who is to benefit, pay for them.

Of "Les Promenades" some twenty parts are now out, and deal wholly with the Bois de Boulogne, illustrating and describing minutely every portion of it, giving the mode of formation, and the cost of the several works. The history of the place is, of course, sketched.

The Bois de Boulogne, the delight of the present race of French citizens, is all that remains of the vast forest of Rouvray, which formerly spread for miles along the right bank of the Seine, and where Dagobert I., according to the chroniclers, enjoyed the pleasures of the chase when he inhabited his castle at Clichy. The ancient forest, gradually divided and cut up, lost its old name from the commencement of the twelfth century, and was called the Wood of St. Cloud, from the name of a neighbouring village. In the year 1319, however, some pilgrims having erected at Mennèz-Saint-Cloud—a little hamlet in the wood—a church on the model of that at Boulogne-sur-Mer, the name of the hamlet was changed to Boulogne. The wood, following the fortune of the first inhabited portion of it, took the same name, and remains the Bois de Boulogne to the present day. Situated as it is, at the gates of the capital, and facing the smiling country that borders the left bank of the Seine from Mondon to Suresnes, the Bois de Boulogne has been for several centuries the favourite promenade of the Parisian population, and suc-

cessive sovereigns have sought how best to embellish and improve it. As a church gave the wood its name, so an abbey christened its most famous drive. The abbey of Longchamps (*Longus Campus*), founded in the year 1256, by Isabel of France, sister of St. Louis, is the most ancient of the princely residences in the wood recorded by history. It was at one time a place of pilgrimage, and afterwards a promenade frequented by the court and the city during the Holy Week, on pretext of listening to sacred singing,—a custom still kept in memory by the practice of the fashionable part of the population, who annually disport themselves there on the last days of that same week.

François Premier, after much improving the wood, erected from the designs, it is believed, of Primaticci, in 1530, the Château of Madrid, which was occupied by several succeeding sovereigns, and contained many marvels of art that have all disappeared, with the exception of some works of Della Robia. Another building in the wood was called the Château de la Muette, because of a hunting-box near, wherein were deposited every year the horns cast by the stags at their shedding time (*muc*). Here also was *Le Ranelagh*, set up under the direction of Marie-Antoinette, in imitation of the still well-remembered gardens in Chelsea of that name. The first Napoleon did much for the Bois; but in 1814 and 1815, when foreign armies occupied Paris, the wood was for the most part destroyed. The reparation was soon commenced; but our history must be brief. Louis Philippe's fortifications cut off certain portions of the land. After the revolution of 1818, the Bois de Boulogne ceased to belong to the Civil List, and reverted to the State.

In 1853 began the works which were to render it a place of recreation worthy of the capital. By a law passed on the 13th of July, 1852, it was ceded to the city of Paris, which undertook at its own cost to maintain it, and to execute works within four years, at the cost of 2,000,000 of francs. In 1854 it was determined to extend the Bois towards the Seine, and to enable the city to provide the funds that were required for the great works contemplated, laws were passed, prescribing the establishment of a hippodrome for horse-racing, the State taking upon itself half the cost of the land and works required for that purpose, and empowering the city to dispose of, for its profit, certain outlying portions of the Bois. The purchasers of this surrounding land were made to assist in enclosing it with a wrought-iron railing, of uniform design, and to cultivate as a garden a *zamo* of ground, about 30 ft. wide, next the railing.

Elsewhere a *ha-ha*, or, as our neighbours term it, a *saut de loup*, was formed, and the Bois being thus enclosed all round, seventeen entrance gateways were opened, and lodges for the residence of the keepers were erected. Besides these entrances and lodges, the completion of the design included the conversion of straight paths into sinuous ways, paved and otherwise; the formation of pieces of water, streams, and cascades; the production of extensive lawns around the lakes; the planting of large trees; the construction of grottos and chalets; and the assimilating to the rest of the park the new land united to it.

All the works commenced in 1853 were completed in 1858, leaving the total area of the park 346 hectares, 5 ares, 39 centiares. To supply the cascades, an Artesian well of large diameter was sunk in the plain of Passy. This affords from 9,000 to 10,000 cubic metres in the twenty-four hours.

The drainage of the roads is effected by means of dry wells at certain intervals. The bottoms are not paved, and the permeability of the soil allows storm water to escape quickly. It is unnecessary to say that the works executed have led to a large expenditure; but this has been

covered to a considerable extent by the sale of the outlying lands, while great advantages have otherwise resulted from the works to both the State and the City.

To go a little into details, from the consideration of which a valuable lesson may be derived. Our author, M. Alphand, gives us the cost of—

	Francs.
The works	7,473,836
Purchase of adjoining properties	6,878,188
Sale of land and the value of parts not yet disposed of	14,382,004
From this to be deducted half cost of Hippodrome to be paid by the State ..	8,779,365
	5,602,639
Leaving the cost of the whole to the City of Paris	2,110,513
	3,462,126

Paris has thus, for the trifling sum of 138,480*l.*, obtained a promenade, the renown of which assists to bring multitudes of money-spending strangers to the city, while it affords healthful enjoyment to the population. To the State it has been even more advantageous. The price of land adjoining the Bois on all sides has been increased enormously: land, the value of which did not exceed from 1*l.* 5*o.* to 6*l.*, the *mètre*, is now worth from 20*l.* to 100*l.* the *mètre*. It is computed that on the surrounding land 487 châteaux or expensive villas, the cost of which, with the furnishing, cannot be put at a lower average than 8,000*l.* each, have been built and fitted up. These of course bring a large annual income to the State; and who shall further calculate the sums it has received in stamps and fees connected with the transfer of properties as well as from the taxes on materials and on the articles of food consumed by the workmen?

The works in the Bois de Boulogne include a number of buildings, such as a Kiosque for the Emperor, garden-seats, the Tower of Longchamps, and the lodges, or keepers' houses, at the different entrances to the Bois and elsewhere. The Kiosque, erected on an island in the great lake, is placed on a circular basement, the lower part being of freestone, the upper part of brick of two colours (*rejointoyées à l'Anglaise*). An external staircase leads to the apartment above, which is formed of woods of various colours, and has a balcony all round it. The roof is hnlous, covered with slates of two colours. Although of small size, this construction cost 1,040*l.* The prospect from the Kiosque is charming.

The lodges or pavilions are of six classes. Although each building differs from the other in plan and elevation, the use of similar materials and mode of construction gives to the lodges in each class a certain amount of resemblance. We are enabled to reproduce a few of the smaller illustrations of the book, representing three of these lodges, with the plan of each, as well as a view of the Pool of Suresnes; namely, the Porte de Passy, the Porte d'Anteuil, and the Porte Dauphine.*

The walls of these lodges are constructed of brick, disposed in horizontal bands of two colours, rising from a stone plinth; the window dressings, parapets, cornices, and so forth, being also of stone. The roofs, of high pitch, are covered with slates from Mézières and Angers, which differ slightly in colour, but harmonize with each other, and the chimney-pots are of terracotta, and all from the same model. One class of lodges has overhanging roofs, with ornamental barge-boards. The total expense of nineteen lodges was 15,180*l.* One of them, the Porte de Passy, of which we have given a view and plan, cost 780*l.*

We repeat our commendation of the admirable manner in which this work on the Promenades of Paris is being produced.

* "Les Promenades de Paris. Bois de Boulogne, Bois de Vincennes, Parcs, Squares, Boulevards." Par A. Alphand, directeur des Promenades de la Ville de Paris. In folio, illustrated with Chromolithographs, engravings on steel and on wood, drawn by MM. Davioud, Chief Architect of the City of Paris; Hochereau, Architect of the city; Dardozet, Antoine, Puth, Engineers of the city; and by the best French artists, as M. de Bar, Lancelotti, Grandis, Gaidran, Freeman, &c. Paris: J. Rothschild, Agents for England; Messrs. Williams & Norgate, Henrietta-street, Covent-garden; Dulan & Co., 83ho-square; Messrs. Barthes & Lowell, Great Marlborough-street; Hardwicke, 11, Piccadilly.

* See pp. 285, 286, 287. The elevations are on a scale of 0.01 m. to a *mètre*; the plans, 0.005 m. to a *mètre*.

THE KENSINGTON AMPHITHEATRE.

With the decline and fall of the Roman empire, the erection of amphitheatres ceased. Those characteristic buildings were probably far more numerous than we are accustomed to suppose, basing our ideas, as we do, on the small number of ruins yet remaining. But when we find, in so small a city as Pompeii, that an amphitheatre, proportionate to the population, existed, as well as a regular theatre, while another of the former buildings is yet standing at Pozzuoli, at a similarly small distance from the Campanian capital; and when we remember that the mutual jealousies and rancours between neighbouring cities (Pompeii and Nola to wit) would not allow the citizens of one to take part in the festivities of another, we have reason to conclude that an amphitheatre was regarded as a necessity for almost every town of tolerable magnitude during the imperial sway. In a country where earthquake has so often changed the face of nature, the mere negative evidence of the absence of any distinct class of ruins must weigh but little against our positive testimony as to the habits of the pleasure-loving Campanians.

The condition of several of those ruins, which are to be found in Italy, in Roman Gaul, in Itria, and, most notably, in Rome itself, is such as to give us a very distinct view of the general arrangement of the amphitheatres. No relics of the time preceding the Gothic invasion, nor portion of the art, the literature, or the poetry that have survived that great deluge, give us so full and distinct an idea of the savage habits of the masters of the world. In Pompeii, indeed, we view the scenes familiar to the daily life of the first Christian century, when Christianity had not yet secured a footing, but little removed as it was from the sensuous Southern habits of to-day. But in that very city,—the richest museum of antiquities yet laid open to this student,—the amphitheatres, though one of the latest, is one of the most important discoveries.

The central portion of these colossal buildings, the arena, was a level surface, covered, as its name imports, with sand. It was surrounded by, if not reared upon, vaults, and the arrangements for admitting the gladiators who were to exhibit their prowess; the wild beasts who were to contend with each other or with human opponents; the criminals who might be exposed to an unwilling strife with these monsters; and the necessary attendants, were all very carefully and completely. In some instances provision was made for flooding the arena, so as to have the means of presenting a sham sea-fight to the spectators. In the largest of these buildings, which was erected in the capital by the Emperor Vespasian, six acres of ground were encircled by the outer wall, of which surface the arena occupied rather less than a sixth part. This enormous structure, known as the Coliseum, was capable of containing more than a hundred thousand spectators.

The arena was bounded by a wall, of sufficient height to preserve the spectators who filled the coveted seats which most closely bordered the scene of action, from any untoward spring of maddened lion or stealthy panther. The form of the amphitheatre was generally elliptical, or oval; the proportions of the Coliseum being as 5 to 6, between the conjugate and the transverse diameters. By this arrangement a certain number of seats would be brought nearer to the very centre of the sport than could have been the case if the same number of spectators had been accommodated in a circular building.

The revival, fantastic and ill-omened as it may seem in this nineteenth century, of imperial style, and morals, and language in France, has stimulated some of the most able French artists to give us strikingly realistic glimpses at the cruel Roman life which glowered over the exhibitions of the amphitheatre. In our own country the *Retiarius* and the *Secutor* were replaced and long represented by the champions of the prize-ring. The struggles of the lion in the arena are yet recalled to the Spaniard by the bull-fight. With us bear-baiting is a thing of the past; and that once favourite sport, in which, on a miniature scale, the arena was represented by the cockpit, is no longer a national or a fashionable pursuit. But at the very time when the increasing civilization of modern manners, the displacement, it may be, of crimes of force by crimes of fraud, or the direction of the attention of our dangerous classes rather to profitable depredation than to brutalizing amusement, has banished the last relics of public bloodshed, we

see rising in our metropolis a veritable amphitheatre.

From the podium, or low wall surrounding the arena, the part of these ancient buildings which was intended to contain the spectators rose in a vast funnel, or inverted cone; resembling, on a colossal scale, the den of the antlion. This widening ascent was divided into steps, which, at all events in the minor amphitheatres, served at once for the seat of one tier of spectators and for the foot-rest of the row immediately behind them. The continuous bench, which in any somewhat similar arrangement among ourselves, allows the feet of persons seated in one row to be accommodated below the seat of those in the rank before, and below them, was not adopted in the more solidly constructed buildings of ancient Rome. For persons entitled to the dignity of a curule chair, space was reserved in a tribune, or place of honour: hut the arrangement of cushions on the stone steps was this extreme of luxury ordinarily allowed.

Lines of entrance and of exit, radiating from the centre of the arena, divided the series of seats into *cunei* or wedges. The apparently solid structure was really raised upon vaults and arches, and openings from the radiating passages led into corridors at different levels, by means of which the vast number of spectators entered and left the building, with an ease and rapidity of which the general arrangements of our own public buildings are far from enabling us to form any adequate and practical idea.

The theatre of the Royal Institution, on a miniature scale, is arranged somewhat on the principle of the seats of the amphitheatre. Exit from this room is rendered more tedious by the presence of the benches; but the difference in the facility of ingress and egress, compared with that which is presented by the aisles and galleries of a church, or by the straggling doorways of some other places of assembly, is not to be overlooked.

It is far from impossible to realize the scene which one of these vast buildings must have presented when thronged for some great festival. We are far less able to form an idea of the order of the service of the temples. At Athens, and other cities, most notably at Pesteum, we see the structure of these ancient places of worship almost untouched, by the tooth of Time. But how the suppliants were arranged in, or around, the naos, what processions of priests, or what throngs of fillets, filled the peristyles; how the service of the immortal gods was carried on, at a time when men were forbidden to approach their altars with unwashed hands, we know not. In some of the great ecclesiastical anniversaries which are yet held in *Magna Græcia*, pilgrims, barefoot and bearing a gourd slung to a long staff, throng, at the present day, from distances extending to as much as three hundred miles, to the shrine of St. Nicolas of Bari, or the *Quattro Incononati*. The blindness and the fervor of the faith of these pilgrims are evinced by the humiliating penance of proceeding round the great church on their knees, with the forehead rubbing along the pavement. There is no question as to the earnestness of these tens of thousands of peasants. But, apart from such unusual instances, the processions now to be seen in Southern Europe (which to some extent may be regarded as the lineal descendants of the ancient rites) have a painful character of unreality, of irreverence, and of mockery. They can give us but little idea of the pagan worship at the time when the awe of the immortals was real; as, for instance, in the days of Herodotus.

But when we gaze upon the ruins of an amphitheatre, it requires but scant effort of the imagination to conjure up the terrible spectacle which that great concourse of men and women, intent on the life-struggle and thirsting for blood, must have presented to any eye that was turned, not on the arena, but on the spectators. The fierce gaze of the Spanish women on the mangled heroes of the bull-fight may tell us somewhat of the effect which the gladiatorial spectacles had on the children of the She-wolf. The scenes which, in our own country, might have supplied the painter with models, maddened with the frantic excitement of watching the death-struggles of a prisoner, are happily ended by the prohibition of the brutalizing exhibition of public executions. Still we may form no feeble idea of the stony glare of ruthless cruelty that met the gaze of the wounded gladiator, when he read his doom in the downward-turned thumbs of his thousands of judges; and we may read, with a thrill approaching to a shudder, the

simple and grateful words, "And I was delivered out of the mouth of the lion."

It is for no purpose of gladiatorial display; it is not for the revival of the sports of the prize-ring, the cockpit, or the bull-fight, that an amphitheatre capable of holding 16,000 persons is now silently and rapidly rising in Kensington. Shortly after the closing of the Great Exhibition of 1851, numerous representations were made to the commissioners of that Exhibition, on the part of Chambers of Commerce, learned societies, and other bodies of persons interested in science and in art, of the general want that was felt of a central place of assembly in London. The commissioners, agreeing in these views, devoted the surplus funds of the Great Exhibition to the purchase of an estate in South Kensington, with the view of providing a common centre of union for all such public bodies, and for the various departments of the industrial education. In the plans for this central institution, which were prepared under the enlightened direction of the Prince Consort, a vast hall of assemblage formed an important feature. The death of his Royal Highness arrested the steps which were in contemplation, but the scheme was revived in 1855, and the shell of the building is now raised to such a height as to give a fair idea of the architectural importance which will attach to the building when completed. Some views of it have already appeared in our pages.

The Kensington Amphitheatre covers a space of 200 ft. in the longest diameter, by 175 ft. in the conjugate, measured from the engraved plan. The design originally made was on the plan of a more eccentric ellipse. But it is probable that, in working out the details, the fact that concentric ellipses are not parallel, and that the excessive length of the longer diameter keeps proportionately increasing with every external slice that is added to the arena, rendered it impracticable to adhere to this figure. Draftsmen are aware that there is an ellipse in which the proportion of the diameters is such as to allow of a very close approximation to such a form which is drawn by means of arcs struck from only four centres, placed at the angles of a square. A figure of this nature has been adopted, and the difficulties of the incessantly changing elliptic curve are thus, we conclude, altogether avoided. There will, however, be far more complication in the roof than if a circular plan had been chosen.

The shell of the Albert Hall consists mainly of two concentric walls, between which are contained the staircases, corridors, and general arrangements for the service of the central hall, as well as a considerable number of good-sized, well-lighted rooms, which will be available for committee-rooms, offices for scientific societies, or other objects in harmony with the main design of the building. It is also intended to have a gallery at the top of this complex shell, lighted from the roof, which would be serviceable for the exhibition of sculpture or of paintings.

The external face of this shell is enriched with moulded *terra-cotta*, designed and manufactured from the clay of the Trent valley, expressly for this building. The mouldings on the basement are somewhat rough, but improvement is perceptible in the later specimens; and there can be little doubt that the result of this new application of the most ancient form of ceramic art will be at once economical and architecturally effective. We reserve, however, all opinion as to the merits of the building at present. The drawing of the exterior shows, above the basement, an order of square-headed windows divided by channelled piers. Above this is a balustraded row of circular-headed windows, divided by twin pillars. A third order follows, consisting of square-headed windows (about half the height of those in the lower tier), one above every alternate aperture, with a balustrade below, and a modelled frieze and projecting cornice above. The cornice hides a setback, which will be occupied, we presume, by the gallery skylight. In the great spheroidal roof, within the parapet that crowns the cornice, are arranged one order of dormer windows, and a second row of circular or elliptical lights. Three carriage porches will afford access from the Kensington and the Exhibition roads, with intermediate *parsons*, or flights of open steps, for pedestrian visitors. The southern end of the building will communicate with the conservatories of the Royal Horticultural Society.

The arrangement of the central hall presents a novel combination of the features of the theatre with those of the amphitheatre. Of course there is no stage; but a large organ, and

seats arranged for an orchestra, at the end of one of the larger diameters, will break the perfect regularity proper to a structure intended for spectators, rather than for auditors, for the former of which classes of attendants the Roman buildings of this nature were provided. The *arena* will be maintained, and, on such occasions as scientific gatherings, will form a most important part of the hall. From the *podium*, or fence wall of the *arena*, seats will arise step above step, as in the Roman amphitheatres. We regret to see that this part of the building is in course of construction as a piece of carpentry. The English public might perhaps object to dispense with the ugly but convenient expedient of the bench, a feature which is so immensely inferior, in a pictorial point of view, to the solid steps of the ancients. But it is on all grounds important that as little combustible material as possible should be employed in an edifice intended to contain so large a number of people. It is not so much the danger of fire as the danger of panic, which the architect should resolve to avoid. Panic in a crowded assembly is likely to be, if once excited, far more fatal than any other source of calamity; and in case of an alarm, real, fanciful, or even malicious, the confidence which might be placed in a building which manifestly owed little to the carpenter would be invaluable.

The arrangement of the *cunei*, wedges of seats as well as of the corridors and vomitories, will be amphitheatrical. But, before the hollow cone formed by the seats reaches the inner wall of the spacious hall, a series of three tiers of *loges* or boxes is interposed, running round that part of the building which is not occupied by the orchestra. This arrangement, resembling that of a theatre, will probably detract from the grandeur of the *coup-d'œil*. The majestic simplicity of the vast conical basin will be destroyed. On the other hand, the richness and picturesque effect of the scene will be increased. But we wish some gracefully moulded form had been adopted for the pillars which are to separate the boxes and to support the upper tiers. These are plain, solid, well-executed castings, forming plain Doric columns. Their frequent repetition will render them the most prominent elements of the physiognomy of the interior. We fear that this severity of outline will give a hardness and poverty to the tiers of boxes, which no decoration in the way of cornice and curtains can counteract. The floors of the boxes, and of the gallery which runs over the upper tier, are fireproof, being supported on Belgian wrought-iron girders, filled in with the customary expedient of concrete laid on battens.

The great feature of the hall will be the roof. The idea which may be formed of this colossal dome from drawings or models must fall very far short of the actual effect. The preparations which the contractors are making for raising the great ribs show that these builders are aware that their task is no child's play. The building has, of course, no central axis or point of support (the builders use a simple vernacular term), and it has therefore been necessary to construct a great wooden tower or framework, on which one end of each rib will be supported, until they are all fairly bedded and riveted together to the central ring or lantern. Substantial iron wall-plates rest on the interior portion of the shell, bind together the brickwork, and form a solid and tenacious abutment for the springing of the dome.

In the wooden model of the amphitheatre, which is to be seen in one of the private apartments of the South Kensington Museum, a species of *velarium* is shown beneath the roof, expanding like a gigantic umbrella. We think that this arrangement may be abandoned with advantage. The soffit of the roof, as shown in the engravings, is incomparably finer than any textile canopy, on so large a scale can be. If the light prove too strong, it can readily be dealt with by internal and external blinds or sun shades to each window. In the Italian amphitheatres a *velarium* was a matter, if not of necessity, at least of great luxury. That season of the year which often gives a rainless interval of six months, would naturally be selected for entertainments given in these great hypocaustal places of concourse. But the fierce rays of the sun are dreaded by the Italian, whom experience has made acquainted with their dangerous power, scarcely less than rain. To shelter the spectators from the sun a tent-like roof, in the later days of imperial luxury, was provided, in the form of a sloping, pent-house-like canopy, declining from the top of the inner wall towards

the *arena*. Such an arrangement would be incompatible with a dome; and an upward slope, suggesting the idea of an enormous umbrella, could only hide the structure of the roof, to the great disadvantage of the pictorial effect.

DUBLIN SANITARY STATISTICS.

Dr. MAPOTHER, the Medical Officer of Health for Dublin, has recently presented to the Public Health Committee of that city his annual report, reviewing the vital statistics for last year. The report is eminently satisfactory, both as evidence of the existence of a thoroughly efficient sanitary executive in that city, and as recording an improvement in the standard of health there prevailing during 1868.

The death-rate in Dublin city per 1,000 persons living, which in 1866 and 1867 had been 29.5, and 28.9, further declined last year to 26.7. This rate, although three per 1,000 in excess of that which prevailed last year in London, compares favourably with the rates in Manchester, Liverpool, Glasgow, and several other large towns for the same period. It may be usefully noted that the annual death-rates in Dublin, in the four quarters of last year, were respectively 32.0, 24.1, 24.9, and 22.8; from these it appears that the principal excess of deaths occurred in the three months ending March, the excess being mainly due to the fatality of diseases of the respiratory organs.

In examining the death-rate of a city as evidence of its sanitary condition, it is natural first to ascertain the mortality from zymotic diseases. The report tells us, that of the 6,604* deaths registered in 1868 in the city of Dublin, 1,526 were referred to this class of diseases, against 2,309 and 1,673 in 1866 and 1867. Allowing for the mortality from cholera, these figures show a satisfactory and progressive decline in the deaths from these causes. The 1,526 deaths in 1868 formed 23.1 per cent. of the total deaths, a proportion which, although affording a large field for the future exertions of the Public Health Committee and the officer of health in Dublin, compares favourably with the proportion in London, where, during 1868, 25.2 per cent. of the deaths resulted from zymotic, and, as they have been justly termed, "preventable" diseases. Perhaps the deaths from typhus, typhoid, continued, and other forms of fever, may be most safely taken as an index of the sanitary condition of large towns. The deaths from all forms of fever which, in Dublin, in the three years 1865-7, had been 492, 480, and 309, further declined last year to 256 in 1868. If any further evidence were necessary of the declining prevalence of fever in Dublin, it is afforded by the report in the following statement:—"The Hardwicke and Cork-street Fever Hospitals received from city dwellings during 1868-8, 3,245, 2,536, 1,841, and 1,211 patients respectively, or in the ratio of 127, 99, 72, and 49 out of each 10,000 of the population." The report details at considerable length the machinery by which the medical officer of health, and his eight assisting sanitary sergeants of police, are immediately informed of all deaths from fever and other zymotic diseases, and what is almost more important, how they receive bi-weekly lists of the patients admitted to the fever hospitals; and, moreover, the addresses of all patients suffering from infectious diseases are furnished by the fourteen dispensary physicians. We must especially commend this portion of the report to all those interested in the sanitary administration of large towns.

Not only has the mortality from fever declined, but measles caused in 1868 less than a sixth of the deaths from that disease in 1867. Small-pox also, to which seventy and twenty-three deaths were referred in 1865 and 1866, has been almost eradicated, causing only one death in 1867 and not one in 1868. Scarletina and diarrhoea formed exceptions in 1868 to the declining mortality from this class of diseases. Scarletina was fatally prevalent in Dublin in the latter part of 1868, and resulted during the year in 377 deaths, whereas in 1865-6-7 only 43, 63, and 199 were respectively referred to this disease. It will be remembered that scarlatina was extensively fatal during 1868 in London, Manchester, and many other large towns, and assumed a severely epidemic form. The 367 deaths from diarrhoea in 1868, against 194 in 1867, is explained

by the intense heat of the summer. Four-fifths of these deaths were of children under five years of age, although infantile diarrhoea was far less fatal in Dublin than in many other large towns.

The mortality from diseases of the respiratory organs is always largely influenced by the general sanitary condition of a community; a low standard of health is especially conducive to phthisis. It is not, therefore, surprising to find that in recent years the mortality from this disease has declined, and extended system of sewerage. In the four years 1865-8, the deaths from phthisis have been 969, 929, 831, and 804 respectively. Bronchitis caused 855 deaths last year, and the disease is reported to be still one-third more fatal in Dublin than in London.

The periodical inspection of workshops in Dublin, which has till recently been but imperfectly carried out, the opening of more spaces for play-grounds, the improvement of the dwellings for the poor, and the erection of public baths, are pointed out among other measures, the adoption of which would probably still further reduce the mortality from diseases of the lungs.

Dr. Mapother shows that abundant and useful sanitary work has been carried on under his superintendence during the past year, which can scarcely fail to effect a still further decline in the death-rate during the current year; he, however, regrets, in conclusion, that the non-extension of the Local Government Acts to Ireland, and the general unsatisfactory state of the Sanitary Acts, through want of codification, considerably militate against the usefulness of himself and his assistants. It is to be hoped that the legislative failings here pointed out, the latter of which is also widely felt in England, may receive attention during the present session.

ON THE ART OF VALUING AGRICULTURAL LAND, AND ON THE INDICATIONS OF THE VARIOUS QUALITIES OF SOILS.*

WHEN pasture land contains a large proportion of the mosses, it is a sure sign of poverty, and more often of poverty caused by constant mowing and the want of manure than of natural barrenness.

On commons and unclaimed land the common brake or fern (*Pteris aquilina*) generally grows on the best land, and Irish gorse, heather, &c., on the inferior portions.

The general colour of the surface of pasture land is also some guide to its quality. The colour of all pastures changes with the season, and no land is green all the year round (though the best land looks green the longest), and a fresh green colour is often dependent on recent manuring; but in winter, when the frosts have stopped the growth of the grass, poor cold grass land turns brown, whilst good sound pastures are never brown, but assume a whitish hue.

I must now proceed to point to that which I had especially in my mind when I commenced preparing this paper—the primary indications to be obtained by an examination of the soil itself, by which, I think, the same results may generally be arrived at with greater directness and certainty. By far the larger proportion of the food of plants is derived from the air, through their leaves, or from water absorbed by their roots; and of the remainder, the greater part is obtained from animal or vegetable matter, applied to the land in the form of manure (not necessarily for any particular crop, because the soil has a remarkable power of absorbing and retaining a portion of such matters); so that it happens that the food supplied to the crops by the actual natural soil itself is confined to very small quantities of certain soluble mineral matters, such as the various combinations of lime and silica. What is, therefore, chiefly required of the soil, by plants, is not a supply of food, but mechanical support, under favourable conditions, for allowing a free circulation of the air, necessary for the decomposition and assimilation of organic matters, and for retaining a constant supply of moisture even in dry weather, without, on the other hand, retaining an undue amount of water in wet seasons, and allowing it to become stagnant, to the exclusion of the air. All soils are mainly composed of three substances—sand, clay, and lime—and every fertile soil must contain a proportion of each, because each in a slight degree enters into

* A table in the report gives the deaths in Dublin city as 5,694; but this is an evident misprint for 6,604, which figures are used above.

* See p. 264, ante.

the composition of plants; but it is on the mechanical condition or consistency, resulting from the proportions in which they are combined, the depth of the surface soil, and the character of the subsoil in reference to the retention of moisture, that the fertility or barrenness of the soil primarily and mainly depends. Thus, when mixed in good proportions, with good depth, with a slight preponderance of clay, a strong fertile loam is the result, capable of producing large corn crops; or, with a slight preponderance of sand, a deep sandy loam, producing great root crops and prolific market-gardens. Where one element is greatly in excess—a hungry sand or gravel, a thin barren chalk soil or a poor thin-skinned clay is the result; where the sand is greatly deficient, and the other two elements greatly in excess, a tenacious marl; or, where the lime is wanting, the weak clay soils, characteristic of the Silurian slate formation, and some others.

In the great majority of cases, the soil is only the subsoil altered by long exposure to atmospheric influences and cultivation, and with a supply of organic matter derived from the roots of plants. Thus, light land usually has a subsoil of sand, gravel, or rock, whilst a clay subsoil usually underlies a clay soil; but, when from special causes this is not the case, the effect on the fertility of the land is very striking. Thus, some of the finest old pasture lands will be found to have a strong soil of sufficient depth to retain moisture and manure, resting on a bed of gravel, which provides a perfect drainage. This is also managed artificially, to a great extent, in warping, on the Hamber, by taking advantage of the fact that the sand settles much faster than the clay, and allowing the water, when the current is checked, to flow first over a piece of land just beginning to be warped, and afterwards to reach the portion which has more nearly attained its intended level.

Although the mechanical condition is thus the chief cause of fertility or barrenness, there are in some cases other substances which have a direct influence on vegetation. The chief of them is phosphate of lime, which enters so largely into the composition of bones, but also exists in certain fossiliferous strata, and adds considerably to their fertility. On the other hand, certain salts of iron and other substances occasionally occur, which have a deleterious influence; and the fertility of alluvial land, deposited at the mouths of rivers, may, in great measure, be due to the amount of organic matter brought down along with the soil by the stream; especially if we recollect that a century or two ago the use of manure can hardly be said to have been known in many parts of this country, and the refuse from stables and cow-houses was not unfrequently thrown into a neighbouring stream.

But whatever other circumstances may have to be noted, the mechanical conditions of the soil remain by far the most material; and these are precisely the ones which can be most certainly arrived at by an examination of the soil itself. There is no difficulty with a good walking-stick in ascertaining the depth, nor in judging of the texture; and by examining the ditches and the sides of sand, gravel, clay, or chalk pits, the nature of the subsoil can often be learned, even without using a spade; and if his conclusions are based on a real examination of the land itself, the valuer is not liable to be misled by the results on vegetation of peculiar seasons, or the particular time of year when he sees the land. And when he has the opportunity of fairly testing his results by the crops, he will not find that he has been misled.

There is one science which is often spoken of as having an important bearing on the profession of a surveyor, but I have never seen any practical suggestion of how it can be rendered really available in the valuation of land; and that is, the science of geology. I am, however, myself, fully convinced that although a very complete knowledge of the science in all its details is not useful for the purpose, a knowledge of its general laws—the distribution of the strata, their order, thickness, general direction and dip, and a sufficient acquaintance with each to recognise it in passing across the country—is exceedingly useful in land valuing, provided the surveyor knows how practically to apply it. Mr. Bravender, in the paper before referred to, has taken great pains in preparing a careful and interesting enumeration of the soils found on each formation, and states whether they are barren or fertile; but as the practical result is that almost all of the formations contain both barren and fertile soils, I fear that all the

information we derive from that mode of treating the subject, if we consult a geological map before setting out on a valuation, is only a general idea of the sorts of land we are likely to find; but no real assistance in actually valuing it. It must be borne in mind that geological classification is chiefly palæontological and not mineralogical; and, even if it were, the various beds do not always come to the surface, but are overlain by all sorts of surface deposits, from small accumulations of soil in hollows to vast deposits of overlying drift. And the surface soils are often so mixed and varied, that most of the formations have both fertile and barren soils, according to the various mechanical conditions resulting from the accident of their particular position. I have been led to think, in the course of my observations of the soils on the various strata, that this subject is susceptible of an entirely different treatment; and the use to which I propose to apply geology in land valuing is to correct and modify the results of a direct examination of the soil, according to certain known characteristics of the various formations. Thus, to begin with the clays and heavy soils, which are the most easily compared. These consist principally of alluvial clays, the London and Plastic clays of the Tertiary system, the Weald, Kimmeridge, Oxford, and Lias clays, and the new red marl of the secondary system; the clays of the coal measures, and those weak clay soils devoid of lime, found amongst the Silurian and Cambrian systems, besides the prurer clay formed by the decomposition of granite. Now clay soils, on each of these formations, comprise a considerable range of difference, as respects consistency or texture, and depth; and it is not difficult to find specimens of soils in different formations, which, in these respects, and even in colour, and in everything that can be judged of by touch or sight, are as nearly as possible alike. What I have observed and am disposed to allow for in making valuations is, that, under these circumstances, there are certain formations, the soils on which will be of better quality, and others where they will be worse than they appear. The alluvial clays are, no doubt, the most fertile, even when judged by this standard, as one may well be led to suppose likely, considering the large proportion of organic matter which they generally contain. Next to them I should place the Lias clay. This formation comprises some very stiff, poor, thin-skinned land, as well as much that is better, and some of the best Leicestershire pastures; but when it is had it always looks so, and is, I believe, always more fertile in proportion to its texture and depth than some to be afterwards mentioned. It will be recollected, that this formation is associated with the Lias limestone containing all the great saurian fossils, and a very small per centage of phosphate of lime, in addition to an ample supply of the carbonate, may possibly account for what I have observed. The London clay also, though not in so great a degree, may be said to incline to fertility; and it will be noticed that this also rests upon a carbonate of lime in the form of chalk, though it does not possess the same supply of fossils. The Oxford clay, on the contrary, which bears the same relation to the middle oolitic series that the Lias does to the lower one, is certainly of a barren nature in comparison to either it or the London clay; i.e., a soil on the Oxford clay will be found slightly less productive than one of the same consistency and depth on either the Lias or London clay. I can offer no satisfactory explanation of this fact, but I feel sure it is a fact. Still more are the clay soils of the Weald of Sussex and Kent of an infertile nature; although they contain small deposits of shelly limestone, called Petworth or Sussex marble, this deposit is, probably, generally deficient in lime, whilst it is often associated with ironstone; but whatever the cause, I know that stiff and poor as it often looks, the Weald clay is even less fertile than its texture would indicate; and that a valuer, accustomed to other formations, will do well to make his calculations with great caution on entering the Weald. Of the other soils mentioned, the red marls are among the most fertile; the plastic and Kimmeridge clays do not occupy large areas, but most nearly resemble the London and Oxford clays respectively; the clays of the coal measures are often very poor, and those on the slate rocks especially so.

The lighter soils are not so easily compared, because they do not so closely resemble each other in appearance and texture. The similarity between two different clays is much closer

than, for instance, that between a light soil resting on the chalk containing flints, and made up chiefly of sand, gravel, and chalk; and one resting on the oolitic rock, containing small pieces of brown limestone, which, though a light thin soil, is in reality composed of particles of clay mixed with limestone, with only a small proportion of sand. Still, I think, some comparison may be made; and, I believe, it will be found that the same fertility observed in the Lias clay is preserved throughout the whole of the lower oolitic series, even to the great or Bath oolite; although Mr. Bravender, whose residence is near the worst part of it, instances this as a noted specimen of barren land. But, although its average rental value along the Cotteswold Hills is low (probably considerably below 1l. per acre), if its extremely shallow soil, lying on a hard rock for subsoil, on the tops of those hills, be considered, I think it is evidence of the wonderful property of this ruddy rock for retaining moisture, that the crops are not hurt up, as they certainly would be with a gravel or sandy subsoil, with only a similar depth of soil, which on the chalk would form hardly more than down land, and on slate rocks be almost worthless. And on other parts of its range, on Lincoln Heath, not to say in Oxfordshire and Nottinghamshire, its rental value rises to very respectable figures.

The narrow belt of inferior oolite sand between the Bath oolite and the lias, which runs through England, from Gushborough in Yorkshire to near Crowken, Sherborne, and Yeovil, in the south-west, is everywhere singularly fertile, and forms some of the best light, deep, arable land in the kingdom. This formation, again, is singularly full of fossils, and, like the adjoining lias, I suspect that it contains a trace of phosphate of lime. The sandstone of this formation contains the celebrated Cleveland iron, and I believe it is in great measure due to its containing a certain portion of lime that the iron can be made from it so economically, although it is not enough to supersede the use of other limestone as a flux. The green sand also, associated with the lower chalk, is essentially fertile; whilst the Hastings sand and ironstone of the Weald of Sussex are essentially barren.

I am not at present able to carry these comparisons out with certainty through the remaining varieties of light land, and therefore must be content to leave these notes somewhat imperfect on that point. This mode of comparing the different strata is one that has occurred to me, and which I have never heard suggested by any one else, and possibly it may be considered as fanciful; but I am rather desirous of calling especial attention to this part of my paper, because I should be much interested in hearing what others think of it.

In addition to those enumerated, many other signs of good or bad land are often pointed out, but I believe most of them naturally result from what has been already stated. Thus the size and colour of the stones in light stony soils is often much thought of, and there is no doubt that in the chalk, small water-worn gravel stones indicate a thin gravel immediately below the surface; whilst larger flat flints, though they make the ground look more stony, and cover a much greater surface, are split off by the plough from a more solid layer of flint below, which may have a very useful soil over it. Again, the colour of soils is often spoken of, but it varies so exceedingly in both good and bad land, that all I am inclined to say about it is, that the darker coloured soils usually contain the largest proportion of "humus" or vegetable matter, which is generally an advantage, but, like all things else, may be in excess, as in peat soils.

To sum up, then, my ideas about the indications of the intrinsic value of a soil—I think the valuer should form his conclusions primarily from an examination of the soil itself, as to its mechanical composition, depth, and subsoil; then he should modify these conclusions by his knowledge of the geology of the district, and check and confirm them by all the botanical evidence his observation may collect. By carefully carrying out this method, I believe he secures himself from being misled, either by high or low farming, dry or wet summers or winters, different seasons of the year, or any other causes, which are apt to affect the appearance of the surface, and sadly deceive those who look at what is upon the land, rather than at the land itself.

Having determined the intrinsic value of the soil, there are many other things to be considered before arriving at the rental value of a farm. One of the most important is the situa-

tion of the lands with reference to the homestead, a compact farm with a homestead in the centre being much more economical to work than one where the lands are scattered. But if the valuation be for the purpose of sale and not for letting, it will be well to recollect that what is inconvenient for one occupier may have a special value for another, and that a simple re-letting may bring each enclosure to its full value. The sizes of the enclosures and the quantity of land lost in wide fences may also be noted; but small fields generally imply small tenants who pay high rents, so that, practically, the great loss of space and labour resulting from too numerous hedges does not usually fall on the landlord. The particular position of a farm with reference to markets and railway stations, and its having a ready access by good roads, are very important points; but since, with our present railway system and easy communication, the values of the principal agricultural products are pretty nearly equalized over large areas, the rental value of the same quality of purely agricultural land, devoid of any accommodative character through proximity to towns or otherwise, will not be found very greatly to vary throughout the country, except in those districts where a marked alteration in climate materially affects the character or quality of the produce.

There are favourite counties where the number of years' purchase obtained for an estate is increased by competition, but I do not think the rents that farmers give vary to the same extent for similar land.

The elevation above the sea level and the climate make a great difference if the valuer's observations are extended over a sufficiently wide area. In the south-eastern and Midland counties the variations are not important. All along the west coast the dampness of the climate materially affects the course of husbandry, and gives a great preponderance to grass land.

The aspect should be noted. It is, of course, desirable that land should slope to the south rather than to the north, so as to receive the sun's rays at a larger angle, but it must be remembered that any steep slope is objectionable in whatever direction it may be.

Of the drainage of retentive soils I say nothing here, because, in the examination of the land itself, it will, of course, be ascertained whether it is dry (naturally or artificially), or whether it remains wet; but any liability to flood should be carefully allowed for. The character of the farm buildings, the presence or absence of hedgerow timber, adjoining woods, game and rabbits, are also modifying circumstances of importance, enough to occupy more than one paper for themselves, and I merely allude to them to show that the subject is not complete without them. The whole subject is one that must be very interesting to many of us; but it depends so entirely on personal experience and judgment, that it is very difficult to convey much information upon it in a written form. Still, I believe, that every attempt to reduce one's ideas to a systematic shape must be useful, if only that it tends to help us the better to arrange our observations, so that more of their results are permanently preserved in the mental storehouse for future use.

RIVERS POLLUTION AND SEWAGE IRRIGATION.

KINGSTON-UPON-THAMES.

THE important questions, how to diminish the present gross forms of rivers pollution, and how best to apply liquid town-sewage to agricultural purposes, require answers. Towns which pollute streams with their sewage are actionable at common law for such abuse, and Parliament has, in some degree, provided a way of escape through the powers of the Sewage Utilization Acts recently passed. Both questions are complicated in many ways. Some rivers are polluted by manufacturers as well as by towns. If, therefore, rivers are to be conserved from pollutions, there must be official supervision armed with powers covering the entire areas polluted (town and country), and capable of coercing all polluters and obstructors of streams.

Experiments and experience have proved that irrigation of land under grass cultivation is the most effective mode of purifying town-sewage; the real difficulty being, to find sites suitable for sewage farming, and means to convey the sewage to the land. There are evidence and experience enough to prove that sewage farming need not cause any nuisance injurious to human health; as, also, that where land can be obtained at even

an extravagant agricultural price, the operation may be made to pay; but there must clearly be a limit to the price to be paid. Land near large towns for instance, studded with houses (villa residences), surrounded by ornamental grounds, will not be available, for two reasons: firstly, local opposition; and, secondly, cost. Local opposition, in fact, means "cost." There are hundreds of acres of land surrounding large towns now letting at agricultural prices, but which would only be sold at building land value; that is, land letting at annual rents, from 3l. to 6l. per acre, but which would only be sold at 500l. or 1,000l. per acre, and under a forced sale after heavy costs. These things being so, no town would be warranted in paying such prices for a sewage farm.

The Kingston-upon-Thames Corporation proposed, recently, to acquire 150 acres of the "Ham Fields," stretching along the margin of the most beautiful portion of the Thames, partly above and partly below Teddington Lock. On the opposite side of the river stands Twickenham, and on both sides there are large mansions, which are inhabited because the district is open, beautiful, and free from manufactures and the suspicion of nuisance. The proposal of the Kingston Corporation has, however, set all these owners of property and residents in the district in violent opposition; and numerous signed memorials against the scheme have been received at the Home Office. An inquiry has taken place, and the Kingston Corporation proved certain well-known facts with respect to properly irrigated land—namely, that the effects and results of sewage irrigation are not necessarily injurious to health.

The land proposed to be taken in subsoil and surface soil was proved to be suitable for sewage irrigation—this portion of the valley of the Thames being alluvial, that is, a loamy gravel.

The Croydon witnesses on behalf of the Corporation proved that fresh sewage, applied to such land in proper volumes, would produce heavy crops of Italian rye grass, and would not create local nuisance nor disease.

Land valuers on behalf of the Corporation estimated the estate at 32,000l. (less than 150l. an acre), and the necessary works were estimated at 11,000l. The land is "freehold," subject to "Lammis rights;" and it was stated that in effecting a purchase a hostile lord of the manor and hostile commoners would have to be bought out. Evidence was given, in cross examination, that land in the immediate neighbourhood had been sold at prices varying from 500l. up to 1,000l. per acre; and that such prices would be contended for if the question of a forced sale ever came before an arbitrator. The opponents, however, declared their intention of resisting the purchase of this land for a sewage farm, by every legal means, at any price. Supposing that the Secretary of State assented to the preparing of a provisional order, this would be opposed on the "second reading," when it must go before a "select committee," and all the evidence, they said, and all the cost would be again incurred; and further, supposing the bill to have escaped this ordeal, there would be violent opposition in both Houses of Parliament, and according to any reasonable doctrine of chances, defeat would be certain. Evidence, it was stated, would be tendered by the opponents to prove that land can be obtained in the neighbourhood free from the objections raised against Ham Fields, as also that combination with other districts would make the proposed sewage irrigation works better and cheaper for all parties.

Those members of the Kingston Corporation who promoted the scheme profess to be angry with the Home Secretary for declining to sanction a prolonged inquiry; but when there is time for cooler judgment this feeling will doubtless wear away. There are two sides to most questions, and more than one way of parties interested looking at them; an official, however, ought to arrive at his opinions, if possible, free from bias, and then decide fearless of either praise or blame. The Kingston sewage irrigation would undoubtedly have saturated the subsoil of 150 acres opposite to a portion of the river drawn upon by the great water companies for the supply of London, and suspicion would have been thrown upon all the local wells. One of the open spaces in the most beautiful part of the Thames would thus have been vitiated by sewage utilization. The question, as may be learned on reading the published evidence, ceased to be one of nuisance or no nuisance, and became one of relative cost, in the first instance; and, if the corporation like to put it

so, of sentiment on behalf of the local proprietors. But besides the resident objectors there was a loudly-objecting public, in the persons of many commoners, who reasonably objected to the enclosure of so much open common land, over which, from time immemorial, there have been Lammis rights. Town sewerage and sewage farming are both necessary; but town authorities, in selecting sites for sewage irrigation, ought to have regard to local feeling, probable cost, and to public convenience. The margin of the river Thames opposite to Twickenham and parallel with Ham village ought not yet, at any rate, to be selected for town sewage farming.

THE DRAINAGE AND HEALTH OF LEICESTER.

WE have received, amongst other letters on this subject, and in reply to recent observations in our pages, one from Mr. E. S. Stephens, the borough surveyor, and another from one of the inspectors of the Leicester deep sewer works, who signs himself "Not Ashamed of my Job." The facts stated in our article of the 27th of March were derived from the report addressed to the members of the highway and sewerage committee of the town council of Leicester, signed Jas. Thompson, and dated February, 1869.

Mr. Stephens in his letter complains of the statement that the "sub-committee, in a great measure, traces the extraordinary death-rate from diarrhoea to radical defects in the main sewer of the town." The report gives three conclusions at which the sub-committee arrived in tracing the cause of the mortality from diarrhoea.

The 2nd conclusion is, "The inefficiency of some of the main sewers in carrying off the daily supplies of fecal and other offensive matter conveyed to them from the houses by side drains." To this are appended the following remarks:—"It will be in the remembrance of some members of the highway and sewerage committee that the main sewers were laid down by contract; that the contractor found his bargain unprofitable; and suspicions were entertained at the time that the work was done on incorrect principles—the lower tiers of bricks being laid in without mortar. In consequence it would be found, I firmly believe, were investigation to take place, that many of the sewers are nearly filled up with silt, and hence the sewage matter chooses them up, continually evolving gas of a most injurious description, which forces itself up the side drains into the houses, through the imperfect arrangements made for trapping the pipes in sculleries, and kitchens, and cellars."

Conclusion 3rd is, "The introduction into wells, by percolation, of the emanations of cesspools, the water being drunk by the inhabitants of the locality, and thus occasioning the disease."

Among the remedies proposed, No. 2 is "The taking up of the brick sewer by degrees, when proved faulty, and the substitution thereof of the pipe sewer. At Liverpool, I hear, a pipe sewer, nine miles long, is in course of construction." No. 4 is "The prompt discontinuance of the use of well-water in all quarters where the contact is near with the lower parts of cesspools, and other similar places of deposit."

At the end of the report is printed a letter written by a friend of Mr. Thompson's, and an eye-witness of the construction of the main sewer. The following is an extract from the letter:—"You will remember that Mr. Bown was appointed inspector, and it was generally understood that the appointment was to be a sinecure. When the sewer was being made, I was induced, by the rumours afloat, to go with a friend to see with my own eyes whether they were being laid without mortar. I went to some streets between Belgrave Gate and Humberstone Gate, and saw in a number of places that the lower half, at least, of the sewer was laid without any kind of cement; that a small quantity of mortar appeared on the top of the completed work; and that filling in with earth had commenced, so that the work was visible in all stages."

The suggestion as to the cause of this defective construction, is also contained in the same letter appended to the printed report, and is not as stated by Mr. Stephens, a sage suggestion of our own.

Mr. Stephens says the only inference he can draw from our observations is, that the writer "must be a large shareholder in the water company, and that his desire is to frighten the public into taking his water." Mr. Stephens evidently knows nothing of the *Builder*.

THE ARRANGEMENT OF FARMSTEADS.

At a recent meeting of the Tarporley Agricultural Society, Mr. R. Beckett, of Hartford, read a paper on "Cheshire Farmsteads," which contained suggestions that may be usefully attended to in other counties. We therefore print the pith of it:—

I have nothing particularly novel to propound, nor do I claim entire originality, either in the matter of this paper, or the plan accompanying it; so far from this, you will often find me indulging in quotations—of which I am fond—for when fitting they are as "grains of wheat in bushels of chaff." And as to my model plan, you will find many of its features in one or other of the other plans exhibited, whose authors' names are attached to them, and whose consent I have for bringing them before you. I have not the least intention of adding to the number of *unpractical* practical suggestions—which abound already—in proof of which I may say, that, although this model plan has not in its entirety in any particular case been carried out, yet in one place or another its main features are those of buildings I have myself erected within the last fourteen years, and have more or less received the approval of experienced farmers.

If I am asked what is the best advice I could give to those about to build, it would be something of this sort:—As "understanding a thing is half doing it," be thoroughly satisfied before you lay a brick that the plans not only show the accommodation you want, but that it is well and conveniently arranged for its purpose—ever remembering that as the area covered is a criterion of cost, so let as little room as possible be given to unnecessary passages and useless places. It is easy to correct what is wrong before you begin; it is not so when built, for then needless additional expense must be incurred or there it must remain, it may be, to the discredit of all concerned.

Then, if you build by estimate, be prepared with something more than the sum first named, for depend upon it there is truth in the old adage, "The charges of building and making of gardens are unknown." Rely more on the character of your tradesmen than on figures; and, above all, what you do build, build substantially. Give your orders as long beforehand as you can. To delay them until spring is advanced, and then to insist on the work being done in the few summer months, perplexes an employer, is injurious to the employed, and leads to disappointment and loss. Moreover, "God and quickly seldom meet." Shakspeare says:—

"When we do mean to build,
We first survey the plot, then draw the model;
And when we see the figure of the house,
Then must we rate the cost of the erection,
Which if we find outweighs ability,
What do we then, but draw anew the model."

As the tenant is the most interested in the convenience of the buildings, it is but right that his opinion should be taken; and, indeed, so far as my experience goes, it generally is. But still I am no advocate for the sort of parliament which the Chronicler of a Clay Farm has so humorously described:—"The landlord, the tenant, the bricklayer, the carpenter, the workmen, and last, not least, the gaping neighbour, each has his opinion, and gives it freely enough. The result is generally a mongrel compromise between them all. No one voice, no one plan is predominant; and by the time the whole outcry is spent, the job is half a job, and the ship is expedit for a haporth of tar and an ounce of oakum! The extreme of cold, as well as the extreme of heat, will leave a lister on the fingers."

Position.—When you possess the power of choosing the situation, Lord Bacon's advice is, "Avoid ill ways, ill markets, and ill neighbours." The two last are, perhaps, greater ills than the first, and not easily avoided. Good accessible roads are unquestionably a greater consideration than central position, which writes on this subject have theorised so much about. Another authority says, "A house built in low or flat ground by a river side, makes work for the physician, apothecary, surgeon, coffin-maker, and grave-digger," so there is more in this question of locality than we are disposed to think.

Site.—This, as well as the last, does not often happen to be a matter of choice, but when it does it is just as well to recollect what an artist has said, "None but a fool would build a house on a hill unless there was another hill behind it as a shelter against northern storms." But there is one very material consideration these wise men

have not mentioned, and that is, a constant and abundant supply of good water, a *sine qua non* about a farmstead.

Aspect.—This, at any rate, in new buildings, can and ought to be considered. If in other dwellings comfort and health are affected by it, in a Cheshire farmstead, there is the other advantage—usefulness. Aspect is, to some extent, as necessary in a *farmhouse* as in a *greenhouse*, for if there is a manufactured article one may call vegetable, and which requires treating as such, it is cheese. The best front aspect is south-east; north and east are cold and cutting, south and west hot and wet. A reference to the plan before you will best explain what I deem the best disposition of the different rooms. The living-room is on the south-east, kitchen south-west, and the milk-house on the north and north-east. Of a milk-house Professor Voelcker says, "It should be dry, well-ventilated, and protected from the rays of the sun."

Arrangement.—Here again, I must refer you to the plan, mentioning only some of the points which strike me as important. As "One eye of a master is said to see more than ten of his servants," the living-room, with master's bedroom over it, should command a view of the farm-yard. A good sized back or working kitchen, with a soft-water tank under it, is provided. In this kitchen, the bulk of the rougher work and cheesemaking are done; the best kitchen being more of a dining and general living room for the servants.

Over this working kitchen I have placed the cheesemaking room, or rather rooms, for the smaller the room the more uniform the temperature. No farmhouse, at any rate, ought to be without a second staircase, if only for the complete separation of male and female dormitories. Good cellarage is indispensable; and attics, where the elevation will allow of them, are a great convenience.

For the arrangement of the farmery, I consider the cruciform plan as best adapted for our purpose, the double cow-sheds forming the main leg; the root-house, with chopping-room over it, filling in the intersection between this and the young stock sheds on the one side, and the cart and implement sheds on the other. Dutch hays have of late entirely superseded the old lock-up barns. These are placed against the root and chopping houses. Over the cart and implement sheds is the granary. Stables and loose boxes form a wing on the south-east side. Piggeries, yards, as well as sleeping sheds, should, I think, be roofed in, but open on at least two sides. Pigs, from their general treatment, might appear to be considered an exception to all other animals, which thrive and fatten best when sheltered and warm. A covered pigsty has also less of "rank compound of villainous smell" so common to open ones.

There are no lofts over the cattle sheds; the little convenience these may be being more than counterbalanced by their many disadvantages, such as injury done to the provender from exhalation, the health of the animals being affected by the confined space, and the discomfort to the milkers in hot weather. Add to this the danger of fire. I have known so many losses from fire traceable to these lofts, often from unprotected lights, that I wonder insurance offices do not levy an increased rate where they exist. Other depots for the provender must of course be provided in lieu of lofts. Liquid manure tanks, so popular a few years ago, are now, it is to be feared, very little cared for. Where they are not regularly emptied either for distribution on the land, or on to the manure, they are a doubtful advantage, for they then simply convert a visible and partial waste into an invisible and total loss. I do not recommend that the drains should be taken directly into the tank, but that they should deliver themselves on to the manure in the manure yard, which should be sunk for that purpose. The tank being in the opposite corner of the manure stand would thus only receive what the manure (or the next best thing, sand or soil, oarted in for the purpose) failed to absorb. The liquid should likewise be constantly pumped back again on to the manure or soil, and never be allowed to reach the overflow pipe.

A great want in our modern farmeries seems to be a sufficient number of good loose boxes for breeding and sick animals, and fair-sized straw-yards for young stock. That useful fluid, rain-water, is too often allowed to run to waste, instead of which I would provide a large underground tank, having a lift-pump and drinking-trough in the yard.

Stationary engines can hardly, in these days of locomotives, be said to be a necessity; and as "Tis use alone that sanctifies expense," I do not consider that engine-houses are a fair demand on a landlord's purse. Horse-power, both for preparing cattle-food and churning, is more economical in the long run. The rick-yard would, of course, adjoin the Dutch bays. I may mention here, I think it a too common practice to place this very near the buildings, for if a fire takes place, it results in the destruction of both buildings and produce. I have placed the higher building so as to protect the cattle-sheds and yards from the prevalent cold winds and wet.

Construction.—By this is meant both materials and their disposal. The strength of materials should always be proportioned to what is required of them, and of the two "stronger than strong enough," Tredgold, a great authority on this, says: "The strength depends more on the right position of the materials than on the substance." I will epitomise some practical points which suggest themselves.

All underground work, especially in wet situations, should be set in hydraulic mortar. Astbury, in this county, supplies an excellent quality of hydraulic lime. Good sand is essential to good mortar as well as good lime. External walls, especially of cheese-rooms and dairies, are better built with a cavity, thus resisting all external influences, whether from heat, cold, or damp. Brickwork can hardly be set too wet in summer, nor too dry in winter. Hereabouts we are not rich in good building-stones. Ramocorn provides a fair red sandstone, and Mow Cop and Biddulph Park an excellent grey grit. These last have but one fault, that is, the expense of working them.

In timber, there is nothing equals our famous oak for internal fittings to cattle-sheds, door-frames, and such like, especially as it is now much cheaper than formerly, iron having forestalled it so much in ship-building. For general purposes, American red and yellow pine are the best; American spruce is the cheapest and the worst. We have a maxim in carpentry which is worth remembering, namely, "kniss with wood, and tie with iron." All large doors, and those exposed to wind, should slide, where practicable.

For roof covering, tiles, although heavier than slates, have the advantage of being less costly; they are also slow and imperfect conductors of both heat and cold. All roofs should be spotted, and eaves and verges should overhang the walls at least a foot. Let there be as little to keep up in the way of external exposed wood and iron work as may be.

External Appearance.—It has been well said "houses are built to live in more than to look on; therefore let use be preferred before uniformity, except where both may be had." Both can be had, as we all know. It is well to remember "the difference of cost between good and bad building is very small, the difference in their appearance and utility immense." The architecture should be distinctive, that is, the appearance of a building should bespeak its character and use. The Elizabethan stylo is generally preferred. Much may be done by colour as well as outline. What dress is to an individual that colour is to an elevation.

Ventilation.—For a definition of this, I will quote from a lecture I heard a week or two ago, by Mr. Reid, ventilator, of Prescott. He says: "To define the word Ventilation—it is to be understood as being the due and suitable supply of air to any apartment or place not having free and unlimited communication with the open atmosphere. This definition therefore includes all buildings, and all parts of buildings: and the supplying to them of the most important and the most indispensable of all things necessary to sustaining the life and health of the occupants of such dwellings—for without clothing a person may live long, and without food may live days, but without air, life cannot be sustained even for a few minutes; therefore, air is the most absolutely indispensable of all life-sustaining substances. The definition also embraces the art and skill necessary to introduce such air in due quantity, at proper places, in a fit condition, and appliances to insure a continuous circulation into and out of every apartment.

So that, to be satisfactory, it implies ingress as much as egress—a free current without draughts. For admitting the air into cattle standings, a glazed drain tube, a little above the floor, pointing inwards and downwards, is not a bad expedient—the point of egress should be as high as possible. What are known as honnet-ridges, and louvre ventilators, are generally used

for the purpose. As to the ventilation of the rooms of a house, there is no doubt every room which is closed for hours together, should have two flues—one for smoke, the other for vitiated air. It certainly seems odd that we should devote such endless ingenuity and expenditure in securing the most perfect system of ventilation in our parlours and workhouses, and yet so entirely neglect it in our own dwellings. I cannot refrain from quoting here some remarks I met with a day or two ago on this subject—reflecting, though it does, on my own craft:—"The manner in which rooms are now constructed is, in my opinion, really criminal; one would suppose that every pains and care were taken to render them thoroughly uncomfortable and unwholesome as possible; they are positively as much like air-tight boxes as they can be. They have no properly-constructed inlets for fresh air, which is left to get in as it can through the chinks and crevices of ill-fitting doors or windows. It is a mercy, for the sake of their inmates, that the joiner does not more perfectly complete his work; were he so to do, the chances are that they would not 'live out half their days,' where the foul or respired air is guardedly retained as though tenacious of losing one's breath."

Light is only secondary to ventilation, and being cheaply come at, there is the less reason to withhold it. Continual darkness is without doubt injurious to sight, and so also is too glaring a light in front of an animal.

Heating of cheese-rooms either by hot air or hot water is the exception, and ought, we are told, to be the rule. The simplest plan, and I think the best, because the most easily regulated, is having a stove in the press-room, with its pipes passing through an aperture much larger than itself, in the floor of the cheese-room above.

Cost.—Bailey Denton, in his "Homesteads of England," a most admirable work, computes this at about 7l. per acre, which probably as an approximation is as near as one can hope to get; but it is evident this would vary in proportion to the extent of the farm. The number of cattle kept is so disproportionate to the acreage on different farms, that any average computation based on extent is necessarily very uncertain. The next thing which would follow upon cost—namely interest—is so unwelcome a theme, and so rarely brought into question in Cheshire, that we will, as the schoolboys say, "skip it," although, mid way, I am not a convert of those who seem to think a landowner is the only man in the world who should eschew an interest table.

I shall conclude with a few general remarks, which I hope you will not think irrelevant.

A landed estate has not inaptly been styled "an animal with its mouth ever open." It is, therefore, wiser to expect too little than too much.

There is one essential to a satisfactory homestead I have not yet mentioned, and that is, an occupant who appreciates it, and will see that as there is a place for everything, so everything shall be in its place. I care not how good and well arranged it may be, if misappropriation within and untidiness without are the rule, the effect can only be the reverse of pleasing. A good homestead without a good tenant is a lock without a key.

My views of what chiefly constitute a good Cheshire Farmstead are now before you, and all I can say is—

"If a better system's thine,
Impart it frankly, or make use of mine."

Most of you have the advantage of experience in the every-day working of them, which I have not; therefore, so far, your opinions are worth more than mine, and I trust you will not hesitate to give them as freely and candidly as I have tried to do. No one can be more interested in learning than I am, and none, I hope, more willing.

Notwithstanding we have in this country some of the best landowners, the best farms, the best farmers, and the best farmsteads in the world, we have a sufficient number of the latter, at least, which are so unworthy of the name of farmsteads as to render this subject worthy of our considerations.

The plan which the most successfully combines working convenience with economy of space, and the best facilities for manufacturing cheese and manure, must be the best, come from where it may.

Building Act.—It is understood that no endeavour will be made this session to obtain a new Metropolitan Building Act.

THE LIVERPOOL HEALTH REPORT.

THE usual annual report (for last year) on the health of Liverpool by Dr. Trench, the medical officer of health for the borough, has been printed, and we give a few extracts from it.

The average death-rate of the borough for 1868 was 2.91 per 1,000. The average during the previous ten years (1858 to 1867) was 3.2 per 1,000, or 3.1 per 1,000 more than in 1868. This is equivalent to a decrease of 1,552 in the number of deaths relatively to population, or, in other words, it may be regarded as a saving of 1,552 human lives when compared with the mortality of the previous decennial period. The deaths during 1867 were 14,513, or by seventy numerically less than in 1868; but if allowance be made for increase of population, at the rate of 1.68 per cent., then the returns of 1868 are more favourable than in 1867 by at least 172 deaths, or by a rate equal to 0.3 per 1,000 of the population. This decrease, though slight, is satisfactory, because the excessive heat and dryness of the seasons occasioned an unusual amount of infantile sickness throughout the country during the summer and autumnal months of 1868.

Zymotic diseases occasioned, during 1868, 3,944 deaths, and thus accounted for 27 per cent. of the total mortality from all causes. This rate is 3 per cent. more than what in ordinary years is found to be the proportional rate of zymotic deaths throughout the country; but it is 1.5 per cent. less than the proportional rate within the borough of Liverpool during the preceding decennial period.

Typhus and infantile remittent fever accounted within the borough of Liverpool for 841 deaths; or for 532 in the parish and 309 in the out-townships. The rate of their mortality was equal to 1.7 per 1,000 per annum of the estimated population; their per-centage rate relatively to deaths from all causes was 4.2 during the first, 3.8 during the second, 4.7 during the third, and 10.2 during the fourth quarter of the year. Their deaths included 432 males and 409 females; 239 persons below the age of 15; 231 between the ages of 15 and 30; and 371 above the age of 30.

During the months of August, September, and October, while summer and infantile diarrhoea were likewise extremely prevalent, there raged a wide-spread epidemic of the enteric type of continued fever. It first showed itself in the rural districts on the north and north-east of Liverpool, where, beneath a sandy soil of very moderate depth, the substratum is hoelder clay of great extent and thickness. Its attacks were not restricted to the weakly, the poor, the indigent, or the overcrowded; but, on the contrary, while it spared no class, its chief victims were the young and adolescent of families in comfortable circumstances. It was not on the whole a very fatal malady; its death-rate being much less than that of ordinary typhus.

The drainage of houses throughout the whole of the rural districts is at present necessarily imperfect. The land is flat, the clay substratum impervious to fluids, the subsoil water line near to the surface. The drains, such as they are, either terminate in cesspools, or empty into stagnant ditches, or enter the muddy and sluggish tributary streams of the river Alt, or allow their contents to percolate through the porous soil around the houses. In Bootle the sewers are unventilated, and notwithstanding the lessons so sadly taught by the death registry of Liverpool, the houses in that rising district are constructed in many respects without due regard to the principles of hygiene. The season was favourable to the injurious miasmata which result from vegetable decomposition aided by a high temperature.

The number of privies certified for conversion into water-closets throughout the borough, from July, 1863, to end of December, 1867, was 8,323; from January to December, 1868, both months inclusive, the number was 5,068.

The corporation, availing themselves of the provisions of the 29th Vict., cap. 28, have erected on land, purchased for the purpose, six blocks of tenements, containing in all 146 dwellings for the labouring class. The rents at which it is proposed to let the houses are extremely moderate, and the rent-charge includes sanitary and parish rates, and the water and gas used in the households. The St. Martin's Cottages cost, for site and buildings, 16,151l. They contain 84 two-roomed houses, at rents from 3s. to 4s. 3d.; 42 three-roomed ditto, 4s. to 5s. 3d.; 20 four-roomed ditto, 5s. 6d. to 6s. 6d.; gross total rents, 1,647l. 14s.

PROPOSED CHANNEL TUNNEL.

DUNGENESS TO CAPE GRINNEZ.

In a prospectus on this subject, Mr. George Remington, C.E., says,—

"The Wealden formation, consisting of very strong clay, beds of freestones, and freshwater limestone, extending from Dungeness across the Channel to Cape Grinnez; and having concluded that that was the proper course for the construction of the tunnel; I at once proceeded, at considerable expense, to prepare plans and sections, and laid them before the Board of Trade, the Minister of Works, Paris, and also placed copies in the hands of many noblemen, including the Earl of Derby, the Duke of Richmond, the Duke of Sutherland, and others.

The line is intended to commence at the town of Lydd, where it will join the branch railway from the South Eastern at Appledore. It will descend from Lydd at an inclination of 1 in 70, the distance of 31 miles to the point of Dungeness, where the level of the rails will be 249 ft. below the level of low-water spring tides; the rails would then rise from Dungeness shaft at the rate of 1 in 3,795 for about 7 miles, then fall at the rate of 1 in 1,200 for about 8 miles, to the centre shaft on the "Ridge"; from thence fall at the rate of 1 in 3,265 for 11 miles to Cape Grinnez, and then rise at the rate of 1 in 70, and 1 in 81, to join the French railways.

The height of the tunnel, as shown on the section, will be 30 ft. from the soffit of the arch to the centre of the invert, and there will be a clear headway of 20 ft. for the trains; the space between the rails and the invert will be occupied by a spacious sewer, running along the centre of the tunnel, and on each side of it two air tunnels, for the purpose of providing perfect ventilation. The width of the tunnel will be 25 ft.; it will be constructed of brickwork and masonry, surrounded with concrete, and also a mass of concrete will be placed upon the invert surrounding the air and drainage tunnels, and forming a bedding for the sleepers of the railway.

There will be three main shafts of large dimensions. The centre shaft on the "Ridge" will be protected by a break-water, formed of rubble and faced with ashlar; the other shafts are to be effected by means of wrought-iron tubular shafts from 8 ft. to 10 ft. square, or diameter, the inside strengthened with plates on the cellular principle. These piles will be provided with proper valves to regulate the ingress and egress of water during the time of sinking into position, and when sunk they will be supported by proper guy chains and tackle from anchor moorings placed in various directions around the piles, every pile forming a shaft of sufficient length to reach the entire depth of water and through the bed of the Channel down to the level of the tunnel. It is intended to weight the lower end of the piles, and to sink them into position on the principle of the angler's float. The water will then be pumped out by steam power, and the soil brought up from the interior and cast over on the outside, forming a cone round the pile; thus, very rapid progress may be made with the works according to the number of shafts put down."

Each temporary shaft, he estimates, will cost 19,800l. —

"Should it be decided on to employ ten intermediate shafts, it is quite clear that the tunnel may be carried on in twenty-six sections simultaneously, and, as the distance across the Channel is twenty-six miles, gives only one mile for each section, or two miles for a shaft; and, assuming only one yard advance per day for each heading, the whole works might be accomplished in 64 years; but by means of improved machinery for tunnelling I believe that much more rapid progress might be made."

He estimates the total cost of the works at 6,998,200l., and the probable net profit at 975,540l. per annum.

COMMUNICATION BETWEEN RAILWAY PASSENGERS AND GUARDS.

A PLAN, to some extent on the principle we have long advocated, of opening a way of personal communication for passengers who require it, while trains are in transit, has been invented by Mr. Henry Ledger, builder, Halms. The specification says:—"The object of this invention is the application of simple, inexpensive, and reliable apparatus, which cannot be tampered with, to railway carriages, in order that passengers may communicate or signal to the guard or driver of a train, and at the same time receive instantaneous personal assistance in case of necessity, whilst the train is in motion, from their fellow-passengers in any other compartment of the same carriage; and the application of this invention is also to afford a means of escape from any compartment, in case of fire or accident, whilst the train is in motion." The invention consists in providing a *thoroughfare of ample dimensions through the whole length of the carriages, and from one carriage to another, if necessary, by forming a doorway and fitting a door in each division or partition which now separates carriages into compartments, and, if necessary, in the ends of the carriages. These thoroughfares and doors are situated above the seats, and the doors are made to slide up and down in grooves behind the seats, so that when closed such doors give all the privacy to each compartment which at present exists. When closed, such doors are fastened by means of a self-acting hook, which is acted upon by a lever or series of levers connected to a rod running along the whole length of the roof of the carriage. In each compartment a chain is suspended, which is connected to an arm branching from the longitudinal rod before mentioned*

so that when such chain is pulled by a passenger, the longitudinal rod turns partially, and thus the hooks are caused to release all the doors in such carriage, so as to open up a communication through the sliding doorways between all the compartments. At the same time the doors in falling come in contact with two levers connected by chains, passing over guide-pulleys, to semaphore signals mounted on each side, or on each side of the roof of such carriage, so that such semaphores are thrown out to signal in which carriage the guard is wanted; whilst at the same instant the chains connected with the actuating lever of such semaphore are caused, by means of a peculiar clutch attached to them, to pull the ordinary cord or rope which passed from one end of the train to the other, and thus actuate the hammer of a gong situated either in the guard's van or on the engine, or both; or, if connected with the steam whistle, to cause it to sound an alarm. An indication is also given from which compartment the chain has been pulled, by means of a self-acting latch, which, when once released, renders it impossible to replace it in its original position without the use of a key made expressly to suit it. The whole mechanism of this apparatus is closed in so as to render it impossible to be tampered with.

An important provision of the Railways Regulation Act has now come into operation. Every train travelling more than twenty miles without stopping is to be provided with an efficient means of communication between the passengers and the servants of the company in charge of the train. There is a penalty of 10*l.* for each case of default, and passengers using the apparatus without sufficient cause will be liable to a fine of 5*l.*

In the Commons, in reply to a question, Mr. Bright said:—Some weeks ago a deputation of the principal railway companies north of London called at the Board of Trade, and recommended a new mode of communication between the guards and drivers, and between them and the passengers. After examining it, and hearing the statements of the deputation, the Board of Trade sanctioned the application of the system to those railway companies, and it is known as the rope system. As regards some other lines,—as, for instance, the South-Eastern, which does not generally, or even as a rule, run trains in connexion with the northern lines,—another system, called the electric, has been adopted, and sanctioned by the Board of Trade. If these means should not be found effective, then the Board of Trade will be ready to make such other recommendations and sanction such other plans as may be found more efficient.

NEWS FROM PARIS.

On the 4th inst. the veil which concealed the great bas-relief at the Louvre, representing Napoleon III., full size, on horseback, was removed. It is placed between the Lesdiguières and La Tremouille pavilions, above the public entrance to the court. This bas-relief is of bronze, set in white marble. Above there is an inscription commemorative of the termination of the works of the new Louvre, executed by order of the Emperor. He is represented in Roman costume, with naked legs and arms, and wears a crown of laurel on his head. It brings to mind the bas-relief equestrian statue of Henry IV. over the entrance-door of the Hôtel de Ville.

The Paris circular railway is at last wholly open to the public, the gap between the Courcelles and the Villette stations being completed. Three collisions have taken place on this line within a few days.

It must be very disagreeable for the owner or inhabitant of a house in an obscure street to be promised a first-class central street crossing his own, and to find that the new thoroughfare differs in level from his street to the extent of above 60 metres, or nearly 200 ft., a depth in which the Monument of London could be hid. The town surveyor calculated the difference of level as only a few metres between the old and new street, and tried to maintain it; but the *Sicéle* has proved that the most out-of-the-way carelessness combined with ignorance of municipal engineering has been allowed to prevail over the just complaints of the inhabitants. The Chamber of Deputies was lately occupied with this question, and a sharp but very wholesome discussion was the result. All persons who have visited Paris know the rue Neuve-Saint-Etienne-du-Mont,

now called the rue Rollin, leading from the rue Lacépède, near the Jardin des Plantes, to the Concarneau-Saint-Victor. This is the old street alluded to. Chroniclers inform us that Pascal died in this street, No. 22, in 1662; Descartes and Bernardin de Saint-Pierre lived in it; and No. 6 existed the convent of the Filles de la Congrégation de Notre Dame, where Madame Rolland passed, when a young girl, several years.

The new street (Avenue Napoléon) leading from the New Opera to the Louvre is in a very forward state. As it does not form an oblique angle, like the rue de la Paix and other streets, with the Boulevard des Capucines, it has been so laid out as to be opposite and perpendicular to the façade of the New Opera-house. Its length is 800 metres, and breadth 30 metres—about 100 ft.—and during its passage through the *Batte des Moulins* serious displacements of level of adjoining streets will have to be made.

M. Michael Chevalier, the well-known statesman, said, a few months ago, that, by the position of the Opera and the construction of the Place de l'Opéra, one of the finest streets in Europe—the rue de la Paix—was spoiled. One of the French periodicals has borne out the provisions of this great statistician; it says, "*La rue de la Paix, si belle autrefois, ne semble plus aujourd'hui qu'une façon de ruelle, à côté de cette avenue colossale.*" The same paper seems to exult in the commercial prospects of this new thoroughfare, basing the calculations on the ruinous price paid for land at the corners of the avenue. This amounts to 6*l.* or 7*l.* per square metre, or from 6*l.* 1*g.* to 7*l.* a square foot (taking roughly 10 ft. to the square metre); whereas at the Boulevards, even near the New Opera, rue Scribe, and elsewhere, the land is only worth 5*l.* a square foot at present, even for the new palaces there rising up.

On the 4th inst., the "Achille le Clerc" architectural competition was decided by the judges, the subject proposed being "A Monument to the Memory of Rossini." The prize was awarded to Mr. A. Dillon, pupil of M. Questel.

We learn from the *Journal Officiel* (late *Moniteur*) that during the last fifteen years only the collections of the Imperial museums have been increased by 45,000 objects of art, such as paintings, statues, antiquities, &c., owing to the good taste and activity of the Comte de Nieuwerkerke. Objects of the richest artistic value are lying in the streets all through Paris, but the administration has had as yet no place to put them in, and therefore did not buy. There is no excess at present, for the museum space now available in the Louvre is immense. There are, since the restoring of the building, 142 saloons, including the two new galleries on the quay. In spite of all these resources, there is not room for what is in the inventories. The minister proposes to place the surplus in churches and galleries of provincial towns for a certain sum.

SUBURBAN VILLAGES.

The ceremony of laying a memorial stone in connexion with the first village about to be erected by the Suburban Village and General Dwellings Company has taken place at Loughborough Park, Brixton. This company, which is under the limited liability principle, has been established for the purpose of building houses in healthy suburbs, for the accommodation of the many thousands of the industrial classes in our large cities and towns who are suffering from "overcrowding." The ceremony was performed by the Earl of Shaftesbury. The objects of the company are set forth in an address, with this preface or motto, taken from writings our readers know of:—

"'Overcrowding' means want of pure air, and want of pure air means debility, continued fever, death, widowhood, orphanage, pauperism, and money loss to the living. It should be needless now to give proof of its deadly doings."

The leasehold of the Loughborough Park estate was purchased from the Ecclesiastical Commissioners on very reasonable terms, and this has been laid out in plots for dwellings. The whole extent of the ground thus required is about 26 acres. It has been planned out in six main streets, each house having its garden in the rear. The houses, which are to be built on plans by Mr. Fife, the architect, are to be cottage dwellings in ornamental brick, and built in six, eight, or ten rooms, exactly as the shareholder and intending occupier may wish. The rules of the society are so framed that any one can purchase

his house at once on payment of the amount down, or in one or two years; or he may spread over his payment in the form of rent for seven, fourteen, or twenty-one years. Thus, if a shareholder selects a number one house, the price of which is 200*l.*, and pays for it by yearly instalments in twenty-one years, he would have to pay 19*l.* a year and twenty-one years' ground-rent at 3*l.* 5*s.* a year, so that at the end of the twenty-one years he would have paid 470*l.*; but, on the other hand, it must be recollected that at the end of his twenty-one years the house becomes absolutely his own property, and that for the same description of house elsewhere he would have to pay at least one-third more rent, and at the end of his twenty-one years have no more title to the property than on the first day he entered on his occupancy. Mr. Habershon is the chairman of the company.

The Earl of Shaftesbury, at the laying of the stone, said he firmly believed that the great want of the day in our large towns, and some parts of the agricultural districts, was a better domestic condition for the mass of the working people. The efforts which had been made to alter the old state of things showed unmistakably that the great mass of the people did desire improved dwelling-places, and he rejoiced that companies were being inaugurated to improve the moral and social condition of the working-classes. The present movement had his cordial and hearty support.

OPENING OF AN ART AND INDUSTRIAL EXHIBITION AT CARLTON.

The Art and Industrial Exhibition at Carlton, promoted by the rector of the parish, has been formally opened by Earl Manservants. The rooms are well adapted for the purpose, and by the supervision of Mr. W. Bailey they have undergone a transformation. Amongst the articles exhibited are a large number of the products of local industry, prominent amongst them being several varieties of hosiery. Prizes have been offered by the rector, Mr. Forester, to the residents in the parish. Among the contributions are a model of a cottage by a brickmaker, and a second one by a bed-ridden bricklayer, living in Norfolk-lane, Nottingham. Joseph Barnett, of Derby, a youth of sixteen, shows a model of a steam machine, to which the first prize has been awarded. There is also a model of Carlton Schools made to form a chieftain. Near the end of the room are some etchings by Mr. Parker, a Lincolnshire schoolmaster, scarcely distinguishable from steel engravings.

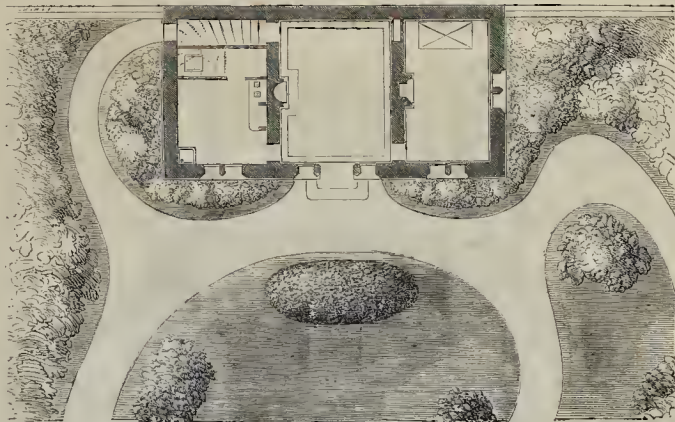
There is a collection of woods, all of which have been grown on the estate of the Duke of Rutland at Belvoir, and arranged by his grace's wood-reeve. There are specimens of various kinds of wood, from cedar down to hick-thorn, and the varieties and intricacies of grain are well brought out by the hand of the polisher. Among the varieties are English oak, knotted, twisted, light, dark, and diversified in size; sections of chestnut; and silver birch, elm, walnut, ash, maple, yew, alder, pear, cedar, mulberry, hawthorn, &c. The proportionate weight per foot is given, and also the soil in which each is grown, with other facts of interest.

THE WISBECH NEW CATTLE MARKET.

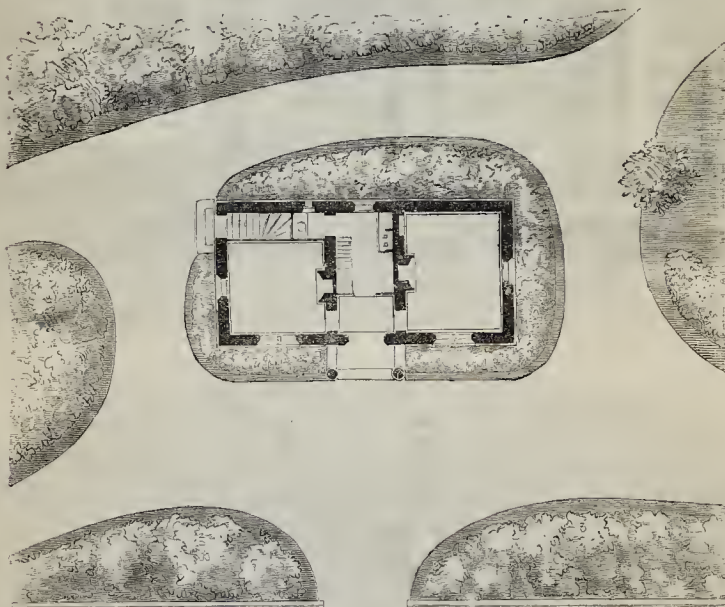
This market was opened on Thursday, the 1st inst., by the mayor. It stands upon the same site as the old one, and occupies about an acre, one-half being devoted to the cattle-yard.

There are two entrances, one for cattle and the other for sheep and pigs. The pens are of wrought iron, let into stone sills, and the cattle-stalls are wrought-iron rails with cast-iron posts. The pens and avenues between them are asphalted. The cattle-stalls are paved with granite squares, the roads and the cattle-yard being macadamized. There is also an asphalted walk, 5 ft. wide, completely round the cattle-yard, and a large watering-trough, supplied by the Waterworks Company, in the centre. A long covered shed is provided for calves and pigs, and an office which forms part of a Gothic front for the collector, and for settling accounts. The works were designed and carried out by Mr. Charles Mumford, C.E., the borough surveyor; the contractors being Messrs. Mellard, Southwell, & Co. of Rugeley, for the ironwork, 497*l.*; and Mr. J. J. Fast, of Melton Mowbray, for the other work, 1,199*l.* The market will accommodate about 1,400 sheep, 500 pigs, and 400 head of cattle.

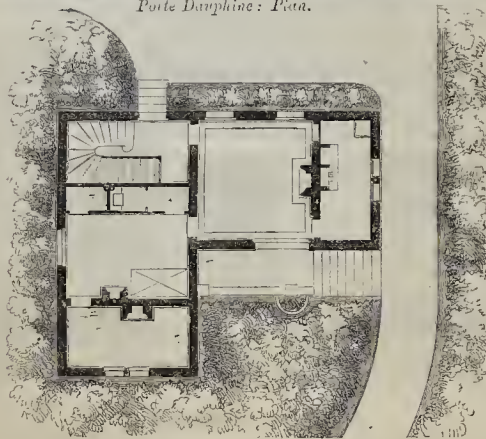
THE BOIS DE BOULOGNE, PARIS.



Porte de Passy: Plan.

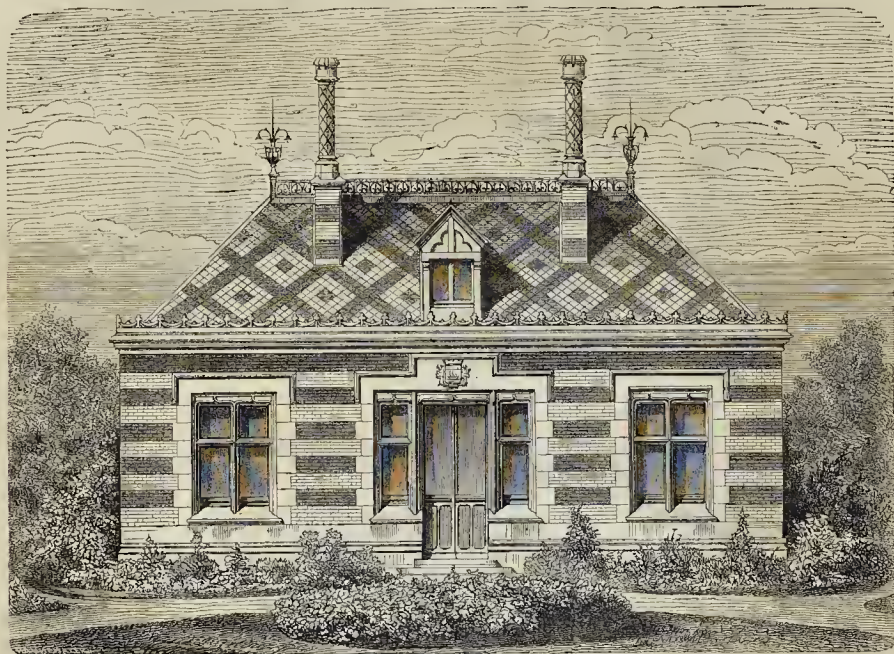


Porte Dauphine: Plan.



Porte d'Auteuil: Plan.

THE BOIS DE BOULOGNE, PARIS.



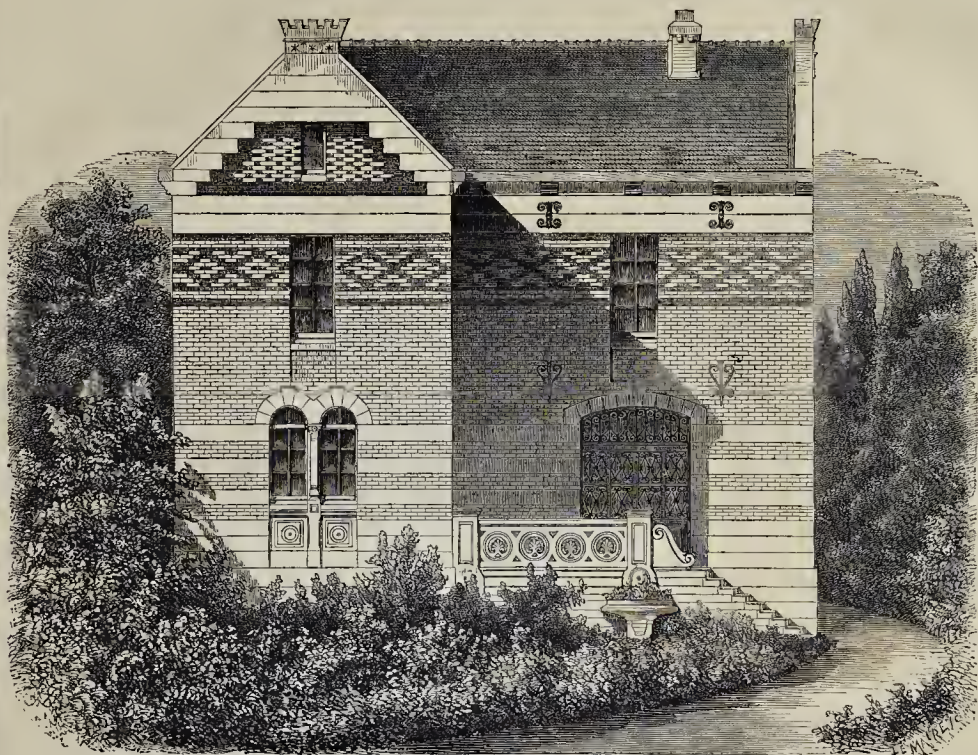
Porte de Passy.



Porte Dauphine.

[See p. 277, ante.

THE BOIS DE BOULOGNE, PARIS.



Porte d'Auteuil.



The Pool of Suresnes.



THE NEW NATIONAL GALLERY.

The correspondence relative to the appointment of the architect for the New National Gallery has just been printed, by order of the House of Commons, on the motion of Mr. Beresford Hope, M.P. It will be remembered that eleven architects submitted designs in competition for this work; and the judges, of whom Mr. Hope was one, reported that they were not prepared to recommend any one individual design for adoption; at the same time, they thought it "due to the competitors to point to the design for a new gallery by Mr. Edward Barry, and to that for the adaptation of the existing gallery by Mr. Murray, as exhibiting the greatest amount of architectural merit."

The competitors, on seeing a statement, which, we believe, we were the first to publish, that it was intended to make no selection from the designs, addressed a unanimous protest to Lord John Manners, then First Commissioner of Works, in which they said:—

"We agreed to enter the competition on the distinct understanding with your Lordship's predecessor, the Right Hon. W. Cowper, that one of the competing architects would be selected for employment; and we most respectfully represent to your Lordship that a contrary course would be a breach of faith with us, and would confer a lasting injury upon every one of the competitors."

And Mr. Cowper, writing at the same time to Mr. Austin, said:—

"The expectation held out to architects to induce them to compete has always been that an impartial decision would be made and published between the competing designs, and that the successful competitor would be engaged as the architect of the building, even though the identical design was not adopted."

In drawing the instructions for the Courts of Justice competition, we stated distinctly that the successful architect would be employed; but in framing the other instructions I thought it better to reserve a discretion on this point, because the vote for the building had not been passed by Parliament, and future proceedings must be subject to the action of Parliament; but I did not intend practically to place these competitors in a worse position than the others."

In inviting a limited number of tenders for works, the Office does not commit itself to accept the lowest, and yet there is a general understanding that the lowest tender will be accepted under all ordinary circumstances; and I suppose the competing architects must have understood that the one whose design had the award of the first place would be engaged."

The correspondence now printed opens with a letter from the Office of Works to Mr. E. M. Barry, A.R.A., dated 16th June, 1868, appointing him to be the architect for the New National Gallery. Mr. Barry, in his reply of 20th June, says:—

"In accepting the appointment, I have to express the high gratification it has afforded me, coming, as it does, after the report of the Judges of Designs in the recent competition, that of all the designs submitted to them, mine exhibited the greatest amount of architectural merit; and I have to assure the First Commissioner that this is the only point on which I am permitted to render the building suitable for the important purposes for which it is destined, and not unworthy of the nation as a work of art."

He further adds:—

"I shall be glad to be informed whether it is intended to proceed immediately with the new building."

This letter received from the Office of Works a reply, dated 26th June, which contains the following passage:—

"To prevent any possible future misunderstanding, the First Commissioner desires me to inform you, with regard to your remark as to the report of the Judges of Designs, that it was upon a consideration of all the circumstances attending the competition for the National Gallery and the Law Courts, that your appointment took place."

It is also stated:—

"I am to add that as soon as the ground is acquired, and the design approved of, it is intended to commence the building; and that instructions will shortly be sent to you, in relation to the communication with the trustees of the National Gallery, and of the National Portrait Gallery, with that object."

Mr. Barry remarks on the foregoing in a letter dated 4th July, 1868:—

"It is the first intimation I have received that the Government considered that there was any connexion between the competition for the National Gallery and any other matter; and I had supposed that my appointment as architect of the former was due to the fact that the Judges of Designs had decreed my design for a new building to possess the greatest amount of architectural merit; and to the statement of the competitors that their preference for the former was due to the belief that an understanding existed that one of the competing architects would be selected for employment. As, however, you refer to all the circumstances attending the competition for the National Gallery and the Law Courts, it may perhaps be permitted to advert to those circumstances, as far as they affect my position. I was honoured by invitations to send designs to both competitions, in common with Mr. Scott and Mr. Street. The latter gentleman and myself furnished designs in each competition, and I was the only competitor who was distinguished by the favourable mention of the Judges in both cases."

Deeply as I appreciate the compliment of being appointed architect of the National Gallery, I shall have reason to regret having been placed in the position awarded to me by the judges of the two competitions, if I am to understand that in consequence of it, it has been thought right to appoint me to the lesser work, and to refuse me the opportunity of obtaining lasting fame and advantages, by having my name connected with the largest and most important public building of the age, in respect of which I have been specially recommended for employment (jointly with Mr. Street), by the Judges of Designs, whose award the competitors were told at the outset would be regarded as final by her Majesty's Government; and on the faith of which promise, I, in common with the other competitors, agreed to enter the competition."

The remainder of the Return is taken up with a report of the trustees and director of the National Gallery, and by subsequent correspondence placing Mr. Barry in communication with the trustees and director of the National Gallery, the trustees of the Portrait Gallery, and the officers of the Department of Science and Art at South Kensington.

A pamphlet by the Right Hon. A. H. Layard, M.P., is also specially brought under the notice of the architect by a letter dated 16th Nov., 1868, before the recent change of Government occurred.

OUR ANCIENT MONUMENTS.

In the House of Commons Sir H. Verney asked the First Commissioner of Works to consider whether measures could be adopted to place the ancient monuments now existing in the country under the protection of some authority which might prevent their destruction. Mr. Layard said the question was one of very considerable importance. Not only had a great many royal and very interesting sepulchral monuments been allowed to fall into decay, or been removed or destroyed, but many monuments of great archaeological value had shared the same fate. This was not creditable to the country. In France and elsewhere care was taken to preserve such monuments as parts of the public property. When he (Mr. Layard) first came into office his attention was directed to the subject, and he addressed a letter to the Society of Antiquaries requesting them, if possible, to prepare him a list of monuments which they thought required public protection. That request was met in a cordial spirit by the distinguished president of the society (Lord Stanhope) and its members, and they had taken steps which would enable him to obtain such a list, and permit him to submit some proposal to the House for the preservation of such monuments.

He hoped to be able to do something in that direction, but could not conceal that there were some difficulties in the way of legislation on this subject, arising from private rights and property. A case, for instance, had recently occurred where a monument of great national value was destroyed in such a manner as, if the accounts in the newspapers were true, showed an amount of vandalism which one could hardly believe was possible in those days.

SOUTH KENSINGTON MUSEUM.

Sir,—In your issue of February 6th there appeared some observations by your contributor, "Art Lover," on the objectionable name which attaches to the museum at South Kensington. I quite agree with him and others on the point, but I object to it still more strongly on the ground of its being singularly inappropriate that a great national institution should be known by no other name than that of the locality in which it happens to be situated. We are told that "a rose by any other name would smell as sweet;" yet I can hardly conceive, that had the British Museum been called the Bloomsbury Museum we should have felt it so worthy and appropriate an appellation. The term "Art Museum" would neither be sufficiently significant, nor yet would it meet the case; for, as "Art Lover" suggests, it would "ignore the British Museum," whilst, of course, for many reasons, it would never do to divide the honours of the name with that grand and matchless collection. In the desirability of having a name for the museum at South Kensington which shall be at once "short, euphonious, and acceptable to everybody," "Art Lover" suggests its being called the "Albert Museum." Now, although that suggestion has been made some time, so far as I have observed or response has been made to it, and I, for one, take exception to it. I do not think there is any probability of the name of "Albert" ceasing to be honoured, nor any likelihood of its

dying out in the land, and, with all due respect for it, I submit that it appears to me inappropriate to apply to one of the distinctive and characteristic institutions of the country the name of any individual, however good and great he may have been.

"Honour to whom honour is due," is always desirable at proper times, and under proper circumstances; but in the case of a vast and ever increasing collection of works of art, the result of many princely gifts, of loans, and of immense cost to the country—which is maintained as a national institution at the expense, and under the control, of the Government of the country, and which has necessarily connected with it so many names which must ever be held in reverence and in honour—I do not think that a name of dignity and significance as to its ownership and its intentions should be given to it. It is the property of the nation (acquired by the gifts of many, and by purchase) for the general good, and therefore I would suggest that it be called "The National Museum." This appellation, I think, would meet all the requirements of the case. It is grand, simple, expressive, and appeals to the understanding of every one, whilst it is also short, euphonious, and not liable to any abbreviations; and we should then be following the precedent set us in the other magnificent collections of the nation, and should possess "the National Gallery" in Trafalgar-square, "The British Museum" in Bloomsbury, and "The National Museum" in South Kensington (in the latter of which is already included a part of the National Gallery).

BONUM NOMEN.

NEW HEAD-QUARTERS FOR 1st SUSSEX VOLUNTEER ARTILLERY CORPS AT BRIGHTON.

The old Eagle Foundry has been altered and converted into new head-quarters for the local artillery corps. The black frontage has been repaired and tuck-pointed. The gates open at once into the drill-hall, 106 ft. in length by 38 ft. in width; but on the left an orderly-room reduces the length of the hall to 88 ft. In the centre of the wall on the left-hand side of the drill-hall is a large opening, fitted with double sliding doors, forming the entrance to a gun-shed, 60 ft. by 38 ft., in which are placed four 18-pounder field-pieces; the room being amply sufficient to permit four detachments to drill at the same time, including limbering and unlimbering the guns. On the north side of this shed is an armourer's workshop. This room also affords space for the quarter-master's stores, and leading from it is the armoury, fitted with racks for 516 stand of arms. The arched roof and walls of the armoury are composed of masonry, strengthened by iron girders. The block of buildings described forms the northern and central portion of the premises. In the southern portion is a private room for the colonel and officers; and above are two rooms, one a reading and smoking room, 25 ft. by 18 ft. for the non-commissioned officers, and the other, 38 ft. by 25 ft., a reading and smoking room for the gunners. On the west side of the premises there is an eight-roomed house, which forms the residence of the sergeant-major. The work has been performed by members of the corps, at cost price,—that is, they merely charge for labour and material,—the carpenters' and builders' work being carried out under the superintendance of Sergeants Hilton and Bunting, upon plans furnished by Lieutenant Gouley (Gouley & Gibbins, architects), and the gasfitters by Sergeant Allen. The expense will not be covered by 1,000. The colonel advanced the money.

ABUSE OF LIBERTY.

Sir,—We boast of our liberty, and, no doubt, liberty is good if you know how to use it. Now, it seems to me there is a liberty greatly abused occasionally, connected with the province of the *Builder*, and that is the liberty which persons appear to possess of letting houses stand untenanted and running to ruin to the great annoyance of their neighbours. This has been the case for many years past of a row of houses at the corner of Stamford-street, Blackfriars; there they stand from year to year, in all their filthiness and dilapidation, a nuisance to the whole neighbourhood, simply because some crazy or crotchety wretch wills it, and there is no wholesome law to will otherwise. Oh, for a little wholesome curtailment of this unchastened liberty. H. W.

THE BELLS OF ST. MARGARET'S, WESTMINSTER.

ON the north side of the venerable Abbey stands the well-known and very interesting parish church of St. Margaret. Its tower contains a peal of ten bells, in the key of E flat; weight of tenor 26 cwt., & a clock.

During the sixteenth century this church, like many others, had only five bells for ringing in peal. But in the course of time these were increased to six, subsequently to eight, and at length to ten in number.

The following extracts from the "Churchwards' Accounts," indicate some of the various occasions on which the bells were formerly used:—

Table with 3 columns: Item description, Quantity, and Price. Items include ringing for Master Taysdale, the burial of Abbot Iltyspe, Christmas evens, the King's Graco, mending the second bell, ringing for joy of the great victory, the Queen's coronation, and various other church events.

Numerous items also occur for ringing on divers other occasions. See Nichol's "Illustrations of the Manners and Expences of Antient Times in England." to. 1797.

The bells now in the tower have no inscriptions besides the names or initials of founders, churchwardens, &c. I will, however, give a statement showing by whom, and when they were severally cast:—

- 1. Lester & Pack, London, 1761.
2.
3.
4.
5. Samuel Knight, London, 1739.
6.
7.
8. Pack & Chapman, London, 1773.
9. Thomas Mears, London, 1831.
10. Lester & Pack, London, 1761.

As I have said, the church at one time had a peal of eight bells, and it is probable that these were all made in 1739 by Samuel Knight. Be this as it may, it is certain that the last three of the peal were subsequently recast or replaced.

I may remark, in passing, that Samuel Knight cast the grand peal of twelve bells at St. Saviour's, Southwark, of which I gave a descriptive account in the Builder of June 13, 1868.

In 1761, Lester and Pack added two new trebles to the peal of eight, above mentioned, recast the tenor, and thus completed the present peal of bells, upon which ten members of the Society of College Youths rang, on the 6th of March in the same year, a true peal of Grand-airs Caters, consisting of 6,040 changes, in three hours and thirty-five minutes. This was the opening peal upon the ten bells.

Several remarkable exploits of change-ringers from 1751 to 1828 are recorded upon tablets placed on the walls of the heltry.

Certain members of the "College Youths," and other Societies, still ring here occasionally, Mr. S. Smith being the steeple-keeper.

The clock was made in 1712, by Laugley

* I have given the weight of this bell as generally reported; but, like that of many other tenors, it is, in my opinion, over-rated.

Bradley, from whose hands came that of our Metropolitan Cathedral, and now strikes the quarters upon the 3rd, 4th, 5th, and 6th bells, the hour being struck on the tenor.

Having personally surveyed the bells and heltry, I may state, in conclusion, that the above account will, it is hoped, be found more trustworthy than any other yet published.

I need scarcely say that the Rev. Mackenzie E. C. Walcott has given the best history of the church in question in his "Memorials of Westminster," Svo., 1851. THOMAS WALESBY.

THE TRADE-UNION COMMISSION REPORT.

SIR,—As the last Report of the Commissioners is issued, I hope you will think a few thoughts on the matter by a working man worth inserting in the Builder. It appears that the Report is not likely to please the unionists, and there are others who have some fault to find with it. For the first it is too definite; it proposes to clash with the primary objects of trade-unions, and would abolish their objectionable and oppressive features. The commonest of the press on the reports differ on almost every point; and if a workman thinks he can learn anything from them he will be disappointed. The portion of the Report which has been severe upon the report of the majority, and exceedingly kind to that of the minority, and would grant the unionists the sanction of the law to oppress those who differ from them.

I cannot see what is unfair or unjust in the report of the majority. It gives power to the workmen to combine, and would grant protection to the funds accumulated, provided their objects were not criminal. To my mind, the tale short, the report of the majority of the Commissioners differs much from the one by the minority, inasmuch as they would allow working men some freedom in the disposal of their labour, and would give non-unionists the right to gain a living, and to dispose of their article, labour, in the way they believe to be most conducive to their interests. It is generally acknowledged that we live in a free country, and that it is a citizen's duty to try and preserve it intact, and see that liberty and justice are not outraged or trampled upon by any portion of the community. Oppression in relation to labour has not yet been recognised by law, and the minority are certainly bold men in proposing that it shall be legal for a majority of workmen to starve the minority into conformity with their objects and views. Their report "recognises" that persons should be allowed to combine as to the men they will work for or for. No such combination to be penal, unless it has a criminal object, or uses criminal means." Upon the last point hangs all the objects of trade-unions. The Trades Commission proved conclusively there are men in this country who are troubled with oblique vision; who cannot see right from wrong; whose sense of justice is so blunted that they believe every one must, under pain of starvation, do as they do, and think as they think; these men could not, in our dignity and unjust proceedings, draw a distinction between what is just or what is penal. Broadhead and his followers thought their acts were glorious and commendable, and that the ends justified their crimes.

The question of combination, as to whom a workman or a number of workmen will work with or for, seems so commonplace, the difficulty to common minds seems to be so easily settled, that it is not worth any report at all. For instance, five men are working in a shop, and known as Jack, Bob, and Tom, Bill, and Joe. After working some time together in peace and harmony, they find they have it would be for their advantage to join a trade society. Bill and Joe, after due consideration, conclude their interests are best served by abstaining. The first three are not so satisfied with their decision, and find themselves extremely disagreeable, and at last determine that they shall not work with them, and by signing a round robin, or some other course, inform their employer of their decision. The employer is satisfied with the services of two men, and sooner than part with them, he would let the three first-named go, and would fill their places with others, but let all in their power to prevent the employer from getting others. The absurdity of the matter is, that the first three want to work for the employer, and yet will not because he employs others who will not do as they do. It is not then a question as to whom the trade-unionists will work with, but that all shops shall be union shops, and all workmen shall work upon the same conditions as themselves. Common sense would say that the three men, being dissatisfied with the employer's terms, would go away and find other employment; experience proves the contrary, and thus it is not a question as to whom they will work for, but that all employers shall keep their places open for trade-unionists, upon trade-union terms, and that outsiders shall not have permission to get a living anywhere in England. What the two or three commissioners want for their clients, and they might have concluded it in their report: it would have saved a deal of palaver and beating about the bush.—"We, the dissenting commissioners, recommend the Legislature to enact a law which will for ever endow the trade-unionists of England with a perpetual right to all employers and all shops, and that no outsider, no matter what his abilities or disabilities may be, shall trade in any domain, unless he forego his English birthright, and fulfil all the conditions the trade-union executives impose upon him." When that law is passed, as I suppose it will be as soon as the advanced Liberalism of the day will allow, as well as it is the fashion just now for advanced M.P.s and would be M.P.s to fraternize with trade-union leaders, and say such pleasant things together that commoners would suppose they were in the same business, I do not suppose the three commissioners will find what the consequences will be. At any rate, a large number of Englishmen in trade-union have already, as we would be reduced to starvation or pauperism, as there are several cases irrespective of the objection to trade-union rules, or trade dictation, which incapacitate working men from joining trade societies. In such cases, the question of health. The union requires a candidate to be in sound health, and pass the ordeal of a medical examination. There are many that would not pass such a scrutiny, and

yet are able to do a day's work as the others. 2nd. A candidate must be a competent workman. Whether that rule is intended to be carried out, of course I am unable to say; but I have seen some very incompetent society men as well as some of our trade-union tools, and it is open to conclude that it will be enforced. Then all incompetent workmen, according to trade-union rules and legal enactments, would be prevented from gaining a living. I might still farther illustrate this part of the question; and if I intended to allude to what I believe would obviate and abolish the idea of a necessity of trade-unions, and also to show some fallacies in connection with that part of the question, I hope to have an opportunity for that in another issue of the Builder. JACK PLANK.

GOVERNMENT CONTRACTS.

SIR,—I had hoped that some one "learned in granite matters" would have responded to the suggestion of "A Layman," and have favoured us with some explanation of the subject. As a step in that direction, I wish to call your attention to a report of the proceedings of the House of Commons, on Friday night, April 2nd. On the motion to go into committee of supply, Mr. Monk wished to say, "that those who were instructed to prevail amongst commercial men that it was of no use offering to contract for Admiralty stores, unless they had friends to support them. He had heard of cases of contracts entered into to supply articles, which, if there had been fair competition, might have been supplied for something less than half the amount. He knew as a personal matter that many houses refused to tender to supply the Government, believing they had no chance. Then there was another matter with regard to articles supplied to the Admiralty, and also to other departments of the service. It was left to the decision of a 'peer' whether the articles should be ordered or not; and he knew as a positive fact, that in many instances viewers had refused to receive articles, without assigning any reason whatever. He thought they should be required to give some reason." &c.

To the alarming statement, made by one of our great merchants, there was no response on the part of any one, and the House went into Committee of Supply at once, and voted away millions.

It will probably be objected that the Trinity Board is not the Admiralty, but I think it may fairly be referred to in one of the other departments of the service referred to by Mr. Muniz. Besides, the Trinity Board is not open quite as much to the inquiry of Parliament and the public, as I think it might be. But, if we are to do these things, we must expect them to be done in the dry." A CLERK OF WORKS.

APPRENTICES.

SIR,—Our trade has been inundated with apprentices, perhaps more than any other. A small master down at Brighton, for example, made it a constant practice to have more apprentices than journeymen—six of the former, and four of the latter, in one of his departments of the service referred to by Mr. Muniz. Was there anything right, commendable, or fair about this? Creating and carrying out a business principally by the aid of apprentices, their work and their premiums ranging from 0/ (parish) to 50/ (parish) there have been anything wrong in the journeymen trying in some measure to restrain and regulate this practice? Can you be surprised at their looking with disfavour on such a system? Their trade swamped, and they themselves compelled to be the means of bringing it about, neither the master nor his family having any trouble in the matter, —all out door apprentices. In other countries the same system has prevailed; not so bad now, I believe, as a few years back. From Norfolk, I hear of a case of five apprentices to four journeymen, and this carried on year after year. Can such a system be justified? Is it just to other masters in the same town? Do you not see that such a one could easily undersell another that was content with three or four apprentices to eight journeymen? Can you again ask, is such a system right? Do the public expect cheapness on such an unjust system? Can it produce a good feeling between employer and employed? It does not produce good journeymen, as of course their fellow-men have been antagonistic throughout their term of apprenticeship. ONLY A TAILOR.

POPULAR NEW WORKHOUSE.

At the last meeting of the Poplar Board of Guardians Mr. Morris, the architect of the proposed new Workhouse buildings, represented the necessity of appointing a clerk of the works. He also stated that he would be glad to be informed if the Board contemplated any ceremonial in connection with laying the foundation-stone of the new house, and if so, what day they would fix upon, in order that the requisite arrangements might be made.

The Board resolved to advertise for applicants for the situation, fixing the salary at three guineas weekly. They also decided that the barman should be invited to lay the foundation-stone on the 11th of April.

The Clerk said that, according to agreement, Mr. Morris had written to the Board on the 29th of March, in relation to the contract for the erection of the new workhouse.

Resolved that a cheque be signed for the amount. The Clerk then said that Mr. Dobson was ordered to pay of the sum of 182/ for taking out the quantities of the new buildings at 1 per cent. on the outlay. A cheque was also signed in payment of this sum.

ENGINEER FOR CALCUTTA.

The appointment of Assistant Engineer to the Municipality of Calcutta has been given to Mr. Thomas W. Gardner, C.E. We understand that Mr. Gardner was some years ago a pupil of Mr. J. W. Bazalgette, of the Metropolitan Board of Works, and that he has been recently engaged in assisting to carry out the drainage works at Olesca.

* This will be sufficient answer for the nine gentlemen who have written to us wishing to know where to apply.

ARCHITECTS' ACTIONS.

Fisher v. Jackson.—In this action, tried at Liverpool, before Mr. Justice Brett and a special jury, Mr. Quain, Q.C., and Mr. Charles Russell were counsel for the plaintiff; Mr. Holker, Q.C., and Mr. L. Temple for the defendant.

The plaintiff is an architect and surveyor at Birkenhead, and the defendant, formerly member for North Derbyshire, is the owner of a considerable quantity of building land in and close to Birkenhead. The defendant was in the habit of letting his land for building, under agreement to make advances from time to time towards such building. The advances varied, but did not generally exceed 50 per cent. of the value of the erections made. In 1865 the plaintiff was employed by the defendant to superintend the building with a view to certifying for such advances, and also to see that the buildings were conformable to the agreed plans. The plaintiff now sought to recover a balance of 166l. 6s. in respect of 38 houses and two shops and premises in Vulcan-street, Birkenhead, claiming to be paid at the rate of five guineas per house. The defendant's contention, on the contrary, was that he had made a specific agreement to pay 1l. per house and 2l. per shop. If this were correct, the plaintiff's claim had been discharged by the payments made. The cause was tried at the late Winter Assizes, where the jury disagreed, and it now came on for a new trial.

In the result there was a verdict for the plaintiff—Damages, 166l.

THE MEDALS AND PREMIUMS OF THE INSTITUTE OF ARCHITECTS.

At a special general meeting of this Institute, held on Monday, the 5th inst., the recommendation of the council that the Royal Gold Medal for 1868-9 should, with her Majesty's gracious sanction, be awarded to Professor C. R. Lepsius, of Berlin, was formally adopted.

The Institute medals and prizes were (also in accordance with the recommendation of the council) awarded as follows:—

The Soane Medallion (with 50l., subject to certain conditions of continental study) to Mr. H. L. Florence.

Mr. Beresford Hope's prize of 10l., for the design of a theatre in accordance with Medwari principles, to Mr. E. J. Roede.

The Institute Silver Medal, with five guineas, for measured drawings, &c., illustrative of Hatfield Hall and St. Peter's Church, Wimborham, to Mr. E. C. Wilberforce.

In the same competition, Medals of Merit to Mr. T. E. Williams, for drawings of the Abbey Dore; Mr. E. B. Ferrey, for drawings of Wingfield Manor House; and Mr. W. Howes, for drawings of St. Mary Overy Church, London.

The Student's Prize, in books, for the design of a gateway leading to a courtyard, to Mr. A. S. Bird.

The Institute Prize, for an Essay "On the Revival of Italian Art in England during the Sixteenth and Seventeenth Centuries," to Mr. H. D. Sheppard.

A Medal of Merit, for an Essay "On Timber," to Mr. T. A. Britton.

A special Prize of 10l., for an Essay "On Bricks and Terra-cotta," to Mr. E. Locke.

The formal presentation of the Royal Medal, Institute Medals, and Prizes will take place on Monday, the 10th inst., at eight p.m., after which Mr. W. V. Papworth, fellow, will read a memoir of the late A. Ashpitel, F.R.S.

THE TRADES MOVEMENT.

A MEETING of the members of the Manchester Court of Arbitration and Conciliation has been held at the offices of the Chamber of Commerce, in Manchester. There were present Messrs. J. M. Bennett, H. J. Leppock, and J. Slagg, jun., representing the employers; Messrs. W. H. Wood, G. Townley, and C. Swain, representing the employed; and Mr. T. Browning, secretary. Mr. A. Milne, who had accepted the office of president, took the chair. The court reconsidered alterations which had been suggested in the draft of rules, and these being finally determined, the rules were formally adopted. The court being now fully constituted, will meet quarterly for the despatch of ordinary business in the months of January, April, July, and October, or at such other times as are provided for by the rules. According to the rules as now settled, the Manchester and Salford Court of Arbitration and Conciliation will be open to all trades and occupations within the parliamentary boroughs of Manchester and Salford. The object of the court will be to arbitrate on any question or dispute relating to wages or other matters that may by mutual agreement be referred to it from time to time by employers and employed, and by conciliatory means to interpose its influence and put an end to any disputes that may arise. The court is composed of a president and sixteen members, eight to be nominated by the Chamber of Commerce, and eight by the Trades' Council, all to be elected yearly.

There is a strike among the masons at Welbeck. Several meetings of union men have been held. The Duke refuses to comply with their requests. Many are leaving the district, and it is anticipated that shortly the few who remain will commence work again. Men who do not belong to the union are set on when they apply.

At a numerously-attended meeting of employers of operative joiners held last week in

Edinburgh it was unanimously resolved that, taking into account the present state of the building trade and of the labour market, the request by the operatives for an advance on the current wages is uncalled for, and should not be complied with.

Paris is threatened with a strike of the men of all trades engaged in house-building. The men, it appears, require the masters to contribute certain sums monthly to their (the men's) charitable associations, and the masters resist. The men have nominated delegates to confer with the employers; but there is not much likelihood that an arrangement can be made. The workmen engaged in building operations are more numerous than those of any other trade in Paris. At the present moment it is said they are at least 150,000, and yet this is the period of the year at which building is least active.

STAINED GLASS FOR SHANGHAI.

STAINED glass is about to be forwarded to Shanghai, for a group of windows in the apse of the handsome church now being built there by the English residents, from the designs of Professor G. G. Scott. The subjects represented are—The Agony in the Garden of Gethsemane, the Carriage of the Cross, the Crucifixion, the Entombment, St. Mary Magdalene in the Garden, and the Angel announcing the Resurrection to the Three Holy Women at the Sepulchre. Each subject is surmounted with a small canopy laid upon a ground of rich colour. The windows are designed to commemorate the late Mr. George Henry Fitzroy, of Shanghai, and an inscription bearing his name is placed beneath the groups. The commission has been intrusted to Messrs. Lavers, Barrand, & Westlake, of London.

THE CLERK TO THE GUARDIANS OF KENSINGTON.

MR. SAMUEL CORNELL has retired from this post, and the *Kensington News*, a spiritual local sheet, urges that the parishioners should present to Mr. Cornell a substantial testimonial in recognition of the sterling worth which has marked his long devotion to their services. We endorse this recommendation most cordially. Mr. Cornell's whole life has been spent in the discharge of his duties, first in Chelsea and then in Kensington, always doing what he considered right, without fear or favour. The guardians themselves have presented to him their own testimonial in the form of a handsome clock; but the parishioners should do more than this. In these days, when self-seeking is the rule, the absence of it deserves to be marked prominently.

WELLCLOSE-SQUARE.

SIR,—Would you allow me for one moment the use of your machinery to flash the signal far and near to the world, that Wellclose-square, down east (own brother in desolateness to Leicester-square, up west), is in danger of being again built upon? They have taken down the dingy central building, and are going to erect a *larger*! Is there no society, or association, or league, or Board of any kind, for the securing of Open Spaces in London? W. P. S. The building they are going to erect in the middle of Wellclose-square is to be for schools to St. Paul's Church, Dock-street (the Sailors' Home Church). These schools could be erected much better on a large piece of ground, now vacant, *next the church*. Shall it be schools, only, or schools, and Wellclose-square for a health-giving, heart-refreshing open space?

AMUSEMENTS.

Royal Italian Opera.—Some very successful performances have been given, mainly by members of Mr. Mapleson's company. "Rigoletto" last week was admirably done, although the personator of the heroine, Mdle. Vanzini (one of Mr. Gye's company, by the way), can scarcely be pronounced inexceptionable. With respect to Mr. Santley, Signor Mongini, and Signor Foli, the *Spartacite* of the opera, the word may be used in its fullest sense. The choruses too, notwithstanding a new conductor, Signor Li Casti, went admirably. "Fidelio" on Saturday drew a crowd, the admirers of Beethoven and Titiana united. In this, also, Mr. Santley was supereminently good. What is the mystery at Her

Majesty's Theatre? There certainly is one. Not merely is the house completely finished, and the gas lighted, according to contract, by Messrs. Trollope, but the act-drop, beautifully painted by Mr. Telbin, is in its place, and the dock and the painting-room are full of new scenery, ready for a performance.

The Gallery of Illustration, Regent-street.—Mr. and Mrs. German Reed's new entertainment, titled "No Cards," and written by Mr. W. S. Gilbert, the music by Mr. Reed himself, is a decided success: seldom have these two excellent persons, as well as excellent entertainers, been seen to greater advantage than they are in this ingenious and spirited production. The time will come when the future of one who, like Mrs. German Reed, has afforded the public for a long term of years wholesome delight, will be made the care of the nation. The new actor and singer whom they introduce, Mr. Arthur Cecil, is a decided acquisition. "Cox and Box," a musical version of the immortal "Box and Cox," written by Mr. Burnand, and the music composed by Mr. A. Sullivan, had achieved a success in private before it was produced here, but never went so well before. Mr. German Reed and Mr. Arthur Cecil represent the "Long Lost Brothers." The two pieces together make a capital evening, and on Thursdays and Saturdays as good a morning.

Exhibitions.—The Exhibition of the Society of British Artists, Suffolk-street, is now open. So, too, is the annual collection of French and Belgian pictures, Pall-mall. We must postpone notice of these until next week.

Polytechnic Institution.—Professor Pepper has at length obtained what he has long desired, the largest and most powerful induction-coil in the world. It has been made by Mr. Alfred Apps, and is 5 ft. in length and 2 ft. in diameter. The core wires weigh 125 lb., and these are covered with a primary coil composed of two miles and a quarter of cotton-covered wire, and a secondary coil consisting of 150 miles of wire covered with silk. The condenser is divided into six parts, and tinfoil has been substituted for glass, by which means, with plates of 125 square feet, a charging surface of 1,500 square feet is obtained. In the construction of the coil Mr. Apps has used 477 lb. of ebonite, and between the secondary coil and the outer insulator he has left an air space about 1½ in. wide, which it is found makes the working of the instrument much more reliable. At the private view the maximum length of spark obtained with forty-eight Bunsen cells, each containing a pint of nitric acid, was 24½ in., but it was stated that Mr. Apps had, in experiments made by himself, obtained still better results. With five cells he obtained a spark 10 in. long, and adding five cells at a time he obtained sparks of 14, 17, 21, 23, 23, 26, and (with forty cells) 27 1/2 in. in length respectively, a battery of fifty cells giving a spark of from 28 to 29 in. long. We are waiting an opportunity to see for ourselves some of the effects produced by this enormous machine. It will doubtless be turned to good purpose.

ACCIDENTS.

Burslem Parish Church.—During a severe gale of wind the centre portion of the chancel window of Burslem parish church was completely blown in. The project for rebuilding the church appears, of late, at least, to be making little or no progress, although no church in the district requires rebuilding more than it does.

Fire in Whittington Church.—Whilst a party of ladies were decorating the church, one of them noticed some large fragments of burnt wood inside the tower entrance. On ascending the tower, the floor of the bell chamber was discovered to be on fire. The fire was, however, put out without much difficulty. The woodwork of the tower is very old and dry, and the wind was strong at the time. The fire originated in a flue, on which one of the beams of the bell chamber is fixed.

Startling Occurrence at Preston.—The Preston Gas Company are erecting in Ribblesdale a tank, intended for the reception of a very large gas holder. In the erection of the tank, which is 150 ft. in diameter, and 450 ft. in circumference, in consequence of the wet weather which has lately prevailed, the dry well was left out, and the walls of the tank were propped up instead of being backed up. The workmen were waiting to put the dry well in, and while it had been getting ready the walls had been

shored. Mr. Greene, of the Preston Gas Company, having been informed that the walls looked to be in a rather dangerous condition, immediately proceeded to the spot, and, on arriving there, just had time to order a gang of navvies off, who were working on the wall at the moment, when instantaneously, as the last man had sprung off, the structure of brickwork, to the extent of some twenty yards, fell inwards with a deafening crash. No one is injured. The damage done is estimated at 1,000*l*.

Fall of a House Side at Wigton.—The side of an inhabited house has fallen, through the violence of the wind, at Wigton. The house is rather an old one, and is situate on the Market-hill, the back part being in the yard known as the Old Coach-house-yard. The side of the premises has been noticed for some time to be in a bad condition, and bricks had been laid down to have it repaired. It would seem that for some years the outer and inner parts of the wall have been separating, the wall looked bulged out, and the recent wet weather made it much worse.—A high chimney on a workshop in Water-street, Wigton, has also been blown down by the violence of the wind. It had looked tottering for a length of time. The large mass of bricks fell on to the roof of a house and smashed in the slates, but no one was inside.

SCHOOL-BUILDING NEWS.

Leicester.—St. Mary's Schools, which were originally erected by the Rev. Thomas Robinson, vicar of St. Mary's, at the latter end of the last century, having been found too small for the wants of the parish, have been taken down, and in their stead a more spacious and ornamental building has been erected. The schools, which are Gothic in design, are built of granite, lined with brick, with brick and stone dressings, the windows being filled in with cast-iron frames with ventilating casements. The school-rooms, which are of the following dimensions, 39 ft. 3 in. by 20 ft., 32 ft. by 24 ft., and 51 ft. by 20 ft., with one classroom 21 ft. by 11 ft., form the ground plan; and the rooms are provided with screens, so that they may be divided when required. The roofs are open-timbered; and the interior is lighted with nine decorated gas coronas, each having sixteen burners, which have been designed by Mr. A. Robinson, of the local Gas Office, and manufactured and supplied from his workshop. The total cost of the work is estimated at about 2,500*l*, and it has been carried out under the direction of Mr. Joseph Goddard, architect. The stonework was executed by Mr. J. Fim; the woodwork by Winkles Brothers; the plumbing and glazing by Mr. Bazzard; and the ironwork by Messrs. Richards & Co. The building, being sufficiently advanced towards completion, has been formally opened.

CHURCH-BUILDING NEWS.

Hertford.—At a recent meeting of the Committee for the rebuilding of St. Andrew's Church, Earl Cowper presiding, the Rev. C. N. Williams read the resolution of the last meeting, directing that the opinion of the architect should be obtained as to the feasibility and expediency of erecting the chancel and transepts at once, and postponing the erection of the nave until the requisite funds had been collected. The resolution also directed that the architect should be requested to give an estimate of the increased expenditure which would be incurred by erecting the church in two parts. Mr. Williams said that this resolution had been communicated to Mr. Johnson, who had since visited Hertford, and that he had consulted with Messrs. Dove, the contractors, who had also been down. Mr. Johnson reported that there was no constructional difficulty in erecting the church in two parts, as suggested; and he sent in estimates from Messrs. Dove, showing the comparative cost of erecting the church complete according to the original plans, and incompletely with a view to the structure being finished hereafter. The estimate for the church completed was 3,265*l*.; in carcass, with glazing done, 2,680*l*.; chancel and transepts complete, with nave in carcass, 2,965*l*.; chancel and transepts complete, with temporary boarding sunk to old nave, making provision for the performance of divine service in the nave and aisles while the new works are going on, 2,233*l*. The latter estimate further showed that the cost of erecting the nave and aisles, if the order for the work were given before the withdrawal of the plant, would be 1,185*l*. Mr. Williams stated that there would be accom-

modation for 300 in the new chancel and transepts; and if the committee had not sufficient funds in hand to enable it to proceed with the building, when this part of the work was done, the temporary boarding would be taken down, and the new chancel and transepts thrown into the old nave, greatly increasing the accommodation. A resolution was agreed to, to the effect that it was desirable to adopt the estimate for building the chancel and transepts, at a cost of 2,233*l*. It was also resolved that the secretary be requested to write to the subscribers who had not paid their promised contributions, informing them that the Committee, bearing in mind that the great object of the subscribers was the providing of further accommodation for the parishioners, and being anxious that so important a work should not be neglected year after year, had resolved to erect a new chancel and transepts, leaving the remainder of the plans to be completed, according to the views, as soon as sufficient money was in the hands of the treasurer. The secretary was then requested to communicate with the Committee's solicitor, with a view to the drawing up of the contract.

Dorking.—The new aisle on the south side of St. Paul's Church has been recently completed. The new aisle, which is in the early Decorated English style, is 60 ft. in length by 23 ft. 6 in. in breadth. It has been built from the designs of Mr. Benj. Ferrey, architect, by Mr. Shearburn, of this town, builder. Considerable difficulty was experienced in the course of construction, in consequence of it having been necessary to take away the whole of the south wall and having to support the nave roof, in order that divine service might not be interrupted during the time the work was in hand. This difficulty, however, was overcome, and without causing the congregation any discomfort from speaking of. The total cost of the new aisle, including a porch at the west end, has been about 1,000*l*, towards which Mrs. Hope has contributed the sum of 300*l*. (besides erecting a window in memory of her late husband, Mr. H. T. Hope, at a similar cost), and Mr. J. Deverell, 500*l*, the remainder being made up by donations. The church was built in 1857 at the sole cost of the late Mr. J. H. Labouchere, and an aisle on the north side was added about five years since, also at the expense of that gentleman.

Manchester.—The foundation-stone has been laid of a church to be erected in Waterloo-road, Cheetham, to be dedicated to St. John the Evangelist. The church, the site and the structure of which are to cost 10,000*l*, is to be built and endowed at the cost of Mr. Lewis Loyd, of Monk's Orchard, Surrey. It will be constructed on designs prepared by Messrs. Paley & Austin, of Lancaster, architects. The style will be Early Gothic of the thirteenth century, and the edifice will be calculated to seat 600 persons. The total interior length will be 111 ft. from east to west, and the width 57 ft.; it will have the usual arrangements as to nave and side aisles, the nave being divided from the aisles by four pillars and arches. The tower at the west end of the side aisle will have a large porch or narthex. The chancel will have an apsidal termination, doubled by arches, the vestry on one side and the organ-chamber on the other. The church generally will be of simple construction, durability and permanence being aimed at rather than ornamentation. The exterior will be built of stone; and the interior, instead of with the ordinary plaster, will be lined with coloured bricks made specially. The roof will be covered with Staffordshire tiles. The tower will be 24 ft. square, and rise to a height of 130 ft. It will be covered with a lofty pyramidal roof, ornamented with tiles. The contractor for the building is Mr. J. Robinson, of Hyde.

Wintzlog.—Visitors to Tintagel will remember the picturesque old church which stands at the edge of the cliffs overlooking the sea. This church, which is ancient and archaeologically interesting, possessing as it does portions of Saxon as well as Norman work, is now in a sad state, and urgently requires restoration. The amount necessary for the work is 1,200*l*. Towards this the vicar, the Rev. R. B. Kingsman, has contributed liberally, as have his parishioners, who are less than 1,000 in number, and for the most part poor. The sum mentioned is beyond their resources, and it is hoped, says the *Western News*, that visitors who have pleasant recollections of this splendid coast, and those who are interested in archaeology, as well as that far larger class who have generous hands to help those who deserve to be helped, will aid in this work of restoration.

Pelton (Durham).—The little church here has just received an addition in the erection of a new south porch. The edifice being in an exposed situation, with its only entrance through the tower at the west end, it has always been considered very desirable that a more sheltered entrance should be provided, and with a view to such a provision the ground to the south-west has been preserved free from burials. By the liberality of a parishioner this pressing want has been supplied. The work was done by Mr. George Bailey, in ashlar, both externally and internally. It is in the Early English style, with polished red granite shafts to the columns, and other enrichments.

PROVINCIAL NEWS.

Portsmouth.—The foundation-stone has been laid, at Portsmouth, of the first of the docks proposed to be constructed on the extension works of the dockyard. The dock is situated at the south end of the works, and is designated "No. 12." The firm having the contract to construct the dock is Meers, Leather & Smith. The dock, which will be built on blocks, is to be 410 ft. long, 110 ft. wide at coping, 42 ft. 6 in. in breadth at floor, and 80 ft. wide at entrance. The depth of water at the entrance will be 30 ft. at high water (neaps), and 32 ft. 6 in. at high water (springs). The dock is to have a granite floor and Portland-stone altars, and is expected to be completed in about three years.

Basingstoke.—The arrangements for erecting a new building for the Mechanics' Institution have been so far completed. The successful tender was sent in by Mr. W. Pistell, of this town, who undertakes to erect the building according to plans prepared by Messrs. Messenger & Seymour, architects, London, for the sum of 855*l*.

Stone.—At a committee meeting, twelve tenders for the erection of the new town-hall were opened. That of Mr. John White, builder, Nottingham, for 2,130*l*., was accepted. The building, after plans of Mr. F. Bakewell, of Nottingham, architect, will be immediately commenced, and it is expected that it will be handed over to the trustees by the 1st of September next.

Books Received.

Collage Plans. Dedicated to the Landowners of Carmarthenshire and Pembrokehire. By JOHN FREDERICK VAUGHAN, EARL OF CAWDOR. London: William Ridgway. 1869.

The intention of this book is excellent; the spirit that prompts it, on the part of the Earl of Cawdor, cannot be too highly commended; but if such information as is here given be necessary in the United Kingdom, it shows the existence of even greater ignorance than the saddest croakers have ventured to believe. The plans are for the most cow-houses and dog-kennels that can be imagined: four walls with holes in them and a partition or two within. Nevertheless, and we are ashamed to say it, we must suppose that there are districts where even such rudimentary information as is here given may be useful.

When we mention that in no one of these plans, nor throughout the letter-press, is there any allusion or instruction as to the provision of a convenience, to meet the first necessity of decency, and without attention to which all other changes in the house are useless, the frightful condition of the dwellings on which these plans are intended to work an improvement will be obvious. A litterer, condemnation of the land-owners of Carmarthenshire and Pembrokehire than the Earl of Cawdor's book it would be difficult to concoct. Let us hope they will take it seriously to heart.

VARIORUM.

"Town Life among the Poorest." By John E. Morgan, M.D. Longmans. This is a paper read at the State-medicine Section of the British Medical Association, Oxford, in August last. It treats of overcrowding, &c., in our large towns; and, although there is nothing of importance in it that has not been urged by us over and over again, this is a subject whose echoes cannot be too often or too widely repeated till it reach every ear and pervade all society; and when public opinion has been thus fairly and fully brought to bear upon it, then it will be that the originators of the movement will have the satis-

faction of seeing useful and abundant fruits resulting from their exertions and those of their followers.—“Observations on Some of the Fundamental Principles and Existing Defects of National Education.” By Neil Arnott, M.D., F.R.S., Longmans. The author of this pamphlet here takes a slight but comprehensive view of the national divisions of human knowledge in all the three great kingdoms of nature, mineral, vegetable, and animal, and shows how science and art should be brought to bear upon education. The conclusion drawn from what he writes is that Government should cause to be prepared short summaries or outline statements of the chief branches of knowledge, as specified by the author; and “determine by law that none of its people should grow to maturity without being rendered able to read with facility and good understanding, and therefore with much satisfaction, any book suited to their age.” A valuable lesson, he remarks, would thus be given to others. The manuals suggested, the author adds, would be read as reading lessons, to be further explained, if requisite, when read, and might be made as interesting to young minds and general readers as Defoe’s “Life of Robinson Crusoe” is to ordinary boys.

Miscellaneous.

New Club House for Malvern.—Plans have been prepared by Messrs. Haddon, and tenders are about to be received to carry out the new Club House at Malvern. The entrance will be from Church-street by a stone porch, and on the ground-floor there are provided an entrance-hall, a reading-room, 24 ft. by 17 ft., with a square bay window jutting out at the angle, affording views up and down Church-street and the Graham and Promenade roads. There will also be a committee-room, 18 ft. by 14 ft., with bay window, a coffee or chop room, 18 ft. by 15 ft., a private entrance from the Promenade-road, with living-rooms and kitchen for attendants, lavatory, and other offices. On the first-floor will be two billiard-rooms, smoke-room, attendants’ bed-rooms, &c. The billiard and all the principal rooms will be heated by hot water. The style of architecture chosen is Italian, after the Palladian model. The principal facade it is proposed to face with Cradley stone ashlar, if the state of the exchequer will admit; if not, then with pressed red bricks. The dressings will be of Hollington stone. For the present it is only intended to carry up the front part of the building, containing one billiard-room, reading, committee, and smoking room, with offices. It is further contemplated to erect in connexion with this building a Masonic hall, embracing lodge, tyler’s, ante, and other rooms.

Medical Officers for the London Poor.—A return prepared by the Poor-law Board shows that the unions and parishes in the metropolis have 55 medical officers of workhouses and 159 of districts. Their remuneration for the year ending at Michaelmas last amounted to 28,699*l.*; and the guardians paid 6,796*l.* for cost of medicines. The number of sick poor attended in the year was 79,375 in-door, and 268,135 out-door.

Opening of Eccleshill New Mechanics’ Institute.—The Mechanics’ Institute, which has just been erected in Eccleshill, has been formally opened. The building, which has been erected from the designs of Mr. S. Firth, of Eccleshill, is at Stone Hall Hill, fronting Stoney Lane, and in view of the valley of the Aire. It is of the Doric order of architecture, externally plain. It occupies an area of 64 ft. by 40 ft.—500 square yards, and is two stories in height. On the ground-floor are a reading-room, 20 ft. by 10 ft., four class-rooms, and a library and a cooking-room, each 15 ft. by 12 ft. The whole of the second story is occupied by a large lecture-hall accommodating 600 to 700 persons.

South Kensington Museum.—During Easter week the visitors to the Museum, Meyrick, and other Galleries, have numbered 54,354. The long delay in the publication of the catalogue of the Armour is much to be regretted.

Finsbury Park Preservation Association.—This association, for the preservation of the open space formerly called Hornsey Wood House, is about to make application to the Government to interpose, and prevent the Metropolitan Board of Works from building on the frontage of Finsbury Park.

The Belgrave Market Bill.—It is proposed, as our readers know, to erect near Sloane-square, Chelsea, with a branch from the Metropolitan District Railway, a general market for flowers, fruit, vegetables, meat, fish, game, poultry, &c., provided with all the new requirements of civilization, aided by telegraph and direct underground railway communication, in order to command the supply from abroad and the three kingdoms. The Bill has now passed the second reading, and is referred to a Select Committee of the House of Commons. The site, consisting of about seven acres, on which the market will be erected, is in the middle of about a dozen roads, in the neighbourhood of Sloane-street and Queen’s-road, and in front of Chelsea Bridge.

Opening of Railway Bridge at Runcorn. The great viaduct over the Mersey at Runcorn, which has been constructed by the London and North-Western Railway Company to shorten the distance between Liverpool and London, has been opened for public traffic. The quickest train is the 10 a.m., which does the journey to Liverpool in 5 hours and 10 minutes. At Rugby an artesian well has been sunk for the supply of water to the engines. The water is let into cisterns between the rails, and is scooped up by the tender while the train is in motion. The Runcorn viaduct was planned by Mr. William Baker, engineer to the London and North-Western Company. The bridge—a wrought-iron open lattice girder—consists of three openings of 305 ft. each, the height to the under edge of the girders at spring tide high water being 75 ft. The piers are built upon the rock. The approaches are by two viaducts of brickwork, containing on the Lancashire side 65 arches, and on the Cheshire side 32 arches. These arches are built in blue Staffordshire bricks, and are of 61 ft. 6 in., and 40 ft. spans. The facings and piers of the bridge are of Bramley-fall stone.

A Scheme of Juvenile Emigration.—Miss Rye is going to try the experiment of deporting the street Arabs of London and other large towns to Canada and the Western States. She is encouraged to make the experiment, according to the *Pull Mall Gazette*, by the success which has attended the labours of Mr. Van Meter, who claims to have rescued 2,000 children from the slums of New York, and to have given them a fair start in the West. Miss Rye is prepared, she says, to start with a party of children for the West about August. The matter was pressed upon her attention by both press and people in America:—

“I propose,” she says, “taking only female children, and they are to be—1, orphans; 2, children who have been deserted five years; 3, foundlings, also deserted; and all to be of the age of from five to ten years. To start this work properly I shall want 1,000*l.* at least. Should I be able to raise this sum I shall take some small piece of land near London as a sheltering home until the children are ready to start, and another and similar place in Canada to receive them upon arrival in that country, and from which the children would be draughted as fit and suitable opportunities occurred. I am in treaty for a little property in the village of Niagara, and if it be ultimately so arranged that our ‘Western Wanderers’ Home’ should be in this locality, I have received many promises of help in kind to keep the children on our first arrival, and an assurance from the people of that one district that they will adopt, either for life or to bring up with a view to ultimate service, 25 of the children when I bring them.”

Property in England.—The assessments for income-tax purposes in 1866-67 of railways showed an increase (as compared with 1865-6) of 323,000*l.* in England and 111,000*l.* in Scotland. A similar assessment of mines showed an increase of 411,000*l.* in England and 138,000*l.* in Scotland. A similar assessment of ironworks showed an increase of 449,000*l.* in England and 109,000*l.* in Scotland. A similar assessment of gasworks showed an increase of 260,000*l.* in England. Something of the increase is probably attributable to the increased stringency with which the income-tax has been collected of late years.

Statue of the Prince Consort for London. At a meeting of the Common Council, held at Guildhall, the Lord Mayor presiding, Mr. Alderman Canston gave notice of his intention to move at the next Court that a statue, in commemoration of the late Prince Consort, be erected by the Corporation at a cost not exceeding 3,000 guineas, as the City of London memorial of his late Royal Highness.

Plymouth Guildhall Competition.—Three or four correspondents repeat the complaint of our correspondent “Provincial.” The Corporation should revise their officers.

The French Government and English Working Men.—An official letter from the French Government has just been received by the secretary of the Society of Arts, asking permission (which has of course been granted) to translate Mr. Coningsby’s report from the English volume of workmen’s reports on the Paris Exhibition, and republish it with the reports of the French workmen. The letter is couched in very complimentary terms to all the English reporters, and expresses regret that the whole of the book—owing to its bulk—cannot be used, instead of one report.

The Water supplied to Bristol.—The water used in Bristol in February contained (according to Professor Frankland’s analysis) in 100,000 tons, foreign solid matters amounting to 127 tons in the All Saints’-lane water, and 29 tons in the water supplied by the Bristol Waterworks. 100,000 tons of the All Saints’-lane water contained 67 tons, and the water supplied by the Bristol Waterworks 24 tons of carbonate of lime, or an equivalent quantity of other soap-destroying ingredients. Of the All Saints’-lane water the surgeon to the Bristol Dispensary says:—“It is not supplied by the waterwork-company. It is much used in the neighbourhood, and also by small trading vessels.” Professor Frankland remarks:—“This water is simply sewage oxidized and filtered. Its use for domestic purposes cannot but be attended with much risk to health, and the supply to the public ought to be stopped.” The Bristol Waterworks Company decline to state whence their supply is obtained.

Working People’s Hotels in New York. Mr. A. T. Stewart offered to bestow upon the poor of New York the entire profits of his business for as many years as he remained Secretary of the Treasury, but Congress, it is said, declined the offer. This, it seems, does not at all interfere with Mr. Stewart’s schemes of extensive and systematic benevolence in other directions. Among his property is a lot of land on Fourth Avenue (one of the most pleasant streets in the city), 100 ft. by 205 ft., for which several years ago he paid 220,000 dollars. He is now removing the buildings upon this lot, and will erect thereon, at a cost of 2,000,000 dollars, an iron building, seven stories high, and of band-women’s architecture. This is to be a “working-women’s hotel,” and in it sewing-girls, female clerks, and other working women are to be furnished with comfortable and wholesome apartments, and the best of food, for the smallest possible sum. The building will be ready for occupation in two years. When it is completed, Mr. Stewart will erect a similar hotel for working men in another quarter of the city. And this he bids fair to rival Mr. Peabody in the extent and munificence of his charities.

New Railway Regulation.—The following provisions in the Act 31 & 32 Vic., chap. 119, “To Amend the Laws relating to Railways,” for the safety of passengers, have taken effect.—“After the 1st of April, 1869, every company shall provide and maintain in working order, in every train worked by it which carries passengers and travels more than twenty miles without stopping, such efficient means of communication between the passengers and the servants of the company in charge of the train as the Board of Trade may approve. If any company makes default in complying with this section, it shall be liable to a penalty not exceeding 10*l.* for each case of default. Any passenger who makes use of the said means of communication without reasonable and sufficient cause shall be liable to a penalty not exceeding 5*l.*”

Open Spaces.—Mr. Thomas Chambers, M.P., has given notice that in committee on the Endowed Schools Bill he will move the following proviso to clause 25:—“Provided always that no open space now frequented or enjoyed by the public, within a radius of twenty-five miles from Charing-cross, shall be inclosed or otherwise dealt with as an endowment under this Act, without the special intervention of Parliament, even though dotes in money or kind may have been given arising from herbage, wood cutting, or other produce of such open spaces.”

Australian Glue.—A movement has been talked of in Geelong for the establishment of a company to manufacture glue, a person skilled in the process of making this article having stated his ability to supply it by a company at a price considerably less than it can be manufactured for in England.

Cleveland.—A new pier has been opened at the north end of the beach at Cleveland. The structure, which has cost about 12,000*l.*—the ironwork alone costing 8,000*l.* and weighing 350 tons—is upwards of 1,000 ft. in length, including the pier-head and approaches. The actual length of the pier is 500 ft. It is six years since the levels were taken, and the work was commenced two years ago. A new market-house—a Gothic structure—has just been opened at Cleveland.

Australian Meat for the London Poor.—Arrangements have been made by which the London public will be able to purchase engand-salt-cured Australian mutton and beef at 5d. and 6d. per lb. without bone, at the eighty and odd shops of the Afrated Bread Company, who will sell it on commission under an agreement with the Australian Meat Agency in Norton Folgate. The success which has attended the opening of an experimental establishment in that locality it said to have exceeded the most sanguine expectations of the company.

Halifax Borough Survey.—The accepted tenders for this survey are as follows:—
Mr. Henry C. Roper, Dudley—
No. 1, or Ovenden District 2150 0 0
No. 2, or Northwram District ... 365 0 0
No. 3, or Western District 105 0 0
Mr. E. Brown, Newcastle—
No. 4, or Town District 493 3 2
Mr. Daniel Kershaw, Halifax—
No. 5, or Skircoat District 280 0 0
Mr. John Edmond, Leeds—
No. 6, or Southwram District ... 377 5 0
Total 1,770 8 2

Sheffield Architectural Society.—On Tuesday a meeting of the members of this society was held at the local School of Art, the Rev. J. Stacey, the president, in the chair. Dr. Syson, of Manchester, formerly of Watb, delivered an address on the functions of archaeological societies, dwelling specially on their usefulness as guardians of our national monuments and old churches, as educators of the middle class in art, and as sworn foes to architectural shams.

Royal Academy of the Fine Arts, Vienna.—English architects appear to have been specially favoured by this body. In addition to the two gentlemen mentioned in our last, we are glad to be able to say that Mr. E. M. Barry, A.R.A., and Mr. A. Waterhouse have been elected honorary members. Amongst other artists to whom the diploma of honorary membership has been forwarded we may name Mr. Frith, R.A.

Remedy for Damp Walls.—We have received a strong testimonial in favour of a water-proofing material invented by Mr. John Spiller, late assistant chemist to the War Department. We must leave those who manufacture it for him to make it known.

The House of Commons.—On Tuesday a long and interesting discussion ensued on Mr. Headlam's motion, touching the insufficiency of the present House, and the plans submitted for a new one. The motion was ultimately withdrawn. We will look into the question presently.

The Drinking-Fountain, Westminster. The costly drinking-fountain, erected by Mr. Buxton, M.P., at the corner of Great George-street, Westminster, and of which we gave a view some time ago, has been opened for public use.

TENDERS.

For alterations to the Primrose Tavern, Bishopsgate-street, for Messrs. W. & A. Nicolson—
Kiddle 695 0 0
Cook 884 0 0
Ashby & Son 890 0 0
Stoner 895 0 0
Killy 782 0 0
Blackmore & Morley (accepted) ... 768 0 0

For additions to Dove House, Pinner, Middlesex; Lucius Harlock Reichel, architect—
Cox 2695 10 0
Carter 678 12 0
Larson 650 10 0
Roberts 1325 0 0
Wheeler 570 0 0

For alterations and additions to a villa residence at Eritb, Kent, S.E. Mr. Herbert Ford, architect—
Carter & Sons 41,235 0 0
Crab & Vaughan 1,214 0 0
J. Vaughan 1,051 0 0
Tongue 1,325 0 0
Willis (accepted) 830 0 0

For rebuilding premises at Stratford, for Mr. Henry Norden. Mr. James C. Timms, architect (first contract). Cohen (accepted) 4650 0 0

For new villa, Downs-road, Clapton, for Mr. John Hopper. Messrs. Osborn & Russell, architects—
Ashby & Son 43,305 0 0
Brown & Robinson 3,183 0 0
Pritchard 3,133 0 0
Colls & Sons 3,039 0 0
Webb & Sons 2,986 0 0
Wood Brothers 2,873 0 0
Sabej & Son 2,830 0 0

For new Primitive Methodist Chapel and Schools, Leigh, Lancashire. Mr. E. Pritchard, architect. Quantities supplied:—
Winnard 21,810 0 0
Collin & Son 1,750 0 0
Taylor 1,650 0 0
Preston 1,633 0 0
Bithell (accepted) 1,512 0 0

For the erection of a house and shop in North-street, Brighton, for Mr. William Hart. Mr. Dallimore, architect. Quantities supplied:—
Parsons 21,590 0 0
Chappell 1,548 0 0
Lynt & Sons 1,528 0 0
Cheesman & Co. 1,624 0 0
Lockyer (accepted) 1,430 0 0

Infirmary for Malling Union, Kent. Mr. Martin Bulmer, architect. Quantities by Mr. George Rank:—
Bishop 43,659 10 0
Henshaw 3,365 0 0
Bridge 3,261 0 0
Warren 3,100 0 0
Webb 3,097 0 0
Cox Brothers 2,877 0 0
Naylor 2,853 0 0
Vaughan 2,936 0 0
Cleunens 2,929 0 0
West 2,900 0 0
Solitt 2,797 0 0
Ansoomb 2,742 0 0
Lass 2,597 0 0
Church (accepted) 2,510 0 0

For alterations to the Albion, Bridge-road, Stratford. Mr. R. Washington Hart, architect—
Jones 4505 0 0
Knight (accepted) 461 0 0

For external painting, &c., Foundling Hospital. Mr. Henry Curry, architect—
Laing 2407 0 0
Nash 463 0 0
Durrant 423 0 0
Bracher & Sons 368 0 0
Beard & Morrison 363 0 0
Higgs (accepted) 313 0 0

For the erection of a pair of semi-detached villa residences at Central Hill, Upper Norwood, for Mr. R. S. Shrigley. Messrs. Lavender & Son, architects—
Extra if White Brick Facing to Front.

King & Sons 23,460 0 0
Eves 2400 0 0
Johnson 1,919 0 0
Bowler & Son 1,865 0 0
Mendy 1,150 0 0
Goodman 1,825 0 0
Staines & Son 1,690 0 0
Littlejohn 1,675 0 0
Percival 1,615 0 0
Warr 1,585 0 0
Hoburn (withdrawn) 1,380 0 0
* Same price if yellow mains in arches, strings, &c., instead of red and white bricks.
† 15s. cheaper if yellow mains, &c.

For building five houses at Horsey, for Mr. Andrews. Quantities supplied by Mr. Ormes—
Torode 22,800 0 0
Welch 2,243 0 0
Garret & Wilkinson 2,920 0 0
Nightingale 2,168 0 0
Saiter 2,068 0 0
Johnson 2,018 0 0
Tull 2,015 0 0
Clark 1,968 0 0
George 1,685 0 0
Warr 1,665 0 0
Ward 1,645 0 0
Turner 1,625 0 0
Hugheson 1,420 0 0

For erecting new house and shop, Short-street, Windsor, for Mr. R. Baker. Messrs. Edgington & Son, architects. Quantities supplied:—
Harrison 21,670 0 0
Hollis 1,440 0 0
Restell 1,649 0 0
Norris 953 0 0

For repairs of No. 17 to 33, Malmsmore-square, Park-road, Peckham, and Hanover and Rose Cottages adjoining—
Sharppington & Cole 21,443 0 0
Selkirk 850 0 0
Pekrpoint 800 0 0
Goodwell 796 0 0
Williams & Son 780 0 0

For alterations to the Buckingham Stores, Strand, for Mr. Burton. Mr. R. Washington Hart, architect. Quantities supplied:—
Langford & Way 4515 0 0
Hodson 482 0 0
Eaton & Chapman 489 0 0
Knight 420 0 0
Kely, Brothers 410 0 0
Ball (accepted) 367 0 0

For making new streets for the Leamington Local Board of Health. Mr. T. D. Barry, C.E.:—
Green 23,039 17 9
Marriott 2,610 3 4
Clark (accepted) 2,012 0 0

For erecting Poor Schools in Parliament-street, Cambridge-road. Mr. C. A. Buckler, architect—
Meritt & Ashby (accepted) 2543 0 0

Chapel, &c., East-road, Hoxton.—Sir: In your last number you give the lowest two tenders as—
Srivastar & White 24,791 0 0
Bishop 4,734 0 0
I can assert that the amount of Mr. Bishop's tender as opened in the presence of the competitors, was 43,731. A BUILDER.

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Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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The Builder.

VOL. XXVII.—No. 1367.

Exhibition of French and Flemish Pictures.

NCE more, with the same good fortune that appears ever to attend this undertaking, Mr. Wallis has managed to convolve many choice examples of some of the best representatives of the French and Flemish schools of painting, and to have been even more fortunate than usual in the nature of the works collected, most of them appealing to the sympathies that "make the whole world kin." So much has been said and written in favour of the long apprenticeship, the strict discipline and regularity with which the Continental-art-student graduates in his profession, the means that enable him to acquire the requisite knowledge to practise it at last with the same degree of certainty attending the



learning of any other, and how much to be deplored it is that similar opportunities do not exist for the English, that it might be thought any one could become an able artist who chose.

To hear and to read, it would be thought that those foreign painters with whose works an acquaintance now is as common, or nearly so, here as at home, are but a fair sample, in fact, instead of being—as is surely the case—rare exceptions; as rare as the best of our own painters. It would be a very interesting experiment to compare the picture produce of any year throughout Europe; divide it under the several denominations of good, bad, and indifferent; and, making fair allowance for quantity, determine if England stands "where it did." M. Meissonier, of course, is inimitable: to be ranked with exceptions of the past, let alone the present. He is represented by two celebrated works,—one, the property of her Majesty the Queen, "Les Bons Amis" (76), very richly coloured, and finished to a marvel: the expression of gravity with which the fuddled toper strives to listen as the other two argue, just able to avoid sliding off his chair, is wonderfully comic, without the slightest approach to caricature; and an equestrian portrait of "Napoleon I., 1814" (75), lent by Mr. Ruskin, as perfect with regard to finish, also, as it is possible to be. This is cold and grey in tone, with a threatening storm-cloud for background.

Putting aside a very efficient method of educating them, there are qualities and a charm that enthrall the attention—matters beyond mere training, and that defy translation or adaptation—in M. T. E. Daverger's exquisite rendering of a subject so often illustrated before as to have become "stock" with the delineators of ordinary incidents, but which in its worth as an investment has seldom returned such interest as it does now. A mother, in a paroxysm of grief, is leaning over "The Empty Cradle" (15) that has so lately held her child, now lost to her; tearless, with burning eyes and parched throat, she is writhing with the anguish of her hereavement, watched by her own mother, whom experience

may have taught how unavailing all condolence is at such time; for her pity is for the living, not for the dead: a lad at the half-opened door is about to retreat on tip-toe, as he silently beholds that he is intruding on so solemn an occasion; and even the faithful dog stands gazing at the mourner's face, as if he, too, shared the grief he cannot help to assuage. All the accessories assist in telling the story,—a sad one, but, told with such intense pathos, and with no vulgar emphasis to destroy its effect, it leaves no painful impression on the mind, beyond that calculated to be of benefit. Another phase of family grievance provides M. Daverger with a theme for a second important work. A youth, the black sheep of the flock, has been "Led Astray" (67) by bad companions. He has been out without leave, roystering at some cheap masquerade, and is brought home in a condition easily imagined and often described, very much to the consternation of his sisters and grief of his mother, who is, however, interceding to prevent the sterner parent from inflicting the horsewhipping the youngster richly deserves. The incident is so clearly narrated by the artist that it horders more on theatrical representation than is usually the case with him; but the stage is so well dressed, and the actors so well up in their several parts, that it could only be a French performance.

For dramatic power, as well as for the aptitude with which M. A. Tadema revivifies classic history by appropriate character of personations, and appropriated architecture, costume, and general accessories, his composition entitled "School for Vengeance" (51) is strikingly singular. The chronicles of the ages when cherished revenge for injuries—however old the injury, however long-cherished the idea of retaliation—was accounted a virtue are replete with such episodes as the education of Chlothilda's children. "Gondobald, king of the Burgunds, in order to be master of the whole country, had had his brother Sigibort murdered. Chlothilda, Sigibert's daughter, kept a prisoner in Lyons, Gondobald's residences, had devoted the whole of her life to avenge her family; and with this view trained her sons from childhood to fierce retaliation." A subject repulsive enough: and barbarity needs no recorder of its practices. Every day furnishes fresh evidence of how much of it lies latent even amongst civilised humanity, and any precedent of its fiercest expression is better forgotten. The affectionate mother is seated, with her attendants respectfully grouped about her, watching with a cold-blooded delight the successful efforts of her eldest son to hit the mark with the hatchet he is hurling at a target; the hoy himself—a pocket Hercules—behaves as if he knew what was expected of him, and accepted it as the great purpose of his life. This figure is capital in action, as, taking aim, he prepares to hurl the axe with an unmistakable precision and sturdy consciousness of coming strength and opportunity to make full use of it. His younger brother waits his turn, whilst the grandfather, with long plaited grey hair twined about his head, watches, with keen appreciation and a speculative view of being some day satisfied, the graceful agility of his hopeful descendant. There is a marked individuality in each of the heads of the many figures introduced in the picture, and, as already intimated, a general propriety in its treatment, its sombre but harmonious colouring and total effect, that make it valuable as a faithful tradition and a fine work of art.

It is to be hoped that M. J. Israel's chubby baby's early path will not diverge for some time to come from that which his "first steps" (132) are marking out for him—an equal desire to gratify his pa and delight his ma; but "as the twig is bent, the tree's inclined," and as in

totting along towards his father, who with outstretched arms entices his progress, he evinces that liability to fall common to his species; it would be unwarrantable to promise his safe conduct for long. To its simplicity and naturalness this picture owes its interest; it is very broadly and finely painted; and so is an interior with a fisher-wife "Waiting her Husband's Return" (112), by the same artist.

M. G. Brion's "Family Worship—Alsace" (19), with the convincing evidence of its excellence corroborated by the award of the medal of honour, is magnificently conspicuous for its executive power, the harmony of its deep tone and rich colouring, and the strongly-marked character of the listeners, as well as of the reader or expounder of the doctrine who holds them in such rapt attention. There is no attempt at ideality in this plain depiction of a household engaged in the exercise of their religious duties, but the feeling of quiet earnest piety generally expressed seems to reach the spectator, and to include him in the congregation of homely, ordinary-looking men, women, and children, for the most part, ministered to by one who, the oldest, is the most ungainly of them all, yet of such patriarchal and benevolent appearance as quite to account for any amount of respectful deference that might be paid him.

How far preferable is the impression left by contemplating this and cognate works to the most startling of sensational effects produced by others of the opposite tendency! Such, for instance, as (43), "The death of John the Baptist," by M. A. Glaize, with all the awful concomitants—the headless, rigid trunk stretched on the blood-streaked pavement, the severed head, and so forth. Without denying the exceptional abilities of the painter, one can but wish that such elaborate literal exactness were more exceptional still, if it be desirable to represent such matters at all, that fall even on the imagination. M. J. Caraud's two scenes from "The Marriage of Figaro" (10), Cherubino, the Countess, and Susan, and (33) Count Almaviva, the Countess, and Susan again, are highly finished genre performances, that depend mainly on pretty faces, excessively well imitated drapery, and good taste in arrangement. All these recommendations are to be found in these instances, though, perhaps, the faces might have been prettier.

A little gem, a peasant child poring over a book, entitled "Reading made Easy" (14), by M. E. Frere, is one of those things that come under the category of "joys for ever," for it might be looked at every day and a new charm discovered each time of inspection. (31) "Rival Pets," F. Willems, a lady dressed in satins, with two dogs to divide her favours, rests, and may safely rest, on the perfect workmanship it displays. And Madame Henriette Browne's monastic head, "A Seminarist," exhibits admirable quality of a larger and less elaborate style. In "Recovering" (91) M. G. de Jonghe has tried the complexions of two charming members of the fair sex by surrounding them with vivid yellow curtains and furniture to the proof that they were above proof, for it is an exquisite example of power and delicacy combined, and a picture, although it is composed but of an invalid, still in bed, but approaching convalescence near enough to receive a visitor to congratulate her, who, dressed in black, is the key-note of the harmonious arrangement of so much bright brimstone colour, and the key to its management.

"Faust's First Sight of Margerite" (95), by M. G. Koller—one of many draughts from the same fountain of inspiration—is distinguished by the clean, solid painting remarkable in all this painter's works, but with no novelty in its description of the episode: it could scarcely be better executed, however, though it appears to want air "F'nal Confessions" (105), by C. Boutinone:

so slight in narrative that it appears wonderful how much valuable workmanship and how many rare qualities should be made to hang on its so slender thread. Both mother and daughter—winning through refinement—are natural in their actions, and very expressive of the sentiments that are actuating them. The young lady has evidently disposed of her affections in a way her mother would deprecate. M. F. Heilbuth contributes a sketchy but dexterous performance; but why it should be called "Watteau" (118) "no fellow can make out"; and two portraits of very original style, "Wreckers' Wives making False Signals" (138), by M. G. Clinrin—some weird and wicked women making a fire on the coast with dried seaweed, and whatever other fuel they can find, to mislead their victims—and (183) "The Wreckers" themselves, creeping along the shore to get at a long-shot distance of their prey, are very clever and striking, but disagreeable pictures.

"Going out for a Day's Sport" (5), by M. E. Poittevin; "Travelling in Valaquia" (27), and "The Halt on the Road, Valaquia" (16), by A. Schreyer, two masterly works, produced with evident rapidity; "The Origin of the Corinthian Pillar" (61), "Capital" would be the better term) by M. P. Leyendecker, carefully studied, well drawn, but not quite pleasant in colour, from a prevalence of green; "Pleasures of the Imagination" (106), a fair reflector on "the inspiration which no language finds;" "After Mass" (120), by M. A. Weiss; and "The Unwilling Scholar" (108), by M. P. Seignac, are in their diversity sure to attract observation for their merit. M. C. Landelle contributes a life-size study of "A Fellow Woman" (139), rich in golden ornaments and academic grace; and M. Bonqueron a laughing Italian peasant "In the Cornfield" (191): of consummate finish and refined treatment, but of too elegant a polish to convey the idea of absolute truth to those who recognise its nearer semblance in the less smooth but more subtle expression of it to be found, for instance here, "In the Hayfield" (209), by M. Jules Breton. It would seem very difficult indeed to surpass M. C. Bieschop in obtaining such force and splendour of colour as are to be witnessed in "The Lovers' Quarrel" (170), that attain almost an overpowering brilliancy, an obtrusive gorgeousness that exceeds probability, and, though fascinating to the sense of such agreeable influence, destroys all idea of reality.

It would be supererogation to write a word of more than general acknowledgment of the worth of the greater number of the items that constitute this collection; all are to be identified with a peculiar capability of making much of trifling materials by innate good taste and patient labour of imitating all that is to be represented in relation to the subject selected for illustration.

Such characteristics in their highest degree of value are to be found exemplified in (25) "More Free than Welcome," by M. J. G. Vibert, and the admiration it excites is entirely derived from them. A lady and a favoured cavalier have just sat down to dine, when an intruder disturbs them,—a priest, who evidently thinks he has a right to an invitation to join them, though he approaches the lady with the most respectful and deferential appearance of obsequence: the cavalier, it is quite plain, wishes him where, in all probability, he never prays he may go; and the annoyed mistress as clearly wishes herself well out of so embarrassing a predicament. In its entirety the picture rivals any of the Dutch school whose works it emulates.

M. A. Cabanel, however, is quite independent of such means of inviting attention as well selected accessories, wonderfully copied costume, and the like, so often prove. "La Naissance de Venus" (184), a small replica of his famous picture, offers nothing but the naked truth for a story, though it can scarcely be said to be confined to bare fact, for she is so idealized as to become and as becomes a mythologic personage, and super-exquisitely beautiful as the Cupids demonstrate they opine her, as they hover about her in enamoured wonderment. The drawing of this figure is beyond praise, and the Goddess of Love could hardly complain of her portrait failing to do her justice. But for the eyes of the goddess, the picture would be purely itself.

"True to his Post" (113), by M. Schenck, exhibits great skill in apprehending and depicting animal life, and painting landscape, or rather atmospheric influences; for one can hear the rain as it splashes on the rocky shelter that protects

but partially the sheep that cuddle together as even sheep do, so strong is family affinity and affection, in times of annoyance and trouble. But there is no shelter for the poor dog, the protector regarded in quite another light, perhaps, by those whom he protects: with shivering haunches he braves the storm from which his fidelity to his trust forbids him to screen himself, and from his exposed position on the sheltering boulder sees that his master is better located than himself. He is no evasive dog, that is very certain, and thinks of others rather than of himself. Seldom have pictures of this class been invested with so much interest, and very few are the painters who could so thoroughly impress the spectator.

(63) "Ejlbakka, on the Coast of Ekinstan," is a barren moonlit scene, with silence and solitude to make it poetical, by M. Whalberg. "Calm Weather" (143) is delightful in colour, and shows in what a masterly manner M. P. J. Clays can paint the sea and vessels, with their reflexions in its depths.

(195) "A Sedgy Stream," by the late M. Troyon, a charming landscape, recalls the recollection of others that have preceded this, and the fact that none will follow it.

COMPENSATION TO LAND AND HOUSE OWNERS.*

ALTHOUGH a work of this description is written mainly for the advantage of the profession of the law, yet it claims serious attention at the hands of the surveyor, not only on account of the enormous amount of business which has been and will be enjoyed by many men eminent in our profession, but because the best interests of the claimants are so much more dependent on the knowledge, tact, and skill of the surveyor than of the lawyer, more especially as the introductory steps of most claims are taken by the former, although in difficult cases no surveyor is wise who fails to take into his counsels a skilled member of the other profession.

It is some fifteen years since a work on this subject has been published—we are not forgetting that hook on "Railway Precedents" in 1866, which touches slightly on this subject amongst others—since which date decisions have been given in the Courts of Appeal which have considerably changed the position of many claimants. Our proceedings, as surveyors, must be guided in these matters by the dicta of the Courts, and we are thankful when these are gathered together from their scattered records. This volume being exclusively and intentionally devoted to that branch of the subject, it becomes a paraphrase of the Landis Clauses and the Railway Clauses Acts, 1845, with notes of the decisions on cases taken to appeal. To the experienced surveyor, therefore, it is too much, for the Acts are sufficient without the diminished equivalent, and a collection of the records of decisions would suffice; while to the beginner it is deficient, as lacking information on, to others, well-known and every-day practice—the result of chamber research rather than of the daily attendance in the Courts of the Sheriffs and Arbitrators. Yet, fatal mistakes may be made by even a tolerably experienced surveyor without information at his elbow such as this work conveys.

The volume seems to have suffered, even to the clipping of its grammar, in the desperate attempt to lessen its bulk; and yet that bulk might have been reduced by the extent of the Acts of Parliament in the appendix, or their paraphrases in the body of the work might have been omitted, and would have saved much repetition of cases. This was the plan adopted by *Shelford*, the notes of decisions being appended to each clause; and the former would appear to have been the first intention of the editor, for the Acts of Parliament are in no way noticed in the index, which is a serious oversight; and, while we are on the subject of indices, we may add that this is no better in that respect than other law books. A copious and accurate index is a necessary part of every volume, and, in its absence, the volume may frequently be called a sealed book. This is a common complaint against law books. In the index there are no such heads as *Disputed Compensation; Costs of Mandamus; Engines, or Locomotives, or User of Railway; Neglect to Act; Obstruction of Access; Summons by Yearly Tenant; Action of Mandamus; Invest-*

*ment, or Reinvestment; Right to a Jury or Arbitration by Yearly Tenant; Right of Renewal; and a dozen other important subjects mentioned in the volume; while, in some instances, the cases are indexed reversely,—that is, showing an opposite decision to that in the text. And in the advertisement it would have been better, we consider, to have stated what does not constitute an interest, for the case cited is the *refusal*, to consider a right of sporting as an interest.*

Having thus introduced the volume generally, we propose to point out some of its good points, as well as its failings, and to refer more in detail to some of the matters treated of; and we are led to do this because there are many novelties in practice which mainly depend on the decisions, and this book does not deal with them thoroughly.

The author has paid a tribute to skill in the general remarks on claims (p. 59). "The actual amount awarded will of course vary according to the views taken by the parties or arbitrators, or the ability with which the claim is laid before the jury." We remember a few lines to the same effect in the Dictionary of the Architectural Publication Society. "The estimates of the value and the damage must almost entirely depend upon the ability, knowledge, and skill of the surveyor." Again (p. 87), he says, "It is not at all easy to say what is exactly meant by, and how much is included in, the words, 'injuriously affected.' It is almost impossible for any but a practical surveyor to point out."

It is, perhaps, needless to say that both law and practice assume that no advantage is to be taken by either party; on the one hand, the company (or promoters) are to pay for every value and loss; and, on the other, no profit is to be made out of the company, but a liberal and full sum should be given and taken: that is the theory. In practice, alas! each party mostly struggles to overreach the other. Much of this is due to professional pride, but much, also, to extortion on one side and inadequate offers on the other. The result has been continual complaints of robbery and oppression. This will probably never be changed, so long as the tribunals are constituted as they are.

The subjects, very naturally, are divided by the author into chapters, the principal of which, as affecting us, are agreements in Parliament:—with companies after incorporation; compulsory powers; restrictions; injuriously affecting; modes of settling compensations; lessees and yearly tenants; costs; and special railway powers.

The subject of Parliamentary agreements has not hitherto received sufficient attention: the few paragraphs here are useful, but lead to doubt and disturbance, inasmuch as they unsettle our minds as regards the stability of any such contracts, unless they are incorporated in the Act; but we may say that we have not known any such agreements repudiated by respectable companies. It is more correct, perhaps, to say that many agreements made in the committee-rooms are valueless, unless they are money contracts, as they are rarely properly drawn up, and frequently are resolved into a written expression of some existing rights under the general Acts. In all such cases, persons expert in compensations should be consulted on the effects of the agreements, and a clause, if possible, obtained; companies, however, naturally object to commence admitting clauses when the consequence might be a legion of them.

Attention is properly drawn to the execution, after the passing of the Act, of documents otherwise than under seal. Certain notices may be signed by the secretary, but there is no reference in the work to the legality of such contracts as are made by the surveyors of the companies. If these are appointed under seal, we presume their Acts would bind the company. We know that injunctions have been obtained under such informal agreements. We remember also a case of great hardship not reported here, where a claimant withdrew his claim on an undertaking given by the counsel for the company to sell the freehold of a portion of the premises to him. The company repudiated this bargain, but the Court of Chancery compelled its fulfilment. He, however, enjoyed his triumph but briefly, for the company almost immediately served another notice to treat, and ejected him from the whole. His trade had in the mean time been nearly destroyed, and his claim thereby lessened.

In exercising the compulsory processes of the general Acts, both parties have a certain amount of power, the initiative being always taken by

* Compensation to Land and House Owners: a Treatise on the Law of Compensations, &c. By J. D. Ingram. Second edition. Edited by J. J. Elmes. Butlerworths, Fleet-street. 1869.

the promoters by the service of a "notice to treat." From that time the powers are, if he so choose, entirely in the hands of the claimant. The course of proceedings is not quite as laid down in pp. 135 and 136, where it is stated that if the parties do not concur in appointing a single arbitrator, "a request should be made by one party to the other, that the latter should appoint one. Then each should make his appointment in writing," &c. How this slip has occurred we cannot imagine, because the Acts are clear, and the authorities and decisions are all one way—namely, that the party requesting an appointment *must have already appointed* his own arbitrator. There is a very proper direction on p. 138, that "no person connected in any manner with, or employed by, the company, should be appointed arbitrator or umpire." How constantly is this wholesome advice violated in practice! How frequently does a regularly retained witness of to-day sit as judge on the adjoining property to-morrow! Is there no remedy for this? Unfortunately the Board of Trade is no refuge, because, if appealed to to appoint an umpire, it names one of the very persons who may already have been refused, notwithstanding the representation that the refusal has been on the ground of employment by the company. Our own opinion has long been that the Board of Trade should appoint no one who does not give a pledge to act on neither side on the particular undertaking; that, in fact, an umpire should be entirely free from bias, and unconfounded by evidence given by himself in similar cases on the same line. Until this be done, the appeal to the Board of Trade is a delusion and a snare. We know of systematic refusals of companies' arbitrators to concur in appointing an umpire outside of the charmed circle, knowing the result of the appeal. This was not formerly so, the gentleman who was generally appointed having kept himself entirely independent of both parties. We believe that it was "companies'" influence which caused his being less frequently appointed. It may be said that the proper alternative is a jury. Those who are aware of the caprices of juries, and the manner in which the twelve men are brought together, are not inclined to prefer that tribunal in the cases of valuation to an independent professional judgment. It is the knowledge that that independent judgment is so difficult to obtain that causes so many inquiries before juries, doubtful as the result always is. In one respect a great improvement has been effected in jury cases by the Regulation of Railways Act, 1868, either party being at liberty to apply to a judge of any one of the superior courts; and if he think fit the inquiry is to be in one of those courts. No such inquiry has yet been held, and we do not see whether or not the right to special juries has been withheld. No notice is taken of a peculiar case of recent Metropolitan Acts, where the occupiers are entitled to six months' notice—we presume to prevent the scandal of rapid ejections in towns. These six months' "ratepayers'" notices have been held to be "notices to treat."

We should have been glad to have had some information upon the subject of an arbitrator's "neglecting to act." What is neglect in these cases? Our author answers by referring to the case of *Willoughby v. Willoughby*, in the Queen's Bench Reports. That case, however, is not in point. It was not a railway case, but simply a case of an award made after the time limited, and the court set it aside. The Lands Clauses Act enacts that "if either of the arbitrators refuse, or for seven days neglect to act, the other may proceed *ex parte*." We confess we never knew of a case of *ex parte* proceeding, but we have known of very many cases of real neglect; meaning by that expression that the arbitrator neither makes the statutory declaration, nor takes any steps towards the appointment of an umpire, and therefore no attempt at any settlement. Frequently, however, all approaches for a settlement have previously been made. Before proof of neglect could be adduced, most seven days' notice be given to the arbitrators? We are still without any means of knowing what is neglect—not neglect to appoint an umpire, because there remains the appeal to the Board of Trade.

In the case of a claimant requiring a jury to be summoned, the best mode is by action of mandamus, to which there appears to be no answer. It is desirable in all cases to have proof of a request having been made to the promoters for a jury.

There are several kinds of interests all sup-

posed to be antagonistic, but in reality most intimately connected and mutually supporting, and, unless by the collusion of a railway company in the way of a bargain with an owner for empty possession, which means that the owner is to give notices to quit to the yearly tenants (whose demands have of late years been more carefully considered than they were formerly), every interest is separately treated for by the company. There are anomalies, however, entirely in practice, which our leading surveyors, acting, as they do, almost solely in the interests of the companies, consent to adopt in the vain attempt to generalize instead of treating each case on its own merits. For instance, a freehold house may fairly be reckoned at 20 years' purchase—if at say 100*l.* a year, the value would amount to 2,000*l.*; but take the case of the adjoining house (and it is not a mere supposition, for the case has frequently come before the writer of this article) which has an original ground-rent of 10*l.*: this, on principle, is usually taken at 25 years' purchase, 250*l.*, and the tenant's interest, 90*l.*, at 16½ years' purchase, 1,500*l.*; total, 1,750*l.*, an error of 250*l.* In truth, every variation from the exact proportion of one of ground rent to one and a half of building rent is a disturbance of the equity of the several interests, and makes either the whole greater than the parts, or the parts greater than the whole.

There is no law on this state of affairs, and so long as surveyors are content to be unscientific, and guided by red tape, so long will injustice exist in our compensations. In truth, the ground-rents are, as regards London, almost invariably estimated too low, and, while in many cases the leasehold interests might fairly be estimated at the rate of 5 per cent., yet in a large number of cases 6 per cent. is much too high. The usual acknowledged proportion of ground-rent to building-rent is as 1 to 5; that is to say, the ground-rent should be, to be fairly apportioned, one-sixth of the full net rent. This again is subject to great exceptions, as in the city of London, and in the more desirable positions at the West-end, as well as in other large towns, where the additional value of property arises entirely from its position, or "ground-rent," to such a degree that sometimes the latter is two-thirds of the whole value. How would the calculation of the separate interests then tell on the totals? We will answer that question by a case where the value *per annum* was 450*l.*; this at 20 years' purchase was 9,000*l.*; ground-rent, 300*l.* at 25 years' purchase, 7,500*l.*; building-rent, 150*l.*, at 16½, 2,500*l.*, making a total of 10,000*l.*, or 1,000*l.* of error in one of the modes of calculation. It would thus seem that the large majority of "compensation" surveyors being retained by the railway companies, have rough-and-ready modes of ascertaining compensations, and have compelled the adoption of their illogical calculations, causing a mischief which it seems almost impossible now to prevent. No remedy exists for any error of this kind, nor perhaps would it be possible to ascertain on what grounds either juries or arbitrators' decisions could be reviewed by any court.

It may be sufficient to state, as regulating the principles of compensation, that the sum received from the sale is assumed to be reinvested in property of the same nature. It is not an uncommon notion amongst annuitants that they are entitled to an equal income in Consols. Though no case is mentioned in this book, we know of those where the Court of Chancery has sanctioned investments in similar limited leasehold property. It is to some extent desirable that there should in some cases be an amendment in the law, because even where the directors of a company are desirous to be liberal (a state of mind which is rare in those bodies), it is questionable whether they could conscientiously be so. A case in point is that of a charitable institution where a trade was carried on. The chairman of the institution was the actual lessee; the trade was carried on at a loss, being in competition with more skilled and efficient labour, the balance being provided by public voluntary aid. In such a case the company felt compelled to refuse any compensation for the loss of trade, the trade being unquestioned; and although the loss of the sale of the goods for a time would throw several hundred workmen either out of employment or on the charity of the world, yet as those hundreds of men had no legal interest in the premises, compensation was steadily refused, on the ground that nothing but the leasehold interest and the plant and fixtures could be paid for, and that to the person who nominally held

the lease. This case was not tried, as the company abandoned the undertaking; we were curious to see what a jury would say. Other charitable institutions have been hardly dealt with because they were not corporate bodies damaged. We shall continue our remarks in another number.

HOW TO USE OUR FUEL PROPERLY.*

Now that we have been told that we are getting through our great coal supply at an annually increasing rate that threatens to bring us to the end of our stock at no very distant date, it would be folly not to examine with minuteness all plans brought before us that bear upon the husbanding of our fuel. But setting aside this probably remote exhaustion of our supply, we should carefully consider all propositions setting forth modes of economising the use of fuel, for the weighty reason that money expended upon its wanton, ignorant, and unscientific waste could be beneficially laid out in objects that would conduce to the health, comfort, or mental elevation of the household in which extravagance is permitted. This is a subject upon which we have before dwelt at length, and to which we have often referred, feeling that a great addition to the domestic comfort of the whole country might be made by a little earnest attention and determination. A fresh endeavour in this direction has been made by Mr. Edwards, the author of a work on "Domestic Fireplaces," noticed in these columns. He urges that there is peculiar fitness in the present season in an invitation to consider the subject of waste of fuel because the national prosperity has flagged a little, and it may be deemed expedient to think over means by which money can be saved.

Mr. Edwards makes suggestions relating to improvements in our present cooking-stoves, that would, he says, reduce the cost of the fuel to a fourth of that at present required. A kitchen fire that annually consumes four sovereigns' worth of coal would thus need but one sovereign's worth, and its owner would remain in possession of three sovereigns to expend upon something more useful or beneficial than a volume of thick smoke ascending out of his chimneys to waste. The subject was taken up about seventy years ago by Count Rumford, who, in the great kitchens under his administration in Bavaria, reduced the consumption of fuel to one-fifth of that hitherto used. A biography of this remarkable person occupies a considerable portion of the book, and is instructive in showing the importance attached to saving in this department by one of the most methodical managers and administrators that ever lived. Count Rumford, we may briefly state for the benefit of those whose memories do not go quite so far back, was an American gentleman, by name Benjamin Thompson. In the declaration of American independence he was a loyal adherent to the English monarch, and was selected to carry the news of the evacuation of Boston to London, where he was warmly received by Lord Sackville, and provided with employment in his department, and soon created under-secretary of state. On a change of ministry he returned to America, reorganized the cavalry, went to Jamaica, and afterwards, when peace was declared, returned to Europe, intending to place his services in the hands of the Emperor of Austria against the Turks; but making the acquaintance of the Elector of Bavaria, he was invited to arrange his military affairs. The English Government gave consent, with the title of knight and a pension. In this new position Sir Benjamin Thompson reorganized the Bavarian army, established numerous schools, and put down mendicancy; and it was in providing dinners for the thousands of persons thus under his care that his wonder-working attention was directed to the great saving that might be effected in the use of fuel. Twelve hundred, and at some seasons 1,500, persons dined daily in the House of Industry he founded for the mendicants, upon soup and bread, at a cost of a penny each, and 200 dined daily on roast meat at a correspondingly small expenditure. The cost of the fuel required to cook 1,000 soap dinners in the public kitchen

* On the Extravagant Use of Fuel in Cooking Operations, with a short Account of Benjamin, Count Rumford, and his Economical Systems, and numerous practical Suggestions adapted for Domestic Use. By Frederick Edwards, Junr., author of "Our Domestic Fireplaces," &c. London: Robert Hartwicke, 182, Piccadilly, 1868.

of the military workhouse at Munich, after his mode, was 43d. In the hospital of La Pietà, in Verona, he instituted a similar economy; and his plan was adopted ultimately in the Foundling Hospital, the Royal Institution, and the Heriot's Hospital, Edinburgh. We will now describe the contrivances by which he arranged that so much cooking should be effected with so little fuel.

His leading idea was to cut off every source of waste. To this end he endeavoured to prevent all radiation into the cooking apartment, and to turn heat to the fullest account before it could find its way up the chimney shaft. First he substituted the close stove for the open fire with the gaping chimney. His stove consisted, indeed, of a number of small fire-places sunk into a level surface, each of which was provided with a vessel that fitted it accurately, and each little receptacle for fire was provided with a flue that surrounded the vessel with which it was furnished, and so carried round it the heat and smoke before they escaped. Mr. Edwards gives an illustration of Count Rumford's arrangements as made in the house of a gentleman in Munich, with sections and details of the cooking vessels. The stove has the appearance of a solid table or counter of brickwork, at one end of the kitchen, with a semi-circular recess in the centre of its front, in which a person could conveniently stand and adjust the different vessels upon the surface. We will condense the author's explanation:—

"Upon the horizontal surface of the brickwork are seen various cooking utensils, each fitted into an aperture so as to leave nothing but the covers and handles projecting above. Below each cooking utensil a small fire-place was arranged, consisting of a grate to contain the fuel, with an ash-pit below, and a door in front of it for the removal of ashes and the regulation of the supply of air. To the larger utensils another door, termed a stopper, was provided, through which fuel could be introduced to the fire-place. The smaller fire-places were refilled with fuel by removing the utensil in them for that purpose. In every fire-place there was a small flue, which compelled the smoke and heat to pass round every portion of the utensil before their escape, and their exit was further checked by a damper in the escape-flue, which was regulated so as to allow no heat to pass away as long as it could be safely retained. The utensil became in fact immersed in a sort of hot-air bath; and to complete the arrangement, each cover was made double, with a hollow space between the two parts filled with air, which, acting as a non-conductor, most materially checked the escape of heat. Flues from the different utensils passed horizontally into four main vertical flues formed in the brickwork at back, by which the smoke escaped daily into the chimney."

Over and above the block of brickwork thus perforated with fire receptacles and flues, and, as we should have mentioned before, with a boiler for hot water heated by the smoke and hot air from the three fire-places nearest to it, there was a hearth on which a fire could be lighted and two ovens heated. Instead, therefore, of an enormous fire burning to waste when but a little cooking was going on, this plan permitted of the use of the exact quantity of firing required, and the particular construction of the flues provided that all the heat should be utilized before it left the neighborhood of the vessel in which food was in course of preparation. Generally three of the small fire-places sufficed to cook a dinner: occasionally only one was lighted, while on occasions all would be in use together. That there might be no mistake as to the comparative consumption and cost of fuel, Count Rumford instituted a series of experiments, and ascertained beyond the possibility of doubt that twenty-eight gallons of water in a large boiler on an open fire required 62½ lb. of wood to bring it to the boiling point, and maintain it for two hours, while the same result could be obtained on a closed fire with the use of 13½ lb. Again, a copper pan on an open fire-place consumed 11½ lb. of wood in the process of holling its contents, while the same vessel required but 13½ lb. on a closed fire. Hence he laid it down as a fact that in the large open fire-places five times as much heat was required as was used when the fire-place was closed.

It is upon the basis made by Count Rumford's experience that Mr. Edwards has built his superstructure. He first traces the introduction and gradual adoption of the kitchener now in pretty general use in newly-built houses, and then makes a series of suggestions for its material improvement. The drawbacks to the present kitcheners are, they give out a great deal of heat; the scent of the cooking, having no open chimney to ascend, is apt to spread over the house; repairs to them are expensive; and they are not so frugal in their call upon the coal-cellar as they might be. These questions of heat, ventilation, wear, and economy are successively gone into by Mr. Edwards, and upon all he has something sensible to say. A great deal of the radiation

would be done away with by the use of tiles instead of metal, wherever possible; the ventilation might be improved by a funnel and tube over the fire-place communicating with the chimney above the height at which the small flues enter it; the necessity of frequent repairs might be reduced by the use of the most indestructible materials known; but the matter of extravagant consumption of fuel cannot be disposed of so easily. Waste of fuel means waste of heat. To prevent this in every portion and department of a kitchener, so many alterations would have to be made, that it would, when perfect, bear scarcely any likeness to its original appearance and construction. Four causes of waste are pointed out: too free admission of air, the exposure of a needlessly large surface of metal, too rapid draughts, and the use of a single fire for all purposes, whether great or small; and some half-dozen means are considered by which they might be cancelled. The fire-place, the ovens, the boiler, the dampers, and the hot-plate are all open to improvement. Mr. Edwards shows, in the first place, that the fire-place is unnecessarily deep. Now that people know how to prevent the peculiar taste that used to be urged as an objection to baked meat, the open fire is not used for roasting, nor, indeed, for anything more important than toasting bread: 6 in. or 8 in. of depth in the frontage of the fire, he therefore considers would be sufficient. The next thing he urges is, that the bottom on which the fire rests should be of fire-brick, pierced with a number of holes for the dust to fall through. Perhaps such of our readers as have used the plan now generally known as "The Builder's Fire" would go a little further, and consider the piercing not wanted. Another suggestion is based upon Count Rumford's conclusion, "that any air which entered a kitchen fire, and which was not required for combustion, was a thief, which stole the heat, and escaped with it up the chimney." To prevent this waste, the author recommends the use of the fire on the slow combustion principle, by closing the fire in front with a perforated door. His last hint brings him still nearer to "The Builder's Fire," though, as he thinks, further from his own recommendation of the nearly solid bottom in preference to bars. He would have a fire receptacle large enough to have a day's consumption of coal in it, on the top of which the fire should be lighted and the fuel gradually raised to it, as required, by simple machinery. But whether it would be strictly economical to light a fire that would go on burning all day, when only a dinner was required to be cooked with it, should be considered. The whole question of economy in the matter of fuel seems to be compressed into the possibility of using only the smallest quantity for the shortest time; and the lighting of a furnace that is to burn all day seems to be going away from the mark set up. It seems to us the plan of lighting the fire from the top might be useful without any subsequent winding of fuel from below. Mr. Edwards considers the ovens would be better heated if they were put on the top of the hot-plate, instead of below it; and he would adopt Count Rumford's plan of furnishing them with double doors having a non-conducting material between them. But his most striking improvement relates to the hot-plate. Here he brings more of Count Rumford's teaching to bear. Instead of the large metal surface, all of which is equally heated, and therefore much waste is going on because but little of it is in actual use, he would have the kitchener covered with tiles, except where he would provide a double row of metal rings with covers; and under these covers he would have all the hot air conducted in channels. As in the Bavarian stoves, utensils provided for the purpose could be fitted into either of the metal rings and there maintained in a bath of hot air. Mr. Edwards gives illustrations of kitcheners in which these improvements are shown. Mr. Burch's American kitchener, Norwegian cooking-stoves, and gas stoves are also shown with a view to the completeness of the work.

Among the illustrations is a section of the heating arrangements of a six-storied house, containing the kitchen and attics, which are embraced in the scheme. From the boiler of a kitchener in the basement to the top of the house stretch ascending and descending pipes conveying hot water to a hot-water cistern, which is placed below one for cold water fixed beneath the roof. Branch pipes from this hot-water cistern supply the basins in the bedrooms, and the bath and basin in the bath-room. And in the hall is a hot-water coil, heated by the

circulation of hot water conveyed to it by branch pipes from the first-mentioned ascending and descending pipes. The simplicity and frugality of this scheme are weighty recommendations. But the usual difficulties are not altogether vanquished. When the bath is for use, for instance, and all the hot water in the boiler drawn off for it, how can the supply of heat to the coil be maintained? The passage of branch pipes between floors and ceilings, too, is always attended with disaster, sooner or later, either from carelessness or frost. Where such an arrangement is inevitable, the ceilings below the pipes should be rendered waterproof with a layer of asphalt, and every facility made on the floors above them for getting at them expeditiously. When an extra fierce kitchen fire has burnt for some time, it sometimes happens that the water in the cistern at the top of the house boils too with dreadful gurgling, hissing noises that alarm all hearers. So what with the chance of having the water cold always for some time after the bath is filled, when it is wanted hot for the coil, perhaps, from inclement weather; and the contrary possibility of having it too dangerously hot after a dinner-party, just as the fatigued household are going to rest; and the certainty of the pipes bursting some time or other from the effects of frost; we must not yet rest satisfied with our contrivances in this department.

Improvements are brought about slowly. National customs are not to be uprooted with one effort, like weeds in a garden, and many a long day must come and go before thriftiness is thoroughly understood in the English kitchen. Mr. Edwards may feel satisfied that he is doing something towards bringing this about.

THE RESULTS OF ASSOCIATION FOR PROVIDING DWELLINGS FOR THE WORKING CLASSES.

INSTITUTION OF SURVEYORS.

At a meeting of this Institution, on the 5th inst., Mr. T. Chatfield Clarke reviewed the progress made in providing dwellings for the working-classes. We print that portion of his paper which gives results:—

In the order I have proposed to myself, I desire first to refer to the work of the Metropolitan Association for Improving the Dwellings of the Industrious classes, as being the association that, on a charter involving much preliminary expense and with many restrictions, has proceeded in such a careful manner with various tentative experiments as to entitle the managers of such association to much praise.

It is satisfactory to learn from the clear and detailed accounts presented by this association, that several of their larger buildings are earning, after the payment of every expense, more than 5 per cent., and in one of their largest blocks, 6 per cent.

The statement of general results is as follows, to Midsummer, 1868:—

Paying on a capital of about 100,000*l.*, exclusive of loans and advances and provincial branches, this association was enabled to divide at the rate of 4 per cent. last Midsummer, though having earned nearly 5 per cent., accommodating a population of 3,342 persons at that date, and with the favorable rate of mortality of 14 per 1,000, the average rentals per room being, I estimate, from 2*s.* to 2*s.* 5*d.* per week.

Ranking next in interest, perhaps, is "The Improved Industrial Dwellings Company," from the spirited way in which, in a short space of time, so many blocks of buildings have been raised in various parts of the metropolis, on plans peculiar in their conception and original in the class of material used in their construction.

This company are going to avail themselves largely of the power to borrow from the Government at 4 per cent., to assist their undertaking, though the advantages likely to accrue from so doing have been lessened considerably by the great expense hitherto incurred in obtaining such loans.

With a productive capital, by the last report, of about 90,000*l.*, this company is enabled to pay 5 per cent., accommodating a population now of about 2,900 persons, but shortly hoping to increase that number, by their buildings projected, to 3,890 persons. No statistics of the health of the inmates have been kept, but from some partial observations in one locality they have been very favorable. The average rentals derivable are from 2*s.* 3*d.* to 2*s.* 6*d.* nearly per week per room.

The munificent and repeated gifts of Mr. Peabody next claim some notice—indeed, such an amount as the total of 350,000*l.* put in trust for this object must impress every one as an unexampled instance of a generous and high-minded man seeking in what way his great wealth can be devoted for the permanent good of the community of which he is not even a countryman.

In reviewing the action of the trustees hitherto, it is difficult to go into much detail as to the results, inasmuch as the accounts presented annually to the public are so meagre in character, no revenue account being published, and no analysis being given of the interests obtained on distinct blocks of building. It is much to be wished that the trustees would consider the advisability of furnishing more detailed accounts, as great interest is felt in the matter, and it might serve to remove from the public mind, by explanations, false results, possibly otherwise arrived at.

As to the scale and substantial character of the buildings, there cannot be a question with their large and airy secluded playgrounds, landries, and other conveniences; all must add very much to the comfort and convenience of the dwellers therein; but, judging by the recent letter of the secretary to the trust, it is a source of regret that it has been hitherto impossible to realize a larger rate of interest than 2½ per cent., "a sum," as he justly says, "much too small to induce those actuated even partially by a view to investment, to follow the same example."

The capital hitherto expended has been about 150,000*l.* with a total population of 1,971 persons, the rents demanded being at the rate of 2*s.* 6*d.* for one room, 4*s.* for two rooms, and 5*s.* for three rooms; the health statistics show a mortality of about 15 to 16 per 1,000.

The average wages of the working men in these buildings are stated to be about 2*s.* per week, and to be as carefully selected as possible to avoid a class who could pay higher rents.

The buildings erected by the Corporation of London in Farringdon-road next claim notice as a large and spirited undertaking, which sets a good example to like corporations.

These buildings are on the model (with some modifications) of those erected by The Improved Industrial Dwellings Company, with the addition of shops on the ground floor.

The outlay on this property has been about 54,000*l.*, showing on the average of three years a clear net receipt of rather over 4 per cent., beyond which there is a portion of the site not yet utilized.

The population in these buildings amounts to 872 persons in 168 tenements, and the average number of deaths is at the rate of 22 per 1,000, showing only a difference of 1 per 1,000 over the whole of the metropolis, but as compared with a small property not far off it shows a very favourable result, where the death-rate is 31 per 1,000.

The Society for Improving the Condition of the Labouring Classes claims to rank with the Metropolitan Association as setting up models for imitation, and as having led this movement. This Society, at the present moment, is not extending its operations, and does not consider itself committed to any continued series of erections. Its properties are various in character, several being occupied by single men and women, and it has also a public washhouse, which occasions the Society considerable expense and loss; it has also adapted existing houses, with every needful comfort, which yield, the report states, a fair average balance.

It is almost to be regretted, I think, that the mode of conducting the operations of this society does not seem to provide a clear balance to accumulate for the extension of their operations, or a sinking fund to reduce the leasehold, as is the case with other societies, and the expenses seem large; but this society is working with a large amount of borrowed capital, obtained as to a considerable proportion at 5 per cent.; several of the blocks of buildings show in the accounts a considerable surplus of from 4 per cent. to 5 per cent., after deducting the charges upon same.

The capital account, not including a freehold property at Hull, shows an expenditure of about 37,000*l.*, an entire population of from 1,600 to 1,700 persons, and a death-rate of 15.5 per 1,000.

Miss Countess, whose name is so universally respected for her long and generous interest in the welfare of the poor in the metropolis, has also aided this movement by the erection, in Columbia-square, Shoreditch, of a large pile of

buildings, giving every facility for healthy living, and on a scale superior to others as to external decoration.

The outlay upon this undertaking has been in land and building about 45,000*l.*; the gross rents amount to about 1,840*l.* per annum, and the deductions upon the same to about one-third, yielding therefore, according to Mr. Darbishire's report, about 2½ per cent. per annum.

There are 189 tenements, let, I am informed, at very moderate rents, which Miss Countess will not permit to be raised, and commencing at 2*s.* per week. The number of inhabitants is about 716. These buildings have the advantage of landries, drying-rooms, baths, and other conveniences, and are much valued in the poor neighbourhood in which they are placed.

Mr. Gibbs has also erected a large pile of buildings, on the scale of those erected for the trustees of the Peabody Fund, in Rochester-row, Westminster, and it is a gratifying fact that after a large outlay in buying up the leases of old properties, so good a result comparatively should be derived; but here, also, taxation presses heavily on the success of the scheme in a financial point of view, the taxes, rates, gas, superintendence, and repairs, amounting to about 7½ of the gross rental derivable.

These buildings consist of 166 tenements, housing about 650 persons, at rents varying from 2*s.* 3*d.* for a single room to 5*s.* for a three-roomed tenement. The total outlay has been about 32,000*l.*, and a net dividend derived of something over 3 per cent.; the death-rate averaging for two years 19 in 1,000.

Sir Sydney Waterlow, with great boldness, before initiating the company with which his name is connected experimented in this matter in the erection of a block of buildings called "Langbourne Buildings," at a cost of nearly 8,000*l.*, containing 78 tenements, with about 390 inmates, and these (partly on account of the less cost of building when they were erected) yield, after deducting all expenses, and providing for repairs, a net result of over 9 per cent.; and these figures are obtained after a trial of five years.

The Right Honourable Russell Gurney, M.P., has also made a most interesting experiment in his own neighbourhood, which has a special value that not only does it locate the poor near to their work, but combines the element of retaining poor families in the neighbourhood adjacent to their richer brethren, in whom they may justly take a special interest.

The outlay was 2,500*l.*, giving accommodation for ten sets of dwellings, and from 50 to 60 persons; the rentals being 7*s.* 6*d.* for three rooms with conveniences attached, and yielding a full 5 per cent. on the outlay.

These buildings are constructed on the same design, and with similar material to those carried out by the Improved Industrial Dwellings Company.

Before closing this paper there are one or two other associations for this object in the metropolis which it is right to refer to; among others, the Marylebone Association for Improving the Dwellings of the Industrial Classes, and the Highgate Dwellings Improvement Company. With respect to the former, I am hardly able to present many particulars, but with a capital of about 27,000*l.*, spread over six properties, doubtless a considerable work is being effected. The dividend on the ordinary shares last declared was at the rate of 4 per cent., and 4½ per cent. on the preferential stock of the company.

With respect to the Highgate Dwellings Improvement Company, built also on similar plans to the Improved Industrial Dwellings Company, it provides on a total capital of about 6,000*l.*, though the expenditure of the same is not fully defined, for 96 rooms, and the company have been enabled to pay a dividend of 5 per cent. on rentals varying from 2*s.* to 2*s.* 3*d.* per room per week, and for two or three rooms in a somewhat less proportion.

In giving this sketch, I ought not to omit some other kindred societies and persons who have privately worked out schemes of the kind, and amongst others the Strand Buildings Company, the Central London Dwellings Improvement Company, the London Labourers' Dwelling Society, the Rev. Mr. Burgess, Mr. G. Barker, Mr. J. H. Harlowe, the Rev. Thos. Ainsworth, Mr. John Newson, and Mr. Hilliard may be mentioned; nor ought the labours of the late Prince Consort in this direction to be omitted, as tending probably more than any other person, by his high position and his pure and disinterested motives, to have infused energy and

excited inquiry in many minds that might otherwise have been directed into other channels.

Of the results of some of the above operations it may be briefly noted that the Strand Buildings Company, on an expenditure of 5,000*l.*, pays 4½ per cent.; the Central London Dwellings Improvement Company pays 3 per cent. on a capital expended of about 10,000*l.*; the London Labourers' Dwelling Society pays 5 per cent. on about 30,000*l.*, spent chiefly in renovating old buildings. As to that of the private owners, Mr. Hilliard receives from 6 to 7 per cent. on an outlay of about 14,000*l.*, and Mr. Newson is reported to have received a net 5½ per cent. on an outlay of 13,000*l.* or thereabouts.

I am aware in this paper I omit altogether any notice of cottage dwellings, both suburban and agricultural; but I should like to mention that the Metropolitan Association have an interesting experiment in suburban dwellings at Penge. I trust that some other member of the Institution may be found willing and more able than myself to deal with this question. It is by no means second in interest and importance to the subject considered in this paper; it also abounds with similar problems as to the difficulty of providing adequate accommodation for the humbler classes, at fairly remunerative rates.

With respect to the general results obtained from this paper, I trust they may be looked at as on the whole encouraging. With a total sum expended in the metropolis of about 650,000*l.*, housing approximately from 15,000 to 16,000 persons at moderate rents, giving an average return of 4½ per cent. on fifteen ascertained returns, with a death-rate in a great proportion of reported cases much below the average rate of mortality in the metropolis, and considerably below the rate in the poorer districts taken singly, and with a rate of interest derivable not varying much from that receivable for freehold property elsewhere, I trust we may look to the future with hope.

SOCIETY OF BRITISH ARTISTS.

The forty-sixth exhibition of the Society of British Artists may be better, perhaps, than has been the case for some seasons past. A fortuitous combination of atoms,—some of the smallest contributions to be the most honourably acknowledged,—numbering 1,058 works, including water-colour drawings and sculptures, besides oil pictures; with sufficient of the pleasing, the clever, and the natural; make the collection a popular one, and lift it above the average level of its tide of prosperity. Even now, however, there is nothing to awaken a fresh interest in the existence of this old institution; very little to revive a past one. The better known of the members do but repeatedly repeat repetition, until their works have become like dissolving views,—views that they were formerly so well able to explain, that there are few among the new-comers to Suffolk-street likely to interfere with the recollection of their early impressions.

Mr. G. Cole's large landscape (9) "Evening," will scarcely be called an atom, or thought to be an atom too large; it conveys an idea of truthfulness, and is one of those ordinary scenes that a sunset effect would invest with extraordinary beauty. Carefully studied, and well painted throughout, it invites the criticism of a great number of appreciators, and will satisfy the most of them. Mr. A. J. Woolmer contrives some half a dozen of those perplexing combinations of paint, poetry, and power that for so many years gone by have made him conspicuous on these walls. They have less of paint, and less of poetry and power, than formerly to recommend them, but are still attractive. (23)

"Milton found Sleeping by two Ladies," is the avenue of an Italian garden, has a mysterious grace and harmony of colour to condense in some measure its shortcomings. At his best, Mr. Woolmer relies too much on his imagination, and often shows little respect even for probability; but, looking back at such of his works as may best illustrate his peculiarities of style, it is hard to refrain from wishing it were more easy to learn from them how ideal and reality might be made more compatible. The difficulty must be a real one, and never more apparent, or to be deplored, than at present, when matter-of-fact representation only is so insisted on, and, of course, persisted in, to the exclusion of anything else that would distinguish the artist from the mere painter. Mr. J. B. Pyne has but one picture (33), "Bay of Naples, from the Villa Rocca Romano, Nuova Strada," to recall his

many triumphs when dealing with similar themes; Mr. J. Tennant, several, notably (97) "Hillsborough," "The Lantern Rock Light-house, and Part of the Town and Harbour of Ilfracombe;" and Mr. A. Clint, in (231) "The Harbour of Little Hampton," with a gorgeous sunset illumination, to wit, and many another instance, proves himself to be as clever and productive as ever.

There are bold life-size figures, by Mr. F. Y. Hurlstone, of Spanish boys; an illustration of "Desdemona and Othello before the Senate" (128), by Mr. W. Salter; soft-eyed, speckle-complexioned "Kate Kearney" (50), and other unimaginable and unimpeachable beauties, by Mr. C. Baxter; a very plain, if not ugly, statement of Mr. J. J. Hill's notion of "Happiness" (475), that does not fairly represent him, or it; and a variety of engagements of Mr. E. J. Cobbett's favourite models as expressionless, motionless, motiveless, and cleanly washed as heretofore. "Absent Thoughts" (328) is the title of one, and might well describe all.

(55) "The First Time of Asking," by Mr. W. Hensley, introduces a would-be happy pair undergoing the severe ordeal denoted, and as they look as if but a slight modicum of happiness would content them, it would be gratuitously unkind to remark their awkwardness, the more especially as the ceremony is only interesting to themselves. (397) "Little Woman" is far better worth looking at, as she nurses the big, stiff baby, and seems to have the cares of a household on her back, though but a child herself; possibly she will never be "asked" in church, as is often the case with very kind housewifely elder sisters and aunts. (71) "The First Step," by Mr. Haynes King, though but a conventional rendering of a very often depicted incident, is very carefully and nicely presented in this case; the same may be said of a smaller interior (307), "A Highland Home;" but (556) "Granny," a single figure of the old lady who does duty in "The First Step" as antithesis, is a step beyond—a very excellent study, highly finished, with no display of manipulative dexterity.

Mr. T. Roberts has taken great pains with his "fancy portraits" of Richard III. to substantiate Horace Walpole's opinion that the king was nothing like so ugly as he has often been painted. Who is? But in spite of all the careful labour bestowed, the cleverly-drawn and well-painted figure racked by painful dreams, "The Night before Bosworth" (78) will scarcely be accepted as a true and correct likeness. The draperies, armour, and other accessories bear too modern an appearance; a more ideal treatment of the subject, or any such a one, would convey it far more really to apprehension than the best mechanical skill could ever do if confined—as it is here—to the representation of bare appropriated facts. Mr. Roberts is more successful in another "Ghost Story" (565), where he has had but to describe the reader of, and the listener to, the tale, not the awful relation of it, the terror caused—not the cause of the terror—this is a favourable specimen, proving how well he can paint. In a third picture, "After Waterloo" (526), suggested by an incident in "A Soldier's Fortune," by Mrs. Marsh, he intimates that he does not limit himself to a special dealing with one class of subject. A hero has lost a limb in the great battle, and with no means of his own to procure a substitute, is bedridden longer in consequence than he otherwise need have been, until his good genius intervenes and makes him the grim but gratifying present of "the most perfect of wooden legs." The workmanship of this picture is less satisfactory than in former instances, and consequently it falls short of being quite so good as it might easily have been made if a prevailing hardness and paintiness had been overcome; and Susanna, the little daughter, shown to have been more indebted to nature: she is not pretty here. "Left in Charge" (83), by Mr. J. Gow, the custodian being a dog big enough to take care of himself, and, no doubt, faithful enough to be intrusted with the safe keeping of a cradled infant and any amount of property comprised in this composition, which is a pleasant one to look at, by reason of its subdued colouring, is one proof that Mr. Gow is a gain to the society; (347), "Quiet Thoughts," with the lady taking care of baby herself, is another. More ambitions, if less pleasing, the illustration of Goldsmith's readiness to oblige a fellow-lodger with the historical "Pot of Coals" (538), would seem to forestall further distinction.

There are not many of the exhibits here that can at all compete with those of Mr. E. C. Barnes:

"The Tease" (155), a young lady, in Middle Age dress, and with very old young proclivities, worrying the only specimen of the parrot-tribe she happens to have near her at the time—a cockatoo; and (572), the same handsome fair-haired heroine "Dissatisfied" with a more modern costume, with some show of excuse, for she does not look quite so well in it; besides having to divide the honour of attractiveness with a brunette who has equal claims to it; are signalled by extraordinary force and brilliancy, apparently obtained by easy means. Want of refinement is the chief objection to these productions, though it arises more from an excess of power that should be restrained, rather than positive vulgarity, and it is to be wished very much that the same remark were applicable more generally.

Mr. G. Pope's delicate Nunn, who typifies "Rest" (199), owes to her quiet nonobtrusive character an attention and respect not to be obtained by the louder demands of the "come and look at me" class of beauties that abound here; and Mr. A. Patten's contemplative gilt—(236), "Pancies, that's for Thoughts,"—when contrasted with, even (165), "The Blonde," by the same, though the latter be more clever in technical merit, and not at all exemplary in wider comparison, will sufficiently indicate the value of modesty and refinement as opposed to meretriciousness.

(313) "His Lordship," by Mr. P. B. Morris, is rather a plagiarism, and a weak one—a noble infant, surrounded by an adulatory crowd of menials. "Glory" (613), by the same—a wounded soldier, by the side of his dead charger, watching the sun rise—is better in executive quality, if even less novel in design. Mr. A. B. Houghton's "Playmates" (62), which may also be traced to a precedent, but he is sufficiently clever and original to defy such an imputation; Mr. Croft's Border-rider, "The Fugitive" (103); Mr. A. Provis's elaborate "Interior of a Welsh Farmhouse" (135); Mr. W. H. Weatherhead's "Arah Storekeeper" (136), though but an Academy study, and his "Lovelorn Damsel," in sixteenth-century costume, taking a solitary stroll (235) at the hour

"When from the boughs
The nightingale's high note is heard.
And gentle winds and waters near
Make music to the lonely ear,"

very nice in tone; Mr. V. W. Bromley's painter renovating an old dial, "Repairing the Ravages of Time" (300), a slight but characteristic trifle, though more completely satisfactory than his more finished warder jocularly forbidding the supply of provisions brought by a hard-featured handmaid for the solace of some favoured prisoner, since it is "Against Orders" (545), and "The End of a most Beautiful Tale" (578), by Mr. P. Hoyoll, are a fair sample of what the collection can boast in abundance. Mr. D. Pasmore's "Cavalier and Lady-love playing at Cards, with Hearts for Trumps," is distinguished by the flickering brightness common to him (45), but is rather more carefully made out in parts than usual; Mr. L. Smythe's fisherboy "Come Ashore" (51); Mr. E. Roberts's old dame who has ostensibly taken something out of a teacup that disagrees with her, and is consequently "Poorly" (196); Mr. Collinson's very highly elaborated "Irish Flower-girl" (225); Mr. T. J. Watson's broadly painted but sufficiently finished interior, with "Ransacking the old Cabinet" for incident (269); Mr. W. Bromley's fishman "Bothered" (420); Mr. T. Heesly's little lady her own hair-dresser,—"I won't come Smooth" (441); Mr. A. B. Donaldson's sombre and Venetian-looking "Students of the Collegio di Propaganda Fide at their Devotions," though rather too black, it may be said, without invidious allusion to one in particular who is so by nature (504); Mr. J. Ritchie's traveller "Fallen amongst Thieves," very tall thieves, with small heads,—depredators in open daylight (510); Mr. J. Hayllar's admirably-painted pedestrian wearing the Suffolk Conservative colour, "True Blue" (606); and Mr. J. K. Thomson's chilled victim to heart-pain apostrophising the "Cold Rivulet," and illustrating Tennyson, are selected out of more from having been more particularly observed. Mr. R. Buckner's Italian peasants at "Roadside Prayer" (626), somewhat old-fashioned and conventional, is agreeable by contrast where so much has been accepted hap-hazard as worthy of depiction. A study of a "Roman Beggar-girl," by the same (308), is very mannered, but to be classed with the better of the cognate examples present. To

those belong Mr. Barnes's "Spanish Girl" (4), though not quite pleasant in complexion and expression; Mr. J. Harwood's "Josephine" (27), that reminds one of Rothwell; Mr. A. Ludovico's unsophisticated little German peasant leaving home for church, "Sunday Morning—Bohemia" (37),—she is individualised as well as natural; and Mrs. Anderson's big "Fairy" (239), with golden hair and pomade that appeared to be a very efficacious "Catch 'em alive oh!" for butterflies, they clatter so thickly to enwrap her head. This is individualised, too, and as well not natural as it is the nature of fairies to be, but a mixture of "most beautiful things," according to receipt, and very well mixed and made out they are.

The multiplicity of the landscapes renders it too onerous a task to say more of them than to acknowledge their general merit, which is, on the average, high. Mr. J. P. Pettifit's "Aiguille de Bru, Valley of Chamounix" (117), after the first fall of snow, October 15th, 1868, almost too faithfully copied to look true, for the influence of the weather destroys all perspective to the effect of destroying effect,—the chalets, figures, and cattle, whether far off or near, are equally visible, and look like toys surrounded by such an overwhelming mass of snow,—is one of the leaders, one of the most remarkable of the remarkable; and "The Fern Harvest," of quite an opposite character (168), with its misty, warm, autumnal season to describe in sky and on common, has enabled Mr. H. Moore to do wonders in his way. Mr. C. N. Hemy has a very graphic view of "The Thames, below Bridge" (191); and Mr. J. Danby a poetical adaptation of sea, rocks, and sunset-sky—"Algerine Pirates" (294).

The collection of water-colour drawings is quite a feature—an exhibition apart. With nothing calculated to astonish from particular excellence, there are many items to repay a search for what may be best amongst them, or considered best, for there is variety enough to minister to nearly all tastes; as "A View in Highgate Wood," by Mr. G. Lucas (958), very bright and sunny;—Do all Londoners know how soon they may get into the country?—Mr. E. J. Skiff's Britany washerwomen "At the Fountain" (959); "The Backwater," by Mr. W. W. Gosling (964); "The Old Well in the Campo Zanipolo, Venice" (990), very carefully, but somewhat too manneredly drawn, for the figures want vitality, and the colouring is too pure and pretty to look anything but colour, by Mr. J. Bouvier; "The Victor's Wreath," in preparation by a stout, handsome Roman wife, or daughter (1003), very well studied with regard to drawing and accessories, by Mr. A. Innes; Mr. E. Hall's little bit of truth, "An Autumn Nook" (1047); and Mrs. Backhouse's peasant child, "Happy as a Queen" (1058), will help to prove.

"The Blackpool on the Lledr, North Wales" (645), by Mr. J. J. Curnock; Mr. T. F. Wainwright's exquisite sheep, "By the Sea" (669); Miss A. Claxton's ontcast, who is sorry she is, like Topsy, "so drefful wicked" (681), though morbidly sensational, and exaggerated in every respect; Mr. J. Hardy's juvenile ristics "After the Butterfly" (682); "Fond Recollections," by Mr. J. C. Playfair (719); Miss S. S. Warren's "Beech-hill Common, Hants," with its quiet, rich evening effect" (736); "The Thames, near Boleby, by Mr. W. W. Gosling again; and Mr. E. Taylor's hewching young sorceress (779), "The Witch," she is, are of better quality still; whilst Mr. H. Hardy's dogs, and the force he procures from the use of pure water-colour as exemplified in the workmanship of (773) "The Keeper's Boy," give to his drawing quite an exceptional character. We will say one word too for some sketches by Mr. Burrell.

Dedication Ceremony of Freemasons' Hall, London.—On Wednesday afternoon an imposing Masonic ceremony was performed in the new grand hall in Great Queen-street, by the Most Worshipful the Grand Master of English Masons, the Earl of Zetland, in the presence of the largest and most distinguished body of the craft ever before assembled. The ceremony was that of the dedication to the Order of Ancient Free and Accepted Masons of England of the new grand hall and offices, on the site of those which were pulled down some few years since. The Grand Master, when seated on his throne, was surrounded by upwards of 1,000 officers of lodges from all parts of the United Kingdom.

THE SCULPTURE AT THE UNIVERSITY OF LONDON, BURLINGTON GARDENS.

THE new building in Burlington-gardens, Regent-street, now fast proceeding under the direction of Mr. James Pennethorne, architect, already shows a very large amount of the sculpture with which the front is to be formed. Our

readers will, doubtless, be glad to have the following list of the statues, and of the artists by whom these have been executed. We would suggest before it be too late for easy remedy that a little further attention should be given to the figures at the extreme angles east and west, which as seen from various positions have the effect of reclining towards the south:—

Sculptors.	Position.	Subject.
Joseph Durham, A.R.A.	Four seated figures on portico. (Not yet up.)	Bentham, Milton, Newton, Harvey.
W. F. Woodington	Three standing figures on roof line of west half of centre portion.	Plato, Alcmeades, Justinian, Cicero, Galen, Aristotle, Locke, Bacon.
J. S. Westmacott	Three figures on east half of ditto.	Adam Smith, Cuvier, Leibnitz, Linnaeus.
William Theed	Three standing figures in niches of west wing.	Hume, Hunter, Sir H. Davy, Galileo, La Place, Goethe.
Patrick McDowell, R.A.	Three figures on east wing.	
Mathew Noble	Three standing figures on roof line of west wing.	
E. W. Wyon	Three standing figures on roof line of east wing.	

Meanwhile, pending the selection of a name, I may still be allowed to use my own pet cognomen, modestly placing it, as I have hitherto done, parenthetically, to show that as yet it only appears on surfface; though of course I think it an excellent designation, and naturally hope it may some day take its stand there of right. And now to return to my own especial work.

Although I have already particularized so many beautiful art-objects belonging to Mr. Boreford Hope on loan at the Museum, those that remain unnoticed in these "Notes" are still very numerous. Immediately to the right on entering, and below the large Spanish altarpiece painted with the legendary history of St. George, and brought from a destroyed church at Valencia, date fifteenth century, stands a glass case containing the following rare and costly articles:—a boat-shaped bowl cut out of a carbuncle, about 2½ in. long by 2 in. wide; a sword-hilt formed of the largest known aquamarine stone, chased gold handle, terminating at each end in a lion's head, the whole mounted in gold, and set with precious stones (it formerly belonged to Joachim Murat, king of Naples); an enormous pearl, the largest known, darkened almost to black at one end, and slightly resembling a clenched hand (it is mounted, at the wrist end, with a crown set with diamonds); a large Hungarian opal, very rich in varied colours, set in a square hilt enamel frame; a vinaigrette, bottle-shaped, carved out of an emerald, with cover of the same; a ring set with a wonderful sapphire, called "Le saphir merveilleux," of such a rich blue, and bordered with small diamonds; a plain gold ring, with a large diamond cut in the shape of a cross, which looks exactly as if the diamond were perforated with the cross form; an antique cameo sardonxy ring, the under stratum white, the dark layer cut in high relief with bearded mask, having ruby eyes; a gold ring, formerly belonging to Pope Gregory XIII. and Pope Pius VI., having a boy's head in high relief cut in a jacinth, and set round with eight pearls, that are fastened on by a gold wire, or nail, pierced sideways through each; and the Mexican sun-opal, carved with the head of Apollo—the sun, that is to say—set in enamelled and gold, or gilt, frame, with rays, like flames, surrounding.

The hock of rock-crystal enclosing a drop of water, and the three pieces of amber, the one enclosing a small fish, and the others a fly and various insects, are all extremely interesting to see; as are the twenty-three specimens of double and single-eyed Oriental agates, mounted as rings, and the twenty-four specimens of Oriental striated agate, mocha stones and pelhies, bearing most a rangely natural representations of the human face and other objects. Mr. J. Tennant likewise shows nineteen specimens of mocha stones from India that are very beautiful and very interesting. The antique dark sand cameo bearing the head of a Roman emperor, on a white under stratum, belongs to Mr. Boreford Hope, as do the jacinth cameo hnt in high relief, of Cleopatra, fifteenth-century work; the massive gold ring with emerald intaglio head of Jupiter; and the small cross formed of six rare green brilliant diamonds set round with small white stones. A rich collection of precious stones, mounted as rings, adjoining the above, was bequeathed by the Rev. Chauncey Hare Townshend; the large rubies set round with diamonds, and the full-coloured and large turquoises, also diamond-framed, are especially beautiful.

Turning sharply round we find ourselves before the high glass case containing "the collection of miniatures, snuff-boxes, watches, jade and crystal ornaments, porcelain and decorative plate, lent by Lord Chesham." The title is sufficient warning of the task undertaken by any person who shall attempt to give even a superficial account of the various objects. The miniatures alone are forty-nine in number; Van Dyck's handsome young face stands bravely out from its companions, and first attracts the eye; an oil portrait of a gentleman in large ruff and embroidered coat is lifelike, and impressive from its calmness; there are two miniatures of Cromwell, and if both are true, the difference in them makes one feel how much more intellectual the face became with age and deeper matter for grave thought; there are also two of Louis XIV., of which the one said to be by Petitot is much the less refined in its expression; the costume of the neck-gear in the other, with the blue riband across the breast,—namely, necktie with long full ends of lace hanging down over a

THE DISCOVERIES OF ROMAN REMAINS AT BATH.

DISCOVERIES are still being made of Roman remains during the excavations on the site of the old White Hart. The remains of the Roman wall, discovered south of the temple platform when the foundations of the south wing of the hotel were put in, have been traced right across Stall-street, and left passing under the foundation of the Pump-room. A week or two ago there was found a fine fragment of the side cornice of the Great Temple; part of the trough of rain-water gutter remains on the top of the stone, as well as one-half of the spiritedly carved lion's head, which served to discharge the water at various distances along the cornices. The carving is bold and effective, and consists of an egg and tongue, formed of a sort of reversed fleur-de-lis, tied by a band in the centre; the half of each coming together forms the egg, and the point of flower the tongue. Beneath was a head mould formed of a running scroll. Part of the front cornice of the temple below the pediment has also turned up; it slightly differs in its design, and has enriched cartouches, and the scroll mould at the bottom is replaced by one of real pattern. Many other fragments of the massive wall stones were found, and one retained very perfectly the slots for large metal cramps used to join the stones of the wall, no mortar having been used; these must have been of lead or bronze, as no stain-marks of rust could be seen. One large mass took the united strength of 3 or 4 men to roll out of its bed; the wrought faces seemed to be formed by very correct sawing, requiring no alteration. The section of the soil at the site of the Great Temple supports the presumption that this building must have stood perfect or nearly so, less roof, as late as somewhere about 1070. In the angles of the carving are remains of the red paint used by the Romans to decorate or preserve the stone.

nuisances. Now, it occurs to me that the police might with the greatest propriety and usefulness be employed to aid in the enforcement of the sanitary laws.* I speak particularly of the smaller borough and county towns, and of the rural districts, where happily the duties of the police are very nearly a sinecure, and where the officers appointed for sanitary work are few and far between. I am quite prepared to understand the objection there might be raised to the intrusion of the police into and about our dwellings on the pretence of having "an eye to a drain," or with a view more clearly to apprehend a savoury or unsavoury smell; but this is not what is intended. Practically, take an inland town, with its thirty or forty police and its one nuisance inspector. There are many cases where one inspector only is allotted to towns having a population of 60,000 to 80,000 souls, and where the police go their weary and monotonous rounds day by day, in search of that thief who may be lurking in secret places to steal our goods and chattels, whilst the sanitary officer contends in vain against a hundred thievish causes which in open day steal our very lives and those of our children. Sixty intelligent and sharp-witted men are set to catch one Jack Frig, whilst one man alone has to detect and punish the wholesale hordes of malaria and disease.

I would select, say, half a dozen of the most intelligent and deserving officers, give them a trifling increase of pay, put them into the sanitary department of the town's police, mark their preference by a prominent S in real silver lace on the left arm, and having trained them with a few practical rules, send them out upon their double mission of preservers of the public peace (so seldom broken) and preservers of the public health (so generally violated). The rural police in the counties would be especially serviceable in this respect, seeing that in most of the out-of-the-way districts there is no organized sanitary work.

JOSEPH BRIERLEY.

THE (ALBERT) MUSEUM, SOUTH KENSINGTON.

BEFORE continuing my "Notes," I must just say that I have read with much interest the suggestion of "Bonum Nomen" in last week's *Builder* respecting a name for the above Museum. I think, if London did not already possess,—as he himself remarks,—"the 'National Gallery' in Trafalgar-square" and "the 'British Museum' in Bloomsbury," his notion of calling the Museum at South Kensington "the National Museum" would be an excellent idea; but having the former, I fear sad confusion would arise with foreigners and country-folks between the *National Gallery* and the *National Museum*; and having the latter, I—being a staunch Britisher—cannot help considering the *British Museum* the national one. However, "Bonum Nomen" seems as desirous as myself to find a suitable appellation for our most excellent but nameless museum, and therefore I cordially shake hands—mentally—with my fellow-worker in the good cause.

* In the metropolis they are so.—Ed.

A SANITARY POLICE.

HOME-BOUND during two or three days as an invalid, I happened to turn for an hour through an old volume of our ever-fresh and inimitable friend *Punch*. In the volume for the latter half of the year 1848, there occurs a most humorous reference to what Mr. Punch calls "A Sanitary Police," and beneath the guise of his laughter-enticing jokes there is an idea so excellent, and a suggestion so palpable, that it is almost a wonder that it has lain unappropriated for twenty-one long years. Take a sample of the humour:—

"We should, however, suggest that to facilitate the arrangements of the General Board of Health a sanitary police force should be at once organized. This corps might be empowered to order the stagnant pool to move on, and in case of unlawful assemblies of large vegetable bodies, the sanitary policeman should have instructions to take them up at once without any other warrant." Again—"Large crowds of persons in small houses or single rooms might be declared illegal, and power should be given to the sanitary police to call upon them to disperse, while the law of arrest should at once be put in force against anything in the shape of a pestilential vapour."

Thus and thus does Mr. Punch, in 1848, raise his voice and his baton against prevailing

wide bow of red ribbon,—is picturesque, and would be worth reviving in these days of innovation on the too-long neglected and ugly costume of our modern heaux. There is very careful work in the miniature, painted in oil on jasper, of an elderly head, almost bald, the face bearing a straight rough moustache and pointed beard, and below, a square lace-edged collar; next comes the pretty likeness of Louis XV. in youth; a small oval engraving on mother-of-pearl of a naval engagement is careful and clever; and the oval miniature in oil of a lady in a large high lace ruff, amongst the folds of which the face only is visible, reminds one of Fitzgerald's fascinating fairy scenes, wherein the tiny beings are all dressed in flower-petals and leaves.

Of snuff-boxes, the most notable are an octagonal flat gold box, with painted enamel portrait of the Dauphin of France, in filigree border; a basket-shaped box of two pieces of lapis-lazuli mounted in chased gold; a square gold box, chased with "roocoo" scrolls, set with diamonds, and having slabs of moss-agate on top and sides, and a miniature of a gentleman inside the lid; a gold box, cover inlaid with slab of bloodstone; another, with slabs of Labrador spar, mottled green brown and white; a red sardonyx basket-shaped box; an oval agate box marked with dark-brown spots; a square Oriental agate box of a light-brown colour; an oval one formed of two slabs of striped red and drab onyx; an oval moss-agate box; an oval gold box, with pieces of amber at top and bottom; a pale amber box in form of a hook, mounted in silver; an Oriental agate egg-shaped box; a red Oriental agate box, pomiform, with gold rim and hinge; a square bloodstone box, gold rim and hinge; a square amethyst-matrix box, on the lid a bull-dog couchant, diamond eyes and collar; a square gold box, inlaid with insects, flowers, and leaves in translucent enamel; an octagonal gold *bonbonnière*, covered with green translucent enamel and white flowers; an Oriental-work octagonal flat gold patch-box, the cover chased with Cupids and scrolls, eighteenth century; a circular gold *bonbonnière*, with raised beautifully-modelled flowers and leaves, enamelled in natural colours on green ground, very rich; and a circular gold and blue enamel *bonbonnière*, with dome-shaped slabs of agate top and bottom.

Very charming are the gold and purple-enamel oval toothpick-case, shuttle, and large clasp, the latter having hair, under glass surrounded with large pearls, in the centre; the two former bearing a cipher of diamonds, the toothpick-case being also set round with diamonds. There is a fluted oval bowl hollowed out of rock-crystal, the gold rim set with emeralds and rubies, and having a crystal cover to match; there are two oval crystal boxes, with lid, silver rim, and hinge; a rich one-handed bowl of root-of-amethyst, with red jasper stripes; four fine cups of clear pale jade, two with double handles, one with dragon handle, and one covered with over-lapping leaves; six cups and saucers of Oriental white agate, no handles, and various other agate cups and bowls. An oval basket-shaped amber box, with gold hinge and lid, the lid unfortunately broken, is very clear, and rich, and dark in colour; an amber cup, on turned stem, is also of dark amber; and there are three cane-handles of the pale. One bowl of red agate is spoiled by its stem, a frightful seated Hindu deity of gold, with necklace and ear-rings set with jewels,—possibly rare and valuable, but still very ugly; and a mild version of the above comment must apply to the two Oriental agate covered cups, composed of several pieces of varied form, built up one above another; and the lofty bloodstone cup, striped with red and yellow, and having a long thick stem and foot. One smaller Oriental agate cup on a foot white with brown stripes, has a thick fleshy-looking stem, that makes it wonderfully like a sea-anemone just beginning to think of stretching out its tentacles. I cannot see any beauty in the last-named object, nor yet in the alabaster column surmounted by an agate egg-shaped ornament, and having an agate base; nor in the bloodstone handle mounted at one end with a pointed piece of cornelian; nor the agate handle mounted with a piece of sard. The Oriental agate hemispherical bowl, with pierced base of enamelled green and white leaves, is good; also a small white oval agate bowl, with projecting handle at each end. The moss-agate teapot and cover, with silver rims, is quaint and rich; and there are besides an oval jasper bowl carved with cherubs' heads, on a stem and foot mounted with gold rim and enamelled flowers; an Oriental agate cup on silver stem of three helmeted

terminal figures, the foot chased with recumbent figures, and borders of sixteenth-century work; a crystal boat-shaped tazza on foot, with handle in form of a dragon's head, with enamelled wings and breast, and enamelled border and foot; a crystal bottle, pyriform, carved with cherubs' heads and festoons; a shell-shaped bloodstone howl, mounted with silver-gilt handles and foot, and a pretty little white Oriental agate scent-bottle with pointed stopper.

I cannot admire the three *Sèvres* vases of blue-du-roi, covered with gold spots; but the *Sèvres* easel-stand and cover of *gros-hien*, mounted in ormolu, with twisted scroll-handles, and chased square foot and marble plinth, is very elegant and of most careful workmanship. The three Chinese porcelain globular vases of celadon, mounted in ormolu, are handsome; as is the gourd-shaped *Sèvres* vase and cover, painted with a marine subject, by Morin, and groups of flowers. This vase was apparently intended to be mounted on an ormolu base, judging from the unsnaphy band of white, which is now its sole foot, and which is an eyesore, detracting from its otherwise rich and finished appearance.

A small German sun-dial, with compass, level, and indexes to show the hour and minute of the day, in original leather case, is curious. There are seven rich watches, one of which has a bloodstone case set with diamonds, and another a case of Oriental agate; two gold anchors, inscribed respectively, "Espérance—Keppel," and "Keppel—Victory," and a gold onseigne pierced and enamelled, and in the centre a white cross and blue knot, with "High Borlace" inscribed below: date 1759.

A *Sèvres* calaret of six pieces, covered with blue trellis-pattern enclosing roses on gold-spotted ground, and painted with medallions of pastoral emblems, is not particularly beautiful as to form. The Chelsea porcelain tea-service, gold indicated pattern on white ground, and painted with blue forget-me-nots, is interesting from the fact that some of the pieces are of "Crown-Derby," made to match the others, and marked with the crown and Italian capital D in puce colour, two crossed sticks, with three dots between each two ends, separating the crown and the D.

A toilet service of silver gilt, with white silver plaques of classical subjects in relief, and consisting of eighteen pieces large and small, is costly but not effective: though this may arise from the manner in which it has become tarnished; it is in the German style and dates from the end of the seventeenth century. The two Chinese melon-shaped silver canisters, chased with birds and flowers in relief, are much more satisfactory on account of the vigour and sharpness of their execution.

ART-LOVER.

THE CARLTON ART AND INDUSTRIAL EXHIBITION, NEAR NOTTINGHAM.

THIS exhibition of art and general industry, which was opened on Monday, the 29th ult., by Earl Manservants, comprises a very respectable collection of articles of local industry, and a valuable selection of rare and costly articles calculated to please the eye, improve the taste, and elevate the class among whom the originator of the Exhibition, the Rev. O. W. Forester, rector of Godling, is labouring.

The following lines on the opening of the Exhibition were written by Lady John Manners, of Belvoir Castle:—

I.
Treasures of art, and toil, and thought,
From far and near, are hither brought;
Castle and homestead, cottage, hall
Have kindly answer'd to our call;
Jewels of industry they send,
Which here, as in one casket, blend.

II.
From rich and poor, from young and old,
These gems of toil we here behold:
They prove that powerful fairies dwell
With all who labour to excel;
Genius and industry their name,
They lead to happiness and fame.

III.
In ancient times, men used to say,
"My son, to labour is to pray."
The power who gives the artist skill—
The lesson Nature's wonders preach;
Encourage all, in every sphere,
To use their father's gifts aright.

IV.
May art's creations ever teach
The lesson Nature's wonders preach;
Encourage all, in every sphere,
In doing well to persevere,
And seek, in humble faith and love,
Light, life, and help from One above.

BUILDINGS FOR WORKMEN, DEPTFORD.

ON Tuesday, the 6th, the new group of buildings for workmen, consisting of a mission hall, to hold 350; Institute library and reading-room, with lodge and soup kitchen, were opened at Deptford, Lord Sydney presiding, supported by the Bishop of Colombo (in the absence of the Bishop of Rochester from illness), and others. The buildings were erected mainly by the freeholder of a large estate there, Mr. James J. S. Lucas, who also gave the site at a cost of 1,800*l.* They were built by Mr. Saunders, under the designs of Mr. Joseph Peacock, architect, and are attached to St. John's Church, Lewisham-road, under the guidance of the Vicar, the Rev. C. F. S. Money.

THE SEWAGE QUESTION AT BRIGHTON AND BOLTON.

Brighton.—The town council have had a discussion on the outfall question, upon a report from the local works committee, who informed the council that they had had under consideration the desirability of constructing a new outfall for sewage opposite the west end of the King's-road, at the joint expense of the town council and the Brunswick-square and terraco commissioners, in lieu of the two present outfalls in that neighbourhood. The borough surveyor had submitted a report upon the existing outfall for the Brighton western district, which, he stated, was in a very dilapidated condition, and recommended that a new outfall be constructed and extended to a distance of 2,000 ft. from the shore, where the depth of water was about 14 ft. at low water and 3½ ft. at high water, with a strong current east and west. This outfall (3 ft. in diameter) would be sufficient to carry away the sewage of the Brunswick-square district, in addition to the Brighton western district, if, at any future time, the two should be combined. The works committee passed no resolution upon this recommendation, but reported that they hoped to be in a position to state to the council, at a meeting on the 21st of April, what course they would recommend to be adopted. The report of the works committee (which embodied the surveyor's report and recommendation) was, on the formal motion of Mr. Fahian, chairman of the committee, ordered to be entered on the minutes of the council's proceedings. Alderman Smithers then said if Mr. Fahian took no further steps in the matter, he should. He considered the report a most important one; and thought the council ought not to postpone this matter. Therefore he moved that the report now presented be approved and adopted, and that the works committee be requested to carry out the same as quickly as possible. After some discussion the motion was carried by a majority of 26 against 13.

Bolton.—Mr. Arnold Taylor, of the Local Government Act Department, has had an interview with the street committee of the Bolton corporation. Two schemes had been before them for some time for the interception of the sewage of the borough,—one by the borough engineer, costing about 12,000*l.*, and one by Mr. Councillor Lomax, surveyor, to cost about 5,000*l.* Complaints having been made to the Home-office that nothing was being done in the matter, Mr. Tom Taylor has been pressing the question upon the corporation, who have now adopted Mr. Lomax's scheme, with slight modifications.

ACCIDENTS.

Fall of a Bridge, Saltburn-by-the-Sea.—Messrs. Hopkins, Gilkes, & Co., of Middlesbrough, are building an iron bridge of 700 ft. in length across the glen, along which the Skelton heck runs at Saltburn-by-the-Sea, for Mr. J. T. Wharton, of Skelton Castle. The work has been in hand some time, and the whole of the piers—eight in number—which consist of cast-iron columns, were finished some time ago, and four of the girders, which are about 85 ft. in length, are fixed, and the flooring completed. On Monday a strong force of workmen was employed fixing a pair of tiers upon two of the piers, which are eight tiers in height, reaching about 130 ft. from the ground. Everything appeared to be progressing favourably, when suddenly one of the girders slipped from its holding upon the pier, swung to and fro, and then struck against the other pier, smashing the two girders and one of the piers absolutely into scrap iron. Three men were unfortunately killed.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the meeting of this Society on the 10th ult. (Mr. W. H. Hay, vice-president, in the chair), Mr. R. Jähns, late of Berlin, read a paper under the title "Carl Friedrich Schinkel," being an endeavour to define the place and influence of Schinkel in connection with the revival of the Greek spirit in art. He claimed for Schinkel the character of a "prophet" in art, as being one of those who perceived the real origin and tendency of the movements of thought in his day, and who entered on his artistic career upon certain fixed and definite philosophical principles. This position he illustrated by quotations from the writings of the celebrated Berlin classicist, showing that his object and intention were not to revive the Greek style in its ancient forms, so much as to study its spirit and principles, and continue its historical development, instead of merely repeating the early history of classic art over again. The paper was illustrated by a great number of engravings and drawings of Schinkel's principal designs, both executed and unexecuted, including not only purely architectural design, but many beautiful sculptural designs for friezes and bas-reliefs, showing a complete knowledge of the difficulties of figure-drawing. Among the illustrations also were several lithographs of designs made for important scenes in the grand operas given at the Berlin theatre; some of which, intended for Mozart's "Zauberflöte" and Gluck's "Armida," were of a highly imaginative and original character. A lengthened discussion took place upon the principal points touched on in the paper.

INDUSTRIAL PARTNERSHIPS IN CABINET-MAKING.

Sir,—The letters in your journal on industrial partnerships in cabinet-making, show it is not widely known that the principle has been, for three years past, practically applied to the manufacture of furniture, a number of journeymen cabinet-makers having started a co-operative manufacturing society. They had long seen the tendency to deterioration in the quality and style of the work in the trade, fostered by the want of taste in the public, and the unfolding cry of the day, cheapness of production. To the mores tyro it must be evident that where cheapness is the one desideratum, excellence of work and taste in design are sure, to a certain degree, to be sacrificed. However, I think, that co-operative effort is a great step towards checking the evil; but more than that is required,—the technical education of the industrial workers, and a cultivation of their taste, by means of schools and easier access to the national and local museums,—so that, by having ever present to their minds an ideal standard of excellence, they will unconsciously strive to emulate it. The same means that tend to elevate the workmen will also gradually have that effect on public taste, and we shall then find that persons wishing to furnish will rather have an article thoroughly well made, even if severely simple in design, than a florid and showy piece of furniture, in which the joints will start, the dovetails loosen, and, in fact, become useless in three or four years. I do not subscribe to the idea that the required excellence of work cannot at present be attained by many of the London cabinet-makers; such as are attracted to our society, for instance, and who are capable of carrying out any design that might be submitted to them; and the remark applies to too many of our trade. Yet it must be borne in mind that the workman's efforts in that direction are stifled by his technical education of the industrial workers, and the employer is driven by the competition of his own class to purchase a system by which those engaged in the trade suffer, and the underselling public obtain an article which may appear cheap, but in the end will prove anything but a bargain. Experience has confirmed my opinion that the general adoption of a system, such as we have successfully inaugurated, or the twin principle of industrial partnerships, as advocated by your correspondent, is necessary, before we can expect to realise that happy combination of taste and efficiency, together with the minimum cost of production, which is desired. EN. MEADS.

THE MÈN ROCK, OR TOLMÈN, RECENTLY DESTROYED.

You inserted in the *Builder* of April 10, p. 289, Mr. Layard's reply in the House of Commons to the question of Sir H. Verney respecting the preservation of our ancient monuments. The concluding sentences refer to "a monument of great national value," which, he stated, had recently been destroyed in a Vandalish manner. It may interest your readers to know that the relic of antiquity of which Mr. Layard spoke was the Mèn Rock or Tolmèn, in Western Cornwall, about 3½ miles south-west of Fenyryn; and I propose here to give a very brief outline of its appearance previous to its displacement into the quarry below. The Mèn Rock was one of those objects designated by Borlase as *tolmèn* or *holod rocks*. Two of a similar character occur in the island of St. Mary, Scilly, but these are not of such a curious formation as was the recently-displaced Tolmèn, in Constantine parish. Situated on a high ground, this latter rock was such a prominent and interesting feature, both from its

position and from its huge size, that it could not fail to be noticed even by a stranger to the locality. Borlase states that at least 750 tons of granite were contained in the stone itself, but I believe this estimation to be a rather exaggerated one, and a value probably nearer the truth would be about 500 tons. Even this is an immense weight to rest simply on the points of two rocks several feet apart; and, more remarkable still, beneath the huge stone there was an open passage large enough for a full-grown person to creep through without much difficulty or exertion. The length of the stone, which was oval in form, was about 33 ft., decreasing in width from 19 ft. in the middle to 18 ft. and 16 ft. at the north and south ends respectively. Its circumference measured approximately 100 ft. The passage beneath the stone was about 3 ft. square, and, through this, it has been customary among the ignorant and superstitious to pass men, women, and infants to cure them of lumbago and all spinal complaints. I have been unable to ascertain the exact date of the overthrow of the Mèn Rock; but it probably occurred some time during the second week in March last. The deed was done, I believe, without the knowledge of the proprietor of the ground, by a man to whom he had let the adjoining quarry, and to whose discredit and shame belongs, therefore, the blowing up by gunpowder of the bed of granite on which the stone lay.

When shall we have our pre-historic remains, all of which are so valuable in elucidating the history of an ancient race, preserved from further mutilation and destruction? The county of Cornwall is rich in these remains; but almost every year brings under our notice fresh acts of vandalism, which call for the strict inquiry of some learned and well-qualified body. The Ethnological Society of London has recently appointed a committee to look after our pre-historic monuments generally; why should not the local societies at Truro and Penzance, originally formed for the purpose of protecting the antiquarian relic of the county, follow the same good example? and, with the local influence and personal knowledge of their members, much might be done to prevent such an unpardonable act of vandalism, as the recent blowing up of the Mèn Rock, from again occurring. X. X.

MODERN BRICKLAYERS.

Sir,—I said "scamping times" advisedly, and your correspondent—their apologist—thinks they are hardly used thereby. I do not know whether any good would accrue if I were to stop now to enumerate the various practices in the building trade alone which are wrong and indefensible, and of modern date, but if he desires it, I shall have no objection to mention such as have come under my own observation. That facing bricks are cut down the middle lengthwise I know, having seen such recently, but it has been only in single course hands of costly material, and never with any pretence of veneering.

With the latter part of your correspondent's letter I would rather some third person—an architect—had dealt, and, with your permission, I will quote Mr. Garbett, in his recent communication to you on sundials (p. 184). He says, "I am obliged to say 'carpentry' not 'building,' because in no branch of building craft but the carpenter's do we any longer attempt more practical science than the builders of Timbuctoo." Such is the opinion of a living architect, and such is, I fear, the experience of many others, and it seems to offer a reason why bricklayers are seldom appointed to superintend brickwork. That there are honourable exceptions I am very sure, but they are rare, and it is deplorable to every thinking mind that an important body of men like the bricklayers should have lapsed into such a state as to produce so few men capable of conducting their own work in a proper manner. There is a very small percentage of the whole body who know enough of the practice of their art to set a nicely out and ganged arch, and fewer still who can set it out, especially if it be an elliptic or Gothic pointed, and one may inquire of a very, very large number, Why is a brick red?—or white? and get no answer; not to speak of such practical, every-day matters as the composition of mortars and cements, and their changes and behaviour. I am sorry to say all this; but it is true, and the statement of the fact may do good. I hope it will, for bricklaying has been a fine art

in past times, and may be as again, if we can get men to give their minds to it. At present, whoever acts about doing good brickwork has to educate his men up to it, and as there are always many unwilling to be taught, it is very up-hill work and discouraging. Why do not men, who now indulge in filthy talk at their work, who curse and swear at every sentence they utter, and which goes under the general term "scarfing grammar,"—why, I say, will not these men be persuaded to discuss their work and its connections—geometry, geology, chemistry, colour, &c.—thus making themselves masters of their business, and able to undertake anything that may be expected of them. When will the trade societies become the successors to the old trade guilds, and require every man to undergo a theoretical and practical examination before he imposes himself upon the public as a tradesman? I must confess I like good work; and wish to see every workman a good workman; but as long as we pay all men alike, whether they be good, had, or indifferent, and allow any additional wage offered to the good workman to be characterized as "blood money," we cannot admit a very powerful incentive to improvement, and so long will our trade, I fear, remain in the very unsatisfactory state in which it now is. E. G.

HAVE CHURCHES OF EVERY DENOMINATION A RIGHT TO USE BELLS?

In a paragraph, "The Bell-ringing of England," very lately published, occurs the following statement:—"It is not generally known that the use of bells in churches and chapels is restricted to those of the Establishment; so that Dissenting bodies are not allowed their use in England, and the same law is applicable in Scotland." Now, in order to show that this is a mistake on the part of the writer of the paragraph, I subjoin an extract from a judgment of Lord Chief Justice Jervis in the case of *Soltan v. De Held*, relating to the use of bells by a Roman Catholic community in such a manner as was alleged to be a nuisance, which was tried at the Croydon Assizes on the 13th, and reported in the *Times* of the 14th of August, 1851:—

"First, with regard to the right of using bells at all. By the common law, churches of every denomination had a full right to use bells, and it was a vulgar error to suppose that there was any distinction at the present time in this respect. At the same time, those bells might undoubtedly be made use of in such a manner as to create a nuisance; and in that case a Protestant church and a Roman Catholic one were equally liable." "He would now tell them what, in his opinion, constituted a nuisance. The mere fact of ringing bells so many times in the day did not in itself constitute a nuisance—the nuisance must be of an enduring and substantial character, not such as would give offence and annoyance to a nervous mind, but which was calculated to cause permanent inconvenience and disturbance to men of ordinary mind and nerves. The jury would say whether the evidence satisfied them of this in the present case."

I may add that the jury gave a verdict for the plaintiff—damages, 40s.

Upon the application of the learned counsel, his lordship said he thought it was a case in which he ought to certify. THOMAS WALESBY.

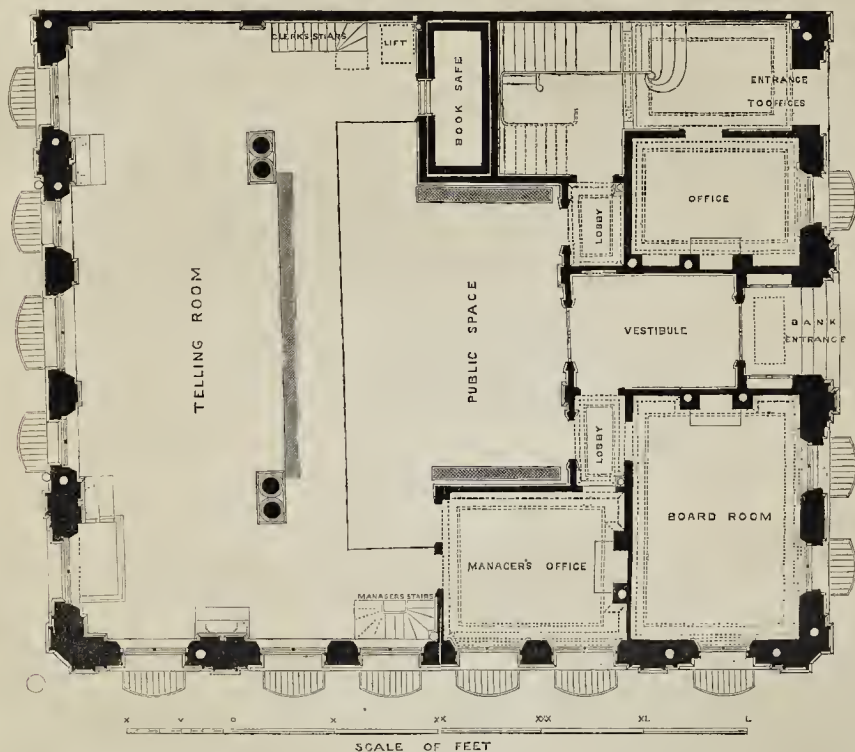
BRECON COUNTY GAOL COMPETITION.

The designs sent in to the clerk of the peace for the above were six in number, and were opened in the presence of the committee of visiting magistrates on the 6th of March ult. After examinations, the committee recommended the design of Mr. Thomas F. Fillary, of 27, Leadenhall-street, London, as possessing marked advantages in its general details and arrangements over the others, to the Court of Quarter Sessions, which was held on the 6th inst., when their selection was finally endorsed, by vote of the whole court in favour of its adoption, and that it be carried out, after the publishing of the necessary notices, &c., in the local papers. The following were the estimates of the competitors, viz.:

Mr. Lawrence, of Newport, Monmouthshire.....	£6,500
Mr. Fillary, London.....	6,300
Mr. C. J. Phipps, F.S.A., 28, Mecklenburgh-square, London.....	6,000
Mr. Nicholson, of Hereford, about.....	5,000
Mr. Williams, County Surveyor, Brecon, about.....	5,000
Mr. Sutton, Bromley Hall, County Surveyor, Nottingham, did not specify the amount in his report on his design.	

Mr. Fillary's estimate will be considerably reduced by making use of the native stone externally, instead of impervious brick, as shown in his drawings and plan.

THE ALLIANCE BANK, LIVERPOOL.



Plan of Principal Floor.

THE ALLIANCE BANK, LIVERPOOL.

AN important building has just now been erected in Castle-street, Liverpool, for the purposes of the Alliance Bank, formerly carried on in Brown's Buildings.

The site upon which the building has been erected is conspicuous, and there is reason for supposing that it is immediately contiguous to the ground upon which the famous old Castle once reared its head. The building, which covers 525 superficial yards of ground, has three elevations, the principal entrance front being towards Castle-street, the other two fronts being to Derby-square and Lower Castle-street respectively. The whole of these fronts and the ornamental chimney-shafts are executed in stone of a light cream colour, from the Cefu quarries, near Knahon.

The entrance to the bank occupies a central position in the Castle-street front; and, to give it importance and to distinguish it from the entrance to the offices, which is also in this front, it has been made a prominent feature in the design. The style of architecture adopted is Italian, of the Venetian type.

The interior of the building has been finished in a substantial manner. The public room of the bank is handsomely fitted up. A spacious vestibule intervenes between the street and the public room, fitted at each end with folding-doors of oak, glazed with ornamental glass, to avoid draughts. Passing through the second pair of doors, the visitor stands immediately under a large dome, from which and the eight windows ample light is obtained in all parts of the room.

The side walls are divided into bays by pilasters of Devonshire marble, and panelled with detached columns of marble supporting the main ceiling beams. The bases and carved capitals to these columns and pilasters and the dressings to the various doors are of stone. An enriched impost band and frieze, ornamented with festoons of fruit and flowers, are continued

entirely round the walls, the space between them being filled in with panelling. The soffits of the main ceiling beams are finished with panelling, the ceiling itself is also divided in panels, and decorated. The dome is an important feature in the composition. The walls and ceilings have been painted in oil of subdued tints, gliding being introduced to obtain richness of effect. The floors of the vestibule and public space in front of the counter are laid with tiles; the floor behind the counter is of oak. The counter, enclosing screens and other fittings in the public room, are of Spanish mahogany, designed to be in character with the building. The board-room, and a private office for the manager of the bank, Mr. James Beckett, adjoin the public room.

The offices erected over the Bank are entered, as before stated, from Castle-street, the entrance-hall being spacious and well-lighted. From this hall access is obtained to the various floors—three in number—by a wide staircase of Hopton Wood stone. The walls of the staircase and entrance-hall are finished in Keene's cement, divided into panels, which will be painted in tints. Four rooms are provided as a mezzanine floor.

Descending to the basement, we find the strong-rooms belonging to the Bank, and notice that precaution has been taken in their construction to obtain security. Among other provisions is a passage running entirely round the strong-room, so that the manager, who has a private entrance to it, could at once detect if anything wrong were going on. For the removal of cash and books to these rooms, an hydraulic lift affords a ready means of communication with the banking-room. Retiring-room and lavatory accommodation is provided on the basement for the manager, and for the clerks, with ready access, by separate staircases. A portion of the basement fronting Castle-street is appropriated to the residence of the keeper of the premises; whilst the residue, or that portion fronting Lower Castle-street, is devoted to offices, to be

let off to wine merchants or others, in conjunction with the vaults in the sub-basement. The reason the vaults were introduced was, that in sinking for the foundation it was discovered that the rock on which a portion of the premises stand had been cut away, and the opinion of the builders was, that they had alighted upon the moat of the old castle, a view which would be favoured by the circumstance of a subterraneous passage having been discovered, leading, it is supposed, down to the river. Under the circumstances, therefore, foundations had to be built, this led to the formation of the fire-proof vaults.

The following are the dimensions of the building:—Area, 525 superficial yards; height from the street level to the main cornice, 66 ft.; ditto to the top of the ornamental chimneys, 78 ft. 6 in.; depth from the street to the vaults, 22 ft. The area of the banking-room is 263 yds.; height to the ceiling, 22 ft.; height to the eye of the dome, 33 ft.; diameter of the dome, 14 ft.

The contract for the whole of the work was taken by Messrs. Holme & Nicol, and they have been assisted by the following sub-contractors: viz., Mr. Dempster, masonry; Mr. Merrick, plumbing, painting, and glazing; Mr. Jones, slating, plastering, and modelling of decorations in banking-room; Mr. Oppenheimer, of Manchester, ornamental tiling; Mr. Green, of Manchester, sculpture. The late Jos. Smith and George Owen & Co. supplied the marble chimney-pieces, and Messrs. Pilkington & Sons the glass for the dome. The contract for decorating the public room, and the other rooms occupied by the Bank, and for supplying the necessary furniture, was taken by Messrs. J. R. & W. Jeffery & Co., and they have carried out the work entrusted to them satisfactorily. The hydraulic machinery was supplied by Messrs. Easton, Amos, & Anderson, of London.

The architects were Messrs. Lucy & Littler, whose designs were originally chosen in competition with those of other architects.



B. SLY. DEL.

W. E. HODGKINSON. SC.

THE ALLIANCE BANK, CASTLE-STREET, LIVERPOOL. — MESSRS. LUCY & LITTLER, ARCHITECTS.

THE TRADES MOVEMENT.

The Potteries.—A reference was recently made to Mr. Davis, the stipendiary magistrate, as umpire in the arbitration of a difference between the builders and bricklayers of this district. The bricklayers had applied for a reduction of the hours of labour to the extent of half an hour a day, enabling them to leave off work at half past five, and an advance of a farthing an hour in their wages. Mr. Davis has given his decision, which is adverse to the operatives on both points. He says:—"I have come to the determination that the operatives have not made out a case for an alteration in the existing rules."

Sheffield.—We understand that the whole of the operative carpenters and joiners in this town are under notice. The object of the masters is that day payments be changed to the hour system. The men are believed to be adverse to the change, unless some rules are agreed to which would have the effect of enabling them to earn adequate wages in winter, as in Birmingham and some other towns.

Stockport.—The sawyers have struck for an advance of wages, equivalent to 17½ per cent., taking the work "all round." They have declined to accept the Manchester rates of payment.

Manchester.—The masons in the employment of all the principal firms in Manchester have struck work. The masters desire to introduce payment by the hour, which the men refuse to accept, and make a demand for a reduction of time, from 54½ to 48½ hours per week. There are also questions about quarry-dressed stone, and the introduction of machinery. It is greatly to be desired that the whole question should be referred to some disinterested party to effect a settlement. The masters, we understand, are willing to adopt arbitration. In the case of the operative joiners a similar result is feared, the masters having given the men notice that after May 1st they will pay by the hour, and the men in turn having given notice that they will expect from the same date a diminution of half an hour a day in their hours of labour. The case is rendered still more complicated by the masons and joiners wishing to begin and leave off work at different hours, an arrangement which the masters say would be prejudicial to their interests when carried into practical operation.

THE LIABILITY OF INFANTS.

COLLINS V. PHILLIPS.

This was an action brought at the Bloomsbury County Court before Mr. G. Lake Russell, Judge, by Mr. Collins, a builder, to recover the sum of 22l. 12s. 6d. for work done. Mr. Wright appeared for the plaintiff, and Mr. Williams for the defendant. The case was tried by a jury. Plaintiff stated that in March, 1868, he fitted up a shop for the defendant, who then carried on the business of a boot and shoe maker in Duke-street, Grosvenor-square. Defendant's name was put up on the trade cards very near the defendant's name; he also did some work for defendant's father at the same house. When he applied for payment he was told that defendant was under age. Defendant had since given up the shop in question, and had become a cab proprietor. The defence was, firstly, that defendant was an infant in the eye of the law when the work was done; and, secondly, that the father had paid for the work in the amount he paid to the plaintiff. His Honour left three questions for the jury to decide. Firstly, was defendant under age at the time the work was done, and did he give the order? Secondly, if so, was the work necessary? And thirdly, were the charges fair and reasonable? The jury, after a short consultation, gave a verdict for the plaintiff on each point. Judgment for the full amount of the claim and costs were therefore given.

A PALACE.

Sir,—When one reads of the reception that our own princes as well as others on the Continent meet with, and the magnificent palaces in which they are accommodated, it appears to me rather a surprise on our own country when we reflect that we have not a palace worthy of its name, or one that would command the attention of foreign princes, and this after the vast sums that have been squandered in streets, additions, &c., without a single result. If you go back to the period of George IV. not one vestige is left of his atrocious taste fortunately. Even if you look at Buckingham Palace, what is there that is satisfactory? Again, look at St. James's, which is also termed a palace; and Windsor Castle is really the only one that merits such a designation. The finest opportunity that offered of making a magnificent palace was at Kensington, which might and ought to have been secured, and no part of the land left off or sold for building purposes, which has been a great mistake. There is now no site scarcely left for such a purpose, and if there had been, the only mode at the present day would have been to have selected a certain number of talented and tasteful men to have completed by Royal patronage for such a purpose, by being liberally remunerated for the task. The style selected should be that of *Italian or Roman Architecture*, of the age of Palladio, and the architecture of Venice. As for Gothic, it would be out of the question, frittered away in absurd and extravagant ornament, to be, in the space of

some few months or years, obliterated with soot and dirt; and it is still to be hoped in the new law courts all this extravagance may be avoided, and that good and telling masses will predominate rather than trifling ornaments. Only witness the result of all this in the new Houses of Parliament, wherein, if a bolder outline, with a less profusion of ornament, had been adopted, there would have been less occasion to censure the talented architect. I hope still it may not yet be too late in the rising generation of our praiseworthy princes to set the example for a Royal palace worthy of this great country.

A SUBSCRIBER.

THE THAMES EMBANKMENT AND THE DISTRICT RAILWAY.

IN the House of Commons Lord Elcho, as chairman of the Thames Embankment Committee, called attention to the serious danger to private and public buildings in the metropolis from the vibration of the trains of the Underground Railway. He moved—

"That it be an instruction to the committee on the Metropolitan District Railway Bill to inquire and report whether any and what provision will be made by the railway company in constructing their line from Westminster to Cannon-street, with a view to prevent injury to adjacent buildings from the vibration caused by the passage of trains."

Mr. Dent, the chairman of the Select Committee on the Metropolitan District Railway Bill, said that the committee had reported on it that day, and it was now too late to move this instruction.

Mr. Layard said he thought good service was done by calling attention to this subject. He hoped the noble lord would either move the recommittal of the bill, or propose new clauses, on the third reading. He was informed that Somerset House would be endangered by the workings of the Underground Railway.

Lord Elcho, having said that he would consult with his right hon. friend as to the course he should adopt, withdrew his motion.

The following resolution was, on another occasion, agreed to on the motion of Lord Elcho:—

"That it be an instruction to the Select Committee on Hungerford-bridge and Wellington-street viaduct to inquire and report specially to the House whether any public buildings now existing, or that may hereafter be erected on the Thames Embankment site, are likely to be injuriously affected by the Metropolitan District Railway, or by any other railway or railways now in progress or sanctioned by Parliament on the embankment; and, if so, whether it would be possible in the construction of the railways to guard against such injury."

THE WORCESTER SOCIETY'S CRITICISMS.

Sir,—Will you kindly allow me space in your paper to briefly notice the "eccentric" remarks in the last report of the Worcester Architectural Society in reference to the new Orphan Asylum now in course of erection at Henwick, near Worcester, extracts from which appeared in the *Builder*; not that I have any fear those remarks will carry much weight with them, the author being well known—by the profession at least—for his partial criticisms.

Just and honest criticism is a wholesome thing, and of immense advantage and instruction to the uninitiated as well as the profession; but when it degenerates into a morbid desire to attack, a disposition and, indeed, determination to appreciate nothing (unless it be from the pencil of the personal friends of the critic), its influence becomes derogatory and damaging to the very cause it purports to uphold and advance.

I am not the first who has been malign in this society's reports. I remember the malignant disposition shown towards one of its own members a few years ago in reference to the St. Clement's schools at Worcester and the Bromsgrove Lacey Church, and the still more bitter feeling displayed in reference to the Worcester new Cemetery chapels, upon each of which occasions the *Builder*—well-known for its integrity and honesty of purpose—depreciated its action and mode of criticism.

In this instance the few general terms condemnatory of the architecture as applied to the building in question, although evidently intended to be damaging, are really so weak and meaningless that the spirit of a wilful desire to injure its authors, for not a single argument is adduced in support of the charges; and I am left with the alternative, therefore, of denying them *in toto*, and asserting that I am prepared to defend the building upon the true principles of Pointed architecture. It is true I expected nothing from the society except the treatment I received; and I ought to be thankful since I find the second part of the report asserted that the secretary had been less sharp in his criticisms than in former years.

WILLIAM WATKINS, Architect.

PROVINCIAL NEWS.

Derby.—Messrs. R. Dennett & Co., of Derby, London, and Nottingham, builders, are now proceeding with the new Government Offices, at the Victoria-street corner of the new St. James's-street, having undertaken the contract for its erection at a sum approaching to 6,000l. The elevation will be Classic, from designs by Mr. J. Williams, of London, the Government Post-office architect. The fabric, which will be of stone externally, will rise from a deep plinth of Devonshire marble. There will be two entrances from Victoria-street, that front to St. James's-street being for the public on Post-office business. Another, at the contrary end of the same front, will lead to the Revenue Offices, which will be on the second floor, and to the Postmaster's room and other offices. There will be two windows between on the ground floor, flanked by columns with deep sunk bases and projecting capitals. These will carry a string or series of stone lintels, which will extend along the entire front, and upon them the ornamentation will be fretted Grecian. Above these windows there will also be a plate-glass panel, corresponding with them in width, and flanked by carved corbels assisting to bear the first cornice, which will project from 4 ft. to 5 ft. Above this, the first floor will be lighted by four lofty windows, with balustraded balconies, and moulded architraves, finished with pedimental heads. Above these, the upper story will be of a somewhat plainer character, and the entire front will be completed by a projecting dental cornice, surmounted by a balustraded parapet. The St. James's-street front will be of precisely the same character as far as the main building extends. The sorting-room will extend beyond it, and will be a plainer structure, of one story only, but in keeping with the Classic order of the whole. It will be lighted by a large raised skylight, which will extend from the principal elevation to the end of the site. The entrance to the sorting-room will be by a central door in St. James's-street, which will be used by officials only. The Telegraph Office will be on the St. James's-street side, but the business connected with it will be transacted at a central counter in the public hall, which will be entered by the first door in Victoria-street, and which will occupy the entire area, except the Entrance Hall for the Revenue Offices. The space in the rear from St. James's-street of the sorting-room, and extending from the main structure, will be occupied by rooms for the clerks, sorters, &c., and the basement story of the public hall will be used for revenue stores, and will be fire-proof, as the floor over them will be on the principle of the contractors, who are the patentees for fire-proof flooring, whose principle has, we understand, been also adopted at the Derby and Derbyshire Infirmary.

Wareham.—For the proposed new Town-hall and Corn Exchange several designs have been submitted to the committee, but abandoned in consequence of not having sufficient support by subscriptions to carry either of them out. A design, with plan, was placed before the corporation at a recent meeting, and the Mayor was requested to ascertain the amount likely to be required to carry it out, or one somewhat similar. It was carried unanimously—

"That, inasmuch as money to the amount of 1,400l. or thereabouts will be required for the purpose of building a new town-hall, corn exchange, &c., and, as it appears that 500l. or thereabouts have been raised by voluntary contribution, the Corporation hereby consent to borrow (if required), on such terms and in such manner as may be hereafter determined upon, a sum not exceeding 900l. to complete the building."

And,—

"That the Corporation will not accept any tender for the building until the sum of 500l. already promised by subscription, be collected by the secretary."

Additional subscriptions meantime are solicited, and will be received by the Mayor.

Wolverhampton.—The Public Works Committee of the Town Council have been advertising for tenders for works required to be done in the erection of a new Town-hall upon the site of the present one in North-street. Several tenders were forwarded in answer to the advertisement, and the committee held a meeting to consider them. After opening and discussing the tenders, the committee adjourned in order that certain necessary inquiries might be made.

Bury Saint Edmunds.—The rectory-house at Hargrave has been restored and enlarged. The house formerly was small, and occupied as a double cottage. It is situated in front of the church, in its own grounds, and for the last 100 years no resident rector has been

able to reside therein. The old part is built of oak studding, and plastered externally. The additions are all of brick, and faced with white Suffolk bricks, with red bands. The window arches are executed to match. The gables have moulded large-boards, with ornamental finials. The interior has been renovated. The old roof tiles have been taken off, and the whole covered with slates. The floor of the hall is laid with red, black, and white local tiles, in pattern. In a limited competition, the tender of Mr. James Drake, of Ousden, builder, was accepted for 560*l.*, exclusive of the bricks, drains, and formation of roads, and he has just completed the same. The whole has been carried out under the direction of the architect, Mr. Ralph Chamberlain, of London.

STAINED GLASS.

Gloucester Cathedral.—The memorial window to the late Cazon Bankes has just been completed, according to the local *Chronicle*. It occupies the northernmost division of the east walk of the cloisters, and completes the series of nine painted windows lately erected on that side of the building. The window is by Messrs. Clayton & Bell, of London. The subjects are the healing of the daughter of the Syrophenician woman (Matt. xv., Mark vii.), and the raising of Jairus's daughter (Matt. ix., Mark v., Luke viii.), each subject occupying four lights. In the centre of the left-hand compartment is the woman of Canaan kneeling, and addressing the supplication "*Domine adjuva me*" (Lord help me) to our Saviour, who replies, "*Fiat tibi sicut vis*" (Do it unto thee even as thou wilt). Behind the woman is her daughter lying on a bed, and with a conventional representation of the departure of the unclean spirit. Behind our Lord are two disciples. The other compartment represents Christ taking the hand of the maiden who is lying on a bed; behind her are her father and mother, and behind Jesus the three apostles, Peter, James, and John. On the extreme left are two females (one seated) lamenting. The four tracery lights above are each filled with an angel holding a scroll inscribed "*Sanctus, Sanctus, Sanctus.*" The four remaining windows in the carols, or cells, in the south walk of the cloisters have just been filled in with ornamented quarries, having medallions of scrollwork, birds, &c., in the centre. This completes the work undertaken at the expense of Mr. Thos. Holt.

St. George's, Stamford.—A memorial window has just been placed at the east end of the chancel of this church, in memory of the late Mr. Titus Berry. The five-light window is of the Perpendicular style, the whole of which has been filled with stained glass executed by Mr. Wailes, of Newcastle. The subject represented is that of our Lord's Ascension, the figure of the Saviour being in the centre compartment, and his eleven apostles, with the Virgin Mary and Mary Magdalen, grouped in various attitudes in the side-lights. With the exception of the centre opening of the window, where our Lord is shown ascending to heaven amid rays of light, the figures are surmounted by canopied work, and this is repeated at the bottom of the window in the shape of pediments or bases, to raise the whole subject from the stonework of the sill. The panels in the tracery are filled with angelic figures engaged in adoration and praise. The window formerly contained the figures of St. Catherine, St. Anne teaching the Virgin, the head of a mitred ecclesiastic, and our Saviour blessing the elements, copied in 1705 from the celebrated piece by Carlo Dolce, at Burghley. The latter was the gift of John Langton (by whom it was executed), a celebrated writing-master of Stamford. He lived in the house now occupied by Mr. Hare, and in 1700 revived the art of glass-painting, staining, and tinging, in the way of the ancients, and made a new discovery for painting flowers and fruits on white glass. His handiwork has been recently discarded, and is now in private hands; but the ancient glass has been preserved, and is to be placed in one of the compartments of one of the south windows, which will be filled up, at the expense of a parishioner, with the figures of St. George and St. Paul, executed at Mr. Wailes's stained-glass works, Newcastle.

Cosley Church.—A memorial window has lately been placed in this church, by Mr. David Hill, Sedgley, to the memory of his deceased parents. The window is executed after the style in vogue about the earlier portion of the

sixteenth century. The composition is arranged with reference to the galleries, which cut off the upper part of the window. The subject of the lower panel is the procession to Calvary. Above this, arranged *en grisaille*, are busts of angels, and personages of the Old Testament. In the centre of the top compartment is a figure of St. James the Apostle. The window was executed by Messrs. Lavers, Barrard, & Westlake of London.

CHURCH-BUILDING NEWS.

Rhos Crowther, Syc. (Wales).—The church of Rhos Crowther, Pembrokeshire, has been reopened, after extensive restorations from the designs of Mr. Wehnert, architect, Milford. The churches of Manorbier, Hubberston, and St. Katherine's, Milford, have lately been restored by the same architect; and Walwy's Castle, Llys-y-fran and Llanstian Churches are now in course of restoration.

Holmside.—The foundation stone of a new church has been laid at Burnhope, in the ecclesiastical district of Holmside. Mr. T. C. Ebdy is the architect of the building. The style of the architecture is Geometrical Gothic, of the thirteenth century. The plan of the church consists of a nave, chancel, organ-chamber, vestry, and western porch. The east and west window will be filled with tracery, and the church throughout will have an open timber roof, supported on detached columns. The whole of the sittings will be free. The works have been in progress for some months. The contractor for the masonry is Mr. Robert Kell, junior, of Chester-le-street.

Pontefract.—The ancient parish church at Pontefract, after having been closed some time for repairs, has been reopened by the Archbishop of York. The present alterations have cost about 2,000*l.*, and of this sum more than half has been subscribed. It is intended that the seats, with the exception of corporation pews, shall be free and unappropriated. The principal contributor to the alteration fund was the Earl of Harewood, the lay rector, who gave 350*l.*, and this sum was devoted towards the erection of a new chancel. The plain windows that were formerly in the building have been replaced by Gothic ones. The old pews have been removed and replaced by open deal benches, and the floor has been lowered for some depth.

Slad (Gloucester).—The church of the Holy Trinity at the Slad, which has recently been enlarged and improved, has been reconsecrated by the Bishop of the Diocese. The old pews and galleries have been removed. On the north side a new aisle has been built, the old wall being pierced with arches, and thus considerable additional accommodation is afforded. The chancel has also been lengthened. The floor is inlaid with encaustic pavement. Modern stained deal pews have been placed in the church. The walls are cream-coloured, with mural decorations. A new organ, the gift of Mr. R. Hastings, has been erected. The architect is Mr. Benjamin Bucknall, and the builder Mr. W. Restall, Bisley. The work has been done at a cost of about 900*l.*

Otley.—The parish church at Otley has recently been restored and reopened. It is dedicated to All Saints, and was originally a Saxon fabric. The east or old church window is certainly very ancient. The south end of the church belonged to Denton, and the north end to Lindley, in all probability. They were then called chapels. The windows have evidently been long, narrow, and round-headed. The west, or new part of the church, it is conjectured, was built in the reign of Henry VIII. The great north door is very early. The church abounds with monuments. There are also five or six painted windows, one of which has been recently erected by subscription, in memory of the late Mr. F. Billam, of Newall Hall. Something was done towards the restoration of the edifice nearly twenty years ago, the colling which covered the roof having at that time been removed, and subsequently other improvements, which were much needed, have been effected. The chancel floor has been raised. All the plastering has been cleansed off the pillars, and they have been wrought to a face and the arches have been treated to correspond. New capitals and bases have been made to the pillars; the Norman windows in the chancel have been opened out; all the walls have been replastered; an opening has been made to the tower by the removal of a gallery; encaustic tiles have been placed upon the chancel floor, and the old oak

roof has been opened up; a new organ-chamber and a new vestry have been erected, and the whole of the church has been re-pewed, all the pews being of oak. A new warming apparatus has been inserted, and all the aisles are boarded and felted. These improvements have been designed by Mr. Rhodé Hawkins, architect, London, the contractors being Mr. Beckwith Maston, stonemason, Otley; Messrs. C. Chaffer & Co., plasterers, Otley; Mr. T. Hall & Co., Leeds, joiners; and Messrs. Suthill & Warrington, plumbers, Otley. The cost of the whole has been about 2,400*l.*, towards which sum subscriptions have been raised amounting to 1,700*l.* A number of special gifts have also been presented. The organ has been refitted and improved by Messrs. Forster & Andrews, of Hull.

Battersea (London).—A site has been obtained at Battersea Park for a new church. The district is a poor one. The church will be called St. Saviour's, and will make the third church erected in the parish during the last twelve months.

Newark-on-Trent.—The tower and spire of the parish church, in this town, being considered unsafe, Mr. G. G. Scott has recommended immediate and substantial repairs. The works are entrusted to Mr. John Fae, of Melton Mowbray, under Mr. Yeoman as clerk of the works.

Colliton (Devonshire).—Memorials of the founder of the church of St. Mary the Virgin, the late Rev. J. R. Hogg, have recently been placed in the chancel of this church, and consist of a rearedos, with wall-arcades on each side of it, and returning north and south, and two stained-glass windows on the south side. The rearedos and wall-arcades, designed by Mr. J. F. Bentley, architect, are like the church itself, of Early English Transitional style: the subject in the former is the Institution of the Holy Eucharist, executed of Caen stone in alto-relievo, by Mr. T. Pophers, sculptor, and the architectural portions by Mr. T. Earp, both of London. The Caen stone sculptured frame to the rearedos is composed of side panels of diaper patterns, resting on a moulding of white Mansfield stone, surmounted by traceries enclosing Christian emblems of the Sacrifice in the "Agnus Dei," and the legend of the "Pelican in her piety." The canopy, with groined soffits and cusped arches, carries a line of trefoils panelled with polished Irish green marble, beneath a carved cornice of conventional foliage and fruit, created by Gothic embattlement work, which last-named feature forms a symbol of the "Church Militant." The buttresses, with diapered faces, support crocketed pinnacles and finials. The wall-arcades (also of Caen stone) spring from plinths of white Mansfield stone, and contain large panels of polished Staffordshire alabaster in hooped mouldings, with cusped headings, under a line of trefoils; also, between the panels are canopied angels holding on discs the "Alpha" and "Omega," and the whole design terminates in an embattled cornice. The windows are in the style also of the late part of the First Pointed period, and are from the designs of Mr. J. F. Bentley and Mr. R. H. J. Westlake (artist), both of London; and executed under the supervision of those gentlemen at the stained-glass works of Messrs. Lavers, Barrard, & Co. The Resurrection is the subject of the one window, and Christ's Charge to St. Peter that of the other. The panels of ornamentation contain angels holding on discs the Christian emblems of the Resurrection and St. Peter; and the conventional tree, foliage and fruit springing from the base and running through the borders to the arch, symbolically suggest thoughts of the "tree of life," and, to apply another allusion, "taking root downward and bearing fruit upward."

Tanhill (Leicestershire).—St. Ann's Church, which was re-consecrated by the Bishop of Chester on the 3rd inst., consists of a nave and chancel, 88 ft. by 31 ft.; the latter consisting of a raised platform, projecting westward, the width of the eastern bay; north aisle, 88 ft. by 18 ft. 6 in.; south transept and south chancel aisle, 18 ft. 6 in. wide. The numerous graves on the south side prevented a south aisle to nave being added. The open roof timbers are carried on attached shafts with carved caps. The church is entirely new, except the lower portion of south and west walls of nave, and the tower and spire and south transept. It is proposed ultimately to extend the church to the westward, and build a new tower and spire. The new east window is a large seven-light window, filled in with Perpendicular tracery. It is intended to fill this window with stained glass. The original

church was erected about thirty years ago, and had become far too small. The enlargement and rebuilding were mainly brought about by the vicar, the Rev. W. L. Clay. The contractor for the entire contract was Mr. George Harris, of St. Helen's. Mr. William Middlehurst was the sub-contractor for the masonry, which is of the local red sandstone; Mr. J. Westwood, for the plasterer's work; Mr. G. R. Stockwell, of Liverpool, executed the carving; Messrs. Cooper & Son, of Liverpool, the heating apparatus; Messrs. Forrest, of Liverpool, the glazing; and Messrs. Maw & Co., of Broseley, the plain and encaustic tiling. Mr. G. H. Ridsdale, of Liverpool, is the architect. The church has seat-room for 845 persons: 250 sittings are free.

Eaton Socon, Beds.—The parish church of this populous village, which has for the past twelve months been undergoing an extensive restoration, has been re-opened for public worship. The church is in the Decorated style of architecture, with the exception of the chancel, which is Perpendicular. The restoration has been conducted under the supervision of Messrs. Cory & Ferguson, architects, Carlisle. The roofs of the aisles have been replaced and re-lead; and the east bay of the nave has been restored to its original dark green and gold, with other embellishments, while the nave itself has been painted anew in a light greyish tint with ornamentation. The roof of the chancel was originally composed of oak, but from time to time had been repaired with deal; it has now been encased with oak, formed into panels and compartments, and left in its natural colour. The old whitewash has been cleared off the stonework, which has been pieced where required; and the plaster has been removed from the walls, and stucco substituted. The old square pews have now entirely disappeared, and modern oak seats, with curved poppy-heads, have succeeded them; a few of the same style, nevertheless, which were in the church before, have been restored. This latter portion of the work has been executed by Messrs. Moody, of Durham. The organ, which was formerly placed in a gallery at the west end, has been removed to a space between the east end of the north aisle and the vestry, and the old organ-chamber cleared away, so that the tower arch can now be seen. The organ has been rebuilt and enlarged, with the new swell and other modern improvements, by Messrs. Gray & Davison, of London. The new stone arch to form the west front of the organ-chamber is 20 ft. in height, and 10 ft. in the opening. Underneath the organ-chamber is formed a cellar for the reception of the hot-water apparatus, which warms the church by means of pipes traversing the several aisles, the heat being allowed emission by a fancy iron grating. This, it is said, has not proved injurious to the old memorial slabs, as they have all been retained in the flooring. The apparatus was supplied by Mr. George Bower, engineer, St. Neots. A new floor has been put in the tower for the ringers, who now approach the belfry by an outer entrance, instead of having to come into the church. Patterns of mosaic design in encaustic tiles (by Moore & Co., of Broseley, Salop), compose the flooring of the chancel. An old Norman font has been restored and replaced in the church, after being out for many years. The restoration will cost something like 2,600l. The local parties engaged in the work were Mr. William Wade, Eaton Ford, and Mr. Edey and Mr. Wildman, St. Neots.

DISSENTING CHURCH BUILDING NEWS.

Burton Joyce.—The foundation stone of a new church and schools for the Independents, at Burton Joyce, has been laid. The building will be in the Gothic style of the thirteenth century. Externally it will be faced with Bulwell stone and freestone dressings; internally it will consist of a chapel, school-room, and vestries. The chapel and school-room will be divided by an arcade, to be fitted with movable shutters, so as to admit of the two parts of the edifice being used separately or together on anniversary and other similar occasions. Accommodation will be provided for upwards of 200 persons in the chapel, and about the same number in the school. Mr. Tait, of Leicester, is the architect, and Messrs. J. Wright & Son, builders, Nottingham, are the contractors. The contracts for building the chapel, enclosing it, and heating it, amount to 1,000l. Other charges will probably bring up the amount to 1,100l. The site upon which the building stands has been given by Mr. S. Ruddock, of London.

Worcester.—The Free Church, Friar-street, has been opened for divine service. The old prison wall forms one side of the building, sustaining with other corresponding walls a steep-pitched roof. Its length is from north to south 83½ ft., and breadth 30 ft. The principal entrance is from Friar-street. The church will accommodate about 500 persons, and should more room be required a gallery can be constructed. At the south end is a window of three lancet lights, and the other windows are round-headed. Three coronas, having twenty burners each, hang from the ceiling, and the chapel will be warmed by a couple of stoves. The seats are open and free.

Tunstall.—The Goldenhill Wesleyan New Chapel, situated in High-street, and combining both chapel and schools, the foundation stone of which was laid in July last, has been opened for divine service. The building has been erected from the plans of Mr. Roberts, of Trentham, by Mr. John Grosvenor, of Bradley-green. The total cost, including the land, is expected to be 2,300l.

Todmorden.—The new Unitarian church, which has been erected at a cost of 25,000l. or 30,000l., by Messrs. Fielden Brothers, of Todmorden, has been opened. The spire, from the base to the extreme point of the vane, is 192 ft., in which is placed a peal of eight bells, and an illuminated clock. Internally the edifice is of rather costly character, and consists of chancel, nave, and side aisles. The pews are of English oak. The chancel is paved with Sicilian marble, and the aisles with Mansfield stone. An organ is placed on the south side of the chancel. The font is of white ornamented marble, inlaid, and rests on polished granite. The pulpit and reading-desk are of carved oak, and the former rests on a pedestal of marble and granite. Three stained-glass windows are placed in the chancel.

FROM SCOTLAND.

Portobello (near Edinburgh).—Building operations have been commenced at the north end of Brighton-place, immediately adjoining the Roman Catholic Chapel. The block of buildings now in course of erection will be three stories high, presenting a frontage to Brighton-place. The plans drawn are by Mr. Hay, architect, Edinburgh. The new block will embrace twelve dwellings—four main doors, and eight on the upper flat. These and other improvements have deprived two of the most popular local institutions, the Portobello Bowling and Golf Clubs, of their bowling and putting greens. Among the improvements referred to is the erection of a new and more commodious place for public meetings, concerts, and penny readings, &c., and he called "The New Public Hall," capable of accommodating 1,200 persons.

Paisley.—The new works for giving Paisley an additional supply of water have just been completed, and the branch supply for the town of Johnstone has been formally opened. The new reservoir is at Rowbank, about seven miles west of Paisley, on the elevated ground which is a continuation of the Braes of Gleniffer. The plans were prepared by Mr. Leslie, civil engineer, Edinburgh, and the new reservoir is estimated to contain about 75 millions cubic feet of water, being about equal to the supply at present obtained from the reservoirs at Stanely, about a mile to the south of Paisley. The entire expense of the new works will be about 70,000l., and the Provost of Paisley states that he believes the Commissioners will be able to carry through the undertaking without the slightest increase of the water rates. Hitherto Johnstone has had to depend entirely on a few pump-wells throughout the town, and in the summer weather the inhabitants were frequently sadly in want of good water. The turning on of the water was the occasion for a half-holiday in Johnstone. A number of temporary fountains were erected in Houston-square for the purpose of testing the pressure of the water, which proved sufficient to propel it several feet above the highest building, so that in case of fires the use of engines will no longer be necessary. The filters are about 300 ft. above the town.

Meigle.—The Parish Church at Meigle has been burned to the ground. A few of the parishioners had assembled in the church to attend divine service, when the fire was discovered. The building is heated by hot air, and flames were soon issuing from the outlet of the fire situated near the pulpit. The fire at once seized on the building, and spread with alarming

rapidity. Every effort was made to stay the progress of the flames, but without avail. In Meigle no proper apparatus for the extinguishing of fire exists, and the only means for suppressing the flames available was throwing the water on the budding from buckets. In about half an hour the roof fell in, and in less than one hour all that remained of the church were the walls. The edifice was improved last summer: a new roof was put on it, and the interior was renovated—the repairs entailing a considerable expenditure.

CASES UNDER THE METROPOLITAN BUILDINGS ACT.

CAUTION TO INEXPERIENCED GASFITTERS.

Mr. J. M. LAMB, gasfitter, of No. 10, High-street, St. John's Wood, was summoned to appear before Mr. D'Eyncourt, at the Marylebone Police-court, on the 16th inst., by Mr. Alexander Peebles, District Surveyor of North St. Marylebone, "for, that he being engaged in doing certain works at No. 44, High-street, St. John's Wood, did fix a pipe for conveying smoke or other product of combustion nearer than 9 in. to combustible material," Sec. 21, Paragraph 5.

From the opening statement of Mr. Harston (Rooks, Kent, & Harston), who attended with Mr. Peebles, it appeared that the defendant had been employed last February to fit up a gas-light containing twelve burners in this shop, which was fixed close under the ceiling, and the iron pipe for conveying from it the product of combustion was laid in between the wooden flooring joists, and from them it was only distant 2 in. or 3 in. on each side. The pipe ran along between the joists till it reached the bressummer, which was notched out to receive it, then turned upwards in a chase out in the front wall, and emerged into the external air in front of and against the wooden sill of the first-floor window, where it was fitted with a cap. No notice of these works had been given to the surveyor.

The gas was put out at eleven o'clock upon the night of Saturday, March the 6th, and at half-past six o'clock on the following Sunday morning the premises were discovered to be on fire in the flooring and bressummer. Had the premises been burnt out, the origin of this fire could not have been ascertained. For infringing Sec. 21 a penalty not exceeding 50s. is attached.

Mr. Harston called the fireman who attended and extinguished the fire, for the purpose of proving the state he found the premises in, and the position of the pipe, when a solicitor, upon behalf of the defendant, stated he could not resist a conviction; but that as his client had erred in ignorance of the law, and the district surveyor's motive was not to obtain a heavy fine, but a conviction, in order to put a stop to such irregularities, he trusted the magistrate would inflict a nominal penalty.

Mr. D'Eyncourt, after scrutinizing the various clauses of the Act, and that which rendered these proceedings imperative on the surveyor, said he was afraid unless he did inflict a heavy penalty, it would not act as a warning; however, as it was the first case of this description in that court, he would impose a fine of forty shillings and costs; but upon the occurrence of a similar offence, he would inflict a heavy penalty.

SCHOOLS OF ART.

The Hanley School.—The annual meeting of this institution has been held, Mr. G. Ridgway, the mayor, in the chair. The attendance was good, but not so large as on some former occasions. A considerable number of drawings and models were exhibited. The report of the headmaster, Mr. Carter, said:—

"The total number of individual students who attended the school for the year 1867 was 177, and for 1868 175, while the attendance has been unusually good and very much higher than was stated in my last report. I may here mention that for the past two years our chief strength lay in the elementary section as now fixed by the Department, and although the results at the time are not so apparent as in the advanced section, the works in the latter for the present year will sufficiently corroborate my assertion, for without a good foundation it would be hopeless to look for a satisfactory result in the more advanced stages. The public examination in the second grade took place as usual, on the 10th and 11th of March, 1868, when 29 students presented themselves for examination, of whom 32 were successful. The return of the examination, held in March in the present year, has not yet been made known."

Mr. G. Wedgwood, in moving a resolution, which was passed, expressing the satisfaction felt by the meeting at the progress made by the pupils, as evidenced by the master's report, the works exhibited, and the prizes awarded by the Department, said, as an old School of Art student both at Edinburgh and Hanley, he had much pleasure in moving this resolution, because he thought the results of the tuition given in the school were most gratifying. At the same time he was much disappointed that a town like Hanley, having a population of 40,000 inhabitants, only sent 175 pupils to its School of Art. He was glad to know that the school had always stood well in the matter of medals, but he did not consider that the number of medals awarded was a conclusive test of efficiency. It was not a few forced plants which were wanted, but a good average of general growth amongst all the

plants. That that was Mr. Carter's aim was shown by the drawings exhibited, which were free from any attempt at tricky effects, and were not what were called show drawings.

The Carlisle School.—The annual exhibition of drawings by students in this school has been opened, in the rooms of the Academy in Finkle-street. The collection of drawings comprises studies in various departments of art, and many of the specimens exhibit considerable ability. The geometrical and mechanical drawings are for the most part executed with precision, and some of the architectural sketches delineate faithfully different styles of architecture.

The Boston School.—A free exhibition of works by the students of this school has taken place. It was in every sense of the term a success, says a local paper; the productions were of a superior order, and the number of visitors greater than on any previous occasion; the art works were of a high class, and must be taken as an evidence of Mr. Howard's skillfulness as an art-teacher. The number of visitors admitted on Friday was 300, and that on Saturday upwards of 900.

Books Received.

A BATCH of reading-books (without any particular reference to our specialities) have just now reached us, foremost amongst which (*facile princeps*) is "The Fight of Faith," a story in two volumes, by Mrs. S. C. Hall, published by Chapman & Hall. Commencing with the persecution of the Huguenots in France, it ends with the Battle of the Boyne in Ireland. The heroine, Pauline de Chavernay, is an original conception, worked out with great care and delicacy, and resulting in a perfect picture. The other characters are also incisively marked, and incident follows incident throughout the volumes. It is no small praise to say that, as a literary production, "The Fight of Faith" is Mrs. Hall's best book, making the admirable author's announcement in the preface that it will be her last work of fiction the more to be regretted. The interest of the story is maintained unflinchingly throughout, in the latter half of it especially, which sets forth the life and death struggles between the Protestants and the Romanists in Ireland, and, once taken up, the volume can scarcely be put by until read through.—"Studies on Thackeray," by James Hannay (George Routledge & Son). Mr. Hannay has a deep reverence for Thackeray, and in these studies, looking at him as novelist, humorist, critic, and poet, sets it forth with earnestness and eloquence. They make an interesting little book.—"Pioneers of Civilization," by the author of "Crimson Pages" (J. Hogg & Son), deals with the soldier, the explorer, and the missionary, and is a recommendable hook for boys, likely to induce desires to see and do. It contains portraits and other illustrations.—"The Book of Ready-made Speeches" (Routledge & Son) is intended to supply hints to persons who are called on to make a speech, and are in the position of having nothing of their own to say.—"The Swiss Family Robinson" and "Evenings at Home" (Routledge & Son) have been put into words of one syllable by Mary Godolphin, who performed the same kind office for "Robinson Crusoe." Two better little books for the purpose could not have been chosen; they will be found of use in the education of the young.—"Poems," by Geo. Francis Armstrong. (Moxon, Son, & Co.) These poems seem to speak of a strong struggle against temptation,—a struggle probably not successful.—"The Quarterly Journal of Science" for April (Longmans) contains some excellent and interesting papers.—"On the Future Water Supply of London," by C. W. Henton, F.C.S.; "On the Projected Mersey Tunnel and Railway (from Liverpool to Birkenhead)," by Sir Charles Fox; "On Vesuvius;" "On Recent Spectroscopic Researches," by W. Huggins, F.R.S.; and there is also much interesting matter in the "Chronicles of Science."—"On Going to Sleep." By C. H. Moore (Hardwicke). This is a strictly physiological paper,—perhaps too physiological, since the true nature of waking and sleep,—showing wherein they differ as well as wherein they agree, and what it is for the one to be superinduced upon the other, or to take its place,—can never be clearly known apart from psychological inquiry and discovery of the true nature of mentalization and of the powers or

forces whereby it is carried on. It may be all very true, and we believe it to be true, that, "as a general rule, with more oxygen in the brain occurs the brighter wakefulness; with less oxygen the reader sleep; but what is the precise nature of wakefulness, and wherein does it essentially differ from sleep? An attempt was made incidentally to shed some light on these vital and fundamental questions, in a paper "On Geometrical and other Symbols,—the Psychological Key," in the *Builder* of July 11th, 1865.

Miscellaneous.

Fever in Dorking.—We learn from the *County Times* (Surrey) that an inquiry into the existence of fever in Dorking has been instituted by the Privy Council, and that Mr. Simon, in the name of the council, has taken the local authorities sharply to task. It would appear from the report of the council's inspector, that the water-supply of the town is very unsatisfactory; that the portion which is supplied by the water-works is not only scanty, and delivered without filtration, but is also stored in dangerous proximity to sewage. The inspector further reports that the sewerage of Dorking is urgently in need of improvement; that in parts of the town where there are no sewers, the filth is detained in cesspools close to houses, while in other parts the drains are so defectively constructed as to let sewer-air pass into the houses. To the defective sanitary arrangements referred to, Mr. Simon attributes the prevalence of fever. It is to be hoped that the vestry will immediately take measures for putting the drainage and water-supply of the town on a permanently improved footing.

The Opening of the Wedgwood Memorial Institute.—The art exhibition which is to be associated with the opening of the Wedgwood Memorial Institute at Burslem will be, it is asserted, the best ever seen in the Potteries. The Government, through the Department of Science and Art, will send a liberal selection of pictures, with pottery Medieval metal work, and other objects of art-industry, from the South Kensington Museum. What is equivalent to a *carte blanche* has been given to the committee to select from the Mayer Museum at Liverpool, which town, thanks to the untiring labours of Mr. G. Melly, M.P., will contribute on the most handsome scale to the exhibition. Many private collectors will lend valuable objects. Portraits of Wedgwood, Boulton, Darwin, Bentley, and probably Dr. Priestley, with various personal memorials of the great potter, will also form an attractive feature. Up to the present time works from the studios of not less than eighty artists of eminence have been promised.

National Industrial Home for Crippled Boys.—The annual meeting of this institution has been held at Willis's Rooms. The Earl of Shaftesbury presided. The home was established three years since, in a house at Kensington; but so numerous were the demands for admission that a second house was taken, both of which are now filled, by thirty-four boys. During the past year over 200 applications have been made for admission; but there being no room, it is impossible to entertain these deserving cases. The committee, however, in full confidence of aid in such a cause, have purchased a freehold house, with an acre of land, close to the new station at Kensington. The purchase-money exceeds 6,000*l.*, and a sum of about 4,000*l.* more will be necessary for proper workshops, plant, fittings, furniture, &c., making a total of 10,000*l.*; but it is believed that the institution will become self-supporting, as the boys have already been sufficiently instructed in the trades of carpenters, die-stampers, and tailors to earn their own living. A gentleman has offered to give 50*l.*, on condition that nineteen other fifties be contributed on or before the 25th of June next.

Enlargement of the Britannia Works.—The foundations have been commenced for an entirely new foundry department. There will be nearly an acre of land within the walls of the building, and four large furnaces producing some 150 or 200 tons of castings weekly. Employment will be afforded to about two hundred additional hands. The general arrangement has been planned by Mr. James Howard, M.P., and the erection of the building placed in the hands of Mr. John Usher.

Remunerative Labour by Soldiers.—The latest reports on the result of employing soldier labour on incidental repairs of barracks, and on new works, have been issued. At Aldershot there has been a saving of about 10 per cent. on incidental repairs, rising up to 50 per cent. on some new works. A larger number of military superintendents are required for military labour than for work performed by civilians. At the Curragh the saving is estimated at 39 per cent. To work the system satisfactorily it is essential that the troops should remain for a considerable time at each station, and that they should be superintended by officers and non-commissioned officers of Royal Engineers. At Parkhurst there has been a saving of 30 per cent. The hearty co-operation of all concerned is essential for the successful employment of soldier labour. At Woolwich there has been a saving, estimated at 20 per cent. on incidentals, and 25 per cent. on new works. A continuance of the system will develop its advantages in a higher degree. It would be well, we should think, for its final success that the soldiers employed should uniformly receive some small benefit in the shape of additional pocket-money for the work done; especially since it must be recollected that no such employment was contemplated by the soldiers when they enlisted.

The Proposed New Gallery of Art for Liverpool.—At a recent council meeting, Mr. Pictou moved a recommendation of the library, museum, and education committee, to approve of plans of the new gallery of art prepared by the architect and surveyor, to whom, he said, they did great credit. The condition of the museum rate was not such at present as to afford the 10,000*l.* already granted for the excellent purpose in question, and in existing circumstances he felt it would be hopeless to ask the council for a grant. The committee, therefore, simply submitted the plans which they had obtained according to instructions, and proposed to wait till a more favourable opportunity for carrying them out. Mr. Melly moved that the plans be referred back, and brought up again for an estimate of the cost for the site and building, and an estimate as to how it was proposed to meet the outlay. Mr. Pictou expressed his willingness to accept the amendment, and, subject to this, the proceedings were confirmed.

The Half-yearly Reports of the Inspectors of Factories.—These reports, ending in October last, have just been issued. They are on this occasion more than usually bulky, forming an octavo volume of 350 pages. They chiefly bear upon the application of the new Factory Acts to the miscellaneous trades and occupations carried on in the United Kingdom. The report of the senior inspector, Mr. A. Redgrave, opens with the gratifying information that but few instances have occurred in which it has been necessary during the half-year to prosecute offenders under the Factory Acts. From the manner in which Mr. Henderson concludes his report, but little good, it would appear, is likely to be effected by the Factory Acts in the metropolitan in the way of assisting or promoting the education of the young. Upon two important points Mr. Baker's opinions appear to be widely at variance from those entertained by his colleague, Mr. Redgrave, who thinks that it is a waste of public money to call for reports upon accidents which occur in factories, and which are not caused by machinery; and he also questions the necessity of compelling employers to be at the expense of providing a surgical certificate for every young person or child they may employ.

Wire-Rope Transport.—The practical value of the wire-rope transport system, invented by Mr. C. Hodgson, C.E., is now being recognized by those engaged in working mines. Sir G. S. Robinson has given an order to the Wire Tramway Company to construct one of their patent ways, for carrying iron ore from his quarries to the Cranford Station.

The Bessemer Steel Trade.—It is understood that Mr. Bessemer has signified his willingness to reduce his royalties for 2*l.* to 2*s.* 6*d.* per ton, except for steel rails, for which a rebate of 20*s.* per ton is already allowed. Ordinary Bessemer steel will thus be reduced nearly 2*l.* per ton, and rails about 1*l.* 10*s.* This will permit steel rails to be sold in the market at a price but little higher than that of iron. If the Heaton process should solve the question of converting cheap pig-iron into steel, iron rails may, probably, be entirely displaced.

Royal Commission on Historical Documents.—The *Gazette* announces the appointment of a royal commission, the objects of which are stated as follows:—Whereas it has been represented unto us that there are belonging to many institutions and private families various collections of manuscripts and papers of general public interest, a knowledge of which would be of great utility in the illustration of history, constitutional law, science, and general literature, and that in some cases these papers are liable to be lost or obliterated; and, whereas, we are informed that many of the possessors of such manuscripts would be willing to give access to them, and permit their contents to be made public, provided that nothing of a private character or relating to the title of existing owners should be divulged; and whereas it appears to us that there would be considerable public advantage in its being generally known where such papers and manuscripts are deposited, and that the contents of those which tend to the elucidation of history and to the illustration of constitutional law, science, and literature, shall be published. The *Gazette* then gives a list of the commissioners nominated to carry out the objects of the commission. Mr. Mayer, of Liverpool, suggested this in a pamphlet, and the suggestion was recently specially referred to in the *Builder*.

The Great Railways.—The London and North-Western is the oldest of the great railway systems, dating from the Liverpool and Manchester line as the parent germ, and coming down to the amalgamation, in 1864, of the Grand Junction, the Manchester and Birmingham, and the London and Birmingham. This system has never lost its lead as in different respects the greatest of our railway systems. In mileage about 1,400 miles—the Great Western comes nearest to it, but it and all others fall short of the London and North-Western in miles run by trains, in revenue, and in other respects. In 1867 the miles run by trains were as follows:—London and North-Western, 22,269,542 miles, revenue, 6,752,567*l.*; Great Western, 14,157,224 miles, revenue, 3,911,519*l.*; North-Eastern, 15,548,099 miles, revenue, 3,804,220*l.*; Midland, 13,084,287 miles, revenue, 3,139,855*l.*; Great Northern, 9,115,204 miles, revenue, 2,112,150*l.*; Great Eastern, 6,835,163 miles, revenue, 1,915,481*l.*; Lancashire and Yorkshire, 8,227,128 miles, revenue, 8,227,128*l.* As regards rolling stock of the companies just named, in 1867, the London and North-Western had 1,413 locomotives; the Great Western 812; the North-Eastern, 851; the Midland, 623; the Great Northern, 468; the Great Eastern, 380; and the Lancashire and Yorkshire, 455.—*The Engineer*.

Danish Church, Wellose-square.—The Danish Church in Wellose-square, between the Tower and Whitechapel, has been levelled to the ground. The edifice, which somewhat resembled the parish church of Kensington in its ugly nondescript style, was built in the reign of William III., for the use and benefit of the Danish seamen, who appear mostly to have congregated to that part of the metropolis. Inside it, at the south-eastern corner, stood a royal throne pew, intended for the use of any of the reigning house of Denmark. After it had ceased to be used by the Danes, the building itself appears to have experienced more than its fair share of vicissitudes. The lower part of the wall on the north and south sides is now all that is left. The site, an inclosure within the garden of the square, will be devoted to the erection of a new school in connexion with St. George's mission. Endeavours are being made to prevent the erection on this site, so that it might be kept open.

New Public Offices.—Lord J. Manners asked the First Commissioner of Works if it was the intention of the Government to introduce a bill in this session for the acquisition of the property recommended to be purchased by the Treasury Commission for the concentration of the public offices, and for which the proper notices were given last November. Mr. Layard said a bill was in course of preparation, and when it was presented he would state what portions of the property were to be acquired.

A Welsh University.—It is expected that within two years the university of Wales will be in a full operation. A building, which has been purchased for the purpose, is receiving the necessary alterations, and other requisite steps are being taken.

The Manufacture of a Frying Pan.—A brief description of the *modus operandi* employed in the construction of that familiar domestic article the frying-pan will afford a general idea of the process of kitchen-ware manufacture. It is given in the *Engineer*. The disc plate is first heated, and then placed on the "hed" die of the first of three stamping-machines ranged in a row. The stamp is next released, and the disc receives its first impression, the required shape being completely attained by the two succeeding stamps. To restore the toughness of the iron—impaired somewhat by these three violent operations—and also to prepare it for the subsequent operation of tinning, the pan is reannealed, and then subjected to a systematic process of hammering, in which the hammer is made to fall with the greatest possible uniformity so as to insure a perfectly smooth and regular surface. This process requires a good deal of tact and agility in manipulation, and can only be successfully performed after long experience on the part of the workman. The "stripping" or paring of the rim is the next operation, by which all roughness of the outer edge is removed, after which, by a sort of scraping process, all particles of oxide are taken away. A second "hammering" is then effected before the pan is transferred to the "mounting shop." Here a forged iron handle—made of Staffordshire rods—is riveted on, and the frying-pan is then ready for the final process of tinning. The tinning shop is, as a rule, a large and well-ventilated building, fitted up with a number of vats containing sulphuric acid, and "baths" filled with molten tin. The dipping of the article to be tinned into the sulphuric acid—an operation expressively termed "pickling"—thoroughly cleanses it, and it is then ready for immersion in the tin "bath," which effects the required coating, and renders the article ready for use.

Birmingham Bells for Sydney.—The process of casting a peal of six bells, by Messrs. Bells, for the church at Yass, near Sydney, New South Wales, has been successfully effected. The moulds for this peal were set in the same pit with those for three other bells, including one for Mexico and another for Mr. Walker, of Berkswell Hall, the weight of the entire casting being about three and a half tons. The cost of the peal of six bells for New South Wales, together with the requisite beams, wheels, &c., complete, is about 320*l.* The inscription borne by the tenor bell in this peal is from Psalm cxxvii. 4.—"We sing the Lord's song in a strange land." The whole of the bells came out of the pit perfect, both the inner and outer surfaces being quite clear, and the tone pure.

The Roman Catholic Church of St. Mary of the Angels, Bayswater.—Extensive alterations have lately been made by the oblates of St. Charles to the Church of St. Mary of the Angels, Bayswater. They consist of two chapels ranging laterally with the north aisle, dedicated respectively to the Sacred Heart and St. Joseph; a baptistry at the west of the aisle; and an oratory, entered from and attached to the presbytery adjoining the church, and extending over the corridor leading to the refectory to the east of the first of the above-mentioned chapels. The style is described to us as that prevailing about the middle of the twelfth century. Mr. Bentley was the architect engaged.

A Present from the Queen.—The workmen of Messrs. Chubb & Sons, lock and safe makers to the Queen, have formed a library, comprising about 800 volumes of standard works. On Easter Tuesday they had the honour of receiving from her Majesty a copy of "Leaves from the Journal of our Life in the Highlands," with the following inscription, in the Queen's own handwriting, on the fly-leaf, "Presented to Messrs. Chubb & Sons' Workmen's Library, at Wolverhampton, by Victoria R., March 29th, 1869." Some other libraries have been similarly honoured.

United Presbyterian Church, Dublin.—The first United Presbyterian Church in Dublin has been opened for public worship. The edifice is constructed in the Gothic style of architecture. It is situated in Abbey-street. The centre is covered with an arched roof, supported on Grecian columns arched towards each other by masonry. Semi-wings running parallel along the church add to the space for sittings, for which there is accommodation for nearly 600. At the rear of the church there are a lecture-hall, reading-room, and vestry.

Subsidence of Land.—An occurrence in a field belonging to Marton Hall, Cheshire, has caused a great deal of excitement in the neighbourhood. It was discovered that a circular piece of ground, with a diameter of 60 yards, had, during the night, sunk to the depth of 20 yards, leaving a hole very similar in shape to a cone with the point downwards. There were two trees growing on the spot, but these have disappeared, water having risen to within about 14 yards below the level of the field. Many say that the withdrawal of brine from underneath to supply the Winsford Salt Works has caused the incident. On the same spot a kind of pit, about 8 yards across and 3 or 4 yards deep, is reported to have sunk in the same manner a few years ago.

Gas.—The price of gas at Sheffield is about to be reduced. The present prices are 3s. 6d. per 1,000, and 3s. for all consumed above a certain quantity. It is proposed to reduce these charges to 3s. 3d. and 2s. 9d. respectively.—The directors of the Swansong Gas Company have made a reduction in the price of gas of 3d. per 1,000 cubic ft., the past price being 3s. 6d.—Sentence has been passed upon John Firth, convicted some months ago at the West Riding Sessions of stealing 50,000 cubic ft. of gas, the property of the Halifax corporation. The fraud was effected by intercepting the gas from the mains of the corporation by means of a pipe introduced at a point where the gas could be obtained and used without the quantity being recorded by the meter. The presiding magistrate said the evidence showed that the Halifax corporation had been abominably robbed by a system of fraud which had been carried on for ten or eleven years, and sentenced the defendant to six months' imprisonment, with hard labour.

Tramways for the Metropolis.—The Tramways Committee have given their decision on the three Bills under their consideration. They find that the promoters have established their case so far as regards the construction of the southern line, less the loop between Hercules-buildings and Westminster Bridge; that some limitation must be placed on the proposed monopoly; and that, after a period to be fixed, the street authorities are to have the power of purchasing the tramways; that the police shall have power to regulate the traffic; and that the bye-laws shall be subject to the approval of the Home Office. The other bills have since been under consideration.

Open Spaces in the North of London.—A memorial, with 50,000 signatures appended, prays that her Majesty's Government will interpose on behalf of the public and inhabitants of the northern suburbs of the metropolis, with the Metropolitan Board of Works; and, if necessary, introduce an Act to restrain that Board from building upon, or letting for building, any part of the land purchased under the Finsbury Park Act, 1857, so that the whole of the land so purchased may form the said park, and be devoted to the use, recreation, and enjoyment of the public.

Lead and Rats.—A correspondent has sent us a length of lead-piping eaten into holes by rats in a space of time as short as from Saturday to Monday. It shows that lead should not be trusted to in positions where these "varmint" can get access to it. Greasy matter smeared on a pipe will occasionally induce them to eat through it; and gasfitters have a dangerous propensity sometimes thus to butter their bread for them.

The last new Thing in Sweets.—A London confectioner has appealed to Chancery to protect his copyright in a design for a sweetmeat—an imitation in sugar of an oyster, which is affixed to and sold upon a real oyster-shell. Vice-Chancellor James held that the sweetmeat was a "design" within the meaning of the Act, and granted an injunction.

Emigration of Pauper Children.—The Liverpool Workhouse committee have decided to entertain a proposal from Miss Rye to take all their orphan girls for her emigration scheme, each girl being supplied with 5*l.* by the parochial authorities. Mr. Ratbone, M.P., brought Miss Rye's scheme forward.

Proposed Sale of Painters' Hall.—The court of the Painters' Company, according to the *City Press*, are contemplating the sale of the hall in Little Trinity-lane, without, if information be correct, consulting the body of the livery upon the subject.

Proposed Withdrawal of the Liverpool Borough Architects' Resignation.—Mr. Robson has written to the corporation, expressing a desire to withdraw his resignation; and there has been some discussion on the subject, which has been referred to the finance committee. Some arrangements were being made for the separation of the office of surveyor, from that of architect, and for the settlement of the question of salaries to any future borough architect and borough surveyor.

The Society of Beefsteaks.—It is much to be regretted that a social club of this kind, which has become a part of literary history, should be broken up. It seems to us that the late members of it had really no right to wipe it out as they have done without giving the opportunity to others to carry it on if they would.

Bridlington.—At a recent meeting of the Local Government Board the clerk reported that he had entered into a contract with Messrs. Fraser & Prudhoe, of Sunderland, for erecting a groyne and barrier on the north beach at Bridlington Quay, according to plans and specifications prepared by Messrs. Meik & Nisbit, for 2,379*l*.

An Apparatus for Examining Ships' Bottoms.—A scientific lady, Mrs. Devoe, has invented an apparatus for the examination of ships' bottoms. It consists of a boat, into the sides and bottom of which are let panes of glass, and a series of reflectors and tubes, by which the magnesium light can be thrown upon any part of the ship's sides or bottom.

Fire at the Junior Carlton Club-house.—This club-house has been seriously damaged by a fire which broke out on Monday morning. The newspaper and waiters' room on the ground floor, the billiard-room on the third floor, and the roof were in great part destroyed. The building and contents are insured.

The Royal Society.—The number of candidates for the degree of F.R.S., from which list the council have to select a limited number for ballot, is forty-five. More than one-third of these belong to the medical and surgical profession.

TENDERS.

For re-erecting butchers' shop, Dover, for Mr. H. W. Thorp. Mr. Rowland Rees, jun., architect. Quantities supplied:—
 Reid & Co. £1,219 0 0
 Tunbridge & Denne. 1,150 0 0
 Adeock 1,009 0 0
 Matthews (accepted) 953 0 0

For sewerage, forming, and metalling roads at Colchester. Mr. John Leaming, surveyor:—
 Leo £352 10 0
 Nason & Sons 350 0 0
 Strickson 34 0 0
 Edwards 274 0 0

For building Mechanics' Institute at Basingstoke. Mr. Seymour, architect. Quantities supplied:—
 Jennings £1,250 0 0
 Darwell 998 0 0
 Harras 903 0 0
 Nightingale 843 0 0
 Macklin 830 0 0
 Muselwhite 809 0 0
 Hatal 875 0 0
 T. & W. Hohen 893 0 0

For new offices at Cowfold, Sussex, for Mr. R. Hooper. Messrs. Habershon & Brock, architects. Quantities supplied:—
 Pengoe £233 0 0
 Nightingale 488 0 0
 Porter 461 0 0
 Sharpe 449 0 0
 Fowler (accepted) 435 0 0

For Church at Ore, near Hastings. Messrs. Habershon & Brock, architects. Quantities supplied:—
 Howell £3,285 0 0
 Langridge 4,110 0 0
 Wilkins & Son 4,069 0 0
 Constable 3,851 0 0
 Nightingale 3,847 0 0
 Hughes (accepted) 3,564 0 0

For three cottages, Boundary-road, St. Laurence, Ramsgate, for Mr. Austin. Mr. John R. Collett, architect:—
 Kelson (accepted) £200 0 0

For the erection of chapel, College-street, Chelsea. Mr. J. Hall, architect. Quantities not supplied:—
 Bywaters £1,085 0 0
 Stimpson 1,069 0 0
 Taylor, Pitts, & Fern (accepted) 1,030 0 0

For Queen-street Chapel, Peterborough. Mr. J. Wallis Chapman, architect. Quantities supplied:—
 Chapel. Add for side galleries.
 Jepson £3,675 0 0
 E. & B. Andrews 3,347 0 0
 Thompson 2,848 0 0
 T. & G. Hinson 2,747 0 0
 Halliday & Cave 2,685 0 0
 Hobson & Taylor 2,555 0 0
 Nightingale 2,573 0 0
 Bell & Sons 2,558 0 0

For villa residence at Surbiton. Mr. E. Dates, architect:—
 Cooper & Collem £2,300 0 0
 Johnson 2,205 0 0
 Collins 2,286 0 0
 Nightingale 2,054 0 0
 Fowell 1,953 0 0

For alterations, repairs, and additions to No. 18, Howland-street. Mr. J. B. Wiley, architect:—
 Tull £767 0 0
 Eight 718 0 0
 James 698 0 0
 Foale 680 0 0
 Melville 643 0 0
 Bedford 623 0 0
 Yates 587 0 0
 Robson (accepted on finding security) 455 0 0
 Rankin 400 0 0
 Vickery 375 0 0

For taking down and rebuilding Crown and Masons' Arms Tavern, Cannon-row, Woolwich, for Mr. Edwin Dillhen. Messrs. William Gosling & Son, architects. Quantities supplied:—

The contractor will be allowed to use any of the materials approved of by the architects:—
 Thompson £1,550 0 0
 Richardson 1,408 0 0
 Wigmore 1,450 0 0
 Hughes 1,120 0 0
 Hunt 1,280 0 0
 Huggins 1,275 0 0
 Wood 1,275 0 0
 Vickery 1,255 0 0
 Williams & Brown 1,247 0 0
 Edgheter 1,200 0 0
 Hohen 1,180 0 0
 Ginger 1,145 0 0
 Harrison & Edwards 1,135 0 0
 Stone 1,090 0 0
 Carter 1,042 0 0

For alterations and addition to a warehouse in Adde-street, City, &c. Mr. Herbert Ford, architect:—
 Moreland & Burton £490 0 0
 Young 941 0 0
 Henshaw 825 0 0
 Conder 898 0 0
 Kilby 769 0 0
 Crabb & Vaughan (accepted) 696 0 0

For reinstating premises destroyed by fire, St. Mary Axe. Mr. H. H. Collins, architect:—
 Williams £975 0 0
 Richardon 796 0 0
 King & Sons 686 0 0
 Cohen 550 0 0

For alterations and additions to a house, Dulwich Common. Mr. H. H. Collins, architect:—
 Robinson £676 0 0
 Stuart & Bennett 640 0 0
 Cohen 559 0 0
 Mitchell 525 0 0

For new banking premises at Tavistock, Devon. Mr. H. Elliott, architect:—
 Call & Pethick £2,240 0 0
 Hoach 2,207 10 0
 Hinch 2,145 0 0
 Condy Brothers 2,050 0 0
 Adams 2,049 0 0
 Matham 2,022 10 0
 Sargent 1,828 0 0
 Walters 1,866 0 0
 Blatnford (accepted) 1,869 0 0

For pulling down and rebuilding 10, Crombles-row, Commercial-road, E., for Mr. H. Jewell. Mr. G. F. Payne, architect. Quantities supplied:—
 Allow for old materials.
 Scrivener & White £1,357 0 0
 Enzor 1,248 0 0
 Harding 1,220 0 0
 Wicks, Bangs, & Co. 1,180 0 0
 Hearle 1,122 0 0
 Moyle (accepted) 836 0 0

For alterations to Roding House, Woodford Bridge, for Mr. C. Ritchie. Mr. J. W. Morris, architect:—
 Arbour £505 0 0
 Rivett 553 0 0
 Hinch 423 0 0
 Stevens 498 0 0
 Wicks, Bangs, & Co. 493 0 0
 Abrahams 404 0 0
 Albertson 409 0 0
 Sheffield 444 0 0

For completion of Church, Kenal New Town, Mr. B. White, architect:—
 Rivett £3,833 0 0
 Hill, Keddell, & Waldram 3,249 0 0
 Kinner 3,165 0 0
 Hearle 3,160 0 0
 Scrivener & White 2,971 0 0

Accepted for the erection of a chapel at Cross Banks, Batley, for the Wesleyan Methodist Society. Messrs. H. Sheard & Hanstock, architects:—

Mallinson £1,247 0 0
 Joiner, &c. Work.
 Willans £790 0 0
 Plumber's and Glazier's Work.
 Brammit £64 15 6
 Plasterer's Work.
 Parker £149 14 0
 Slater's, &c. Work.
 Thornton £59 14 0

For alterations and additions to Henley Cottage, Cheltenham, Croydon, for Mr. William Foster. Mr. Houghton Spencer, architect:—
 Giles £1,328 10 0
 Hooper 1,388 0 0
 Falkner 1,078 0 0
 Ward 1,038 0 0
 Farnener 987 10 0
 Wills 949 0 0
 Hunt 795 0 0
 Spencer 770 0 0
 Hall 763 0 0
 Patrick 680 0 0

For Mansion House-street, for Metropolitan Board of Works:—
 Nicholson £24,100 0 0
 Webb & Son 22,716 0 0
 Keeble 22,667 0 0
 Thirst & Co. 22,150 0 0
 Hill, Keddell, & Waldram 22,150 0 0
 Peeson 21,790 0 0
 Knight 20,400 0 0
 Anderson 19,490 0 0
 Yeare & Fry 19,830 0 0
 Mowlem & Co. 19,790 0 0

For enlargement of the infirmary of Paddington Work-house. Mr. Theo. R. Parker, architect. Quantities applied:—
 Merrit & Ashby £11,000 0 0
 Moore 10,449 0 0
 Green 9,945 0 0
 Williams 9,900 0 0
 Wigmore 9,900 0 0
 Manley & Rogers 9,847 0 0
 Croaker 9,790 0 0
 Henshaw 9,737 0 0
 Johnson 9,669 0 0
 Salter 9,345 0 0
 Welch 9,353 0 0
 Crockett 9,328 0 0
 Nightingale 9,270 0 0
 Tull 9,142 0 0
 Foale 8,737 0 0
 Bennett 8,122 0 0

For the carcassing of seven warehouses on the Charter House Estate. Mr. John Collier, architect. Quantities supplied:—
 Brialey £8,180 0 0
 Keeble 5,664 0 0
 Pattern & Fotheringham (no late) 5,538 0 0
 Crockett 5,480 0 0
 Downes 5,460 0 0
 Wicks, Bangs, & Co. 5,385 0 0
 Hockley 5,368 0 0
 Wigmore 5,300 0 0
 Gannon & Sons 5,260 0 0
 Merrit & Ashby 5,112 0 0
 Crabb & Vaughan 5,077 0 0
 Perry 5,050 0 0
 King & Son 4,983 0 0
 Henshaw 4,937 0 0

For erecting shop and sundry works at No. 33, Church-street, Stoke Newington, for Mr. W. Widdows. Messrs. Osborn & Russell, architects:—
 Devereux & Son £314 0 0
 Sabley & Son 313 0 0
 Fletcher & Caughay 280 0 0

For the erection of a Presbyterian Church, Gravesend, Kent. Mr. A. Bedborough, architect:—
 Carter £6,830 0 0
 Hunt 6,830 0 0
 Moreland & Co. 6,020 0 0
 Wigmore 6,000 0 0
 Wicks, Bangs, & Co. 5,900 0 0
 Colham 4,938 0 0
 Staines & Son 5,888 0 0
 Pink & Co. 5,549 0 0
 Blake 5,500 0 0
 Newell 4,960 0 0
 Nightingale 4,873 0 0
 Sawyer 4,848 0 0
 Bull & Son 4,799 0 0

TO CORRESPONDENTS.

G. C. E. O.—O. & R.—T. J. H.—B. E.—R. T. P.—E. K. & W.—J. A.—W. B. & Co.—J. A. R.—E. P.—J. L.—R. E. N.—R. R.—J. de M.—W. P.—A former Contributor.—J. R. C.—W. G.—E. H. B.—E. H. W. D.—H. T. E.—A. U. P.—J. F.—J. H. P.—J. L.—Indian Engineer.—S. & H.—H. E.—L. Q. M.—O. N. W. (such a form of seat is often used)—L. R. (we can have nothing to do with forming a company)—J. R. B. (we are not likely to file trials)—J. R. (such information has already been given in our pages)—J. W. (let us see them)—C. & B. (next week)—J. T. (next week)—Water Analysis (next week).
 We are compelled to decline pointing out books and giving addresses.
 All statements of fact, list of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.
 NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

The Builder.

VOL. XXVII.—No. 1368.

The Status of the Architectural Profession in the Provinces.



E recollect contemplating, one day, on the lid of a German toy-box of "bricks" for children, a "gilt and illustrated" representation of the supposed actual working of the ancient craft, typified by the contents under the lid. On one side were seen the labourers—the base manual workers—engaged on the shell of a half-finished mansion; on the opposite side, the noble proprietor, at whose bidding the work was proceeding, in the glory of military costume and cocked hat, his horse held by a humble dependant behind him, while before him,

clothed in modest black, and hat in hand, stood the equally humble *Bau-meister*, respectfully presenting a plan for the languid inspection of his aristocratic employer. Judging from incidental hints which turn up now and then, in conversation and in books, we surmise that there is a certain proportion of the British public out of the metropolis whose idea of the dignity of the architectural profession, and of the relation of its members to those who use their services, is very much that which seemed to be indicated in the childish illustration referred to. It has been our painful lot to hear (not without certain inward feelings) the declaration, from people in good society, that they could not by any possibility frame unto themselves an idea of the distinction between an architect and a builder, or even imagine what there could be in architecture to render it worthy to be called a "profession" at all, beside those noble and time-honoured professions, the army, the navy, and the "church," the killing of bodies, and the saving of souls. Certainly, from these views we have only heard from representatives of the old school of "County Family" aristocracy, the Squire Hazeldeans and their daughters, whose idea of life ranges between partridges and county-town balls. But in our current light literature it must be confessed that the architect is not on the whole treated very deferentially. He is commonly looked on as a sort of inferior, a character belonging to the "debatable land" between gentility and rusticity. "Dobbs," says the parson of the novel, "has made a very pretty thing of the church; he is really a clever fellow;" as if Dobbs were the village cabinet-maker, and had just turned out a decent piece of furniture. In one of Mr. Trollope's cleverest stories, the archdeacon declines to listen to Bishop Proudie's complaints of dilapidation in the Palace, hinting that the diocesan architect, "or his foreman," would be the proper person to speak to; and further on the same dignitary counsels one of his brother

clergy as to the alteration of the wine-cellar in his new rectory, with "leave it to me; these fellows" (*i. e.*, the architects) "know nothing about wine." We might certainly go with better hopes of "particular" wine to a contractor's cellar than an architect's, the difference being that between 15 and 5 per cent. upon "work executed." But when we contrast the manner in which the architect is alluded to (if alluded to at all) in the current literature of fiction, with the heroic part often allotted to the engineer in similar works, which teem with interesting engineering heroes with compressed lips, square chins, and broad foreheads; and when we consider the indifferent manner in which a "noble" or "honourable" client often ignores the claims of "his architect" to social recognition (the architect's "assistants" being of course "damned," in a body, by that one fact, as creatures too small for consideration), it is evident that we must either be what our Yankee consins would call "very small pumpkins" ourselves, or that a section of our natural employers must be under a great misapprehension about us.

"They manage these matters better in France." It was the hard lot of one of our professional friends, on one occasion, to travel through part of France in company with a fellow-countryman of the *genus* "snob." "I have filled up my passport," said the latter, "as *landed proprietor*: I advise you to do so; it procures one more respect and attention." "Thanks," was the reply; "I shall content myself with my professional title, and I will venture to predict that my *architect* will procure us more consideration than your *landed proprietor*;" and the event proved he was right. But in England the result would have been the opposite. In France an artist, as such, has a soul to be saved, and a position and title to recognition in good society. Many Englishmen have still in their blood the feeling embodied in Lord Chesterfield's advice to his son, to "pay fiddlers to fiddle for him." Yet with regard to the architectural profession more allowance must be made for the public than with regard to some other artistic professions. It is reasonable to conclude that the pure and unadulterated ignorance concerning architectural design, what it consists in, and why it should be at all, which is prevalent in this country, is at the bottom of part of the neglect with which our representatives are often treated. Most people see definitely what a painter or musician is, and that he does something which no one else can do, even if they look on that "something" as altogether trivial and ornamental. And if we glance at the cognate profession of engineering, and feel aggrieved at the importance attached by the British public thereto, and the popular glorifying thereof in biographies and novels, it must be remembered that the results of engineering skill are of such a nature as to be appreciable by the practical common-sense majority. We may, they think, do without cathedrals or monuments; but we cannot do without railways and viaducts; and every unprejudiced person must admit that engineering has been the great power of the present century, owing to a concatenation of circumstances, and that its professors are those who have recently done one of the most important parts of the world's work. But to the ordinary mind the exact work which has to be done by the architect is something not altogether perceivable, something impalpable, and which cannot be defined to their satisfaction. It is not engineering, they know, and they are told it is not simple building, and what it is precisely they cannot make out; the *raison d'être* of the profession is not clear to them; and it is difficult to know how it can become so, as long as our towns consist of congregated masses of endless ugliness, of itself sufficient to familiarise the eye with all that is mean, and stifle

the desire for anything like beauty or poetry in the disposition of our streets, and towns, and public buildings. Many people, indeed, before they have had occasion to employ an architect, have not the remotest idea as to the nature of the work done in the office; and we have often been witnesses to the unfeigned astonishment of a client at the number and elaboration of the drawings required in carrying out a building artistically. To show wherein the profession really consists, and to vindicate it as something essentially distinct from or superadded to engineering, is not our purpose in this essay, and would lead us to a disproportionate digression from our subject.

We fear, however, that it will scarcely be a fair statement of the case, to represent the present very partial recognition of the architectural profession among us, the want of appreciation of its real importance, as entirely chargeable on the want of right knowledge of a certain portion of British society. There is no smoke without fire. We have referred to French estimation of the profession, as contrasted with English. But the man who goes under the title of "architect" in France represents to the national mind a person educated duly and on a defined and known system; one who has passed through an *Ecole des Beaux Arts*, and has had his period of education systematically apportioned in such manner as to afford him the opportunity of learning satisfactorily the artistic and the practical portion of his profession in due order. But what does "architect" represent in England? It may represent, and happily we are glad to know that in not a few cases it does represent, a very accomplished, clever, and ready man, with a more varied stock of information than most men possess. But there is no guarantee, in the present system of architectural education, for its representing anything of the kind. In the best circumstances, an architect has, amongst us, picked up his own education at hap-hazard, and by his own exertions, commonly made in a desultory and unsystematic manner; and it is only after he has obtained the chance (which many never obtain) of carrying out a work of some importance, that the public can form any idea of his claims to respect as an accomplished professional man. And in less happy cases, it turns out occasionally that the "architect" has been originally a builder, a joiner, a mason, or that he has passed his apprenticeship in some office where surveying and valuation were the chief employments of his principal; and has, in fact, learnt nothing of architecture, properly so called, until the lucky day arrives when he gets, through friendship or interest, a commission to try his hand upon. There is nothing to prevent such a man, when once he gets a start, from representing himself to the public as on precisely the same level with the man who has spent years in studying the history of architecture, and the art of architectural designing; and if we so ill guard the inlet to our profession as to make no distinction in such matters ourselves, it is idle to expect that the public will make the distinction for us, except so far as that in the long run the really able man will generally, by a process of "natural selection," find his level. But again, with regard to those who really are competent and worthy practitioners of the profession, and every way entitled to the rank of "architect," is there so much attention to general cultivation of mind and manner as there ought to be with men who aspire to fill a good position in society? Mere ability and knowledge in his peculiar profession will not in itself render a man an agreeable companion, or one whose society will be sought for or valued by the best and most refined of his fellow men in other professions. And it must be confessed that indications appear, now and then, of a lamentably low standard of education and manner existing among some of those who

are, nevertheless, talented and hard-working members of their profession. We have heard, in no means despicable assemblies of members of the profession, ill-usage of a certain letter of the alphabet to an extent which reminded us of a sentence in the Book of Proverbs, about a "continual dropping;" and we have been startled by the assertion of the architect, that the works of Durandus, and some other Medieval lights, were better literature than Plato and Sophocles, which, for all the speaker knew of the matter, they might have been. This state of things is unfortunate, not only in its immediate results, but because it is also an indication that architecture as a profession is verging more and more into mere fine drawing and diligent copying, qualities which call little or no mental culture to their aid. The architects of the retiring generation were and are, many of them, men of quiet, refined habits, and of good education,—men to whom could be confided the task of planning mansions and public buildings with the view of securing at once dignity, grace, and practical fitness. They may have been wanting in force of character, and both their merits and defects are reflected in their works. The rising generation of architects seem too much characterized by a want of cultivation, an indifference to everything beyond the actual working part of their profession, which infallibly narrows the mind, and cannot advance the profession in the eyes of the educated portion of society. Their main strength seems to lie in clever, rapid, rough-and-ready drawing (*designing*, in many cases, it cannot be called), which they stick to with a diligence and perseverance that enable them to get through a great amount of this kind of work, and make a great show for their trouble; and they are apt to stigmatise "writing" architects as persons who can make admirable theories, but can carry nothing out. But rapid drawing does not necessarily mean rapid designing; often it is a substitute for designing altogether, and is unaccompanied by any real thought or consideration as to the best way of solving the problem committed to the architect. Money is made by the process, and will be made so long as the majority of the public are unable to distinguish between design and mere drawing. But if the new generation of architects elect to give so much of their time and labour to what is in fact merely the preparatory work in erecting a building, viz., the drawing and getting up of plans,—if they neglect the most usual accomplishments of modern education, take no interest in any of the great questions of the day, or in anything beyond the routine of professional work; and adopt a roughness of manner and want of polish, two results will naturally take place,—the more refined portion of society will be content to employ their services, and beg to be excused their company; and the best class of intellectual men, whatever natural talents they may possess for architectural designing, will not care to join the ranks of a profession which does not seem to offer them any work worthy of their energies, or any position in society, except in a few cases, equal to that filled by the members of some other professions, artistic and scientific.

COMPENSATION TO LAND AND HOUSE OWNERS.*

THERE is considerable uncertainty manifested in the volume we are considering † as regards easements. Doubt is expressed whether companies are empowered to purchase any easement, such as the easement of a tunnel instead of purchasing the land out and out (see p. 51), and the case of an arch over part of a manufactory is confused (p. 53). We believe that the effect of all the cases is that, although the parties may agree for an easement, it cannot be taken by compulsion, and an arch over, or a tunnel under, is equally a *taking* within the meaning of the Act. This, however, does not apply to such works as sewers by public boards, who can take such easements, but must pay for the depreciation and damage resulting. Another point rather loosely discussed is that of "statutory owners," as the author calls them, being parties having limited present interests. He fails to say that parties may insist on having life interests or other limited claims settled separately, leaving reversions and mortgages to arrange on their own account.

* See p. 298, ante.

† Ingram on Compensation to Land and House Owners.

The promoters cannot compel the limited owner to sell the reversionary interests; but if they take possession they may deposit one sum in the bank and give bonds to every person interested. A question has often been raised, but not decided, whether, if a claimant does not disclose a mortgage, he or the company should pay the six months' interest in advance in lieu of notice. The claimant receives the 10 per cent. compulsory sale on the whole, including the mortgage.

By a recent Act of Parliament (Railway Companies Act, 1867) a great impropriety in practice has been remedied. In the cases of taking possession of lands under the 85b section it was the law that a deposit of the value, as ascertained by a surveyor (always the nominee of the promoters), should be made in the Bank of England, and bonds given for a like sum. This in the case of owners in fee was sufficiently equitable; but in the cases of lessees, whose injury might be a hundredfold the value of the interest, it was manifestly absurd. (Under the new Act not only is the surveyor now independently appointed, but he is to take into consideration the damage as well as value. The compiler of this book has evidently not been aware of what has been done by bankrupt companies, when at p. 38 he says, as regards the old Act:—"Though the approval of the Justices is provided in case the parties differ" (*i.e.*, as to the sureties), "the sureties may be fixed upon by the company without notice to the claimant. But as the company are bound to deposit the amount of the claim or valuation, as well as to give a bond, no practical harm can arise from this construction.") Imagine a flourishing tradesman, having only a short lease, being turned into the street at a few days' notice, his protection being a deposit of a hundred or two of pounds, and a bond signed by one or two whose names had been appended to other bonds for hundreds of thousands of pounds! And yet this was the case until 1867.

It is not important to notice, except to show the misapprehension which may be created as to the nature of some cases, Wood's case against the Charing-cross Railway. It is mentioned on p. 33, where the plaintiff is described as an "obstinate landowner," the fact being that his land was taken possession of by the contractors for two lines of railway on viaducts without any deposit or bonds. An injunction was thereupon granted. A jury was shortly empanelled, and a settlement effected. The "obstinate landowner" here was in fact an ill-used man; difficulties had previously arisen, and, as usual when a little temper is displayed, were not smoothed away by high-handed proceedings.

As regards deposits, one of the most remarkable of the habitual proceedings of railway companies has never attracted attention nor is noticed in this work, namely, where they are effected by agreement with the claimants. The companies, seemingly as a matter of course, insert in their printed forms a clause by which the deposit is placed in the hands of their own bankers. Whether any such deposit really takes place we cannot say, but even if it does, such a deposit can scarcely be so equitable as when it is in independent hands, and there may be some special understanding between the companies and their bankers as regards interest. In any case it is an inducement to postpone the completion of the purchases. Endeavours, too, are often if not always made to alter the statutory interest of 5 per cent. on deposits to 4 per cent., and as companies have rarely been able to borrow at less than 5 per cent.—more frequently it is 6 per cent.—it follows that, with a part return from their bankers, they may in effect be borrowing from the landowners at about 2, or even 1 per cent.

A few words may be devoted to what is termed "compulsory sale;" the words appear in the index, but the text is on another subject.

It is a very ordinary custom to add a small per-centage to the value of the property—mostly 20 or 25 per cent. on land, and 10 per cent. on other property. In the northern counties, however, a much larger sum is added. This item is another of those lame ways of setting aside a difficulty instead of surmounting it. Prior to the Lands Clauses Act no such item was usual, parties then claiming for extra costs, expenses of reinstatement, loss of interest by delay, and other claims now condensed. In the case of property only, the 10 per cent. probably more than suffices, but in that of a small interest, such as a leasehold occupation of short duration, it is wholly inadequate. We should like to see a more reasonable system adopted instead of

this clumsy and almost lazy way of saving thought by the persistence in generalization. One or two of the assessors very properly set their faces against this item, but we doubt very much if they could with reason object to the equivalent claims under the separate heads. If the per-centage is adopted, it should unquestionably be on a sliding scale, when judgment would once more be brought into play. In the cases of "reinstatements" and "injuriously affecting," no per-centage is added—no one can say for what reason.

The skill of the surveyor is sorely taxed in cases of claims for approaches to land fit for building purposes where it is to be intersected by a railway. In inquiries of that kind the company need not define what bridges they will give, being under the orders of justices, nor can any one foresee what damage may result from any peculiar views of two magistrates.

The class of claims for "injuriously affecting" is perhaps the most anxious and interesting to professional men. The courts of appeal are evidently holding views perfectly consistent, although apparently contradictory, and whether from the varying modes of presenting the questions, or from the many new positions arising, each case seems to be decided upon its own merits. Thus it is that the notorious case of Ricketts v. The Metropolitan Railway in all probability would have had an opposite result but for the evidence on which the appeals were made. It was not alleged, as we think it should have been, that the land was injured; but it was proved that the custom fell off, and *ergo* the damage to the trade depreciated the land. It was not proved that the land had been injured; hence the disallowance of the claim. Nearly similar cases where the claims have been for the depreciation of the land, temporarily or permanently, have been adjudicated on and paid, thus showing that the nature of the proofs deterred the companies from raising any objection.

Very recently, in the case of Knock v. The Metropolitan Railway Company, the liability for injuriously affecting has been materially extended by a claim for injury to goods being allowed: there was a *locus standi* by reason of the property being damaged. How far the injury can be claimed for where the property is not injured it is not easy to say. One kind of case has been now given (since the publication of this hook) permanently settled by the House of Lords in the case of Brand v. The Hammersmith Railway. This claim was for vibration and other injury caused by the proximity of the railway, and has been upheld by the highest tribunal. It had been previously held that injury legally ceased when the railway works were completed. It is now clear that the user of the railway may cause injury, to be compensated.

There is a curious oversight in page 59 and the note thereon, where it is stated that juries cannot legally give damage for other land than that taken. Sections 49 and 63 in the Lands Clauses Act alike authorise juries, justices, and surveyors, to assess all values and damages that can be foreseen,—indeed, the words of the clauses are identical. In the case of juries they may be given separately, but it is difficult to say for what purpose, unless it is to fix the stamp duties on the necessary deeds of conveyance.

It probably never was intended that in cases of property injuriously affected, when held by tenants for less than a year, they should be entitled to either an arbitration or jury where the claim is over 50l. This power sometimes more unfairly presses on a company than if they had the same right if the property was taken, because in the case of an injury only it must naturally be less than if the whole were taken, and the proportion of costs to the claim is proportionately greater, and it appears to have been the main object of the framers of the Act to avoid costly modes of settlement in small cases. The avidity, however, with which claimants seize on opportunities of having either juries or arbitrators shows that the Justices have not earned a character for sympathy with them.

The almost universal feeling of magistrates seems to be against claimants, but there have been some extraordinary exceptions; a change certainly seems to be demanded, because they have not the professional skill and knowledge to come to a conclusion of themselves, and the course of proceedings before them does not tend to enlighten them. Their jurisdiction would very properly be limited to cases where less than 50l. is claimed, or there should be a few selected

Justices. There is no inducement to make them acquire amongst themselves what is done, so as to obtain a greater unanimity and certainty in their decisions.

It is not generally known that a yearly tenant, having received a notice, can summon the company before any two justices acting together in petty session. This is not noted in Ingram's volume simply because no "esse" has arisen from it.

One of the greatest hardships we are aware of is created by bargain made between owners of small property and railway companies for empty possession, which means that in consideration of a larger sum of money the owner undertakes to give his tenants notice to quit, thus saving the company the compensations to the occupiers, and turning them into the street without recompense. To their honour he it said, most of the metropolitan companies have generally refrained from this hard bargain.

Two statements are made, the first, we suppose, founded on some case (which, however, is not quoted), that "a lease is entitled to compensation for (inter alia) the loss of his chance of a beneficial renewal." It was so in some of the early special Acts, but so far is it from being the case now that, except in the case of customary renewals, where some special rights exist under the Ecclesiastical Acts, even a power to determine a lease is taken advantage of, and the onus is to value only the shortest term. We acknowledge the severity of this arbitrary proceeding, but so long as the courts recognise the right of a railway company to determine tenancies when they have acquired the ownership, the converse cannot be maintained in the case of leases. The second statement is on page 64, where the foregoing case is flatly contradicted, and cases are cited to show that no claim for "chance of renewal" can be sustained.

Throughout the work the writer has confounded the word taken with required: the result is positive error. In the one case a yearly tenant has a right to a jury or arbitrator, and in the other he must appear before justices. Constantly the expression "required and taken" is adopted. There is no such expression in the 121st section, but that used is "required to give up possession." In page 181 this want of precision leads to a decided mis-statement on the subject.

We are brought now nearly to the close of the matter, and "costs" form the only point desirable to be noticed.

In all preliminary matters, and in settlements by agreement, no costs are legally payable. It has become a custom to do so, but the amount is absolutely under the control of the purchaser. The legal fact is stated in the book, but not the custom. When, however, the claimer has been "tried," costs are payable by the promoter, unless, in ordinary language, they have a verdict, i.e., the sum offered has not been exceeded, in which case the costs are, as it were, divided. The mode of taxation, however, are very unsatisfactory: up to last year arbitrators very properly settled the costs. This appears to have displaced the companies who have succeeded in getting all costs taxed by the Masters of the Queen's Bench, there being a bill now before Parliament to complete the references of costs to those officers. In one respect only it is better, and that is the somewhat certain scale on which costs will be allowed, leaving it open to claimants to make an item of "extra costs" in their demands. This volume has not quite accurately given the law on taxation as it stood; but as probably the bill above named will pass, it will become accurate by anticipation.

We are amazed at one of the assertions on page 200, to the effect that it is extremely doubtful whether in the cases of "injuriously affecting," if no offer be made by the company, the claimant is entitled to the costs of the inquiry. The author can know nothing of the every-day proceedings of every company where these costs are as undoubted as in any ordinary action. Again, at page 202, a doubt is suggested whether lessees are entitled to half costs in a certain case. He must mean liable, as the company invariably pay the expenses of the court; and at page 203, because a lessee is not strictly an "owner," he may not be entitled to costs, "but the courts might, and probably would, interpret the word 'owners' so as to include all claimants." We think so too. We may add, that it never seems to have entered into any other mind that lessees' costs could be evaded.

The costs before justices are in their discretion, and vary in assessment as much as in their other

"discretions." Counsel, solicitors, and scientific witnesses are frequently employed, and yet we have known two guineas allowed for costs of the inquiry.

In the cases of apportionment of rents by justices, there is no power as to costs. This appears to have been another oversight in the general Acts.

Amongst the special railway matters as different from those of other public bodies are questions of certain kind of "injuriously affecting." In the case of interference with light and air, for instance, railway companies cannot be interrupted, but the claim must, once for all, include every anticipated damage. In the other cases the injury must be first complete, and a second inquiry in an action at law must be held, or the works can be stopped as in the case of ordinary adjoining owners. This, however, is not explained here, because it only arises in practice.

There are many other subjects to which we could call attention; but we have written enough to show the great interest pertaining to such a volume as this: and it would become a treatise instead of a review were we to extend this notice further. We cannot but hail this edition of a work especially designed as a book of reference.

HÔTEL DIEU, PARIS.

It seems that all the forces of the town of Paris are really concentrated upon the early completion of even a portion of the new Hôtel Dieu. All the best masons are there congregated, and if it were objected that the new theatres, operas, or the Château d'Eau are left nearly at a standstill, the reply would be, "The poor first." This vast structure is laid north and south, and stands upon a surface of nearly 5½ statute acres.

As to the site, various opinions have been put forth by professional men, medical and architectural, with regard to the propriety of keeping this hospital in the heart of the city, and they have rightly urged its removal. Some medical men state that, although the building is far advanced, the proximity of the Seine will be fatal to the inmates, and they want to change the destination of the new house.

The hospital is to contain 800 beds; but it will not receive generally more than 700 and odd sick, the wards for the remainder being reserved for cases of emergency, when a sudden change is prudently advisable from one ward to another.

Six pavilions, isolated on three sides, are to contain wards, one over another, of twenty, six or thirty beds; thus the fatal crowding of the inmates will be avoided. These pavilions have only two stories. This is to facilitate the circulation of air throughout the building. Chambers containing from one to ten beds are to be provided for those patients who require isolation.

The main ventilation is to be effected by large windows opening out on the façades of the pavilions. M. A. Tardien conceiving that it was impossible at all temperatures to obtain a sufficient supply of fresh air by these means, the authorities are preparing to install a system of artificial heating and ventilation combined. M. Tardien states in his own words:—

"Des ventilateurs mms par la vapeur font puiser l'air à une grande hauteur, cet air, après avoir circulé dans les calorifères, suivant les besoins du chauffage, débouche par des orifices disposés dans l'axe de chaque salle. Il s'éleva jusqu'au plafond et redescendra par couches successives pour servir à la respiration et à l'entraînement des miasmes. Quant à l'air vicié, il s'échappera par des ouvertures ménagées au niveau du plancher et aboutissant à une vase chimique, où un appel énérgique sera, entretenu et comme l'évier par la chaleur du réservoir d'eau chaude. Cette ventilation artificielle pourra porter le renouvellement de l'air à plus de cent mètres cubes par heure et par lit."

Hoisting machines, cranes, and hydraulic lifts are to be adopted. In fact, of all that modern science, ingenuity, and skill can apply to the alleviation of the sufferings of mankind, none will be found wanting,—they say.

THE TALKED-OF LAW COURTS.

WE must leave off saying the proposed Law Courts, for the whole matter is now in abeyance again. The present Chancellor of the Exchequer deals in surprises. After the advocate of the Embankment site and the Strand site had done their very best in support of their different views, the Chancellor of the Exchequer made a very elaborate speech, showed the House that the undertaking as it then stood would involve an expenditure of something like four millions in

stead of the one million and a half originally contemplated, and that the cost would fall on the public, notwithstanding what had been said to the contrary. It had been assumed, he continued, that there were only the two alternatives of Gargy-street and the Embankment; but he believed there was a third plan which he hoped the House would accept. There was a street called Howard-street, which ran half-way between the road on the Embankment and the Strand, parallel to both. Above that street the property was of considerable value, consisting of very good houses in Norfolk-street, Arundel-street, Essex-street, Surrey-street, and the Strand. Below it was of a very inferior character, consisting of premises of different kinds, which had been left, as it were, derelict by the Embankment. He believed that a piece of land, amounting to six acres, between roads 100 ft. wide, might be purchased there for 600,000. He was advised that on that piece of land might be erected buildings which would hold all the courts of justice, all the ancillary offices, and several others not so ancillary, and that it would be a high estimate to put that down at a cost of 1,000,000. So that together the cost would only be 100,000, more than the original estimate. All that might be made, without great expense, extremely ornamental on the side facing the river. On the other side, towards the Strand, not being exposed, it would not require to be so ornamental. For the façade of the building, he would suggest to the House to consider Inigo Jones's magnificent design for a palace for Charles I., which was to have consisted of a great quadrangle, occupying all the land between the river and the Horse Guards, with a façade of 874 ft. to the river. The plans and elevations of that building were in existence, and he would entreat the House to give every consideration to a scheme which had been the result of much consideration and of many anxious inquiries.

Ultimately the debate was adjourned, the Government accepting the responsibility of bringing forward a scheme.

It is obvious that if the plot of land pointed to by Mr. Lowe is sufficient for the building required, it must be a very different building from that necessitated by the Commissioners' instructions. A more remarkable meet was probably never made by a Royal Commission than that which is now before us.

OUR ANCIENT CASTLES.

At the last meeting of the Bath Literary and Philosophical Association, Prebendary Scarth read a paper on "Castellated Architecture," in which he described the castles of various periods.

At the close, the chairman, Mr. J. Goodwin, F.S.A., said that one feature in the paper they had all listened to with so much pleasure was to him of very peculiar interest—namely, the effectual way in which the Rev. Prebendary Scarth had dissipated the idea, very diligently maintained by authorities of no inconsiderable repute, of the remote antiquity of existing remains of castellated architecture in this country. Only that afternoon he had read a work of reference, far from meagre thought of, that the castle of Richborough, near Sandwich, in Kent, was not only built on the ground plan of the ancient Roman stationary camp in that locality, but retained features of the original Roman architecture; whereas if they looked to authentic illustrations they would find that only a few bare walls were standing, and it was very doubtful whether anything earlier than of Norman date was now extant there or in any other castellated remains in England. Even the Saxons, as explained by the lecturer, had left very little, if anything, of the kind behind them, and he strongly inclined to the opinion that it was to the massive solidity introduced by the Normans that they must look for the first and best examples of castellated architecture that had descended to us from early times.

Why upsetting the belief that there are in this country remains of castellated architecture of remote antiquity should give any antiquary particular pleasure, is not very obvious. The truth is, of course, pre-eminently desirable; but one school of antiquaries of the present day seem to think it their mission, oddly enough, to prove all English antiquities modern. Mr. J. Goodwin can scarcely know Richborough, except from the illustrations of which he speaks, and possibly has never seen Pevensey.

A NEW CATHEDRAL FOR CRAFTON, AUSTRALIA.

DESIGNS for a new cathedral at Crafton have been made by Messrs. Slater & Carpenter, and will be taken out by the Bishop of Crafton and Armidale, when it is expected a commencement will be made at once. The plan consists of a nave and aisles, 72 ft. long and 42 ft. wide; choir 38 ft. long, and of the same width. There are two towers placed to form quasi-transpts, as at Canova and Exeter; these are of lofty proportions, with shingle spires. The detail is necessarily very simple; the arcades have moulded caps, and only one order for the arches. Above is a clearstory of lancets forming internally a continuous arcade. At the east of the square-ended choir, are three arches opening into the octagonal chapter-house, communicating also with the ambulatories, as in "Becket's crown," at Canterbury (if the comparison indeed could be allowed). North and south of the chapter-house are placed the vestries, with porches opening also into the ambulatories of the choir. The chapter-house is finished with a high pyramidal roof, and over the three eastern arches of the choir is a large rose-window, with an internal enclosing arch. Stone can be procured in the neighbourhood of Grafton, but all skilled labour is very dear and scarce; it will therefore probably be many years before the chapter can enter their cathedral in its completed state. The choir will be first undertaken, and the works will gradually extend westwards.

THE HOLBORN VALLEY IMPROVEMENT.

This important work, long delayed, at last approaches completion. It is stated that the main line will be so far finished that the traffic may be expected to be resumed during this present summer or autumn.

After many years consumed in consideration of various schemes and in endeavours (not always happily resulting) to reconcile conflicting interests, the plan now being carried out was decided upon, and Mr. Haywood, the engineer to the Commissioners of Sewers of the City of London, was instructed to proceed with the necessary works. These have been in progress since May, 1863, and have been carried out without accidents of any consequence. The nature of the works themselves, and the delays in effecting the demolition of the old structures and roadways, embarrassed, too, by much litigation, are given as answers to those who complain of delay.

All passengers who remember the dangers and discomfets of old Holborn-hill will appreciate the relief afforded by the wide and level road which now spans the valley between Hatton-garden and Newgate-street; the necessity, in fact, of this new viaduct is so apparent, that in a year or two the public will scarcely think it credible that so obvious an improvement could have been so long delayed. Not only will the new viaduct afford a continuous line for traffic between the West-end and the City, but it will cause a large amount of most valuable land now lying nearly unemployed to be made immediately available for building purposes. In the neighbourhoods of old Smithfield, Snow-hill, and new Farringdon streets, already large warehouses and other commercial structures are rapidly rising, and in a few years the Holborn Valley Improvement will be the substantial centre of almost a new part of London.

The nature of the undertaking may be thus described.—Commencing from the Holborn end, the first feature is a wide circular open space, called the Holborn Circus, resembling its namesakes in Oxford-street and Piccadilly. From this the new road starts in continuation of the present line of Holborn, and takes an easy curve of about a quarter of a mile radius to the iron bridge which crosses Farringdon-street. On the north side of this circus Hatton-garden opens, and immediately near to it, on the north-east of the circle, is the commencement of a lateral road, which will presently be described. Upon the opposite side is the new entrance to Bartlett's-buildings and the intended opening into a projected street, at present terminating in St. Andrew's-court and Thavies-inn, which is to run diagonally in a south-westerly direction, and join Fleet-street near the site of the present Temple-bar. The width of the Holborn continuation is 80 ft. Before reaching the bridge over Farringdon-street, the road is carried by a smaller girder-bridge over Shoe-lane, and passes close to the Church of St. Andrew, Holborn,

removing a large portion of the present church-yard, and all the houses that formerly stood upon that side. Continuing on nearly a perfect level with the surface of the street at its point of starting, the new road crosses at Farringdon-street at an angle by means of a skew bridge, and thence passes up what was formerly Skinner-street, until it reaches the western end of Newgate-street. This forms the main line or simple viaduct of the Holborn Valley; but growing out of this are two secondary lines, scarcely less important.

The first of these is a new street starting from the Holborn Circus, and continuing in a north-easterly direction to Farringdon-road, immediately opposite to the new street leading to Smithfield Market. These roads will be 60 ft. in width, forming a continuous thoroughfare to the market and to the North-east of London. In connexion with this Shoe-lane is widened to 30 ft., and, passing under the viaduct, connects with a second auxiliary street, which, beginning at Farringdon-road, is carried nearly parallel with the viaduct for some distance, and then unites with it by an easy curve by the side of St. Sepulchre's Church. This street will join King-street, and thus give another line of access to the new market. With the buildings to be erected on either side, it will take the place of what was once known as Snow-hill.

The present level of the road-surface of a portion of Farringdon-street will be raised, so as to form more easy gradients for junction with the side streets.

Access is gained to the upper level of the roadway over Farringdon-street by steps for foot-passengers, enclosed by uniform buildings at each of the four corners of the viaduct. These buildings are intended as shops and for other commercial purposes, and form substantial abutments for the springing of the viaduct. The architecture of each of these is uniform, the style being a free rendering of what we suppose must be called modern Italian, a convertible and yet appropriate name for that which has not the pointed element too freely prevailing, and owns desire for beauty and common sense with some slight reference to Classic as its parents. How these four buildings will appear in reference to their position with the line of angle of the roadway, is an open question. Rectangular structures applied to a "skew" plan are always ticklish things to manage, and as the buildings are as yet not sufficiently developed to fairly allow a judgment to be formed, we shall be curious to see how Mr. Haywood's ingenuity escapes a somewhat difficult dilemma.

The impression left upon the mind after a first leisurely walk from Holborn to Newgate-street on the top of the new roadway is of a wide and level thoroughfare raised above the old pavements, and of a spacious bridge crossing the busy thoroughfare of Farringdon-street below. The improvement is so grand and yet so simple, and the direction taken by the new road so obviously the easiest and the best, that difficulties of construction and engineering details are in a manner lost sight of, and it is not until the work concealed from the eye is divined into that the true nature of the undertaking is understood. To know what has been accomplished, and to appreciate rightly the work, an observer must leave the upper level and penetrate the interior; to comprehend his subject he must do as all patient learners do, commence at the foundation.

The problem that the engineer had to work out appears at first sight a simple one. The postulates were a bridge crossing the great artery of Farringdon-street, and a level causeway on either side from Holborn on to Newgate-street. Then came considerations of detail that soon assumed a complex and difficult shape. Sewers, and gas, and water pipes had to be carried, levels had to be regarded, and connexions with lateral thoroughfares had to be maintained. Then arose questions of modes of construction. Obviously a solid embankment was not possible, and an open arcade would be a waste of valuable space. So the design gradually shaped itself into what may be briefly and accurately described as a plan consisting of two lateral passages, one on either side, supporting the pavement, and cross arches forming vaults between, and carrying the carriage roadway above.

As the great depth of the Holborn Valley caused the viaduct to be of considerable height at its point of crossing Farringdon-street, the engineer took advantage of this to subdivide his vaulted passages into stories, and there are accordingly one, two, and three as the dip of the

level permits. First is appropriated a space for areas and vaulted cellars of the houses, and then against these is at top a subway in which are the gas, water, and telegraph pipes; then a passage, and below these a vaulted chamber constructed with damp-proof courses through its walls, and of considerable depth, at the bottom of which, resting on a concrete bed, is the sewer. The sewer is intended to be open, and the accumulation of foul gases is expected to be prevented by upward ventilation; but as a matter of passing criticism we would suggest that there seems a source of trouble in prospect which might readily be obviated by constructing an enclosed sewer in the ordinary manner, and using the ventilating flues and pipes (that are provided for the purpose of carrying off effluvia) from the sewer direct instead of from the large chamber in which at present it is placed.

The height of these subways is 11 ft. 6 in., and their width 7 ft.; they are constructed of brickwork, excepting where carried over the London, Chatham, and Dover Railway, at which point they are of tubular form, and are constructed of iron. The subways are interrupted in the level course at the crossing of Shoe-lane and Farringdon-street, and dip down under the lower level by means of vertical shafts. In this connexion a question arises as to the means to be adopted to relieve the great pressure upon the water-pipes caused by this descent and ascent.

The subways contain ventilating shafts which are connected with trapped gullies in the roadway above, also with the pedestals of the lamp-posts perforated for the purpose, and with flues specially directed to be left in party walls of buildings,—all these contrivances being specially made for the carrying off of gases that may escape, especially from leakage from the gas mains. It is not anticipated, however, that the difficulties arising from this latter source of trouble will be so great as some supposed. It is well known that an enormous loss annually occurs to the gas companies from defective joints, the evidence of saturation of the earth around them showing invariably a most formidable leakage; but we have always been of opinion that this waste should not exist, and it remains to be seen whether true economy will not be found in a system which permits the pipes to be always accessible, and compels better workmanship by leaving it constantly exposed to test and examination. The temptation to conceal bad or careless work by burying it in the earth is too great for most workmen to resist. As it is, in these subways, defective joints will soon tell their own tale, and the smallest possible escape will be soon detected and easily stopped. It should be the policy of the gas companies to have men specially employed to examine the mains in the subways, and there is no doubt that the more careful workmanship that exposure of the whole pipe must necessitate will result in a gas-tight joint and a sensibly diminished waste. Provision is made for the easy ingress of workmen and materials, and the subways are lighted by means of gratings fitted with globes of thick glass. Their ventilation has been already alluded to.

The extensive range of vaults under the centre of the road is calculated to yield a considerable revenue. They are large, commodious, dry, and of an agreeable temperature, and for storage of goods and other commercial purposes may fairly be expected to be gladly appropriated. They will have tramways laid through them for the more easy carriage of goods, and the entrance to them will be in the abutments of the bridges over Shoe-lane and Farringdon-street.

The plan and sectional views that we give will make the mode of construction thus briefly described readily understood.

The extent of the viaduct from Holborn to Newgate-street is about 1,400 ft. in length, and the width between the building line 80 ft., affording space for a 50-ft. carriage-way in the centre, and two pavements, each 15 ft. wide on either side. The brickwork is composed of stocks, with Calt facings from the Medway, and the cement is Portland. The stone of the buildings is Portland, and the granite, black Guesney, red Ross, and Mull, with Aberdeen. The surface of the carriage-way will be paved with cubes of granite 9 in. by 3 in., hedged on fine ballast 4 in. thick, resting on concrete 12 in. deep, lying on coarse ballast, with a layer of 3-in. asphalt next to the brick arches. The side pavements will be laid with 3-in. York flags, with perforated gratings, as before described, to light the subways.

The quantities of materials so far employed, may be roughly stated at about 16,000,000 of bricks, between 50,000 and 60,000 yards of concrete, 120,000 yards of digging and carting, 25,000 tons of stone, and, including the bridges, but exclusive of water and other pipes, about 12,000 tons of iron. The cost of the works can scarcely at present be approximated; it appears probable, however, that the construction account will seem small compared with the cost of purchase of site, settlement of compensation with owners and occupiers, and the money sunk in much unfortunate litigation.

The bridges afford the principal opportunity of ornamental display, that over Farringdon-street being the most important. This is constructed with cast-iron girders covered with flanged corrugated plating, and crosses the thoroughfare at an angle. It is divided by rows of piers into three spans, the outer rows resting upon the curb of the pavements. These piers, as well as the half-piers of the abutments, are of polished granite, very boldly wrought, and effective in design. The ornamental metal enrichments of the open girders is simple in its general arrangement, and far from commonplace.

The leading idea is of circular panels, connected by scroll work, and filled with emblematic devices, in which the civic emblazonry and the well-known griffins are appropriately conspicuous. The outer central piers dividing the pavement from the carriage-road, are carried above the railing on the parapet of the bridge, and terminate in pedestals on which are to be placed four stone statues of oivc worthies of older times, which, when in place, will be well seen, and will form effective features. The panels composing the balustrading are already partially placed, and from the decoration that is hinted at by a small specimen on the northern front, promise to be light and cheerful, with colour and gilding, as well as of a substantial character. The ornamental castings, by the way, throughout struck us as clean and good, the artistic details being sharp and well preserved.

The height of the Farringdon Bridge will be 16 ft. at the curb, and a minimum of 21 ft. in the centre. At present the apparent altitudes exceed these; but, as before remarked, the surface-level of the street will be raised.

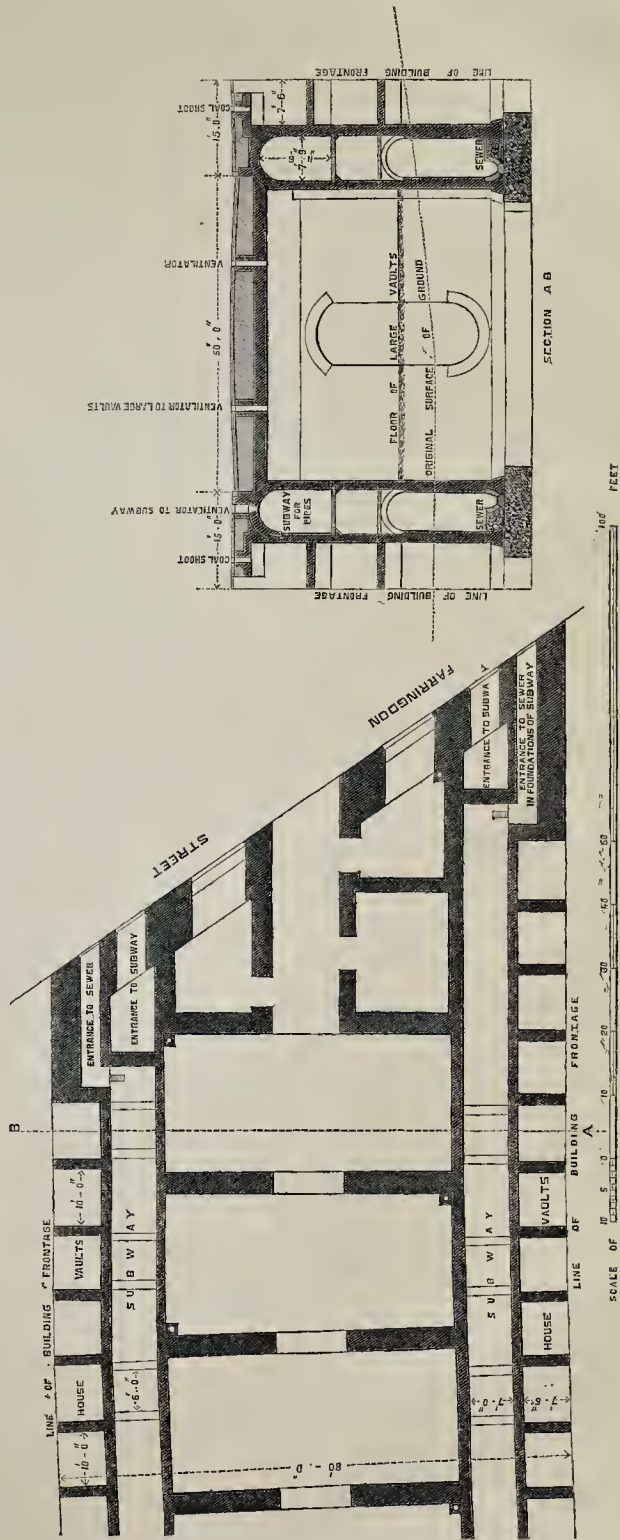
When completed, the effect of this wide level thoroughfare will be very satisfactory, and nowhere do the dome and lantern of St. Paul's appear to so good advantage as when seen from the centre of the Farringdon Bridge. Much, of course, must depend upon the style and finish of the new buildings that will line its sides; but from present appearances it is not to be supposed that they will be otherwise than well designed, and of ornate and costly finish.

A large and handsomely embellished building for Messrs. Negretti & Zambra is rapidly approaching completion from the designs of Mr. Waterhouse. This stands upon the corner of the Circus at the junction of the new street, and next to it are the new premises for the Messrs. Fearon, the wine-merchants, in a similar state of forwardness, and for whom Mr. F. W. Porter is architect. Close by in Holborn is the site for a large building intended to be erected under the direction of Mr. Lockwood.

During the demolition of the old streets and houses nothing of any special value or interest was brought to light; the most noteworthy being the frequent discovery of all sorts of concealed passages for escapes and nooks for hiding plunder in the villainous old houses of Field-lane and its unsavoury neighbourhood, the removal of which alone should cause the Holborn Valley Improvement to be considered a blessing to this part of London. In carrying the new road through St. Andrew's Church-yard, a large slice of the ground was required, and this compelled the removal of a great number of human remains; between 11,000 and 12,000 were therefore decorously transferred to the City Cemetery at Ilford.

It now only remains to mention that the works of this important and most beneficial improvement are being carried out by the Improvement Committee of the Corporation of the City of London, from the designs and under the supervision of Mr. William Haywood; Mr. Robert Lidstone acting as his principal clerk of the works. Messrs. Hill, Keddell, & Waldram are the contractors for the whole; and the charge of the ironwork of the Farringdon Bridge, and of the greater portion of the remainder, is in the hands of Messrs. Cochrane & Groves.

HOLBORN VALLEY VIADUCT.



Plan of Part of Viaduct next Farringdon-street.

INSTITUTE OF PAINTERS IN WATER
COLOURS.

The summer exhibition of the Institute of Painters in Water-colours is less distinguishable than could be wished from the collection shown during the winter months, and this arises principally from the want of ambition amongst the younger members, who might be supposed to share a desire to support the *prestige* of the society, and may be espahle of the undertaking. The figure draughtsmen, with the exception of those who for years past have supplied the leading pictures at this gallery, show a want of inventiveness that in itself is very astonishing, and a harneness in conceiving the simplest incidents more astonishing still.

There are numerous small drawings that have scarcely cost as much thought as many an inferior magazine illustration, and that might have been acceptable in a gathering of sketches and studies, but leave no favourable impressions as finished works; for in too many cases the matter is not worth the method employed in making the most of it.

In landscapes, however, in coast-scenes, interiors, exteriors, and still-life, or in any respect where thought and creative faculty are less to be exercised, and executive skill is the great desideratum, the collection is rich, and in choice examples. A too ready excuse may always be found in the assertion that demand influences supply, when it would be more just to remember that the better quality of the supply would more certainly produce the demand. Mr. Louis Haghe's drawings, of which there are half a dozen this year, display most of the characteristics common to all he does. Well-selected themes to invest such capabilities as he excels in, are (37) "St. George's Chapel, Windsor: Burial of King Charles I.," and the hedchamber in which happened "The Arrest" (28) of the monarch; though the incidents depicted are of less consequence than the studied and ably represented interiors: by dint of clever light and shadow arrangement and sombre rich colouring, they are made very interesting.

"Cromwell on the Morning of the Battle of Naseby" (93); the Republican hero reading in his tent, his hard, stern features illuminated by the light of the lamp, is a more important production, rising to the dignity of historical illustration, and a very impressive and suggestive portrait. "Reading the New Sonnet" (157); the poet himself, perhaps, attired in black, surrounded by a well-dressed assemblage of late eighteenth-century fashion, is—doing as Sterne used to do—treating some of his acquaintances with the first taste of his latest effusion: this again is very remarkable for the apposite style of the room, furniture, and appointments, and a very pleasant example of the master.

Mr. E. H. Corbould is not so strongly represented as is customarily the case; but, as usual, his drawings are conspicuous for clearness and brilliancy, as well as for force. (63) "Joan of Arc forsaken," though little more than a single figure, is at once to be identified by the precise drawing and well-selected costume and equipments: the horse appears rather small, and there may be some difficulty in finding legs for some of the dead warriors, but there is this to be said, they will not require them again even if they are found. "My Grandfather's Choice" (16), a hepatched, bepowdered beauty of certain uncertain age, in qualified pink drapery, and with an unqualified green fan; and a ladylike, agreeable portrait of "The Lily of Oakwood" (40), form his share in the exhibition.

Mr. Henry Warren, besides a subject—enclated on a large scale—from Biblical history, "Abraham purchasing the Field and Cave of Macpelah" (143), with its correct redaction of Eastern habits and observances, has an "Arrival at the Well" (13), with (109) a procession conveying "The Queen of Sheba on her Way to visit Solomon," to represent him.

A study for the last work that had engaged the ntring industry and valuable acquirements of the clever, amiable Mr. Edward E. Wehnert (15), "Galileo before the Inquisition," a quaint fancy portrait, "Pavonina" (117), by Mr. J. M. Jopling; and two life-size companion-pictures by Mr. Guido Bach, very deftly, but somewhat slightly done,—(175), the one, of a pretty, perplexed maiden, whose thoughts may be supposed to be not totally concentrated on the means of bettering herself, since her adoration to the monk, "Father, advise me," implies some divided in-

clinations; and the other, "The Appeal" (181) of a rugged-faced petitioner of the rougher sex to a knight of mundane ideas with regard to favour, who shows no divided inclination, for he looks quite determined not to allow the appellant to get the better of him,—are amongst the more ambitious performances to be noted. Skillfulness, again, and careless drawing deteriorate from the claims of Mr. Bach's classical composition (198), "Psyche, having lost Cupid, appeals to Pan for advice to aid her in his recovery." There is so little needed to make this a favourable example of the pure resources of water-colour—emulating the qualities of fresco-painting—that the failing is the more observable and disappointing.

"A Mistake" (12), by Mr. Valentine W. Bromley, made by a gallant at a masquerade: he has declared his love to the wrong lady. It would have been a more sensational situation had she been a wronged lady, and in that the artist has missed a point. There is good workmanship to recommend good colour in this, but a want of story. Were the loved one rather more lovely (123), "Kiss and be Friends" would be a charming drawing; it indicates no common taste for refinement, and an originality of idea in treating simple episodes of an ordinary life's history so as to invest them with a peculiar interest. Such is the passing anger of an impetuous hoy-lover, who, after a tiff, is leaving the castle-home to show the end of an alternative dose that checks his sanguine hope of everlasting worldly happiness, armed with a weapon to bring down the deer—with more chance of success abroad, he it hoped, than he has had with the dear within walls, who, however, relenting, follows him to invite reconciliation before the wound should rankle. "The Ferry" (158), also by Mr. Bromley, is another short chapter of romance very well told, but of less merit than the former as a picture. "Persuasion" (22), by Mr. C. Green, is more remarkable for the care with which the variety of articles dealt in by the broker are made out than from much that interests in the pair, who, about to pair, are buying furniture, or in the persuader, who is trying to dispose of a clock to the best advantage.

(66) "A Cup of Tea," "The Writing Desk" (232), "Contentment" (234), and "The New Novel" (236), are nicely manipulated, and serve to indicate the nature of many of the items to be found on the walls and screens this year. "The Doubtful Coin" (45) that a tenant has offered to the steward amongst his rent-money, by Mr. H. B. Roberts; (57) "A Question of Time," the lover pleading his suit to a lukewarm listener, with a sundial to divide them and serve for their support—one of Mr. J. Absolon's prettiest productions on this occasion; (51) "Rhoda," more subdued in colour than usual, by Mr. A. Bouvier; more love-making, as described in "Enoch Arden" (207) and by Mr. G. G. Kilburne, are also noteworthy. With a photographic distinctness of outline and the utmost finish that could be lavished on this, throughout there is a want of vitality inseparable from camera reflexions. Both silent and loquacious swain, with "that one girl" on whom "either fix his heart" appear to have a very cool idea of the affections. Enoch is speaking his love, whilst Philip is like the parrot that said nothing, but thought the more.

"A Candidate for Adoption" (202), by Mr. A. C. Gow, selected by a wealthy lady from an orphan-school, is a pretty subject; "Old Comrades" (247), a monk, perched on the garden-wall of the monastery, conversing with an armed and mounted man of war about old times, when peace was not so compatible with his happiness as now,—an elaborated and clever drawing; and "Chamber Practice" of an old gentleman who is desirous of becoming an adept at fencing with other than fornicatory adversaries, are all distinguishable among the more valuable examples present. "Faust and Marguerite" (163), the garden scene, by J. D. Linton, is more curious than pleasing. Neither hero nor heroine has much in the way of personal advantages to boast of, and they, with their surroundings, are so lighted up with reflected light as to suggest a phosphorus diet had been prescribed for them by their worthy friend and enemy, Mephistopheles.

(178) "Near Selborne, Hants," by Mr. George Shalders, is unquestionably a most astonishing and perfect production of its class; though but a composition embracing an expansive tract of country with numerous sheep feeding and reposing to be influenced by the effect of a gorge-

ons sunset sky: the harmonious brilliancy of the whole is to be marvelled at. Mr. Mole, if he do not work with an incredibly rapid pencil, must be indefatigable. No less than fourteen emanations repeat his name in the catalogue, though they are not all of the calibre of (39) "An Autumn Evening in South Wales," his principal work.

There are numerous landscapes of a very high degree of merit, charming drawings by Mr. H. G. Hine for witness, "On the Downs, near Willington, Sussex" (41), from eight or nine specimens; (17) "Reef at Peveril Point, Swanage, Dorset;" (27) "Downs near Folkington, Sussex;" and an unpretentious rendering of "Gravesend Reach, from Milton, Kent" (183). Others of the sea by Mr. J. G. Philip, such as "Rescue of a Derelict Ship" (15), "Effect of a Gale near Falmouth" (61), and similar works betokening close study: more by Mr. John Mogford, "Elizabeth Castle, Jersey" (26), "Tynemouth Priory, Northumberland—Evening" (150), and (173) "By the Sad Sea Waves," with exemplary specimens of Messrs. W. W. Deane, D'Egville, Leitch, Maplestone, McKewan, Pidgeon, Prout, Reed, Rowthorn, and Vacher, with their several methods, styles, and manners.

Mr. James Fahey, amongst a number of capital landscapes, has a very interesting picture (29), showing Barrow-in-Furness, Lancashire, in 1867, and as it was in 1846. It is painted for the present mayor, Mr. Jas. Ramsden, to whom much of the change is due, if we remember rightly.

Mr. Carl Werner's half-dozen works are marked by the strict adherence to fact that always distinguishes them—mannered though they be. They are valuable and faithful transcripts of Eastern buildings, and local propriety and truth extends to the smallest matters in all of them; their accessories are most appropriate. The interest is not confined to the immediate subject represented, but enlisted in a comprehensive view of life, habits, costumes, and customs, besides localities and buildings.

But how foolish it is, or it appears to be, to decry mannerism, when it secures such admiration as protects Mr. Edmund G. Warren's wonderful drawings from all effects of adverse comment: he needs no protection from infringement of copyright. The tact with which he adapts whatever he intends to represent—and one pity is, that he should restrict himself quite so much as he does—gains for him more credit for literal exactness than his works really possess, though there is more of prose than poetry in them, after all. Novelty in their author's description forms no part of the cause for their success, in treating such natural circumstances as are most likely to delight the spectator in scenes like "Harvesting by the Sea" (23), with its golden corn, turquoise and emerald sea, and exhilarating sky; or "Harvesting in Surrey" (149), with another such cheering sky, more aureate wealth, but with woodlands and hills for the distance that lends enchantment to the view—a very fine one—in lieu of the liquefied jewels. An admirable perspective arrangement and management in this composition is one of its most noticeable points. (186) "The Beeches in the Wood,"—

"Where, the long drooping boughs between,
Shadows dark and sunlight seen,
Alternate come and go;"—

are represented with the appearance of extraordinary reality shared by similar drawings that have preceded it, and the perfection attained is a strong argument in favour of repetition, though the present instance of their use may make it all the more difficult for the artist to surpass himself in a future one. "Sheep Washing" (194), a fourth contribution, is brilliantly lighted by sunshine.

All these drawings, if they go no way towards refuting the proverb that "there is nothing new under the sun," at all events will enable those who possess them to enjoy at home, in the smoky, dusty atmosphere of hazy London, some of the calm pleasures of country out-door life.

The New Theatre, South Kensington Museum.—The Lord President of the Council has requested Sir Charles Wheatstone, Sir Michael Costa, Professor Tryndal, Lieut.-Col. Scott, R.E., Capt. Donnelly, R.E., and Mr. Bowley, to report on the acoustics of the new lecture theatre. There will be three trials—one by a lecture, with demonstrations, on Musical Pitch; a second by voices; and the third by instruments.

THE ÆSTHETICS OF CONSTRUCTION.*

No sooner had I taken up my pen, to put into shape the innumerable but disconnected ideas on the subject of the Æsthetics of Construction, which have from time to time engaged my attention, than I discovered my utter inability to place them in anything like the convincing form in which they have occurred to me, and which has induced me to choose them for the subject of this paper.

The principles I advocate are certainly not new; they are co-existent with the pleasure we derive from all natural forms and motions around us on the earth, and I had almost added, in the planetary and sidereal systems; but I must draw a line here.

The man who can gaze into the starlight night, and conceive at once the motion of each planet—the grand elliptic sweep—the influence of each upon each—the drawing nearer, and the drawing off—has a higher conception of the beauty of the Creator's work than he who can imagine the pure ellipse alone, and to whom the infinite perturbations are but irregularities which puzzle his brain, and dim the grandeur of the scene. Here then the pleasure derived depends chiefly upon the extent of mental culture and intellectual energy of the man. The impression of perfection and of consequent beauty is in a different degree conceived by each mind, and in both cases it is wholly artificial.

There is yet another man who will call the stars beautiful. He looks up into the silent night—all is confusion there—perchance the crescent moon is up, and a dim light covers the darkened portion of its sphere. Earth light! Did he ever think of that? If so, would he not call it more beautiful? The other minds see all the glory that he sees, but far more that he can never see.

Fortunately, the man for whom we build is born and bred in a world where the laws of nature, which he sees and admires unknowingly, are those in subjection to which our art is exercised. We build for none of the three first named. We build for a man who would perceive the absence of those laws, not because he understands them as the astronomer understands the paths of the planets, but because he has seen them around him all his life—the Creator has covered the earth with them, and we see no beauty where they are not.

The subject of my paper, then, is the consideration of the conditions under which we are pleasantly impressed by the presence, in our structures, of those natural laws with which we have become familiar, in a greater degree perhaps than we are prepared to believe, by the senses of sight and touch, and not of necessity by that higher mental power which analyzes mathematically the action of those laws. I only speak of the absence of mathematical analysis in the minds of those for whom we build, and do not by any means suggest its exclusion from the minds of the builders. I have always believed that the distinction between the professions of the architect and the engineer is, or ought to be, a distinction rather of degree than of kind. We are both of us constructors. We must investigate in common the resistance of materials to the simple strains; those, for instance, of compression, shearing, and tension; and we must, to become masters of our subject, be conversant, though perhaps in a different degree, with the more complex calculations arising from the combination of such strains, either in the same piece of a structure, or in pieces depending for their support upon one another. We must both of us consider without prejudice these elements in the works of eminent men who have preceded us, not with a view to servile imitation, but as a safe and well-tried foundation upon which to erect original, and, it is to be hoped, better works of our own.

This cursory glance at the minimum amount of scientific knowledge which it appears to me we ought to possess in common, suggests the consideration of that particular branch of æsthetics included under the general term *decorative*, which is altogether independent of construction, and which is excluded from the more immediate subject of this paper.

Our scientific speculations, which are themselves subservient to the adaptability of the result to the end in view, having brought the design in which we are engaged to a certain point, we must, in carrying out our enterprise, and without in any way hiding the work pro-

duced by our reasoning faculties, exercise in a greater or less degree our imaginative faculties; often for the purpose of adding pleasing outline or relief, always with a view to the development of that intrinsic beauty which, as I hope to show, is rarely absent from scientifically-designed structures.

Agreeable sensations arise in our minds from the contemplation of the beautiful in nature and the beautiful in art, from two distinctly different causes; the one depending solely upon our appreciation of the action of the mechanical forces of nature, the other affecting our senses in virtue of certain distributions of form, colour, or light and shade, for which we can lay down but few rules, and those of a merely empirical nature.

Take in your hand a frond of the common lady-fern. It has, for some reason, a most pleasing effect on the eye, and you call it beautiful. Paste the same frond on a sheet of paper in a vertical position, and to most minds more than half its beauty will have vanished. And why? On the first impulse one would be inclined to answer, "because it formerly hung in a beautiful curve, and we have now rendered it rigid and straight;" but a little consideration will show the incompleteness of such a reply. The circle is a beautiful curve, so is the spiral, so is the cycloid; but the fern, when bent into any of these, will have but little more beauty than it had as a straight line. Only one curve will answer the purpose, and that is the curve into which it naturally falls, the curve in which the force of gravity is exactly balanced by the resistance of the stalk to flexure.

Innumerable examples of a similar nature might be adduced, and I think they would one and all show, that there is a pleasurable effect produced upon the mind by forms resulting from, or balanced by, the direct action of the mechanical forces of nature, when those forces act in a manner which we apprehend intuitively, and are not complicated in their mode of producing their effect upon the senses by artificial means, or by the superimposition of one upon another. And this result is evidently altogether independent of the arrangement of the component parts—a division of the subject to which I have already alluded, as including all embellishments not necessary to those conditions of stability which the ordinary mind is capable of appreciating, but which may nevertheless be introduced to enhance the beauty of the structure.

The first of these effects appears to have a peculiar interest for the engineer, as it is the basis of a great problem; namely, how he is to produce, in those works which are pre-eminently dependent for beauty on their lines of construction, such forms as the mind will at once apprehend as curves natural to the conditions involved, and which it will not be slow to call beautiful; in short, such curves as are known by engineers as lines of equilibrium. The second, or decorative effect, it is the more immediate object of the artist to produce, and in all cases it should be subordinate and subsidiary to the first.

For the purpose of illustrating my statements, or, I would rather say, as the best arguments that I can adduce, I have collected engravings and photographs of a few of each type of designs for iron bridges executed or proposed; and I have numbered these types, not according to their scientific classification, but rather as they produce a pleasing effect or the reverse.

- Type 1. Box and plate girders.
- " 2. Lattice girders.
- " 3. Bowstring girders.
- " 4. Arched ribs with braced spandrels.
- " 5. Suspension-bridge with stiffening girders.
- " 6. The continuous parabolic system.
- " 7. Simple suspension-bridge with vertical rods.

If we consider for a moment the disagreeable impression produced upon us by the first of these types (and every Englishman has ample opportunities for considering it), we cannot fail to notice that it does not altogether arise from the monotonous oblong form, or even from the flat uninteresting face, of the structure. Cover it with mouldings and ornaments of cast iron—paint it in the best taste—decorate it as you will—you cannot redeem it from its uncomplaining ugliness. And why? Because it appears to be out of place; it is a form which seems to want some additional support; it is essentially deceptive. We cannot appreciate the beauty of construction, the principles of which we do not instinctively comprehend. In a limited

sense, those principles are correct enough. In the molecular structure of every straight beam there are curves of direct tension and compression, which clear up the mystery at once. The lines of compression are concave downwards, those of tension concave upwards. They cross each other in every case at right angles, and each cuts the neutral surface of the beam at an angle of 45°.

Although the two halves are in all respects similar, there are not two points in the half elevation of the web and flanges, at which the stress is at once the same in amount and direction. Along each individual curve the stress varies from centre to end, and every curve represents an amount of stress differing from that of every other. Then what an infinitely complicated piece of workmanship we should have, if we attempted to vary the section of our wrought-iron plate, in proportion to the duty that each point in their elevation has to perform. Practically we cannot do this. It is for the engineer to determine how far he can approximate to the theoretical conditions involved, and thus save material without necessitating more labour than the value of that material represents; and in most cases this can be done with great advantage. In small wrought-iron girders we may, perhaps, by due attention to the principles of stress, save 15 per cent. of the material necessary in a girder of equal strength, but of uniform section, and that without adding to the labour in the least. This per centage, however, is but a fraction of the weight which theoretical perfection represents as lost.

This type, then, is essentially bad in respect of its response to the theoretical conditions of a minimum weight of material. Nevertheless, in small spans the economy of labour consequent on simplicity of construction often compensates for this defect.

Type 2 is the straight lattice girder; and here the lines of stress are guided from their natural curves, and concentrated in the flanges and diagonals. This fact, however, does not assist the mind in conceiving the mode of action of the beam, and I am inclined to think that all the superiority of appearance is to be traced to the decorative effect produced by the open lattice work, and the reduction of apparent weight. Among the best known bridges of this class are, in England, those at Crumlin and Runcorn, and on the Continent, those over the Rhine at Cologne, and at Kehl, near Strasburg, and that over the Vistula at Dirschau. But one and all of these must be regarded as failures in an æsthetic sense. Probably Mr. Baker's towers at Runcorn, and the piers at Dirschau, are most in keeping with the works. The Gothic piers of the bridge at Kehl have a singular effect. Their appearance is very striking, but they do not harmonize well with the long horizontal lines of the girder, or with its lattice bars arranged at angles of 45°. The proximity of Strasburg Cathedral, too, is not calculated to impress one in favour of that puny cast-iron architecture.

The Bowstring girder is our next type, and it includes all those in which the top or bottom flange, or each, consists of a segmental or parabolic rib, connected together by diagonal lattice bars. The best known of those which have both flanges curved are Brunel's bridge at Saltash, and that over the Rhine at Mayence. All these structures are, as regards the iron work, more natural than either of the preceding types, and we must accord to them the merit of giving us the first clear idea of the manner in which they do their work. We may not feel satisfied with their appearance, but we must admit that it is, or may be made, much superior to that of either of the straight types.

We now come to the arch, respecting which I shall say more hereafter, but assuredly we cannot hesitate to assign to it, in our classification, a higher place than we would to those already mentioned. The mind at once perceives the natural and efficient manner in which it supports the load to which it is subject.

Our fifth type is the suspension bridge, stiffened in such a manner by lattice work as to be capable of bearing, without undue vibration, heavy rolling loads. It is sufficiently obvious that the effect of the simple parabolic or catenarian curve is, in a great measure, marred by the proportions of the stiffening girder.

In the late Paris Exhibition were exhibited two striking drawings, by Herr Carl von Ruppert, for bridges across the Bosphorus, and over one of the great chasms in the tertiary limestones of the Balkan. In carrying out the

* By Mr. G. F. Deacon, C.E. From a paper read at the Liverpool Architectural Society.

Austrian project of a railway to Asia Minor, it will be necessary to cross these places, and Von Ruppert has probably solved the difficulty in a very complete manner. It is well to mention that his investigations have been published, and they can leave no doubt in the mind of the reader that the Austrian engineer has brought together principles already well understood, with a boldness and originality resulting in a complete success.

There is but one more, and that is the pure suspension bridge. We cannot improve upon that simple catenary. Its mode of action is apparent at a glance, and its curve is evidently a natural one. But, unfortunately, we have no means of rendering it sufficiently rigid for railway purposes, without destroying its chief aesthetic characteristic.

Thus far I have endeavoured to lead you through the general principles, in virtue of which each of the seven types supports its load. You may feel inclined to change the order of one or two, but that will not affect the general result.

Had I based the classification upon the relative economy of material, upon the absolute weight of the superstructure which each would have required for the same span, and to bear the same moving load, it is at least gratifying to know that the arrangement would have been precisely the same, and that, although in small

spans, the order of ultimate economy is somewhat changed by the different proportions of labour to material required, it would not be felt in the large spans.

These general facts have been long known to the engineer; but Mr. Benjamin Baker has recently reduced them to approximately correct figures for different lengths of railway bridges up to the limiting spans, and I have prepared, from his investigations, the annexed table showing the weights of material in spans of 700 ft., and also in spans 100 ft. less than the limiting spans. The types are in principle the same as those I have described, though not arranged quite as Mr. Baker has classed them.

I have now laid before you the general arguments which, you will probably admit, prove, at least in regard to great bridges, the truth of the statement that, in equal spans, the aesthetic properties of the lines of the structure vary in direct proportion to the simplicity of the design, in a scientific sense, and in the inverse ratio of its actual cost.

These results are sufficiently remarkable; and if we can in every case find beauty and science walking hand in hand, as here, shall we not be able to do more in the course of both than we do at present? And this, I think, we can find in our works of stone and brick, without either the conditions of great size, or the cost of extra labour.

TABLE compiled from Mr. Baker's Analysis, showing the Approximate Weights of Wrought-iron or Steel in the Superstructure of Railway Bridges of six different Types; the working stress of the iron being taken at 4 tons, and that of the steel at 6½ tons per square inch of sectional area:—

Description.	700 feet Span.		Limiting Span minus 100 feet.	
	Iron.	Steel.	Weight of Steel in Tons.	Length of Span in Feet.
Box girder	61,030			
Lattice girder	17,360	4,410	27,315	900
Bowstring girder	6,650	2,730	68,055	1,300
Arched ribs with braced spandrels	3,500	1,405	393,429	1,900
Suspension with stiffening girder	3,445	1,715	276,450	1,900
Continuous girder with varying depth*	2,660	1,820	1,329,000	3,200

WATER ANALYSTS.

My attention has been drawn to a letter signed "W. R.," and headed "Analysts' Differences," which appeared in your columns on the 3rd of this month. I will endeavour to explain, perhaps I should say to apologise, for some of the matters complained of in that letter. I must premise that I have myself entered too deeply into water analysis controversies to be regarded as a perfectly impartial person. The great difficulty in water analysis is to get rid of the water; for it is only with the impurities of the water, amounting perhaps to 0.01 or 0.03 per cent., that we have to deal. Of this matter a very small fraction only is organic, and to get at, and estimate this, is on the face of it not an easy matter. We cannot remove the water without endangering the organic matter; hence the attempts to estimate the organic matter in the water. Up to the present date, no method exists by which an actual estimation of organic matter in water can be made. We can only attempt to estimate the leading constituents of the organic matter, and even to do this accurately, I believe, a task beyond our present powers. The enormous difficulty, and, what more directly concerns the public, the enormous cost, of these attempted precise estimations of organic matter, has driven chemists to attempt to find re-agents which shall directly indicate the condition of the water. The first of these was permanganate of potash. But though certainly it has a great tendency to decolorise in the presence of organic matter, it does so also in many cases where no organic matter is present; it deals, also, quite differently with different forms of organic matter. It is now nearly universally agreed that this re-agent is almost valueless for the purposes of water analysis. Occasionally we see in analysts' reports, that water contains so much organic matter—nature not specified. This datum is another term for loss on ignition of the residue; it represents a variety of matters, and may, I think, with the consent of all the first chemists, both here and abroad, be dismissed as valueless.

I will now try to point out what data have a real meaning, and within what limits they may be relied on.

* This type is nearly equivalent to Von Ruppert's system.

1. The estimation of ammonia in water, as now almost universally carried out, gives us not only ammonia existing as such, in the water, but also a certain amount, derived from the nitrogenous organic matter during the process of analysis. Its quantity should be exceedingly small. When it exceeds one part in ten millions, the water must be looked upon with great suspicion; in good water it is often not more than a fifth of this, and seldom more than half. I believe all chemists, without exception, regard the presence of ammonia in water as a bad sign, and would condemn any water which contained as much as one part in a million.

2. The estimation of nitrates. Very great diversity of opinion exists as to the value of this datum; however, other things being equal, we may safely say the less nitrates the better, especially if the water is required for stowage on shipboard, &c.

3. Estimation of total solids. The connexion between the salubrity of a water, and the amount of solids it contains, has never been satisfactorily established, but it is generally believed that waters containing large quantities of solid matter are undesirable, but we cannot pretend to fix the exact limit.

4. Estimation of nitrogen from organic matters. There are two processes which profess to make this estimation; the one by Frankland and Armstrong, the other by Wanklyn Smith and myself. Frankland and Armstrong aim at an estimation of the total nitrogen of the organic compounds; we, on the contrary, are content to obtain a portion of the nitrogen; and as we know for any given organic compound what proportion of the nitrogen we obtain, we are obviously in a position to calculate the quantity of any nitrogenous compound known or assumed to be present in the water. That we can and do effect this, we believe, not now questioned by any one. With regard to Frankland and Armstrong's estimation, if it can be satisfactorily made, it is here obviously exactly on a par with our own, but the only data we have as to its practicability are some test analyses, published by Frankland and Armstrong, the admitted errors of which are greater than the quantities to be estimated in ordinary waters.

The quantity of nitrogen or ammonia from organic matter certainly should not exceed one part in ten millions, and ought to be much less.

5. Estimation of carbon in organic matter. This estimation is only described by Frankland and Armstrong. I am unable to give an opinion as to the value of this datum.

The fact is, considered from a sanitary point of view, the chemical analysis of drinking-water has, till within the last few years, been of very little use. With regard to the methods of returning analyses, it is, no doubt, to be regretted that greater uniformity does not prevail. But this does not interfere with the comparableness of different analyses; as half a minute's calculation would suffice to bring the results into one system.

ERNEST T. CHAMMAN.

INDUSTRIAL EXHIBITIONS.

The Derby Art and Industrial Exhibition.—This projected exhibition of works of art and products of industry, in connexion with the new Drill Hall, which is being erected for the use of the First Battalion of Derbyshire Volunteers, in Derby, promises to be a success.

The exhibition is intended to consist of sculpture, oil paintings, water-colour drawings, portraits of Derbyshire worthies and eminent persons, engravings, photographs, porcelain, and earthenware (especially that of Derby); a loan collection from the Science and Art Department, Kensington Museum, London (in connexion with the schools of art in Derby); industrial objects and machinery; mineral products of the county in their raw state, &c.

The estimated space at the disposal of the committee, including the various rooms attached to the Central Hall, will, according to the local Advertiser, be as follows:—

Total wall surface	8,600 feet.
„ surface of screens	10,300 „
„ „ wall cases	1,900 „
„ „ „ floorstands and cases	1,900 „
	20,500 feet.

South Staffordshire Industrial and Fine Arts Exhibition.—The main building for the forthcoming exhibition of South Staffordshire Arts and Industries has been completed, and the various other departments are progressing. The main building is planned as a central nave 150 ft. long by 60 ft. in width, and 18 ft. high to the spring of the roof. The roof is of semi-octagon form, rising to a total height of 45 ft. from the floor. Around this nave and across the ends of the building is continued a wide and spacious gallery, approached by three broad staircases. On each side of the nave, and of equal length with it, are wings 10 ft. wide and 14 ft. high, and again projecting beyond the eastern wing is an annex for refreshment buffet, ante-room, and ladies' and gentlemen's retiring-rooms. The building is well lighted from the roof. The framing is of timber covered externally with corrugated iron, and internally with boarding on felt. The decoration has been very simply treated. The roof is carried by eleven ribbed principals, and these are coloured of a deep maroon relieved by a broad line of grey: the fish-plates and ironwork are tinted grey, the washers picked out in chrome yellow, and the nuts vermilion. The soffit of the roof, between the centre and second sky-light, are tinted grey with a design dividing it into panels drawn in vermilion: the ridge boarding and soffit are treated in similar colours. The side boarding is coloured sage green, and so much as will be exposed over the hanging space for paintings and art productions is lined with a simple pattern in vermilion. Around the front of the gallery is a railing in ironwork of a light design; the ironwork is bronzed, and the gallery cornice is picked out in colour, with a design of leaf and stem pencilled on the fascine. The end gallery facing the principal entrance to the building has been adapted to the proportions of the grand organ that is in course of erection. The architect is Mr. Bidlake, from whose designs the decorations have also been carried out; the contractor is Mr. F. N. Clerk (whose manager, Mr. Lysaght, has been in daily attendance). The rooms in Molineux House, as before stated, will be adapted for some of the lighter and more ornamental portions of the exhibits, and a covered way will be erected from the house to the main building above described. Earl Granville is to perform the opening ceremony. A notable piece of art-workmanship, in the form of a presentation key (the gift of Messrs. Chuht & Son), will be handed to his lordship, with which he will unlock the principal entrance, and declare the Exhibition open.

THE SANITARY TREATMENT OF THE REFUSE OF TOWNS, AND THE UTILIZATION OF SEWAGE.

At the Ordinary General Meeting of the Institution of Surveyors, April 19th, 1869, a paper on this subject, by Mr. William Menzies, was read. In the course of it he said,—

To the treatment of the refuse of towns I intend entirely to confine myself in this paper.

The first question that may be asked is, "What is a town?" My investigations would lead me to think that when there are some such number as 2,000 people living upon an area equal to the half of a square mile, or 320 acres, the community may be spoken of as residing in a "town" and not in a "village." From that number the population increases in density, until we have, in some cases, 100,000 on a square mile.

By way of illustrating my subject, we may very properly take a town with a population of 10,000 living upon a square mile, which is something like the average of English towns.

It is also necessary to define what the refuse of such towns includes.

Under the general name of "sewage," properly so called, are included the whole excreta of the inhabitants; all refuse water from houses, baths, washings of butchers' yards, the liquid part of stable drainage, and, in fact, all polluted water. This polluted water is principally the result of the use by the inhabitants of the water supply to the town, which we may assume, on a general average, at 20 gallons a head. The term "sewage," however, has hitherto included more or less of the rainfall, the washings of the streets, and the water from the roofs of the houses, and it is important to bear this in mind in the course of the following paper, as I have at first used "sewage" in its popular sense, inclusive of the rainfall, and have afterwards, for reasons which will become apparent in the course of the discussion, carefully distinguished between sewage properly so called, and a compound of sewage and rainfall mixed. I may say here, also, that it is proposed to leave out of the discussion, for the present, all reference to seaside towns, and confine myself to the much more difficult question of the consideration of those in the interior of the country. Although allusion will subsequently be made to this part of the subject, I shall also assume as a general conclusion that this sewage is not to be discharged into a river until it has been purified.

In proceeding to consider the method of treatment that should be adopted with "sewage," using the word in that more general sense, the subject divides itself into—

- 1st. The questions affecting the public health that attend upon the management of this sewage.
- 2nd. The efficiency and cost of whatever system is adopted for its removal.
- 3rd. The mode of dealing with this refuse when so removed.

The first principle, and one which will be almost universally accepted as of paramount importance, is that the removal of sewage should be complete, continuous, and safe, in all weathers, and in all seasons, without injury to the public health; and the second, that the sewage should produce, if possible, some return, when applied to the purpose for which nature evidently designed it, viz.,—the re-fertilization of the earth, from which mankind derive their food.

I could not admit that the water system cannot be made perfectly safe for the inhabitants, and successful in the utilization on the fields.

The feelings of the upper classes on this subject must also be considered, as they have a decided preference to the complete washing away of all impurities. Many other practical difficulties suggest themselves in the way of working such a process, and I am forced to the conclusion, that however excellent the earth system may be for cottages, growing villages, establishments built upon land belonging to such establishments, and all entirely under the supervision and perfect control of one supreme authority, with full power to enforce his regulations, and to visit and inspect when he pleases every portion of the building under his charge, I cannot see my way to recommend the attempt to be made in any such specimen town as we have selected; but must leave it to some one who has more confidence in the success of such a scheme.

Before proceeding to consider the question of

water carriage of this sewage, it appears desirable to state generally my views on the treatment of such sewage at the outlet. Vast sums of money have been spent in attempting purification by means of different processes, such as by using milk of lime, carbolic acid, animal charcoal, and a vast number of other substances which need not be mentioned, but universal failure followed, and it seemed to have been working against the natural law, that vegetation is the great purifier of all refuse, and that living plants should build up again into some useful and safe shape the polluted matter which is discharged from human dwellings. Any one who has been bred an agricultural engineer and surveyor naturally looks to the fields at once as the only safe agent to be entrusted with this work of useful purification.

Every one must admit the great benefit to the towns themselves that has resulted from the general adoption of systems of drainage and other sanitary measures. Although there appear to be exceptional cases, which are very puzzling, it is impossible to deny the fact; and the latter mentioned system has, apparently, judging by the mortality tables, done more good than the former; and believing that the systems of drainage hitherto adopted in England have been better than anything similar in the world, and that we must proceed most cautiously before proposing to change them; we must keep at the same time before us constantly the question,—“Have the present systems fulfilled all the requirements of the case? and will they, if followed out, solve the difficulty in all its aspects?” My own feelings and conviction lead me to believe they do not, and some of the evils which they have entailed will now be mentioned.

In proceeding to discuss the second system of drainage previously adverted to, viz., that of having very small pipes, only sufficient for the dry-weather flow of the sewage, and providing for the wet-weather discharge by sending the contaminated mass into some stream or ditch by an overflow, it is more difficult to produce a clear impression. It is obvious that the variations of such a system must be endless, and I would much rather give my opinion of it in the broad terms that, the nearer it approaches in any case to the older system of putting all the rainfall into the same drain as the sewage, the worse it is, and that I would much rather leave you to form your own judgment on its merits after I have endeavoured to explain to you the system, which I trust I am not assuming too much in saying, that if not for the country generally, at least for the Thames valley, I may take the credit of having introduced. That system is, that the rainfall shall in all cases, as a principle, be entirely separated from the sewage; the rainfall being conveyed to the nearest outlet, and the sewage to the most appropriate land for utilization.

Under the system of separation of rainfall from the sewage, the first advantage anticipated is that there will be no gullies or openings into the streets communicating with the foul drains by which effluvia can rise into the streets or court-yards. The second, that men will not require to enter into the drains, to clean out the sand and grit off the roads. The third, that no overflows of foul or sewage matter will be necessary. And the fourth and most important, that the treatment at the outlet by irrigation will be uniform, economical, and practically perfect. The fifth advantage is, that perfect and continuous removal of all sewage may be secured by a complete system of flushing, under command at all times and at all seasons; and it is worth observing that the greatest flushing will be necessary, or, rather, desirable, in the town in dry weather, just when the fields outside will take it best. The sixth advantage is, that when pumping is necessary, as it is in such a vast number of cases, the economy will be very great. The objections that have been raised to this system must be noticed.

The first is, that the water off the streets will be so polluted as to be unfit to be poured into a stream; to which the answer is, that the streets ought, therefore, to be thoroughly scavenged, as it cannot be maintained that any filth is to be left there till the rain washes it away.

The second objection is, that it will be enormously expensive to provide two sets of drains. This might be answered at once, by saying that efficiency is the first essential element; but the question of expense is open to full consideration. Every town, before it is drained for sewage purposes, has a system of surface drains of some sort existing, and the new sewage drains

may therefore be reduced to the smallest size, for removing the sewage alone, instead of being capable of removing sewage and maximum rainfall mixed. I shall allude to this more particularly hereafter, when speaking of the drainage of Windsor, Eton, and Oxford. We must look at the expense of the process from first to last, keeping in remembrance that the whole question is one affecting the rates on the town itself.

The last objection which has been raised is, that it is stated to be impracticable. On that point I would merely ask, "Has it ever been tried?" or, "where it has been tried has it failed?"

I hope to be able to convince all of my hearers that it is worth a trial, at least.

Without, however, perfect ventilation and flushing, no such system, nor indeed any system of drainage should ever be attempted.

The speaker then gave a very long account of what has been done with reference to the Thames Valley drainage, and said,—I have thought it advisable in this somewhat too long paper to restrict my remarks more especially to the much more debatable question of the principle upon which the drainage of towns should be conducted, as that must be settled first before any really satisfactory result can be obtained. Keeping my mind, I hope, at all times free from prejudice, and having had no object in view except arriving at the truth in my investigations, and influenced by a pardonable ambition before the community, I trust that this Institution will support us in the conclusion in which those who have been acting with me have daily become more confirmed of, that the system of entire separation of rainfall from sewage is the safest and most proper course to follow.

It is necessary that something should be said of the subsoil water under a town, and the method of dealing with it. The great advantages of lowering the level of this water are undeniable, and there are not such strong objections to admitting this as there are to admitting the rainfall into the foul drains; but, at the same time, in all practicable cases, it would be preferable to deal with it in some other way. That must be entirely judged of by local considerations, and the origin of the subsoil water must be traced, before any means are taken for lowering it effectually.

Reverting, finally, for one moment, to the question of separation of rainfall from sewage, I would merely point out that, if this system is right, large questions present themselves, such as, "Are all the older systems wrong? Must many towns, and London among them, be drained over again, by restoring their surface drainage, or what is to be done? Is the principle applicable to all towns, or only those special towns in the Thames valley?" A new Sanitary Commission has just been appointed by the Home Office, and we are curious to know what they will inquire into. Will they open this vast subject afresh, and examine all the engineers over again?—or, will they turn their attention to the many other sanitary subjects equally demanding attention.

Allow me to sum up what has been attempted to be proved in this paper.

Under the system of mixing sewage and rainfall together we have the danger, if not the certainty, of putrid deposits in the sewers, imperfect flushing of the drains, impure air in the street, large and expensive foul drains leading out of the town, dangerous storm overflows laden with putrid filth, cumbersome and excessive arrangements to make when pumping is necessary, putrid sewage discharged on the fields, unnecessarily extensive land to lay out for irrigation, and, when taken at all times, as it ought to be, liquid to distribute that must frequently be not only worthless as manure, but injurious to vegetation,—and this profitless labour and expense involved on all hands.

Under the "separate system" it is anticipated we shall have means of dealing rapidly and efficiently with the rainfall, perfect, safe, and continuous removal of the sewage while fresh, cheap and small foul drains, economy at the pumping-station, economy in the fields, valuable and comparatively innocuous liquid at all times to distribute on the land, and absolute control from first to last.

This question and its kindred subjects are, as pointed out by your president in his opening address, of the first importance; and as many members of this Institution will, during the next few years, be professionally engaged in considering them, free investigation will be of the

greatest benefit; and I may take the liberty of suggesting that the first and most pressing to be discussed is that to which this paper is almost entirely confined, viz., "What is the best system of removing and utilizing the refuse of the inland towns of this country?"

A vote of thanks was put and carried to Mr. Menzies for his paper, and a short discussion followed, in which Mr. J. H. Lloyd, Mr. W. Hope, and others, took part. The meeting then adjourned to Monday, May 3rd, when the discussion will be resumed, and a paper will be read by Mr. W. Hope, "On the Distribution and Utilization of Sewage."

A NEW WINDOW IN WESTMINSTER ABBEY.

WITHIN the last few days Messrs. Clayton & Bell have set up a stained-glass window in Poets' Corner (south transept), immediately over the monuments to Milton and others of our distinguished poets. The window is of two divisions, each containing a canopied figure of a poet of holy writ. In the one light is introduced David representing the poetry of the Old Testament; in the other St. John, as the author of the Apocalyptic poetry of the New Testament. David is in attitude of rapt inspiration, holding his pen, rather than using it, and looking upward, while on a scroll held in the left hand runs in Latin a passage from the Psalms—one of the poet's most fervid ascriptions of praise and glory to God.

The other figure, St. John laden with years, the St. John of Patmos, is attended by his symbolic eagle, and is engaged in writing his Apocalypse, a passage from which is written on the scroll which he holds across a writing-table. This work, which is too high up for proper examination, is one of the most elaborate in execution and powerful in colour that these able artists have executed. It is the gift of Dr. N. Rogers, who formerly lived in the parish, and along the base of the window is an inscription recording the donor.

GLASS IN SHAM WINDOWS.

SIR.—Loving such little puzzles as that offered by "W. B." in your issue of the 20th of March, permit me, though not offering a solution of the difficulty (for I have not seen the windows), to suggest a remedy.

Let the grooves in which the glass is to be set be deeper in the mullions than is actually required for the size of the pane—for the sake of the force of expansion,—and let the glass be set in cement instead of putty, the edges of the glass having first been wiped with an oily rag, that the cement may set towards the mullions, and not towards the glass. The edges of the glass need not be hedged in cement, but after the pane is placed in the grooves let the intervening outside space be filled with it. The cement should not be rammed into the grooves, as that might warp or bend the glass, and a very little warping or bending may induce the breakage when there is but a little difference between the outside and the inside temperature; and to further avoid the warping, the cleaning of the glass should be deferred until the cement has set. If this suggestion, being adopted, is found to answer, I must ask "W. B." to acknowledge it in the *Builder*.
Pro.

NEW OFFICES AND SHOW-ROOMS, MARK-LANE, LONDON.

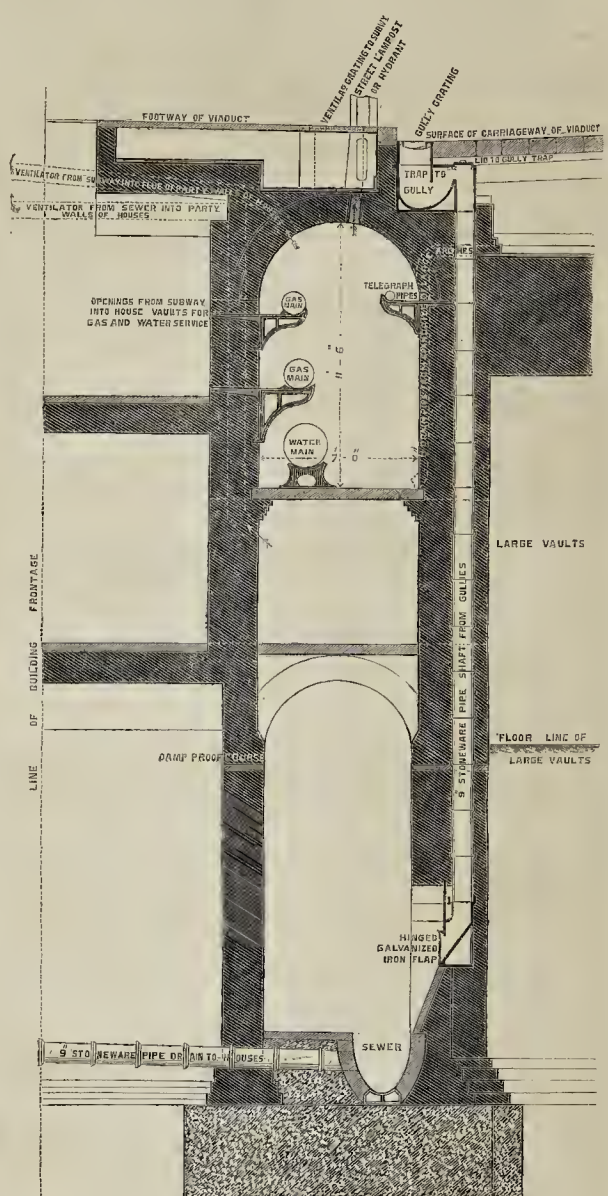
The building, No. 36, Mark-lane, as shown in the accompanying engraving, is constructed especially for mercantile offices and show-rooms for colonial produce, where great light is required, and has a frontage in Mark-lane of upwards of 70 ft.

It belongs to the City of London Real Property Company, and was carried out from the designs, and under the superintendence, of Mr. Edwin A. B. Crockett, architect.

The front is of Portland stone; the piers on ground and first stories being of grey Aberdeen granite, with shafts of red granite, all polished. The shafts to the second-floor windows are also of polished red granite, and those in front of the first-story piers, which carry the hood mouldings, those to the third-floor windows, and the bosses, are of polished serpentine marble. The vousoirs of arches are of Forest of Dean and red Mansfield stone alternately.

The entrance lobby is built of Casn stone, and barrel-vaulted with polished serpentine

HOLBORN VALLEY VIADUCT.—MR. W. HAYWOOD, C.E.



SCALE OF FEET

Section of Subway, &c.

[See p. 320, ante.

marble columns, supporting red Mansfield moulded and carved ribs, which divide the vault into three bays. The barrel-vault between these ribs springs from a carved string, and is inlaid with Forest of Dean stone to a pattern, the centre stone of each bay being a red Mansfield hemispherical quatrefoil, holding a polished serpentine marble hall.

The floors are carried on wrought-iron girders, resting on cast-iron columns and stanchions. The pavement of corridors is supported on ornamental cast-iron bearers, and is formed of York stone landings, covered with Maw's tiles. The

dado running round corridors and staircase is formed of glazed tiles, with a border of majolica. The wrought-iron gates at entrance were supplied by Messrs. Skidmore & Co., of Coventry.

Messrs. Handyside & Co., of Derby, supplied the cast and wrought ironwork, including the cast-iron balusters to staircase; Messrs. Jackson & Shaw were the builders; and Mr. C. J. Jones was the clerk of works. Mr. W. Flows, of Westminster, did the carving; and Messrs. Mannelle supplied the granite, and the Lizard Serpentine Company the marble.



LONDON STREET-ARCHITECTURE: OFFICES AND SHOW-ROOMS, MARK-LANE.—Mr. EDWIN A. B. GREGORY, ARCHITECT.

THE SOUTH METROPOLITAN DISTRICT ASYLUM.

The foundation-stone of the asylum for imbecile poor of the south metropolitan district at Caterham was laid on Saturday last. As our readers may recollect, this asylum is to be in all respects a duplicate of that now also in course of erection at Leavesden, in Herts. We gave full particulars of the designs in a leading article for July 26th, 1868, with view and plans. Some little progress with the extensive blocks has been made by the contractors for the new buildings at Caterham. The works, when complete, like those at Leavesden, will cost about \$5,000. The contractor is Mr. John Chappell, and the architects are Messrs. Giles & Biven. The site is in the parish of Caterham, near Croydon, and about four miles from the Caterham Junction of the London and Brighton Railway. The foundation-stone was laid in the vestibule of the central block, and the ceremony of laying it was performed by Dr. Brower, M.P., the chairman of the board. A numerous company was conveyed to Caterham for the purpose of witnessing the ceremonial, and for the convenience of the visitors a special train had been provided by the board. From Caterham Junction the contractors have laid a single line of railway, by means of which the materials for the new buildings are conveyed, and along this line, which is a rather up-hill piece of work, with a gradient which in some parts is about 1 in 30, the visitors were conveyed.

THE TRADES MOVEMENT.

The Bill of Mr. Mundella and Mr. T. Hughes upon trades-unions, based upon the report of the Trades Union Commission, is intended to repeal all the combination laws. It provides that any number of persons, whether workmen or employers, shall be at liberty to make any agreement with respect to the wages to be paid or the hours to be worked, and with respect to the persons or the mode by which the work is to be done, on any terms whatsoever. No combination established for merely giving effect to such agreement shall subject any person a party thereto to criminal prosecution. The Bill, however, shall not exempt from liability persons guilty of offences under the common law. The Bill legalises the formation of associations for mutual support in every trade or employment, the subscribing of funds, &c., provided no such association be formed to promote the commission of any offence, and it confers the benefit of the Friendly Societies Act upon such associations. The rules and by-laws of these associations are to be registered, and the person depositing the same must declare that no other rules or by-laws are in force. The Bill also provides for the protection of the funds of these societies, provided only that they are duly registered. The Government, it appears, will not oppose the Bill.

The relations between the builders and their workmen are likely to be disturbed this year by the attitude taken by both parties in respect to the hours of labour, rate of wages, &c., several notices and cross notices having been given by the masons, and joiners, and their employers. The greater portion of the stonemasons of Manchester have struck, their six months' notice having expired. The carpenters' notice expires on the 1st of May, but it is hoped that in the mean time the dispute may be settled by an appeal to the arbitration of Mr. Rupert Kettle, who has consented to arbitrate in the dispute between the operative carpenters and joiners of Manchester and their employers with reference to the introduction of the hour system by the latter. It is generally alleged by the workmen that this system would act very injuriously to the interests of the "out-door" men, who would in the winter months have to suffer a considerable curtailment of wages. Mr. Kettle has requested that in the interim all agitation of the matter may cease, and this course has been agreed to by both parties.

The house-painters of the West Riding have agreed to the appointment of a board of conciliation, to which it is to be referred all disputes respecting wages and other trade matters which may arise between the employers and employed. The board is to consist of nine employers and the same number of operatives, who are to be elected annually, and whose decision upon any matter is to be final.

The whole of the carpenters and joiners of Sheffield and the neighbourhood are under notice, preparatory to the introduction by the

masters of the hour system. It is stated that both sides are anxious to settle the matter in a friendly spirit. An interview between nine representatives of the Masters' Association and an equal number of operatives has taken place, and the propositions of the employers have been discussed. The workmen explained that they were anxious to be fully informed of the proposed alterations in the existing system of working, with which they were perfectly satisfied, in order that they might be laid before a general meeting of the trade. Several representatives of the operatives expressed the opinion that some of the new rules would require modification before they would be acceptable to the workmen. The men are anxious not to involve the unions in any dispute with the employers, and are willing to submit any points upon which the deputations fail to agree to arbitration.—The Sheffield trade have agreed to the establishment of a board of arbitration and conciliation, and representatives from the workmen and the manufacturers have already settled the rules, and appointed a president and board, as well as a joint secretary.

A serious workmen's strike has occurred in Belgium. The colliers and puddlers of the extensive coal works and machinery establishments of Messrs. Cockerell, at Seraing, near Liège, have struck; and, as is too often the case with Belgian workmen, they have resorted to acts of violence, which have led to the usual consequences, the calling out of the troops to restore order, and a collision with the rioters, in which several were killed and wounded.

THE WHITEY JET TRADE.

The local drawing class connected with the Mechanics' Institute is doing much for the jet trade, and it has risen from six to between fifty and sixty lads who attend during the winter months. The master is indefatigable, but he can only get them to a certain point, and a local correspondent wishes to know how they could obtain some models for the drawing class, or whether the Kensington Museum would aid them, there being no School of Art in the place. Designs in fruit, foliage, and flowers have been extensively used, but the material is rather fragile for some of the designs, and a desire for variety has led to other patterns being chosen, especially those allowing of greater solidity, and the best workmen are now imitating Roman cameos and antique gems in high relief. The material is becoming dearer than it was. There is in the town a very general wish to assist the workmen, and raise the manufacture in artistic excellence; but it is difficult to know in what way this can be best promoted. At present it would probably be impracticable to establish in the town a permanent School of Art; but it is worthy of consideration whether something might not be done to form a collection of models and such objects as are used in art-education, and to obtain occasionally the assistance of the living instructor; not merely for the sake of the jet manufacture only, but also for the promotion of art in some other trades of importance in the town, and to improve the public taste. We shall be glad to receive any suggestions to these ends.

DANGEROUS EXEMPTIONS CLAIMED BY RAILWAY COMPANIES.

On the north side of St. Paul's-road, Islington, on ground adjoining the North London Railway, Messrs. Mansfield & Prie have recently erected a wooden building 31 ft. long, 12 ft. wide, and about 13 ft. to ridge of roof. When the District Surveyor of South Islington inquired, he was informed it was intended for the Electric and International Telegraph Company. The builders, however, refused to give notice to the District Surveyor, as required by the Building Act, on the ground that the building belonged to the North London Railway Company, and they paid no attention to a notice of irregularity calling on them to construct the building of brick, stone, or other incombustible material, served on them by the District Surveyor. As soon as it was finished the Electric Telegraph Company, who had previously occupied an office close by, took possession, put up their boards, and carried on business. The District Surveyor then summoned the builders to the Clerkenwell Police-court, and on Tuesday last the case was heard before Mr. Ellison, sitting for Mr. Cooke.

The defendants, nominally Messrs. Mansfield & Prie, but really the North London Railway Company, were represented by a solicitor, who pleaded exemption under Sec. 6, which says the following buildings and works shall be exempt from the operation of the first part of the Act, viz. :—

"The buildings belonging to any canal, dock, or railway company, and used for the purposes of such canal, dock, or railway, under the provisions of any Act of Parliament."

Mr. Matthews, engineer to the company, gave evidence to the effect, that the Telegraph Company transmitted messages for the Railway Company. He said the Telegraph Company were paid for keeping the Railway Company's posts and wires in order, but denied that the Telegraph Company were paid anything for transmitting messages for his company, the accommodation afforded them being sufficient return. The District Surveyor said, if that would exempt the building from the control of the Act, the Railway Company might erect next to another equally dangerous wooden building, and let it to a potato-merchant, taking out the rent in potatoes for the stokers. The magistrate said he was afraid it was so, and that in the present case the summons must be dismissed. He had arrived at this opinion with the greatest possible reluctance, and fully agreed with the District Surveyor, in his opinion as to this disastrous state of things. He hoped soon to hear that the Railway Company had taken down the objectionable building. The summons was then dismissed.

During the past twelve months the District Surveyor has been forced, in the discharge of his duty, to compel dozens of poor costermongers and others to take down small wooden sheds erected for the storage of goods in their own yards, almost to the ruin of some of them. What respect for the law can be expected from these people when they see a powerful company able to erect with impunity a huge structure of wood abutting on the public highway? We commend this scandal to the attention of the Metropolitan Board of Works, that they may take steps to obtain such an alteration of the law by their proposed new Act as will prevent its recurrence. The North London Railway Company have here committed an act which will probably assist in cancelling the most unwise and unjust privilege of exemption railway companies now enjoy. In this same district we know of a carpenter's yard between dwelling-houses filled with dangerous wooden structures, the occupant of which sets common sense and the law at defiance by showing that they belong to a railway company, and that work for the company is done in the shops.

TEMPLE BAR AND THE STRAITS OF THE STRAND.

In the leading thoroughfare of the metropolis it is strange that a barrier like Temple Bar should be allowed to impede the stream of traffic, which every day, at intervals, becomes stagnant, and is retarded for at least half an hour, between Charing Cross and the Bank.

So soon as the driftway along the Embankment is completed to the Mansion House, the pressure upon this line will be much alleviated; but even then it will be requisite to remove the useless bit of architecture which intercepts the route of the thoroughfare by nearly one half of its capacity!

The narrowest part of the way on the whole line to St. Paul's is at the Bar, which measures 21 ft. on the Fleet-street side, and 24 ft. on the west side; the abutments of the piers taking up 5 ft. on either side, and thus giving an interval of 14 ft., barely sufficient for a double line of teams; whereas, if the structure were removed, there would be ample space for three lines, and that without any interference with the present range of houses, or the footways.

In many parts the Strand is of great width,—at Clement's Danes it is 172 ft., at St. Mary le Strand the traverse is at either end of the church 102 ft.,—and the mean width throughout is 60 ft. from house to house, save the portion backed by Holywell-street, which is only 36 ft., and this strait extends a length of about 150 yards, or the whole distance between the two sacred fanes of the highway.

Now this block of houses facing the Strand south, and Holywell-lane (15 ft. wide) north, is of nearly an equable width, varying from 5 ft. to 70 ft. throughout; it is as it has been for 150

ing the houses being still erect which stood in the times of the Alsatia; and, in fact, the range facing Holywell-street, and that fronting the Strand, are for the most part built back to back, some of the houses having front to both streets, and others being separated by only 5 ft. or 6 ft. of back area. Why such an aneurism, or antiquated constriction, in the principal arterial duct of a great and wealthy city, should have been allowed to remain, would be a puzzle for foreign visitors, who must notice the clearances of Holborn and the exaltation of the valley.

It may happen that the New Law Courts will necessitate a transformation of these slums, and that New Inn, Lyon's Inn, and their wretched abominations, will give place to respectable ranges of open and quadrated frontage. Without a wide lateral thoroughfare between the Strand and Holborn, either by Serle-street and Great Turnstile on the east, or by a continuation of the west side of Lincoln's-inn-fields from Little Turnstile, southward, in a direct line, the contemplated new Courts would be comparatively inaccessible, except from the Strand.

Now, as to the location of the Law Courts, whatever visionary speculators may predicate with respect to the lately-proposed site on the Embankment, there is no position so appropriate as the ground already cleared. Lying intermediate between Lincoln's-inn-fields, Gray's Inn, and the Temple, it would be most convenient to offices of law practitioners as they are at present situated; the difference of level between Carey-street and the Strand is less, and would be more easily adapted than the site along the Embankment, which would require the erection of two stories, 15 ft. high each, beneath the floors on the Strand level. Like the lower floors and vaults of Somerset House, all that portion of the structure must be comparatively dark, ill ventilated, and unsuitable for public offices; and the cost in attainment of the Norfolk and Salisbury estates would be far in excess of the old slums now demolished, whilst the scope of ground would not equal the extent of that already cleared.

Whichever site is chosen, it is clear that suitable streets of access must be formed on all sides of the Courts and Offices; and as a new thoroughfare struck out from Holborn by Little Turnstile must involve the clearance of some of the worst slums of central London, such an opening would tend to the improvement of the whole vicinity.

The shortest opening in nearly a direct line would be only 500 ft. between the south-west angle of Lincoln's-inn-fields and Newcastle-street, which opens into the Strand at the west end of Holywell-street, and this would involve the diagonal traverse of only Sheffield, Claro, and Holles streets.

A more direct line, issuing into the Strand opposite Sarrey-street, would cut through Lyon's Inn and touch New Inn, but would cause demolitions and reconstructions extending nearly 1,600 ft. In such clearances, however, the value of the building ground having frontage to a street of at least 60 ft. would be considerable.

As it stands, Lyon's Inn is a disgrace to municipal authority, and the whole neighbourhood.—Holywell and Wych streets, together with New Inn,—seems to indicate that the most valuable positions and sites for building may continue in desolation for want of some directing authority.

T. H. H.

HOSPITAL COMPETITION, ROTHERHAM.

SINCE our last notice of this competition, which was written on March 15th ult., nominally the last day for receiving designs, the number has increased to 93 separate sets, including alternative plans.

Last week the exhibition of drawings was on private view; but it is now open to the public. The exhibition is held in an ordinary dwelling-house, containing seven very small rooms, and two lobbies, not in the public hall, as was at first expected. Each set of designs occupies a vertical compartment, one drawing in width, and five high. As many architects have submitted from 9 to 12 drawings, the superfluous ones are stowed away out of sight behind the bottom plan. Coloured showy views occupy prominent positions on the walls, whilst really important plans cannot be got at. In only one case was the written description of the design connected with the drawings, the remainder not being visible. A list of the notices and numbers of the plans has been drawn up and printed, show-

ing the amount of the architect's estimate, and the number of drawings comprising each design.

The cost which the conditions state that architects must not exceed is under 5,000l., but many of the estimates go considerably beyond that amount; one, indeed, being placed at 10,000l. The condition of cost is, surely, as important as any other rule of the competition, and the committee should require its strict enforcement.

Few of the architects appear to have visited the site previous to preparing their design, judging from the plans, or the bird's eye and other views submitted. The importance of direct south light for the wards, and their thorough isolation from the front or administrative block of buildings, as well as from each other, has been frequently overlooked.

As it is nearly impossible for a committee composed of unprofessional men to arrive at a fair selection, we earnestly recommend that they call in the assistance of some distinguished architect to guide them in their choice. The course will secure to them the confidence of the competitors, who otherwise would have just cause of complaint.

HOMAGE TO ART.

ON Monday last, the 19th inst., about three o'clock in the afternoon, an amusing incident occurred in the British Museum. It appears that three young ladies, apparently sisters, and of the respective ages of from 19 to 22 or 23 years, were passing along, taking the greatest interest in everything they saw. At length they chanced to come upon a sleeping Cupid. There he lay, with a most delicious dream-smile on his face; they gathered round him, and, with the true sympathy of woman, soon began to smile also.

"What a sweet child!" exclaimed one. "What a dear, lovely boy!" sighed another; and they gazed and revelled in silent ecstasy over this embodiment of the sculptor's genius. But the eldest of the three certainly put the climax on the whole, for, without any idea of the possibility of the thing, or the logical sequence of what she was about to say, she breathed forth, "What a handsome man he would have made!" We put three notes of admiration to this whispered expression, so warm and intense was the feeling that inhaled it into the world. What next and next? Why they all looked silently at each other, and at the dreaming marble before them, when, with that touch of nature which is said to make the whole world kin, they each bent over the sleeping God of Love, kissed him in turn, and went away with lingering looks behind.

Like most other mundane joys, it had, however, its shadow—but very light; in fact, so lightly did that shadow fall at the blissful moment, that those poetic daughters of Eve will not have known of its existence until they read these lines. To be plain, then, a young art-student was quietly encoined behind a group of statuary sketching something before him, and perfectly hidden from the sight of the ladies. When he saw the unusual turn which affairs had taken, he crouched down, and almost hid himself in his boots. Poor fellow, what a Barmecide feast was his!

"But time at last brings all things even,—
And if we do but wait the hour."

To him our readers owe the discovery.

THE INSTITUTION OF CIVIL ENGINEERS.

At the meeting, April 13th, Mr. C. Hutton Gregory, president, in the chair, the paper read was on "Experiments on the Standards of Comparison employed for testing the Illuminating Power of Coal Gas," by Mr. T. N. Kirkham.

It was observed that the standards of comparison at present in use were known to be wanting in that uniformity of result necessary for determining with accuracy the difference in the intensities of two lights. But as the amount of the variation had never been clearly defined, the author had instituted a series of experiments for the purpose of ascertaining the extent of these differences.

From these experiments the author believed it was evident that a more reliable method than that at present in use, for determining the correct illuminating power of the gas supplied to the public, was urgently needed; and he thought the following system would be found to give results approaching as nearly as practicable

to a truthful estimate: Let the illuminating power of the gas be determined by the aid of the present recognized photometer, fitted with a Carcel lamp, burning oil of the same quality, and verified in the same manner, as that adopted by the municipality of Paris as a standard; and let a sufficient number of experiments be made, so as to cover the errors that were known to exist, and the average of these be compared with the illuminating power, as shown by the jet photometer and the Dutton test, and then the "mean of comparison" might be taken as the illuminating power of the gas.

ANCIENT MONUMENTS IN IRELAND.

MR. AGAR-ELLIS, on Monday, in the House of Commons, asked the First Commissioner of Works whether Ireland would be included in any measure he might bring in for protection of ancient monuments, as indicated in his answer to the hon. member for Buckingham on the 2nd inst.

Mr. Layard said:—The Office of Works has no control or jurisdiction in Ireland. The Irish Board of Works is under the Treasury. There are many most valuable and interesting national monuments in Ireland which might be placed under proper supervision, as many such monuments in Scotland are, and I think that the time will come when they will no longer be taken care of and preserved. My attention has been called to me in the subject by many communications which I have received from Ireland, and I may especially allude to one from the President of the Royal Irish Society, Lord Talbot of Malahide, who has most kindly offered to be of any assistance to me in the matter. I can only say that if it should be determined to place the national monuments of Ireland, like many of those of Scotland, under the care and jurisdiction of the Office of Works, I would do my utmost to take measures to preserve them. But this is a matter which does not rest with me.

DURABILITY OF BATH STONE.

SIR.—I observe in your valuable periodical a perpetual outcry about bad building-stone, particularly as to what is known in the market by the name of Bath stone. These complaints I have no doubt are not without reason; but to any who make them I would say the fault is among your own people, and all your own.

The fact is, there is plenty of good stone to be got from the Bath quarries, which will last for centuries, if builders will get it from the right quarries, and the masons — particularly the *bankers*—will work it to be right bedded; instead of which, it is to be feared, the contractors prefer the inferior stone, because it is more easily worked, and many masons care little about the bed. Young ones do not understand it, so as it will split their moulds, and can be got rid of in the quickest way.

In the spring of 1854 I rebuilt the top of the tower of this parish church. The upper string course was to be of Bath stone, as well as the copings of the battlements and the embrasures. I went myself to the quarry at Combe Down in the autumn of 1853. There it was all worked, and there it lay exposed all through the winter. Early in the following spring it was sent down, and used; and there it now is in place, without an arris having perished; nor is there the slightest show of scaling or defect. Afterwards I had a deal of work from the same quarry,—crocketed bell-cot, barge tabling, window mullions, heads and jambs, and door jambs, &c., for substantial school buildings: not a single stone shows any sign of defect—all as perfect as when it was set, and a great deal harder; in fact, the drag will not touch it. Such is the nature of the best Combe Down stone. I had experience of it before I came into this county. I have no interest in the quarries; I wish I had, for I have heard they used to be rented at the rate of 1,000l. an acre; but I have no doubt Mr. Dardige or Mr. Snmption, of Combe Down, will be happy to supply any quantities equally durable.

There are plenty of old buildings in Bath adorned with carved work, and old chiroches in the neighbourhood, standing proofs of the durability of the sound and hard beds of the old Bath quarries.

If people would not be in such hurry to run up churches and mansions, and would take more care in selecting the stone and allow it to season, there would not be such cause for complaint.

Building by contract, under high pressure, driving it on at railway speed, is the bane of sound building. That was not the way they built when our noble cathedrals and churches and old castles were erected. It is said that William of Wykeham never allowed a stone to be set during the winter months—all which time the masons should be mending work under cover; but now it is "nil mora nil requies." But up goes the work sometimes, in spite of cold and frost, it may be even to a topmost spire!

What is the present condition of the stone-work in Portland-place? That is where the first stone from Bath was used in London, and was, I believe, from the Combe Down quarries.

Clyst St. George. H. T. ELLACOMBE.

UGLY WORK IN THE SOUTH KENSINGTON MUSEUM.

SIR,—It is well known to be the universal wish—and more especially so with all the authorities concerned—that the South Kensington Museum (or the "Albert Museum," as some people desire to have it called) should be rendered as pure and perfect as possible; and, therefore, I trust the remarks I am about to make will not be attributed to a propensity for finding fault.

An important and beautiful addition to the Museum is being created in the grand staircase to the "Keramic Gallery" now in course of decoration, and which, at great cost, and with admirable taste, is being decorated with mosaics and painting. This staircase is a favourite portion of the Museum to me, and I constantly go up and down it, in order to study the effect of the decorations. I have seen that has been added, or developed, since my last visit. To-day, to my dismay, I perceived in one of the centre side-pieces on the staircase walls, a decoration which I cannot but consider a most fearful violation of good taste and of common sense.

As you doubtless remember, the top and bottom lines of these panels take the slant of the stairs and ceiling; in one of them was placed an "affixed" or "workmen say" but there it was—a sort of trophy consisting of an escutcheon, on which is a female mask with closed eyes; a trident; the "open hand" of the old Romans; Mercury's caduceus; and an oval ring, whose purpose I could not understand, below all. Some of these objects are made to slant while others are straight, and—oh! horror of horrors—the mask, or face, is all awry too! The right-hand corner of the mouth is drawn down an inch below the left; the closed right eye is treated the same; but the nose is tolerably level.

You will scarcely form an idea of the outrageously frightful appearance this distortion presents, suggesting a decapitated head that has been woefully ill-treated; or, at best, a gutta-serena toy face, squeezed out of shape. The colour, too, is quite-perhaps greenish; rather a death-like hue. The various objects—objects, with a witness—are in bas-relief; and as they are carefully executed, and by no means sparingly gilded, I fear that whoever designed or created this nightmare, has grown so accustomed to its ugliness as not to perceive its enormity. Pope has said,—

"Vice is a monster of so frightful mien
As, to be hated, needs but to be seen;
Yet seen too little, he goes unseen."

We first endure, then pity, then embrace."
This argument of the poet can be the only excuse for the author of the above-mentioned having allowed anything so utterly at variance with the usual course of their proceedings, to be placed in this beautiful museum. Pray call their attention to the deformity I have mentioned, and, if all the other things are not so objectionable, let the complaint in its entirety. If the panel be permitted to remain it will bring lasting ridicule on what otherwise promises to be an elegant work.—Ed.

PROPOSED REGISTRATION OFFICE FOR WORKMEN.

SIR,—I venture to address you upon a subject which I think is of some importance to those who are in the habit of reading your widely-circulated journal. I, as a builder, feel that there is a necessity for instituting some plan by which the employer of labour may make his requirements easily and expeditiously known. At present, if a builder requires a good and efficient foreman at a short notice, he is at his wit's end, should his staff be fully engaged. He probably makes inquiries of those in his line of business or publishes his wants through any channel he thinks most likely to make them generally known. But this process is slow and unsatisfactory, and he very likely, after all, sends a man who is a very inefficient superintendent to a work of importance.

It occurs to me that all this might be remedied by creating a registration-office in some central position in London, with a manager carefully selected for the post, in whom confidence for sound judgment and discrimination may be placed. The expenses need not be great and could be defrayed by small annual subscriptions from the builders. It should be the duty of this manager to receive personally each applicant for a situation, and he should character for ability and integrity—that is to say, his age, what works he had conducted, their extent, whom for, &c., and after these questions he should make it his business to test the accuracy of his statements, and, in point of fact, make himself thoroughly acquainted with the man's antecedents, or to use a book-keeping expression, "post up" his character for the ready inspection of any of the subscribers, so that an answer should have the privilege of knowing where to go, with some chance of being able, without loss of time, to find the sort of man he wanted. I think there are numbers of foremen who would at once present themselves for registration. It would be necessary for the manager to have a personal interview, so that he might be able to judge by a *visu et tactu* examination to know the man's business, and to assist his judgment as to whether the applicant appeared to be shrewd, intelligent, and energetic.

It would be necessary to make it supportable by subscriptions, and not by inquiry-fees; for this reason, that it ought to be an office where both sides could feel that something was known both of the builder and foreman.

Such an establishment would enable many promising young men to work their way to the front. My knowledge of the men is this, that there are many intelligent, well-conducted, energetic, and trustworthy workmen, with all the elements of good foremen about them, and these would thus have a chance of bringing themselves before the notice of the builders, who, did they but know where to find them without delay, would be delighted to give such men an opportunity. Should the scheme answer, branch-offices could be granted to the parent institution, and the idea might be extended to the registration of workmen's names and addresses. Notices might also be posted at these branches, stating that at such a place bricklayers or masons, &c., were wanted. The builder would thus merely have to make his requirements known at the central office, from whence they could be promulgated, saving the workmen the present disheartening custom of walking from works to works to find employment, or seeking information from their mates as to where it is to be found. I am, of course, not sure that the scheme would answer, but my belief is that it would. However, if you will be good enough to give this suggestion a space in your paper it may have the effect of eliciting some remarks from employers, superintendents, and workmen. It seems to me that it would tend to bring all these classes into free communication with each other, and with immense advantage to all. I should take great interest in its development.

A BUILDER.

THE VOLUNTARY ARCHITECTURAL EXAMINATION.

The Institute of Architects have adopted the following Resolutions:—

"1. That passing the Voluntary Examination ought to be followed by advantages such as will promote the advancement of life and in the profession of the Student.

"2. That each Candidate who passes the Examination should receive a formal acknowledgment of his having passed.

"3. That passed Students in the Class of Proficiency should become, *ipso facto*, Students of the Institute, without further payment, for as many years as they have paid guineas.

"4. That the names of Candidates who have passed in the Class of Distinction be formally notified, by the Secretary, to the Board of Examiners for District Surveyorship Certificates, when such Candidates present themselves for Examination before that Board."

The Council have been requested to determine the manner in which the recommendation embodied in Resolution No. 2 shall be carried out.

INUNDATION OF A BATH-STONE QUARRY.

We understand that the flooding of Messrs. Pictor & Sons' Corsham Down Stone Quarry has completely subsided, and quarrying operations were recommenced on Monday, the 12th inst. The workmen and boys, nearly 100 in number, have been thrown out of work for the last twenty weeks, thereby causing great distress.

The flooding of the quarry is attributed to the heavy rainfall that we had at the close of last year. The volume of water, when it first broke in, was computed at 60,000 gallons per hour. This continued to flow until there was water enough in the quarry to fill a lake equal to three acres and a half in extent, averaging 9 ft. deep. The present working chambers were high and dry, but not accessible to the workmen, the entrance being on the lower level, the stone inclining from the bottom of shaft at 3 ft. in 100 ft., consequently completely blocking the only entrance; in fact, at that point the shaft was 15 ft. deep,—that is, 7 ft. higher in the water than the ceiling of the quarry. The proprietors are sinking another inclined shaft that will penetrate to the workings at a level above that reached by the water, so that should there be a flood again next winter the working of the quarry will not be delayed.

BRIGHTON BATHS.

The Brighton (Brill's) Baths Company are now having a first-class swimming-bath added to their premises at the bottom of East-street, with its accompanying hot-baths, shower, vapour, douche, and shampooing. The frontage of the new building in East-street is 96 ft.; its height, 45 ft. The chief feature of the lower facade will be polished granite columns, with sculptured stone capitals; five facing on East-street, and two on Pool-valley, with eight smaller pillars on the ground-floor and seventeen on the upper-floor. At the summit there will be a stone palisade. The grand entrance leads to a reading-room, 24 ft. square. Out of the reading-room the visitor can pass to the first-class swimming-bath or to warm-baths on the second floor. The swimming-bath is 61 ft. in diameter; the depth of water will be from 4 ft. to 6 ft. 6 in.; its area will be twice that of the second-class

swimming-bath, and it will be surrounded by twenty-two dressing-rooms, each 9 ft. by 7 ft., considerably larger than those of the second-class, and which will be more handsomely fitted up. The interior of the swimming-bath obtains its ornamental character from courses of coloured brick, intersected by Portland stone, from which latter springs the dome, formed of iron ribs, filled in with coloured brick, and a glass lantern as its apex. This dome will not be much smaller than that of the pavilion. Mr. G. G. Scott is the architect of the company.

DISASTERS.

On Saturday night, when "True to the Core" was finished at the Surrey Theatre, the crowd in the gallery rushed out, and pressed so heavily against the barrier on the second landing, where checks were being given, as to force it out of its place. Of course, a great portion of the crowd were precipitated down the lower stairs, and several people were seriously hurt. One man had his leg broken, another man had an arm broken, and a third had his ribs fractured.

A new Baptist chapel is now in course of erection in Everton-road, Liverpool. On Saturday morning some of the workmen, in removing a block of stone weighing between 3 cwt. and 4 cwt., placed it upon a newly-hilt arch. The latter at once gave way, precipitating the whole of them into a vault beneath. The block of stone fell upon a man and killed him.

The New Adelphi Music Hall, Union-street, Oldham, which was opened a few months ago by the Oldham Philharmonic Society, fell in on Monday morning, and has become a complete wreck. It having been ascertained that the building was unsafe, on Monday morning the lessee, Mr. Seal, and some of the others connected with the place were in the orchestra collecting their music, when the east wall gave unmistakable evidence of its unsoundness, and they therefore rushed for the outside. They were only just in time, and Mr. Seal was struck on the head by some of the debris, but he was not seriously hurt. The cause of this catastrophe is said to be the undermining of the foundations while excavating the adjoining new buildings.

ACCIDENTS.—OFFENCES.

Or all the tenements that are every day wantonly destroyed, none can compare with that mortal tenement which contains the principle of human life. It is one which no legislature can absolutely protect, excepting it may be in altering the circumstances, or circumscribing the conditions; and hence the great necessity of pointing out again and again, with all the wearisome iteration of which the subject will admit, that the horrible colliery calamities which we hear of every day are always to a greater or less extent preventable. There are to be sure different varieties of fatal accidents. If an earthquake happen; if a gulph spring open under a man's feet and swallow him up; or even let us suppose the recurrence of that awful catastrophe which happened to the ancient inhabitants of Pompeii and Herculaneum, he is overwhelmed in a single night with red-hot lava; these are fatal events against which in the present state of our knowledge there is no provision. The law pronounces such cases, and with justice, to be inscrutable visitations of Providence; in plainer words, to be "the act of God," in the face of which all human foresight and prudence is inoperative and ineffectual. There are, moreover, certain accidents connected with coal-mines and manufactories on which we have previously dwelt that would seem practically to come very near within the reach of this category. Putting aside the unfortunate temerity of the miners, and the laxity in adhering to well-known rules of prevention, —smoking in the mine, for example, in the midst of the dangerous fire-damp, opening their safety-lamps, and so forth,—it is obvious that 500 men cannot work in the bowels of the earth with the same degree of safety and security that they can do on its surface. And so on. There are, in short, classes of accidents and casualties to which human beings working in coal-pits are liable which are more or less beyond the control of the human will, and for the results of which therefore, in the great aggregate of fatality, we must hold the unfortunate victims, as well as society itself, almost, if not altogether, exempted. We sincerely trust that the State will at length intervene and contrive some special rules by

which these fatal accidents in collieries may be at least taken out of the category of wanton and reckless sacrifice of life. Nothing, we will add, is more discreditable to the present state of education in our public schools than to find men who have been liberally educated—graduates of our best universities not infrequently—profundly ignorant of the simple and elementary rules of physics and mechanics by which our civilization is increased. How, then, shall we expect more at the hands of poor miners, who have hardly any education at all? Since Mr. Stanley Jevons pointed out the growing and increasing difficulty of mining for coal, we have always felt that the process would involve an increasing waste of human life. The only antidote, we are afraid, is an increased intelligence on the part of the miners. No mere inspection, of necessity irregular and superficial, can supply this want. Let these men be as well educated and as well paid as railway engineers or other classes of men who risk their lives every day in a profession equally perilous, and, above all, let their voices be heard periodically—weekly, it might be—on the state of their mines; and, above all things, let them exercise more frequently their undoubted prerogative of entering well-founded complaints with the Government inspectors; and, without saying we can do everything to prevent this horrible loss of life, we may at least discover a method of circumscribing its extent. There must be some limit to coal-mining, just as there is to high speed on our railways; and it appears to us that no mine whatever should exist unless with separate shafts, and safety-chambers, ventilated from the surface, attached to every gallery.

SCHOOL-BUILDING NEWS.

Lynn.—A contract has been entered into for the erection of a building designed by Mr. Teulon, architect, for a boys' and girls' school in connexion with St. Nicholas's chapel, for the education of the children of the poor at the north end of the town; a site for the purpose having recently been purchased in an eligible situation in Pilot-street. The cost of the land and building is estimated at 1,900*l.*, and a large portion of that sum has been subscribed.

DISSENTING CHURCH BUILDING NEWS.

Totmorden.—The architect of the Unitarian Church erected here, as already noticed, by Messrs. Fielden Brothers (in memory of their deceased father), was Mr. John Gibson, of London; and the contractors for the wood work (chiefly oak) were Messrs. Clay & Son, of Manchester: the masonry was executed under the charge of the clerk of the works on the stone being supplied to him. Although the edifice has cost between 25,000*l.* and 30,000*l.*, it will only accommodate about 500 persons, so that the workmanship and materials have been of a very costly description.

PROVINCIAL NEWS.

Stockton.—The foundation stone of new stores proposed to be erected by the Stockton Industrial and Provident Co-operative Society has been laid. The site is in Wellington-street, at the top of St. John's-road. The building will have a frontage of 40 ft., and from the back to the front will measure 49 ft. The store will consist of grocery and drapery shops on the first floor, a dry goods warehouse, committee and reading rooms over the two shops, and cellars underneath. To place one large assembly-room at the disposal of the society, a partition has been placed between the reading and committee rooms, which can be removed at pleasure. The contract for the mason and wood work has been taken by Mr. Craggs, builder, for 709*l.* The site of the building has cost 154*l.*

CHURCH-BUILDING NEWS.

Easby.—The church, which has recently received a thorough restoration, under the hands of Mr. Gilbert Scott, has been reopened. The restoration has been effected at the joint expense of the Earl of Zetland and Mr. Leonard Jacques (patrons of the living). The edifice possesses interesting features, amongst which may be mentioned some curious wall paintings of rude design, which were only revealed at the time the

building was undergoing restoration. They adorn the north and south walls of the chancel, and are specimens of the decoration of the twelfth or thirteenth century. These have been restored at the instance of the Earl of Zetland, under the direction of Messrs. Burlinson & Grylls. They represent various incidents of Scripture history—the Creation, the Birth of Eve, &c. The total cost of the restoration will be about 2,000*l.*

Burton Latimer.—The parish church of Burton Latimer, dedicated to "the Blessed Virgin," has been reopened for divine worship, after undergoing a restoration. The work was commenced in June last, and the expense incurred amounts to something like 4,000*l.* The chancel has, perhaps, undergone the most restoration, 700*l.* having been expended on it. The screen, the top part of which exhibits some carving, formerly occupied a position at the further end of the chancel, where it was made to serve the purpose of a chancel screen. It has been restored, however, to its original position, that of dividing the chancel from the nave. The church has a raised boarded floor, and the high-backed pews have given way to the ordinary rush-bottomed chair. The clearstory walls are adorned by paintings of the twelve patriarchs. These are of comparatively modern date, and are, perhaps, of small intrinsic worth, but as they are in a good state of preservation it was thought advisable to retain them. On the wall of the north aisle is another, a representation of St. Catherine being broken on the wheel—the aisle being dedicated to St. Catharine. A west gallery, which served to hide an Early English arch, and a lancet window in the tower has been removed. The south aisle has been almost entirely rebuilt, the outer wall having been out of the perpendicular. The roof of the church, too, is almost wholly new. The whole of the windows have been newly glazed. A separate subscription is on foot for the purpose of providing a new pulpit and font. The restoration has been executed under the superintendence of Mr. Slater, of London. The restoration of the chancel, tower, and spire was done by Mr. Henson, of Wellingborough, builder; that of the body of the church by Messrs. Foster & Wynn, of Kempston. The hot-water apparatus with which the church is warmed was provided by Messrs. Rynington.

Grantham.—The re-opening of St. Wolfstan's Church, Grantham, after an extensive restoration, took place on the 1st instant. Mr. Gilbert Scott has superintended the work. The galleries have been removed, and a partition of wood and glass, which supported the organ and organ-gallery, and divided the aisle-church from the eastern half of the building, has been taken down. The walls have been cleaned, the columns repaired and restored. A new roof has been placed on the whole of the church, with the exception of a small portion at the south-west angle—where a portion of the old work remains in a sound state. This has cost about 12,000*l.* The roof of the chancel is coiled with oak, and covered with carved wood of the same material. There are carved borderings, with inscriptions of the same material. The pews have been removed, their places being temporarily supplied with rush-bottomed chairs. The organ, which cost some 2,000*l.*, has been enlarged and embellished at a cost of 900*l.* It is placed in the north end of the church. An open screen of carved oak, surmounted by a cross, has been erected between the chancel and the body of the church. It does not, however, interfere with the view of its dimensions. The pulpit and lectern are of the same material. A corona of lights depends from the roof. The total cost of the restoration has been between 16,000*l.* and 17,000*l.*

Chester.—The chief stone of the new Church of St. Thomas, for St. Oswald's parish, has been laid. The site is a plot of ground off the Park gate-road, near the Training College. The building will stand upon a gentle rising ground, about 7 ft. higher than the road. The style is Early English, and it will be built entirely of red Knottstone, the inside of dressed ashlar, and having an open timber roof. The building will consist of tower, nave, and two aisles, with chancel and chancel aisle on the north side, the tower being on the south side of the chancel. The nave will contain a western entrance. There will also be an entrance by a porch at the north, with a priest's doorway at the chancel aisle. The vestry will be underneath the tower, with entrance from the south aisle. Beneath the tower there will be a chamber devoted to the

heating of the church. The nave and chancel aisle will be lighted with a two-light window. There will be an additional three-light window in the chancel, and another of the same description at the western end. The tower will be at the south-east angle, its height being 72 ft. from the parapet, the roof being spiral in form, and made of wood covered with lead. In the tower there will be bell and ringing chambers, the latter 13 ft. square. The total length of the church inside will be 130 ft. 6 in., and the total width 63 ft. 2 in. The edifice will afford accommodation for between 1,100 and 1,200. The total cost is between 10,000*l.* and 11,000*l.* Mr. Gilbert Scott is the architect; Mr. Roberts, of Chester, the builder; and the clerk of the works is Mr. Frater, who is also in charge of the works connected with the Cathedral Restoration. At present it has been arranged that only a portion of the building shall be erected, but sufficient to render it capable of being used as a place of worship. That portion will not include the tower, and it will depend upon the funds that are forthcoming at what time the church will be completed. The necessity for a new church for the parish of St. Oswald arose from the nave of the cathedral being used for the Sunday Evening Special Services, which prevented the use of the parish church.

Kirkley.—The foundation stone of the new church of St. Chad, Kirkley, has been laid. The old church was built in 1609, and as it was scarcely suited for the requirements of the present time, the Earl of Sefton, at the cost to himself of 10,000*l.*, has resolved to build a new one.

Newtown, near Wem, Salop.—The new church here was consecrated on the 17th inst. It consists of nave, chancel, bell turret, vestry, and porch, and provides accommodation for 214 persons. The roofs are open-timbered and covered with tile. The floor of the chancel, which is separated from the nave by a low screen, is paved with Maw & Co.'s encaustic tiles, the stona slah at the back of the altar being also laid with majolica and enamelled tiles. Grinshell stone has been used for the walling and all dressings. The style is Early English. The east window consists of flowered quarries and coloured roundels, the centre light containing a subject in painted glass representing our Lord appearing to St. Mary Magdalene: the artists were Messrs. Sanders & Co., of London. The church has been erected at a cost of 1,200*l.* by Messrs. Nevett, Ironbridge, from the designs of Mr. E. Haycock, jun., architect, Shrewsbury.

South Kensington.—The dedication stone of the new Church of St. Matthew, South Kensington, was laid on Monday, 12th April, by Mr. G. North. The church, when completed, will consist of nave and chancel, with aisles separated by arcades, and a tower at the west end of the south aisle. The style is Early Decorated, and the edifice is calculated to hold about 1,000 persons. The contract, which at present only includes the chancel and aisles, has been taken by Messrs. Myers. The architect is Mr. J. H. Hakewill.

Subbury.—The alterations and repairs of Lammarsh Church having been completed, the edifice has been reopened for divine service. The work has been done according to the plans of Mr. A. Blomfield, architect, by Mr. T. Holland, builder, Subbury. The work of restoration commenced by taking out a gallery and opening up the tower by a large Gothic arch, putting in a raised floor, and seats for schools. The east lancet windows are new, the mullions and tracery of the other windows have been restored, and two new windows have been inserted on the north side. A new vestry has been erected on the north side of the chancel, uniform with the church. The tower is now surmounted by a new octagon spire, covered in with ornamented lead, with dormer windows in each square. The spire adds 35 ft. to the height of the tower, making the total height more than 80 ft. The east gable is entirely rebuilt, with corner buttresses, and is surmounted at the apex by a stone cross. The porch has also been restored. The inside of the church has undergone a material alteration. The chancel, altar, and reredos are decorated with Maw & Co.'s encaustic tiles and with mosaic work. The stalls are all new, in stained wood. The screen has been restored with new spandrels, bosses, and cresting in old oak. The old ceiling beams have been taken out, and the ceiling panelled and otherwise ornamented. Other improvements have been effected, and the grave-yard, over an acre in extent, surrounding the church, has been

levelled, the mounds restored, and the walks newly laid out.

Matlock Bath.—The new church of Scarthen, in this parish, has been opened for divine service. The church has been built under the direction of Mr. Whyratt, architect, Manchester; and the whole of the sittings will be open and entirely free.

Hannington.—The parish church of the small village of Hannington, dedicated to St. Peter and St. Paul, has been re-opened for divine worship, after restoration. The church, previous to its restoration, was in a dilapidated condition. Everything connected with it is new except the walls, and they have been restored. The pitch of the roof has been raised. The restoration has been effected at a cost of about 900*l.*, under the superintendence of Messrs. Slater & Carpenter, of London, architects, the contractors being Messrs. Clark & Heap, of Northampton.

Books Received.

Law of Patents for Inventions. By F. W. CAMPBELL, Barrister-at-Law. London: Virtue & Co. This treatise sets forth the state of the law resulting from decisions more recent than those of any other work published up to the present time; although it is intended more for the use of inventors and patentees, engineers, mechanics, manufacturers, and others interested in patent matters, than for the instruction of lawyers. The author also gives explanatory notes on the law as to the protection of designs and trade marks.

VARIORUM.

"THE Ninth Annual Report of the Amalgamated Society of Carpenters and Joiners, from December, 1867, to December, 1868," Office, 113, Stamford-street, Waterloo-road. In his remarks, the general secretary, Mr. Apple-garth, says:—

"The arrears of contributions owing to the society in 184, per member less, while our funds average 1*s.* 7*d.* per member more than at the end of 1867; nor is this all. We have opened thirteen new branches (three of them in Ireland), have added 714 to our number of members; and, after meeting an extraordinary expenditure, we have increased our balance in hand by 2,628*l.* 4*s.* 10*d.* During the past year, though we have had some trifling differences respecting wages and working hours, in no instance have we had occasion to resort to a strike.

There is little doubt but that the encouraging trade may to some extent account for this encouraging fact, but it is nevertheless true, that amongst our members there is an increasing desire for arbitration."

"It is most gratifying to observe the progress which has been made by our members during the past year in the direction of technical education. In many of the principal towns, and in several parts of London, classes have been formed, assisted by loans granted by the council from the contingent fund; and the progress which many members are making by close application to their studies is most encouraging. . . . It is a matter of remark that, with the exception of a few employers of labour at Bradford, and others at Manchester, none, that I am aware of, have given any encouragement to a scheme which would be of the greatest value to their apprentices, and consequently to themselves."

—Doncaster in 1868. By William Sheardown. Gazette Office, Doncaster. The matter of this pamphlet was communicated to the *Doncaster Gazette* in the present year; and it gives a full account of the meteorology, vital statistics, town improvements, markets, railway system, &c., of Doncaster, for the past year.—Transactions of the Institution of Engineers in Scotland; Twelfth Session, 1868-9. This part of these Transactions is occupied with reports of two papers,—one by Mr. James Gale, C.E., the president, on some recent additions to the Loch Katrine waterworks; and the other by Mr. William Moodie, on an improved form of horizontal propeller, and results of experiments.—The papers are illustrated by engravings.—The Sun not the Source of Heat and Light to the Solar System: a Lecture at Ryde. By George F. Harrington. Ryde: Mason. This lecture develops an ingenious but somewhat fallacious theory, which seems to be an inversion of an old one, according to which light alone actually emanated from the sun, while heat and actinism were generated in the planetary atmosphere. According to Mr. Harrington's theory, it is the actinism which generates the heat and light in the planetary atmosphere. This it does by bringing about a slow combustion between its oxygen and hydrogen, the nitrogen by its dilution of the oxygen preventing a more rapid configuration, which must otherwise occur by the combination of the oxygen which floats in the nitrogen with the hydrogen, which floats mainly above it, notwithstanding the law of the

diffusion of gases. Light, according to the author, is the "incandescence atoms" in process of combustion. But what is the meaning of incandescence atoms. It must just be luminous atoms, or atoms radiating light, so far as regards that light apart from the heat; and how can light be such atoms if it only emanates from them? This is no explanation of what light is, although it is an attempt to show whence it comes. The way in which the author attempts to prove that the space between the sun and planets must be an absolute void seems to be equally fallacious. On the whole, however, the author's theory is one worthy of consideration, although spectral analysis and the general drift of speculation as to the sun seem at present to be much against such a theory.

Miscellaneous.

Destruction of a Church in Exeter.—The New Congregational Church in this city, which had nearly reached completion, was unfortunately almost entirely destroyed by fire on Monday, the 12th ult. A large commodious building of considerable proportions, it has been erected from the designs of Mr. Tarring, of London, and with the exception of differently arranged roof timbers, and the omission of the clearstory, is almost a facsimile of his church at Huntingdon. On the whole, the building was most satisfactory, and if we except a profusion of rather coarse and commonplace stone carving, it promised to become a great ornament to the city. The *Devon Weekly Times* says:—"The fire originated in the roof of the building, but from what cause is not definitely stated. It is, however, reported that some of the men had lighted a fire in a little room, at the top of the building, near the tower, which they left unprotected while they ran to witness a circus procession, and when they returned the roof was in flames. The wind was blowing in the direction of the hospital, and the tower and scaffolding escaped; but the flames rapidly extended in the opposite direction, and the interior of the roof was a mass of fire in a few minutes. The loss occasioned by this disastrous fire will fall on the Insurance Company, and not on Messrs. Bragg & Dyer," the contractors.

Tewkesbury New Waterworks.—At the last quarterly meeting of the town council, Mr. McLandsborough, engineer to the Cheltenham Waterworks Company, laid before the members plans of the proposed works for the supply of water for the borough. The pumping-station will be placed on the Brick Kiln Meadow, and will consist of a Gothic engine and boiler house, and engine-man's residence, built with red and black bricks and Bath-stone dressings. The water will be drawn from the Severn, and first pumped into a large subiding reservoir, out of which it will pass on to the top of three filters filled with nearly 7 ft. of filtering material, through which it will pass, and thence flow into a covered pure-water reservoir, from which it will be again pumped into the service-reservoir placed on an ornamental tower, to be built on the top of the hill, near to the Mythe Tuto, from which the water will flow directly to the town. This tower will be about 80 ft. high from the ground. The water will reach to the tops of the highest houses in Tewkesbury. The works are estimated to cost 12,000*l.* The company, under their Act of Parliament, undertake to give a constant supply of water to the owners of property at the rate of 5*s.* per cent. on the rental, and to supply the cottage property at the rate of 2*d.* per week per cottage.

Salisbury Cathedral.—The restoration of the west front is now approaching completion. Most of the figures have been placed in the niches. Some half a dozen more are to be added, but still there will be many niches left vacant. The polishing of the marble shafts lately added to the windows, &c., in place of those which were decayed, is now in progress, and when finished the immense pile of scaffolding now completely covering the west end will be removed. The interior restorations have not yet been begun, but it is expected they will shortly be proceeded with. Funds, however, will be wanted for this.

National Portrait Exhibitions.—The receipts at the three exhibitions, in 1866, in 1867, and in 1868, were 8,845*l.*; expenditure, 10,134*l.* The deficiency is supplied by the Parliamentary vote for the Science and Art Department.

New Bridge at Halifax.—The foundation stone of a new bridge over the valley of the river Hobbie, at Halifax,—the construction of which is demanded by the large increase that has taken place in the amount of traffic between Bradford, Leeds, and the towns eastward since the original structure was built,—has been laid with much ceremony. The new bridge, which is to be of iron, with two spans of 180 ft., is to be built by the corporation of the town, at a cost of 21,000*l.* It is designed in the Decorated Gothic style of architecture, and the elevation shows two flat elliptical arches, each of 160 ft. span, with a rise of only 16 ft. The clear width between the parapets, available for traffic, will be 60 ft. The outside ribs, which are to be of cast iron, will be 4 ft. deep at the centre, and 5 ft. 3 in. deep at the springing, and will carry open-traceried spandrels at the haunches, crowned by a cornice, and a partly quartered and battlement parapet. The inside ribs, of which there will be six, are placed at a distance of 8 ft. 7 in. apart. The centre part for a space of 52 ft., will be composed of wrought-iron plates: the remaining parts of the ribs are to be of cast iron. The road will be formed by a layer of asphalt concrete, upon which the paving is to be laid. The total weight of the cast-iron work will be 1,200 tons, and that of the wrought-iron work 150 tons. The iron to be used will be from the West Yorkshire Iron and Coal Company, Limited. The masonry of the central pier and of the abutments on each side the valley will be finished by five spires, like terminations, which will rise 15 ft. above the parapet on each side of the bridge, and will carry large octagonal lamps, to be supplied with gas for lighting the roadway. As a portion of the new bridge will stand upon the site of the old one, it is intended first to build one half of the new bridge, and then to divert the traffic from the present structure on to the new half. The present bridge will then be pulled down, and the remaining half completed. The roadway of the new bridge, when completed, will be 11 ft. above the level of the old one, and by this means a gradient almost level will be obtained from Cross Hills to the opposite side of the valley. The construction of the bridge, and also of a new road in lieu of the present Bridge Lane, rendered necessary by the increased width of the approach, has been let to Mr. Archibald Neill, of Bradford, for 21,000*l.* The construction of the ironwork has been sub-let by Mr. Neill to Messrs. Joseph Cliff & Co., also of Bradford. The bridge will be made from designs by Mr. John Fraser, C.E., of Leeds.

Civil and Mechanical Engineers' Society.—On Saturday last the members of this society visited the St. Thomas's Hospital and the Lambeth section of the Thames Embankment works, by permission of Mr. Henry Curry and Mr. Bazalgette. Amongst the gentlemen present were Mr. B. Haughton, president; Mr. G. E. Eachus, past president; Messrs. J. B. Walton, G. W. Usill, and R. M. Binocott, members of the Council, &c. Amongst other things worth noting, a sample of Portland cement as used on the Embankment works was broken in the presence of the members of the society, showing a tensile strength of 603 lbs per square inch of section.

Crystal Palace.—The programme of the sixteenth season is to be issued next week by the directors. The season will open on Saturday, May 1st, with a grand musical festival in honour of Rossini. The orchestra will be on a gigantic scale, approximating with to of the Handel Festivals, consisting of upwards of 3,000 selected performers. The programme will include the Overtures to "Semiramide," "La Gazza Ladra," and "William Tell." The "Stabat Mater," a work eminently suited for interpretation by a large body of performers, will form part of the selection. On May 1st, likewise, a transparent scene, which has been specially painted for the Crystal Palace by Mr. Matt Morgan, representing the "silver" and "golden" illuminations of St. Peter's, at Rome, will be exhibited in the Concert-hall. Another novel attraction is the announcement of operas to be performed on the complete stage, which was last year erected in the Concert-hall. These will be played in English, supported by efficient companies, and will be under the management of Mr. George Perron, Mr. Manns conducting. The "Bohemian Girl," "Lurline," and other popular operas will be produced, the series commencing at the termination of the Whitsuntide amusements.

New Sanitary Commission.—An order has been issued by her Majesty revoking the commission appointed last November for inquiring into the operation of the sanitary laws, and appointing a fresh one with enlarged powers. The new commissioners are—C. B. Adderley, Earl of Romney, Earl of Ducie, Lord Robert Montagu, Russell Gurney, Stephen Cave, Sir Thomas Watson, C. B. Ewart, J. R. M'Clean, Samuel Whitbread, J. T. Hibbert, E. M. Richards, George Clive, F. S. Powell, Benjamin Shaw, James Paget, H. W. Acland, Robert Christian, Wm. Stokes, John Lamher, and F. T. Bircham, and Mr. W. H. Birley is secretary. This order gives power to inquire into the operation of the sanitary laws, so far as they apply to sewerage, drainage, water-supply, removal of refuse, control of buildings, prevention of over-crowding, and other means of promoting the public health.

The New Workhouse for Poplar Union. The foundation stone of this new workhouse has been laid. The buildings, which have been designed by Mr. J. W. Morris, of East India-road, are to be constructed on the double pavilion principle, for the accommodation of 800 paupers. The site is that of the present workhouse, portions of which will be removed as the new work progresses, the main block of the present structure facing the High-street being simply altered and adapted for the future administrative offices. A chapel is to be erected, with accommodation for 500 persons; and attached to the institution will be spacious labour-yards, workshops, mills, and a bakery. The contractors for the works are Messrs. Hill, Keddell, & Waldram, and the contract price is 32,480l. This building will be the first metropolitan workhouse constructed specially for accommodating able-bodied paupers. The expenditure on the new house will amount to 40,000l., which will have to be repaid, with interest at 5 per cent., by instalments extending over thirty years.

House Decoration.—At the Society for the Encouragement of the Fine Arts, last week, Dr. Dresser gave a lecture, the subject of which was how to decorate and furnish a house from an artist's point of view. The lecturer, commencing with the general principles that all art should be truthful in its utterance, all decorated objects appear to be what they are, and all excessive decoration avoided, proceeded to point out how this might be carried out in the furnishing and embellishment of a house. Amongst his suggestions were the following:—That of a creamy buff colour, with stars stencilled upon it, to replace the cold whiteness of our ceilings; the rejection of floral mural patterns that aped relief, being mere repetitions of pictorial objects, and therefore objectionable as backgrounds. In lieu of these last he recommended simple patterns having a bloomy effect, and he concluded his discourse by impressing upon his audience the importance of seeking after general harmony, and cautioning them against strong colours in large masses, repose, not glitter, being the great object.

Transplanting in the Night.—A gentleman anxious to ascertain the effect of transplanting at night, instead of by day, made an experiment, with the following result:—He transplanted ten cherry-trees while in bloom, commencing at four o'clock in the afternoon and commencing one each hour until one o'clock in the morning. Those transplanted during the daylight shed their blossoms, producing little or no fruit, while those planted in the dark maintained their conditions fully. He did the same with ten dwarf trees after the fruit was one-third grown. Those transplanted during the day shed their fruit; those transplanted during the night perfected their crop, and showed no injury from having been removed. With each of these trees he removed some earth with the roots. The incident is fully vouched for; and if a few more similar experiments produce the same result it will be a strong argument to horticulturists, gardeners, and fruit-growers to do such work at night.—*Dowells.*

Artists' General Benevolent Institution. The dinner in aid of this institution, the object of which is to afford relief to distressed meritorious artists, whether subscribers to its funds or not, as well as to their widows and orphans, and distrest constituting the claims to its benevolence, is fixed to take place on the 8th of May. The Right Hon. Lord John Manners, M.P., will preside. Mr. John Everett Millais, R.A., is now hon. secretary.

Architecture in Carlisle.—At a recent meeting of the Carlisle City Council, on an application of Mr. J. Graham, a councillor, for leave to purchase from the Corporation a corner site of Cavendish-place and Alfred-street, at 8s. 6d. per square yard for building-ground as far as it is square, and 4s. 6d. for the three-corner plots adjoining, it was resolved, after some discussion,—

“That architects be invited to send in elevations for houses to be erected in Alfred-street, and that 2d. be given for the design approved by the council. In the meantime the sale of the site at the corner of Cavendish-place and Alfred-street, and other sites in Alfred-street, be postponed.”

A committee was appointed to carry out the arrangements, and the Town Clerk was instructed to insert an advertisement in the local papers, and also in the *Builder*, *Manchester Guardian*, and *Scotsman*.

A Warning.—Such Societies as the Literary Fund, the Artists' General Benevolent Institution, and others that distribute “doles in money or kind,” should at once petition against clause 259 in the Endowed Schools Bill, or they will find themselves forced to apply their funds for a purpose entirely different from that for which they were gathered.

The Burning of Theatres.—A boy is in custody for an attempt to set the Belfast Theatre on fire. In the middle of the night it was discovered that all the meters had been turned on, and the gas escaping, the place full of smoke, and that the under part of the stage had been on fire. The prisoner was caught in the act of escaping from the house.—The Bellini Theatre in Naples has been burnt to the ground.

TENDERS.

For the erection of a row of three villa residences, for Mr. W. Wallis, Watford, Herts. Mr. Frank E. Thick, architect.

Bennett.....	£2,132 0 0
Allen.....	1,984 0 0
Halley.....	1,835 11 0

For the erection of a villa residence, at Wandsworth for Mr. W. W. Barth, Messrs. Tolley & Dale, architects:—

	Do, with back additions omitted.
Knight.....	£888 0 0
Fawcett.....	819 0 0
Steele.....	748 10 0
Stark.....	690 0 0

For certain alterations at No. 1, Pan-lau-street, Finsbury, for Mr. E. Midwinter, Messrs. Tolley & Dale, architects:—

Green (accepted).....	£400 0 0
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For enlargement of the warehouse premises of T. Adams & Company, Limited, Nottingham. Messrs. T. C. Hine & Son, architects:—

Barker.....	£6,250 0 0
Stevenson & Weston.....	5,954 0 0
Dell & Son.....	5,943 0 0
Hill.....	5,900 0 0
Hall.....	5,847 0 0
Lynn.....	5,825 0 0
White.....	5,825 0 0
Deane & Co.....	5,575 0 0
Wood & Son.....	5,511 0 0
Marrillott & Co.....	5,500 0 0
Wood & Slight.....	5,494 0 0
Johnson & Wright.....	5,412 0 0
Fish.....	5,371 0 0

For building a new ward at the Faversham Union. Mr. B. Adkins, architect. Quantities by Mr. T. M. Hickman:—

Bull.....	£2,050 0 0
Bawyer.....	1,860 0 0
Foote.....	1,830 0 0
Eastell.....	1,705 0 0
Judges.....	1,699 0 0
Austen.....	1,694 0 0
Adcock.....	1,693 0 0
Naylor.....	1,673 0 0
Whiting.....	1,630 10 0
Shrubsole.....	1,519 0 0
Sollitt.....	1,537 0 0

* Accepted, we are requested to say, in consequence of the little difference above the lowest tender, and the builder being a resident within the parish.

For alterations to Roding House, Chigwell. Mr. J. W. Morris, architects:—

Arber.....	£295 0 0
Mivett.....	283 0 0
Egan.....	232 10 0
Stevens.....	498 0 0
Wicks & Bangs.....	493 0 0
Abraham.....	484 0 0
Abertott.....	460 0 0
Sheffield (accepted).....	444 0 0

For erecting two dwelling-houses and shops in Walworth-road, for the Rev. J. C. Clark, Mr. Robert Parris, architect. Quantities supplied:—

Newman & Mann.....	£2,626 0 0
Bottomley.....	2,595 0 0
Sharrington & Cole.....	2,577 0 0
Downs.....	2,463 0 0
Marland.....	2,397 0 0

For constructing the Western Outlet Sewer, from Woolton to Garston. Woolton sewerage, Contract No. 3. G. W. Goodison, C.E. (Reade & Goodison), engineer. Quantities supplied:—

Thomas.....	£5,080 12 6
Maugrove & Roper.....	4,780 0 0
Jones.....	4,762 0 0
Hauking.....	4,316 0 0
Lee.....	4,250 0 0
Mitchell.....	4,214 8 6
Harland.....	3,969 0 0
Martin, junr.....	3,890 0 0
Dixon & Sleigh.....	3,680 0 0
Pilkington.....	3,669 0 0
Winnard, junr.....	3,561 5 5
Rothwell.....	3,550 0 0
Hardacre.....	3,471 6 0
Standing & Littler (accepted).....	3,419 12 0

For Serpentine marble shop front, &c., 85, Edgeware-road, for Mr. V. M. Blades, Mr. W. Seckham Witherington, architect:—

Drew.....	£319 0 0
Melville.....	316 0 0
Hawke.....	315 0 0

For repairs to twenty-five houses in Trafalgar-squares Peckham:—

Williams & Son.....	£1,467 0 0
Goodwin.....	1,349 0 0
Selkirk.....	1,200 0 0
Sharrington & Cole.....	1,197 0 0
Pierpont (accepted).....	1,095 0 0

For house and shop at Rottingdean. Mr. T. Simpson, architect. Quantities supplied:—

Gorrage.....	£1,180 0 0
J. & W. Sawyer.....	1,683 0 0
Nightingale.....	970 0 0
Lawyer & Simmons.....	965 0 0

For additions to Boscobee, near Christchurch, Hants, for Sir Percy Shelley, bart. Mr. T. Dashwood, architect. Quantities supplied by Mr. L. C. Riddett:—

Futcher.....	£4,890 0 0
Adamson & Son.....	4,490 0 0
Jackson & Shaw.....	4,310 0 0
Bull & Sons.....	4,318 0 0

For new buildings, enclosing railings, gates, lodges, &c., for the Hambro Synagogue Burnt-ground, Victoria Park. Mr. H. H. Collins, architect:—

Stuart & Bennett.....	£1,060 0 0
King & Sons.....	1,025 0 0
Nagel.....	948 0 0
Colen (accepted).....	850 0 0

For four pairs of cottages at Southgate, for Mr. Medwin. Mr. H. Phillips, architect:—

Linsell.....	£1,910 0 0
Marland.....	1,460 0 0
Conibley.....	1,350 0 0
Wills.....	1,435 0 0
Everitt.....	1,433 0 0
Quennell.....	1,460 0 0
Gibbs & Son (accepted).....	1,336 0 0

For alterations, Cambridge Lodge, for Mr. H. Dodson, Pezze, Mr. H. White, architect. With Zinc. Greenhouse.

Croaker & Son.....	£395 0 0
Cooper & Cullum.....	340 0 0
Gibbs & Son.....	363 0 0
	349 0 0
	45 10 0

For St. Augustin's Church, Highbury. Messrs. Habershon & Brock, architects:—

Brass.....	£10,375 0 0
Colls & Co.....	8,393 0 0
Myers.....	7,925 0 0
Newman & Mann.....	7,720 0 0
Patnam & Co.....	7,600 0 0
Nightingale.....	7,573 0 0
Scrivener & White.....	7,398 0 0
Downes.....	7,030 0 0
Manley & Rogers.....	6,984 0 0

For additions and repairs to Hele's School buildings, Plympton St. Maurice, Devon. Mr. H. Elliott, architect:—

Sanders.....	£694 15 0
Seney & Hellings.....	538 0 0
Opie.....	490 0 0
Condy, Brothers.....	463 0 0
Bishop.....	460 0 0
Radcliffe & Crocker (accepted).....	450 0 0
Webber & Rowse.....	407 10 0

For alterations to the British Queen Tavern, Trafalgar-road, East Greenwich, from Mr. A. Beckwith, Messrs. Shaw & Lockington, architects. Quantities supplied:—

Bricklayer, Carpenter's, &c., Work.	
Hiscock.....	£287 0 0
Wooding.....	228 0 0
Miller (accepted).....	215 5 0

* Accepted, we are requested to say, in consequence of the little difference above the lowest tender, and the builder being a resident within the parish.

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Downs.....	2,463 0 0
Marland.....	2,397 0 0

TO CORRESPONDENTS.

W. R. (received).—J.B. (we do not publish a stamped edition. As to Velociped makers, we must refer you to advertisements. The question as to measurement could only be settled by one who had the specification, &c., before him).—J.H. (the reply we could give to such a question might mislead. The agreement should be fully considered).—A. L. R. H. V.—Mr. B.—P. H. Jew.—F. D.—H. & Son.—T. H.—R. A.—R. H. C.—K. S. S.—C. T.—A. Builder.—J. E. W.—W. B. W.—J. W. M.—I. & M.—J. C. & Son.—H. C. & Son.—G. L.—J. A. W.—R. M.—L. G.—R.—S. & C.—G. W. G.—R. & Son.—J. W. H.—C. M.—Cherr. (as R.—H. R.—E.—E.—C.—F. B. C. We are compelled to decline printing out books and giving addresses.)

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

TOWN TRAVELLER.—WANTED, to represent a large SMITHING ESTABLISHMENT in the East of London, to call upon Builders and Others. He must be able to draw, take out quantities, and make estimates. If accustomed to bridge, girder, &c. he would be preferred.—Apply, by letter, to the care of Mr. Taylor, Cashier, Count, Birchenhead, &c. Stationary railway expected and the name of last employer.

TO CLERKS OF WORKS.—The Board of Guardians for the Monmouth Union, wish to ENGAGE the SERVICES of a competent Publican or Clerk, to be in charge of the new Workhouse building, to act under the superintendence of Mr. G. C. Hadow, of Hereford Architect.—Candidates are requested to send applications, accompanied as to fitness and state terms to the undersigned, by THURSDAY, MAY 4, 1869. T. J. A. WILLIAMS, Clerk to the Guardians, Board-room, Monmouth, April 21, 1869.

WANTED, a CLERK in a Builder and Decorator's Office. Must be a good Bookkeeper, have a knowledge of the business, and be used to abstract men's time, materials, &c. Good references required.—Address, stading lowest terms and length of former service to BUILDER, Bishop's Library, Great Portland-street, W.

TO SURVEYORS ASSISTANTS. WANTED, temporarily, by an ARCHITECT (30 miles from London), an ASSISTANT competent to take out and prepare bills of quantities. A month's engagement preferred. Salary, 3 guineas per week, and board and pocket-money. First-class references required.—Address, ARCHIBOLD, care of Mr. Newbury, News Agent, 107, Finsbury-lane, E.

WANTED, a GENERAL WORKING FOREMAN (a Carpenter and Joiner preferred), to take CHARGE of a JOB, in the country. He should be well versed in his trade, and where last employed.—Address, A. R. C. in care of Mr. Boyce, Queen-street, Portsmouth, Hants.

WANTED, in the Office of a Builder, a respectable Youth. Must write a good hand, and be quick & accurate in the use of the pen. He should be well versed in his trade, and where last employed.—Address, with age and full particulars, to T. MARTIN, Library, Church-street, Camden-wall.

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TO GRAINERS, WRITERS, AND DECORATORS. WANTED, immediately, a thoroughly good and experienced HAND in the above branches, and one who would make himself generally useful in a country business. References required and specimens of work. Salary permanent. None under 30 years of age need apply.—Address, stating wages and requirements, to D. M. W. Postoffice, Torquay, Devon.

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WANTED, a RE-ENGAGEMENT as CLERK OF WORKS, or as Assistant to an Architect or Builder in the country. Age 38.—Address, F. BROWN, 31, Vi-com-square (near Beckett-street), S.W.

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WANTED, a RE-ENGAGEMENT as CLERK OF WORKS, or Out-door Foreman, by a thoroughly practical Man, Joiner by trade. Middle age.—Address, A. S. Postoffice-Crafton-road, Kew, W. W.

WANTED, by a Young Man, a RE-ENGAGEMENT as CLERK, in a Builder's Office, thoroughly acquainted with Office duties. Two years and a half with last employer.—Address, W. B. 27, High-street west, Piccadilly, S.W.

WANTED, immediately, by the Advertiser, a first-class CHAINMAN, Writer, and Decorator.—Apply by letter only to Mr. T. GRAHAM, Beckenham, Kent.

TO BUILDERS, BOAD-MAKERS, AND CONTRACTORS. WANTED, by a first-class practical MAN, a Carriage-way Fitter, Street Mason, Goads Dresser (Wood Bites, Bush Clinkers, or Tiles), to TAKE WORK by the PIECE. Labour only. Good testimonials and references.—Address, JAMES CRITCHFIELD, No. 7, James-place, North-street, Poplar.

TO SURVEYORS AND BUILDERS. WANTED, a RE-ENGAGEMENT, by a Young Man. Well acquainted with office duties. Has a general knowledge of building, drawing, taking out quantities, measuring up, and estimating works. Ten years' references in town.—Address, H. B. 10, Francis-street, Great-street, W.G.

WANTED, by a thoroughly practical Man, a RE-ENGAGEMENT as GENERAL FOREMAN or CLERK OF WORKS. Good references.—Address, J. Z. J. Butts-road, Stratford, Essex.

TO BUILDERS, GAS-FITTERS, AND OTHERS. WANTED, by a Young Man, a RE-ENGAGEMENT as CLERK of office who can draw, abstract accounts, and is well acquainted with the usual routine of an office.—Address, J. H. 24, Little Queen-street, Stoney-gate, Westminster.

TO BUILDERS, PLUMBERS, &c. WANTED, a SITUATION as good PLUMBER. Can do Hot-water Baths, Cold-work, Pumps, Zinc Work, &c. References. Good references. Town or country.—Address, 68, office of "The Builder."

WANTED, a RE-ENGAGEMENT, as GENERAL FOREMAN OF WORKS. Experienced in the different branches, also in the general estimating and carrying out of works. Understands measuring up, drawing, taking out quantities, drawings, &c. Good references from last and (if required) former employers.—Joiner by trade.—A. J. Postice College, Geddard-road, Heston.

TO ARCHITECTS AND SURVEYORS. WANTED, in an Architect's or Surveyor's Office, a SITUATION as ASSISTANT. Three and a half years' experience in office. Care of Mr. Macmillan, 21, King's-road, Chelsea, S.W.

WANTED, a SITUATION, as FOREMAN of FLAHERTERS, or Lath Piece-work. If required, Good references.—Address, J. H. Postoffice, Clarendon-road, Lancaster-road, Notting-hill, W.

WANTED, by a Young Man, who has been accustomed to a good Jobbing business, a SITUATION or JOB near London or GASTYTES. Has no objection to fill up his time with painting and gilding. Town or country.—Address, J. H. at Mr. Halley's, Gable-court, Oxford-street.

TO CABINETMAKERS AND JOINERS. WANTED, a RE-ENGAGEMENT, by a steady Young Man, as CABINETMAKER. Has had good experience in general work. Can do jobbing, if required. Willing to make himself generally useful. Town or country.—Address, R. F. 28, Finsbury-street, Cannon-town, London.

TO BUILDERS. WANTED, a RE-ENGAGEMENT as GENERAL FOREMAN, or Foreman of Carpenters and Joiners. Age 30. Good references to be given.—Address, A. B. 9, Rigmanton-road, Tulse-hill, Hampton.

TO BUILDERS, &c. WANTED, by a thoroughly experienced and well-educated Man, a SITUATION as FOREMAN, or to work any kind of Wood-Cutting and Joining. Well versed in making Cutters, Shaping Baws, &c.—Address, J. H. 205, New North-road, Hoxton, London, N.

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WANTED, by a Young Man, aged 29, a SITUATION as BUILDERS' CLERK or MANAGER. Can make plans, drawings, and estimates. Is a good Book-keeper, and accustomed to the superintendence of jobbing works.—Address, J. B. 7, College-terrace, Bond-street, Chelsea, S.W.

WANTED, by a steady, experienced Man, CONSIDERABLE EMPLOYMENT, as GRAINER, WRITER, and FENCIBLE HAND. Would do any work. If required.—Address, G. F. 7, Bull-lane-chambers, Holborn, London.

WANTED, a SITUATION as thorough PAINTER, WRITER, and GILDER. Accustomed to the management.—Address, C. R. 26, Seymour-street, Euston-square.

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TO BUILDERS AND CONTRACTORS. WANTED, a RE-ENGAGEMENT, as GENERAL SHOP or WORKING SHOP FOREMAN of JOINERS, or as Clerk and Foreman in a Jobbing Business, or office in building, thoroughly experienced and trustworthy. Well-versed in building, church, and first-class work. Town and country. References. Age 38.—Address, 674, Office of "The Builder."

WANTED, by a practical Man, a RE-ENGAGEMENT as CLERK OF WORKS, or General or Out-door Foreman. Carpenter and Joiner by trade. Age 36. Six years' experience from present employer.—Address, R. M. Gino of "The Builder."

TO ARCHITECTS. WANTED, a RE-ENGAGEMENT, by an efficient CLERK OF WORKS, Joiner by trade. Middle age. First-class testimonials.—Address, H. H. 1, Richmond-road, Esher, Surrey.

WANTED, by an experienced Man, a CONSTANT JOB as PAINTER, GRAINER, PAPER-HANGER, and GLAZIER. A useful man to any master.—Address, C. GRANVILLE, 4, Lombard-street, HILLYWOOD.

TO BUILDERS. WANTED, a SITUATION as FOREMAN of BRICKLAYERS. Piece-work preferred. Just completed a four years' job. Highest references.—Address, S. J. Garden-road, St. John's-road.

WANTED, by an energetic Man, the CHIEF or SECOND FOREMAN of BRICKLAYERS, or any kind of work in the line. Labour only. Well up in church work. No objection to the country.—Address, SEPTIMUS, 51, Amberley-road, Finsbury, W.

TO ARCHITECTS AND BUILDERS. WANTED, a SITUATION, by a Young Man, who has worked at the bench. Had experience in measuring and quantities. References good.—Address, G. 10, Ashdale-terrace, Strand-green, Holloway.

TO DECORATORS AND BUILDERS. WANTED, by an experienced DECORATIVE PAINTER and RESTORER, a SITUATION to fill up his time at painting, &c.—Address, G. TUN, 4, Adwate-terrace, London-ditch, Hackney.

TO BUILDERS. WANTED, by a WORKING FOREMAN of BRICKLAYERS, a SITUATION in town or country. Good references.—Address, C. W. 11, Lee-street, Kingsland-road.

WANTED, PIECEWORK, by a thorough practical Carpenter and Joiner. Good references from last Job.—Address, E. B. 88, Union-street, Kennington-road, Lambeth.

TO BUILDERS, PLUMBERS, AND OTHERS. WANTED, by a respectable Young Man, a SITUATION as PLUMBER. Good references if required.—Address, A. F. 8, South-street, Finsbury.

TO BUILDERS, &c. WANTED, a SITUATION, by a Young Man, aged 21, as IMPROVER to a CARPENTER and JOINER. Has been in the trade two years at a half.—Address, A. D. 15, Manor-square, Kennington Park-road, S.W.

TO CIVIL ENGINEERS, CONTRACTORS, &c. WANTED, by the Advertiser, a SITUATION, as a well-versed and reliable workman. Good references. Age 15.—Address, G. E. No. 1, Allcroft-road, Kenal-town.

WANTED, by a thoroughly practical, steady, and active Man (Joiner by trade), a SITUATION as FOREMAN of JOBS in town or country. Well acquainted with all branches in the building, having been engaged as above for the last thirteen years, and has just completed a job in the City. Wages not a special object.—Address, 738, Office of "The Builder."

WANTED, by a Builder's son, aged 21, a SITUATION. Good accountant, can take men's time, make out estimates, measure up, and the general duties of a Builder's Office. Good references and security. Salary, 100s.—Address, ALPHEA, care of Mr. Parkinson, Church-end, Finchley, N.

TO ARCHITECTS. WANTED, a RE-ENGAGEMENT as ASSISTANT in a London Office. Used to competition work. Schools, &c. Is working for a gentleman to whom he was articled. R. A. Signet, 81, St. Michael's, 84, 7, 30, —Address, CROSS, 8, Bull-lane, Duke-street, Adelphi, W.G.

WANTED, a SITUATION as PLUMBER by a middle-aged Man. Has filled one situation for some years; left through the death of his employer. No objection to fill up his time with painting and glazing. No objection to the country.—Address, J. C. 158, Gleditsia-terrace, Willow-street, Finsbury, London.

WANTED, a RE-ENGAGEMENT, by a Young Man, as Assistant Surveyor's Office. Is a good draughtsman, neat penman, and can assist in taking out quantities. Age 23. Good references.—Address, G. F. 138, Buckingham Palace-road, Finsbury, S.W.

TO ARCHITECTS AND BUILDERS. WANTED, a RE-ENGAGEMENT as CLERK OF WORKS or MANAGING FOREMAN, by a thoroughly practical Man, capable of drawing, measuring, and estimating.—Address, D. R. 42, Oatford-road, Kenilworth.

WANTED, a SITUATION, to Superintend the Management of a large Stud of Horses. The advertiser has been ten years in practice as a veterinary surgeon, and has had the care of a large stable of horses. Well accustomed as to stable work, ability, &c.—Address, A. B. Tickford Abbey, Newport Pagnal, Bucks.

WANTED, by a Young Man, a Carpenter, aged 18, a SITUATION as IMPROVER. Has been three years at the tool. Money not so much an object as constant employment.—Address, J. W. F. 27, Chancery-row, Blue-stile, Greenwich.

TO ARCHITECTS AND BUILDERS. WANTED, a RE-ENGAGEMENT, by a first-class DRAUGHTSMAN. Well up in construction, detail, and descriptive drawing, taking out quantities, specifications, measuring, and superintending works. Good testimonials.—Address, H. B. 9, Havelock-street, Coptham-square, Lambing, N.

TO BUILDERS AND OTHERS. WANTED, a SITUATION, as TIME, STORE, and STOCK KEEPER, Estimating Clerk, or to make himself generally useful in any way. Experience, High-class testimonials. Leaves situation through illness of principal. Town or country.—Address, M. N. Postoffice, High-street, Fockham.

TO ARCHITECTS. WANTED, by an ASSISTANT, a RE-ENGAGEMENT, in preparation of bills, and is a good writer.—Address, D. 34, Maddox-street, Regent-street, W.

TO BUILDERS AND OTHERS. WANTED, by a LEDGER CLERK, a RE-ENGAGEMENT, in a good office. Uses rule of the year in presentation (a builder's office), and thoroughly understands the general routine. First-class references as to ability and character.—Address, A. C. Postoffice, Islington.

TO ARCHITECTS AND BUILDERS. WANTED, in an Architect's or Builder's Office, a SITUATION as ASSISTANT. Can design, draw up specifications, well up in quantities, estimating, surveying, and detailing, and has seven years' present employment, and previously with a county surveyor. First-class testimonials.—Address, J. H. Claxton-avenue, Newport, Kent.

WANTED, by the Advertiser, a Carpenter and Joiner by trade, aged 41. Fifteen years' former employment. First-class references. Good experience.—Address, A. B. 11a, Wellington-terrace, Barnsbury.

TO ARCHITECTS, &c. WANTED, by a good ASSISTANT, a RE-ENGAGEMENT. Is a domestic draughtsman and designer, and an estimable old man. Terms moderate. Good references.—Address, N. Postoffice, Islington.

WANTED, EMPLOYMENT in Town or in branches of the Building Line.—Address, F. D. 8, Bond-street, South, Euston, N.E.

TO ARCHITECTS AND SURVEYORS. THE Advertiser, aged 21, desires a RE-ENGAGEMENT with the above as ASSISTANT. Has been accustomed to the duties of both offices. Good references, &c.—Address, 709, Office of "The Builder."

TO ARCHITECTS AND SURVEYORS. THE Advertiser, who has not long completed his articles with an architect's surveyor, temporarily or otherwise.—Address, TUGAN, at Bath's Library, Grosvenor-gate, London, E.C.

TIMBER TRADE (English or Foreign).—WANTED, RE-ENGAGEMENT as SALESMAN and Yard Foreman, by a young man (age 27), strictly sober and industrious. Two years in last place. References. A. W. care of Ackman & Co. Stationers, London, E.C.

TO BREWERS, RAILWAY CONTRACTORS, &c. SIGN WRITER.—WANTED, by a Young Man, a SITUATION as SIGN WRITER, in a brewery, railway works, or general advertising business. Good references in all in view.—Address, G. F. W. 1, Wood-street, South Hackney, N.E.

TO NORLEMEN, ORNAMENTERS, AND BUILDERS. RE-ENGAGEMENT, WANTED, by a thoroughly practical general FOREMAN. Fully conversant with estate works generally, and the building business in all in business. Good testimonials. Age 40.—Address, R. W. Postoffice, Selhurst, Surrey.

TO BUILDERS, LIME AND TIMBER MERCHANTS. LATHENDING WANTED, by a thoroughly practical and good practical Man. Good testimonials.—Address, W. A. 2, Underwood-place, Shepherdess-walk, N.

FIRST-CLASS FIGURE CARVERS and POINTERS WANTED.—Apply to THOS. BOOMFIELD, sculptor, 275, Kennington-road, Lambeth.

The Builder.

VOL. XXVII.—No. 1369.

Military Labour and the Builder.



IN the order of the day for going into a Committee of Supply being moved recently in the House of Commons, Mr. Hanbury Tracy called attention to an important subject, to which, on repeated occasions, we have devoted our columns. In any matter of real reform, which is neither a private crocheted nor a party move, a considerable amount of unconcerted unanimity will generally be found to prevail amongst its advocates. Approaching the question from different points of view, arguments of varying weight and character will be found to converge;

as the movements of various bodies of troops may be combined by a skilful general. When the reform is uncalled for, or illusory, these various arguments will be often found to be mutually antagonistic. But when, as in the present case, the purport is concurrent, although the points of departure are distinct, conclusive evidence is afforded that the general in command is no other than the truth.

Mr. Hanbury Tracy's point of departure was the idea of the waste of public money which arises from the system of employing civilian labour in the construction and repair of works and buildings connected with the War Department. He moved a resolution to the effect that "an authorized system should be adopted for extending the system of 'military labours to military works' to all stations of her Majesty's army." The point of view thus selected may be described as the abstract and philosophical. That economical advantage is foregone by the idleness of the soldier, when not under drill, is a proposition which may seem almost self-evident. Mr. Headlam, in seconding the motion, enforced the arguments of the hon. mover, by testifying, from his own experience as Judge Advocate, the fact that many of the crimes of which soldiers are guilty are really committed in consequence of the lack of employment. Thus far, the motion met with the cordial sympathy of Mr. Cardwell, who regarded everything which diminished idleness among soldiers as a boon, seeing that, in the army, as out of it, idleness was a fruitful source of evil. But the difficulty of superintendence arose as a detailed objection to the enforcement of any general rule.

It is at this point that the arguments which we have previously urged appear, to our judgment, to come in with irresistible practical force. To a certain extent we may consider the ground to be cleared by the discussion in the House of Commons. The old-fashioned notion that a soldier must be nothing but a soldier, has dropped out of sight. We are no longer told that stooping to use the spade and pickaxe prevents a

man from standing upright at drill. We hear nothing of that spirit of the martinet which, Mr. Kinglake tells us, made the Russian emperor so averse to enter on the Crimean War, because he had at last put his army on so satisfactory a footing. That men are to be drilled to such perfection that it is a pity and a shame ever to allow them to do anything but appear on parade, was not urged on the present occasion.

The grand idea that the army might, to its own advantage no less than to that of the rest of the nation, be made to a considerable extent a self-supporting institution, was not, indeed, distinctly present to any speaker who joined in the debate. No one questioned the advisability of taking steps in that direction. The only obstacles that blocked the course were those of detail. But these are precisely the most formidable. For it is when we descend from the region of the theoretically advisable to that of the practical, that all depends on detail. Thus the opposition of commanding officers is rather hinted at than brought distinctly forward. It is hinted at, however, as a fatal obstacle. Want of superintendence was another stumbling-block. It seemed to be tacitly assumed by General Herbert that, when engineer officers were not available, no others were capable of taking the direction of works. Thus in discovering detailed causes for the postponement of a scheme which was intended to prevent the waste of public money, we find the argument employed by the Hon. General that "another difficulty to be got over was the financial one. When engineer officers were not available to superintend the labour of soldiers, it was in many instances cheaper to have work done by contract."

An argument of this nature has a wider range than its author appears to have contemplated. If urged against the general theory, that the army should be rendered, as far as possible, self-supporting, it has neither weight nor relevance. It is a simple admission of the inferior and inadequate state of our military education, outside of one very distinguished corps; and it implies more than it admits, for it seems to contemplate the adhesion to a system of passive resistance to improvement. Officers cannot be expected, this objection implies, to know anything about brickwork, or masonry, or carpentry, or any useful art. If they know—we were going to say, the art of war, but the art of war includes making the best possible instrument of the soldier—if they know their military hand-books, it is all that the country has any right to expect from them! The best friends and the most genuine admirers of the British army take a widely different view—a view diametrically antagonistic to that which would prevent a single brick from being laid without the presence of a lieutenant of Engineers.

The mode in which we have ourselves approached this important subject was derived from a long and wide practical experience. It includes not only a personal acquaintance with the great departments of our own public works, with the procedures of the Ordnance (as it was) and of the Admiralty, but one with that which is yet more germane to the matter in hand, namely, the practical education of the workman.

An engineer who, in the remoter districts of the British Isles, as well as in various parts of the continent of Europe, has had to form workmen out of clumsy, untaught, less than half-fledged, agricultural labourers, has an advantage in approaching the question of cost, which few other men can possess: and the experience to which we refer has been acquired under circumstances of difficulty compared to which the attempt to introduce remunerative labour into the army, bears no proportion at all. For with the civilian, moral obstacles occur which tax the utmost skill and the most sustained energy to overcome. In opening a new district for a road,

a harbour, or a railway, it is by no means a simple matter to commence operations. If the country be, indeed, entirely uninhabited, as in the *Landes* of the South of France, the difficulties may be said to be at a minimum. Then it is only necessary to collect the workmen, to house them, and to feed them. The obstacles, in this case, to a rapid and economical progress, arise either from the national or provincial jealousies of the labourers, if brought from different districts, or from their coming to the conclusion that they are masters of the situation, if they fraternize. Between this Scylla and Charybdis, however, it is not impossible to steer.

But in a country which is not desolate, but only remote, the case is different. The reasons for the employment of local labour are frequently irresistible. Sometimes it is matter of contract or of Governmental direction that such should be the case. Everywhere the local labourer expects employment, and regards it as a right. He brings to the works a good-will, an untrained pair of arms, and that resentment at the idea that any other workman is his better, which is always most keen in proportion to its unfounded character. Then the local magnates exert a disturbing and somewhat inconsistent influence. The invading engineer is expected to employ local labour, because it will reduce the poor-rates; but he is not to employ any but surplus labour, or to pay more than the local rate of wages, because in either case the agricultural labourer will be encouraged to strike against the farmer. We could cite not a few instances. In one, the local rate of wages for agricultural labour was eight-pence a day; the rate of payment at that time for the best-paid "navvy," the "getter" or pick-man, was 4s. 3d., and from that down to 9d. The county magistrates considered it outrageous that the contractor should pay more than the lower figure. The country people considered it unjust that "foreigners," who spent great part of their wages in beef and beer, should come into their country and earn from six to seven times as much for a day's work as they could do themselves. They could not understand that the sturdy giant, who would consume half-a-crown's worth of substantial solid and liquid food during his ten hours of labour, was actually converting his beef and beer into a measurable mechanical "duty." With the best will in the world, the countryman could not fill sixteen cubic yards of earth into a wagon, if he only ate eight-pennyworth of food. The actual cost of the mechanical duty, however effected, was far more. For a day or two pluck and resolve may do much, but in the long run mechanical law must prevail. For a man to do a man's work he must eat a man's dinner.

Little by little these difficulties were overcome. They are of a nature to be overcome by resolution, good temper, and perseverance. The eight-penny workmen, who could not at first do eight-pennyworth of work, learned in a few months to earn their half-crown per diem. They also managed to consume no inconsiderable portion of the value of that coin. They improved in *physique* no less than in skill; and in decent self-respect as well as respect for their betters. They learned to distinguish between the skilled and the unskilled workman, and to avail themselves of the advantage of the guidance of the former. And thus, in the particular case we have in view, by the time that one of the most out-lying districts of Great Britain was opened to the flow of an important stream of through, as well as of local, traffic, the peasantry of the districts served had been raised from a state that could hardly be denominated as anything better than that of savages, to be men who could command, as well as deserve, remunerative employment.

The material here employed was identical with that from which care and discipline form the British soldier. Few natives of Northern

Europe are so "unhandy" as the English rustic, "pure and simple." Few have in them the elements of so good a workman when educated. None, Marshal Soult thought, make better soldiers, and the patriotic Frenchman piously thanked God that their numbers were so few.

What the civil engineer had to deal with in the case we have quoted is the problem now before the Secretary at War. But, in the army, the case is every way more simple. For to teach the utterly untaught peasant, is a widely different task from teaching the disciplined man. The latter has, at all events, learned the moral part of the lesson, how to look up to the hetter instructed for guidance, and how to give prompt obedience to the voice of authority.

We cannot, therefore, hesitate to reiterate the opinion that the technical education of the soldier, not in the use of firearms alone, but in that of the pick, the spade, the trowel, the chisel, the saw,—in fact, in the general implements of the more rough and ready of the crafts of the builder,—is an imperative national duty. We insist, in the first instance, on this branch of military education, because self-defence is the first requisite. In case of war, the English soldier, taking him as he actually is, would be placed at a cruel disadvantage as compared with the soldier of some more provident nations. He would be almost as unfairly pitted against either the French or the American soldier as if he were sent with the old-fashioned musket to face the *Chassepot* and the repeating rifle.

Each day that is added to the history of arms of offence increases their irresistible power. There is no courage in facing the inevitable when it is evidently useless to do so. Cover from fire is becoming the first point to be regarded, even in the field. The troops that can most readily, in the face of the enemy, provide themselves with cover, will remain on the ground. The exposed masses will be not decimated, but annihilated.

In the construction of our military works, changed as they must all sooner or later be by the introduction of the Moncrief system, we have an admirable opportunity for giving the whole of our line this most essential education. We may at once render our troops hetter soldiers, more educated workmen, and productive labourers. But the attempt must be guided by a wise experience. No increase of the duties of the soldier must be introduced with a high hand. The demoralisation of the army would be the result of such an endeavour. The plan must be so digested as to tempt both officers and men to volunteer. And the simple, and no way dishonourable, temptation, must be a combination of distinction for extra service, with payment for work done.

No man of adequate experience can doubt that on the first attempt to execute public works, or large military works, by troops of the line, there would be no economy effected. If the men were paid by time, the work done would be over costed. If they were paid by piece, they would be altogether discontented with the remuneration; and the disproportion and discontent would be even greater on the part of the officers, on whose leisure the nation has no right to make any gratuitous demand not contemplated when they took their commissions.

But with systematic training, calling in, probably, in the first instance, the assistance of the civil engineer and a few of his subordinates, and deriving no little aid from those meritorious men, the non-commissioned officers of the Sappers, these financial difficulties would disappear. It must be borne in mind that a considerable pecuniary gain will be effected so soon as the troops are educated to their new implements. But, in the first instance, an outlay will be requisite. That outlay will be recouped, but it must not be deferred. The men must be encouraged—not disgusted. This encouragement, our civil experience tells us, can only be afforded by paying, in the first instance, by time. When the soldier has become a craftsman, he can be paid by the piece. He would be the gainer, and so would be the nation.

All minor and subsidiary crafts would follow, in their development, the establishment of the first practical success. To induce the soldier to become an engineer is a duty which we shall neglect at our peril. To attempt to force him to become one would be to repeat the costly folly of Louis XIV., who set his army to work to bring water for his fountains at Versailles. To lead and encourage him thus to become a man, instead of a machine, is that for which we are urgent. And when we have once taken this course; when every

commanding officer feels that he must rely on his own forces for what human hands may effect; when we come to take it for granted that a regiment of infantry ought to be at least as ready to provide for themselves defence and shelter as a party of hunters or of squatters would consider to be requisite in their own case, the minor and less essential details will follow. The men will learn naturally to assert themselves according to their trades. Aptness will go for much; civil experience, when it exists, will go for more. The framing of a code of regulations, providing for the due remuneration of all kinds of work, will not be a more insurmountable difficulty than the framing of an engineer's schedule of prices was, hore the time of the Stephensons. By adopting this course we shall at once raise the *morale* of the soldier; produce a far more efficient combatant, and a combatant who, like the Spartans, will consider defence of his own life a prime military duty; and tend towards the development of what the world has not yet seen, an army that shall be something more than a collection of men, *fruges consumere nati*, whose only mission is to waste and to destroy.

DIARY OF JOHN MANNINGHAM.*

AMONG the Harleian Manuscripts in the British Museum is a small book of 133 pages, scarcely 6 in. long by 4 in., in which, with small neat penmanship in close regular lines, one of the young gallants of the days of Queen Elizabeth and her successor jotted down observations, occurrences, the witty sayings of his friends, or of his contemporaries as related to him by his friends, notes of information he wished to remember, scraps of foreign news, the talk of the town, and the pith of the sermons he heard preached. The diminutive volume has been looked through more than once by historians seeking to know more of the life of those days of the ruff and rapier, or of individuals who lived in them; and they made out from its contents that the diarist was probably a student of the Middle Temple. They found jottings relating to such celebrities as Shakespeare, Ben Jonson, old Stowe the antiquary, Sir Thomas Bodley, the unhappy Sir Thomas Overbury, the scarcely less unfortunate Earl of Northumberland, who was imprisoned in the Tower for fifteen years; Sir Walter Raleigh, Sir Thomas More, Bacon, the Lord Keeper Egerton; the nimbleprossible alter Raleigh, as well as author of the famous *Coke upon Lyttelton*; Pym, the Cecilis, Fleetwood, the recorder of Tudor London, as well as to a host of judges and divines; just as the diary of a young Templar of the present day might refer to the leading actors, statesmen, legal celebrities, and other public characters of our time. They also found notices of the queen, especially of her last illness and death; and of the proclamation of James, and the manner in which it was received; and of the family of Oliver Cromwell. The varied interest of this diary awakened a curiosity as to the authorship of it. Mr. Payne Collier, in his "Annals of the Stage," first pointed out that the writer must have been a barrister, and had numerous relations in Kent whom he frequently visited. The late Mr. Joseph Hunter, searching for further "Illustrations of Shakespeare," took the trouble to follow the clues the diary afforded further, and succeeded in identifying its writer most satisfactorily. He found, by many ingenious references and inquiries that we need not follow, that the young gallant in question was John Manningham, the adopted son and heir of his cousin Richard Manningham, of Bradbourne, Kent, and was entered a student of the Middle Temple in 1597-8, and who, having been on the books of barrister; and was called to the degree of barrister; and ultimately, on the death of his cousin, whom he called his father-in-love, came into possession of the Bradbourne estate; married Anne Curle, the sister of his "chamber-fellow" at the Temple, and of Dr. Curle, Dean of Lichfield, had a family; and died 1621-2. Thus the little volume was invested with a fresh interest: its writer was no longer one of the nameless and indistinguishable persons that made up a Tudor crowd, but had an individual history: the estate he enjoyed

down among the cherry orchards and hop-gardens, the monument he placed in the noble old church at East Malling to the memory of his benefactor, his will, as well as that of his cousin, were all tangible facts like so many illustrations to it.

We now come to the point with which we are most concerned. The Diary of John Manningham has just been printed at the expense of Mr. Tite, and presented by him to the members of the Camden Society, of which he is president. He tells us he wished to make some acknowledgment of his sense of the honour the Society conferred upon him in appointing him the successor of the Marquis Camden, and at first thought of printing one of the manuscripts in his own library for presentation to the members; but on taking Mr. John Bruce into counsel, who pointed out the intrinsic interest of John Manningham's diary in the British Museum, he resolved upon selecting this instead. Mr. Tite also tells us that Mr. Bruce saw the relic safely through the press; and we may see for ourselves that he has prefaced it with a sane and succinct digest of its contents. Very pleasant reading is Mr. Bruce's account of the diary: fresh, short, full of movement and sparkle, like one of the Templar's spring afternoons upon the Thames, when he took wherry to Richmond "to be assured whether the Queens were living or dead." To Mr. Hunter's researches respecting the Manningham family he has added discoveries of his own, which he has woven into a connected narrative; but it is in the methodical assortment of the leading facts recorded in the diary that we are most gratified. He shows us through the volume, as it were, turning over every page with us, grouping incidents, pointing out individuals, explaining associations, accounting for every thing mentioned, save one. This one unexplained puzzle is "Kentish taylor." The diarist wrote one day in June, 1602, "Kentish taylor are nowe turned to such spectacles, soe that if a man put them on his nose he shall haue all the land he can see." Mr. Bruce consulted the late founder of the Kent Archaeological Society as to the nature of these hindling tails, but seems to have received no information to clear up the mystery before his death. Whether they have any connexion with the old legend of Kentish tails, he says, he knows not, and leaves the question in the dark. Perhaps some of our readers can throw a little light upon this matter.

We will now turn over the pages of this valuable accession to our stores of information of the Tudor period in our readers' company. The first date is March 28, 1602. This was Palm Sunday, and the entry relates to the sermon preached at the Temple. In this and all the sermons, in fine, it is curious to note the epigrammatic pungency, the *conceits*, the types, and the frequent Latin quotations. Thus one divine begins his sermon, "The love of the world is the divels eldest sonne;" and another thus, "The proverbe is that building is a thiefe, because it makes us lay out more money then we thought on;" but we pass on to more other entries of a more general nature. The next somewhat unchronologically relates to a visit to the diarist's father-in-love at Bradbourne:—

"At Bradborne with my cosen this Christmas, 1601. My cosen told me that Mr. Ribbers would give his cosen Cretwright 3,000*l.* for his leas of the Abbey of towne Mallinges, the reversion whereof the L. Cobham had purchased of hir M. jestie.

An old child sucks hard; [i.e.], children when they growe to age prone chareschie.

Peter Conrthope said it would be more beneficial if our wall and cloth were not to be transported but in colours; but my cosen said we may as well make it into clothes and garments, as ye it in colours before we carry it oner; for both variable, and as much obange in colour as fashion."

In this way the young Templar notes down the mixed information he gleans as he lives. His cousin, before the purchase of the Bradbourne estate, was a London merchant and a member of the Mercers' Company; consequently well fitted to give an opinion on the subject discussed above. In the course of this same visit he rode with his cousin's wife, probably behind him, to Maidstone, and dined with a cousin Gellibrand, a physician there, who showed him a skull in his study, and pointed out the seam, or suture, which he told him, midwives used in female children before the wit could enter, adding, "and that is a reason that women hee such foolcs ever after." Perhaps thus riding through the heart of the hop country put his cousin's wife in mind of her young days, for she told him when she was first married to her first husband she was riding behind him one day and slipped down, and he rode on without looking to

* Diary of John Manningham, of the Middle Temple, and of Bradbourne, Kent, Barrister-at-Law, 1602-3. Edited from the original manuscript by Mr. John Bruce, and presented to the Camden Society by Mr. William Tite, M.P., President of the Society. Westminster: printed by J. B. Nichols & Sons. 1865.

see what had become of her, or waiting to help her up again, "so shee went soe long a foote that shee tooke it soe unkinde that shee thought never to have come againe to him, but to have sought a service in some vnkowne place; but he tooke hir at last." This discipline under her first husband did not prevent her, from being perverse under the genial sway of her second, Richard Manningham; for we read further on that she contradicts him vehemently and obstinately before company, and then kisses his hand penitently, "with an extreme kind of flattery." On the 22nd of January, John Manningham is in London again, hearing and noting the news from Ostend, concerning the negotiation Sir F. Vere was deputed to make with the archduke; the arrest of several merchants for shipping more cloth than they were entitled to do by their licences; a grievance of the company of Pewterers; anecdotes, anagrams, epitaphs; a new order by the benchers that the students should not eat bread newer than two days old; an account of a play called "Twelve Night; or, What You Will," performed "at our feat," the arrest of a Cousin Norton, with his application to Sir Robert Cecil to bring one Copping, "a notable riche practiser," who has charge of his lunatic mother and their goods, to order; and town talk of various sorts; but in February he revisits his "cosen in Kent." On the 19th he was at Malling with Mr. Richers, and seems to hear much of a claim from Mr. Cartwright upon divers parcels of land belonging to Richard Manningham, called concealed land, which his cosin acknowledged to exist, but could not define how it was bounded. The countryside was then talking of Sir Robert Sydney having bought Oxford House, and selling it again "by parcels;" of Mr. Jo. Sedley building a house in Aylesford that cost above 4,000l., and yet had but fourteen acres of ground belonging to it, and the probability that Lord Bechurst would take it off his hands.

In May John Manningham was in London again, recording for that month scarcely anything but elaborate notes of the sermons he heard at the Temple Church, at "Paules Crosse," and at Westminster successively. In June his entries are more miscellaneous. He tells the talk be and Mr. Foster, of Lincoln's-inn, had, as they walked together to Westminster, about Sir Thomas More and his witticisms over his altered fortunes; how, when he was in office, his gentlemen attendants used to notify to his lady when he had left church, that she might follow; but on his deprivation of place he went himself and opened the door of her pew, saying "Madame, his lordship is gone before," alluding to his loss of dignity. "Come, wife, nowe wee may goe together and talke." Soon after this there is one of the frequent interruptions of the regularity of the entries to record information acquired in a visit to Huntingdonshire, where a horse-race was run at Sapley, in which Mr. Oliver Cromwell's horse won the "silver bell," and Mr. Cromwell, the nucle of the future Protector, "bad the glory of the day." This Mr. Oliver Cromwell was married to a distant connexion of Richard Manningham's first wife; hence probably the Templar's interest in him and his family.

"Upon marriage with the Lady Poliuzeina (the connexion to which we refer, Sir Henry Cromwell conveyed his lands unto his sonne, Mr. Oliver, in marriage. See Mr. Oliver, with his owne and his ladies living, is the greatest esquire in those partes, thought to be worth neere 5,000l. per annum. There lives a housefull at Hinchbrook, like a kennell.

On Easter-day, Dr. Chamberlaine was at Sir Henry Cromwell's, and ministered the Communion, but without booke."

Among the Templar's acquaintances was the Queen's chaplain, Dr. Parry, to whom he is indebted for most of the particulars he has dotted down about his sovereign lady. Once she told Dr. Parry she would not bear him preach on Good Friday, because she was sure he would preach against her; but heard him nevertheless. Another time she forbade Dr. Barlowe, who was also a chaplain, to come into her presence because he had preached against the Earl of Essex, and when he presumed to do so, notwithstanding, she taunted him curiously. "O, sir," said she, "wee heare you are an honest man: You are an honest man." &c. These items of royal vacillation he seems to have received when visiting Dr. Parry, before making another journey to Bradbourne. Further on, we shall find John Manningham waiting upon this divine at Court, dining with him in the Queen's palace, and finally hearing from his lips an account of the last moments of the grand old lioness. Meanwhile, he returned to London, a thirty-mile

journey only from Malling. We next come upon two consecutive entries relating to joiners:—

"Mr. Stenon Beckingham, of Hertfordshire, was brought into the Kings Bench at the suit of two poor ioyers whom he hath undone; they seeld his house, which came to a matter of some 80l., and they could hardly obtaine any thing by suit. A man of a hott colerick disposition, a creaking lond voyce, a greay whitish head, a reddish beard, of long starring mouchetons; wore an outworne muff with two old gold laces, a playne falling hand; his cuffs wrought with colored silke and gold, a satin doublet, a wrought wastecote, &c. at fawle quis cognoscat, haud fawilat in cum alije centre posset, qui voo, facte, vestitu sua secum disidet. One of his witnesses would not answer anything for him vntill he were payd his charges in the face of the court. Soe little confidence had he in his credit who had dealt soe hardly with his ioyers.

On Fossar, an old ioyner dwelling [in] Paules Church-yard, a common and a good measure of ioyners work."

Soon after this his chamber-fellow told him how the founder of the Bodleian library had courted and won a rich widow in her garden while a fellow suitor waited in her house and held "his cardes" for him; and some one else told him of an epitaph upon a bellows-maker, to which the initials of Ben Jonson are attached:—

"Here lyes Jo. Potterell, a maker of bellowes, Master of his trade, and king of good fellows; Yet for all this, at the houre of his death, He that made bellowes could not make breath. (B. J.)"

And then thirteen closely-written pages are filled with the notes of an able sermon preached by Dr. King, rector of St. Andrew's, Holborn, at Paul's Cross, October 24, 1602; and two more with the speech of Mr. Croke, the recorder of London, on the nomination of Mr. Lee, as Mayor, at the bar, "in the Chequer," and the replies of the Lord Chief Baron Perian, and of the Lord Treasurer. The first of these said an improvement in the management of the city might be effected by a monthly search for idle persons and "unaisierles men," of whom there were then 30,000 in London, all of whom ought to be sought out and punished as they were "the very scumme of England," and the "sink of iniquity." The last said there were two things her majesty wished to see attended to in the city, to his certain knowledge: one was to make "in this time of plenty" great stores of corn in the magazines to serve for occasions, and from which the poor could be served in times of dearth; and the other was the foundation and furnishing of hospitals, neglects he advised the mayor to especially amend "while their fault sleeps in the bosom of bir Majesties clemency." "Theise were things," continued the Lord Treasurer, poet and statesman, better known as Earl Dorset, "must be better regarded than they have bin; otherwise, howsoever he honours the Citye in his priat person, yet it is his dutie in regard of his place to call them to account for it." And the young Templar, unimpressed with the municipal formalities, jots down below this the scuffling remark of one of his confères:—

"One said the Recorder was the mouth of the Citye; then the Citye hath a black mouth, said Harwell, for he is a very blacke man."

In November, among other talk, he notes how a grant of land was made to one Burke, in Ireland, and taken away from him again, to appease another Burke, who was jealous of the liberality; how Sir Robert undertakes nothing but what he can blame some one else for, should the enterprise be unsuccessful; how Plowden had such a check as he never had before for saying to a "circumventing justice" that "neither justice nor counsell could commit any to prison without a cause;" how the Earl of Northumberland was living apart again from his wife, the daughter of the first Earl of Essex, notwithstanding that she had brought him an heir, which he had said should be the "soder of their reconciliation," and was living at Sion House with the child, playing with it, but being otherwise "of a very melancholy spirit;" how Mr. Overbury, in telling that a thief had stolen his cloak from his chamber, said "the villaine had gotten a cloke for his knavery;" how his saucy landress answered him, "I was brought up as my freuds were able; when manners were in the hall, I was in the stable," when he rebuked her for her boldness; how "the old Lord Treasurers wit was as it seemes of Borrowe Englishe tenure, for it descended to bis younger sonne, Sir Robert;" and similar gossip. Then come a string of poses for a jet ring lued with silver, with their significations, a selection of aphorisms, more anecdotes, rumours, sermons, an anagram, with device—"John Swete: wee shine to: a companie of stars about the moon;" quotations from hooks, and, hy-and-hy, an account of the Queen's visit to Sir Robert Cecil:—

"On Monday last the Queen dyed at Sir Robert Cecil's new house in the Siran. Shee was very royally

entertained, richely presented, and marvelous well contented; but at hir departure shee strayed her foot. His hall was well furnished with choice weapons, which her Majesty took speciall notice of. Sundry deuses; at hir entrance, three women, a maid, a widow, and a wife, each commending their owne states, but the virgin preferred; an other, on attired in habit of a Turke deyrans to see hir Majesty, but as a stranger without hope of such grace, in regard of the retired manner of hir lord, complained; answered made, how gracious hir Majesty in admitting to presence, and howe able to discusse in any language; which the Turke admired, and, admitted, presents hir with a riche mantle, &c."

In December he called upon Stowe the antiquary, and when he was at home again dotted down as much as he could remember of what the quaint old gentleman had told him. They seem first to have discussed his portrait prefixed to his survey of London. A "modell" of this, Stowe said, was found in the study of the Recorder Fleetwood, with the inscription, "Johannes Stowa, Antiquarius Angliæ." Then they touched upon the unremunerative character of the historian's labours, the old antiquary declaring, doubtless smiling at the retrospect, that he thought himself worthy of the title the Recorder conferred upon him, for he had no other gain for his "travaille." Perhaps the Templar led up to the next explanation by asking why many of the newest monuments were not mentioned in the survey. We can see the genuine antiquary in the reply that as the men who had placed these monuments had defaced or removed others of antiquity, he was determined, as far as he was concerned, that they should be deprived of that memory or record of which they had deprived others. And, lastly, the old gentleman told the young harrier a legal fact of which he does not seem to have been aware:— "He told me that the cheife citizens of London in ancient tymes were called Barons, and soe divers Kinges wrote unto them, 'Portegretio et Baronibus suis Londoniæ,' and the ancient seale had this circumscription, 'Sigillum Baronum Londoniarum.'" We may picture the slow, stiff how of the antiquary, then almost an octogenarian, and the dash and flowing ease with which John Manningham took his leave, and turned his face towards the Temple again.

Christmas sees the diarist once more at Bradbourne, where his cosin tells him the news of the county as before, and deutes him to see to some legal business for him. He made a round of family visits at this time, sleeping one night at his "cosen Chappans at Godmersham," dining one day at his "cosen Cranmers at Canterbury," sleeping another night at his "cosen Watts, hy Sandwich," who rode with him next day to Canterbury, where they dined together at his "cosen Cranmers." Between mention of this journey and the dinner there is a "rime" entered which probably Cousin Watts told him as they rode along the winty road and through the hare lanes, and now and then took to a bridle-path:—

"Sir Wa. Rawley made this rime upon the name of a gallant, one Mr. Noel,—
The word of denial, and the letter of fry,
Makes the gent. name that will never be thrify. (Noe. L.)

And Noels answer,
The foe to the stommeche, and the word of disgrace,
Shewes the gent. name with the hold face. (Raw. Ly.)

The next entries include notice of the good fortune of Mr. Bodley, which hath made the famous library at Oxford; more anecdotes, gossip, rumours, observations;—"the play at shuntlecock is become soe much in request at court that the making shuntlecockes is almost growne a trade in London;" all dated February, 1602. The next few pages, dated March, tells us more of the Court. We may be sure there was no play of shuntlecock going on when the young Templar made his way to Richmond on the 23rd of March, to ascertain the truth of the rumours that were in circulation of the Queen's death. He heard Dr. Parry preach and pray for her, both before and after the sermon, which assured him she was still living; and then he dined with him in the Privy Chamber, and understood from him and the Bishop of Chichester, the Dean of Canterbury, and Dean of Windsor, the particulars of her Majesty's malady; how she had been melancholy for three or four months, but within the last fortnight had become much worse, through her obstinacy in not taking any remedy, or food, or rest in bed; and how she now laid "very pensive and silent," almost speechless, yet conscious enough to delight in prayer, and hng the hand of the Archbishop when he spoke of Heaven and its joys.

"24 Mar. 1602. This morning about three at clocke her majesty departed this life, mildly like a lambe, easily like a ripe apple from a tree, cum leue quadam ferre, abaque gemita. Dr. Parry told me that he was present,

and sent his prayers before his soule; and I doubt not but shee is amongst the royall saints in Heaven in eternal joyes."

This pious and loyal expectation of the young barrister seems to have been shared by a large proportion of her subjects. The regret was so general and so genuine that the people had no voice for shouting when the Council and a company of noblemen, headed by Sir Robert Cecil, proclaimed James the Sixth of Scotland King of England at ten o'clock the same morning at Whitehall gates and again in Cheapside; though they recovered themselves sufficiently towards nightfall as to light bonfires, and set the bells a-ringing. "I think," wrote the diarist, with his heart full of regard for the dead queen, "the sorrow for her Majesty's departure was soe deep on many hearts they could not so suddenly showe any great joy, though it could not be lesse then exceeding greate for the succession of soe worthy a king." The content at the quiet accession of James was doubtless the greater for the expectation that had prevailed, that the queen's death would be signal for the many rival claimants of the throne to come forward; nevertheless, the transitory nature of all things must have jarred upon his mind when he wrote, before he went to rest on this eventful day, "This evening prayer at Paules the King was publickly prayed for in forme as our Queen used to be." Her fresh memory does not pass away from him so speedily, for, interspersed with various news from Scotland of the new monarch, and notices of the Scottish nobility with their "leeping, fumbling language," on the following pages, dated 1603, are entries such as:—

"Dr. Parry told me the Countess Kildare assured him that the Queenes caused the ring wherewith shee was wedded to the crowne, to be cutt from hir finger some six weekes before hir death, but wore a ring which the Earl of Essex gave hir unto the day of hir death.

It is certain the Queen was not embowelled, but wrapt up in cere cloth, and that they cut it, through the covetousness of them that desired hir, of the allowance of cloth was given them for that purpose.

I heard the Queene left behinde hir in money, plate, and jewels, the value of 12,000,000*l.*, whereof in gold is said, 400,000*l.*"

And thus we come towards the end of this communicative little hook. The last few lines record news from turbulent Ireland. Tyrone had submitted, not having heard of the Queen's death, and Tirrill had also given himself up; and then John Manningham had filled up his diary, and it was laid aside.

For our share of the pleasure of its perusal in our readers' company we cordially thank Mr. Tite.

VISION IN ITS RELATIONS TO THE FINE ARTS.*

The static arts,† painting, sculpture, architecture, have two modes of expression, and two—form and colour. For the appreciation of both we are dependent upon the eye: hence it follows as a natural sequence, that the conceptions of the beautiful for which we are indebted to this organ, are subject to certain restrictions imposed by the physical laws of vision. It may indeed be said that there is a science of Optical Aesthetics, whose laws have never yet been formulated. Raeb as the attempt may appear to subject our mental emotions to any sort of material control—savouring somewhat of irreverence, the contemplation of art-mysteries with the cold eye of the physicist—aesthetics has no cause to dread the encroachment of the exact sciences upon her domain.

There is a law, the result of the limited capabilities of human vision, which affects our appreciation of size and colour alike.

This law, which was first recognized by M. Fechner, has been rightly regarded by him as psychological rather than physiological, seeing that it corresponds to the transformation of a material impression into a mental emotion.

We will endeavour to explain it, taking, in the first instance, the case of lines. Place two lines of equal length side by side: we evoke a consciousness of their equality. Let one of the lines be lengthened by the successive addition of equal increments, and the illusion will continue until the difference acquires a certain definite proportion to the original length. This proportion no doubt will vary in different individuals. In my own case it is about equal to a millimetre in lines of a decimetre in length, or as 1 : 100.

* Extracted from an article in the "Revue des Deux Mondes," by M. Auguste Laugel.

† Painting, sculpture, and architecture are classed by M. Laugel as static arts; music, as involving no additional element, that of time, as a dynamic art.

When this proportion is departed from, either in excess or defect, a sense of inequality is experienced; but where it is not altered, the two materially dissimilar images are identical in their effects.

This phenomenon, which is at once physiological and psychological, is easily explained by the consideration that our perceptive faculties are restricted within certain limits. It is worthy of notice that if we repeat these experiments with different lines of various lengths, we shall find that the proportion remains constant as long as the lines do not greatly exceed in length those which the eye is accustomed to regard.

From this we must conclude that our perception of size becomes more obtuse as the dimensions of objects are augmented; in familiar objects it is in direct proportion to the size of the objects themselves.

My eyes, which readily detect a difference of 1 millimetre in lines of a decimetre length, can appreciate no difference under 2 millimetres in lines of 2 decimetres; nor under 1 centimetre in those of 1 metre.

In very long lines the proportion is slightly increased—at first to 1 : 95; afterwards to 1 : 90. This increase takes place very slowly; so that generally speaking, the larger the object seen, the less capable we are of appreciating differences in its proportions.

This law is of great importance, and is equally applicable to all our perceptive faculties. Let us consider it in reference to the subject of Light. Illuminate a white screen by means of two wax candles of equal size, in front of which hang a ring or some such object, so as to throw two shadows upon the screen. By advancing or retiring one of the candles we modify the depth of the shadow cast by it, on the screen, and thus we are enabled to compare the luminous intensities of the candles themselves. The candle may be removed so far from the screen that the shadow becomes invisible. It exists still, but it is imperceptible. Measuring the respective distances of the candles from the screen, we shall find that at the instant of the disappearance of one shadow the luminous intensity are in the relative proportion of 1 : 100. This experiment shows that the eye is incapable of appreciating a difference in luminosity equal to $\frac{1}{100}$ of the intensity of a wax candle. Let us now substitute jets of flame or other brilliant objects for the candles, and repeat the experiments: the proportion remains the same: the eye accommodates itself anew to the circumstances of each case. The appreciable proportion becomes slightly increased with very bright objects, the luminous power of which greatly exceeds that to which the eye is accustomed. This, from the above cause, M. Helmholtz observes, can be detected slight cloudings and shadows upon surfaces which appeared to the eye to be equally and perfectly illumined throughout their whole extent.

A less delicate experiment will enable us to appreciate the universal applicability of this law. Take two nearly equal weights, one in each hand. The lighter the weights the more easily any slight difference between them can be detected. When once the arms are fatigued by heavy weights, the difference between which is small, the perceptive faculty becomes confused. When the weights are light, the appreciable differences are nearly proportionate to the weights themselves; but when the muscular tension is greatly increased, comparison becomes more and more difficult. In every case the mind compares its impressions with others of a like nature. It creates for itself a sort of standard, and its aptitude for appreciating differences of detail is proportioned to this standard. The mental effort is made unconsciously, and with the rapidity and certainty of an instinct.

Thus we are taught that our ideas of size are inseparable from those of measurement: whatever is undivided appears smaller than reality.

Here we have a second psychological law, equal in importance to that of Fechner. A multitude of examples might be adduced in proof of its existence.

Take two lines of equal length—one divided into a certain number of equal parts, the other undivided: the latter will appear the shorter. Divide a square surface by equidistant horizontal lines—it appears to gain in altitude; range the lines vertically, and its apparent breadth is increased. A right angle, subdivided by lines drawn from the apex, appears more obtuse than an ordinary right angle. A room

appears smaller when empty than when filled with furniture and other objects, which destroy the sense of distance. Painters know that their figures appear to grow, and swell out upon the canvas as the outlines become filled in.

The mind thus obeys a double law. First, it evokes a standard of comparison; and this standard having been found, it proportions its sensibility thereto. The human mind is not an inert mirror, across whose surface images flit capriciously. The lens of the eye does not more readily adapt itself to varying distances, than does our mental susceptibility to a diversity of impressions. It is by this peculiarity that we acquire our fixed impressions of natural objects, for it rarely happens that they are presented to us twice under precisely similar conditions, so as to produce images which are absolutely identical. The mysterious power which elaborates these impressions, in each case seizes upon the most permanent and indestructible element in the phenomenon. Sight-feeling intuitively becomes subordinated to sight-judgment. Of this we have proof in the fact that, if we desire to quicken our perceptive powers, it usually enforces to regard an object from an unaccustomed point of view.

To the amateur fixedly regarding a picture through his hand as through a telescope, or with head posed thoughtfully aside, the canvas seems to spring to life, the perspective to deepen out into the distance. Why is this? Simply because through these changes of position, the material side of the perceptive faculties resumes the predominance. Examine a landscape in any unusual manner, so that the vernal ray may pass under the arm, or between the legs: all seems transposed,—colours and forms alike appear more defined, more pronounced. Paintings upon ceilings, which involve a certain constraint in the effort to observe them, appear harsh and crude. The unaccustomed position in which they are seen acts more surely on the retina than on the sensorium, and evokes a material rather than an ideal sensation. When the eye reposes under ordinary circumstances upon the horizon, it loses to some extent its susceptibility to colour. We find it difficult to distinguish distant hills; while the distance covers them, in place of a greenish hue, with a bluish or purplish haze. We make no effort to follow the endless undulations of wide-spreading plains. This natural dulness of apprehension in regard to the nicer gradations of colour, and of luminous intensity, permits the painter's art to produce its illusory effects; for the light with which objects are shown by it, after all, the feeblest and most diluted imaginable. If we contrast photometrically the sunlight of one of Claude Lorraine's pieces with the light of the most miserable candle, we shall be astonished at the weakness of the former in comparison. Yet, in the picture, it suffices to light up the farthest depths, to gild the tops of the waves, to whiten the sails of the ships, to bring out the sunlit fronts of the buildings into marvellous relief.

The artist's work once before us, the eye accepts unhesitatingly the standard which he has been compelled by force of circumstances to adopt. Were it not for this precious faculty, the painter's art would be an impossibility,—the work of the most brilliant colourist would appear cold and poor.—Rembrandt's living forms would no longer be transmuted by that mystic aureola which fills the centre of his canvasses,—the "Sleeping Nymph" of Correggio would no longer repose in that glorious sunlight,—the most life-like conceptions would appear as faint ephes, thin shades!

The painter cannot cope with Nature in the intensity of his light; his resource lies in the skillful gradation of tints, and in contrasts. He should address himself to the imagination,—to the reflective powers; lure the observer's mind away from the material side of his subject; but when these primary conditions have been satisfied by due care in the selection and arrangement of the latter, it is still in his power, by attention to certain physical phenomena, to heighten the effect and lend to the ideal a material charm.

What these phenomena are, and what are their bearings upon questions of colour, size, and form, are points which we propose now briefly to discuss.

We all know that music takes cognizance of concords and discords of sound. Are there concords and discords of colour? Can certain tints be so blended as to produce upon the optic nerve effects analogous to those which harmony produces on the ear? Here it may be desirable to observe, once for all, that the laws of harmony

in colouring are at present but very imperfectly understood. The eye is gratified by the contrast of two complementary colours, because they illumine each other reciprocally—each appears the brighter for the contrast. But a pleasurable sensation appears also to arise from the toning down and general indistinctness which result from the juxtaposition of two closely-allied tints. The more we study the works of the great masters of the art, the more difficultly we experience in discovering any precise rule on the subject. Where the effect desired is brilliancy, distinctness, vigour, the painter instinctively resorts to the complementary colours, white and black, red and green, orange and blue, yellow and violet. When he wishes to employ three colours, he so arranges them that they may be as nearly as possible equi-distant on the prismatic scale. In the works of the Italian school we frequently meet with the union of red, green, and violet, or of red, blue, and yellow.

If, on the other hand, a softened effect is required, it must be sought in the application of tints which are more intimately related.

Lini, in his admirable frescoes, had no hesitation in intermingling draperies of violet, green, and pale blue—a colouring which harmonizes admirably with the mysterious softness of the rival of Leonardo. With equal hardihood, and with like success, we find him blending together all the various tints of reds and yellows. There are, in truth, no real discords in colour; but the admixture of different tints has different effects and varying expressions. White, rich hues, pure prismatic colours, are suggestive of joy, might, triumphal beauty; sorrow, abstraction, contemplation, require more complex and sober hues.

The painter should avoid any undue predominance of a single colour in his picture. The general effect should be, as far as possible, white or grey. Let the red be in excess, the retina will become fatigued, and the eye will, so to speak, see green, and the effect will be unnatural and dull. To give due luminous effect to a picture, the prismatic colours should be so distributed and balanced that the eye in travelling over the surface may not be fatigued by one colour more than another. It is marvellous with what skill this problem has been resolved in the vast compositions of Veronese. After prolonged contemplation of them, the eye retains a sensation of whiteness, of clearness, of distinct vision. On the other hand, there are pictures which produce the same effect upon the eye as a pane of coloured glass interposed between the landscape and the observer, which destroys every sense of reality.

For a like reason it is requisite to guard against placing pictures, especially if they be small in size, upon bright-coloured panels. Viewed against a violet background, a small picture looks yellow; on a red one, it appears green. In our opinion the most suitable colour is not white, for the thin tints of the painting would be impoverished by its juxtaposition, but a deep grey, as it is preferable to bring out the colours bodily, rather than to alter their effects by the contrast of complementary colours. The reddish-brown walls so common in museums are well enough suited to landscape pieces; but for portraits they are less so,—the latter often look best against a greenish background.

Here a question not unnaturally suggests itself as to the almost universal practice of enclosing paintings in gilt frames. To me it appears referrible to the fact that bright objects produce two dissimilar images simultaneously on the retina, and thus provoke a sense of relief or elevation. The brightness of the frame in these cases prepares the eye for the illusion by which the various details of the picture are thrown into the requisite degree of relief.

Leaving the subject of colour, we now come to the consideration of size and form. In painting, it is true, it is difficult to distinguish between colour and form; for on the flat surface of the canvas the artist can only produce the effect of distance by skillful gradations of colour. The study of the phenomena of vision shows us that our impressions of relief and of depression are due to the simultaneous reception on the retina of two images not rigidly coincident; but a picture presents a single image only, and can therefore never produce precisely the same impression as reality. Besides every picture has its own individual point of view, the centre of its perspective, the point to which all the visual rays converge. There is no need here of geometrical precision. The eye does not take in

the whole picture at one fixed glance; it travels over the surface, pauses for a second, travels on again, advances, recedes a little, ever preserving a certain liberty of movement. The size of the canvas should never be so great as to necessitate much movement in embracing its various parts, for in this case, as the position of the spectator changes, that of the picture should also change so as to appear under a new aspect. Hence the want of effect in long panoramic views. Hence it is, that wide compositions like Horace Vernet's "La Smola," and the "Caesar's Triumph" of Mantegna, at Hampton Court, violate a fundamental rule of art; they have no unity; the canvas is divided into a number of separate pictures, each one of which, no doubt, would be excellent if taken individually.

Theoretically, the image produced by a picture corresponds to one particular point of view. Consequently the size of the canvas should not exceed the limits of the field of vision. This is included by a horizontal angle of rather less than 100°, the vertical angle being still smaller, as the eyes and cheeks oppose material obstacles to its extension in that direction. Painters too often neglect these considerations. Landscape painters, more especially, rarely restrict their subjects within suitable limits. The frame should be as a window through which the prospect is seen; earth and sky should each appear in its due proportion. Whence, let us ask, do we derive that sense of the majestic which we all experience at the foot of a mountain, like the Jung-fra, or Monte Rosa, or Mont Blanc? It is that the whole field of vision is, as it were, filled by these overwhelming masses. We often hear it asserted that art can never reproduce these scenes! May it not be that the impressions they produce have never been thoroughly analyzed, and cannot, therefore, be placed upon the canvas? When we contemplate the ocean, sky and sea appear to divide the visual field as with a line, but the position of this line is by no means arbitrary: let it be placed too high or too low, and the effect is destroyed. A similar proportion is observable in landscapes of open plains. Ruysdael never fails in this particular, although his horizons have an unapproachable depth and reality about them. His clouds never float in a fantastic atmosphere. We see them, as it were, coming towards us in dense masses, lowering, full of wind. In his "Storm" we seem to feel the force of the hurricane, which bows all before it. In his "View on the Shore at Scheveningen," heavy volumes of cloud fill the entire sky, and brood over the ominous-looking, tempest-driven sea, whose turbid waves are yellow with the sand they have borne away from the shore. In this composition there is nothing more than the eye can embrace at a single glance, and yet without an effort the imagination is carried away for miles over those long sand-hills before the cold, gloomy, pitiless North Sea.

But when the painter essays the portrayal of human passion or emotion, this strict adherence to the truth is no longer indispensable. Art readily casts aside the trammels of a more rigorous perspective, and material objects often have an elliptic form, appears as a perfect sphere in the "Melancholy" of A. Durer—the artist's aim having been to suggest the idea of a sphere, interminable, interminate. So in the "Marriage of the Virgin," by Raffaele, the Temple in the distance is out of all proportion to the figures—it is far too small—but its rôle is to add a certain something to the general effect; to accentuate the composition; to give a more religious tone to the scene. Again, in the rival cartoon of "Paul Preaching," the architecture, the temples, columns, porticoes, are all types of the old Roman world, of which the speaker is a part. The laws of perspective are violated, but art is satisfied. The very stones, the monuments of an older civilization appear to re-echo the words of one who declares the tidings of a new dispensation! The miniature painters of the Middle Ages—the German and Flemish masters—often carried this licence beyond all bounds of moderation. Their compositions are too synthetic. Their delight was to crowd a dozen pictures into one; and, without regard to size or distance, to surround their subjects with numberless additional of suggestive accessories.

Since the Renaissance, more attention has been paid to material truth, but it has never degenerated into a geometrical precision which would overwhelm the ideal under a preponderance of material objects.

In painting we have two dimensions only, with which to produce the effect of three. A single image only is presented to the eye, an image which can therefore never produce a stereoscopic illusion. The only means available for the representation of distance are shadows, carefully graduated tints, outline.

To produce an effect of size, the artist has to appeal to that faculty, which we all instinctively possess, of estimating the magnitude of objects by their relative proportion, rather than by their absolute extent. A picture, as we have already said, should be as a window through which we view the objects themselves, the smallest being the farthest distant, the largest the nearest to us. A reduction of size in the objects depicted should thus, strictly speaking, involve a toning down of their hues. A small copy of a large composition should not be executed with precisely the same scale of colours as the original. But painters take advantage of the inherent indifferency of the eye to the degree of intensity of luminous power; and the scope of their palette is, moreover, in reality so restricted that they are compelled, whatever may be the size of the objects represented, to aim at the most marked effects.

In passing through an art-gallery, we see compositions of all sizes, large and small alike, executed in precisely similar tints. Indeed, the special charm of miniature painting lies in the fact that the artist is enabled to disguise the poverty of his palette by reducing the size of objects without diminishing the richness of their colouring.

Bas-relief forms a sort of connecting link between painting and sculpture. The stereoscopic illusion which is wanting in paintings is here present, and the eye readily assigns their correct positions in nature to objects which are in reality confined between two closely contiguous planes. In these cases the imagination is singularly tractable, but we should guard against its abuse. Attempts to give a correct natural outline to certain portions of a bas-relief defeat their own ends: the eye becomes bewildered. Conventionality once admitted must be respected, for our perceptive faculties, though they readily adapt themselves to different standards of comparison, become speedily confused by the presence of several standards at once.

Bas-relief requires broad surfaces and strong lights, where the shadows are rapidly formed and sharply defined. Direct sunlight is specially favourable to its effects. The Greeks showed sound judgment in employing it freely in the exterior decoration of their temples.

Sculpture and architecture possess three dimensions. They have thus greater liberty in the reproduction of form. They are free from the restrictions of the painter's art, but they have difficulties of their own in the nature of the materials at the artist's disposal, the tardiness and material stability which they impose. An air of endurance, of immortality, of serenity, is essential to the sculptor's handiwork. A statue is seen from afar; the warm hues of nature are wanting, for even the advocates of polychromy have never exceeded a few light flat tints. It should speak to the imagination rather than to the eye. Its anatomy should be just, but it need not be the anatomy of the schools. The general effect would be spoiled by too great a profusion of details. The waving of the hair, the swelling of the muscles, the folds of the drapery, should rather serve as it were to abstract the idea of mechanical effort from the marble.

Fechner's law has a constant application alike to sculpture and to architecture. Within ordinary limits, as we have seen, the sensibility of the eye to matters of detail is in direct proportion to the size of the objects. Minute details are permissible in small subjects: the degree of finish should correspond with the size of the ornament. But in large statues, for a like reason, the artist should confine himself to broad details.

In architectural designs, the proportions of the human frame and of objects with which we are most familiar are usually exceeded. To this case, therefore, is applicable the portions of Fechner's law according to which our perceptive powers become weakened by an increase in the size of the object regarded. In this law we shall find the explanation of a long-recognized fact—viz., that in a perfect architectural design the taste is always offended by a reduction of the scale to one-half or one-third of the original size.

This is equally true in the opposite sense. In enlarging a monument, the larger the scale the simpler should be the details, the more marked

the accentuation,—all the proportions should be changed in unison with the increase of size.

Herein lies the real difficulty of architectural design. The architect has never a correct model before him. He is guided by traditions, by styles, by necessity, by the nature of his materials, by the laws of mechanics; but where is he to seek that knowledge which alone can infuse unity and life into his work? His plans and designs yield him at best but approximative notions. He must see his work with his mind's eye as it will stand completed; he must verify its proportions mentally: he must guard against confusion or excess of detail, and assure himself that in every portion of his design the means are in keeping with the end.

But there is a point to which we have not yet referred. Optical science makes us acquainted with a curious phenomenon known as *irradiation*, by virtue of which a white square viewed against a black background will appear larger (as well as brighter) than when seen against a white one. Now size is also irradiative. A square surface appears larger when surrounded by narrow mouldings; the narrowness of the latter gives an air of amplitude to the surface itself. Hence the value of these ornaments: they impart character to the surfaces they divide. Long lines, sharply cut, produce a happy combination of large and small dimensions which is peculiarly favourable to a general effect of size. Ornamentation is also productive of the same effect, provided it be not carried to excess. It should attract and arrest the eye at certain points only. The secret of architectural effect lies in alternation,—delicacy, and strength, narrow lines and broad surfaces.

Our perceptions of size are not altogether independent of climatic influences—our appreciative power is intimately connected with the intensity of the light. Under the brilliant suns of Greece, Egypt, and Southern Europe, the shadows become more transparent, light tints and shades become more intimately blended together. Here the projecting portions of a design should be strongly defined, detail should be simple and distinct, ornament would appear confused were it otherwise than simple in outline and vigorous in expression.

On the other hand, under the changing skies, and in the fitful but tempered light of more northern climes, the eye no longer derives gratification from the contemplation of the broad surfaces and pure outlines of the Greek school; the perceptive powers are heightened in regard to matters of detail; and architects find its greatest charm in the multiplicity of ornament and intricacy of detail of the Gothic style. Let a Gothic cathedral, a Flemish *hôtel de ville*, or a Medieval chateau, be transported to the sunny shores of Greece, and the outlines would no longer appear in harmony with nature. How much our imitations of Grecian architecture lose in character and beauty when set down in the heart of a modern city like Munich or Paris, we know but too well.

Having thus far analyzed the laws and limitations of our perceptive powers, it appears to me that the conclusion is forced upon us that art is only vision unfettered by experience; that its works are to us as material objects of which we have to seek the ideal. To discover the latter we have need to interpret the emotions they produce in us, and this interpretation is a mental effort which is performed with greater ease the oftener it is put in requisition.

PARLIAMENTARY "ART-PHOBIA."

READERS of our admirable contemporary, *Punch*, will probably not have forgotten the incident of the sturdy little specimen of a John Bull in frocks, who, being pitted against a prematurely intellectual cousin, whose precocious accomplishments he was called upon to emulate, laconically retorted,—“I can't speak *Punch*, and I can't sing; but I'll punch his head for him.” Without repeating hackneyed sentiments, as that “the child is father of the man,” and so forth, one may be permitted to say, in the vulgar tongue, that this is not a bad epitome or type of the attitude assumed by the Anglican mind when brought into opposition with purely æsthetic motives and principles. It is true that fighting is nowadays rather at a discount, and that we are no longer inclined to answer remarks on the superiority of French taste and elegance in details, by the heroic declaration that one Englishman can beat three Frenchmen. No;

political economy is superseding the use of arms, natural or artificial; and we ensconce ourselves now behind the shield of utilitarianism. We are a “practical” people; we are not to be taken in by dreams and sentimentalism. It is very well for Continental nations, who know no better, to lavish large sums upon schools of art and grand streets and buildings; we want to see the return for our money, and if my man attempts to seduce us into expending pounds, shillings, and pence upon mere artistic effect, we (metaphorically) button up our pockets, and indulge in reflections which might be shortly embodied in a certain vulgar ditty, whose burden is “You don't come over me.”

Without going into the question here as to the superiority of one site for our national temple of *Themis* over another, it may be said that the debate on the Law Courts, which amused our Legislative assembly for an evening last week, furnished no inapt illustration of this peculiar and so-called “practical” bent of the English mind. Throughout the debate there was a manifest reluctance, even on the part of those members whose names have been specially connected with art-interests, to base their preference for a site upon anything so shadowy and unreal as a mere consideration of architectural effect. There was a latent feeling, evidently, that such a consideration was beneath the dignity and business-like character of a British House of Commons. Those with whom such a motive really had any weight urged their argument only in a sidelong manner, as something which, in fact, they were half-ashamed of. Mr. Gregory, in the motion which initiated the discussion, placed architectural effect last in the order of advantages enumerated, though it is easy to see that the prospect of a grand river front was really uppermost in his thoughts. Then followed one practical lawyer, Sir Roundell Palmer, to demolish the edifice. “His honourable friend had made an imaginative speech, full of high flights of fancy” unparadonable in such a case, since “the question had been considered on its merits before this inflated structure of architectural fancies had risen.” He recoiled with horror from the idea that Parliament “would be tempted to authorise greater expense than was necessary by considerations connected with architectural beauty” (misguided Parliament!); but Government had evidently never intended to make sacrifices for “any such object.” The whole benefit of “concentration” was in danger of being lost by a sacrifice to “the demon of good taste.” The first provision was not made “for a magnificent architectural work” (I never is in England), though the learned gentleman admitted that if that was what was wanted, “no one could tell what it would cost.” It is to be hoped that it would cost some expenditure of thought and of brains, at least, which large buildings unfortunately too often make no demand upon at all. And, finally, according to the prudent Sir Roundell, the “whole world was to be changed in order to carry out the magnificent dreams of Sir Charles Trevelyan.” After this the speaker could scarcely be in a position to accuse his antagonist of “romancing.” Some of us might, after a sort, wish to see “the whole world changed;” but then there must be a *dignus vindicæ nodus*, perhaps more likely to be found in the eliminating of lawyers from the face of the earth, rather than in the mere question of the whereabouts of their habitation—“too cruel, anywhere,” as Lady Macbeth puts it. One might have expected that Mr. Beresford Hope, at least, would have attached due importance to architectural considerations; but he knew his audience too well; “he wished to approach the question not in a *dilettante*, but in a practical point of view.” Lord Bury, following suit in the same strain, “wished to look on this subject as a rate-payer and in a practical point of view.”

Both these speakers were favourable to a particular site on architectural grounds; but both masked their chief solicitude under cover of an appeal to the vulnerable part, the pocket. Lord John Manners said openly that the original motion under discussion “would have been more in place before the Society of Arts,” and “entreated the House to take a practical view of the question;” that is to say, to ignore everything but the material convenience of the legal gentlemen “for whose benefit,” as the Chancellor of the Exchequer observed, “mankind were made.” Finally, the Chancellor of the Exchequer, after hocking up the way with cartloads of figures, showed in the end a leaning towards a project for obtaining a fine architectural façade along the Embank-

ment at a more moderate cost than that of the already proposed Law Palace; but no sooner had such expressions inadvertently dropped from his lips than he, too, hastened to retract and modify, assuring the House “that he had no *dilettante* feeling at all on the matter, but—” &c.; and so, after much talking, an adjournment of architectural effect till a more convenient season.

Now, is there not something supremely ridiculous in all this? Here are a set of gentlemen, representing mostly the highest class of English education (we refer to the speakers in the debate in question, not to the House of Commons *en masse*), discussing the question of the position of a future immense building—a building which, if erected, will largely influence the architectural character and appearance of their capital city in one of its central and most frequented districts,—which, wherever placed, will block out from neighbours and passengers a great space of Heaven's light, and is therefore bound to give them *something* in return,—a building which, if grandly designed, upon a commanding site, where there is space on one side or another to view it properly, would be an object such as would draw visitors of other nations to comment on and admire it!—and yet the question whether such building shall be a grand decoration to the capital, or shall prove a gigantic eyecore to beholders for all time, is treated as a matter of indifference, or of merely trifling importance; and even those few who may be supposed to have strong feelings on this subject have not the courage to express them before an assembly which seems inclined only to turn them to ridicule. We venture to say that in no Continental legislative body, of anything like similar importance to the House of Commons, would such a question be treated as a matter of indifference. But the tone of the House through this debate was exactly that of the ordinary “intelligent British public” to which Mr. Locke so touchingly appealed. The said public is willing enough to have things decent; “neatness” is their *beau idéal*; but talk to them of the importance of rendering a great building an addition to the beauty of their land, persuade them to lapse for a few minutes into contemplation of the poetry of architecture, and their tone, on recovering from so unwonted a trance, is as that of Will Waterproof!—

“I ranged too high; what draws me down
Into the common day?
Is it the weight of that half-crown
Which I shall have to pay?”

The writer of the best book yet current on gentlemen's houses tells us that the English gentleman, as a rule, eschews anything like an attempt at architectural effect in his mansion, thinking such a thing “vulgar” and “pretensions.” This is only saying, in fact, that the average English gentleman is, in regard to matters of art, a dunce,—a sad truth, which we cannot think of disputing. The average English lawyer seems to be no better, and to be somewhat of an egotist in the bargain; and, as a natural result, we have the spectacle of accomplished lawyers and members of Parliament all up in arms because, when it is proposed to build a comfortable house for them, it is proposed also to build it and place it so as to be ornamental as well as useful, and declaring, almost in so many words, that so long as they are perfectly comfortable inside, they do not care whether the millions who are only concerned with the exterior of the building find in it a continual source of pleasure or a perpetual wearisome mass of unsightliness. It is not one of the least pleasing qualities of architectural beauty that its pleasures are for the many in their daily walks and passing to and fro, and that it is eminently the art in which courtesy is embodied; and as long as the lawyer continues to regale so magnificently upon the oyster, it is at least fair that the shell with which the public is presented should be duly gilt and illustrated.

A Warning.—Bramham College for Disenters, near Tadcaster, not far from Leeds, is, we are informed, suffering seriously from the ravages of fever. Two Leeds youths who were being educated there have died from typhus. The cause of this sickness in so healthily-situated and well-conducted an establishment is said to be the accidental percolation of deleterious matter through the earth into the well whence water was drawn for drinking purposes in the college.

A ROYAL AUTHOR ON TRADE-UNIONS.

A REMARKABLE book, from the pen of a distinguished author, has just appeared in Paris. The subject of the book is trade-unions; its author is the exiled Orleansist prince, the Comte de Paris. The prince has entered upon the study of his subject by a minute analysis of the vast body of evidence submitted to the English Royal Commissioners. He informs his readers that he has waded through ten folio volumes, which contain, in the shape of twenty thousand questions and a like number of answers, the laborious result of forty-eight long sittings. By the aid of Lord Stanley, a valuable appendix, consisting of a voluminous collection of documents relating to foreign working men's associations, has been added. These folios are the outcome of a long procedure, extending over nearly two years, during which period the Commission has examined members of almost every class, and almost every profession. Masters and men have been brought before them on the same bench.

What a labour for a prince! Sweet, indeed, are the uses of adversity when they lead so eminent a personage to face the toll of mastering a great question, relating neither to princes nor to the pageants of this world, but to the every-day toilers in our midst. The Count leans neither to the side of the masters nor the men, but deals with his materials in the spirit of the historian and the practical economist. His sentences are penned in a mood as calm and unimpassioned as though he were writing of events which took place a thousand years ago, and which had no connexion with the passions and the aspirations of to-day. The performance of the task is not less satisfactory than the tone which pervades it.

The Count de Paris is no advocate for trade unions, but having been at considerable pains to make himself master of the whole bearings of the case, he has discovered that such combinations are inevitable, and beyond the power of the legislature to cripple. Hence he counsels the State to allow them perfect freedom of action so long as they keep within the limits of the law.

On entering upon his task, the author declares it to be his aim to study, without any party feeling, a subject which should be regarded from a purely practical point of view. He thinks that the development of the principle of working-men's associations must be full of interest, not alone to those who expect therefrom an amelioration of their condition in life, but to society in general. He proceeds—“It appears to us that the new application of the fruitful principle of association will not only assure to society material profit, and an increase of the general wealth, but will render to public morals still more important services.” He apprehends that he shall be able to show that the two elements, capital and labour, formerly and now engaged in an unnatural and deadly struggle, will hereafter regain all their strength by a happy alliance. The first portion of the book opens with a high tribute to the working-classes, and the author expresses the hope that when his task has been closed, he shall have succeeded in meting out the justice which is due, not alone to the mighty manufacturing interests which so powerfully contribute to the advancement of civilization, but also to the honest and laborious working population, which, by “its solid qualities constitutes the strength and the honor of every great nation.” The Count de Paris's book, which, being addressed to French readers, is necessarily written in the author's native language, is entitled “*Les Associations Ouvrières en Angleterre*.” It is divided into ten chapters, the first of which has the somewhat “sensational” title “The Crimes of Sheffield.” In this chapter he affords his countrymen a most animated and picturesque account of the doings of Messrs. Broadhead & Co., as revealed before the notable Sheffield Commission. By way of exhibiting to our readers the style in which the book is written, we will translate a portion of the Count's description of the theatre of these events:—

“Sheffield lies almost in the centre of England, in the neighbourhood of many coal-mines, at the bottom of a densely-packed and always smoke-begrimed valley, in which is situated the active and populous capital of the steel and steam-hammers in all England, together with the immense population of Bessener, gigantic retorts in which settle at some time five or six tons of iron. Here, are manufactured cannon, and the plates for armoured ships. But in addition to these manufactures, there goes on at Sheffield the old industry of the town. Sheffield has lost its ancient monopoly of this trade; some of its branches have been subjected to a rude shock, and among the sufferers none have been more unfortunate than the saw-grinders. The working cutlers, few in number, jealous and exclusive,

formed themselves into associations, in the hope of obtaining thereby a rise in the rate of wages. They did not succeed, the only result being frequent ruptures between themselves and the masters.”

In this pictorial way the author goes on to describe the blowing up of the house of Peary-hough and the other murderous revelations brought to light by the Commission. When the Count has occasion to speak of the Royal Commission which was appointed by the Government to investigate the workings of unionism, he thus writes:—

“No party spirit inspired the Royal Commission. It contained all the necessary elements for eliciting a complete and searching discussion, for its members, to the number of ten, presided over by one of the worthiest of England's judges,—Sir William Erie,—belonged to the most opposite opinions. The House of Lords was represented by Lord Lichfield, whose appointment was due to his efforts, in 1865, at reconciliation between the iron-masters and their workpeople. The House of Commons was represented by four gentlemen, Sir Daniel Gooch, a director of the Great Western Railway, specially known for his participation in the work of laying the great Atlantic cable; the only member who belonged to the ministerial party. The three other members were, Lord Eicho, a moderate Liberal; Mr. Roebuck, a lawyer and an independent member of the Radical party; finally, Mr. Thomas Hughes, a popular who is imbued with democratic opinions. Besides these, there were Mr. Harrison, a lawyer, and the faithful ally of the last-named gentleman, Sir Edmund Head, formerly Governor of Canada; Mr. Booth; Mr. Merivale; and Mr. Mathews, an iron-master, who represented the great manufacturing interest. Divergences of opinion were made manifest even at the very first sittings, in the interrogation of witnesses. Each member having the right to put his own questions, conducted in his own particular form, to witnesses, these witnesses found themselves subjected, after their examination in the presence of the Commission, to a *cross-examination*, on the part of a commissioner who was anxious to scrutinise the value of their statements, or to weaken the force of assertions which were opposed to his own special views. Thus it is probable that the Commission may at the last moment be divided among themselves and be unable to sign a common report.”

The assagery of the prince has here led him to hazard a conjecture which has come to be quite verified in fact. A split in the Commission has actually taken place. The Count's hook was composed before Lord Lichfield and Messrs. Hughes and Harrison's “Conclusions from Evidence” was published,—the conclusions in question being totally opposed to those promulgated by the majority of the Commission.

In his second chapter the Count gives a description of the origin of trade-unions in this country, showing how long since is the day when the first attempt at organization was made. “The terrible plague of 1348 had carried off a fourth of the population and plunged the remainder into the depths of misery; but the natural march of human affairs carried, as usual, the remedy by the side of the disease: the scarcity of hand-labour very soon augmented its emoluments.” The survivors demanded higher wages, but the Legislature interposed and attempted to fix a maximum of wages. Here, then, was the first attempt at combination on the part of labour, and the first attempt of the Legislature, acting on the side of capital, to check its demands. With a bright and impartial pen the author pursues his account of the history of trade-unions till, reaching the period of the Luddites, he stops to describe that unhappy struggle in detail. He says:—

“In 1811 the hoarse trials of Nottingham suffered cruelly. The badly-paid workmen hired, at an exorbitant price, the looms of the employers, for whom they worked at home. The introduction of machinery, which threatened to still further reduce their earnings by coming into collision with this home-manufacture, precipitated the explosion. As is usually the case in such crises, this event occurred at a time when the masters, almost in a rained state themselves, were in the worst possible condition to secret concessions to their men. The result was, not a strike, but a veritable insurrection. Meeting at night in newly-introduced machines, and armed themselves into armed bands to destroy them. Every manufactory was attacked; many were pillaged or burnt; the mad movement spread into the adjacent counties, and very soon the Luddites—a name borrowed by them from one of their leaders—carried out their depredations on the most extensive scale. Their secret was so well kept that, at the outset, they eluded the most vigorous attempts at detection. During the space of six years they burst out at regular intervals, notwithstanding the execution of their principal leaders. Eighteen of these leaders were hanged at York in 1813.”

It will not be necessary to follow the steps of the author while describing the legal position of trade-unions,—a section of the book which is written with carefinesse. In the third chapter he takes up the subject of the “organization of trade-unions.” Speaking of the contributions in money of the workman to his union, he says,—“When this painfully-accumulated capital shall no longer be in great part absorbed by the unproductive expenses of strikes, it will constitute for the working-man a new element of prosperity.”

We next come to certain chapters which are

devoted to an exposition of the operation of trade combination in such industries as house-building, the working of iron, coal-mining, iron ship-building, machinery, tailoring, printing, glass-blowing, &c., in which the Count discusses the mode of formation of the unions in these trades, their character, their development, and the use they have made of their power.

The ninth chapter of this interesting and, in some respects, unique book, deals with the “remedies for strikes” which opens with this impartial paragraph:—

“An unprejudiced examination has enticed to dispel the cruel and unjust suspicions which the crimes of Sheffield had brought upon the whole number of trade-unions. Certain scoundrels thought to serve the associations to which they belonged by their abominable deeds, but their isolated villainy ought never to recoil upon the general body of trade-unions. These latter are not more responsible for these dark deeds than the old chiefs of ‘The League’ were formerly for the murder of Henry IV. of France; or, more recently, the Confederate generals, for the assassination of President Lincoln. They may lie under the reproach of having been the authors of many acts much to be deplored; they have been accused of having organized a system of intimidation against those who opposed their authority—many of these things having been proved by the statements elicited by the Royal Commission. But these instances of wrong-doing will appear more far and far between to those who take into account the vast population from which these cases have been selected. Besides, these cases of wrong-doing show that associations of working-men stand in need of enlightenment, and of being directed into wiser ways, rather than of meriting universal condemnation.”

The Prince next proceeds to narrate what certain innovators have done towards the great work of conciliation between master and workman. He founds his sketch of these schemes upon the statements of Mr. Kettle, Mr. Mandella, and Mr. Briggs, the mining proprietor, of Normanton.

Want of space precludes our following the Count in his description of the enterprises of these and other well-intentioned gentlemen; and we proceed to the final chapter of the treatise, which has for its subject “the future of trade-unions and political liberty.” In this chapter, which displays in no slight degree a philosophical spirit and graphic eloquence, the author declares that, on the day when councils of arbitration shall render almost every form of strike useless and ineffectual, the funds which in the present order of things are absorbed in strike expenses will be left to form the monetary nucleus of co-operative associations, whose peaceful reign shall bring prosperity and improved social status to both employer and employed. Surely a consummation most desired to be wished for; and let us hope, not an entirely Utopian and visionary idea.

This book, embodying the views of an illustrious foreigner, must possess a value to the thoughtful reader, as being illustrative of what men of enlightenment and culture among other nations think of unionism and its struggles here in England. The views expressed in the book are not those of a charlatan, or an advocate who has a particular cause to defend. It is the work of a man of high attainments, who in his leisure has brought great powers to the consideration of a vital question which is alike interesting to all classes of society.

ROYAL SANITARY COMMISSION.

The first meeting of the commissioners was held on April 22nd, in Committee-room No. 14, House of Commons, at two p.m. Present,—Right Hon. C. B. Adderley in the chair, Earl of Romney, Earl Ducie, Right Hon. S. Cave, M.P., Col. M'Clean, M.P., Mr. Hibbert, M.P., Mr. Clive, Mr. Shaw, Dr. Aekland, Right Hon. Lord Robert Montagu, M.P., Col. Ewart, Mr. Whitbread, M.P., Mr. Richards, M.P., Mr. Powell, Mr. Paget, F.R.S., and Mr. Birchan.

The chairman proposed that the first proceedings should be as follows:—

1. To take evidence on the operation of the sanitary laws,—(1.) Their machinery; (2.) Their administration, as to (a) areas, (b) local authorities, (c) powers; and the enforcement of the sanitary laws, and their defects; the central control over the local authorities.
2. That for the present, at all events, scientific controversies as to the best modes of carrying out sanitary improvements should be postponed.
3. Evidence to be taken,—first, from the Home Office and the Privy Council Office; next, from sample towns and districts.
4. A digest of judicial decisions on disputed cases under the Sanitary Acts since 1848, or in matters connected therewith, to be prepared immediately.

They commenced receiving evidence on April 26th, in Committee-room No. 14, Mr. Tom Taylor, secretary of the Local Government Act Office, being under examination. On Thursday, the 29th ult., Mr. Thring and Mr. Rohort Rawlinson were to be examined. The commission will continue to sit on Mondays and Thursdays, until the evidence required has been completed.

THE (ALBERT) MUSEUM, SOUTH KENSINGTON.

On entering the north court of the museum, a very fine statue of white marble, executed and lent by Mr. Woolner, immediately attracts attention. It represents the late David Sassoon, the magnificent Persian merchant of Bombay, and is intended to be set up in that city in a grand hall, which has been erected in his honour. In Bombay, as at Poona, Mr. Sassoon, laid out large sums of money in building schools and hospitals, and doing other good works, both during his lifetime, and by bequest, after his death. The statue represents its subject in the attitude of Oriental thanksgiving, standing upright, with the hands slightly extended, and the palms turned upward, as if ascribing to Heaven's gift all the earthly goods he had received.

The pose is grand and simple, and in perfect accord with the Eastern costume. The latter lends itself admirably to sculptural effect, and Mr. Woolner has been peculiarly happy in the treatment of his drapery, both as to the gracefulness of arrangement, and the varied texture of the materials represented. In accordance with our Western ideas, the act of looking up to God, would be attended with a rather more upturned position of the face; but the old Eastern nations are calmer in their outward expressions than we upstart peoples; and, doubtless, therefore, Mr. Woolner is equally correct in the position of the head as in all the other details of this very admirable and extremely satisfactory statue.

The cause of the differences observable between individual nations is always an interesting inquiry, and the great calm and self-possession of Oriental peoples as compared with those of the Western world, form a peculiarity that is very remarkable. It is constantly said that the vivacity of the southern inhabitants of Europe is mainly attributable to the warm generous climate their countries enjoy; if such be the case, why should Turks, Arabs, and Hindoos be so quiet and unobtrusive in their demeanour? It cannot be argued that their climates are cold and ungenial. For my own part, I think the cause might be successfully sought in the fact of the greater or less degree in which the women take part in the out-door life of each country. To women especially belonging, as their distinctive characteristic—the affections, which are demonstrative, and necessarily demonstrative or they cease to exist for want of aliment; to men belong the reflective powers of mind, which require tranquil meditative composure for their development. When, then, sudden, quick (spasmodic, if you will) actions, bringing life and bustle with them, are constantly being exhibited, calm and repose vanish, and man—who is an imitative animal—catching the infection of liveliness, copies and thus doubles these energetic demonstrations, until a general huzzah is the result; and this, going on from generation to generation, finally becomes the national character. On the other hand, when women from preference or necessity withdraw from public life and shut themselves up within their houses, out of sight and bearing of what is going on out-of-doors, the influence of their vivacious manner ceases to be felt, and men (who in some way or other are always in antagonism to, or rivalry with, their fellow-men) become silent and cautious the better to watch their neighbours' proceedings; sedate and collected so as to be on their guard against surprise, and to be ready to take advantage of any lucky turn in affairs that may ensue; and too often morose and reserved under loss and disappointment, for want of an auditor equally interested with themselves in their failure or success. Thus, as I remarked above, I think the great cause of the difference in national characteristics, arises from the degree in which women mingle in, or absent themselves from, the public life of each particular country.

To return from this long digression to the loan museum at South Kensington. In the south court, close to the east aisle, stands a small table glass-case containing several rich objects lent by Mrs. Sassoon, the widow, I pre-

sume, of the gentleman whose fine statue I have mentioned above. The most attractive specimen in the case is a very beautiful hemispherical box of gold with corresponding lid, of the shape, when shut up, and size, of a large orange. The gold is of a rich deep colour, the surface roughed; it is set with rubies, sapphires, and emeralds, in flowers, scrolls, and a central star, while round the edge of both box and lid—consequently forming a double band round the centre of the ball—runs a row of large rubies set closely together. This is a lovely thing, of the richest type of Oriental lavish luxury, but not in the least partaking of the "barbaric" in its grandeur.

Another interesting object is a watch given by Queen Charlotte to an Empress of China. It is of large size, and has a blue enamelled case set with diamonds in a rich star, with festoons of diamonds around, and a border of coloured enamel. The little coffin of gold, or gilt metal, is very pretty; it is in size about 4 in. long by 2 in. wide and 1½ in. high, and is formed of slabs of imitation lapis lazuli, on which are three medallions of dark translucent enamel, bearing a diamond star, and set round with pearls—the whole enclosed by a band of black enamel, ornamented with coloured flowers. Folding up the inside, are three trays of small instruments, such as scissors, bottles, a tiny spoon, and so forth, the handles and cases being of coloured enamel.

There are besides two curious gold amulets, encrusted with turquoise into various forms, with some Chinese writing in dark blue enamel; and two German coins or counters, dates 1758 and 1776, which are ingeniously preserved in a box of carved wood in the shape of a figure 8, each coin being sunk in a ring of white satin, which, again, is enclosed in a ring of pale jade on a white satin foundation. The oblong box of tortoise-shell, the cover decorated with raised Japanese work of shrubs and very natural-looking domestic fowls, is lent by Mr. E. Thompson, and the large round shallow bowl and cover of porcelain, with white scrolls and ornaments in relief on a light brown roughed-up ground, is lent by Mr. Barnes Dallas. In the same case are several gold coins—Chinese money—called "obang," lent by Captain W. Gore Jones, R.N. They are formed of a flat thin oval sheet of gold, the largest—the value of which is 18l.—being about 8 in. long by 4½ in. wide, and the smallest, worth 8s. 6d., 1½ in. by 1 in. They have stamps and inscriptions on them. The sword of honour, mounted in gold and jewelled, presented by his Highness Holkar, Maharajah of Indore, to the young son of the late Lieutenant-Colonel Townsend Hungerford, C.B., and lent by Mrs. Hungerford, though formed of the richest materials, is utterly devoid of taste or artistic merit. It is of modern Indian work, some of the stones are cut with facets, others are merely rounded and polished; as a whole it makes one regret that Orientals, who, when left to their own judgment, produce such exquisite work, especially where colour obtains, should be set to imitate Western productions they do not understand, and with which they have no sympathy.

Mr. Barnes Dallas, whose elegant porcelain box and cover I mentioned above, has sent a collection of interesting objects sufficient to fill one large upright glass case and half of another. The most noticeable, from being particularly handsome or especially curious, are the following:—A Chinese porcelain two-handled bottle, of flattened spherical form, yellow ground, with dark blue flowers; a square porcelain bottle, red ground and coloured flowers, with two rows of short hairs of white, gilded, and painted with spots, the bars in groups of three; the manner in which variety is obtained by occasionally dividing a bar into two shorter pieces, is very ingenious, the entire and the divided bars being placed apparently by caprice, yet really by design, as shown by the fact that the arrangement on all four sides of the bottle is exactly the same. The vase is mounted on a carved wood stand, and the effect of the whole is extremely rich and "cared-for." An ancient Chinese bottle of enamel and gilt brass is very admirable: it is of spherical form, but flat on one side, as if cut in half, so as to stand against a wall: the ground yellow, with blue flowers and leaves, and a circular gilt plaque in the centre, bearing a Chinese inscription. A similarly flattened tall, slender wall vase, of enamel, has a white ground with blue flowers, birds, leaves, and writing upon it. A double diamond-shaped vase and cover of enamelled copper, blue ground with coloured flowers, has rings at all the angles which serve, on the lower ones, for feet; it has a

carved and perforated wood cover and stand. A large enamelled bronze bird, resting on a natural root of a tree, is very clever as to attitude and form; a pair of terra-cotta bottles, ornamented with leaves and branches and admirably-modelled squirrels; two L-shaped boxes of blue turquoise enamel on copper, with flowers on the top and rosettes on the sides, fit ingeniously one to the other, so as to form a square; and there is an enamelled copper case to match the boxes, of flat scalloped form. A very pretty little box, of round scalloped shape, is made of lead covered with black lacquer, and ornamented with flowers and dragon-like forms in mother-of-pearl, and has mother-of-pearl masks holding a ring in the mouth for handles. An Oriental bronze bowl, with dragons in high relief and a Chinese inscription, is supported by wondrous birds. Two enamelled copper bottles, with long straight neck and two tubular loops, dark blue ground covered with flowers of rich bright colours. A small japanned cabinet, of four drawers and open shelves, is entirely faced with the natural bark of a tree, moss, leaves, &c. it is an interesting example of the ingenuity of this singular people—the Japanese—in turning the simplest materials to good account.

The tall tubular vase of jade, squared on the outside by a sort of billet-moulding, divided into three compartments, and mounted on a carved wood stand, is very elegant; and the various flower-holders, of red and white agate, crystal, red cornelian, Oriental agate, and white and pink cornelian, are very rich. These latter suggest to Western-world beholders, that *Fancy* might be advantageously allowed to have more liberty among our own manufacturers; there is no law to compel a flower-holder to appear for ever in the form of a vase or a glass, nor to be made only of glass or porcelain. Perhaps the richest-looking specimens in Mr. Dallas's collection, are the twelve small silver cups and saucers with raised blue and green enamelled flowers and leaves. On the saucers the enamel is nearly flat; but on the under part of the cups it is boldly raised, so as to form a sort of foot. The cups are in outline shaped like a loaf, with the stalk for handle, and are very similar one to another; but the saucers are of most varied form (in only one instance are there two alike), to wit, a trefoil, quatrefoil, cinq-foil, an oblong, a horseshoe, and so on.

Two diminutive Japanese pill-boxes, one of wood and lacquer, the other of metal, fitting into a brass frame, each box being about 1 in. long, 2 in. wide, and ½ in. thick, prove that these sapient folks are as wisely moderate in their consumption of medicine as are the homoeopaths.

A Chinese seal, apparently of iron, pyramidal in form, and about 2 in. high, is an excellent shape for the purpose. To prevent the fingers from slipping upwards, deep parallel channels are sunk on each of the four sides. The seal is apparently of iron, damascened with gold and silver. Two powder cups, one round and the other fluted, are engraved with Chinese characters, lined with grey enamel, and have jade handles; and there is a red and brown jade teapot, bamboo pattern, with spout and crossed handle, and covered with flowers and leaves in relief; and also a terra-cotta teapot of bamboo-pattern, and brown in colour. The white porcelain bowl, with crab, lobster, tortoise, and flowers in relief, seems a dream of Palissy-ware, or its forerunner; and there is a singular cylindrical cup formed of the root of a tree with blue enamelled interior, and five gilt bars in low relief on the top edge. There are, besides, a number of the clever and very amusing Japanese "nitchies," beautifully carved as usual, and coloured in parts; several curious Chinese books, both plain and coloured; six charming little coloured and four white porcelain snuff-bottles, with figures, animals, and dragons in relief; bottles and vases of glass in two layers, the upper and coloured layer being cut into designs that stand out on the white ground; and three cigar-cases of beautifully-plaited fibre of a light brown colour, in varied patterns and of Japanese manufacture.*

Not far from the above glass cases hangs a remarkable Chinese gong, somewhat resembling a double *fleur-de-lis* in form. It is of bronze, and an inscription upon it says it was presented to Mekok Sang monastery. Its height is 3 ft.

* Since the above was written, I find that Mr. Dallas's collection has been withdrawn from exhibition; nevertheless, I do not omit my description of it, for the objects I have specified are so noteworthy that they well merit the honour of having their memory embalmed in the pages of the *Builder*.

10 in. and width 2 ft. 10 in., and it has a suspending loop of bronze. It was given to the museum by the officers of the 1st Dragon Guards.

As I have, by mention of this gong, wandered from the *loza* portion of the vast collection at South Kensington, I may as well confine out of my usual course; for there are many objects among the purchases that seem imperatively to demand notice, and that it is impossible to pass unheeded by. Amongst these the wondrously beautiful "Paradise Lost" Shield* stands first and foremost. The shield is of silver and damascened iron, was executed by M. Morel-Ladenie, for the Messrs. Elkington, and was bought at the Paris Exhibition of 1857 for 2,000*l.* The form is a graceful oval, the height 2 ft. 10 in., and width 2 ft. 2½ in. In the central medallion, or compartment, Adam and Eve are seated in the Garden of Eden, under the shade of trees, on a bank covered with flowers and charmingly-executed ferns, while the Archangel Raphael stands before them and describes the defeat of the rebel angels. In the other divisions the events of the contest are displayed; while below, the Archangel Michael—a calm, dignified figure in damascened iron that admirably represents the armour he wears—is seen, vanquishing Satan; and beneath the feet of this group crouch Sin and Death. Above are displayed the signs of the zodiac and other objects. The delicate gold tracery introduced on the borders, or frames, to the various designs is very chaste and delicate, and the entire work is most admirable.

Near to the above shield, in a glass case among some objects on loan, are two excellent carved wood frames for miniatures; the one, in particular, of pear-tree wood and modern Florentine work, with much undercutting, is very sharp and true. It was bought for 12*l.* Below these frames are miniature profile busts in ivory, on ebony ground, of Napoleon I. and the Empress Josephine: they are in separate frames, and the Emperor's bust is accompanied by warlike and other emblems; while that of the Empress has a dance of Apollo and the Muses below. The carving is extremely delicate and careful; they are signed "Zanigo," date from the beginning of the present century, and are lent by Mr. W. G. Rogers. On the shelf below is a noticeable table-top formed of various marbles and other minerals irregularly combined, called Borghese mosaic, the light-coloured being placed on the outside, and the darkest towards the centre, where they form a frame to a circular landscape of Roman mosaic; subject, the Foro Romano. A wide border of white mosaic encircles the whole slab, and into it are introduced sixteen various-sized medallions of buildings, figures, and busts, in very minute mosaic, in shades of green. The table-top is modern Roman work, and is lent by Mr. H. Vaughan.

ART-LOVER.

COLUMBIA-SQUARE MARKET.

Not long ago we gave some descriptive particulars of the market founded by Miss Burdett Coutts in Bethnal-green, together with a plan of the whole and a view of the interior of the market-hall, a handsome Gothic structure.* In our volume for 1866 we had previously published a view of one side of the market-square and other illustrations.† We now add to these a view of the north front of the market-hall as seen from New-street.

On Wednesday last the market was opened under the most propitious auspices, the weather being genial in the extreme, and the entire neighbourhood having put on a holiday aspect befitting the occasion. The majority of the shops were closed, and flags and banners waved from house-top to house-top, each bearing an inscription in honour of the event. Miss Burdett Coutts arrived at half-past two o'clock, and was received by a guard of honour composed of about 300 of the Tower Hamlets Volunteers. She was afterwards conducted by Mr. Johnson (chairman of the market committee) to a dais which had been erected in the centre of the quadrangle; and various formal introductions having taken place, the company present received the addition of the Duchess of Cambridge, Princess Mary of Teck, the Prince of Teck, the Duchess of Argyll, the Marquis of Lorne, the Duke of Wellington (lord lieutenant of the county), the Bishop of London, the Earl of Harrowby, the Marquis of Salisbury, Lord Medesdale, the Lord Mayor and the Sheriffs of

London and Middlesex, &c. A procession was then formed to meet the Archbishop of Canterbury.

The company being assembled on the dais, and Miss Coutts having taken her position in the centre, addresses from the tenants of the market and the workmen in the employ of Messrs. W. Cubitt & Co. were presented to her. The address of the workmen was to this effect:—

"Madam,—We, the workmen who have been engaged in building Columbia Market and industrial dwellings in connection therewith, desire to avail ourselves of the opportunity which the proceedings of to-day afford to express our grateful acknowledgments to you, and the admiration which we entertain for the many generous deeds which your name is associated. The care and solicitude you have continuously shown on behalf of the moral and social elevation of our class emboldens us to join in the congratulations of to-day, and we feel assured that the magnificent and beautiful structure now completed, and which your bounty has provided, will be another proof, added to many, of a rare generosity united with practical wisdom. Believing as we do that wealth is put to its highest and noblest purposes when given as the price of useful labour, we as workmen feel deeply indebted to you, and beg to offer our heartfelt thanks. We earnestly hope and pray that this edifice may realise the object of its design; that it may confer lasting benefits upon this locality; that its utility may be established, and the lesson of its beauty appreciated; and that it may remain a monument to a remote posterity of a loving spirit, a fostering care, and a bounteous benevolence. We pray that your valuable life may be long spared, and that your name may be warmly cherished and held in affectionate remembrance by all classes of the realm; and that others, looking at your example, may be encouraged to go and do likewise."

After other proceedings, the Archbishop of Canterbury said Miss Coutts had placed a letter in his hands which she wished him to communicate. His grace then proceeded to read the letter, commenting upon various passages of it as he went along. Miss Coutts, he said, thanked the workmen for the address they had delivered to her. It was a satisfaction for her to know that by their conduct while the works were in progress they had shown a good example to the neighbourhood. Miss Coutts also wished him to thank the tenants for the kind expressions in their address. He might be wrong, but he thought it was unusual for London landlords and tenants to meet in the same relations as those which characterized the meeting between Miss Coutts and her tenants to-day, and to interchange such kind expressions of regard as those which had been made. Miss Coutts hoped that the same good feeling would prevail between her and her Bethnal-green tenants as had been shown to-day. She thanked Messrs. Cubitt & Co. and their workmen for the manner in which the building had been erected. Apart from the beauty of the market, she rejoiced at the reconstruction of a neighbourhood which, from combined circumstances, had fallen into dilapidation and squalor. She was also happy to be able to say that the carrying out of the work had been unattended with any serious accident.

Mr. Darbishire, as architect, and Mr. George Plucknett, as representing Messrs. Cubitt & Co., had proper places in the ceremony.

The whole proceedings passed off happily.

THE THAMES EMBANKMENT.

At the meetings of the Society of Arts' committee, an Egyptian obelisk for the Embankment is being advocated. Sir Charles Trevelyan said, after the recent discussion of this subject, at the instance of Colonel Sir James Alexander, Lord Houghton was so good as to say to me, "You are quite right about bringing an Egyptian obelisk to this country; but the one to bring is, not Cleopatra's Needle, but the remaining obelisk of Luxor, the fellow of the one which has been erected by the French in the Place de la Concorde." Luxor is the modern Arabic name, but the city is Egyptian Thebes of the hundred gates; and these beautiful obelisks, which are in the highest style of ancient Egyptian art, formed the portal of the great Temple of Thebes. These obelisks were given by Mohammed Ali, one to the French and the other to the English. The French brought theirs to Paris, first securing it in a kind of gigantic packing-case, and then, lowering it by means familiar to engineers, they conveyed it to a Nile boat, and so by water to Alexandria, and thence to the Seine. In the same way, and with the advantage of their experience, the other obelisk might, with the help of one of our many old Admiralty hulks, be easily brought to the Thames, and thence to the Temple-gardens.

Whatever may be the general advantages of public monuments, there will be a peculiar advantage in having in this country and in this great metropolis so perfect and beautiful a specimen of that by-gone civilization, the earliest

on record, inasmuch as it will suggest to all who see it that there have been other forms of civilization, which have had characteristic merits of their own. The English and French would then have fellow obelisks, and the Temple Gardens would form a site peculiarly appropriate to the one belonging to us. The difficulty which prevented the transfer of Cleopatra's Needle to Hyde Park will not occur in this case, the Temple Gardens being close to the Thames. In the centre of the Temple Gardens, with all London streaming before it on the Embankment and river, the obelisk would be in an extremely conspicuous situation.

ST. PAUL'S CHURCH, LITTLE EATON, DERBYSHIRE.

THE enlargement and general improvement of the church of Little Eaton, near Derby, having been completed, it has been re-opened for divine service. The old church having been found very inconvenient and too small for the congregation, an enlargement was determined on, and the Building Committee employed Messrs. Giles & Brookhouse, of Derby, architects, under whose direction the works have been carried out. With the exception of the tower and chancel, the church is almost new, and now forms a nave and north aisle, with stone arcade supporting double-span roofs. Accommodation for about 300 persons is provided. The roofs are supported by principals, and the spaces between them are thrown into moulded panels, with wrought boarding terminating at the feet of the principals, with a moulded and perforated cornice. The sittings are open, and, with the rest of the woodwork, slightly stained and varnished. The floors are laid with Whetstone's Coalville quarries, and the building is warmed by a Gurney's patent stove. The contractor for the whole of the work was Mr. Fryer, of Derby. The Rev. J. E. Carr, of the Outwoods, Little Eaton, has addressed a "protest" to the minister and churchwardens of Little Eaton, against the pictorial representation of the Crucifixion, in other words the painted Crucifix, in the chancel window, which has been placed there without the consent of the parishioners; and repeats an offer he had already made to give 50*l.* towards the liquidation of the debt upon the church of condition of its removal.

WESLEYAN CHAPELS.

THE fourteenth annual report of the Wesleyan Chapel Committee shows that since the Conference of 1867, the following cases have been sanctioned:—

126 Chapels, at an estimated cost of, ..	£126,654
8 Ministers' houses ditto ..	4,705
43 Schools ditto ..	30,281
74 Enlargements and alterations, ditto	24,532
22 Organs, ditto ..	5,311
72 Modifications of cases previously sanctioned, at an estimated additional outlay of ..	21,255
Total 345 cases ..	£211,818

Compared with the cases sanctioned last year, there is an increase of nine chapels, and of 1,848*l.* in proposed outlay; an increase of twenty-four school-rooms, and of 22,781*l.* in proposed outlay; being the largest number of chapels, and, with one exception, the largest number of school-rooms sanctioned in any one year.

The report contains views and particulars of several of the chapels recently erected. Of these we illustrate two. It is noteworthy that no chapel is now put up without some attempt at architectural character.

Barnstaple Chapel.—For several years the congregations attending Wesleyan-Methodist services in Barnstaple have been steadily increasing; and the old Chapel having an unsightly exterior, and an uncomfortable and ill-ventilated interior, it was found necessary to erect a new edifice. A design was prepared by Mr. Alexander Lauder, of Barnstaple, architect, and the foundation-stone of the new building was laid on the 25th of February by Sir Francis Lyost. The cost of the building, besides old materials, was 1,620*l.* The builders were Messrs. Thomas Brown, W. Youngs, and J. and W. Oliver, of Barnstaple. The new building is erected on the site of the old chapel, in one of the principal streets, its length being towards the street. The plan comprises ground-floor, large gallery around three sides, and a choir gallery in the recess formed by the double staircases at the other side. The entrances to the galleries are separate from the entrances to the ground-floor, giving a ready ingress and egress to and from the building, also

* See pp. 137, 146, 147, ante. † Vol. xxiv., pp. 796, 797.

WESLEYAN CHAPELS.



MR. ALEXANDER LAUDER, ARCHITECT.

obviating draughts. The chapel will accommodate nearly 900 persons. The roof is open, ceiled to the collar, formed into panels and slightly stencilled in colour. The roof, with all other timber, is stained and varnished. The style is early fourteenth century Gothic.

Longsight Chapel, Manchester.—A few years ago Wesleyan Methodists in Longsight were few in number, worshipping in a hired room. In 1860 the former chapel, accommodating nearly 500 persons, was erected at a cost of 3,000*l.* The demand for accommodation still increasing, the trustees determined on erecting a more commodious place of worship. Freehold land, not subject to any chief rent, in an eligible situation, including a large vacant space behind the chapel, on which it is intended, eventually, to erect an extensive day and Sunday school establishment, was purchased at a cost of 1,372*l.* The new chapel is a Gothic structure, of the Early Decorated period, and has been erected from the designs and under the superintendence of Mr. George Woodhouse, architect. It will seat nearly 1,200 persons, 300 eligible sittings being free. The entire outlay, including land, chapel, organ, fittings, &c., will amount to at least 9,000*l.* The building is cruciform in plan, the total length being 106 ft., the width of the nave 48 ft., and across the transepts 76 ft., each transept being 28 ft. in breadth. The height from ground line to spring of roof is 27 ft., and to the ridge of nave 55 ft. The front gable of the nave, which faces to the main road, contains the principal entrance, which has moulded arch and label, supported by pillars, the whole surmounted by a large five-light window, with tracery in the head. To the right of the entrance there is an octagonal staircase, with tall slated spirelet roof, and on the left there is an entrance porch, with arch-headed door, surmounted by a gable, and by a tower, and spire, the total height of which is 120 ft. to the base of metal finial with which it is crowned. The nave has four two-light windows, with tracery in the heads; each transept has a circular window in the upper portion of the gable, and single light windows below the same. A wheel window is also placed in the back gable of the chancel, which forms the organ gallery, having vestries under for the minister and stewards, also heating chamber below. There is a gallery on each side of the chapel, extended into each transept, and also into the recess in front over the vestibles to the front and side entrances. The roofs are open-timbered, except a flat portion in the upper part of the nave roof, the height of which, above the floor line, is 40 ft. The walls are of stone, the wall-stone from Durnford Bridge, the ashlar from the Hindson's field quarry. Mr. J. Robinson, jun., of Hyde, was the builder.

LONGSIGHT WESLEYAN CHAPEL.
MR. GEORGE WOODHOUSE, ARCHITECT.



COLUMBIA-SQUARE MARKET: NORTH FRONT OF THE MARKET HALL.—MR. H. A. DARRSHIRE, ARCHITECT.

[See p. 345, ante.]

THE ART-UNION OF LONDON ANNUAL MEETING.

On Tuesday last the subscribers and their friends assembled in large numbers in the Adelphi Theatre, Strand, to receive the committee's report, and distribute the amount subscribed for the purchase of works of art. The president, Lord Houghton, having taken the chair, Mr. Lewis Pocock, F.S.A., honorary secretary, read the following

REPORT.

The Council of the Art-Union, in presenting their annual Report, have the satisfaction of stating the amount of subscriptions to be 11,100, 10s. 6d. The Council having been repeatedly requested by the subscribers and agents to produce a chromo-lithograph, for general distribution, instead of the accustomed engraving, the financial committee, selected for the present year a reproduction of one of Mulready's finest and most popular works, namely, "Choosing the Wedding Gown," probably one of the most elaborate and difficult subjects that have ever appeared in art. It is hoped, will prove as popular as the original painting.

The writers in the public press have expressed most favourable opinions, both with respect to the subject, and the execution, as will appear by the following extracts from two leading journals:—
"That this picture by Mulready it would be difficult to find, in the entire range of modern art, any work more eminently combining skilful composition and drawing, with a happy, though a merely, position of the theory of colour, whilst the sentiment and composition are no less excellent. The exquisitely easy pose of the bride's figure, the beauty of the old mirror, and the interest of the depression which has existed, not only in England and on the continents of Europe and America, but has extended to the most remote regions of India, China, Australia and New Zealand, anticipated that, ere long, as on former similar occasions, a reaction will take place, and be followed by confidence and permanent national prosperity."—by a device for the Society's options if this society will again equal, if not exceed, the amount usually attained.

In consequence of the very successful result of the first year, it was decided to continue the Council, in June last, issued the following advertisement:—
"To ASSISTERS.—The Council of the Art-Union of London offer a Premium of Two Hundred Guineas for a Series of original and artistically finished Drawings (size 12 in. by 8 in.), illustrating some poetical or historical work of a British author, or events in British history, the selection being left to the discretion of the artists. The Council propose to add a further sum of One Hundred Guineas if a series of very high character be submitted; at the same time they reserve the right of withholding any portion of the event of not receiving any work of adequate merit," &c.
In reply, thirty-four sets of designs, of various degrees of merit, were received, and, by the kind permission of the authorities at the South Kensington Museum, were there exhibited to the public. After due consideration the Council selected, as most deserving of the premium offered, a series illustrative of Charles Kingsley's well-known story of "Harroward the Wake." These drawings were afterwards found to be the work of H. O. Selous, already known to the subscribers for his admirable designs to the "Pilgrim's Progress,"—by a device for the Society's options if this society will again equal, if not exceed, the amount usually attained.

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In reply, thirty-four sets of designs, of various degrees of merit, were received, and, by the kind permission of the authorities at the South Kensington Museum, were there exhibited to the public. After due consideration the Council selected, as most deserving of the premium offered, a series illustrative of Charles Kingsley's well-known story of "Harroward the Wake." These drawings were afterwards found to be the work of H. O. Selous, already known to the subscribers for his admirable designs to the "Pilgrim's Progress,"—by a device for the Society's options if this society will again equal, if not exceed, the amount usually attained.

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In the year 1857 the Council issued a limited number of etchings by the members of the Etching Club, including Messrs. Rodgrave, Craswick, Horsley, Hoole, Cole, Taylor &c., which gave great satisfaction, copies of that volume being now much sought after by amateurs.

The Council have the satisfaction of being able to announce that they are in treaty with the same Society for the production of another annual work to form a number of prizes, which, they have every reason to expect, may be ready for next year's distribution.

The Council have to announce with deep regret the retirement of Mr. Godwin, one of the honorary secretaries, to whose knowledge of art, and unwearied exertions for the welfare of the Society, from its first formation, much of its success is to be attributed.

He remains, greatly to the satisfaction of his colleagues, a member of the Council, and will, on every occasion, be ready to afford his valuable aid on all subjects connected with the Society.

Death has deprived the Art-Union of one of its most earnest and distinguished vice-presidents, the late Dean of St. Paul's, who, in the earlier years of the Association, as an active member of the Council, was ever ready to assist by his presence and advice.

It is a matter of congratulation to the Society that the Right Hon. Lord Stanley and the Very Rev. the Dean of Canterbury, have consented to be nominated Vice-Presidents.

Vacancies in the Council, caused by the retirement of Sir Gardner Wilkinson and Esq. S. Dallas, and the resignation of Sir Walter Strickland, Bart., and George William Reid, Esq., of the British Museum.

Very considerable progress has been made by the engravers who are engaged on the two great works in Westminster Palace, by Mr. Maclean, as announced in our Reports of the years 1865 and 1866.

The Reserve Fund now amounts to 14,911, 14s. 7d. The Council keep steadily in view the importance of obtaining a gallery and other premises for the purpose of the Association (the original object of this fund); they have likewise long had under consideration the practical mode of establishing a permanent exhibition in connexion with the Society.

Amount of subscriptions.....	£11,100 10 6
Cost of print of the year, report, exhibition, and almanack, including reserve of 2s per cent.....	43,573 8 10
General printing, rent, salaries, &c.....	2,634 13 8
Set apart for prizes.....	4,922 10 0
Total.....	£11,100 10 6

The Council have, as usual, to return their warm thanks to the local honorary secretaries and agents, both in this country and in every quarter of the globe, without whose zealous co-operation the sphere of the Society's action would be comparatively insignificant. It is a fact, continually alluded to in these reports, that, the influence of this Association, acting through the instrumentality of its agents, binds together the remotest regions by a common bond of appreciation of those products of genius which tend to refine and elevate the mind, and that, while the cotton and woollen goods, the hardware and crockery of England, are to be found in almost every clime inhabited by man, at the same time, by the agency of this Society, the natives of all parts of the world are supplied with sources of mental enjoyment and refinement, by the acquisition of engravings, or reduced copies, of the finest works of the first painters and sculptors of the day.

It may be mentioned that, in South Australia, we have no less than twenty agencies at work, under the able superintendence of Mr. Hawkes, of Adelaide, and in amongst other conspicuous good service are Messrs. Wilkie, of Melbourne; Dennet, of Boston, U.S.; Dawson, of Montreal; De Cordova, of Kingston, Jamaica; and Ferris, near Perth. There are also other different parts of Australia, six in New Zealand, eight in the West Indies, and numerous others.

The amount available for the purchase of works of art from the public galleries will be thus allotted:—

22 works at.....	£210 each.
21 ".....	15 "
12 ".....	20 "
12 ".....	35 "
12 ".....	35 "
12 ".....	35 "
5 ".....	40 "
5 ".....	45 "
6 ".....	50 "
4 ".....	60 "
4 ".....	70 "
3 ".....	100 "
2 ".....	150 "
1 work at.....	200 "

There will also be distributed,—
29 Bronzes of the Nelson Column,
10 Medallion Bronze Inkstands,
100 Statuettes, "The Wood-nymph."

Thus, with the parian busts given to all who have subscribed for ten years consecutively without gaining a prize, there will be 402 prizes, in addition to the work given to every subscriber.

The works selected by the prizeholders of the past year were, as usual, by the kind permission of the members of the Institute of Painters in Water-colours, exhibited in their gallery in Pall-mall. The Council are glad to be able to state that the pictures chosen showed a decided improvement, in point of merit, on those of recent years. It must be borne in mind that the task of selecting a picture for a prize is a very different matter now from what it was in the early days of the Society, when the sale of pictures was the exception; while now, as a rule, the greater portion of works of excellence are bought before they are exhibited. The British public has become essentially a picture-buying public, and to the advanced knowledge and interest in matters of art from which this arises, the Art-Union of London may boast of having contributed in no inconsiderable degree. The more difficulty there is in finding works of merit, the greater the necessity for wider dissemination and exercise of the selection; and the Council are glad to find that, in addition to a much higher standard of appreciation of the qualities of a picture on

the part of the prizeholders, there is a continually-increasing disposition to come to the Committee appointed to afford them advice and assistance as to their choice, or to place the task of selection in their hands.

It is not to be supposed that a knowledge of the principles on which depend the power of forming a right judgment of works of art comes by nature, or that the science of "aesthetics" is not dependent on certain axioms and elementary rules, equally with mathematics or chemistry, or any other exact science. A recent writer on art has well observed that "it seems too obvious for argument that we ought to have rules within ourselves to know how to choose, or what to look at; that, in short, it is an eminently desirable thing to have a good taste. The difficulty is, that people often practically deny that there is any such thing in existence. It is true they acknowledge that taste is a substantive thing, ruled by definite laws, in general terms; but the moment that any one disagrees with them, do they not cry, 'That may be your taste, but mine is so and so?' And if reasons are given for disagreement, we often hear 'Tastes are not to be disputed,' quoted with all the gravity which can be given by translating a foolish proverb from the Latin.

The natural bias, without which nothing can be done, we cannot give; and hence the nine-tenths, as Locke called it, which comes to us all through education and knowledge, is clearly the only part which can be discussed to practical purpose. But this natural bias differs with every individual,—indeed, it precisely that which marks out every one's individuality; and hence, returning to art, there is no possibility that the greatest knowledge, uniformly diffused, would end in uniformity of taste. People are born to prefer red to blue, expression in action, figures to landscape, as they prefer extravagancy to clear, or rhyme to blank verse; and tastes, to this degree, will differ to the end of the world."

Prizeholders are reminded that, at some of the exhibitions the prices of the works to be sold are printed in the catalogue, whilst at the Royal Academy and the old Water Colour Society, the prices are not so published; but at the former a clerk is always in attendance to answer the inquiries of purchasers, and at the latter the keeper attends in the gallery for the same purpose.

The National Collections, most valuable means of instruction, are yearly becoming larger and more important; and generalists and amateurs, namely, Mr. Atkinson and Mr. Muzio, to whom the thanks of the Council are offered. The following is a brief summary of the receipts and expenditure, a detailed account will, as usual, be printed in the Report.

The amount available for the purchase of works of art from the public galleries will be thus allotted:—

By these conditions it will be seen that, unless the arrangements proposed be promptly carried out, this magnificent gift will be lost; the attention, therefore, of all interested is particularly directed to the subject. By these noble gifts, Mr. Slade's name will certainly be preserved with reverence and affection, as a great benefactor of his country. Assuming that the proctors will be chosen to teach the theory of art in its highest sense, and its widest relations, rather than to simply instruct in its practical rudiments, it may safely be predicted that art-knowledge will be regarded as part of a liberal education, and no less essential to a gentleman than classics or mathematics, and both professors and students will be influenced by other besides commercial considerations. Men of intellectual culture and refinement will be lured into the fine arts, to the credit of the profession; in short, Mr. Slade has deserved at least as well of his country as many of the successful commanders, politicians, and others, whom the nation delights to honour and commemorate in marble and in bronze.

The Art-Union of London has now been in operation thirty-two years, and, during that time, has collected for this purpose of aiding in the advancement of art, and thereby in the advancement of civilization, a sum exceeding 376,000*l.*; and when it is remembered that the greater part of this large amount could not have been so appropriated, but for the means afforded by the noble gift of Mr. Slade, the advantages and the good which must result from it to the whole nation become at once strikingly evident.

The Council, in conclusion, invite your renewed co-operation for the ensuing year, and they cannot too emphatically request those who are fortunate enough to be prizeholders to-day, to use the utmost discrimination in their selection, a matter in which the whole Society is concerned, to the end that the great object of the Association,—namely, the elevation of the general taste, and the advancement of the fine arts,—may be satisfactorily attained.

LEWIS POCOCK, Hon. Secy.
EMM. E. ARTHURUS, Hon. Secy.

The President, in moving the adoption of the report, said that the general tenor of it was sufficiently satisfactory to ensure its immediate approval. It was perfectly true that this society had partaken of the general depression of

commerce and the circulation of capital in this country. Indeed, it could not be expected to be otherwise, because the institution was supported by the superfluities of men; but he trusted that, if the state of commercial affairs should rally, the prospects of the Art-Union would become still brighter than they had ever been. Considering that there were 12,000 persons who subscribed to the association in various parts of the world, there was sufficient evidence that this was a matter of great general interest to the English people; and there could be no doubt whatever that it was of considerable use to art. He was sure that all present, ladies as well as gentlemen, would allow that *combining* was a universal passion, and he claimed for this society the exceptional privilege of making what was generally held to be a universal preceding subservient to the advancement of the highest intellectual cultivation and moral improvement.

Professor Westmacott seconded the motion, and observed that it was extremely desirable that those who had the opportunity of choosing pictures would be so far careful, that if they had any doubt as to the quality of the works before them they would not be too proud or conceited to ask the opinion of others who were older and more experienced than themselves. He dwelt forcibly on the fact that the state of art in this country mainly depends on the public,—that it was their duty to insist on the striving after a high standard in art by refusing to buy pictures of a low or unworthy character; and that if the artists of England are not harn with a feeling for the beautiful, like those of the warmer South, they may be educated up to it. He had the pleasure to inform the company that he had seen the new Royal Academy, and he was proud to be enabled to state that they might now hold up their heads in the conviction that they possessed the finest exhibition-rooms in the world. The general arrangements as to light, the distribution of the pictures, and the space at the command of the visitors, were such as he felt assured would excite universal approbation. He was happy to have the opportunity of bearing this first public testimony to the excellence of the new building, which, it would be admitted, was not surpassed by any other structure in Europe devoted to the same purpose.

Sir Walter Stirling proposed a vote of thanks to the hon. secretaries, Mr. Peacock and Mr. Anthonis, accompanied with an expression of regret that Mr. Godwin had retired from that position since the last annual meeting.

Professor Donaldson, in seconding the resolution, alluded to what he termed the able and lucidly-written record of matters on art in England, which would be found embodied in the series of the Council's reports.

Mr. Peacock, in returning thanks, expressed his hearty concurrence in the eulogium on his late colleague, which had been pronounced both by Professor Westmacott, Sir W. Stirling, and Professor Donaldson, and his regret at losing the advantage of his co-operation as Hon. Secretary. He remarked that with the aid of the amiable and accomplished gentleman who had been appointed to the office, he felt no doubt of the successful continuation of the Society's operations.

Mr. Hayward moved a vote of thanks to Mr. Benjamin Webster for the use of his theatre, and to Mr. John Kinloch, the acting manager of the establishment, for his active co-operation.

Professor Westmacott seconded the motion, which was cordially agreed to.

A tribute of thanks was passed to the chairman, and the drawing of the money prizes was declared to be as follows:—

- 200l.—Shand, A., Old Churchyard, Liverpool.
 150l.—Cobden, Mrs. A. E., Dumfries; Robertson, J., Edinburgh.
 100l.—Hawker, W. C., Clondesley-square; Smith, E. A., Kensington; Walford, Mrs. W., Wolverhampton.
 75l.—Beach, E., Lincoln-square; Fairhurst, W., Halifax, Yorkshire; Kerr, G., Abchurch-lane; Pecker, J., Windsor.
 50l.—Eaton, H. T., Winchester; Edwards, T., 67, Lombard-street; Lucas, Alfred, Kentish-town-road; Wright, W., Runcorn.
 50l.—Jarvis, W. M., St. John's, N.B.; Manthorp, S., Colchester; Spinks, W., Oxford-terrace; Stewart, Dr., Alton; Taylor, J., Reading; Wright, W., Usklands, Runcorn.
 45l.—Copeman, W. J., Yarmouth; Hetherington, A., Alton; James, William, Haverester; J. Boone, Rev. J. J., Tasmania; Roberts, E., Regent's Park.
 40l.—Corbett, Miss E., Camden-road; Dean, J. I., Putney; Dixon, E. F., Whitehaven; Dodd, J., Sydney; Down, H. A., Queens-square; Haselton, C., New Bedford; Priestman, T., Preston Brook; Rolfe, H. L., Nicholas-lane.
 35l.—Brackenbury, W. T., Thorpe; Burgess, B., Demerara; Christian, B. D., Constantinople; Lawless, J., Exeter; Mortimer, F., Shepherd's-bush; Russell,

W. F., Wanganzai; Thornton, Mrs., Brixton-hill; "Welcome," Knockholt; Withen, H., Fenchurch-street; Woodridge, C., Rochester.

30l.—Blake, E., Whiteladies; Bullock, W. J., Holland-road; Flaxman, J., (Warrimool; Gaunt, W. H., Old Thorville; Gibson, C. W., Ballarat; Hall, H., Cambridge; Harris, W., Woolston; Holden, E. T., Walsall; Inderwick, E. S., Tregunter-road; M'Queen, F. C., Tottenham-court-road; Mumford, A., Walthamstow; Newson, D., Jinn.
 25l.—Adams, Miss, Barnet; Clorley, T. F., Moorgate-street; Forbes, Capt. H. F., Thacker & Co.; Francis, J., Bryndevon; Harbrough, G., Hobart Town; Hawker, W. C., Clondesley-square; Howie, C., Brentford; James, W. J., Hobart Town; Loder, F. W., South Audley-street; Nicholson, Sir Chas., bart., Devonshire-place; Read, R. C., Hobart Town; White, Benjamin, Bishopgate.

20l.—Eopley, A., Eversham; Forwell, E., Wotton-under-Edge; Hall, R., Bolton; Help, F. W., Dean-yard; Holt, C. W., Southborough; Lawrie, W., Inverness; Schaar, Mrs., Holland; Solomon, S., Cape Town; Turner, W. J., Wood-green; Vandy, G. J., Camberwell; Wilson, A., Dandee; Young, W., Bolton.

15l.—Bohl, A., Lima; Collins, G. N., Moreton Hampstead; Clark, C., Sawridge-wood; Clark, R., Cork; Davison, T., Boland-street; Dixon, H. J., Sheffield; Fricker, G. C., Hamilton, Victoria; Gilding, Miss, Edenbridge; Harrington, Elizabeth, Countess of Kensington Palace-garden; Leigh, S. G., Leeds; Manston, A., Liverpool; Moore, H. S., Holyrood-place; Murto, J., Highbury; Noble, H. B., Moorgate-street; Pertwee, A., Woodham; Pridaux, Lady, Netherton Hall, Howton, W. G., Greenwich; Salmen, Mrs., Melbourne; Lohb, Mrs., Greenock; Whittington, J. B., Walleroo; Wright, E., Blackheath.

10l.—Aiken, C., Kentish place; Allingham, Mrs. B., Milton; Bond, W. T., Beady, Camberwell; Burd; Montreal; Carver, E. J., Melbourne, Camba; Child, H., Hackney; Christie, Dr., Clifton, Yorkshire; Colvin, E. M., Melbourne; Holmes, R. W., Ballarat; Hugel, C. C., Crediton; Lightfoot, Mrs. G., Melbourn; Lohb, Mrs., Holland-road; Macpherson, D., St. Petersburg; Montrose, R. M., Melbourne; Newton, Miss, Clapton; Paradise, A. W., Bedford, C. G. H.; Patterson, Miss, Melbourne; Rogers, T. W., Fenchurch-street; Southcomb, T., Belfast, Victoria; Statley, Miss, Belize-road; Tysack, W. A., Cornhill; Weller, W., Littlehampton.

THURNHAM CASTLE.

THURNHAM, called also, from the hill on which it stands, "Godard's" Castle, near Maidstone, is a curious example of a Norman castle, placed upon what is evidently a British camp.

The camp crowned the high point of a very steep spur, which juts out between a depression on the one side, and a small deep combe on the other, in the great escarpment of the lower chalk, about four miles east-north-east of Maidstone. The earthworks were formed by scarping the central knoll, and perhaps raising it a very little, so as to form a slight mound, and thus especially strengthening its weak sides, those towards the root of the spur. On the lower or Thurnham front the defences, naturally strong, are reinforced by a ditch and bank, placed some little way down the hill, far below the body of the fortress, and intended to command the road which here winds up the ridge from the village and church of Thurnham, at the foot of the hill. The ground within this outer defence has been extensively opened for chalk, and is so disfigured by heaps of quarry rubbish, that but little can be accurately ascertained of its ancient dispositions.

The Norman castle occupied a platform close west of the mound, and probably included within the British camp. Here stand the remains of the gateway and court, but as a trace of masonry is still seen upon the mound, it may be that it was included in the encinte wall, or that upon it stood one of the circular or polygonal shell keeps which sometimes, with the Normans, took the place of the ordinary square keep, especially where there was an earlier mound to be fortified.

The ruins are not considerable. They are composed of the two parallel walls of a gatehouse, having on either hand two large round-headed recesses, dividing the passage into two bays, and there are besides two small lodge doors, also round-headed, on the east side.

Westwards from the gatehouse runs a low ornamental wall, about 13 ft. high, and 4 ft. thick, for about 80 ft., ending in a broad flat buttress, perhaps the base of a square tower. The wall thence may be traced southwards, along the edge of the skeep, whence it seems to have been continued towards the mound. A hollow way, cut in the chalk, winds from below, beneath, and close to the west of this wall, and, making a bend, enters the gatehouse from the north. There are no traces of ashlar. Much of the wall shows a face of coarse flints. The work may be late Norman.

On the summit of the knoll is a depression in the soil. This part of the work is so covered with thick bramble and underwood that it cannot be very accurately examined.

Thurnham or Turnham occurs in Domesday, and was one of the numerous manors given by the conqueror to Bishop Odo, and held under

him at the survey by Ralph Curpespine. It then contained a church, and had been held under the Concessor by Sbern Biga.

On Odo's fall, 19 W. C., it was granted to Gilbert Mamint by the tenure of castle guard under Dever Castle. The holders under Mamint were a knightly family, who took their name from the place. Robert de Turnham held it temp. H. II., and founded Comhwell Priory. Possibly he built the Castle. Robert had Rehert, who died s.p. 13 John; and Stephen, who died also s.p. 16 John.

In the reign of Ed. I. Thurnham was held by Sir Reger de Northwode, who died 13 Ed. I., leaving John, who married Jean de Badlesmere, and died 14 Ed. II. Their son Jehn died before his father, leaving Rogcr, who had Thurnham, and married Juliana, d. of Geoffrey de Say, chief lord of the manor. Their son, Sir John, third baron, died 2 R. II.; and his son, Reger de Northwode, who was never summoned to Parliament, alienated Thurnham, and died s.p., leaving a brother.

The Northwodes are said to have resided here, but the castle is thought to have been dismantled at an early period. Thurnham Castle is not named in the Ordnance map.

Binbury.

Binbury, called also Bingeury, is a very complete and very remarkable earthwork, in the parish of Thurnham. It stands upon the high table-land of the chalk, a mile or more from the escarpment, and about four miles from Maidstone. In the Ordnance map it is erroneously called a burrow.

The earthwork is composed of a conical mound about 50 yards across at its flat top, with steep sides, forming the scarp of a circular ditch, so that the platform of the mound is about 35 ft. above the bottom of the ditch, and 15 ft. above the level of the adjacent ground. The mound is wholly artificial, and perfectly regular, and with its ditch includes just an acre. Upon it are some fine old oaks, and both mound and ditch are thickly grown over with underwood, so that an accurate inspection or measurement is scarcely at present practicable. There are no traces of outworks. Towards the south-east the ditch has been filled up to form the garden of an adjacent farm-house of Tudor date, with more recent alterations. There are no traces of masonry connected with either mound or ditch. This was evidently a [Saxon] stronghold, intended to be defended by a palisade, and crowned by a house of timber. The outline is very perfect and well defined.

As the work is thrown up in a plain, where there were no natural advantages for defence, its owner probably selected the site as being within his estate, and convenient for the overlooking of his lands. In this it differs materially from Thurnham camp, which was probably the work of a tribe who lived by hunting and war, and therefore cared chiefly for an extensive view.

Bingeury has always been an important and independent manor, though in the parish of Thurnham. At Domesday it probably belonged with Thurnham to Sbern Biga, who is thought to have resided here and given his name to it. He was a very considerable Kentish landholder under the Concessor, and likely enough to have dwelt upon a mound of this size and strength.

It descended with Thurnham, and in the escheats of 12 Ed. II. Joan, widow of John de Northwode, was seized of the manors of "Thornham and Bongeury." C.

Society for the Encouragement of the Fine Arts.—On Thursday, the 22nd ult., at the rooms of this society, there was an exhibition of engravings of the English school, with a paper, "On the Technicalities of the Art," by Mr. John Sadler; Mr. G. R. Ward in the chair. Adverting to the antiquity of the art, and remarking on the slow progress of technical knowledge as a branch of education in England, Mr. Sadler proceeded to illustrate and explain the various modes of engraving on metal—in line, stipple, mezzotint, and aquatint—pointing out the peculiarities of each, the kind of treatment required for different subjects, and the mechanical difficulties that had to be surmounted, the principles that governed the art, condemning the mixed style now most in vogue, and concluded a very able and interesting paper with some allusions to the law of copyright in paintings, by which, he said, the interests of neither artist, engraver, nor publisher were protected.

THE NEW CHURCH AT KIRKBY.

At Kirkby, a village a few miles north of Liverpool, is a very ancient chapelry. It is a small dilapidated building, partly Gothic and partly base Renaissance, with high painted pews, flat ceiling, and low galleries on three sides. This having become unsatisfactory, is to be replaced by a larger structure. The Earl of Sefton, who owns the district, has selected a site north of the present church, and appointed Messrs. Paley & Austin, of Lancaster, architects. Estimates have been obtained from several builders of the town and neighbourhood, and the tender of Mr. Edward Gahnhit, of Liverpool, for 7,638*l.*, though not the lowest nor highest by nearly 2,000*l.*, was accepted.

The material used is the native red sandstone, dressed, in courses, throughout. Lord Sefton supplies stone and sand. The work has been proceeded with, and on the 31st of March his Lordship laid the foundation-stone of the new church, which is dedicated to St. Chad. The proceedings passed off with great *clat*, a feast being provided for all concerned.

The style adopted is Early Thirteenth-Century Gothic, and the building will consist of a nave and aisles, 88 ft. by 51 ft. inside, and a choir with groined ceiling, over which rises a square tower with saddle-back roof 128 ft. high. The vestry and organ-chamber are situated respectively north and south of choir. The chancel or sanctuary extends 20 ft. farther east, and is rectangular. It has triple sedilia on the south side, and credence on the north side.

The aisles are narrow, and are divided from the nave by arcades of five bays each, resting on massive pillars, those on the north side being octagonal, and on the south circular, and support a lofty clearstory. At the west end of each aisle are placed north and south porches, to be open in front with seats. The south door will be effective.

It is intended to restore and place at the west end of the nave a very ancient font belonging to the old church, which has had its vicissitudes of fortune, and had been brought back from the vicarage garden, where the basin served the purpose of a flower-pot. This is of red sandstone, circular, about 17 in. in diameter, and 16 in. deep, and is rudely carved in panels on its circumference, with figures, one subject being Adam and Eve in Eden, with the serpent and the tree of knowledge. Serpents coiled together form a moulding underneath. The base is formed of a heavy twisted rope moulding in the same material, the weight being lost. Altogether it is an interesting relic of ancient times.

CHEAP RAILWAYS.

I THINK it is high time that we had some reform in our railway system, at least for villages and country places, where the roads are such that the gradients are not more than 1 in 12; I say 1 in 12, because I understand that it has been tried and found to answer; although a deeper gradient than that can be managed with light trains, and adding weight will give power to the engine, or adopting the horizontal wheel and screw friction. Before our forefathers a man could build a house anywhere, and he was at home, because the convenience was nearly as good in one place as another, viz. the common road; but now, unless the hills near to a railway, be nowhere, as the common saying is,—he is out of the world,—and then that cause the country places are neglected, their populations are decreasing, and people are flocking to the railways; also, the land in country places is getting poorer, because there is not sufficient animal and other kinds of matter to maintain the soil, while the towns are getting sicker, and the populations increasing so much, that the sewage and other refuse cannot be carried to the land, so that it is allowed to run into the rivers and pollute them. Our manner of running into the sea instead of being used on the land, and the country places are seldom allowed to improve. I do not pretend to say this is a list of things can be stopped, but I think it ought to some extent be checked; at all events, some good can be done to the villages and other important country places. Where the gradients are not more than 1 in 12, instead of making a railway at a cost of some 40,000*l.* per mile, by driving through hill and dale, and cutting up in all sorts of valuable property, levelling and straightening, no matter whatever the cost, a line of rails on the road side, and one

engine would do all the work, both passengers and goods, for short distances; but where the approaches are favourable and practicable, the main-line carriages and trucks could run on the road branches, which I believe could be done at about three or four thousand pounds per mile, less perhaps than the road itself cost; so that there would not be such a large sum to pay for interest upon the first outlay, which is the killing of all railway schemes for country places. I believe if this could be done the net work of railways would be rapidly increased throughout the land; and in a few years we should have railways nearly at as little cost as we now have the roads made, and with the Mont Cenis three-wheel plan, or Mr. Farlie's Bogie engine, curves are no objects of great importance, no matter how sharp they are, so that we could travel on any road, no matter how circuitous, although the straighter and nearer level a road is the better; but the cost of making them so is a consideration; and where the traffic is light there would be no need to run more than ten or fifteen miles an hour, because for small places there is little need, and the speed could be increased as the traffic increased.

Some may urge that it would be dangerous to the horses and passengers on the road. I say, not so; for as to horses there would be very few on the road, the rails would do nearly all the work. Besides, the horses would become so accustomed to the trains that they would take no notice of them, as they now do near all railway trains. I have seen a horse grazing within a few feet of a train when passing, and he never as much as lifted his head from the grass; and as for foot passengers, they would also be fewer, and it is just possible to make it quite secure by fencing the rails off; and I think I could adopt a brake, the plan of which I can produce, with which the guard might stop a train when going at full speed in a very short time, so that on rather long branches, and where there are few passengers, he could stop and take a single passenger anywhere, like the driver of an omnibus does. There would be no levelling nor straightening of the roads where the gradients do not exceed 1 in 12, and the curves do not matter when going at a speed of say ten or fifteen miles an hour. It could be tried on one of the best roads first, and if it answers (and I have no doubt of it; in fact, it cannot fail), it would be very soon tried on another, and then another, and so on, till it had found all roads in England, where practicable: then the villages and country places would have a railway such as would do the work, and such as they could pay for. The great advantage of railways is having the smooth iron rail to run on, instead of the sandy road, where the wheels are always sinking more or less, according to the weight they carry, no matter how hard the road is: so that they are always pulling up an incline, even when the road is level. It is not so much in the steam-engine as the iron rail that we find the advantage of railways, but of course they both work well together. To apply a locomotive engine on the highways without iron rails is, to say the least of it, an uningenious plan, and they who have tried it cannot be possessed of good theory. It is impossible to have proper friction in the sand; and as the wheels are constantly sinking to some extent, the load needs more propelling, and the engine is less powerful to propel it.

There has been a great deal said lately about railways not paying, and a good many schemes have been thrown out of the House of Commons, on the ground that they would not pay, and that there were already more railways than could employ their shareholders; that is simply because they are so expensively made. If a railway or branch line is mooted for a village or country place, they say at once, "Oh, it will not pay;" and there is great difficulty in getting railway companies to make branch lines to villages, except where they see the danger of a competing company making a line, and so taking away their traffic. The branch lines cannot pay on the present expensive system, simply because there is not sufficient traffic in the district; but let a company make a line on the road between villages and towns, and I venture to say that they would find it to pay as well or better than most railways in England. Of course they would have to get an Act of Parliament before they could do so; that is just what I am now seeking to be done in order that the country may get relieved of the dreadful want of iron rails to run wheels on. I imagine it only wants to be seen to be appreciated, and, once begun, I believe it would go along faster than ever the other rail-

ways have done. The great advantage of the iron rails instead of the roads can be seen from the fact that, while the horse is loaded with 30 cwt. or 40 cwt. on an ordinary road, the same horse can draw 30 tons or 40 tons on the rails of the same level; so that to me it seems strange that we have dragged our loads so long on the rough roads, and that we have not adopted the smooth iron rails long ago,—not by horses, but by steam, whereby the transit can be so much facilitated, and time seems now of great importance; besides, the land which it takes to grow corn and other commodities for horses could be adapted to the growth of other things, so that it would have a tendency to make corn, milk, butter, &c., cheaper. Some would say, "Look how you would narrow the road, and then there would not be room left for the horses, carts, &c., on the road." I say there would be far more room left than there is now, in proportion to the work they would have to do; because, suppose the rails took, say, 9 ft. or 10 ft. from the road, there would in ordinary roads still be left about 20 ft., so there would be only one-third of the road taken; but I should think that nine-tenths of the traffic would be taken by the rails. There would be very little more to do than the laying of the sleepers and rails, so that the cost could not be great, and having only one line of rails, which would be quite ample, in nearly all places there would be no fear of collisions. The roads are made, and the surveyors or roadmakers have continually lowered the bills, and raised the valleys, so that a moderate uniform gradient is already secured, and I should think quite hard enough when the sleepers and rails are laid to bear the weight of the locomotive engine, so that the roads need but a very slight application to convert them into railways.

A locomotive engine with its train of carriages would be a clumsy monster to move on the highways without rails, but lay the rails, and it would do its work as well as on any other railway of the same gradient and curvature. There would be no need to apply the Mont Cenis 3-wheel plan, or Mr. Farlie's Bogie engine, except where there are very deep gradients and sharp curves; but where there is a reasonable gradient, say 1 in 30, or 1 in 40, the ordinary fast-wheel system would be the best and safest, and they can take moderately sharp curves, which can be seen on all railways, although curves detract a little from the power of the engine. As I said before, the best roads could be tried first, and on the ordinary fast-wheel plan, which could not fail, but would be a decided success. JOSEPH TAYLOR.

CONDITION OF WATER.

Sir,—Adverting to, and in continuation of, my communication in your issue of the 3rd ult., upon water impurity and other subjects, I trust that some of your correspondents may be induced to give the result of analyses of waters from wells at Terling, in Essex, and of other places in which it has been shown, or may reasonably be inferred, that an epidemic has arisen from the impurity of potable waters due to sewage contamination.

I take it that too much publicity cannot be given to such important sanitary matters as those which treat upon the quality of waters for domestic purposes. I apprehend, that in the purity of the water we drink, and the air we breathe, lies the grand secret of a healthy mortality bill; and when these are deteriorated, how almost universally does it arise each from the same source—sewage contamination, whose constituents are dissolved in the water, and diffused through the air.

And I believe, when the public is aware, and particularly those who are somewhat responsible in local government, that certain fatal results are known to have followed the use of water of a certain quality, that the like may be presumed to occur in usage of similar water, irrespective of locality. And, therefore, on comparing the results of new analyses with the old, a very useful inference may be drawn. I would not wish to be understood as saying that, because certain quantities of organic substances exist in water, such is dangerous, for this as a test is shown to be valueless; nor even when the impurities are known in much greater detail, as ammonia, nitrates, and other products of decomposing matter, as expressed in even the most elaborate analysis; for I conceive it is not these salts, *per se*, which cause disease, but rather that their presence and derivation are

indicative of some latent and subtle power, the nature of which we know not, but whose property is to generate and propagate certain forms of sickness when taken into the system; as we may wish impunity, and without detriment, partake of a chemical preparation of salts equivalent to those in bad and unwholesome water.

I am obliged to Mr. E. T. Chapman for his information in your last number; and, if the matter be appreciated, many of your readers are indebted to him.

I regret there is so much ambiguity in analyses, as I think is admitted by Mr. Chapman; but this one, like all branches of science, being progressive, may soon be improved. And what I more regret is that so little attention seems to be paid by local authorities to the condition of water. W. R.

THE HOLBORN VIADUCT DRAINAGE.

STR.—After all the speeches and lectures that have been delivered, and the reports and treatises that have been written, during the past twenty-five years, on the arrangement, construction, and ventilation of sewers, it is astonishing, at this time of day, to meet with such an ill-designed piece of sewer-engineering as that exhibited in the Holborn Viaduct. In the works of men in prominent stations we naturally look for and generally find genius, superior skill, happy thoughts, and scientific combinations, which we adopt as models to inspire us in planning similar works. But the work referred to, as regards its drainage and ventilating arrangements, cannot be selected for any merits to be copied, but rather for faults to be avoided. As such, therefore, it may safely be used by professors of engineering to lay before their pupils; for knowledge is gained as much by pointing to defects in inferior objects as to beauties in superior ones.

Running along within the foundation of the viaduct there are two canal-like open sewers—one near each side. Into these sewers the large houses proposed to be built along both sides are intended to be drained. Some years ago open sewers were thought to be so prejudicial to health that they were generally covered over or abolished. It may, therefore, be presumed that the sewer authorities of the City cannot have properly considered the drainage arrangements of the viaduct, or they would not have permitted such abominable things as open sewers to be formed within it.

The house-drains are without water-traps near the sewers. The effect of this will be that the gases engendered in the sewers will constantly force a passage up the drains into the houses, and by this means partly ventilate the sewers. It is a well-ascertained fact that this process goes on more or less in almost every house by the present method of sewerage; and, therefore, it is too bad that those who have the care of the sewers should do nothing to remedy the evil, but rather project and execute works which aggravate it.

Alongside each open sewer there is a paved pathway 4 ft. in width, like the towing-path to a canal. As myriads of rats congregate and multiply in the sewers in this locality, these paths will afford them excellent recreative promenades. Here they may gambol at pleasure climb up the walls, and, by numerous openings, disperse through the viaduct and the houses in search of provender.

Above the open sewers there are air spaces or chambers, 7 ft. in width, and 24 ft. in height, running the whole length of the viaduct, minus the cross streets. These chambers are neither more nor less than huge elongated aerogasmeters; for ventilating which, and for carrying off the effluvia from decomposing rat-excreta (large quantities of which will be sure to accumulate along the towing-paths), 9-in. pipes are carried up in the viaduct walls from near the top of the chambers.

The ventilating pipes are intended to be continued upwards in the party walls of the houses. The effect of this will be that the sewer gases will continually escape into the rooms through the joints of the pipes and the brickwork; for practically whatever pains are taken to stop, flush in, and secure the pipe and brick joints, shrinkage and subsidence, and vibration by heavy traffic, will cause fissures and cracks in the pipes and walls; and, consequently, leakage of foul air will take place into the rooms. As these are common occurrences, it surely is not wise to ventilate the sewers in this manner. If by the methods of construction and ventilation adopted

the object was to introduce streams of impure air from the sewers into the houses and rooms, no better plans could hardly be devised for the purpose. For gases, like liquids, insinuate through the smallest, almost imperceptible, chinks and crevices, and even through porous brick walls, to a greater or less amount, according to differences of temperatures; and, therefore, the foul air which will accumulate in the huge sewer-gasometer referred to, will pervade not only every space in the viaduct, but every room in the adjacent houses.

There is an old exploded contrivance consisting of a hinged iron flap fixed in a niche in the foul-air chamber at the bottom of each gully-shoot. As the hinges of this flap corrode (they all do so), the flap will stick fast, let foul air pass through the opening, and become worse than useless. No one should employ such a worthless thing as a flap-trap nowadays. The only commendable thing in the whole drainage arrangements of the viaduct is the water-trap under the gully grating.

Now what should be done to remedy error is this:—1st. Arch over the open sewers. 2nd. Put water-traps at the outlets of the house-drains next the sewers, so that foul air may not flow up the drains into the houses. 3rd. Take away the hinged iron flaps, and continue the gully-drains down into the sewers. 4th. Ventilate the sewers by the gully-shafts by carrying pipes from near the top under the water-trap of the gullies across the subway arches into the ventilating flues from the subways, which flues should by no means be continued upwards in the party walls of the houses as intended, but connected with specially constructed shafts carried up outside the houses; and 5th. Provide receptacles under the gutter channels for the street-sweepings and horse-droppings to be emptied every night.

The foregoing observations are commended to the serious consideration of those concerned, by
COMMON SENSE.

ARCHITECTURAL EDUCATION.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the last meeting of this society, held on Wednesday, 21st ult., the honorary secretary (Mr. H. H. Statham, jun.) read a report that had been drawn up by a special committee of this body in reply to a communication from the honorary secretary of the Architectural Alliance on the subject of the condition of architectural education. The committee reported that the age at which architectural pupils generally left school was about fifteen or sixteen, and the usual term of articles was five years. Not more than forty architects who were known to practise in Liverpool on their own account (or about one-third of the whole number) were believed to have been articled. Perhaps not more than one-half of the students obtaining education with the view of entering the profession had passed through a school of art, including those who attended one of the Government schools in the evenings. Very little systematic instruction for the improvement of pupils appeared to be given, and there was too little opportunity afforded them of making acquaintance with the practical details of their profession by visiting and inspecting buildings in progress of erection, and for which they may have been engaged in making the drawings, the consequence being that the pupil obtained merely what might be termed a "drawing board" idea of architectural designs and construction. The committee were not aware that the study and sketching of existing buildings are especially encouraged by those who have pupils under them, though it had been urged upon the student members, at the meetings of that society, by various members who have from time to time offered prizes for the encouragement of this study among the students. After speaking of the small amount of support that had been given to the special architectural and building classes held some time since in the Queen's College, of the stores of architectural and fine-art work at the Free Public Library, and of the efforts put forward by that society for the benefit of students, the report went on to say that with regard to the improvement of, and addition to, the existing facilities for instruction, the committee were of opinion that much must depend upon the recognition by individual architects of their responsibility towards their articled pupils, and much also upon the industry and desire for improvement among the pupils themselves. The committee, however, believed that

the strongest inducement to the improvement of architectural education would be the establishment of a compulsory examination for those who wished to enter the profession. The committee concluded by saying it was much to be wished also that the use of a good professional library was available, either by the establishment of one national or of several provincial book societies.

The paper for the evening, which was read by Mr. A. Darbyshire, member of the Manchester Architectural Association, was entitled "The Science of Heraldry." The subject was considered with a view to a more extended application of the principles of heraldry to architecture, as an expressive symbolism, as a means of architectural decoration. Mr. Darbyshire reviewed the origin and the objects of heraldry, traced it down to the most modern times, and went at some length into its different sciences, explained the marshalling and cadency of heraldry, and also treated of its different charges, ordinaries, and sub-ordinaries.

THE SINAI EXPLORATIONS.

At the last ordinary meeting of the Royal Geographical Society, at the Royal Institution—Sir Roderick Murchison in the chair—the Rev. F. W. Holland read a paper "On the Recent Explorations in the Peninsula of Sinai." It was the object, he said, of Captains Wilson and Palmer, Messrs. Palmer and Wyatt, and Sergeant Macdonald, to make a trigonometrical survey. Accompanied by Mr. Holland, who acted as guide, and with three picked men of the Royal Engineers, they started from Suez in the middle of November, crossed the Desert, and arrived at Jehel Mousha, near which is the plain supposed to have been the camping ground of the Israelites. They observed many signs of former cultivation, and numerous hermit cells in all parts of the district, besides circles of stones, like the Druidical stone circles, and formed in the same manner. They took careful photographs and drawings of the inscriptions found on many of the stones, 12 of which contained Semitic and Greek characters together. These were found chiefly in the mining districts at Wady, Ajala, and others, and many of them seemed to have Christian signs and marks upon them, thus indicating a comparatively recent origin. However, Mr. Palmer was investigating them fully, and would publish his researches on his return. At Jehel Nakoms Mr. Holland saw the celebrated bell mountain, which consists of a steep bank of sand, 400 ft. high, facing the sea, and the sound, resembling the dull grating of an Æolian harp, is produced by the falling sand, the noise being greatest when the sand is most dry and heated. Not much was discovered to throw light upon the route of the Israelites.

EXPERIMENTS ON LIGHTING.

THE illumination of the Court of the Tuileries by the oxyhydrogen flame playing on a pencil of zircon, or on magnesia covered with zircon, has now continued for four months in a regular manner. Messrs. Tessié de Motay and Marchal, of Metz, whose chemical discoveries, or rather applications, have been very successful (as we have often noticed) in photographic operations on paper, glass, and porcelain, are the gentlemen whom the Emperor allowed to build a small wooden shed in the court of honour of the palace, and carry on practical operations for the "Drummond lights." Now, from temporary installation, the affair is to pass into a permanent one, and a suitable erection is to be provided.

We have examined the system, and watched its progress ever since M. Tessié de Motay and Marchal had revived the oxyhydrogen light for street illumination, by aid of the cheap production of oxygen, which is mixed at the burner with common coal-gas. We must confess that we were disappointed as to the *à giorno* lighting up of the square. The *individual light* of each burner, if we may so call it, is remarkably intense; but it is a mere point, and has not the same diffusive power even as the electric light in its lowest condition. If we recollect rightly, about thirty years ago a Bude light was placed in the centre of the upper yard (court of honour) of Dublin Castle. It formed a ring of light, 2 ft. in diameter, and about 3 in. high. This sole light was enough to illuminate perfectly the whole of the square, for the simple reason that there was *surface* oxyhydrogen intense flame. If the oxyhydrogen Tuileries

appliance had a number of jets placed a foot apart all round at a good height (to be calculated) the lighting might be accomplished with a pleasing result not yet afforded by the ill-conducted experiments we have witnessed. We cannot end this paragraph without recalling to mind a rather curious episode in the Bude lighting. Near Dublin Castle there is a celebrated lantern; and he put up Bude lights in his shop. They attracted the attention of every one. After a short period he took them away: in our asking him why, he replied, "Why, sir, they melted all my hats."

The Drummond, or any magnesium or incan light, may furnish a very intense point, even from an immense distance, but giving no more light than Sirius, &c., for illuminating the earth, unless a reflector be placed behind or a refracting or catadioptric lens in front. Then an intense light is projected forward in a pencil, whose *impinging area* is, however, so limited that the rest of the "scene" is darker than ever. Not so with the Bude light, by a proper disposition of the circular burner, — the speak of a ring-light — and a suitable supply of oxygen regulated according to the carburization of the gas, we can obtain a light fully equal to that of a harvest moon over a large area. As must be adapted for the open air, the question of heat is annulled.

DIOCESAN ARCHITECTS.

In the course of the debate on the Irish church Bill, Mr. Brodick said he had placed an amendment on the paper in order that justice might be done to a very small and deserving body of men, the diocesan architects, who were appointed under the 14th and 15th Victoria, known as Napier's Act. The bishop appointed in each diocese, and their duty was to superintend all the alterations of the glebe-houses, make periodical inspections, to report on the repairs necessary, and to see that those repairs were properly completed. They were, indeed, in useful functionaries, that he wished there were similar ones on this side of the water. There was no provision in the Bill for compensating these officers for the extinction of their employment. He had added the words "or emoluments" after "salaries," because they were paid by definite yearly salaries, but by a commission on the repairs they had superintended. One gentleman, who had filled this office for fifteen years, told him that his professional earnings from this source for the last three or four years had exceeded 100*l.* per annum. These offices would not be continued because, as the glebe houses fell in and were purchased under the Bill, they became the property of the church body, which need not employ diocesan architects unless it chose to do so. He moved, on the 6, line 27, after "benefices," to insert "the amount of yearly salary or emoluments which diocesan architect appointed under the provisions of the Act of the 14th and 15th years of Victoria is entitled to receive."

The Attorney-General for Ireland said that the compensation clauses had been considered with care, and it was found impossible to extend compensation to every case and circumstance. In this particular case, the claims of those officials who called themselves diocesan architects would not be recognized, because there were no such officers. The diocesan architects constituted themselves officers, but there is no such officials known to the law. The amendment was negatived.

The question has been asked in the *Builder* — who now created the diocesan architects in England? and it will have to be answered for these days, with particulars as to what circumstances led to their appointment, and how we use they have made of their position.

ARCHITECTS IN THE COUNTRY.

It was with the greatest pleasure and thankfulness that I read your admirable leader on the "Status of the Architectural Profession in the Provinces," and I trust will not suffer the matter to rest there, but will again and again refer to the subject, and point out the capabilities of taking in society. I say "capabilities" because unfortunately great numbers of architects seem utterly unacquainted with the habits of society, and take more naturally to the habits of a "Dobbs." And this defective education (or education) is not confined to absence of knowledge on literary topics, but is frequently more apparent, in professional matters, their designs (?) too frequently display an utter ignorance of all dates and styles; but if they have plenty of inappropriate and recy-

moodings, notchings, and chamfers, will "take" with committees as ignorant of art as themselves. But what can be expected when one is known to have been a joiner, another a cabinetmaker, or, as something superior, has been three years with a surveyor? Can it be wondered at that men of this stamp representing the profession, it is looked down on? Then, again, these gentlemen will, on hearing of a new scheme or other building being required, make drawings on speculation, or send photographs of works executed, and offer to make designs, free of cost, if not approved? Then the underhand practices in competition works are too well known to need any mention here. Such being unfortunately too frequently the case in the country, you may imagine how unpleasant it very frequently is for an architect who has been differently brought up, to hear his profession run down, and to feel at the same time how just in many cases is the condemnation. And this low standard of so many members of the profession is a most serious hindrance to united action, for with men of entirely different associations and ideas, it is impossible to cultivate the friendly feeling that should exist between members of so noble a profession. If the rules of the Institute were more strictly carried out, much good might be done, and good men be got to join it; but now they stand aloof, seeing many of its members guilty of the practice I have referred to.

Pray, then, Mr. Editor, confine your good work, and in so doing educate both architect and public.

A COUNTRY ARCHITECT.

DISPUTED LIABILITY.

On Tuesday an action was brought in the Marylebone County Court, before Sir J. Wilnot, bart., judge, by Mr. Pope, ironmonger, of the Edgware-road, to recover *£* 3*l.* from Mr. Wilkinson, architect, also of the Edgware-road.

Mr. Griffiths, barrister, appeared for the plaintiff; and Mr. Clarke for the defendant. It appeared that Mr. Wilkinson required some work done by his offices in the Edgware-road, and employed a builder, Mr. Hatton, of Sutton, to do the work. Mr. Hatton owed Mr. Wilkinson a large sum of money, and was to work it out. Mr. Hatton's foreman went over to Mr. Pope's and obtained various articles for the work, to Mr. Pope sued Mr. Wilkinson for the cost of the articles, but he positively swore that he did not order Mr. Hatton, or the foreman to go to Mr. Pope's; in fact, Mr. Hatton swore that he had every requirement for the work at his warehouse, but his man went to Pope's to save himself the trouble of going to the warehouse for the goods.

Mr. Pollard said he did the work in question for Mr. Hatton, and the foreman instructed him to apply to Mr. Pope for what he required, and he did so.

Mr. Griffiths contended, for the plaintiff, that Mr. Wilkinson was aware that Mr. Pope supplied the goods; but his Honour said he entertained quite a different opinion. No doubt the goods were used in the work stated, but he believed that Mr. Wilkinson had no knowledge of it, and could not therefore be in any way liable. He should therefore give judgment for the defendant, with costs.

THE BUILDING TRADES.

There is said to be some danger of a general strike of stonemasons throughout the kingdom; and, in order to avert it, a pressing invitation to both masters and men to settle their dispute by arbitration has been signed by Lord Lichfield, Mr. Kettle, Mr. Mandella, Mr. Harrison, Mr. Hughes, Mr. S. Morley, and six of the principal trade secretaries.

At a meeting of the trade-unionists of the metropolis, convened by the London Trades' Council, a resolution was unanimously adopted, approving of the Bill lately introduced by Mr. T. Hughes and Mr. Mandella, as a measure calculated to remedy the grievances which had so long been a source of discontent to the workmen, and had seriously disturbed the relations between employers and employed.

THE TALKED-OF LAW COURTS.

MR. LOVE is quite determined to go on with his scheme, and Mr. Street, Mr. James Ferguson, Mr. Thring, and others, are at work upon it. The report is that Mr. Love intends that the style adopted shall be Italian; while Mr. Lyard goes in for Venetian Gothic, and Mr. Fergusson wants something new; but what that something is we do not happen to know.

On Tuesday last Mr. Lyard said in the House of Commons,—

"that the Government had finally decided to propose to the House a plan for the erection of the new Law Courts on the site mentioned by his right hon. friend the Chancellor of the Exchequer on the 20th ult. The site proposed to be acquired by the Government was that comprised between Somerset House and the Temple, bounded on the South by the Thames Embankment, and on the north by Howard-street and several small alleys and passages connecting that street with the Temple College. This site would furnish six acres of building ground. Mr. Street, who was now occupied in adapting the plans which he had already prepared for the Carey-street site to this new site, had informed him that he would be able to erect all the law courts, and every office necessarily dependent thereon, upon these six acres. It was his intention to introduce very shortly, if possible before Wiltsuicide, a Bill in which, should the House think it to meet it, would enable the Government to proceed without delay to acquire the proposed site, and to commence the erection of the Law Courts upon it. He should be prepared, on the introduction of that Bill, to give a full explanation as to the details of the plan contemplated by the Government, and to point out its great advantages over all other plans hitherto

suggested. At the same time he should be able to give such assurance to the House as would, he hoped, convince them that it might be carried out, including numerous and most convenient approaches, for the sum mentioned by his right hon. friend, viz., 1,200,000*l.*, or at a much less cost than any other scheme. He might state to the House that he had received a communication from the Chief Baron of the Exchequer (Sir Fitzroy Kelly), stating that he and all the judges, with one exception, were of opinion that upon every ground as regarded the bench, the bar, the solicitors, the suitors, and the public, the Thames Embankment should be preferred for the site of the Law Courts."

THE NEIGHBOURHOOD OF THE HOLBORN VIADUCT.

SIR,—After reading your account of the Holborn Viaduct in last week's *Builder*, I was, of course, struck with the immense importance of the undertaking and of the benefit conferred on London. Will you allow me to raise my humble voice in stating what I consider should be done in order to make what is already a great boon a still greater one? I see by the papers that about two acres of land formerly used as the playground of the Charterhouse School have been sold. Why not continue Charterhouse-street through Charterhouse-square to Old-street? This could be done now without pulling down a single house, and compensation necessarily would be of a trifling nature. By reference to an Ordnance map of that locality you will, I am sure, see the advisability of such a scheme.

W. GIBBS.

PROVINCIAL EXHIBITIONS.

The Devonport Exhibition.—An exhibition of arts, sciences, and manufactures will be held at the Devonport Mechanics' Institution in July or August next. The exhibition will be directly in connexion with the Institute, the secretaries and committees of which are now organizing it. Its professed object is,—

"To afford to artisans, students, and the inhabitants generally of the West of England, an opportunity of extending their knowledge of the application of science to those particular branches of art and manufacture, on the full development of which so much of social welfare mainly depends."

Another object is to benefit the funds of the institution. The last realised a considerable sum. Committees have been at work for several months past, and many meetings have been held. The exhibition will be held in the halls and rooms of the institution, and will be open for several days. A large number of promises to lend articles has been received. A prize list has been published. The prizes are divided into thirteen classes, which include not merely works applying more directly to the arts and sciences, but also articles of every-day mechanical work and industry.

The South Staffordshire Exhibition.—The articles for exhibition are coming in, and in a short time the new main building will have all it needs to develop its outlines. The annex for the exhibition of machinery in motion is nearly completed. Mr. Lowe, the florist, has planted the grounds, which he has relaid, with home and foreign trees, firs, pines, and shrubs. Geometrical and other beds are prepared for flowers. Ornamental gates, hurdles, fencing, and garden iron furniture of all sorts are being placed upon the grounds. Mr. Lowe has provided a croquet-ground in a shady corner of the garden. The opening is fixed for Tuesday, May 11th.

CHURCH-BUILDING NEWS.

Halifax.—The corner stone of the chancel of the Church of St. Mary, situate in Rhodes-street, Halifax, has been laid. The church is the gift of Mr. Michael Stocks, of Upper Shildon Hall, near Halifax; and the stone was laid by his son, Major Stocks, of Latheron Wheel, Caisness, in place of his wife, who was to have performed the ceremony. The church will be built from designs by Messrs. Mallinson & Barber, architects, Halifax and Brighouse. The style is Geometrical Decorated. The principal entrance to the building is through the tower at the west end of the north aisle. There is also a doorway placed in a shallow porch in the second bay of the south aisle. The interior arrangement will show a nave, 47 ft. to the ridge, and the clearest pierced with spherical triangular tracery windows. The nave, which is 21 ft. 6 in. wide, is divided from the north and south aisles respectively by arcades of five or six arches. The centre aisle of the nave is 5 ft. wide, and the aisles 3 ft. wide, these latter being placed against the outer walls. A stone font, with a canopied

oak cover, will be placed at the western end of the central aisle or passage. The chancel is 34 ft. long and 20 ft. wide, with one bay on the north and south sides, screened off and appropriated to an organ-chamber and vestry. The chancel arch, the large five-light east window, and the Caen-stone reredos are features where the most decoration will be bestowed. The nave and aisles will have plain and open deal seats, and in the chancel will be two rows of oak stalls, the ends of seats and stalls to be filled with pattern panels in low relief. The roofs of the nave and aisles will be open-timbered, with moulded ribs and braces. The chancel roof will be constructed with coupled rafters, having carved moulded ribs, with a boarded ceiling at the back. Advantage is taken of the somewhat rapid fall of the site from west to east, in forming an under vestry the full width of the chancel, which may be used as a robing-room for choristers. The estimated cost of the building, without extras, is 5,500*l.* The contractors for the masonry are Messrs. J. & T. Cordingley; for joiner's work, Mr. J. Bedford; for plastering, &c., Mr. A. Bancroft; and for plumbing, Messrs. S. Fifth & Sons—all of Halifax. The works were commenced on the 12th of May, 1868, and have progressed to the top of the chancel and aisle walls.

Chichester.—St. Pancras Church has been reopened after enlargement. The church abuts against dwelling-houses at the east end, and is limited on the south and west by the street, and the architect (Mr. Gordon M. Hills, of London) found that the only way in which the enlargement could be carried out was by adding an aisle on the side. This has accordingly been done, the contractor for the works being Mr. J. Marshall, of Chichester, known in connexion with the restoration of the cathedral; and the result is additional accommodation for 125 persons. There were formerly 200 sittings, now there are 325, and the old seats have been replaced by benches of stained deal. The pulpit also is new, and is of an octagon form with open tracery on each side. The church has also been improved by the erection of a stone instead of, as before, a plaster arch, with the addition of shafts of polished Ippleden marble, the gift in part of Mr. Henry Halstead and Mr. Charles Townsend Halstead. The gaswork has been fixed free of cost to the parishioners by Mr. Robert Curch, of the Chichester gasworks, by whom the fittings and arrangements were also designed and presented. There are seven standards, each carrying a small brass corona.

Wolverhampton.—The new district church of St. Jude's, erected near Newbridge, on the right-hand side of the Patenhal-road, Wolverhampton, has been consecrated. The site for the church and parsonage, together with 2,000*l.* towards the endowment fund, was the gift of Miss Stokes. The building has been erected by Mr. Nelson, of Dudley, from the designs of Mr. Bidlake, of Wolverhampton, at a cost of 4,500*l.* The plan is cruciform. The nave is 92 ft. 6 in. long by 32 ft. 4 in. wide; the aisles 13 ft. 6 in. wide, and the chancel 35 ft. long by 23 ft. wide. On the north side of the chancel is the organ chamber, and on the south side the vestry. The tower is at the west end of the south aisle, and the entrances to the church are under the tower and a porch in the north aisle. The seating is divided into four bays by central and aisle passages. The shafts supporting the nave arches and clearstory wall are of Aberdeen granite polished, as are also the shafts to the chancel arch, the caps being carved. The style of architecture is Geometric Decorated, and the materials used are Cosmell stone for the walling, laid in level courses, rock-faced, with dressings of light-coloured stone. The timber work is deal, stained and varnished. The glazing is with cathedral tinted glass in lead lights of geometric design. The contractor for the heating apparatus was Mr. Blakemore, of Wednesbury; and for the gasfittings, Mr. Thomson, of Birmingham. The carving, which is executed in the conventional style, is by Mr. Forsyth, of Worcester. The architect has personally superintended the carrying out of the works. The edifice seats 812 adult persons.

Little Marske (Herefordshire).—The parish church of Little Marske is to be entirely rebuilt this summer, from plans furnished by Mr. Huggall, of Oxford. Messrs. Wall & Hook, of Brimscombe, are the builders. Earl Somers is lord of the manor, and one of his daughters is to lay the foundation-stone.

Emberton (Ducks).—The parish church of All Saints' has been re-opened for divine worship.

The church, which is of the Late Decorated period, with tower and spire of the Perpendicular character, has been new roofed, the clearstory walls, which were 16 in. out of the line, being put in their proper position. The north porch has been raised, and a new south porch, formerly the site of the vestry, has been erected; while the south aisle has been rebuilt, and new windows placed throughout the church, and stone mullions substituted for wood. The old fittings also have been replaced, the entire cost hitherto being about 1,700*l.* The new vestry which it is contemplated to erect will bring the total to 2,000*l.* The work has been carried out by Messrs. Winn & Foster, builders, Kempston, near Bedford. Mr. Bland, of Birmingham, was the architect employed.

Church Gresley.—At a numerous meeting in the vestry, it has been unanimously decided that earnest efforts at once be made to restore and enlarge the parish church. Mr. Blomfield, architect, has been named to provide plans and specifications.

DISSENTING CHURCH-BUILDING NEWS.

Bocking.—The Congregational chapel here has been reopened. The works have been carried out by Mr. J. Brown, builder, of Bocking, from the designs and under the direction of Mr. C. Pertwee, architect, Chelmsford. The exterior alterations are complete. The interior improvements comprise new lantern over the dome, new windows, floors, galleries, and plastering throughout, as well as reseating the entire area. The plain surface of the dome has been divided into panels by the introduction of ribs, and an enriched cornice is carried round the base, as also round the main walls of the building. The blank wall at the end has been relieved by a large circular-headed recess, enriched with stencilling, immediately in front of which stands the pulpit on a raised semi-circular dais or platform. In place of the double galleries a single gallery has been constructed round three sides of the building, with light open front, and in the centre, opposite the pulpit, stands the organ. The new lantern light now surmounts the roof, and terminates the dome, the improvement of which is considered one of the chief features in the alteration. In place of the old high-backed pews, under the galleries and in the body of the chapel are new low benches of plain varnished wood arranged in a radiatory manner to give the congregation a front view of the minister from every part of the chapel. The pulpit and deacons' platform are approached on either side by stairs; the front is of open panelling, with crimson cloth lining. The decorating of the recess was done by Mr. Garrood, of Chelmsford. The entrance-lobbies are paved with red and black tiles, and the benches have been cushioned in crimson by Messrs. J. E. Andrew, and A. Adkins, of Brain-tree and Bocking. The building is warmed by means of hot-water apparatus. Lighting is provided for by Mr. Crittall by twelve suspended star gas-burners, each star containing eight jets, and about a dozen smaller burners, of a similar description, to light the body of the chapel and under the gallery. The organ has a frontage in the Italian style, the diapering having been executed by Mr. Garrood, of Chelmsford, in gold and colour.

SCHOOL-BUILDING NEWS.

Northampton.—The new mission schools in St. Giles's parish have been opened. The building is of red brick, from a design by Mr. M. H. Holding, and forms two rooms, each about 35 ft. by 20 ft. The side walls are 14 ft. high to wall-plate, and it is lighted by circular-headed windows. In the south wall is an arcade of four arches to hold the Commandments, &c., which are being illuminated by a lady of the parish. The surface of the walls is relieved by string courses of coloured bricks and tiles. The roof is of a tolerably high pitch, and open to the ridge; the main timbers stained and varnished. The two rooms can be thrown into one by sliding doors. The north gable of the building, which fronts Dyehurch-lane, is also of red brick, with black bricks over the door and window arches; Bath stone is used over the doorway in glazed trefoil openings. The total cost is about 6,000*l.*, of which nearly 600*l.* have been raised.

Bowling (Bradford).—New schools have lately been erected at the back of the Congregational Chapel, in Essex-street, Bowling, with a frontage towards Frances-street. Hitherto the schools

have occupied the back portion of the chapel, which was originally designed with a view to its ultimate extension in the manner which has been carried out, and an additional length of 25 ft. has been obtained, affording 120 extra sittings on the ground-floor, and 70 by the extension of the side galleries. A platform for the organ is placed behind the pulpit, and doorways communicating with the vestries and schools have been placed on each side. The interior of the chapel has been redecorated from the designs of the architects. The new building has separate entrances for boys and girls, and contains, on the ground-floor, vestries for the minister and deacons, infant school-room, large class-room, ladies'-room, and a kitchen with boiler, &c., and a hoist to the room above. The entire area of the first-floor is devoted to the boys' and girls' school-room, is 78 ft. long and 31 ft. wide, and is provided with portable screens dividing it into five class-rooms. This room has an open roof. The building is heated by hot water. The schools have been designed to harmonise in style with the chapel. The windows and doors have semicircular heads, and are doubly recessed, and the centre gable is surmounted by a bell-turret. Messrs. Andrews, Son, & Peppor, of Bradford, were the architects.

PROVINCIAL NEWS.

Ricknansworth.—A company is being formed with a capital of 1,250*l.*, in 5*l.* shares, for the formation of a town-hall here. Shares to the amount of 1,030*l.* have already been subscribed.

Brighton.—The new county-court offices are progressing towards completion. They are situate in Church-street, and are being erected on plans designed by Mr. Thomas Charles Sorby, architect and county-court surveyor. The edifice has a frontage into Church-street, measuring 60 ft., with an elevation of about 30 ft., and a depth of 170 ft. It is Gothic in style, and built with red bricks, the "dressings" being of Bath stone, and it is roofed with Taylor's patent tiles. The principal entrance—the "Judge's Entrance"—is in Church-street, the stone work of it being carved. The public offices of the new court are in the south-west corner of the building, and are in size 31 ft. 6 in. by 20 ft., with waiting-rooms for the public measuring 35 ft. by 15 ft.; and these lead into the court, which is a distinct building—35 ft. wide, 41 ft. long, with an open roof, to the ridge of which is 40 ft. The roof timbers are stained, resting on carved stone corbels; and the court is lighted with ten "lead lights," furnished with Moore's patent Louvre ventilators. Adjoining the waiting-rooms to the north is the registrar's court, with a jurors' retiring-room at the back of it. On the east of the public offices is a private room for the registrar; another for the judge; also one for the high sheriff; together with a "strong room" for the safe custody of books and documents. The passages and waiting-rooms are floored with red and buff Staffordshire tiles, and the flooring of the court is covered with kamptulicon. The above-mentioned departments are all on the ground-floor, and the first floor—the building is only two stories in height—is devoted to apartments for the accommodation of the office-keeper. The work is being carried out by Mr. John Chappell, of Steyning and Brighton, under the superintendence of Mr. John Sharman. The hoarding surrounding the building has been removed, leaving a wall enclosing the different fronts of the new county court.

FROM SCOTLAND.

Leith.—During the past year a considerable number of new buildings have been erected here, and the state of the building trade bears a favourable comparison with recent years. Fears have been entertained that too many houses have been erected, and that difficulty will be experienced in getting them let, but it is not yet certain, according to our authority, the *Scotsman*, that the number will be beyond what will be needed. Within the year 500 dwelling-houses have been built, some of which are already occupied. More than 350 have been erected for the working-classes; thirty-seven are let, or are expected to be let, at rents varying from 20*l.* to 50*l.*, and the annual rents of the remainder are expected to be from 12*l.* to 20*l.* The houses are situated in healthy localities in the suburban parts of the burgh. No manufactories, lofts, or warehouses have been built during the year. The new industrial school in the Lochend-road is now rapidly nearing completion. Almost all the

houses have been built by speculators, who prefer selling to letting. The small houses, particularly if they have gardens or bleaching-grounds attached, meet with ready purchasers. It is expected that the building trade will continue brisk for some time to come. Large lots of ground have been fenced at Hermitage, Easterwood, Lochend-road, Leith-walk, North Leith, Bonnington, &c., and a more extensive house speculation will be soon commenced at Wardie.

STAINED GLASS.

Trinity Church, Tewkesbury.—Mrs. Laing, of the Mythe, has just had an obituary window placed in this church to the memory of a youthful son who died many years ago. It depicts the incident of Christ blessing little children, and forms an ornament to the chancel, which was lately been improved. It is the work of Messrs. Heaton & Co., of London. In addition to this, Mrs. Laing is also causing the other windows of the church, seven in number, which were of the usual common glass, to be refilled with thick tinted glass, with coloured borders.

Miscellaneous.

The Royal Society.—On the 24th ultimo, Mrs. Sabine, the president of the Royal Society, received the fellows of that body and numerous visitors belonging to the different learned institutions of the United Kingdom, at the apartments of the society, in Burlington House, Piccadilly. The reception-rooms belonging to the Linnean Library, the Linnean meeting-room, the saloon, the council-room, and other interesting apartments were thrown open, and many inventions connected with science, besides many attractive works of art, were displayed. At the reception-room were displayed some drawings of Leonardo da Vinci, Luni, and some unknown Italian masters.

Destruction of All Saints' Church, Surrey-square, by Fire.—On Tuesday morning All Saints' Church, situated in Surrey-square, 1 Kent-road, was discovered to be on fire. An edifice was erected about four years since, of modern construction, with no tower, spire, or galleries; the organ being erected in recess of the northern aisle, next to the communion. At first an impression prevailed in the district that the church must have been wilfully set fire to; but, from careful inquiry, there seems to be no foundation for such conclusion. It was evident the fire originated in the vicinity of the organ, for it was in that part the flames were first observed. In about an hour the church was completely consumed, only the wall and stone pillars in the aisle standing. It was insured in the Royal Insurance Fire-office, but only to one-half of the expense of its erection.

The Sheffield Architectural Society.—Members of this society visited Worsnop on Monday, this being the opening excursion for the season. The party first directed their attention to the new church now in course of erection, which bears the stamp of most modern churches, being arranged to accommodate a large number of people at a small cost. The lower only, which is partly built, is an exception. Proceeding thence to the Gate-house, the members assembled in the old school-room, when the President read a paper on the history of the Gate-house and Abbey Church. A cordial vote of thanks was proposed by the Rev. Mr. Lamh, seconded by Mr. Arnold Ward. After the service, the Abbey Church was examined with much interest. The Lion Hotel was the ultimate object.

The Drainage of Brighton into the Sea.—A long debate on this question has taken place in the town council. Mr. Alderman [name] moved—

That a special committee, consisting of ten members, be appointed to inquire into the present system of drainage to be seen in front of the town, and as to the practicality of diverting the drainage therefrom. That the committee be also authorized to inquire, by personal investigation, if necessary, into any systems adopted in other places for the utilization of sewage. That the committee have power to call in professional assistance for their investigations to aid them in making their report.

Mr. Lamb moved as an amendment, "That the appointment of the committee is inexpedient." The council divided, with the following result:—For Mr. Lamb's amendment, 26; against the amendment, 14.

Opening of the New Smithfield at Hanley.—The new cattle market at Hanley, provided by the town council, at a cost of about 3,000*l.*, has been opened. It contains an area of 8,000 square yards. The principal frontage, in Bethesda-street, will be about 100 yards in length. The accommodation to be provided, in the first instance, will be for 220 head of cattle, 1,620 sheep, and 100 pigs. The pens are formed of iron pillars with sockets, in which rails of wood are inserted. There will also be a "champering" ground for horses, 10 yards in width, along the west boundary wall. Some 2,000 square yards of land will remain within the inclosed area of the market, even after pens to the above extent have been all fixed, on which additional pens will be erected as they are required; but that place is levelled and sewered, and the foundations for the necessary pavement and pens are laid. When the whole area is thus covered, there will be ample accommodation for 380 cattle, and 3,600 sheep and pigs. The market will be surrounded on three sides by a boundary wall, and a toll-collector's office, a refreshment-room, and a settling-room will be provided. The new Smithfield has been designed and laid out by Mr. T. Hewson, the borough surveyor. This market is now the only institution of the kind for the supply of the North Staffordshire district.

The Valuation of Property (Metropolis) Bill.—A report has been presented to the Metropolitan Board of Works by their Parliamentary committee, stating the result of their interview with Mr. Goschen on the subject of the bill of the Poor-law Board, to provide for uniformity in the assessment of rateable property in the metropolis. The report stated that the committee had pointed out that the assessment committees should be appointed by the vestries, not by the guardian boards; that the appellate jurisdiction should be vested as at present, in the magistrates in Quarter Sessions, not by committees appointed by the Poor-law Board; that appeals as between parishes should be decided by a court composed of the representatives of each Quarter Sessions who had jurisdiction over the metropolitan area; and, lastly, that the operation of the bill should be limited to local taxation. It was admitted by Mr. Goschen, that with regard to the first objection, there was a good deal of force in it, and the proposal should be reconsidered. As to a Valuation Board, since it appeared that the vestries were opposed to it, the clause would probably be omitted. The suggestion as to the appellate jurisdiction Mr. Goschen was disposed "favorably to consider," and the plan proposed with regard to appeals as between parishes might be carried out. With reference to the last point urged, Mr. Goschen held out little hope of its being adopted. The report was unanimously adopted.

The Quarry Catastrophe in Cornwall.—It is now ascertained that no less than sixteen persons have lost their lives through the shocking accident which occurred on Wednesday before last at the Delahole Slate Quarries. These persons include thirteen men, two boys, and one woman. One man is reported to be dying through the effects of the injuries which he received. Four bodies have not as yet been recovered. It is estimated that the quantity of rock which fell the whole distance of 250 ft. amounted to no less than 150 tons. An inquest on the bodies was opened on Friday, the 23rd, before the county coroner, but after taking some formal evidence the inquiry was adjourned until Monday next. As night has advanced, the catastrophe has created great excitement throughout the district, and although 400 hands are employed in the quarry no work has been done since the accident.

The Public Buildings of the City.—Pursuant to an order of the Court of Common Council the City architect has presented an estimate, as far as practicable, of the probable amount of repairs that may be absolutely requisite for the ensuing half-year for the public buildings of the City. The amount is 7,650*l.*, as follows:—Mansion House, 1,000*l.*; Guildhall offices and courts, 500*l.*; markets, 200*l.*; police-stations, 150*l.*; Coal Exchange, 50*l.*; schools and almshouses, 350*l.*; Corporation buildings, 100*l.*; prisons, 200*l.*; bridges, 5,000*l.*; and other public buildings, 100*l.*—City Press.

Mr. James Pennothorne.—We hear with some surprise that Mr. Pennothorne's connexion with her Majesty's Office of Works has been terminated.

Kent Archaeological Society.—The council of this society held their Spring meeting on the 16th ult., at Chillington House, under the presidency of Earl Amherst. The meeting was held for the first time in the society's new apartments. It was resolved that the general meeting of the society should be held this summer at Malling, which is the centre of a neighborhood rich in architecture and antiquities, including Malling Abbey. Fifteen new members were elected, among whom were the Archbishop of Canterbury. The seventh volume of the Transactions of the society has just issued from the press, and contains Professor Willis's work on the Monastic Buildings of Canterbury Cathedral.

Straw Houses.—An English inventor has built some houses on a novel principle at New Hampton. The houses, says the *Scientific American*, are of a cheap order, designed for laborers. He compresses straw into slabs, soaks them in a solution of flint, to render them fire-proof, coats the two sides with a kind of cement or concrete; and of these slabs the cottages are built. By ingenious contrivances, the quantity of joiners' work is much reduced, and the chimney is so constructed as to secure warmth with the smallest consumption of fuel, and at the same time to heat a drying-closet. The cost of a single cottage of this description, combining "all the requirements of health, decency, and comfort," is 85*l.*

The Dore Gallery, New Bond Street.—In addition to various other new works by M. Gustave Doré, now in this gallery, there is a picture of the composer Rossini after death, from sketches made at the time. Though a painful work, it is deeply interesting, and least painful to those who knew the great master and his custom of closing his eyes even at the head of his own table, and when contributing to the liveliest conversation. Many difficulties are overcome in this painting,—the prevalence of white, for example,—and the result is a startling portrait, broad, truthful, and interesting to all Europe.

The Reredos in St. Edward's Church, Cambridge.—In a letter from King's College, signed W. R. Churton, in the local *Chronicle*, are the following remarks on this subject:—

"As one of the members of the University who took a leading part in the erection of the east window and reredos in St. Edward's Church as a testimonial to the labours of the present Dean of Ely during his incumbency of that parish, I request permission to protest against the manner in which this reredos has been defaced and stripped of its coloured decoration since the beginning of the present year. The design was furnished by the late Mr. P. Strange, and executed at some considerable cost by Messrs. Morris & Co., of Queen's-square, London. It was worked on good clunch, that shows no sign of decay; and if its falling were the reason of taking it off, it would have been quite time enough to have done that when they were prepared to put on something else."

Rejection and Dejection.—Bitter lamentations already reach us from various quarters, branching from Burlington House. We hear of established artists whose works have been wholly rejected, their art not meeting the views of the hangers. Surely, however, this is scarcely the right thing? If an artist has attained a certain position, and is pursuing creditably his profession, it seems hardly fair to cut him short for the year, because one of the hangers says this is not the sort of art that ought to be encouraged. However, we speak at present with great reserve, and hope the statements made to us may have been overdrawn.

A Concrete Pavement, which is called the "Patent Adamantean Concrete Pavement," is being laid in Great Carter-lane, near St. Paul's Cathedral, for the corporation of the City of London. The patentee claims for it that the mud, dust, noise, and wear of vehicles, are reduced to the minimum; that the heat or cold of this country will not affect the material; that it is non-absorbent, so that there will be no tendency for water or other impurities to enter from above, and the pavement can be washed down as easily as the deck of a ship. Time will show.

Llandaff.—The last stone of the new spire erected at Llandaff Cathedral has been fixed by the Bishop of the diocese. The spire is 180 ft. high. The last stone was hauled up by a winch, which the right rev. prelate turned "in a workmanlike manner." After having set the stone, his lordship made an address, in which he gave a lucid history of the restoration of the cathedral from its commencement.

Self-acting Photographic Apparatus.—An invention new to English operators is described in the last number of the "Illustrated Photographer." It is called the "Ophthalmos," and is in reality a camera provided with mechanical contrivances for automatically uncovering and covering the lens, and exposing the plate. It is sent up attached to a small balloon without an operator, and at any required height takes a picture of the surface of the earth beneath it with all the bearings of the compass accurately marked. It has often occurred to the writer of this that a time might come when a system of self-recording photography (microscopic perhaps) might "take note" of the progress of events, such as a battle, or of a spectacle of any kind, such as an eclipse, in a series of successive photographs at brief intervals, showing its whole progress from beginning to end; or the whole series of events in a banking house, with portraits of every one who entered, and of all their movements,—or in a ceremonial such as a coronation, a marriage, &c. But when this idea shall have been realized, we suppose we must not dare to say that we suggested it. The same satyric grin which now meets the suggestion, would then meet our claim to it!

The Shaw Memorial, Castlewellan.—At a meeting of the tenantry of the Earl Annesley's estates, which was convened for the purpose of taking the necessary steps to erect a memorial drinking-fountain in memory of the late Mr. George Shaw, J.P., who was for many years agent, a committee was formed to obtain plans, &c., in competition, and a premium was offered for the best design. Nine designs were sent in, and of these the committee have adopted the one prepared by Mr. Chappell, architect, Newtownards, and awarded him the prize. The memorial is to be executed in the Castlewellan granite.

Tewkesbury.—The waterworks have been begun. The contractors are—for engines, Rottledge & Ommaney, Salford; for service reservoir, Butt & Co., Kingsholm Foundry, Gloucester; for cast-iron pipes, T. Spittle, Newport; and for buildings, water-tower, and general works, T. Dixon, Worcester. It is intended to begin supplying the borough by Christmas.

Value of Property in Regent-street.—The old-established premises known as Newman's-yard, covering about a quarter of an acre, and held on Crown leases for fifty-four years unexpired at about 200l. per annum, have been sold by auction by Messrs. E. & H. Lamley, after a brisk competition, at the sum of 14,200l.

"Specifying" in Criminal Proceedings.—At the Birmingham sessions, the other day, two thieves escaped punishment because the recorder ruled that articles described in the indictment as "deal boards fixed to a building" should have been described as "woodwork belonging to a building."

Prizes for Drawing.—The Court of the Worshipful Company of Coachmakers have resolved to place one silver and one bronze medal of the Company at the disposal of the Council of the Society of Arts, to be presented to the candidates (actually engaged in the trade of coach-building) who shall pass the best examination in "Free-hand Drawing" and "Practical Mechanic."

Aluminum a Bell-metal.—A Belgian manufacturer has just had a bell cast of aluminum, and, we are informed, with very good results. It is, of course, extremely light, so that though large, it can be easily tolled. Its tone is said to be loud, and of excellent pitch.—*Scientific Opinion.*

London Over the Water.—It was stated by a member of the Lambeth vestry, on Thursday, the 22nd ult., that the sanitary condition of one portion of the parish in the neighbourhood of the vestry-hall was so bad that a brewer's drayman had refused to deliver beer there because he would not face the stench.

A Wonderful Feat in High Art for Lowe. (Subject for a Grand Cartoon in the Salle des Fes Ferdus of the New Law Courts).—As a pendant to Lawson carrying off the Gates of "Caza"—Bob Lowe with Inigo Jones's front upon his back!—*Punch.*

Architectural Exhibition Society.—The opening *conversations* will be held in the Conduit-street Galleries, on Tuesday, the 4th inst.

TENDERS.

For alterations at Colonel Morrison's House, Cleygate, Escher. Mr. J. H. Rowley, architect:—	
Erast	£660 0 0
Crabb & Vaughan	646 0 0
Cullingham	625 10 0
Sharrington & Cole	597 10 0
Kilby	622 0 0
Shepherd	529 0 0
Snowdon	495 0 0
Cook	470 0 0
For the erection of the Martyrs' Memorial Church, St. John's-street, Clerkenwell, Mr. E. B. Lamb, architect:—	
Howard	£9,392 0 0
Brown & Robinson	8,729 0 0
Cooper & Cullum	8,168 0 0
Myers & Son	8,069 0 0
Jackson & Shaw	7,926 0 0
Carter & Son	7,890 0 0
Wright	7,735 0 0
Hill & Son	7,490 0 0
For the erection of a brewery at Maidenhead, for Mr. J. Fuller, Mr. C. Cooper, architect:—	
Woodbridge	£2,395 0 0
Price	2,299 0 0
Silver & Son (accepted)	2,267 0 0
For six almshouses for the widows of clergymen, Canterbury. Mr. John Green Hall, architect:—	
Gaskin & Oodden (accepted)	£2,160 0 0
For additions to Barton Mill, Canterbury (exclusive of boilers, engine, &c.). Mr. John Green Hall, architect:—	
Sollitt (accepted)	£897 0 0
For second portion of St. Paul's Schools, Stratford. Mr. Henry Ough, architect:—	
Rivet (accepted)	£1,350 0 0
For residence at Stratford-green, for Mr. F. Hildrey. Mr. Harcus A. Alexander, architect. Quantities not supplied:—	
Pavitt	£1,495 0 0
Waterer	1,475 0 0
Rivet (accepted)	1,471 0 0
For new workhouse at Penkridge. Mr. E. Holmes, architect:—	
Holt	£2,269 0 0
Debney	8,290 0 0
Cobb	5,200 0 0
Yates	7,799 0 0
Gough	7,684 0 0
Bell & Son	7,645 0 0
Batchell	7,625 0 0
Hunter & Bennett	7,589 0 0
Wilkes	7,536 0 0
Horseman	7,485 0 0
Lowat	7,380 0 0
Hilton	7,350 0 0
Matthews	7,232 0 0
Bennett	7,126 0 0
Lidley	7,012 0 0
Coply	6,983 0 0
Nelson	6,980 0 0
Horsley, Brothers	6,975 0 0
Giber	6,910 0 0
Trow & Sons	6,900 0 0
Parnell & Sons	6,810 0 0
For additions and alterations to Belmont House, East Barnet, Herts, for Mr. Chas. A. Hanbury. Mr. A. R. Barker, architect. Quantities supplied by Mr. F. W. Hunt:—	
Messrs. Adamson	£2,686 0 0
Wells	2,075 0 0
Dove, Brothers	2,070 0 0
Hill & Sons	1,935 0 0
For building villa residence, for Mr. W. Price, at Penhill, near Cardiff. Mr. J. Hardan, architect. Quantities supplied:—	
Sride	£2,375 0 0
Jones	2,373 0 0
Webb	2,360 0 0
Price	2,356 0 0
Jones, Brothers	2,290 0 0
Smith & Pring	2,236 0 0
Shepton	2,259 0 0
Seager (accepted)	2,200 0 0
Franklin	2,200 0 0
For Mr. Perry's house, Duke-street, Brighton. Mr. Thos. Simpson, architect. Quantities supplied:—	
Lockyer	£1,265 0 0
Lynn & Sons	1,235 0 0
Mathling & Son	1,230 0 0
Sawyer	1,183 0 0
Cheesman & Co.	1,140 0 0
Nash & Co.	1,139 0 0
Nightingale	1,111 0 0
Dean & Dickerson	1,045 0 0
For St. Augustine's Church, Highbury. Messrs. Habershon & Brock, architects. Quantities supplied:—	
Newman & Mann	£2,737 0 0
Scrivener & White	6,675 0 0
Sharrington & Cole	6,669 0 0
Carter & Son	6,495 0 0
Gannum & Son	6,485 0 0
Nightingale	6,434 0 0
Ennor	6,394 0 0
Wilkins & Son	6,392 0 0
Brown & Robinson	6,289 0 0
Rudby	6,267 0 0
Tarrant	6,191 0 0
Temple Forester	6,175 0 0
Longman & Bagg	5,937 0 0
Perry & Co.	5,923 0 0
For enlargement of the chancel of the parish church, St. Leonard-in-the-Field, for the Rev. S. Hadden Parkes, Messrs. E. Habershon & Brock, architects:—	
Rodda	£545 0 0
Hugges	502 0 0

For new church at Colehill, near Carlisle, for the Rev. John Howard, Messrs. E. Habershon & Brock, architects:—

Lawson	£1,294 0 0
Ormsion	1,285 0 0
Black	1,262 0 0
Armstrong	1,229 0 0
Court (accepted)	1,122 0 0

For new conservatory, stabling, &c. to house at Leatherhead, for Mr. Henry Brooks, Messrs. Habershon & Brock, architects:—

Hambill	£989 0 0
Batchelar	549 3 0

For rebuilding the Harrow Gazette Office, Harrow-on-the-Hill. Messrs. Habershon & Brock, architects:—

Salter	337 0 0
Kindell	300 0 0

For house and stables, Brom-road, Teddington, for Mr. Geo. Browne. Quantities supplied, Mr. H. S. Legg, architect:—

Downs	£2,660 0 0
Stimpson	2,654 0 0
Webb & Son	2,635 0 0
Scrivener & White	2,434 0 0
Brown & Robinson	2,443 0 0
Gibson, Brothers	2,437 0 0
Todd & Sanders (accepted)	2,360 12 4

For rebuilding the Red Lion Tavern, Tottenham. Quantities supplied by Messrs. Reddall & Cumber. Mr. Thos. E. Mandy, architect:—

Wicks, Bangs, & Co.	£2,987 0 0
Preedy & Son	2,950 0 0
Forster	2,931 0 0
Baton & Chapman	2,884 0 0
Crabb & Vaughan	2,679 0 0
Masters	2,640 0 0
Lunzell	2,597 0 0

For erecting two warehouses, Red Cross-square, E.C., for Mr. G. H. Smith. Mr. Wimbale, architect:—

Hill & Son	£3,615 0 0
Scrivener & White	3,605 0 0
Howard	3,617 0 0
Myers & Sons	3,545 0 0
Kilby	3,386 0 0
Colls & Son	3,315 0 0
Ramsay	3,267 0 0
Newman & Mann	3,160 0 0
Anscomb	3,190 0 0
Morter	3,167 0 0
Hart	3,140 0 0

For alterations and additions to the Old Globe, Mile-end-road. Messrs. Hammack & Lambert, architects:—

Perry	£1,085 0 0
Hedges	1,061 0 0
Wicks, Bangs, & Co.	1,042 0 0
Ennor	898 0 0

For the erection of house at Peckham-grove. Mr. Coe, architect. Quantities supplied:—

Mooter (accepted)	£745 0 0
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J. W.—G. P.—J. W.—J. M.—C. H. F.—W. T. V.—E. W.—R. R.—S. H. R.—G. E.—H. W.—J. G. H.—A. B.—K.—S.—R.—E. Mch. —W. G.—D.—C. & Son.—L. A. Co.—Q.—D.—H. A. G.—J. R.—Mr. R.—F. W. H.—W. W.—J. S. M.—H. T. R.—E. R.—A. N.—W. W.—K.—A.—L.—C.—E. R. S.

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The Builder.

VOL. XXVII.—No. 1370.

The Exhibition of
Architectural Works
at the Royal Academy.

REAT additional interest belongs this year to the Annual Exhibition of Works of Art by the Royal Academy, on account of its change of site. The sense of freshness, order, light, and breathing space experienced on entering the new galleries next Burlington House, contrasted with recollections of a crowded day at Trafalgar Square, creates an immediate impression in favour of the new structure. The galleries, as our readers are aware, are in the rear of this fine old mansion, and are approached by a long temporary covered way from Piccadilly,

through the hall of the old house. Mr. Sydney Smirke's work is thus agreeably linked to the associations belonging to Lord Burlington.

The new galleries, of which we have already published the plan,* are in the form of a parallelogram, in which are three suites, ranged side by side,—two of five galleries each on the outer sides, and one of four in the centre, in which latter we find a central octagonal hall with ten salles thus arranged round it: a vestibule, a sculpture gallery, and a lecture-hall, forming three arms of the cross shape of the central suites, making fourteen galleries in all. Thus the new vestibule gives access to the octagonal hall devoted to sculpture, beyond which, and in a line with it, is the principal sculpture-room; and opening out of the hall, vestibule and sculpture-room to the right and left, are the picture galleries. The octagon also gives access to the lecture-hall, in which are hung the architectural drawings, engravings, miniatures, and a collection of character sketches made in Egypt by Mr. Goodall.

We must say a few additional words of the decorations. There are niches in the architrave of the octagon, in each of which is a bust of a painter; and on the bold cornice is written in mosaic letters, one line on each side of the eight sides, from one of Spenser's hymns:—

"The Hearts of men which
Fondly here admire
Fair-seeming shows, may
Lift themselves up higher,
And learn to love, with
Zealous humble duty,
The Eternal Fountain of
That Heavenly Beauty."

The walls generally are covered with a reddish chocolate paper, with leafy ornament of a similar tone, and are finished with a dado of walnut, with an ebony cornice. The ceilings are coved, and both coverings and spandrels glisten with gold, relieved by buff and chocolate and green lines. The architrave and pilasters of the semi-circular arcades leading from the centre hall,

as well as those of the most northern suite of galleries, are of coloured marbles, while the openings of communication between each of the rest of the surrounding suites are square-headed, and the architraves, pilasters, and reveals are of walnut. The largest room, or *Sala Regia*, in which the best pictures by the academicians and associates are hung, has a noble ceiling of the shape Italians call a "schifo," lighted by central skylights by day, and star burners suspended by gilt rods by night, the whole being richly ornamented, and then gilt upon a buff ground, relieved by lines of neutral colours. The floors are of polished marquetrie. The galleries are furnished with comfortable sofas, adding to the ease with which this year's display of art works can be examined.

The display in the architectural department is certainly unexpectedly small, and, as hitherto in the vacated halls in Trafalgar-square, architecture has not a department to itself, nor is it so worthily represented as it should be. We learn that part of the architectural drawings were hung in one of the galleries, planned by Mr. Smirke especially for them, but they were subsequently taken down to make room for the works of painters, and were then lessened in number, and, as they now are, suspended in two divisions on the walls of the lecture-room instead. And here, so few of the architectural designs being accepted, the rest of the room is, as we have said, devoted to the exhibition of miniatures, engravings, and Mr. Goodall's studies. That this lecture-room could never have been intended by Mr. Smirke, moreover, for the exhibition of pictures or drawings of any kind is evident from the fact that a large portion of the works have to be examined sideways from the stepped platform of the gallery, stage by stage, an arrangement so excessively awkward, that narrow escapes from serious fall were taking place the whole time of our visit by the viewers of the drawings, who, absorbed in the examination of the works, forgot they were standing on a series of stepped ledges, instead of on a flat floor, and, moving back, slipped over the steps, and scrambled against falling.

There are fifty-eight frames of architectural drawings. Ten of these are devoted to archaeological subjects, and three to continental sketches, leaving but forty-five frames to illustrate the art and progress of architecture of this great country during the past year, and what may not have been shown of it in previous years. Thirteen of the subjects are churches or ecclesiastical work, ten drawings are devoted to town-halls, four to country residences, two to public schools, three to colleges, one to a university, one to a lodge, one to a villa, one to stained glass, one to a monument, one to a ceiling, one to a sailors' home, one rectory, one wall decoration, one only to the Law Courts, one to Temple Bar, and three to Burlington House and the new buildings, those which are now in progress for the accommodation of the Royal, Linnean, and Chemical Societies. The names of the exhibitors include scarcely one provincial or colonial practitioner.

Probably the most important new edifice illustrated in a large fine drawing is the "New Building in course of erection for the University of Glasgow, Gilmore-hill, Glasgow" (977), for it affords a fine opportunity of marking the architectural age and in giving distinctive character to a large building in a part of Great Britain that has a national style peculiarly its own. Mr. G. G. Scott has endeavoured to graft on to his own Edwardian Domestic Gothic style that of the late ancient Scottish Baronial, and we cannot help thinking he fairly fails in the attempt. The form of the building is quadrangular, with towers at the corners, raised a story above the rest of the building, surmounted by high-pitched roofs with "corbie-stepped" gables and conical capped round

turrets at the angles; imitations of four Border Pele-towers, in fact, so pierced in their basement with windows as to show the want of solidity, that the style requires to give it due effect. The central tower, with spire, is a fine feature, in which there is little attempt to Scotch baronialism, but in the four angular towers, and in the treatment of the oriels under corbie-stepped gables, and wherever Mr. Scott has attempted (always tentatively), to Scotticise in his design; the massive fierce feudal characteristics of the native style have not been grasped, and the ensemble is not dignified. An isolated building, near to the main fabric, which in the absence of a plan we take to be a kitchen, is almost an exact reproduction of the Abbot's Kitchen at Glastonbury. Turning from what is intended to be a sublime design to one that is ridiculous, we see in Mr. E. Turner's "Design for the Improvement of Temple Bar" (966), the latest idea for the disposal of this relic of the City boundaries. Mr. Turner proposes to take down Temple Bar, build a flat four-centered arch across the whole width of the Strand on the same spot, and re-erect the bar, stone for stone, above it! with a gallery on the east side for foot-passengers, and one on the west for communication between the Law Courts and Temple. Thus the bar, in its new position, would be merely a ponderous, useless adjunct, utterly obstructing the view of Fleet-street, and the churches now freely seen.

At (973), we find an "Original Sketch for a Monument to a Friend," by Sir M. D. Wyatt. In a lofty arched recess a female figure repose upon a sarcophagus, with head raised on pillows, and hands uplifted. From a lofty candelabrum, in the centre of each side, spring festoons, which are held by kneeling angels at the base, and standing cherubs at the feet, the latter bearing a cross between them, and an altar, with surmounting cross, is between the former. The paneled and raised pictorial and sculptured ornamentations are most elaborate, and as rich as, and in the style of, the Raffaele Loggia in the Vatican. It certainly will be a grand era for architectural art, when such a monument as is here depicted can be erected to "a friend." We take the cost of the execution of such in marble to be, say only 30,000! nearly equal to the cost of that which we hear Mr. Stevens is at last completing, and will erect in the latter part of this year in St. Paul's Cathedral, as the national monument in memory of the Duke of Wellington, and a drawing or model of which we ought to have seen here.

Mr. G. E. Street, in two characteristic pen-and-ink drawings placed side by side (988, 989), shows two different treatments of church towers and spires,—that for the former, St. Peter's Church, Bournemouth, being a good adaptation of a Northamptonshire steeple, with the spire terminating behind parapets, and pinnacles rising at the corners out of them; and that for the latter, "in course of erection in Toddington Park for the Lord Sadeley," is one with a broad spire of pure Lincolnshire steeple type. There is an absence of that continentalism and mannerism in both these examples which are found in some of Mr. Street's designs. The helly stages,—always fine features,—are treated differently; in the broad-spire design the two lights are under one arch; in the parapeted-spire subject the helly lights are under two arches. In the latter the appearance of the tower is much weakened by piercing the first story with very large windows. The fact of the long-talked removal of the Charterhouse School is established, on inspection of Mr. P. C. Hardwick's large drawing of the "South-west View of the New Charterhouse Schools, Godalming, Surrey" (983). In this we observe several good and some indifferent features. The tower of entrance has a leaden spire rising from behind parapets. The church, close by and partly de-

* See pp. 105, 106, ante.

tached, with nave, aisles, and transepts, has a stone, square spire. Towers at each of the ends of the long wings of the building have square spires, with red-tile coverings. In the absence of a plan the general arrangements cannot well be traced; but we see the great hall is not made sufficiently distinctive. There is a free use of bow-windows, oriels, gabled dormers, octagon chimney-shafts, and a general raddy, thoroughly old-English tone about the buildings, which are designed in the style of the domestic architecture of the Late Decorated period. What will become of the fittings of the hall of the existing Charter-house Schools? By Leech's bequest the boys compete every year for a drawing prize by making an interior view of the quaint old place. We hope the old hall will be incorporated in the new building.

Mr. Sydney Smirke shows us an interesting drawing—"The intended Design for the Future Adaptation of Burlington House to the Purposes of the Royal Academy, as approved by her Majesty" (1141). It is an elevation of the entrance front, as proposed to be altered; is in pencil, shaded with Indian ink; bears his signature and date, April, 1867; and is signed by the Queen as "App^d. Victoria R." It is proposed, we see, to raise a blind story of niches and statues upon the present facade, facing towards Piccadilly. In Mr. Smirke's drawing the proportions of this addition are fairly in keeping with the architecture beneath it. But turn we now to Messrs. Banks & Barry's drawing (968), showing the same subject, in connexion with their own design, in "The View of Proposed Quadrangle as seen through Entrance Archway in New Front to Piccadilly," and we see how completely the proportions of a building can be spoiled by wrong perspective. Mr. Smirke's altered front is seen in the distance, and the height of the new story is so great that it appears to completely overwhelm the fabric on which it is proposed to be built. There is, too, a discrepancy between Mr. Smirke's and Messrs. Banks & Barry's drawing of the same building: the former shows a round arch arched portico at the base of the building; and in the latter it is square-headed. Look at Messrs. Banks & Barry's drawing, too, from the opposite end of the gallery, and Burlington House appears at least a quarter of a mile from the archway in Piccadilly.

Mr. H. Conybeare makes a curious mistake in describing his contribution as a "Romanesque Design for Parish Church at Hyde; interior, looking east" (969);—it is clearly Early Decorated throughout. The seven-light window occupying the whole of the width of the east end has an immense wheel within a wheel in the tracery; the outer one has six quatrefoils and six cinquefoils alternately, and the inner one five cinquefoils. With the exception of the misnomer of the title, and the poverty of size and arrangement of the altar-table, and the hardness and stiffness of the colouring, there are some good points in the design. There is certainly, however, a "Romanesque" design (1013), for it is simply a jumble of the Towers of Andernach on the Rhine, and the apses and octagon lantern of the churches of St. Gereon and the Apostles in Cologne; fortunately, we should say, for the author, his name does not appear in the catalogue. Among the many styles of drawing by which architectural buildings are represented here, some being in pencil, some in pen and ink, some in sepia, others in all the colours of the rainbow, the scratchy pen-and-ink bad imitation of Mr. Street's style by Mr. G. F. Jones is not to be commended. In his channel of Howorth Church, York (1002), misnamed in the catalogue, his drawing, especially the shading, is so sketchy and scratchy that it materially spoils the effect of the design; the repose of the architectural lines are sacrificed, and in the case of the dark lines in the panels of the roof, what is doubtless meant for decoration looks like iron cross-tie rods quite out of place. This interior should have been coloured, as it is evidently intended to be treated with polychromy, and, *vice versa*, the exterior view of the same chapel (1014) might have been in pen-and-ink instead of being treated as it is with a startling landscape, under a highly coloured sunset. There is a conscientiously wrought set of designs for the Manchester Town-hall, by Mr. J. O. Scott (967, 978, 996, 1020, 1021),—one which has been illustrated in our pages. Oddly enough, though this unaccepted design is so fully illustrated, the one actually adopted and in course of execution, by Mr. Waterhouse, is only shown by one small external view, also published by us,

and a view of a well staircase (986, 999). A polychromatic interior is shown in a minute drawing by Mr. J. D. Wyatt, of the "Interior View of the New Chapel for St. John's College, Cambridge, to be consecrated May 12th, 1869,"—G. G. Scott, R.A., architect" (1011). This work, which is said to have cost 50,000*l.*, deserves a larger and bolder representation. The colouring is mainly confined to the elaborate wooden groined roof. A band of figures, on a gold ground in niches, passes round the roof, halfway up its sides, and round the 7-sided apse at the same level, the horizontal line being broken at the centre of the apse by a vesica. The ribs are picked in in the manner of the famous groined roof of St. Jacques, at Liège. In a new lodge to public gardens at Boscombe, near Bournemouth, about to be erected (963), and a new villa at the same place (967), Mr. Edis favours a mixture of Old English and Old German domestic architectural treatment, pencilled as well as designed with much delicacy: hip-roofs he admires, gables he ignores. In the case of the villa, the upper story is marked by an ogee shingled covering to the walls, and a string-course; the tallness of the two lower stories is much aggravated by being string-courseless, and by the sudden fall of the ground giving an exaggerated base. It has a weird aspect.

The Law Courts and Thames Embankment question will not be much furthered by Mr. L. de Ville's "sketch showing the general appearance of the Law Courts if erected on the Thames Embankment site" (971). He would make the river frontage look like a vast cotton-mill. Upon a row of 34 arches similar to those on which Somerset House is built (also showing the elevation), he places four stories (Somerset House has three) of uniform rows of windows, 270 in total number, and in the centre a stark-straight chimney-like tower rises stiffly up to a prodigious height, nine stories above the main building,—15 stories high in all. With red bricks, stone quoins, purple slates, and with a modified French Renaissance chateau Henri Quatre treatment, Mr. T. H. Wyatt plans a mansion now erecting at Brockenhurst, in the New Forest, for Mr. John Morant (970). If the low wings on the left looked less like servant offices brought too prominently in view, or less like an addition made at a subsequent period to the main building, this would be as thoroughly compact a residence, worthy of the name of an English country mansion, as one would hope to see. We wish that Messrs. Banks & Barry's new facade to Piccadilly of the Burlington House new building (972) showed less of a repetition of that of the Board of Trade; twice repeated, we should say, for there is to be a wing of it on each side of the central gateway leading to the quadrangle. The extra tower-like story raised on this central point saves it from the monotony. In their St. Stephen's Church, South Dulwich, as completed (974), the authors show they can tackle Gothic as well as Classic work. There is a Kentish-raggy tone about the drawing. A tower and spire at the north-west corner, a clearstory to the nave with windows all gabled, a lean-to aisle with arched triplets, an apsidal chancel with lipped roof, and a gable to the latter end of the apse only; bands of light brown and purple slates, and a deep zig-zag ornamentation of slate from the terra-metallic ridge downwards, are the features, with a careful and handsome treatment. For a "Sailors' Home, Bombay, about to be erected in the Calaba-road, Bombay, from the designs of J. M. Anderson" (985) we see no special provision for climate, or adaptation to native wants. It is certainly very cradled in two stories, but looks very much like a railway station. Mr. G. G. Scott is about to erect, as we have before now said, a costly parish church for St. Mary Abbot's, Kensington (982), in the Geometric period merging from the Lancet. Mr. Scott confines himself to a reproduction of ancient styles, and he has taken the details of Salisbury Cathedral for the foundation of this design. Among the really practical drawings in the exhibition, Sir M. D. Wyatt sends a detail for a ceiling (980), and Mr. E. W. Godwin one for walls (1012). The former is a large sketch of delicate plaster-work in that Rococo style often met with in mansions a century old, upon buff, blue, mauve, and green grounds. The ceiling is panelled and coved, the walls are green, and for the want of a little gold relief, the general effect is pale even to sickness. In the latter the architect takes Mr. II. S. Marks, the painter, into his confidence, and the two conjointly produce some quaint decoration for the walls of Dromore Castle, with a half Pompeian,

half Japanese treatment, upon Early Pointed architecture. There is an unusual arrangement in there being no distinction made between either the architecture or decoration for the drawing-room, ante-room, or dining-room. The one Rectory-house exhibited is a most elaborate and costly affair. It has a Flamboyant traceried and crocketed tower and spire. The windows, especially the bow, have tracery in the heads, and cusped transoms. It is in red brick, with stone quoins; situated at Wrexham, Berks; and is altered from the designs of Mr. T. Bury (997). Mr. C. Barry's work shown as the "Interior of New Dulwich College" (1018), is in reality the interior of the hall of the college. It is remarkable for double-coved arrangement of roof; its wide span; for the griffins at the hammer-beam ends; and for a large window at the end.

Mr. Waterhouse is constructing new buildings for Gonville and Caius College, Cambridge, in a curious and somewhat heavy Jacobin style (975). The view shows two fronts; one next a narrow street of low old gabled houses, in which he introduces square oriels to every student's room on the first floor; he has an oriel at one corner of the building one story high, and at the corresponding corner one three stories high. There is a general appearance of heaviness every way, his oriels and other projections are not sufficiently well corbelled out to relieve them from an appearance of giving way from the weight.

In Mr. Crossland's interior of "St. Stephen's Church, Copley" (1008), everything is massive, appropriate, constructively real, and rightly subdued.

Mr. Law's competitive design for the "New Town-hall, Northampton" (1015), and Mr. Brydson's for "Bolton Town-hall" (995), may be dismissed briefly; they were evidently unsuitable, and therefore not accepted.

Mr. Street's rough pencil view of "Proposed New Examination Schools, at Oxford" (993), is remarkable for a sombre arrangement of narrow lancets to the upper hall, in six bays between buttresses, placed upon a row of large arches with tracery in them, beneath four of which are cusped doorways; this, and his beautifully coloured drawings of the "Palazzo Celsi, and Bridge of S. Bernardo, Venice" (1010), show his continental predilections.

Turn we now to the subjects strictly archaeological, exhibited by T. H. Watson, W. W. Deane (979), R. Groom (981), W. Richardson (991), and E. George, "Interior of Cathedral, Soissons" (1000), all of which are more or less painstaking and pictorial; and we close our review of the scanty representation of the national progress in architecture as portrayed in the new galleries of the Royal Academy.

THE FUTURE OF BRICKWORK.

THE recent impulse which has been given to ceramic manufacture, as applicable to architectural purposes, bids fair to effect a notable revolution in domestic building. Brick, the most ancient artificial building material, has been styled "ignoble." If we look at the rough stocks with which many buildings now in course of erection are supplied, the term is not undeserved. As far as our personal knowledge and recollection go, such bricks as we now see made use of in many places that we could name, would have been unsuitable a quarter of a century ago. English brickwork, with some honourable exceptions, is not only ignoble, but daily becoming more and more inartistic. The prevalence of the stucco taste of the Regency, the sham classically which replaced the honest, plain, well-banded brickwork of the time of the earlier Georges, and even of preceding reigns, has produced its natural effect on the brickmakers. Anything will do to be smeared over with cement. Quantity and cheapness, instead of excellence of quality, have therefore been aimed at; and although some few places still furnish a slightly, well-squared, well-coloured brick, those advanced works by which London is making its approach to Windsor, supply abundant examples of "ignoble" material.

There can be no doubt that our manufacture of this article has retrograded. Fire-brick, indeed, is produced in our time of a better quality than was considered necessary, or perhaps possible, in days when iron was smelted with wood. But the many curious forms of moulded brick, which are still to be seen in the chimneys and other parts of some of our old country mansions, are things of the past. They have

gone out of date with the chimneys themselves. The demon of economy, or rather the demon of cheap and equal discomfort, has equal dislike to tall chimneys and to moulded bricks. Compare the walls of some of our Metropolitan railway viaducts with some of those to which the elder inhabitants of London were accustomed to look with satisfaction!

As a protest and a counterpoise against the extreme degradation of a style of building which, when rightly carried out, is not devoid of its own appropriate beauty, we regard with the more satisfaction the introduction of moulded terra cotta, and the application to numerous architectural elements of the same skill, and the same material, that have hitherto been almost exclusively applied to the formation of bricks, of tiles, of drain-pipes, and of chimney-pots. Nor is it just to refer to the subject without some acknowledgment of the impulse which the collection, and the designs, of the South Kensington Museum have given to ceramic art in this country.

Throughout every branch of the manufacture of earthenware may be traced the great natural division of enamelled, and unenamelled, ware. That distinction is even more essential than that which is mainly relied on by writers on the subject, of hard and soft paste. The latter form, dependent primarily upon the character of the material employed, results from the application of a greater or a less degree of heat. But the distinctive character of the former results from the adoption of a second process: a material differing from that which forms the body of the article, is spread over the surface after a first firing, and a second application of heat is required to fuse this new face into a species of glass. In some cases the fusible glaze, or *covantia*, is a simple natural product, as in the instance of the true, hard, porcelain of China. Then the body of the article, the "boxes" the Chinese writers on the subject call it, consists of a felspathic earth, the kaolin, which is entirely infusible, but liable to crack from overheating. The glaze, which the Chinese call the "flesh," and the French call the *covante*, consists of another kind of felspathic earth, of opposite qualities, fusible, and of course not liable to crack by heat.

The most ambitious, if not the earliest, attempt to decorate architectural work by inlaid ceramic ware, is to be found in the *della Robbia* ware of Italy. This earthenware is almost exclusively devoted to architectural purposes; statuette, and, very rarely, vases, being the only exception, and, indeed, they can be so called. The *della Robbia* ware is enamelled. It is thus entirely independent of the action of the atmosphere, and is applicable to such purposes as the decoration of baths and fountains, or for constant exposure to those violent changes of temperature that would be likely to prove destructive to more porous terra-cotta. The chief uses of this earthenware in architectural decoration have been either heraldic or religious; the arms of a sovereign or of a noble family, being represented, in their true tinctures, in a medallion built into the walls of a palace or *château*; and the representation of some religious scene, generally a *pietà*, a crucifixion, or a Madonna with her infant, being erected behind the altars of churches, or in the way-side chapels, or mere illuminated niches, with which we are so familiar in Italy.

The secret of the *della Robbia* ware, that is to say, of enamelling in high relief, and in bright and various colours, perished with the third generation of the family. *Girolamo della Robbia*, the grandson of *Luca della Robbia*, the inventor of the style, and the nephew of *Andrea*, who made a considerable advance both in the boldness of relief and in the variety of colours, died in France, whither he had been invited by King Francis I. to exercise his craft. He was the last possessor of the secret. The period of the production of this ware is, therefore, limited to little more than a century, Luca having produced his first work in 1438.

The modern French artists, whose skill has produced, even with advantage, almost all kinds of ancient ware, have as yet sent to this country but very poor specimens of imitated *della Robbia* ware. The efforts which have been made under the direction of the authorities at South Kensington are highly encouraging in their results. Moulded, coloured, and enamelled earthenware is to be seen forming columns in the refreshment-room at South Kensington. In colour, and in hardness of enamel, the results already attained may be regarded as satisfactory. Boldness of relief is wanting, but it is not in that direction that the efforts of the manufac-

urers have been bent. There can be little doubt that within a few years the works at Stoke-upon-Trent, and elsewhere, will be able to produce any description of coloured and enamelled earthenware which the architect may desire to use.

With many persons, however, especially in England, neither the glaze nor the vivid colouring of the enamelled ware finds favour. A true terra-cotta, an unglazed material, resembling the finest brick in its texture, but produced in artistic form, is likely, at all events at present, to be more in demand than the more brilliant substance. Even this dead or "matte" terra-cotta, however, is divided into two groups. Of course the varieties are many, resulting from the almost infinite variety in the chemical nature of the clay, simple or mixed, that forms the basis of the manufacture. Still the main division between a terra-cotta so hard as to resist the file or the chisel, resembling, indeed, very closely the texture of the old Flemish and German stoneware, and a material which, more like the finest brick, is susceptible of finish by the tool of the workman, cannot be lost sight of. The latter, of course, is susceptible of higher finish, and of effect equal to that of sculptured stone (at a much lower price). The former, though not subjected to any enamelling process, yet forms a sort of skin over its surface in the furnace, and, for external work, promises a greater durability.

These two descriptions of architectural terra-cotta may be advantageously examined and compared at South Kensington. In the Albert Hall, of which we gave a description recently, the latter, or stoneware terra-cotta, is employed. In the buildings which are now in progress for the art schools, and the finish and delicacy of the work will strike the student with admiration.

In this promising development in the artistic production of a purely artificial building material, we trace an important step in the secular progress of the builder's art. The general idea of that progress appears to us to be this: it consists in the substitution, first, of the skill of the craftsman for the mere brute force of the piler up of stones; and, subsequently, in the replacement of the manual dexterity of the craftsman by the science of the chemist. Just as smelting made ore available for the purposes to which, in the first instance, virgin metal was applied, and as, in our time, the process of electro-deposit enabled the worker in metal to take so gigantic a stride in advance of even the ablest founder, we conceive that we shall advance from the rude efforts of the earliest masons and pyramid builders, to the chemic-artistic architecture of the future.

The earliest human relics of which we can as yet speak with certitude as to their geological date (although we are as yet unable to attach any astronomical determination to the epoch), intimate the use of caverns for human abode. "Dens and caves of the earth" are spoken of as the natural homes of savage life. To supplement shelter by defence, and to rear enormous stones into a fence to protect the entrance of the cavern, would naturally be the earliest effort of man as a builder, if we consider that his faculties were gradually developed by experience. To protect a hill, instead of a cavern, would have followed, when the already improving intelligence had arrived at the power not only of seeking, but of constructing, a shelter. Whether these earlier steps were, or were not, actually taken, we have yet extant, in many localities, remains of massive walls of rude unwrought stones, so enormous in their size that it is hard to discredit the tradition which designates their praisers as the work of giants. Gigantic strength, to say the least of it, was required for the erection of these rudest Cyclopean walls; while the evidence of skill displayed in their construction is not such as to lead us to suppose that any mechanical aid was made use of to lessen the toil of the builders. After a time, man, or the ancestors of what man now is, learned how to cut stone. In this invention we have probably an indication of the nearly contemporaneous discovery of the use of metal. The Cyclopean walls in which polygonal and partly-dressed stones are used, are thus to a certain extent identified with the earlier part of the Bronze period of the archaeologist.

Masonry, thus originated, had its own career, and its own history. The stone-cutter became more and more the master, both of his tools and of his material. He substituted coursed stones for polygonal blocks. In this change of style it

is probable that we find an indication of the first commencement of the art of quarrying. No longer contented with the endeavour to outline stones left on the surface of the ground, or on the scarp of the hills, the builders of the squared megalithic work attacked the rocks themselves, followed out and utilised beds and joints in the natural *strata*, and reproduced them in a mode of construction that still relied for its stability on the weight attendant on enormous bulk.

With coursed megalithic stone we seem to tread on historic ground. It is possible that the next great step may be that of the introduction of metal for bond. The simple juxtaposition of squared stones led to the employment of constructive means of bond, such as mortise and tenon joints, as we find them existing at Stonehenge, and grooved and tongued work, of which we find examples in the Great Pyramid. But, in the time of Solomon, although the use of the lewis was unknown, and projecting pins or blocks were left on the wrought faces of the stones in order to give means of attachment to the ropes that were used for their removal, the practice of dovetailing or mortising the stones themselves appears to have yielded to that of introducing metal ties or dowels. The discovery of lime cement, whenever that great chemical stride was taken, was destined to revolutionize masonry. When once it became known to the builder that he could produce an artificial substance, which, in the course of time, would harden into something like stone itself, and would thus bind together the separate elements of his work, the day of megalithic structure was passed. It could only be for the purposes of architectural splendour, or for the military reason of offering a more substantial resistance to the blow of the battering-ram, that walls were built of enormous stones, after the use of mortar had become established.

In these distinct steps, then, are to be traced the divisions of the pre-historic periods of masonry. First, the piling up of rocks; then the orderly arrangement of large unwrought stones; thirdly, the partial working, which produced polygonal megalithic work; fourthly, coursed cyclopean masonry; fifthly, grooved, dovetailed, or tenoned structure; sixthly, metal bond; and, seventhly, the general employment of mortar. Much service will be done to the history of architecture by the investigation of the existing ruins, in which traces of this gradual development of the art of the mason down to a period some 3,000 years back, are still to be detected.

We must not suppose that the transition from one style to another was abrupt, or that exact chronological value can as yet be assigned to structural characteristics. Thus, in one of the most ancient buildings of which the exact date is known, we find not only that mortar has been employed in the bulk of the ordinary masonry, but that cement of great excellence of composition has been spread between the joints and beds of large stones, so exactly wrought that the blade of a penknife cannot be introduced between the blocks. The granite masonry of the chambers of the Great Pyramid is as minutely and carefully finished as is the marble and limestone ashlar within the ducal mansion of Chatsworth. If we consider the difference of the material employed, we shall find that the work of the masons of the Memphite king Sopsith, 5,300 years ago, was as finished as, as well as no less colossal than, that of the masons of the Jewish king Solomon, 1,450 years later.

With the introduction of cement, the size of the blocks used in building naturally diminished. Reduction of size is not confined to stonework. The same diminution may be observed to coincide with the decreasing antiquity of brickwork. The bricks of the earlier Assyrian kings are larger than those of the later monarchs. In the brick pyramid single blocks of this artificial material have been measured of the dimensions of '525 metre and '315 metre, or 20½ in. and 12½ in. The small size of the Roman bricks contrasts distinctly with that of the more ponderous masses of the earlier builders.

The attempt to produce an artificial, homogeneous structure may be traced in various forms of work, some deserving of the admiration of the engineer, some being decidedly retrograde steps in the art of the builder. In countries where small stones are plentifully found, to the exclusion of large masses, as, for example, in chalk districts, where flints abound, a neatly-fitted rubble work of the natural material, built in a good lime cement, and protected at the

angles, or occasionally bonded, with courses of wrought stone, is an admirable style of work. With this may be contrasted an oolitic rubble, held together with grout. In our modern inferior work the use of what is called Roman or Portland cement, spread over the face of an ill-built wall, of rubble or of ill-shaped bricks, may be referred to as at once an instance of base and ignoble treatment of structure, and of the attempt to diminish skilled labour by chemical application.

A yet more striking instance of this tendency may be observed in the employment of concrete. In the first and simplest mode of applying this material, when a solid and widespread foundation is provided by its use, the builder has a great resource. In submarine works the employment of concrete made with hydraulic lime has been highly successful. More recently houses have been erected altogether of concrete. The sands of Egypt are being bound into large blocks of artificial stone by the enterprising constructor of the Suez Canal. To such a degree of excellence has the manufacture of artificial stone now attained in our own country, that its durability is considered to be superior to that of almost any natural substance.

In each of these different expedients to dispense with the simple form of squared and jointed masonry we trace an attempt to proceed in the same direction. Whether we regard the rough walls plastered with cement, the concrete house, the brick building with moulded enrichments, or covered with glazed tiles, we find the effort to make science supply the place of skill, and to supplement the labour of the craftsman, by the simpler process of the chemist. When we see how far nature is yet in advance of her most faithful minister and closest imitator, we may believe that we are only on the threshold of discovery in this field. If we compare a dome formed by nature—such, for example, as the egg of an ostrich—with one built by man, such as the vault of the Pantheon at Paris, or the unrivalled ceiling of King's College Chapel, at Cambridge, we see how far the chemical process excels that which is mechanical. It may be urged that we refer to the proceedings of vital and organic chemistry; but, although produced within a living being, the structure of the shell of the ostrich is mineral and inorganic. The shell of the oyster and that of the snail are external deposits, and the liquor contained in the gland of the latter animal has been successfully used as a cement, to repair broken *camei*, *intagli*, and other objects of art. In these chemically produced structures, homes and houses as they are lower and more defenceless forms of life, we find not only perfect adaptation of form, the contour of the myriad substance being determined by the requirements of the soft cellular tissue, but extraordinary economy of material. The shell of the oyster or of the mussel may be thought a rude object when compared with the shadowy grandeur of such an edifice as the Cathedral of Milan. But if the great Italian architects had been able to dispose of their material with the economy which the poor mollusk has been taught to construct his home, what sort of temples would have glorified the abodes of civilisation!

It is, as we might naturally suppose, in Italy that the greatest advance has been made in the chemistry of building. The lime cements, the fine concrete formed with volcanic *lapilli*, the scagliola, and the material used for preparing walls to receive fresco painting, assume, in the hands of the practised masons of that country, a hearty and a strength to which we are altogether strangers in England, as applied, at least, to any ordinary work. The most remarkable example of the manner in which homogeneous and durable structure is produced from materials which are brought together in the form of fine gravel, sand, and lime is that of the beaten floors which are common throughout the Peninsula. In the Italian palaces, which are built not for years, but for centuries, the most luxurious and expensive floor, for a large apartment, is of marble. In the summer the coolness is most refreshing, and in the winter a thick carpet is spread over the polished surface. But the next highly prized is the beaten floor. This is made of a species of very fine concrete, composed partly of volcanic pebbles, and it is incessantly beaten by a gang of men for two days or a fortnight, as it dries and solidifies. The result is a smooth and level surface, finer than any stone except marble, and often to receive the work of the colourist. Designs of pavement or of carpeting are painted on these floors, and

their excellence is undeniable. A homogeneous floor of this nature, in which chemical change is accompanied by patient labour, is perhaps the nearest approach yet made by the art of the builder to the processes of that vital chemistry by which the strongest, the lightest, and the most elegant, of the habitations of the animals that dwell on the surface of the earth, have been constructed under the guidance of the Great Architect of the Universe.

In the highest effort of the art of the mason, the chemical action of lime appears to designate the course of improvement. In the plastic art of the ceramic builder, chemistry acts by the agency of fire. It may be, that in either case, we are yet young in the science of the builder.

SOCIETY OF PAINTERS IN WATER-COLOURS.

This year's—the 65th exhibition of the Society of Painters in Water-colours—is likely to be more than ordinarily attractive, from the numerous large drawings it contains. The members appear to have been actuated by a general desire to make it particularly conspicuous and distinct among the several water-colour exhibitions of the season; or, perhaps, to refute the supposition that two displays in the course of the year must necessarily occasion a rather exhaustive tax on the energies of the same exhibitors—and evidence to that effect might sometimes have been adduced here as elsewhere. However to be accounted for, they have provided for this summer's show ample contrast to mark the difference between it and a collection of sketches and studies. Diversity has some share in creating more than the usual interest; and if there be no more than ordinary proof of the excellence attained by the leading members even in the extra size of their works, others have manifested a laudable desire to emulate them in supporting the character of the institution.

The largest drawing is contributed by Mr. Birket Foster, a combination of landscape and figures; village children for the more prominent, watching "The Meet" (75), very brilliantly and deftly described. The expanse of country under a splendid sky; the fresh, clean-looking fox-hounds, scarlet-coated huntsman, and the healthy rustic boys and girls variously clad in the striped cotton draperies and qualified-coloured clothes that Mr. Foster's peasant children always wear and look so well in; the precisely drawn tree trunks, crisp foliage, herbage, dried ferns, and the like—all brought together with such tact and skill as few possess in common with him—have conduced to a very successful and pleasant result. But with all the admiration due to such an evidence of power and knowledge, there is the want of some of the better qualities that distinguish the smaller productions of the painter; the charm of refinement that so greatly helps to make the simplest objects matters of interest; and the difference is sufficiently marked in comparison with a delightful little bit entitled "A Breakwater" (210); or again when the "Village Children" (274) are more poetically treated; or where a quiet evening effect enables him to show his appreciation of rich subdued colour, if it be but "A Mill Pool" (266) that reflects it.

Precedence, by right, belongs to those whose practice indicates a more exalted application of artistic ability; but Mr. Foster's picture is undoubtedly the leading feature of the present collection, by reason of its forcible appeal to popular taste.

More rich and rare are the gifts and acquisitions necessary to the proper enunciation of Mr. F. W. Barton's conception of "Cassandra Fedele" (20): the figure of a Muse, with appropriate attributes, and invested with the grace that refined feeling helped by such advantages as academic proficiency always secures. Though announced to be unfinished, it has an appearance of completeness,—a fitness of everything introduced,—that associates it with old rather than modern art: it might be the labour of love of some Venetian master. And for the matter of that, so might be Mr. E. Burne Jones's representation of a loosely-clad nymph drugging "The Wine of Circe" (197), but of one who idealizes the possessor of quite another idiosyncrasy. For fine colour this is one of Mr. Jones's best examples; the lady is sufficiently beautiful to look no better than she is, and is known to be, perhaps, by the black panthers—who do duty for the classic tame lions and wolves—in this large

and clever drawing. "A Lament" (43), by the same, though it might be something very fresh from Pompeii, has peculiarity if not originality, and a singular gracefulness to recommend it, even though it emulates immature art.

The rapidity and ease with which Mr. John Gilbert appears to get through any amount of work he may undertake are just as manifest in his pictures as in the thousands of woodcut illustrations with which he has whilom delighted his admirers. Whether Shakespearean illustrations like "Joan of Arc contemplating the Dead Bodies of John Talbot and his Son"—from King Henry VI., Part I., Act IV., Scene 7 (30)—with the heroine, who looks more addicted to fighting than Mr. Corbould's milder impersonation, seated on her white charger, and surrounded by mounted and dismounted, armed and disarmed warriors; or "Lear and Cordelia" (121), with splendid British draperies for themselves, picturesque arrangements for their captors, in addition to characteristic heads and stalwart figures; or in the grey-toned funeral procession, "The Burial of Ophelia" (113), with a brilliantly attired Horatio in juxtaposition to the deep rich black of Hamlet; or in the subject from Gil Blas, including the renowned Doctor Sangrado visiting a doomed patient (234); and "The Introduction" (259), that might be from Gil Blas as well, with its tapestry background and showy costumes, all bespeak their author by the same bold, facile execution that has become as autographic now as any other signature could be to the capital light-and-shadow arrangement of any one of the subjects.

A little boy relating to his smaller sister "The Story of a Suit of Armour" (275) is one of the artist's most agreeable if less important productions; but objection may be taken to an over-prevalence of grey at the expense of brighter, warmer, and more natural-looking light in this case as in others.

For splendour of colour as much as for vigorous use of it, few can compete with Mr. Carl Haug. His portrait of "Kaheen Amran," the high priest of the Samaritan community at Nablous, reading the Pentateuch (131), is exemplary of the resources of the medium, and proof enough of its sufficiency to meet the requirements of general representation, even if a life-sized head of "A Dragoon" (78) were not a corroboration of the superlative merits water-colour can boast; and an artistic rendering of "The Acropolis of Athens," as seen from the monument of Philopappas, shows to what an extent this sense of colour can idealize even stones, and make them consonant with their inherent interest. Mr. F. W. Topbam's Spanish group preparing decorations on "The Eve of the Festa" (151), and a handsome spinster surrounded by sheep in "A Pastoral" (12), are both prominent on other account than their size: they are very beautiful in tone. Mr. J. D. Watson's boy of lively damself "Carrying in the Peacock" (101), to grace some feast in old chivalric times, are cleverly drawn and painted in their quaint fifteenth-century costume, and betoken him to be of those from whom great things might be expected. The work has much of the clear brightness of a fresco that fits it admirably for mural decoration, the purpose for which it was designed. An interior of "A Smithy" (27), with a gally-olad, thirsty smith draining the last drops of ale from a tankard; and another interior, "The Family Pew," with an occupant whose drab has been from the metaphorical cap of sorrow, for she is in mourning and alone, are conspicuous for merit.

(142) "A Hunting Morning: Passing the Gipsy Tents," is Mr. F. T aylor's most important contribution; though two smaller examples,—(236) "In the New Forest," with some ponies that have stood still to be taken, for a wonder, and "A Good Scenting Day" (244), that beholds the huntman make the most of it, and not to mind small spills,—he is pulling his horse out of a ditch,—are of less value for being so small, for they are thoroughly indicative of Mr. T aylor's admirable style. Mr. T. R. Lamont has found inspiration in an old ballad telling how "Glasgerion" (170) was so good a harper as to barge himself into the favour, not only of the king and his nobles, but, by changing his tune, into the graces of the monarch's one fair daughter likewise. He is represented here as having "harpit them a' asleep."

"A" except the young princess,
Whom love did waking keep;
And first he has harp'd a grave tune,
And says he has harp'd a gay,
And mony's the sigh and the loving word
That pass'd a'tween them twae."

Whilst papa and his courtiers are being gently nursed in the arms of Morpheus; and the jester lies cuddled up close to the hearth, whence proceeds the only light that illumines the ardent pair of lovers, and the bright pair of red legs of the clown, that are made by a rather obtrusive feature in the composition, a very effective one, as having afforded Mr. Lamont an opportunity of showing great technical skill; it also evidences originality in dealing with, and research in finding, new subjects whereon to employ it.

Mr. H. Britton Willis is pre-eminent in the treatment of cattle and landscape: his most important contribution is one of these combinations (112), "Early Morning on the Snowdon Range," with a very successful imitation of natural effect.

Mr. Bradley, with far less aptitude for giving picturesque value to his drawings, exhibits the exceptional power of suggesting life-likeness and action. His "Wild Cattle of Chillingham Park," with bulls about to fight (182); "Oxen Ploughing on the Sussex Downs" (196), and "The Chiddingfold Foxhounds in Full Cry, Surrey" (198), are portrayed with astonishing vigour and apparent anatomical knowledge, and on a scale too large to admit of a doubt. Mr. Basil Bradley's works help to give variety to the collection, as does Mr. G. Rosenberg's carefully studied dead swan—"The Angler's Vengeance" (210).

Mr. Holman Hunt, who has lately joined the society, sends two finished studies—"Moonlight at Salerno" (255), with a curious effect produced by the last ray of sunset-colour tinging the horizon with its reflection; and the "Interior of the Cathedral at Salerno" (263). Mr. G. J. Pinwell, another new associate, in addition to a couple of quaint illustrations from Mr. Browning's "Pied Piper of Hamelin" (260), and (282), has a very choice drawing of some such group as may be frequently discerned on "A Seat in St. James's Park" (297). The itinerant musician counting her scanty gains; the poor gentleman, born to disappointment, whose life has been a gradual decline from what he was to what he is, with no other reflection for consolation but the one—that in great measure he has to thank himself for it; the expiring life-guardian and the captivated life-guardian of perambulatory and toddling treasures of a fatuous mamma, who thinks Jane has no followers, and children, the least foolish of the age, when the foolier think themselves wise,—are some of the individualities the artist has depicted with some approach to the delicate but precise finish of Mr. J. F. Lewis. Mr. E. K. Johnson's graceful and lady-like girl contemplating "The Brunt Letter" (300) is charming in her unobtrusiveness; a delightful little drawing, though in very opaque body-colour.

Mr. Jos. J. Jenkins devotes himself entirely to landscape now; and with him we will leave the figures for the present, though they are so much more easily talked of and praised or blamed than trees and stones and limpid brooks, rocks or the Rhine, mountains or Murray-described foreign experience of what may be found in any town all the world over. One need not travel very far to see such scenes as, for the most part, Mr. Jenkins transcribes, such as that under the influence of "Starlight" (9), or when, in some earlier of the twenty-four hours, "Sketching on the Thames" (109), "The Quiet Mill-race" (127); or, leaving the banks of the river, he finds material for his dissertation in rustic bridges, hedged fields, and the like, introducing a flock of sheep "Scared" (286) for incident, to lead point to his capital means of representation that one must needs be very obtuse not to acknowledge.

Mr. Alfred W. Hunt has concentrated his talents and attention to the production of one large and very great drawing, "Loch Coruisk" (155), with giant rocks "at random thrown,"—a masterpiece of workmanship. Mr. E. Daucan sends an exposition of his special supremacy in painting stormy seas and skies in (26) "St. Abi's Head, coast of Haddington;" Mr. G. Dodgson, several admirable examples, notably (148) "Woods at Evening;" Mr. J. Holland, amongst others, a gorgeous view of "Geneva, looking South-east" (126), and drawings that vie with those of Mr. E. A. Goodall in making Venice most Venetian and beautiful; and Messrs. George Frigg, C. Davidson, A. Glennie, W. and J. Callow, P. J. Natel, Collingwood Smith, G. H. Andrews, Francis Powell, C. Branwhite, T. Danby, A. P. Newton, T. M. Richardson, S. P. Jackson, and J. W. Whitaker, all contribute excellent examples of their several styles.

THE PUBLIC HEALTH IN THE FIRST THREE MONTHS OF 1869.

The influence of temperature upon the public health during the winter is so direct and so marked that it is somewhat difficult to institute useful comparison between the death-rates in the first three months of any year with those prevailing in the same period of other years. Nor will the mean temperature of the quarters afford us much assistance, as two or three weeks of frost may be followed by a longer period of warm weather, and thus raise the mean to about the average, whereas the effect of the frost upon the death-rate will not be neutralized. A continuance of frost tells with deadly effect upon the young and old of all classes, but with varying effect. In communities, as in individuals, however, the ratio of the effect of temperature upon health depends very largely upon their sanitary and physical condition. This varying proportion affords valuable information for the consideration of the relative health standards prevailing in different towns and countries.

As it may be said that there was during January, February, and March of this year an immunity from frost, we might fairly have expected to find that the death-rate in England and Wales in those three months had been considerably below the average. The cold winds and low temperature of March, however—more especially coming as they did at the close of an unusually mild winter—so raised the fatality from inflammatory diseases of the respiratory organs, as almost to counterbalance the low death-rates of the previous two months. The Registrar-General tells us in his quarterly return, just issued, that in England and Wales the annual death-rate during the first quarter of this year was 24.8 per 1,000. This average rate in the corresponding quarter of the ten previous years was 25.4. The rate last quarter was 2.5 per 1,000 above that which prevailed in the same three months of last year, but showed a marked decline upon those which ruled in the same periods of the five years 1863-67.

The effect of the steady diffusion of sanitary intelligence which has taken place in recent years should appear in a nearer approach of the town death-rates to those enjoyed by the inhabitants of the country. It appears that during last quarter the rate of mortality in the country districts of England was 22.6, while in town districts it was 26.6; thus showing a difference of mortality so great as 4 per 1,000. In the March quarters of the ten years, 1859-68, this difference averaged 4.2, and varied between 7.2 in 1867, and 2.9 in 1859. It would be too much to expect that sanitary efforts alone will bridge over this chasm by lowering the town death-rates more nearly to a level with those of rural districts. We must look to the practical application of Social Science, and perhaps more than all to the labours of the school-master to help forward this great work.

In the 14 large towns of the United Kingdom furnishing weekly returns, the average death-rate last quarter was 27.7 per 1,000, against 30.5, 28.9, and 25.4 in the corresponding quarters of the three years 1866-8. Arranged in the order of their death-rates last quarter, from the lowest, they were as follow:—

	1869.	1868.	1867.
Birmingham	29.7	24.2	25.4
London	29.4	23.3	26.8
Hull	26.3	22.1	22.7
Bristol	26.6	25.6	25.5
Bradford	30.9	22.9	23.8
Leeds	27.5	23.0	23.3
Salford	27.3	28.2	31.4
Dublin	29.1	29.6	34.6
Sheffield	28.4	23.4	27.3
Liverpool	29.4	30.0	33.3
Newcastle	30.4	25.8	37.1
Manchester	31.0	31.3	33.8
Edinburgh	33.0	28.0	27.5
Glasgow	40.1	30.2	33.6

Apart from the increase of deaths last quarter from the fatal prevalence of bronchitis and pneumonia, which was more or less shared by all the towns, and, indeed, throughout Great Britain and Ireland, the mortality in the above towns was disturbed by a varying proportion of deaths from zymotic causes. Birmingham, which heads the list, enjoyed all but an immunity from this class of diseases, excepting the prevalence of scarlatina in some parts of the town. Scarlatina, indeed, may be said to have been very generally epidemic. In London, for instance, 618 deaths were referred to this disease in the three months, against 339 and 368 in the corresponding quarters

of 1867-8. In Manchester and Salford it was still more fatal, the 494 deaths in Hulme township alone, including sixty-four deaths from the disease; in the city and borough over 200 fatal cases of scarlatina were returned, and in some measure accounted for their excessive death-rate. Small-pox was again fatal in Sheffield, vaccination being still neglected. Typhus continued epidemic in Liverpool throughout the quarter, but to a far less fatal extent than in former visitations of the disease in that town. As some set-off against the low position occupied in the above list by two such important towns as Liverpool and Manchester, it is satisfactory to observe that the death-rate in each during last quarter showed a further slight decrease upon the declining rates of recent years. In Liverpool, for instance, the death-rate in the first quarter of the four years 1866-9 has been successively 45.9, 33.3, 30.0, and 29.6. This, in the face of the general increase in 1869 upon 1868, shows a favourable result for the sanitary activity in Liverpool during the past few years under the able direction of Dr. Trench.

The Registrar-General shows that in 46 other large English towns the death-rate last quarter was 24.6, or more than one per 1,000 lower than in the 14 largest towns above mentioned. The rate was remarkably low in Brighton, Southampton, Plymouth, Chester, Coventry, Birkenhead, and Swansea; while an excessive rate was shown in Exeter, Macclesfield, Wigan, Rochdale, Blackburn, and Preston. The excess in nearly all these towns was in a great measure due to the fatal prevalence of zymotic diseases.

The dwellers in London may well be satisfied with the health of the metropolis during last quarter. Of the 14 largest towns, only Birmingham enjoyed a lower death-rate. If London is the ugliest city in the world, it is no small consolation to know that it is now about the healthiest. In Berlin last quarter the annual death-rate was 34.2, and in Vienna 33.2 per 1,000, against the 25.4 which prevailed in London. Typhus was very fatally prevalent during the past three months in Berlin, Brussels, and several other continental cities. London has almost subdued this disease in its worst and most virulent type.

Space will not allow us to dwell upon other and interesting features in the Registrar-General's last quarterly return. He tells us, however, that the births in England and Wales exceeded by nearly 8,000 those registered in any previous winter quarter on record, and that the excess of births over deaths was over 70,000 in the 90 days.

The natural increase in the population of the country during the quarter by excess of births over deaths, was disturbed by the continual outflow of emigrants. Of the 30,275 persons who left the ports of the United Kingdom in the first three months of 1869, 11,110 were English and 9,800 Irish; the latter showing a decrease on the first quarter of 1868, while the total number of emigrants had increased.

The effect of the stagnation in the nation's commerce, dating from the commercial crisis of 1866, continues to be apparent in the marriage rate: 17.7 per 1,000 persons were married in 1866, 16.7 in 1867, and only 16.3 in 1868, a lower rate than in any year since 1861.

CONVERSAZIONE OF THE ARCHITECTURAL EXHIBITION SOCIETY.

THE nineteenth annual exhibition of this society was opened on Tuesday evening with a *conversazione*, at the galleries in Conduit-street, and with considerable *éclat*. For three hours a stream of visitors paraded the rooms, admiring the numerous collection and subjects on the well-lighted walls. Many members of the profession, accompanied by ladies, were amongst the guests, Mr. James Fergusson, the president, receiving them. The *conversazione* was varied this year by the omission altogether of the usual addresses from the president and members. The omission, however, was supplied by the performance of a band of musicians, placed, in the absence of a music gallery, at a table in the centre of the great gallery.

The whole suites of galleries was opened on this occasion, and is devoted in this manner:—The west or first gallery exclusively to a series of 294 coloured sketches, partly Continental and partly of subjects taken from various places in Great Britain, by the late Rev. J. L. Peit, M.A., F.S.A., all framed uniformly in size; the great gallery to the architectural collection, in a

recess of which is an exhibition of Dr. Salvati's Venetian glass; and the uppermost suite to the models and designs of constructive and building appliances. Want of space prevents us this week from going into a detailed examination of the several works, and we shall therefore content ourselves for the present with a few general remarks upon the whole collection. The works of the late Mr. Petit are astonishing for their number and characteristic treatment; his rapidity of sketching must have been surprising, for his sisters, who have obligingly lent this collection, possess, we learn, some 15,000 drawings by the same hand that is now still. We regret that the Council have not arranged these 294 subjects in a chronological form, so as to mark the periods of his unique style. None of the drawings being dated, they are placed, accordingly, in a jumbled and confused form.

As to the architectural collection proper, the extraordinary treatment which architects have received at the Royal Academy, has been the means of preventing the exhibition of the best specimens of their works in either place. Led by the promises held out to the profession, of ample space and special provision for their designs, some hundreds were sent to the Royal Academy instead of to the Architectural Exhibition; the rejection, at the last moment at the former place of so many works, precluded the exhibition of them at either, and so between the two stools the architects this year have, to a considerable extent, fallen to the ground. There are, nevertheless, in all, in this collection, 295 frames of subjects, exclusive of the 294 sketches: 58 of these are views of ancient Continental buildings, and 7 of English antiquities; there are 33 examples of English country residences and villas, and one Irish. Ecclesiastical architecture is represented by designs and drawings of 57 churches and chapels in or for England, 2 for Scotland, and 2 in Wales. For schools there are 17 specimens; for sick asylums, 2; infirmaries, 3; small-pox hospital, 1; fever hospital, 1; and lunatic asylums, 5. For educational buildings on a large scale, there are for a college and a university 1 each; and for establishments dealing with crime, 1 for assize courts and 1 for police and sessions house. Of town-halls there are 9; business premises, 11; and corn exchanges, 3. For banks, markets, foun-mills, monuments, workhouses, stables, hotels, boat-houses, railway stations, bridges, rectories, hunting and other lodges, almshouses, road-side inns, and club-houses, there are isolated illustrations mainly 1 of each. Of the details of the respective buildings represented there are 27 drawings, showing fonts, sculpture, a reared, a sacrum, porches, windows, dados, and staircases. From the 295 illustrations, we further ascertain the fact that 133, or less than half the total only, are of buildings executed or in progress.

ON THE DUTIES OF AN ARCHITECT WITH REFERENCE TO THE ARRANGEMENT AND CONSTRUCTION OF A BUILDING.

AFTER a paper on this subject by Mr. T. R. Smith, at the Society of Arts last week, a discussion ensued, in the course of which

Professor Kerr said, the impression left upon his mind was that it was a most unwise thing to be one's own architect; he did not know whether the main intention of the writer was to impress this upon the public mind, but he had certainly mentioned a list of dangers to be apprehended from the non-employment of an architect enough to frighten any one. The typical English gentleman, however, was usually determined to act as his own architect as far as he could, as he believed he knew his own requirements much better than any one else, and he (Professor Kerr) believed it to be the professional architect's duty to carry out his client's wishes to the best of his ability. He looked upon the architect as a practical man, and not at all as a sentimental person; his sentimental days were gone long ago, and he hoped they would never return. The architect was the servant of the public, employed for the purpose of doing that which they were not able thoroughly to do for themselves, viz., to design and scientifically arrange a building, so that it should be perfect in all its parts, so that all the refinements of the age might be duly provided for. When this was properly done he considered that a great deal more than 5 per cent. additional value was conferred upon the building. If the architect were an unskilful man, which might sometimes happen, the case

was different; but he was glad to say, for the credit of the profession in England at the present moment, that he knew of no profession in which there were fewer incompetent men, or where a man did more work for less money. Under these circumstances he fully appreciated the effort which Mr. Smith had made to impress upon his audience the importance of the architect's functions. With regard to the degree in which the owner of a house might be allowed to exercise his own fancy in the design, his (Professor Kerr's) opinion was that an intelligent client was entitled, within the limits which no English gentleman was likely to transgress, to dictate to his architect the conditions under which he chose to live; and a skilful architect would fulfil these conditions as perfectly as possible. He was bound to say that he had had clients whose assistance had been of the greatest possible service, and he knew of no greater gratification on the part of a professional man than to feel that he had honestly fulfilled the wishes of his client, and that by the exercise of his own skill he had accomplished that which a less careful man would have pooh-pooled as an impossibility. The lecturer, he was glad to see, had not followed the general rule according to which architects were spoken of in England. Their functions were generally divided into practical and artistic, the latter being considered by far the most important. This he considered a great mistake. He believed that it was, generally speaking, the truth that an architect, at any rate in his calmer moods, considered himself simply as the servant of the public, and it was a mistake to suppose that he wished to force his own principles of treatment on the public against their wish. That which had led architects to produce public buildings which had ultimately gone out of fashion, to say nothing more, was the pressure put upon them by *dilettanti* and others, who, with the best intentions, were not always possessed of that information which enabled them to give judicious advice. If architects, as a body, were more consulted on questions of public architectural art, architecture would not become more outrageous than it had been, but less so. Unless architects were encouraged in the other direction, he believed they would be induced to follow the dictates of common sense, and to remember that, after all, the English character was averse to any excess of display, either in ornament or anything else, and that the best condition of a good building should be that it fulfilled all its internal functions thoroughly and completely, and that any elaborate ornamentation was altogether a secondary consideration.

Mr. C. F. Hayward said, although he quite saw the wisdom of the course which had been adopted, he could not help regretting that the artistic portion of the subject had not been more touched upon. He could not at all agree with Professor Kerr that the time was gone by for sentiment with regard to architecture, and he should much regret if sentiment were entirely to leave him when designing a building. When troubles came, as they would come—troubles connected with contracts, with workmen, with clients, or with other professional matters—he could not help feeling that it would be a most disagreeable task to go on with the building if there were no sentiment connected with it. He would put it to any gentleman present not connected with the profession, if it would be possible to build a granary or factory in the same spirit as such a building as had been brought under their notice in the paper, a gentleman's country house. He must say that, independently of any question of remuneration, it was a great pleasure to an architect to build a good house for a good client, and he believed that was one of the reasons why an English country gentleman was so anxious to interfere with the arrangements of his building; he felt the influence of sentiment, and desired for the time being to be himself an architect, and could scarcely refrain from interfering, although he might know that he would do so to his own cost. It would be evident to any one that, whatever an architect was, he was a working man; and that in the present day was a very honourable term. Even if his own hands took no part in the work, still his mind and brain must be constantly on the stretch until the building was finished. Mr. Smith spoke of an architect designing or superintending the furnishing of a house as well as the house itself, and this he looked upon as a most important matter. Some clients would trust an architect with the carrying out of a building from the foundation to the chimney-top, and yet would not take his opinion with regard to the

design of a stove or a chimney-piece, and certainly not on the question of a paperhanging. This was a point which, in his opinion, ought to be more insisted upon as connected with the duties of an architect. As he understood it, an architect's duty was to carry out a building until it was externally and internally complete, and this could not be the case unless everything connected with it were under his immediate superintendence. He had great pleasure in seconding the vote of thanks.

Mr. Chatfield Clarke thought there were several points which must at once impress the mind of any one who contemplated building. The first was that he should employ an honest and capable architect; and the second, that, having done so, he should give him his full confidence; and this latter point was, in his opinion, one of the principal requisites to success in any building. The next point was to secure an honest and able contractor, for, as had been said, however desirous an architect might be of producing a good building, he could not do so if the builder were a determined rogue; and the result of his own experience was the same as that of Mr. Smith, that, however careful they might be, they could not make a bad builder do good work. Another point, which he considered of some moment, was, that when once a building had been planned, it should be altered as little as possible. A building was a conception as a whole, and, to a certain extent, might be considered as an inspiration, and therefore any subsequent piecemeal alteration very often interfered with the general effect of the structure. In conclusion, he would remark that building a house in the country was a very easy matter indeed compared with building in London. Very recently, in erecting quite a small building, which was not to cost more than 5,000*l.*, he had had eight or ten different negotiations on the subject of party walls, the rights of adjacent lights, difficulties connected with the Metropolitan Building Act, lines of frontage, and so on. Questions of lights and other matters were now refined upon to such an unnecessary and vexatious extent, that he believed it would be well if professional men were to take some means of calling public attention to the difficulties thus thrown in their way. He thought the manifest conclusion to be drawn from all that had been said was, that no wise man would enter on building operations of any extent without the assistance of a competent architect.

Mr. J. C. Wilson said there were a few questions which he should like to ask, not being a member of the profession. Did architects generally approve of deafening the floors of houses, as was frequently done in Scotland, by introducing a mixture of lime and ashes, which was found to keep the rooms warm in winter and cool in summer? Again, did they approve of making flues of a taper shape? He believed such a method would greatly tend to prevent chimneys from smoking. He should also like to know if architects approved of making a separate flue for ventilating purposes from each room to the roof of the house. He was not sure whether or not it was the practice amongst architects, when serving their apprenticeship, to learn the various trades connected with building, such as joinery, masonry, and so on. This course was adopted by engineers, and he believed with very great advantage, as it gave them a knowledge of materials and construction which they could hardly obtain in any other way. He also begged leave to throw out the suggestion whether it would be possible to build houses according to certain classes, and have them classed, much in the same way as ships were classed at Lloyd's, having regard simply to the quality of materials employed and the workmanship, so that the purchaser of a house which had been built and certified, say by the Institute of Architects, as belonging to a certain class, would know that he was buying something of a certain marketable value. Of course, no house would be classed at all which had not been built under the superintendence of a professional man. Whatever the public might think of the value of an architect's services, the members of the kindred profession were quite aware of the great ability and talent which were required to make a man a good architect, and he hoped the day was not far distant when the two professions would be found going more hand in hand than they had hitherto done, the architect doing that portion of an engineer's work which properly belonged to him, and the engineer, on the other hand, assisting the architect in all purely engineering matters.

Mr. Bishop said that last summer he had a

house built, the bills of quantities being got out by a surveyor from the architect's specification, and upon these quantities builders were invited to tender. He went through some of the details himself, and he found, to his astonishment, that on the average the results were 33 per cent. in excess. The consequence was that he had to call upon the different parties who were tendering, and explain the matter to them, and one contractor, who had made out his estimate, was able to reduce it by 400l., which was about 33 per cent. of the total.

Mr. Jones remarked that, having heard what was the amount of remuneration which architects received, he should be much obliged if Mr. Smith could inform him what amount of consideration would secure honesty in a clerk of works. It was quite possible for him to have a commission on both sides, whereas, unless he were quite loyal to the person building, there was every probability of the structure being defective. It was one of the greatest evils in the present day that so few workmen could be trusted; so that a man, unless he could do a thing himself, never had any certainty that it would be done honestly and properly according to his expectations.

Mr. Edwin Nash said all architects knew the difficulty of obtaining good clerks of works, and very often they were glad to have a building erected without such assistance, feeling that they could trust much better to the builder himself. A good clerk of the works was a most valuable man, but though there were some of that class, unfortunately there were a good many of the other; and being generally drawn from the ranks of workmen, it could not be expected that they would always be all that was desired. Architects did not object to deafening floors, which were very often treated in a similar manner to that described, nor did they object to taper chimneys, except as a question of expense, and some little arrangement being required in the management of the brickwork. The effect in the way of preventing smoky chimneys had not been much tried, but he believed it would be found beneficial, although of course there were objections; as, for instance, such chimneys would be much more exposed to the weather than those of one calibre throughout. One matter which had not been touched upon he considered of great importance in connexion with the architects' duties; he was too much harassed with practical office work of a dry technical character. This could not have been the case with Michaelangelo, Raphael, or the other great masters of former periods, or they never could have designed and carried on their magnificent works. He considered that architects ought to be far more of artists than they were, and unless a large amount of their dry business work were transferred to some one else, he thought English architects would never rise to the high standard of excellence which had been seen in former days.

Mr. Hyde Clarke said it had been hinted to him that the audience was to a great extent a professional one, and that the discussion had been principally carried on by architects; but as an old member of the Society of Arts, he might remark that the subject came strictly within their domain as a technological one, and one of very great importance to the public. The point of view from which it had been treated, was eminently practical, for every one was, in some degree, interested in the building of a house, which could not be said to the same extent with regard to building on a large scale, although on that also there was a bond of union between architects and an educated public,—the community of enjoyment in works of art. Unfortunately architects were too often neglected in such matters as house building, and he regretted that a greater number of what might be called the employers of architects were not present, to see, from the drawings which surrounded the room, the great quantity of work which an architect had to perform. The interesting paper which had been read showed the relations between the architect and employer, and pointed out to the latter the real value of the services rendered by that profession. If this were more generally known, he believed there would be a much better understanding between architects and the public. In every business but that of building the value of ability and directing power seemed to be understood. Even in a tailor's shop this was the case, but people were much fonder of having their houses from a "slop-shop" than their clothes; they were not always in the habit of having them made to fit, and yet

every one knew that even in the matter of a coat, a considerable amount of ability was required in order to ensure a successful result.

Mr. Ladd, as a professional man, felt much obliged to Mr. Smith for the manner in which he had presented his drawings to their notice. These plans showed the amount of work which had to be got through; and, when it was done in so complete and detailed a manner, he did not consider that the 5 per cent. was at all an adequate remuneration. These drawings set a good example to any young architects or pupils who might be present, and showed them how their duty should be fulfilled in carrying out any work which was placed in their hands. Very often, he was afraid, not one-fourth of the drawings—in proportion to the extent of the work—were made which were here shown, and in those cases probably 5 per cent. was enough. First-class architects, of course, would do their work thoroughly and well, and in such cases they were not over too under paid. In his opinion there should be different scales of remuneration according to the amount of detail in the building, which involved extra work on the part of an architect.

Mr. Tracy asked if there were any intelligible rule known to architects by which they constructed a house; for, according to his experience, smoky chimneys were the rule in dwellings of all classes, both those on which unlimited expense was lavished, as well as those built in the cheapest possible manner.

Mr. Smith, having thanked the meeting for the kind reception which his paper had received, said that notwithstanding the remarks of the last speaker, architects had a certain amount of knowledge with regard to the building of chimneys, and when they were carefully constructed on principles which were generally understood, they were not often complained of. It must be remembered, however, that it was a very delicate matter to arrange for a column of hot air to ascend, in all weathers and under all circumstances, so that it should never be liable to disturbance either by the opening or shutting of doors, by the starting of similar currents in other parts of the house, or by changes in the condition of the atmosphere inside or outside the building; still he was quite ready to admit that a good deal might yet be learned on the subject of flues. It was a very common practice to deafen the floors in good houses, but he knew nothing about taper chimneys, and should not like to take the responsibility of advising their introduction. Distinct ventilating flues were very desirable where expense was not an object, provided they were constructed upon an intelligible system. It was not usual for architects to go through any large series of workshops, but they not unfrequently spent some time in a joiner's shop, which was, no doubt, of considerable advantage. It would not be very easy to devise a classification for houses; and if it were done, he did not think it would be of any practical value. One of the most important points in the discussion was that raised by Professor Kerr, as to the share which the proprietor himself might take in the erection of a building. What he had said in the paper referred rather to a man acting as his own architect, which he did not deem by any means desirable; but, for his own part, the greater share his client took in the building the better he was pleased, not that the result was always better, but that so much responsibility was taken from his shoulders. He perfectly agreed that a client had a right to dictate his conditions, and it was the business of the architect to carry them out in the best way possible. He believed the best results were attained where the client contented himself with stating his conditions, and left to the professional man the carrying of them out. The whole question was complicated to some extent by a house being so familiar an object, and the furniture even more so. From this cause, probably, it was that an architect was so rarely allowed to give any opinion as to furniture, or even what were really parts of the house, such as chimney-pieces and wall papers. His own idea was that a man who wanted to make the most of his architect would use his skill and experience to the utmost, considering that he knew more than he himself did. Occasionally there were instances in which the client might detect matters which had escaped the attention of the architect, but, as a rule, it was the other way. Some of his brethren had rather complained of his not having said more of the artistic part of an architect's work, but the fact was he had been cautioned not to go into that matter, but to deal with the subject from a

technological point of view, as being more specially fitted for discussion in that room. The truth was, considerations of artistic excellence and beauty never ought to be absent from the mind of an architect, whose loyalty to his profession should make him endeavor to make the plainest and simplest building conform to the true principles of art. He could not agree with what Mr. Chatfield Clarke had said about the alteration of plans when once made; but that was simply an instance of the different way in which different minds worked, and probably it would be found that no two men arrived at the same end by the same road. He could not go into the question raised by Mr. Bishop as to the quantities without having all the particulars, but the remarks of Mr. Jones as to clerks of works were most important. No sum of money would purchase honesty in such functionaries, but at the same time he had had many, and had never had a thoroughly bad one. He always regarded it as one of the most important points to secure excellence in a clerk of works, and spared no pains, therefore, to ascertain what was his previous character.

The Chairman, Sir M. D. Wyatt, said he could not help feeling that the duties which an architect was called upon to render to his client had been, if anything, rather understated in the paper of Mr. Smith. One particular duty which had not been insisted on, but which was of great importance, was that of exercising patience. There were moments of difficulty in the progress of almost every great work when an immense deal of tact and patience was necessary sometimes even to keep the peace between half a dozen people, and to make things go smoothly, and this was worth at least one out of the 5 per cent. Another essential qualification was a combination of selfishness and friendliness. An architect, in the early stages of his intercourse with his client, could very frequently be of the greatest possible service, sometimes by telling a man that he must spend more money, and sometimes that he should spend less. It was important early in the negotiations to be what was the tendency of the client. Sometimes he might be a man with a great taste for art, but with limited means or heavy family claims; and if in a moment of selfishness an architect took advantage of that enthusiasm, and went on glorifying himself at his client's expense he did that which was improper and reprehensible. Again, the relations between the architect and his client being reciprocal, it was his bounden duty to act as a friend to his employer throughout; and from the moment that was clearly understood all mistrust would be removed, and the happiest relations would be established. Another quality which the architect should possess was that of justice. It was necessary for the protection of the employer that contracts should be in very strict terms; and where the employer was of a grasping disposition, the builder was often so much at his mercy, that unless the architect held a very fair hand between the two, great injustice might be committed. He should, therefore, strive, above all things, to earn in all his transactions a character for uprightness, taking care, on the one hand, to protect his client, but never allowing injustice to be done to the builder.

THE KING OF METALS.

NATURE in her beautiful and wonderful divisions completes the arrangement by marking out a ruler or head of the various divisions. To some "one" is given greater, grander attributes; it is marked out as being the chief of the order or species. Not only in things animate does this occur, but in things inanimate also. The stately and noble oak, the king of the forest, fosters the growth of tender parasites under its sturdy arms, yet braves the storm that brings destruction to its meeker neighbours. The greatness of these "kings of creation" does not always arise from great power. They usually have their equal in sustaining or resisting power: has not the king of the beasts, the majestic lion? Yet there is none to equal him in the "grandness" of his nature.

Our subject (see page 243, ante) is not only king in its qualities when brought into manufactures, but is so in its bearing naturally. The records are closely kept of where it is found, and in what condition, and the result shows that it is discovered in the purest condition of any metal. Most ores yield only a small percentage of even ounces to the ton, but gold is got without smelting, and wherever it exists it is visible to the eye without any artificial process. It is rare that

any other metal is found so; but with "our" metal it is the rule,—from 60 to 99 per cent. of pure metal, and be it marked there is little else but its "consort," silver, taken in its embrace. Californian gold averages of pure metal 875 to 885 per 1,000; Australian ditto 960 to 966. Appended is a list of various proportions, from which it will be seen how little else but silver is there:—

	Gold.	Silver.
Inarowski	6908	3038
Titiribi, Colombia	7400	2600
Trinidad	8240	1760
Ogas, Azores	8450	1550
Senegal, Africa	8450	1530
Petropawlofski	8681	1319
Chandure, Canada	8973	1327
Riv. Lucio, W. Mexico	8794	1263
Baja, near Pampelona	8815	1185
Liana	8854	1142
California	8961	1005
Beresel	9188	873
Katherenberg	9409	555
Brazil	9490	565
Australia	9543	359
Katherenberg	9581	353
California	9642	358
Katherenberg	9896	016

Although gold has from time immemorial held the way, it is somewhat singular that there are no records of great finds in early times. Russia, until within a few years since, has been most productive, but nothing approaching recent discoveries is recorded, with the exception mentioned below. In North Carolina, a nugget weighing 37 lb. Troy was found; the largest mass as yet from California is 20 lb. In Paragnay a large mass of rock fell down and brought to light pieces from 1 lb. to 50 lb. in weight. In 1842, at Taganka, Russia, a mass was found of 100 lb. Troy, now in the Museum of Engineers, St. Petersburg. Australia eclipses all these by a trifle weighing 137 lb., sold for 5,532*l.*; another from Forrest Creek weighing 27 lb. 6oz. 13 dwts.*

Wherever gold is found it is visible to the eye without tests, we have said,—i.e., found in quantities worth searching for; perhaps its most natural condition is in quartz; here it is observable in small plates bright and pure; the beds of streams and ravines near will abound with it in grains and nuggets—the small plates rounded by friction with rock and stone. The rock, worn away by diluvial or ante-diluvial torrents, detaches the particles of gold, and they are deposited in little hollows of the soil, and their pureness making them very ductile, they get compressed into nuggets. This is the greatest source of supply of gold, and is the system Nature has adopted all over the globe, and one we claim as distinctive of gold; where large nuggets are found apart from these water-courses undoubtedly volcanic heat has been at work. The primeval condition of metals is a wondrous matter to think over. The round of nature in all things that generate can be in some degree marked out, but with inanimate metals it is different; the air is charged with metallic particles, sea water holds metal in solution, the fissures of the earth contain fluids impregnated with oxides of metals, yet among all these gold is not found. Certainly none of the popular metals can claim the same exemption. Scientific manufacturers have brought down its proud spirit, and if nature does not dissolve it, art has done so; and it does seem one of the few things that are new under the sun, that the decomposition should be a great necessity in trade. A large quantity of gold is consumed in photographing and in other ways, never to be recovered in our vision, but to be gathered together again—when? The gases that foster vegetation are set free by the destruction of coal; and vegetation produces coal, recreated, but there is no recreation in one subject (now a king and a subject too!), but simply a reproduction by being brought together; it passes through no different state of being. When Ophir was the source whence the Romans obtained their gold (believed to be on the coast of Madagascar), California and Australia were overlaid with gold: it was not being formed like other products of nature, but lay there grand in its distinctiveness, chaste in its associations, and glorious in its colour. What a wondrous power has the king of metals! There is a great nation now—great in the number of its people, great in its attributes, in their productions, in the space they occupy; but they lack gold, and their credit suffers. It is sensitive, and has been freighted from their shores, for it taketh to itself wings and flieth away at the prospect of disruption.

* *Vida Dana's* "Metalurgy" (American), in which valuable book there is an error in stating that gold can be beaten to 1,230,000ths of an inch in substance; long before it would come to this it would be reduced to powder.

TECHNICAL EDUCATION IN THE MIDLAND DISTRICT.

DURING the past fortnight Mr. Buckmaster, from the Science and Art Department, has held meetings in the different colliery centres near Chesterfield, for the purpose of promoting scientific instruction. These meetings were brought to a close by a conference, which was held under the auspices of the mayor in the Municipal Hall, Chesterfield. There was a large and influential attendance of the principal colliery owners and others interested in the promotion of educational questions. Mr. C. Binns, J.P., from Clay Cross, occupied the chair, and introduced Mr. Buckmaster, who, after explaining the Government scheme, said—"We have been blessed beyond other countries with an abundance of coal and iron, the raw material of our industrial prosperity and wealth. Where nature does most, man frequently does least, and in countries less gifted with mineral riches schools have been established to compensate by scientific instruction for their relatively unfavourable position. Watt saw the importance of this knowledge seventy years ago, and established a school at Soho to teach workmen elementary mechanics and the laws of heat. It is not supposed that abstract scientific knowledge will ever qualify a man to become a bailiff or overman. The practical part of a miner's business must be learnt in the mine; but superior intelligence will distinguish itself in every situation. What do you propose to do? The Government, through the Science and Art Department, is prepared to give very considerable assistance in promoting instruction in those sciences which relate to the industries carried on in this neighbourhood. The first necessity will be a science teacher. I fear it is now too late for persons to prepare for the science examinations which will be held throughout the country next month. Every science teacher, unless he have a degree, must pass an examination in the subject or subjects he proposes to teach. He must instruct a class under the supervision of a local committee. The class must receive not less than twenty-five lessons, and undergo an elementary examination by means of printed questions in the subject or subjects which have been taught, and on the result of this examination liberal payments will be made to the teacher. The pupils of these science classes are encouraged by prizes of books, certificates, medals, exhibitions, and scholarships, and 50 per cent. will be given towards the purchase of apparatus necessary for the proper instruction of the class. Under certain regulations, scholarships of the value of 10*l.* and 15*l.* a year are given to the best boys in our elementary schools. The scheme contains the maximum amount of help with the minimum amount of interference. Through the various meetings I have attended in this district I have fully explained the details of the science regulations and the conditions upon which the State is prepared to help forward a scheme of scientific instruction suited to the industrial and educational requirements of the country. It now remains to be seen what you are prepared to do. If you believe in this instruction, if you believe men are more amenable to reason as they become more educated, if you believe in the growth of that intellectual nature which God has given in various degrees to every man, then I ask your co-operation and help. It is useless for the State to multiply these agencies and opportunities if those for whom they are intended are careless and indifferent. Our unparalled prosperity has not been an unmixed good; we have not developed in the same ratio as our wealth the culture of humanity. There is one way by which all difficulty can be overcome, and that is, to engage from next October to the end of April a competent science teacher capable of giving instruction in three or four sciences. Such a teacher would move from place to place within a convenient distance from Chesterfield, and teach classes, and from these classes other teachers and assistants would be raised up. Such a scheme has been in operation in East Lancashire, and is now in operation in the colliery districts around Newcastle, and I am informed that the scheme has worked with a success beyond anything which could be anticipated."

The chairman said he should be very sorry if the conference did not come to some practical result. He thought the scheme explained by Mr. Buckmaster capable of doing much good. Mr. Markham, of Staveley, said he should like to ask Mr. Buckmaster what he thought would be a fair guarantee for a science teacher?

Mr. Buckmaster said a teacher could be obtained for a guarantee of 100*l.* a year, but this guarantee must be understood as quite distinct from any payments to the teacher by the Science and Art Department.

The Rev. J. Booth—May I ask Mr. Buckmaster what fees are required of the pupils?

Mr. Buckmaster—This is very much a matter of local arrangement. I find at Staveley and Clay Cross there is a desire, and I believe it is the practice to provide a free elementary education; but any fees paid by pupils of science classes could go towards the guarantee fund. The only regulation of the department is, that the fees shall not be such as to exclude young men, and those who live by manual labour.

The following resolution was passed:—"That this meeting, having heard the explanation given by Mr. Buckmaster, hereby agrees to raise a guarantee fund of 100*l.* a year for five years, for the purpose of employing a competent science teacher, and that this meeting do resolve itself into a committee for that purpose."

In a few minutes nearly half the guarantee, in sums from 10*l.* to 10*l.* 6*d.*, was promised in the room. Mr. Busby was solicited to forward a circular to gentlemen in the district who were not present at the meeting, asking their countenance and support to the undertaking.

SAN ZENONE, VERONA.

SOME days back I was working in the church of San Zenone, when the custodian told me that it was intended to raise part of the pavement above the steps leading to the choir, to see if there were any arches similar to those in the aisles of the church through which the steps lead to the crypt. The two capitals seen in the crypt would seem to indicate the existence of arches at one time in the history of the church. Under the direction of an architect, the workmen very carefully raised some of the marble slabs above the steps, and, to the delight of all present, we discovered the crown of an arch immediately under the pavement. Very carefully removing the sand and rubbish, portions of a fresco were discovered, and then two rows of bas-reliefs similar in form to those on the arches in the aisles. The designs of the bas-reliefs are quite different from those upon the other arches, and they are in perfect preservation, the sharp cutting as fresh as ever, and the colour remaining clearly distinguishable.

Half the arch was uncovered, and upon the spandrel there is a fresco, consisting of scroll work, a large bird, and several figures. The subject is not clearly discernible at present, the other part being no doubt upon the other spandrel still covered; the colours are fresh, and but very little injured. The style of work is similar to that of many others in San Zenone,—very early, the outlines strongly marked, no attempt at gradation of colour, the folds of drapery, &c., simply indicated by lines.

In some places the surface had been broken, revealing the existence of a previous fresco different in design and colour.

This discovery has raised the question of the advisability of opening up the arches, so that the crypt may be seen perfectly from the main point of the church, and restoring the church to the condition it was in before the erection of the steps in the sixteenth century.

Of course the cost is the principal difficulty, unless the municipality undertake the work. There is, indeed, but little chance of its being done unless help can be obtained from other sources.

To open the arches, erect a balustrade above them, and also two small flights of steps in the aisles in place of the large one in the nave, which would seem to have been the original condition of the church by the presence of markings in the aisles, walls of steps on either side, and upon the balustrade to place the statues of Christ and the Twelve Apostles, will cost over 100*l.* English, and the parish of San Zenone is too poor to furnish such a sum.

JOHN BUNNEY.

Post-office Savings Banks.—A return relating to Post-office Savings Banks has just been published. It was moved for by Sir F. Goldsmid, and differs somewhat from the usual return furnished in pursuance of the Act of Parliament, inasmuch as it supplies various additional particulars. It shows, for instance, that the total amount received from depositors, including interest, to the 31st of December, 1868, was 27,153,571*l.* 5*s.* 1*d.*, and the total amount repaid to depositors was 15,186,915*l.* 16*s.* 8*d.*, leaving a balance due to depositors of 11,966,652*l.* 8*s.* 5*d.* The total number of deposits and withdrawals was 11,516,496*l.*, the average cost of each transaction having been 6*s.* 2*d.* Prior to the passing of the Post-office Savings Bank Act, 1861, it was estimated that the average cost of each transaction would be 7*d.*

CARL FRIEDRICH SCHINKEL.*

HAVING the honour to speak about Schinkel, I am rather in a peculiar and difficult position towards you, my professional English friends—peculiar in as far as I do not belong to your great nation, and therefore difficult, as all the profound sentiments and all the different sources of feelings and views, the artistic disposition, and judgment and taste, are generally developed just as differently between two nations as the nations themselves.

Possibly I cannot but speak as a German, which I am proud to be, from a more or less German point of view, particularly when I speak about my countrymen. But I think truth of mind, real nobility of intellect, and independent artistic feelings are coins which have the same value in every part of the world, and amongst every nation, and which do not require a letter of introduction stamped on in the form of the likeness of any king or queen to render them valid, even if it were possible for this to do so. From this cosmopolitan point of view, I will commence the solution of my task, and try to speak to you about a great man, one of the noblest princes of the royal family of superior men of all times.

How shall I do it? Göthe says, "You are like those you understand." In considering these words, I should almost doubt whether I should be able to do justice to the high genius of Schinkel, and should, from the beginning, almost despair of undertaking to depict the material of his intellect, and the forms of its appearing. As I hope to convince you, the material of his intellect was of too high a nature to hear even the ill-founded expressions of devoted admiration; and though full of this admiration as I am myself, I will not trouble you to listen to its effusion, as I cannot approve of the course generally followed in talking about great people. If we never had seen the sun, no talking about its brilliancy and life-creating powers would be able to give us an idea of the blessing spread by the participation of it. Our eyes must see the whole of our being must feel it, by being exposed directly to its action, and will feel it as sure as we are men. Therefore I am sure you will recognize Schinkel's genius as surely as truthfulness towards your best artistic feelings, convictions, and judgment abides in you.

Although Schinkel was an architect principally, I cannot, in characterizing him, first speak of him as such, as it is not his architectural mind exclusively that makes him great; it is far more his philosophic, artistic disposition and profoundness of so high and extraordinary a class which gives us the key to understand him, this solely and totally being the foundation of the structure of his artistic being, the formula for the results of his activity, and the unit for the measure of his merits. It was this high artistic philosophic disposition and capacity which enabled him not only to be a great architect, but also a great painter and a great sculptor, being at the same time gifted with a rare fancy and very great technical talents, and in most of his works, wherever opportunity and circumstances allowed, the architect, the painter, and the sculptor speaks to us simultaneously.

Let us, therefore, first make the acquaintance of some of his æsthetic views and ideas as they come to hand; for instance:—

"Beauty of form is the theory of created things become visible (that is, apprehended by us instinctively)." Or,

"Beauty in form is the logical consequence of recreation grown visible."

"Beauty cannot exist by itself, but only in connexion with objects."

"The vocation of man is to develop the created according to the logical consequences of its laws, and that with self-conviction, and not arbitrarily."

"Independence of thought is increased by the education of the reasonable, sublime, and beautiful. None of these ingredients may be omitted, because even the moral is enhanced by the beautiful, and it is, for instance, of importance whether a beneficial act shows itself with beauty or without. In the first case the act will thoroughly and really render happy and encourage, while in the second it will offend. There is thus an action of the arts on the moral state. The freedom of sentiment represented by certain means through art in the empire of the beautiful excludes every element of egotism."

"The aim of an artist is, that all should parti-

cipate in the delight of the very highest, and this alone is moral and virtuous."

"The beautiful seems to be one of the foundations of the whole existence on which the life of reason depends. Without this foundation it is only a huddle with barbarism."

"Man in every respect should aim at beauty, in order to influence all his motives and render the results of their actions beneficial. Then the idea of duty in a rougher sense will disappear, and he will always act in celestial delight, which is the necessary consequence of producing the beautiful. In other words, every action should be a task of art to him."

Time will not allow me to quote any more, but you will feel through these ideas the spirit of a mind which is able to feel in a highly superior manner, and the aim of which is directed altogether to the idea of the beautiful as the commencement and the end of all earthly and transcendent intentions. Thus he was able to be a worthy priest of art, and of morals through art.

But not only did he preach maxims of this kind on paper or in conversation, but he acted also from this high point of view, and the whole of his works in architecture, painting, and sculpture are only translations of these pure ideas into stone and mortar, into paint and marble. He was a true moralist in art, and as it is impossible for fashion to govern the moral, as moral is unchangeable, equally impossible is it also that Schinkel should have sacrificed any of his art, so holy to him, to do degrading, slavish homage to fashion in art. His philosophical ideas were independent, and so were his artistic creations.

Perhaps they would often have had more the appearance of so-called originality if his intellectual independence had only been founded on the idea of doing something different from what had been done before. This being too low for him, too destitute of high principle and aim, the germs of his ideas were always beauty in its artistic-philosophical sense—beauty of form by its correspondence with natural law—beauty in aim by true, total, and most correspondent fulfilment of requirement.

Before we converse about Schinkel's position towards his epoch, the beginning and middle of this century, in which he lived, we must draw our attention to the state of things as he found them, and to the conditions and circumstances under which he had to develop his ideas and exercise his activity.

The commencement of the nineteenth century signals the latter end of a long and severe illness of the social state of things in nearly the whole of civilized Europe for two centuries previous. All the bands of the general laws of a moral existence had been broken, and the natural consequences were the total loss of consciousness of the nations. The poisoning effect of this was felt everywhere, but, thanks to a wise Providence, the stationary development of affairs now took a favourable turn, and gave the leading nations an opportunity of becoming conscious of their physical power, and thus scattered the seed for a new epoch of formation, which now immediately began.

A feeling of respect for law again prevailed; the state of anarchy was now to be looked upon as belonging to an unworthy past; the illness was overcome; the individual mind of nations began to reflect on the reason of it, in order consciously to be able to prevent its return. Thus a strong and predominant historical feeling is created; philosophers, statesmen, and artists look back to the time and state of things long past away, in order to refresh themselves, to heal the burning wounds late events had inflicted, and to relieve the loneliness and barrenness of feelings by the acknowledgment of their unworthiness.

The recollection of classical times and its spirit did, naturally, not fail to produce its attraction again, being, on account of its everlasting freshness, its simplicity and pure fancy, the most healthy mental food for the state of re-convalescence. But the classical spirit did not only attract again—it soon was cherished and loved. Particularly in architecture we see the leading nations—Germans, French, and English, taking the greatest part in this movement. Since Winkelmann in Berlin, who particularly has the merit of drawing public attention to the remaining relics of the ancients, great praise is due to two Englishmen, Stuart and Revett, for they drew the precious treasures of art to light again, and not only so, but gave them to the whole civilized world, by measur-

ing, copying, and drawing whatever was left to be found of them. Thus the language of forms of the Greek architecture became known again, and the grammatical laws of it began to be understood more or less.

But before this was the case, the grandeur, truthfulness, and beauty of the ancient Greek productions were high enough to fix the attention of the nations upon them; the elements were too new, the idea of reforming or remodelling them therefore very distant, and the long-forgotten charms induced the mind to rest upon them quietly, and enjoy their sunshine.

In England imitations and copies of the ancient buildings soon were seen, and thus, for instance, in London, St. Pancras Church was, in 1819, built in Euston-square, by Inwood. This, singular to say, is an exact copy of the Erechtheion at Athens, at each side of which two imitations of the Pandrosion are given. In order to do the utmost and keep it up to the standing of the day and its customs, the old tower of the winds, the monument of the Andronikos at Thyrre, was placed inside of this Erechtheion, but as it is too small alone, and would not have looked like a somewhat fashionable church tower, the same monument was simply placed again on the top of the first one—certainly an idea about as bright as that of Columbus in making the egg stand.

So is St. Philip's Chapel, by Repton, in Regent-street, merely a copy of Lysikrates's lantern put on the top of an extra clock-case, for the purpose of producing a genuine Greek clock tower; and so on.

These facts seem to be singular, but are quite in accordance with one of the principal English peculiarities; that is, the great respect for everything that has once attained a name and standing, without going deeper into the real cause of the reputation attached to the object. The great weight of so-called authority and real authority has governed the English mind more than any other, and does so still.

Unhappily, nevertheless, the development of classical architecture in England, after the first powerful movement of transplanting it, soon lost its prospects; and very naturally so too, because the spirit of it did only meet an inclination of the public mind, which was interested in making itself acquainted with it, being something new and fresh, imposing, and generally acknowledged. But there was no real sympathy, no natural disposition for the reception of classical spirit, and I venture to say that this will never be very different in England. Nobody could say that this is not as it ought to be—not at all. But the English mind is differently constructed; the English mind is a Gothic mind, and as little as a column or pilaster can do the same service as a buttress, so little is a real English mind suited to possess a real genuine classical architectural disposition.

But, after all, the classical fashion of these days, although it died away, because it did not exceed this state of infancy, had undoubtedly had an excellent effect on the history of architecture in England, as means to a more philosophical way of looking into the æsthetic questions and requirement of architectural constructions.

Thus much about England, whose Gothic architecture has even benefited by it, and now perhaps occupies the first rank in the civilized Gothic world. Let us now see how Germany, and particularly Berlin, the centre of intellectual life in Germany, was influenced by the new movement in architecture.

The effect was similar to that experienced in England as far as the unconditional reception of the refreshing elements of the renewed and completed traditions went, but the understanding with which this was done was very different.

It was generally felt that these traditions were not only to be looked upon as worthy of imitation and a happy and refreshing contrast to the late past; but it was far more felt that they were the source of ideas for the formation of the future, corresponding with the national German philosophical disposition.

Thus no inducement was felt to make an attempt at direct copying only for the sake of copying, but, in fact, an eager study of the alphabet of Greek forms began, in order to be able to read the Greek spirit in artistic form, to learn to understand it thoroughly, to make it the means of education to the artistic views and taste, and thus to lay the foundation for consequent development of ideas and actions resulting thereof. Schinkel was already in his earlier days the bearer, and, perhaps, the leader of these ideas, and the whole of his work throughout his

* By Mr. R. Johns: from a paper read at Liverpool Architectural Society.

life was the fertile embodiment of them. This mental influence was so widespread and intensive that it entirely governed the taste of the day without making it a slave in any respect, the means of his government and his intentions only being true love to art and the highest independence and freedom of thought. His actual endeavours, crowned by rare and extraordinary success, were thus, not only to regenerate Greek architecture, but far more, to form new words and a new language, fit for the use of the present day by means of its best elements. That he did not do this from a prejudicial point of view, but with depth and breadth of genuine artistical tact and nobility of feeling, you will best understand by listening to his own words. He says, for instance, referring to one of his most important works:—

"I followed the simple and superior style of the pure Greek art, which was enabled by an undisturbed development to reject every element strange to its nature; and thus, in opposition to modern art, preserving the character of innocence, used all my mental powers and talents for the most organic formation of details in every part. This totally ideal style, though in direct contradiction to many conditions and requirements of our modern life, was, of course, to be modified accordingly."

"The ideal in architecture is only totally realized when a building entirely corresponds as a whole, and in all its parts, mentally and physically, with its purpose."

"From this alone, it is clear that the ideal is to be modified at every period by its new requirements,—that all the artistic material already inherited by art from the different periods of past history correspond more or less with the requirements of the present day, and therefore must be modified in their application; and it will also be seen that even entire new inventions are necessary to reach the aim, and that in order to

produce a real historic work (not archaeological), not only limited historic matter is to be repeated, which would not produce a new history, but a new matter is to be created, which really allows history to continue."

Again he says,— "It also seems necessary to me to place the different spheres, within which the feeling of an architect must necessarily be formed, distinctly opposite to each other, in order to enable him to survey at the same time the entire extent of his art. At first it is to be taken into consideration what our days require in their architectural undertakings. In doing so we at once commence to criticise the elements in these undertakings. We try to learn which are congenial to the spirit of the day, and which are not, and whether the undertakings of this kind are infringed by wrong views, prejudice, ignorance, want of fancy, and suspicion of new inventions suitable in assisting to remove and overcome difficulties connected with the undertaking."

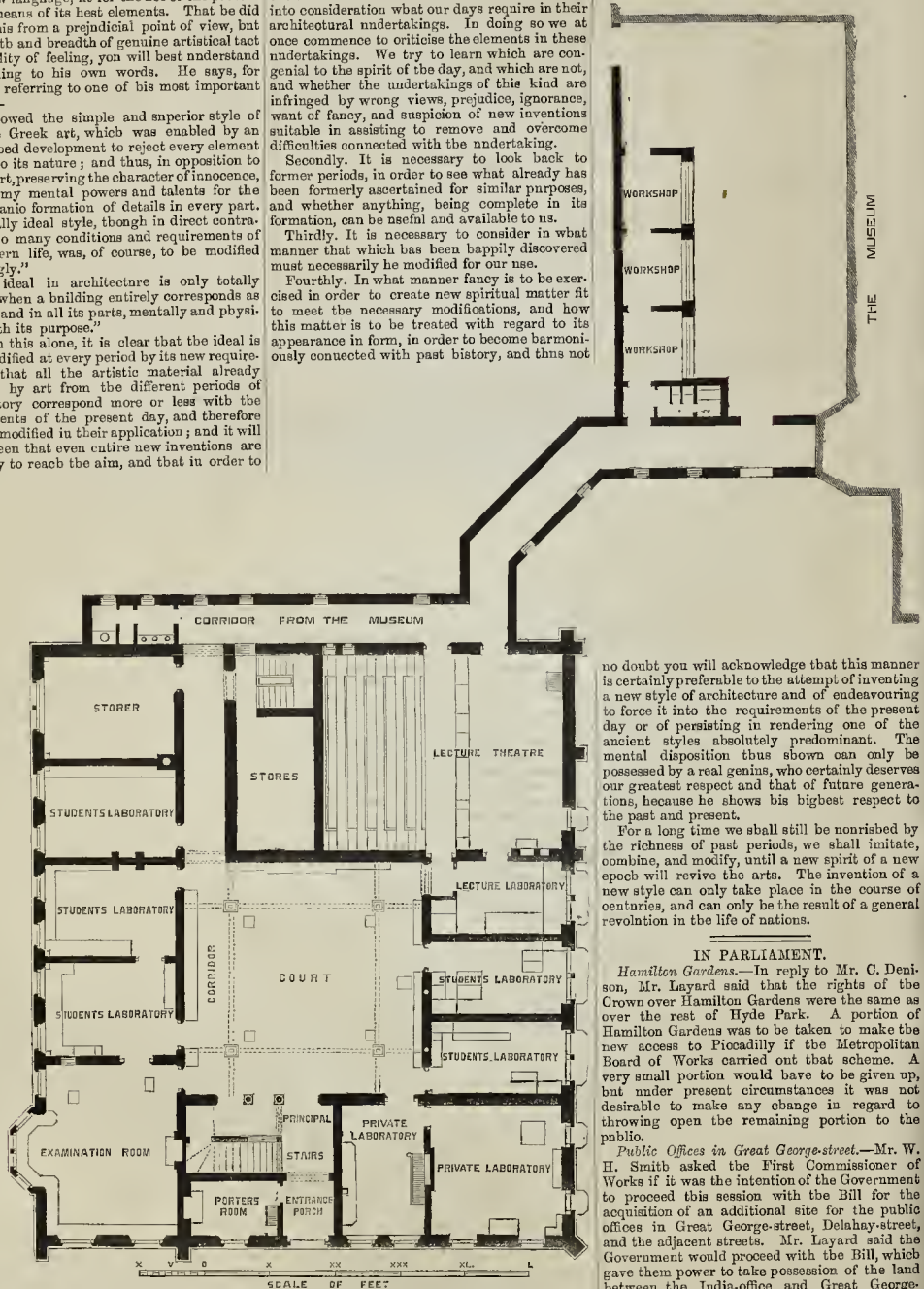
Secondly. It is necessary to look back to former periods, in order to see what already has been formerly ascertained for similar purposes, and whether anything, being complete in its formation, can be useful and available to us.

Thirdly. It is necessary to consider in what manner that which has been happily discovered must necessarily be modified for our use.

Fourthly. In what manner fancy is to be exercised in order to create new spiritual matter fit to meet the necessary modifications, and how this matter is to be treated with regard to its appearance in form, in order to become harmoniously connected with past history, and thus not

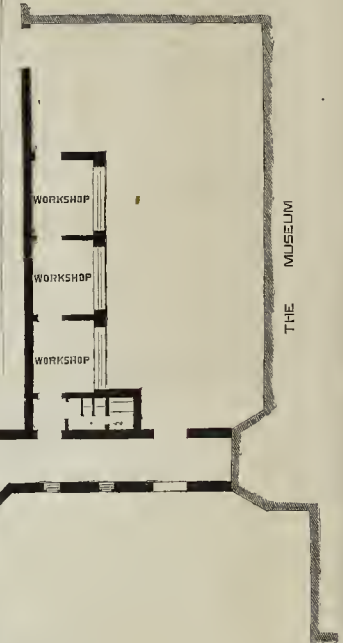
only preserve the style in the work, but much more, in a beautiful manner, combine the charm of novelty with the feelings of the style impressed upon the spectator. Thus a happy creation of the present day results, particularly enhanced in its charming effect by the acknowledgment of the primitive style."

In these remarks you will certainly see very delicate treatment of one of the most serious questions of art of the present day, and I have



THE CLARENDON LABORATORY, OXFORD.

Plan.



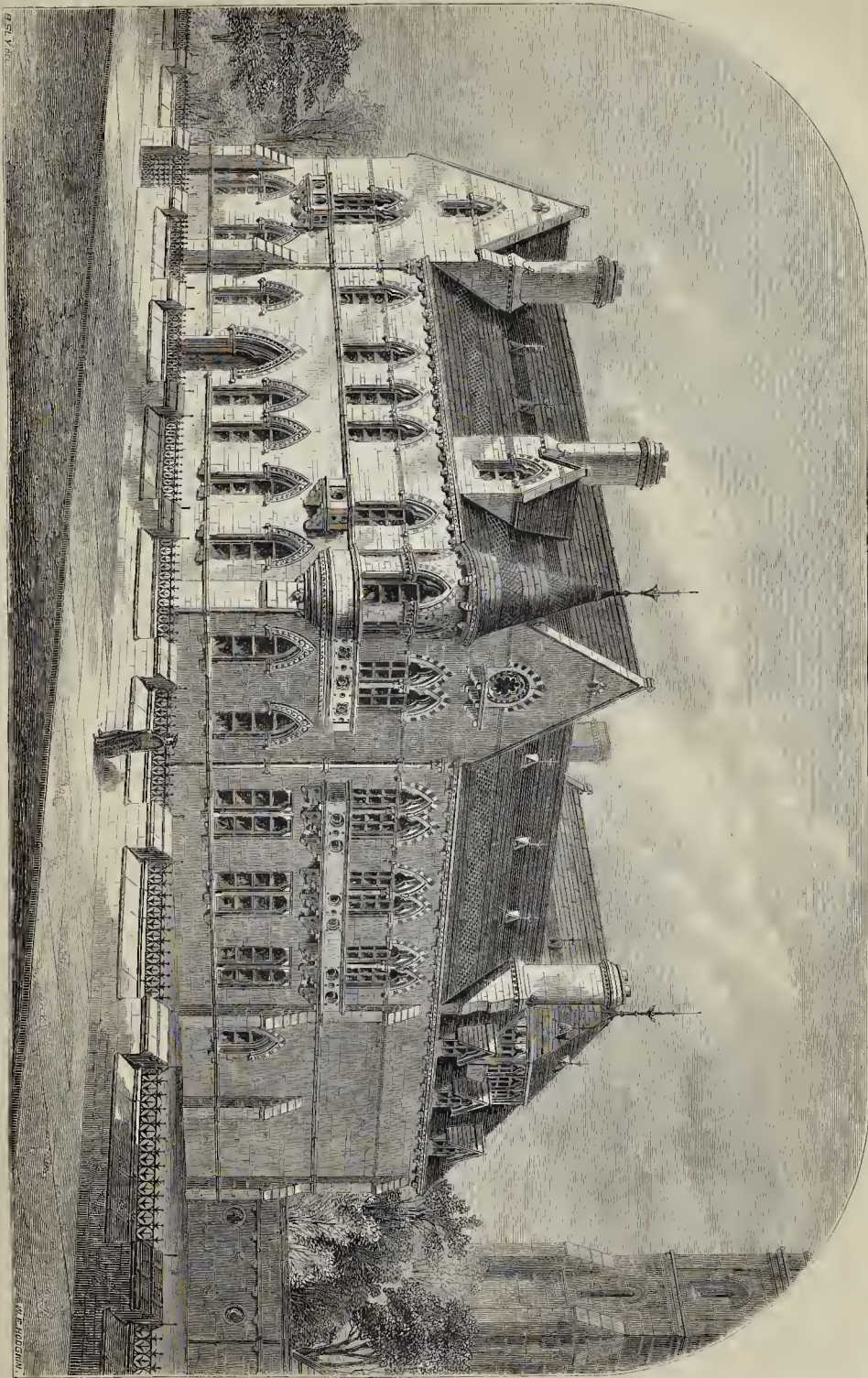
no doubt you will acknowledge that this manner is certainly preferable to the attempt of inventing a new style of architecture and of endeavouring to force it into the requirements of the present day or of persisting in rendering one of the ancient styles absolutely predominant. The mental disposition thus shown can only be possessed by a real genius, who certainly deserves our greatest respect and that of future generations, because he shows his biggest respect to the past and present.

For a long time we shall still be nourished by the richness of past periods, we shall imitate, combine, and modify, until a new spirit of a new epoch will revive the arts. The invention of a new style can only take place in the course of centuries, and can only be the result of a general revolution in the life of nations.

IN PARLIAMENT.

Hamilton Gardens.—In reply to Mr. C. Denison, Mr. Layard said that the rights of the Crown over Hamilton Gardens were the same as over the rest of Hyde Park. A portion of Hamilton Gardens was to be taken to make the new access to Piccadilly if the Metropolitan Board of Works carried out that scheme. A very small portion would have to be given up, but under present circumstances it was not desirable to make any change in regard to throwing open the remaining portion to the public.

Public Offices in Great George-street.—Mr. W. H. Smith asked the First Commissioner of Works if it was the intention of the Government to proceed this session with the Bill for the acquisition of an additional site for the public offices in Great George-street, Delahay-street, and the adjacent streets. Mr. Layard said the Government would proceed with the Bill, which gave them power to take possession of the land between the India-office and Great George-street. It was intended to exclude from the Bill certain houses in Great George-street, Delahay-street, and Duke-street, according to the deposited plan.



THE CLARENDON LABORATORY, OXFORD MUSEUM.—Mr. T. N. DEANE, ARCHITECT.

CLARENDON LABORATORY, OXFORD.

THE museum built at Oxford, under the direction of Messrs. Deane & Woodward, a few years ago, attracted, as our readers will remember, much attention, partly because of its architectural character, partly because of the battle which raged in the University between the New and the Old as to the introduction or exclusion of complete means of scientific education. It seems strange that already within ten years the fine accommodation requires extension. The department of physics, ably presided over by Professor Clifton, F.R.S., is to be wholly remodelled—indeed created. Mr. T. N. Deane, who also designed the new buildings at Christ Church, is the architect of the work. The funds were provided by the judicious wisdom of Mr. Gladstone, Lord Carnarvon, and Sir William Heathcote, trustees of a fund left by the great Lord Clarendon, and arising from the sale of his works. The fund had been long accumulating, and in consequence of the terms of the will the disposal of it came absolutely into the trustees' hands. Looking at the needs of national scientific education, they acted wisely in erecting the Clarendon Laboratory for the study of physics, the most precise and the most fundamental of the circle of natural sciences. The building is arranged to meet the requirements of the three courses into which the study of physics must be divided, viz., experimental lectures on the principles of the science, mathematical lectures on the physical theories, and practical study of experimental methods.

In the portion of the building to be used as the Laboratory, arrangements have been made for properly fixing the different instruments used in accurate experiments, the apparatus required for each branch of physics being placed in a separate room. A student wishing to use any instrument, will perform his experiments with the apparatus thus fixed, and will not move it to a place allotted to himself; in this respect a physical laboratory must differ from a chemical laboratory, as it is often impossible to move physical apparatus without causing great delay, and often injury to the instrument.

On the ground-floor, the theatre for experimental lectures occupies the east side, and is joined at the south end by a store-room, to be used also as a laboratory for preparing experiments for the lectures; joining this on the south side, are two rooms for spectrum analysis and radiant heat. At the south-west corner and half the west side, are the private laboratories of the professors, and the remainder of the west side is devoted to the entrance passage, the porter's room, and the staircase. At the north-west corner is the room for instruments used in weighing and measuring; and joining this, on the north side, are two rooms for heat, one room for static electricity, and a room for acoustics. On the first floor, on the south side, is a large room for the study of optics. At the south-west corner is the private room of the professor, and joining it, on the west side, the library and students' common room. At the north-west corner is a lecture-room for theoretical lectures, and on the north side are the rooms for dynamic electricity.

In the roof of the west side is a long gallery for optical experiments, and over the south end of the theatre are the photographic rooms.

The central space, which is open from the ground to the roof, and is surrounded by a gallery, is to be used for storing the apparatus which is not in use; and in it experiments, for which a considerable height is required, are to be performed.

The basement contains a room for the study of magnetism, store-rooms, and battery-rooms.

Some small workshops are attached to the main building, and a covered passage connects it with the museum.

The theatre will accommodate 150 students, and forty students can work simultaneously in the laboratories. The cost of the building will be about 10,300. The builder is Mr. Symm, of Oxford; the local superintendent, Mr. Bramwell.

OBITUARY.

THE Liverpool local papers recently announced the death of a lady whose talents may well call for a passing tribute in the pages of a journal devoted to art generally, and specially to art in connexion with architecture. The family to which she belonged was already known to those who take interest in art; and the names of Mr. Samuel Huggins, as a critical writer on archi-

lecture, and of Mr. Wm. Huggins, as an accomplished animal painter, will be familiar to many readers of the *Builder*. Their sister, Miss Sarah Huggins, whose sudden and unexpected death will have been a source of regret to all who knew her or her works, shared the artistic talents of her brothers, though not their reputation, except among a comparatively limited circle. Debarred by weak health and a retiring disposition from competing on equal terms with others in the race for distinction, she nevertheless followed her art as perseveringly and conscientiously as any of those more favoured and stronger labourers in the same field who work under the eye of a critical public. Miss Huggins turned her attention, in the first instance, to the depicting of flower and fruit subjects, in which she showed remarkable truthfulness of tone and colour, and extreme delicacy and finish in details: qualities which she afterwards carried to even greater excellence in her "still-life" compositions. She did not perhaps possess the dash of some of our better known water-colour artists, and which they turn to such account; but her truthful adherence to nature, and her exquisite colour and finish, rendered her works highly acceptable to those who would rather be pleased than astonished.

Her residence in Chester for some years, within reach of numerous subjects for picturesque architectural studies, led Miss Huggins to turn her attention to architecture; and such was her natural versatility of talent, that she succeeded at once, in this new walk of art, as completely as she had before succeeded in the totally different class of studies previously alluded to. Her interior views of Chester Cathedral, and of other buildings in and about Chester, and more recently also in the neighbourhood of Liverpool, exhibit a union of general effectiveness combined with the most accurate and finished representation of detail, such as is very seldom met with in drawings of this class, even by artists of much higher pretensions. Most particularly remarkable was her truthful representation of texture in the various material of a building; brick, timber, and stone, in all states of decay and weather-staining, being imitated with the utmost reality, yet without any undue or over-minute touching. Every one who has attempted the colouring of architectural interiors will understand the difficulty of accomplishing this.

Miss Huggins had exhibited pictures regularly for some years in Liverpool, and in most of the provincial exhibitions, and also occasionally in the Royal Academy Exhibition; which latter circumstance may be a sufficient guarantee of her talents with those who have no other means of judging. Some of her works had also found their way into the principal houses in the neighbourhood of Liverpool, but owing, as before observed, to ill-health and a reluctance to put herself forward, her talents were left to be mainly recognised by the generosity of her brother artists, from whom she enjoyed much sincere individual appreciation; and many distinguished artists might be named who were among the admirers of her works, and who held and expressed a high opinion of her powers. Indeed, all those who have seen her works, and who know anything of art, will feel that this short tribute to her memory is not undeserved or uncalled for; and it will not be thought out of place, in a journal like this, to call attention to the merits of one of that class of quiet, conscientious, and painstaking art-workers, whose labours are none the less genuine and worthy, though their praises are not in everybody's mouth; more especially when, as in the subject of the present remarks, talent and industry have been combined with a character and conduct exemplary in every relation of life.

H. H. STATHAM, Jun.

NOTE ON SCIENTIFIC ORIGIN OF ARTISTIC NOTIONS.

THERE are perhaps few things more striking to Englishmen in Roman Catholic countries than the frequent representation of the Crucifixion. Every church and place of worship has pictures or models; even the roadsides are adorned with effigies of the same subject.

In some parts of the Rhine valley this is particularly noticeable; a region luxuriating in madhouses, there these mournful signposts stand, at every turning of the road. There they stand of wood or plaster, gilded and plain, red and yellow, a warm flesh colour and ghastly, the

pure white bodies stained with huge, hot-looking red blood streaks; every freak of the artist's imagination leads him to devise some new horror. But the most frigid of all, the most exceedingly horrible, is one painted wholly in blue, *icy cold*. Even on a hot summer's day the impression is a lasting one; the fearful appearance of that blue Christ is not easily to be forgotten.

That colour has meaning is perhaps one of the simplest and most easily believed in of artistic propositions; and the expression of that meaning has for some time past developed itself into an art. It acknowledges that reds and yellows are warm tints, and that blue is a cold one. It is this one little undisputed law we would concern ourselves with just now. How can the rule be accounted for?

One of our most celebrated essayists, Blair, accounts for this and many other items in taste by supposing that at some primitive period individual taste of a majority assigned such meanings and such arbitrary rules, educated them, strengthened and confirmed them to posterity. To account for such laws,—for laws we admit them to be,—simply by perception and consciousness, is somewhat vague and unsatisfactory; and now that we are admitted more fully into the secrets of science, it is needless to build on so slight a foundation.

It is very gratifying to one's innate consciousness, however, that modern science fully confirms that which perception has already supposed. Newton's theory of the composition of the colour of bodies was the result of laborious experimenting, and his conclusion was that white light is not homogeneous, but formed of several lights unequally refrangible, which he called *simple* or *primitive* lights. It is owing to their difference in refrangibility that they become separated in traversing the prism.

On this theory, too, by a process called "diffusion," bodies decompose light by reflection, and their colour depends on their reflecting power for the different simple colours. Those which reflect all colours in the proportion in which they exist in the spectrum are white; those which reflect none are black. Between these two limits there are of course infinite tints, according to the greater or less extent to which bodies absorb some colours and reflect others. The red colour of a geranium is caused by its absorbing all the rays except the red, which are irregularly reflected in all directions.

Like the solutions of all the greatest problems in science, that belonging to our subject is exceedingly simple. Why is red called a warm colour? Why should a blue figure produce such a chilling effect? Science affords a clue to the mystery. These rays may have their respective heating powers tested, and it is found that the reds and yellows absolutely do possess the greatest amount of heat, and the blues the least. With a sensitive thermometer, the result will be striking. Where the blue ray mark will be but 58° Fahr., in the yellow it will have reached 62°, and a little beyond the red it will be 79°.

Some, among others Mellorie, have found the greatest heat in the yellow ray; but this seeming discrepancy is, in truth, none. An analysis of our sensations will show us that both red and yellow produce a sensation of warmth, the different states of our nerves corresponding to the difference in media through which the rays have been examined.

A scientific proof may be thus afforded,—a thing needed by many,—that our artistic notions are not founded upon the mere arbitrary whim of some leader among men, or upon the power of a majority to influence the education of impressions.

To this test must all our notions come. Will science substantiate them?

Even in this century of education and enlightenment there exist still a few whose rule of life is "I know what I like," and who look upon artistic laws and rules of art as creations of fanciful, and wretched conceited and egotistic, brains, and who delight in having things done "my way."

From these emanate that Icelandic Tartarus, a blue drawing-room; in this refrigerator style a study may still be seen in Kensington; and the old blue drawing-room of Hampton Court may still, though hut in pictures, freeze the spectator.

These matter-of-fact unsensitive men are, however, convincible by a thoroughly good scientific proof, and souls deaf to a discord and blind to the appeals of a sunbeam are still willing and able to stride up, to, and knock till they are opened, the wide, willing doors of scientific research.

S. S.

THE PRINCE CONSORT'S STATUE FOR
THE NATIONAL MEMORIAL.

SIR,—As the memorial in Hyde Park approaches completion, the guise in which we are to represent the figure of him to whom it is raised becomes a matter for serious consideration.

As no decision upon the subject has been arrived at, and no sculptor, so far as I am aware, been entrusted with the task of designing the statue of the Prince, I feel myself free to offer the following remarks upon the question, which have been suggested by the perusal of a brief pamphlet by Mr. Bell, of Kensington, who is now engaged upon one of the marble groups of sculpture to be placed at the base of the memorial, and an inspection of a model for a figure of the Prince designed by the same gentleman.

The central figure in the Hyde Park memorial whatever its design, must be viewed in two aspects, in relation to the Prince, as a good and fitting representation of him, and in relation to the edifice in which it is placed, as in harmony with the sentiment that pervades it, and in conformity with his leading architectural features. At the first blush only two attitudes of the figure suggest themselves as possible,—an erect and a sitting attitude. By the almost universal consent of all men whose opinions on the matter are worth listening to, the standing figure is deemed inadmissible,—not only because there would be a greater chance of failure in a standing than in a sitting figure, but also because the attitude would signify nothing in the Prince's bearing, person, or character, that a sitting posture would not signify equally well, while the latter would be more dignified than an erect attitude, and more in harmony with the style of building, the repose by which it is characterized, and the nature of the memorial.

But granting that of the two attitudes the sitting is preferable to the erect, yet, if we are desirous of something more than a mere facsimile effigy in marble, if we look for something that shall impress us with an idea, however feeble, of the virtue and goodness of the man whose virtue and goodness we would specially commemorate, will a sitting figure give us that something? I think not. Spiritualize the countenance as much as we will, we cannot, without the aid of some startling gesture, some striking facial expression (both in this instance inadmissible), cause a seated figure to represent anything more than a man seated. How is a figure in a sitting posture, whose features must evidence no strong emotion of the mind, but must, on the contrary, be cast in a mould of dignified and placid repose, to signify the possession of virtue or goodness in the man it represents, however correct it may be as a likeness? A man in the flesh cannot, by sitting in an attitude of dignified repose, impress a spectator with an adequate idea of his humility, his piety, his preference of virtue to vice, or his love of the fine arts, even when permitted a considerable play of the facial muscles; much less, then, a man in marble, who has no muscles to move.

And if a seated figure, such as I have described, would not satisfy us viewed as a representation of the good Prince whose memory we would perpetuate, neither, looking at it in relation to the edifice in which it is to be placed, would it fulfil the requirements, æsthetic and architectural, of the situation.

The general character of the memorial is ecclesiastical, or, more correctly perhaps, devotional. It points heavenwards; it is surmounted by the emblem of our faith: in the absence of the groups of sculpture symbolical of the four quarters of the globe and the various departments of art, science, and industry, we should not hesitate to pronounce it a funeral monument: as it is, we should prefer to call it a shrine. To accord, therefore, with the character of the edifice, the figure should be in some sort spiritualized. But how are we to spiritualize a sitting figure except by making an idol of it? Were we desirous of erecting an object of worship,—an idol,—we should fashion a seated figure, and raise a shrine over it. But while the memorial is designed to perpetuate the remembrance of the virtues of a good man, it is not raised to his glorification. The object we have in view is not to exalt the creature at the expense of God, but in all meekness and reverence to honour God through the creature.

Apart, however, from these considerations which probably will not have much weight with a numerous class of men who affect to despise what they would term the sentimental sculpture, there is a serious architectural objection to a

sitting figure. It would be too low. There would be so much space between the head of the figure and the canopy that the latter would be rendered unnecessarily heavy. It is true the figure might be elevated, but this could only be effected by raising the pedestal to a height out of proportion not only to the statue itself but also to the structure in which it is placed.

Again, in every building of a pyramidal form (and if we draw straight lines from the four corners of the base to the top of the cross, we shall enclose a pyramid) I believe it to be an admitted rule that all interior pyramids similarly formed by drawing lines from a conspicuous point in the central line or axis to other conspicuous points outside that line shall, if produced, have their bases either coincident with or wholly within the base of the exterior pyramid. Thus, taking the statue of the Prince as the most conspicuous object through which the central line or axis runs, if we draw straight lines from the head of the figure to the apex of each of the four secondary groups of sculpture immediately beneath it, and produce them in the same direction, they ought to fall within the area of the base of the exterior pyramid. With a standing figure they would fall within it, but with a sitting figure they would fall without it. If, therefore, the rule I have assumed to exist be good, a sitting figure is inadmissible, and I have shown that a standing figure would, for many reasons, be less satisfactory than a sitting figure; therefore, both attitudes, in my judgment, are excluded. What possible attitude then remains? I will leave Mr. Bell to tell us in his own words:—

"In this country, which too frequently elects that its memorials should be prosaic, it may appear a bold proposition to suggest that the statue of the Prince should kneel: and possibly were he still in life, some objection might be raised to it; but now that his good lies before us complete, it appears the only attitude that can fully express the sentiment of religious duty that informed his actions."

In the model of the kneeling figure designed by Mr. Bell, the Prince is represented as a Christian knight clad in armour. The surcoat bears the Royal arms quartered with his own, and over all the mantle of a Knight of the Garter falls in graceful folds. The head is bare, and inclined slightly forward, and the hands are crossed over the breast grasping a sword on the blade, on which is engraved the Prince's motto, *Treu and fast*.

The artist, in a short printed description of the figure, says:—

"The general form, as a mass, is symmetrical, and in all views the head is central; exactly so in the front and back views, and only slightly forward of the centre at the side views to the degree of inclination of the head, which I conceive is just. It is adapted to be looked at in all views, and from close beneath as well as from a distance."

The only question in my mind is whether viewed in front, even from a little distance, the figure would not have the appearance of being cut off at the knees, or just above them. Not to say that a capricious critic would be apt to liken the figure to that of brave Widdrington, of whom we are told that when his legs were both cut off he fought upon his stumps, it must be remembered that where an unusual attitude is adopted, the eye or the mind does not in fancy supply what is not actually visible, but, on the contrary, rather notes its absence. The knees of a man who is kneeling attract our attention more than any other part of his person, because we do not often in private life see a man in such an attitude; not so, however, with the feet of one who stands or sits. In the case of a sitting figure the feet are frequently hidden by drapery; at any rate, when from the position of the statue they are not immediately visible, we mentally supply the omission. However, to carry out the argument to its logical conclusion, custom, or use, the continued presence of the kneeling figure would do away with the novelty, and so remedy the defect, if defect it be.

Considered in relation to the edifice a kneeling figure would in every way be more suitable than a sitting figure. It would, in the first place, stand higher, and so lessen the space between the head of the figure and the canopy,—no unimportant matter, as we have shown on architectural grounds. Then it would accord better with the general design of the memorial, and be in greater harmony with the sentiment of the whole composition. Not that on this account we anticipate a more favourable reception for the proposition from the non-artistic public, since as a nation we do not understand sentiment either in architecture or sculpture. We fall in love with something glaringly unreal,

because it is pretty and catching, like Marochetti's *Cœur de Lion* in Old Palace Yard, or else we run mad after something positively ugly, because it is prosaically real like *Mign's Reading Girl*.

Were the present proposition carried into effect there would be plenty of people who would wish to be informed why the Prince should be represented as saying his prayers, or why so peace-loving a man should be clad in armour utterly ignoring the symbolism of the design, or really ignorant that the knight in armour kneeling, not necessarily in prayer, but in a devotional pose, is typical of the Christian who having fought the good fight against sin boldly and manfully before the world, kneels meekly and humbly before the God in whom he trusts to receive the reward of his piety and valour.

So much eulogy has been lavished upon the Prince, that many people are inclined now to run into the opposite extreme, and declare him to have been greatly overrated. They tell us that the high position he occupied placed him above the temptations to or which beset ordinary mortals, but forget that the very position which exempted him from some, exposed him to other and no less dangerous temptations. But he resisted them all. Instead of aspiring to the acquisition of political power, he was content to stand outside the arena of public life; and, although conscious that in genius and ability he need yield to none of the statesmen of the day, he never permitted himself to oppose, or even to interfere with, the counsels of the constitutional advisers of the sovereign. With every excuse afforded by the tradition of courts and the practice of princes for pursuing a contrary course, he led a pure, chaste, and blameless life, and, by his example and personal influence, materially aided the Queen in her determination to diffuse a more healthy atmosphere and a purer moral tone than had existed in previous reigns over those high circles of society of which she was the centre and their visible head. How effectual for good the personal influence of the Prince was, let the rapid deterioration in manners and morals among the upper classes since his death bear witness.

It cannot, therefore, be considered unfitting that a man who, resisting the temptations of the flesh and the world, practised an active Christianity in a situation where it is seldom more than professed, should be handed down to posterity in the National Memorial under the figure of a Christian knight. While, then, I agree with Mr. Bell, that his proposition is a novel one in the present state of art in this country, I cannot but commend his boldness in putting it forward. C. C.

COLUMBIA MARKET.

SIR,—I was induced by what I had read as to the beauty of the new market to go and see it on Saturday evening last. Curiosity, no doubt, had drawn a large number of persons there, mostly of the working classes, who perhaps intended also to obtain therefrom the Sunday's dinner. On entering, the first impression as to the general appearance was favourable, but disappointment as to the supply was soon felt. Mingling with the crowd, I could not help hearing frequent expressions such as "We can get better and cheaper at home." The butchers' shops, scattered on three sides, are not numerous, and the width of the colonnade is so narrow that the crowd made it anything but pleasant to stop to purchase. This of course will not always be so, though of a Saturday night inconvenience will be felt. One butcher's shop, which certainly had a very clean and respectable appearance, caused some jocosse bantering,—the beautiful-looking legs of mutton hung all round the interior were *dummes*—capital specimens of art!—but the good-tempered salesman outside met the jeers with which he was now and then assailed with astonishing equanimity as he endeavoured to obtain customers for his real provender. The best supply seemed to be in the vegetable market: good fresh broccoli were sold at from 2d. to 3d. each, and secured a large demand. The open spaces was occupied by the usual itinerant vendors of miscellaneous articles, shouting amid the occasional crack of the "shot for nuts," and making the place ring with the hubbub of a country fair.

The hall, grand as it may be in an architectural sense, has the appearance of a cathedral planted on one side. "What is the use of it?" some bystanders asked. Why spend so much

money on such an immense building, the interior of which is dwarfed by a few small shops cramped into the sides like so many porches? The polished granite columns, no doubt, are the admiration of everybody, and the vast expanse above seemed to add to the solemnity which such a building usually creates; at least, there was a feeling that the edifice had something of a sacred character about it which the Gothic arches and their inscriptions tended to confirm. By the bye, why should the mottoes and inscriptions be carved in such letters as but few can read? Surely in a place intended for the education of the unlettered, the plainest type should be employed, and not such as at best of times are a puzzle and an enigma? Contrast, for instance, the inscriptions over the entrance of the outside of the hall with those of the Market-house inn by its side. Two figures are supporting the mottoes—

The Sober The Vigilant	The Bitiful The Courteous
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in such letters that it is almost impossible to make them out. While I stood endeavouring to decipher them, two or three persons told me they had tried for several minutes to do so, but had failed. Now, having rubbed your eyes over this attempt, look on the left,—“The Market House: Combe & Co.’s Entire,” in plain bold gilt letters that everybody can read. It is quite a relief. (The House, by the bye, was crammed with customers, who thus demonstrated that the market contained a stimulant!) It almost looked as if the advice to “be sober” was sinking into the sight in the presence of such company. Even the “Lodgings for a Single Man” chalked on one of the upper windows of the inn by a domestic painter was understood with greater ease than the Gothic hieroglyphics of the scientific carvers. When the romance of the illuminating lamps is worn off, and the centre gas lamp is duly lighted, in conjunction with the present good supply of gas in the shops, business no doubt will be carried on with spirit, and the inhabitants find it advantageous to make their marketing there; but people will not go from home and their own neighbourhood without the inducement of a large, cheap, and good supply, better, perhaps, than they can elsewhere obtain.

ONE OF THE PEOPLE.

THE NATIONAL ARMOURY IN THE TOWER.

For some years, persistently and alone, we have set forth the unsatisfactory, not to say disreputable, condition of the national armoury in the Tower of London, and have called for the appointment of a competent person to bring it into proper order, and to maintain it in a state of efficiency worthy of the country, and in which artists and the public are entitled to find it. It gives us great satisfaction to be able to announce a step forward in the direction we have pointed out. Mr. J. R. Planché, Somerset Herald, has been appointed by the Government to arrange the collection. An order has been sent to the Tower that he is to have all assistance necessary, and he has already made a preliminary survey previously to reporting to the Government what he considers should be done. At present nothing is fixed as to a permanent appointment, but the authorities having now had their attention fairly roused, will scarcely fail to recognise the necessity of this step. With Mr. Planché for superintendent, and a proper use of the funds which the sight-seeing public and art-loving students furnish, and will, of course, supply to a greater amount than ever, we might hope soon to have one of the finest collections of arms and armour in the world.

THE TRADES MOVEMENT.

Lancaster.—A notice recently given by their employers by the operative stonemasons of Lancaster, requiring a reduction in the hours of labour, has come into operation. An interview between the parties took place, the result of which was, that the masters refused to accede to the demands of the men. The building trade of Lancaster was never known to be in a more flourishing condition than it has been of late.

Leeds.—In connexion with the dispute in Leeds, it would seem that there is a very general feeling of antagonism amongst the plumbers to the proposals of the masters, and especially as regards the hour system. There is, however,

no trade society in the town, and up to the present time no organized opposition has manifested itself. It is thought that they will be mainly influenced by the action taken by the masons and plasterers, and should these strike, or, as the men say, be locked out, the result will be, that building operations will be practically at a standstill.

York.—Apprehensions entertained that there would be a general strike among the operatives employed in the building trades here have not been realized; but although the masons as a body have resumed work, and stated that they are satisfied with the proposition of the employers to pay them 6½d. per hour in summer, and 7d. and 7½d. per hour in winter, which would raise the wages about 4d. per week in summer and 10d. per week in winter, amounting in the former period to 11. 10s. 4d., and in the latter to 11. 7s. 10d. The bricklayers, or at least those of them who were dissatisfied with 6½d. per hour in summer and 6½d. per hour in winter, have not so readily made up their minds. They have held two meetings with closed doors, but it is believed that they have arrived at no definite result. A number of the bricklayers, however, have no connexion with any association.

Sheffield.—Some time ago notices were given to the operative carpenters and joiners of this town, that after the 1st of May, the employers intended to introduce the hour system. Several deputations from the employers and the operatives have since met. At the first interview the employers submitted a new code of working rules, but these were rejected by a general meeting of the men, and a modified code was prepared, and laid before the deputation. The men stated that they were only authorised by the constituents to ascertain the requirements of the masters, and to report the result to a general meeting. On behalf of the employers it was stated that they were prepared to submit the matter to arbitration. The deputation reported the result of their conference to a meeting of about four hundred operatives. It was affirmed that the employers were not at one as to the hour system, and it was contended that no sufficient reason had been advanced for disturbing existing arrangements. After an animated discussion, it was resolved to reject the hour system altogether. With respect to arbitration, it was contended that, unless the employers were united no permanent advantage could result from that course, as it was believed a majority of the masters look with little favour upon the proposed change, being generally satisfied with the existing system. A resolution was subsequently adopted, requesting the men in each shop to appoint deputations to wait upon their employers, and the meeting was adjourned.

Bradford.—There is every probability now of a lock-out in the building trade at Bradford, the operative stonemasons having refused to confirm the agreement which their deputation had come to with the deputation of their masters in so far as that agreement relates to payment by the hour and the employment of machine-worked stone; and the meeting of masters resolved to publish the whole of their correspondence, and to fall back upon their original notice, expiring on the 3rd of May, though still willing to refer the dispute to an arbitrator, and to abide by his decision. The lock-out has since taken place.

Miscellaneous.—There are partial strikes or lock-outs of masons at Bolton and Wolverhampton. The strike among the Huddersfield masons has been averted.

Darlington.—The wages question in the North of England iron trade has been under consideration by a Court of Conciliation and Arbitration, with Mr. Rupert Kettle as arbitrator. It is understood that a compromise had been offered on both sides, which has resulted in some advance of wages. The proceedings were private.

PROPOSED INQUIRY FOR IMPROVING THE INSTITUTE.

THE annual meeting on Monday night was pleased to grant me a special general meeting, at which to offer the proposal that a committee be appointed to inquire into the operations of the Institute generally, and to suggest measures for increasing its efficiency. Owing to want of time, all I was able to explain was that as the Institute has now existed for nearly forty years, without any considerable modification of its original system, it might be thought only reasonable to expect that various improvements, chiefly per-

haps of detail, would, on inquiry, be found desirable, in order more completely to adapt its operations to the advanced and still rapidly advancing condition of professional affairs. I was very glad to find the proposition not only cheerfully entertained, but I may say universally and hopefully approved. What I beg you to permit me now to say is that I should be happy to receive from members and friends of the Institute, the profession, and the art, such opinions as they may think fit to entrust to me, in order that I may prepare myself to introduce the formal motion for the appointment of the committee with as wide a knowledge as possible of what is really floating in people’s minds. With its large and influential membership, its high public character, and its established financial prosperity, I cannot help thinking the Institute of Architects might do a great deal of useful work; and any suggestions to this end, if addressed to me in writing, I shall be very glad to consider.

ROBERT KEEL.

22, Old Burlington-street.

LAMBETH INFIRMARY COMPETITION.

WE understand that the Board of Guardians have adopted Mr. Hunt’s award in the above, giving the first premium to Mr. Wilson, the second to Messrs. Stenning & Lepard, and the third to Messrs. R. E. Tyler & Chester Foulsham.

THE GREAT BELL OF MOSCOW; OR, TZAR KOLOKOL.

ACCORDING to the best authorities, the present “Tzar Kolokol,” or King of Bells, was made in 1733-4, and subsequently suspended over the spot where it was cast, at no great height from the surface of the ground. It hung by immense beams and cross beams, and was covered by a wooden edifice, which having caught fire in 1737, the bell became hot, and doubtless was cracked in consequence of cold water being then thrown upon it in order to extinguish the fire.* It fell to the ground, and a large fragment about 6 ft. in height, was broken out of it. There it lay for many years; but in 1837 the Emperor Nicholas caused it to be removed, with the broken fragment, and placed upon a noble pedestal of granite, standing near to the tower of Ivan Veliki, where it is now to be seen, being surmounted by a hall and cross.

With respect to the dimensions and weight of this “mountain of metal”—which would make about a dozen “Big Bens,”—instead of filling several columns with the loose and conflicting statements of various writers, I will give an extract from Lyall’s “Character of the Russians, and detailed History of Moscow,” London, 1823:—

“The different methods employed in taking the measurements account in part for the variation of the statements of different authors.”

* According to the scale of the plate and accompanying section, copied from those of the emperor, the diameter at the mouth of the great bell is 21 feet 8 inches; consequently its circumference must be 65 feet, or 21 yards and 2 feet; its height, not including the top, through which the beams pass for its suspension, is 17 feet.”

Dr. Lyall also tells us that Mr. Murray, the engineer, examined the bell with the most scrupulous attention in 1817, by desire of Mr. Wilson, of Alexandrovskii; and that

“Mr. Wilson himself copied the inscriptions, which I have verified, and which, when compared with those on the same sheet with the drawing executed for the emperor, were found to correspond, notwithstanding that a few words on the bell were almost illegible.”

The following are the inscriptions on the bell, as translated in the work above mentioned:—

“By order of the blessed and eternally worthy of memory Great God, Tsar, and Great Duke, Alexei Nicholavitch, Autocrat of all Great, Little, and White Russia, this great bell was cast, for the chief cathedral, dedicated to the honorable and famous Assumption of the most holy Mother of God, containing eight thousand pounds of copper [and tin], in the year 7188 from the creation of the world, and from the birth by the flesh of God the Word 1654. It began to announce divine service in the year 7167 from the creation of the world, and in the year 1701 [1700] from the birth of Our Lord; in which year, on the 19th June, in consequence of a great fire which happened in the Kremlin, it was damaged.”

“Till the year 7239 from the beginning of the world, and the year 1751 from the birth into the world of Christ, it remained mute.”

* Four of the peal of bells at Oundle Church were cracked under somewhat similar circumstances in August, 1838.

"By order of the most pious, most potent, and great Gosudarina, the Empress Anna Ivanovna, Autocratess of All Russia, in glory of God, in the acknowledged Trinity, and in honour of the most holy Mother of God, this bell was cast for the chief cathedral of her famous assumption, from the eight thousand poods of copper [and tin] of the former bell that was destroyed by fire, with the addition of two thousand poods of copper [and tin], in the year 7242 from the creation of the world, and in the year of our Lord 1734, in the 4th year of her most prosperous reign."

Dr. Lyall then goes on to say:—

"Contrary to the reports of innumerable writers, Russian, German, French, English, &c., that the great bell contains 12,000 poods, or 450,000 Russian pounds of copper [and tin], or a sum equal, nearly equal, or superior to that in German, French, or English weight, we have the most positive evidence from the second inscription that this mountain of metal only contains 10,000 poods, equal to 400,000 Russian pounds, or to 360,000 English pounds" [or, 160 tons 14 cwt. 1 gr. 4 lb.].

Before concluding, I should state that this monarch of bells was cast by Michael Monterino; and it has been so often misrepresented and caricatured in pictorial works, that I may add it is remarkable for beauty of form and just proportions.

The bell is also variously ornamented. On one side is represented the Tzar Alexoi Michaelovitch, above him the Saviour; on the right of the Saviour the Virgin Mary, and on the left John the Baptist. On the other side of the bell is a figure of the Empress Anna Ivanovna in imperial robes, and a figure above it of the Saviour, with the Apostle St. Peter on the right, and the prophetess Ann on the left, besides numerous seraphims and other ornaments.

As I have said, the diameter at the mouth of the great bell, according to the scale of the plate in Lyall's work, is 21 ft. 8 in.; its height being 17 ft. And it is worth noting, that this statement agrees with certain measurements of the bell made in 1868-9.

THOMAS WALESBY.

PATENTEES.

Sir,—I beg to suggest to the notice of yourself, and, with your permission, and aid, to your readers, the advantages to be derived from a combination of patent and other mechanical appliances. Favourable and just to inventors as the security of patent-right is, it frequently occurs that the success of inventors is to give the public a multiplicity of useful articles applicable to one purpose, all of equal merit and service, whereby the most benefit is not given to the inventors or the public, as it would be were inventors to agree to supersede their individual patented articles by a combined invention, enjoying the several excellences of each patent.

The national and international exhibitions have most probably stimulated inventors to a great degree of merit; but in these days of close competition, and in some measure depression, our manufacturers suffer. I beg to hope my hint may be of service in leading our patent inventors or others of merit to endeavour to excel even their own individual excellences by a combination of merit; as surely thereby will the certainty of success be theirs, and the most pleasure arise to the public, who have not always convenience or inclination to purchase every article they admire of a number of desirable articles of various recommendatory purports.

Against foreign competitors excelling our inventive genius this unity would be a bar, and thereby our manufacturing interests be protected in whatever branch of art they are applied, as in iron, steel, and other metal workings; silk, flax, cotton, or other fabrics, &c.

As the origin of most patented articles or manufactures is from a consultation of artistic minds or a consideration of improvement of some already-introduced appliances, we have to suit a purpose, which inventors seek to render more serviceable to the public by some novel advantages, as the unity of patent excellences must tend at all times or agree to give most success and satisfaction to all concerned, and therefore is, I beg to consider, worthy the notice of the public.

UNITY WITH EXCELLENCE.

PROPOSED REGISTRATION OFFICE FOR WORKMEN.

Sir,—I quite concur with your recent correspondent, that there is great need for such an office as he suggests, which would give the opportunity to many men like myself of selling their ability in the best market, but who often row ball in the attempt for want of the first introduction. Likewise it would be the means of inspiring workmen to more energy to make themselves capable to be placed upon the books, with a better hope of a real chance than he has now under the present system of selection of foremen. Hoping I shall soon see such an establishment formed, which, if carried out as suggested, I have no doubt would work beneficially.—I am, &c.

A JOURNEMAN CARPENTER.

VERMILION.

As you have more than one published suggestion of zinc respecting pigments, colour, and colouring, I venture to ask you to submit to the consideration of chemists and colour-makers what, I think, may prove a solution of the question why so few manufacturers (perhaps only one) can produce vermilion of the utmost splendour of which it is (viz., sulphuretted mercury) is susceptible.

A friend of mine, a consulting commercial chemist, tells me that a manufacturer lately applied to him with a sample of his best vermilion, which, when seen alone, my friend pronounced "first-rate;" but when placed by the side of

a sample from another maker it became "bridg-dust" in comparison. My friend, the chemist, confessed himself non-plussed; and both he and his client came to the conclusion that the difference must be the result of some mystery of manipulation.

The suggestion I made seemed to me so obvious that I was surprised to find that the thought had never occurred to either party. I asked, "What sort of quicksilver do these vermilion-makers use?" The answer compels me to conclude that they use it "neat as imported;" if so, it is quite clear that they do not know what they use; they cannot tell what amount of lead (sulphuret of lead is as black as soot), zinc, tin, bismuth, &c., enters into a compound which (for the sake of colour) ought to contain no atom of anything but pure mercury and pure sulphur. To insure this purity as far as possible, the mercury must be distilled, and the sulphur "sublimed" (volatilized) at the lowest available temperature. Moreover, I would venture to suggest that it might be possible and desirable to bring about the combination of the mercury with the sulphur whilst both are in a state of vapour. J. H. M.

PROVINCIAL NEWS.

Chattercoats.—A new hotel is about to be erected at this marine village on the north-eastern coast. It will be in the centre of the bay, and have a fine sea view. Mr. Thomas Oliver is the architect.

STAINED GLASS.

Edenham Church, Bourn (Lincolnshire).—About eighteen months since three stained-glass windows were erected in the north aisle of this church, to the memory of the late Lord and Lady Willoughby de Eresby, by subscription of the tenantry and friends. Another window has just been erected as a memorial of a former incumbent and his daughter. It is a three-light window, with tracery of the Perpendicular period of architecture, and is the easternmost window of the south aisle. The subject represented is the Resurrection of our Lord, which extends over the three lower openings. The centre is occupied by Our Saviour rising from the Tomb; the angel, which is in the dexter opening, having rolled away the stone, is seated upon it in the act of adoration. In the sinister opening are shown the figures of Mary Magdalene, Joanna and Mary the Mother of Jesus. In the foreground are represented the Roman Guard, some asleep, others, in confusion and alarm, making their escape. A text is placed at the bottom of the window, "I am the resurrection and the life; he that believeth in me, though he were dead, yet shall he live." The group is surmounted by passion-dower enrichment. In the tracery are angels, &c. The windows were designed and executed by Messrs. Baillie & Mayer, of London.

Wellington Church.—A new memorial tower window has been put up in this church. The subject is the Birth of our Lord. The individual to whose memory it is dedicated by one of his surviving relatives, having in his lifetime adorned the eastern apse with a representation of the Crucifixion, it was thought that the western end would be most appropriately occupied with the corresponding design of the Nativity. The type of the edifice being of the character so commonly met with in the Georgian period of architecture, precluded a Gothic treatment of the incident; but the window being of a large space, good scope was afforded to the artist for pictorial effect. The main object in the group—the Infant Saviour—is represented lying in the manger with outstretched arms, symbolical of His entrance of the world. At His right side the Virgin Mother kneels in adoration, and at His left Joseph is seated. In the background, through the stable, are shown the peasant cottages, the watching shepherds, and the angels announcing the glad tidings; and above the roof of the stable, a company of heavenly messengers bear a scroll with the sentence of rejoicing,—"Glory to God in the highest." Surrounding the scenery is a border of ornamentation, composed of the stem, leaf, and flower of the Lily, upon a ground of deep ruby; the whole being inclosed by a mosaic framework. The work is seen with the disadvantage of a feeble light borrowed from the small window on the western side of the tower. The artists were the Messrs. O'Connor, of London.

Wakefield Parish Church.—The window in the tower of All Saints, Wakefield, has lately been filled with painted glass, in memory of the late Mr. Thomas Bolton, at the expense of his son, also lately deceased. It has been executed by Messrs. Hardmans, of Birmingham. The subject is the "Day of Judgment," and is divided into three portions: first, the coming of our Lord in glory attended by saints and angels; second, the dead summoned from their graves, and rising

to meet Him; third, angels in heaven worshipping. The lower portion of the window represents the summoning of souls to judgment.

St. James's, Boroughbridge.—A memorial stained-glass window has been placed in this church. The design, which has been executed by Messrs. Hughes & Ward, of London, is founded on Simeon receiving the infant Saviour in the Temple.

CHURCH-BUILDING NEWS.

Arthuret (Cumberland).—The ancient church here has been renovated, chiefly at the cost of the Graham family. The edifice, both externally and internally, has undergone a thorough renewal, although its form, with one slight exception, is unaltered. The tower, except as regards the doorway in it, has not been touched, the principal portion of the external improvements having been made at the east end. Originally the roof of the chancel was flat, and somewhat lower than that of the nave. It has now been raised so that the whole of the roof from the tower to the end of the chancel is of the same height. The old east window has been restored, and the gable surmounted by a cross. The other external alterations require little notice, being merely renovations of the old walls. In the interior, however, everything is changed, the whole of the arrangements having been altered. The old flat plaster ceiling has been removed from the roof, and succeeded by an open roof of oak. The floor, except in the centre aisle, has been hoarded. The pillars and arches, which were previously covered with plaster, have been stripped of their covering and cleaned. In order to increase the number of sittings, the centre aisle has been made narrower by elongating the seats, which have been converted from square pews into open benches. The western and chief doorway has been enlarged. On the north side of the chancel a Gothic oak screen has been erected in front of the pews appropriated to the use of the Graham family. On the south side is a small vestry. The chief feature of the chancel, and, indeed, of the church, is the window erected in memory of Sir James Graham. It is 18 ft. in height, and 14 ft. in breadth. It contains six lights, all filled with stained glass. In the lower panels are representations of the twelve apostles, accompanied by the different symbols which distinguish them. Above the apostles, six other panels are filled with figures of angels, each carrying in her hand a harp or trumpet. Above these, again, the interstices caused by the transverse shafts of the window are filled up with the symbols of the four evangelists; and the whole is surmounted by an argent dove with outstretched wings, in a circular panel. The border round the figures is of a floral design, coloured with a deeper tint than the figures. The building has been renovated under the superintendance of Mr. D. Birkett, of Carlisle, architect, the window being from the establishment of Messrs. John Scott & Son, of Carlisle.

Ewhurst.—The parish church has been for the last few weeks in the hands of Mr. Wm. Vaughan, of Maidstone, huilder, who has undertaken the contract for its restoration, and is proceeding with it, under the direction of Mr. Robert Wheeler, of Tanbridge Wells, architect. The building has for many years been in a very dilapidated state, and at last was considered almost dangerous.

Hailey.—The village church of Hailey, which has been entirely rebuilt, has now been consecrated. The new church stands in a portion of the field in front of the vicarage, one side of the churchyard adjoining the road through the village. The style is of the thirteenth century. Hailey-stone facings are used both inside and out. The roof is of Baltic timber, unstained and unvarnished. Milton freestone is used both inside and out. The whole of the church is laid with tiling, and the arrangement of the edifice provides a heating-vent, chancel (with accommodation and fitting for a surplised choir), nave, south porch, north aisle, and vestry at the west end of the aisle. The church is seated throughout with rush-bottom chairs, with a kneeler to each chair, and will accommodate about 240, including the choir. A dwarf stone wall separates the chancel from the nave. The altar, of English oak, is approached by a flight of seven steps. It is symbolically framed in English oak, and the slab is incised with five crosses. The reredos is built into the east wall of the chancel, and contains a super-altar of red Mansfield stone. The upper portion of the reredos is divided into three com-

partments containing frescoes of the Three Persons of the Trinity. The three-light east window has been filled with stained glass to the memory of the Rev. J. Hyde, a former vicar of Hailey. The principal feature of the centre light is the Crucifixion, and those in the side lights are the figures of our Saviour as the Good Shepherd, and as celebrant initiating the Eucharist. The sides of the east wall at the veresole are lined with encaustic tiles. The side lights of the chancel are partially filled with stained glass. No clerk of works has been employed. The builder was Mr. A. Grove, and the architect Mr. Clapton C. Rolfe. The total cost of the building is about 2,000l.

Miscellaneous.

Professor Huxley on Physical Science in Education.—At a recent annual dinner of the Liverpool Philomatic Society, Professor Huxley spoke on the subject of the introduction of scientific training into the general education of the country. Upon no subject has the public mind been more educated, he was happy to say, than upon this particular topic of the introduction of science into education; and physical science was already recognised as a part of the curriculum at Harrow and Rugby, and some of our great schools, while ample preparations were being made for its introduction at Eton and elsewhere. He would ask any one present who had chanced to take the profession of an engineer how much time he had lost because when he had left school he had had to take to pursuits which were absolutely novel and strange to him. In the interests of mankind and of fair play, why would not the clergy get some little tincture of physical science, and put themselves into a position to understand the difficulties which were forced upon the mind of every thoughtful and intelligent man? The professor, in concluding, said he hoped the time would come when it would not be regarded as a blasphemous proposition that there should be opened in every parish in this country Sunday schools for science. That might be supplemented by a series of Sunday evening discourses upon secular matters, and upon topics which would enlighten them, and enable them to bear better the toil of daily life.

The National Education League.—This League has been started in Birmingham, with the concurrence of educational reformers in various parts of the country, and has already made rapid progress. The object of the League is to establish a system which shall secure the education of every child in England and Wales. The means by which this object is to be attained are stated in a circular issued by the provisional committee of the League. When a sufficient number of persons have joined, it is proposed to call a general meeting in Birmingham, to nominate a governing council, and to form branches throughout the kingdom. The general meeting will probably be held early in the autumn; and in the mean time communications may be made to Mr. George Dixon, M.P., Broad-street, Birmingham, chairman of the provisional committee. The members already include several hundred gentlemen known as promoters of education, and fresh accessions are being daily received. The name of twenty members of the House of Commons are already upon the list, and we observe those of Mr. T. Hughes and Mr. Mundella among them.

The late Mr. Frederick Hering, Architect.—We mention with great regret the decease of this gentleman, which took place at his residence in Argyll-street, Regent-street, on the 2nd inst. Mr. Hering, who belonged to a family of artists, was an accomplished and amiable man, but seems to have obtained few opportunities to distinguish himself in his profession. The elaborate shop-front at the corner of the Quadrant and Regent's-circus, which he designed for Messrs. Swan & Edgar, some years ago, was described in our pages at the time. Mr. Hering was in his 70th year when he died.

A New Exhibition.—So large a number of pictures have been rejected by the Academy on the present occasion, many of them admittedly excellent, that a committee has been formed to arrange, if practicable, a supplementary exhibition. Whether they will succeed in their endeavours is not yet quite certain.

Clubhouse in Birmingham.—The first building erected in this town solely for the purposes of a clubhouse has been opened. The edifice is at the top of Newhall-street, in the centre and the highest part of the town; it is within a few yards of the Bank of England and all the other banking houses. The style of architecture is Italian, with elaborate detail and carving. The fronts are to two streets, are two stories in height, and are of stone, from the Pilling quarries, Derbyshire, with a balustrade protecting the basement area; the ground-floor is rusticated, and has square-headed windows, with boldly-carved keystones and recessed pilasters in the reveals. The entrance, which is in Colmore-row, opposite to Bennett's-hill, has four massive columns with rich Corinthian capitals; the first-floor windows have balconies in front; the windows are circular-headed, with pilasters, consoles, cornices, and pediments, with carved keystones to the arches, and pendants, and other parts; these are of varied design, the triple windows being still further enriched, to make them as salient points in the elevation; above them is a carved frieze of foliage with shields, charged with armorial bearings, including that of Mr. Colmore, of Cheltenham, who is the ground landlord. The cornice surmounts the frieze, and the whole structure is finished with a balustrade and pedestals bearing vases. On the ground-floor there is an entrance-hall leading to a corridor, out of which open a dining-room 41 ft. by 21 ft., the morning-room, 60 ft. by 21 ft., luncheon-room, &c.; the two first-named rooms have richly panelled ceilings and details in character with the principal part of the work. The great staircase is divided into three compartments by stone columns, and lighted by triplet windows of large size. The first-floor, which has a corridor extending the whole length of the building, leads to a drawing-room, library, billiard-room, &c. The cost is about 16,000l. The architect is Mr. Yeoville Thomson, of Birmingham.

Northern Architectural Association.—At the quarterly meeting of this association, held under the presidency of Mr. Watson, the committee which had been named to report on the articles of association of the Glasgow Institute of Architects, expressed their opinion that however useful the same might prove to their Scottish brethren, they would not materially improve the condition of that association; besides, a large expense would be incurred by the adoption of the Act. The committee recommended that the members of the Northern Architectural Association should not apply for incorporation. Mr. Charlton moved that the report should be adopted, which was seconded and carried. With regard to the Architectural Alliance letter, on the scheme for the education of pupils, the committee were of opinion that it would be desirable, before sending answers to the various questions proposed, that the association should consider the same *seriatim*, and that a statement should be forwarded by the secretary. The report was received, and the discussion was adjourned.

Civil and Mechanical Engineers' Society.—The gentlemen of this association made their second visit to works this session on Saturday last, when they visited the new Blackfriars Bridge, which is shortly to be opened for public traffic, permission being granted to them by Mr. Cabitt, the engineer. Mr. F. W. Bryant, the resident engineer, escorted the members over the works. Afterwards the society's members inspected the Blackfriars section of the Thames Embankment, by permission of Mr. Bazalgette. This Saturday the members, by permission of the architect, will visit the new Royal Italian Opera now being built in the Hay-market.

The Munich International Exhibition.—Endeavours are being made to obtain from England architectural designs, models, and appliances; but it is to be feared almost too late, as the exhibition is to open at the beginning of July next. The special committee for this department consists of Messrs. R. Gottgetreu, k. Professor; Hügel, Banrath; E. Lange, k. Professor; G. F. Seidel, k. Baubeamter; and Zenetti, Stadt-Banrath.

Concrete Buildings.—Mr. D. Osborn, of Great Berkhamstead, has erected several Portland cement concrete buildings in that locality. At Rickmansworth Lord Ebury has employed Mr. Osborn to erect buildings with this material.

New Lunatic Asylum for Lancashire.—At Preston a special meeting of the magistrates of Lancashire has been held to consider the propriety of erecting another lunatic asylum for the county. It was stated that authority had been obtained by the General Finance Committee to purchase a site in Whittingham, near Preston, and that one of the instructions of the committee was that the asylum should accommodate 1,000 patients. The cost would be 20,000l. It was resolved that a committee be appointed to provide an additional asylum, and that 20,000l. be borrowed on the county rates for the purpose.

Progress of Invention.—It appears from a Parliamentary return that 3,991 patents were applied for in 1868, and up to the 11th of March last 1,715 of the applications had been granted. The total number for 1868 cannot be known until the 30th of June, owing to the six months allowed patentees (from the dates of their several applications) in which to have their patents sealed and to file their final specifications. The return shows the progress of invention. It begins with 1650, when no patent was granted. Just a century later, in 1750, there were only 7; in 1850 there were 523; and in 1867, 2,292.

The Fine Art Copyright Consolidation and Amendment Bill.—On the motion of Lord Westbury in the House of Lords, this Bill has been read a second time and referred to a select committee. His lordship pointed out that while there was protection for the author's life and 25 years afterwards in Spain; 30 years afterwards in Germany; and 50 years afterwards in France; protection was only accorded in England for 28 years altogether in one class of artistic works, and for 7 years altogether in another class. The new Bill granted protection for the author's life and 30 years afterwards, with certain exceptions. The Earl of Kimberley appeared to think that, as one of the public, he had a right to reap the fruits of an artist's brain, after his death at all events, if not before; although his lordship certainly could not lay hold of the pecuniary fruits of their industry or talent in a similar way.

Science and Art Classes for Ely and Cambridge.—A movement is in progress for the establishment of classes in elementary science and drawing at Ely, in connexion with the Science and Art Department at South Kensington. Some time ago it was proposed to establish similar classes in Cambridge. The project fell through; but it is possible a fresh attempt will be made under more favourable circumstances to bring this really important subject before the attention of the University and town. Professor Kingsley, in his address to the Cambridge School of Art at the late distribution of prizes, pointedly referred to the matter, and the archdeacon of Ely, and others then present, suggested that the new classes proposed might be carried on in connexion with the Cambridge School of Art.

Printers' Almshouses.—We understand that the required sum for erecting the celebration wing to these almshouses has been received or promised, with the exception of about 200l. It is to be hoped that this comparatively small amount will soon be subscribed, and promises realised, to enable the council to appoint a building committee to carry out immediately this much desired object. Subscriptions are received by the treasurer, Mr. W. Clowes, Duke-street, Stamford-street; or by the collector, Mr. C. Pope, 14, Derby-street, Argyle-square, W.C.

University of Glasgow.—Session 1868-9. Certificates of proficiency in engineering science (Mr. Macquorn Rankine, professor) have been granted to Messrs. Anthony S. Bower, C.E., St. Neots, Hunts; Walter Deed, C.E., Colchester; James J. Galloway, C.E., Paisley; James Gilchrist, jun., C.E., Garnkirk; Alexander Malcolm, C.E., Balfron; Robert McFalls Melliss, jun., C.E., Glasgow; George D. Neill, C.E., Greenock; and John Russell, C.E., Glasgow.

Fever.—Amongst the Liverpool detectives fever seems to prevail. Two of them have died of it on one and the same day, and at that time two or three others were prostrated by it. At Tickhill, Doncaster, fever is prevalent in an epidemic form. The Doncaster Board of Guardians have had a discussion on the subject, and have written to the local authorities at Tickhill drawing their serious attention to it. In consequence of the discussion it was stated that defective drainage and contamination of wells were the cause.

The Drainage of Frankfort-on-the-Maine.—Mr. Gordon, late surveyor of Carlisle, who a few years ago left Carlisle for Frankfort-on-the-Maine, having been appointed principal resident engineer to the Board of Works at that place, is at present engaged in carrying out an extensive system of sewerage in that town. The editor of the *Carlisle Journal* has obtained an estimate of the work and the cost of it, from which he gathers that the total length of new sewers is nearly fifty-six English miles, and is estimated to cost 282,103*l.* The secondary division comprises extensions or additions, and improvements to existing sewerage works, and the length is fourteen English miles and a half, and will cost according to estimate 49,103*l.* The grand total length of the whole sewerage is about seventy miles, and will cost, on the whole, 331,211*l.* Mr. Gordon has been invited by Prince Ludwig to visit Darmstadt, for the purpose of inspecting the drainage of the palace, with a view to advising as to its improvement.

A Weekly Return of Work in Birmingham.—A week's work in Birmingham in its aggregate results is something wonderful. According to the *Engineer*, it comprises the fabrication of fourteen millions of pens, six thousand bedsteads, seven thousand guns, three hundred millions of cut nails, one hundred millions of buttons, one thousand saddles, five millions of copper or bronze coins, twenty thousand pairs of spectacles, six tons of papier-mâché ware, 30,000*l.* worth of jewellery, four thousand miles of iron and steel wire, ten tons of pins, five tons of hairpins, hooks and eyes, and eyelets, one hundred and thirty thousand gross of wood screws, five hundred tons of nuts, screw-bolts, spikes, and rivets, fifty tons of wrought-iron binges, three hundred and fifty miles length of wax for vestas, forty tons of refined metal, forty tons of German silver, one thousand dozens of fenders, three thousand five hundred bellows, a thousand roasting-jacks, one hundred and fifty sewing-machines, eight hundred tons of brass and copper wares, besides an almost endless multitude of miscellaneous articles, of which no statistics can be given, but which like those unnumbered, find employment for hundreds and thousands of busy hands, and are destined to supply the manifold wants of humanity from China to Peru.

Accidents.—The new church in the course of erection on Southernhay, Exeter, belonging to the Independents, has been destroyed by fire. The building was nearly finished, and while the men were engaged varnishing the roof, flames burst from it at the west end, near the tower. The fire rapidly extended to the other end of the roof which became one mass of flames. The roof fell in, and the woodwork inside, including the large galleries, was speedily burnt up. Three of the city engines were at work, and by their efforts some of the glass work and the walls were saved.—An excavator was engaged in digging a foundation at the back of the Mare-street Baptist Chapel, Hackney, and had got to the depth of 12 ft., when one of the sides fell in, and he was buried under several tons of earth. When extricated he was found to be dead.

While a number of workmen were engaged in removing some old cottages, in order to make room for the enlargement of the foundry of Mr. Asa Lees, Huddersfield-road, Oldham, one of the inside walls fell down, and buried beneath it a labourer engaged in the work. He was killed at once.

Telegraphic Communication in the Bristol Royal Infirmary.—Mr. Grafton, C.E., of London, is now erecting in the Bristol Infirmary a mechanical telegraph to communicate orders to all the wards in that institution. The point from which the communication is to be made, says the local *Times*, is from the porter's lodge, on the ground floor, where there is affixed a large dial, on which there are twenty points, traversed by a hand. At each of these points will be placed a word, such as "casualty," "meals," "visitors out," "house-surgeon," "matron," &c., so that, by turning the wooden hand to any of these points, a similar hand will indicate the same thing on a similar dial in each of the wards. This will prevent the running about from ward to ward to look for a person, or give any summons which is necessary. The expense (which will be about 250*l.*) will be paid by an anonymous friend of the infirmary.

Works of Living Artists in France.—The exhibition of the works of living artists was opened in Paris on the 1st of May. The *habitués* consider it scarcely up to the mark.

Bursting of a Reservoir.—At the Banister Hall Print Works, Higher Walton, a village a few miles from Preston, there are two extensive reservoirs in connexion with the works, one of them a very large one, covering nearly two acres of land, which was used for clean water purposes. At the time of the accident it contained a depth of 18 ft. of water. Between twelve at night and three in the morning this immense sheet of water burst through its banks into the river Darwen, near which it was situated. The reservoir had been filled too full the previous day, and water having filtered into rat-holes that lined its banks, worked its way through until a continuous opening had been made, and the banks being only composed of clay, a large gap was soon opened, and the water rushed out into the Darwen with immense velocity, carrying all before it. In a very short time the reservoir was quite empty. The fissure is twenty yards wide by over six yards deep.

Fire at Albury Park.—The Duke of Northumberland's mansion at Albury Park has been on fire. The intimation of the fire reached the duke and duchess at Northumberland House. Through the carelessness, it is said, of workmen employed at Albury, a candle had been left burning, and the flame communicated with some part of the building. Fortunately the fire was discovered before it had gained much hold, and a great destruction of property was avoided. The fire occurred in a part of the building remotely connected with the valuable and extensive library formed by the Duchess of Northumberland's father, and with the principal apartments, which are adorned with some of the rarest specimens of the ancient masters. When the duke and duchess, with Earl Percy arrived, the fire was under the entire control of the engines from Guildford. The damage is trifling, and is covered by insurance. Within a few hours of the extinction of the fire, a second outbreak of a more serious character took place in another part of the mansion, which looks suspicious.

Improvements in Mummification.—An odd discovery has just been made by a man of Grenoble, by which it is calculated that cemeteries and graveyards will become superfluous. At the decease of an individual the body is plunged into a liquid invented by the man of Grenoble, and in about five years the individual is turned into stone. The secret of the petrification is known only to the discoverer. He says that in a thousand years' time, if persons will only preserve their relatives and friends, they will be able to build houses with them, and thus live in residences surrounded by their ancestors! Altogether an absurdity.

Designs for Channel Steamers.—The Council of the Society of Arts offer the Gold Medal of the Society, and the large Silver Medal of the Society, for the best and the second-best block model of a steamer, which shall afford the most convenient shelter and accommodation to passengers on the deck of the vessels crossing the Channel between France and England.

Architectural Alliance.—The annual meeting of this association is to be held in London on the 12th inst.

Ruled Paper.—Messrs. Letts & Co. prepare paper ruled (in pencil-ink) in squares by graduation of $\frac{1}{4}$ in. from $\frac{1}{4}$ to the full. On paper thus prepared rough plans can be drawn and coloured in without the ruled line showing objectionally.

City Memorial of the Prince Consort.—At the last Court of Common Council it was resolved to place a stained-glass memorial window at the western end of the Guildhall, to the memory of Prince Albert. There is also reason to believe that a statue, the gift of a private individual, will be erected.

Fine Arts Copyright.—The Select Committee on the Fine Arts Copyright Consolidation and Amendment (No. 2) Bill consists of the Lord Privy Seal, Earl Stanhope, Carnarvon, and Somers, Viscount Hardinge, the Bishop of Oxford, Lords Portman, Overstone, Lyvedon, Westbury, Houghton, and Romilly.

TENDERS.

For erecting a billiard-room over the present skating-ground, at the Prince of Orange, Greenwich, exclusive of gas-fittings, for Mr. Chas. Wall. Mr. Henry Roberts, architect. Quantities supplied:—
 Dining..... 2325 0 0
 Penn..... 402 0 0

For the erection of a warehouse, in the Minories, Messrs. Carter. Mr. G. Barnes Williams, architect:—
 Exchange..... 2,450 0 0
 Hill, Keddell, & Co..... 3,681 0 0
 King & Sons..... 3,400 0 0
 Abby & Sons..... 3,240 0 0
 Brass..... 3,773 0 0
 Abby & Horner..... 3,690 0 0

For iron and glass roof over seed market of the Lond. Corn Exchange, Mark-lane. Mr. G. Barnes Williams, architect:—
 Messrs. Phillips..... 2,080 0 0

For the erection of shops and premises at Peckham. Mr. H. G. Hayward, architect:—
 Ennor..... 42,007 0 0
 Boston..... 2,000 0 0
 Hill & Keddell..... 1,999 0 0
 Colla & Sons..... 1,978 0 0
 Gammon..... 1,951 0 0
 King & Sons..... 1,940 0 0
 Tully..... 1,976 0 0

For the erection of three warehouses, at Wells-street Oxford-street. Mr. J. Deason, architect:—
 Downman..... 42,470 0 0
 Foster..... 4,950 0 0
 Hyde..... 3,900 0 0
 High..... 3,784 0 0
 King & Sons..... 3,780 0 0
 Scriven & White..... 3,773 0 0
 Cooper & Culham..... 3,470 0 0

For the erection of stabling, at Tangley Par Worpleston, Surrey, for Mr. Thos. Osborn. Mr. H. Peak, architect:—
 T. & J. Lee (accepted)..... 2,341 0 0

For the erection of a pair of cottages on the Woodbridge Road Estate (erection of plumber's, glazier's, and painter's works), for Mr. Higlett. Mr. H. Peak, architect:—
 Stradwick..... 2,322 0 0
 West..... 329 0 0
 Gans..... 290 0 0
 Taylor & Downes..... 290 0 0
 Swayne & Sons (accepted)..... 257 10 0

For new school-room and alteration of present school-rooms, Belmont-street, Brighton. Mr. Thos. Simpson, architect. Quantities supplied:—
 Patching & Co..... 4,890 0 0
 Dean & Dickerson..... 4,890 0 0
 Cheeman & Son..... 890 0 0
 Baker..... 835 0 0
 Lockyer..... 832 0 0
 Sawyer..... 793 0 0
 Nash & Co..... 783 0 0
 Barnes..... 740 0 0

For Little Park House, near Newbury, Berks. Quantities supplied by Messrs. Pain & Clark:—
 House. Stable.
 Henshaw..... 25,739 0 0 4724 0 0
 Manley & Rogers..... 4,737 0 0 693 0 0
 Bracher & Son..... 4,903 0 0 678 0 0
 Ebbs & Sons..... 4,810 0 0 617 0 0
 Bull & Sons..... 4,400 0 0 607 0 0
 Accepted.

For alterations at Fairlawn, Acton. Quantities supplied by Messrs. Pain & Clark:—
 Little..... 21,010 0 0
 Bracher & Son..... 2,900 0 0
 Tully..... 1,295 0 0
 Ebbs & Son..... 1,247 0 0
 Cook & Green..... 1,054 0 0
 Manley & Rogers..... 1,945 0 0

For building stables, coach-houses, &c., in Blackmar street, Borough, for Messrs. Hadley. Mr. Josiah Houle, architect:—
 Little..... 24,109 0 0
 Patman & Potheringham..... 4,185 0 0
 Mansfield & Price..... 4,184 0 0
 Tanson..... 4,128 0 0
 Macey..... 4,098 0 0
 Scriven & White..... 3,907 0 0
 Ennor..... 3,608 0 0
 Langmead & Way..... 3,640 0 0

For alterations to the White Horse public-house, 100 High Holborn, for Mr. S. Mead. Mr. F. Cadogan, architect:—
 Sykes..... 2,215 0 0
 Goodwin..... 167 0 0
 Blackmoor & Co..... 145 0 0

For the erection of a new foundry, for Messrs. J. & F. Howard, Britannia Ironworks, Bedford. Mr. John Usher, architect. Quantities supplied:—
 Corby & Son..... 25,071 0 0
 Smith..... 4,767 7 0
 Field..... 4,759 0 0
 Dickens..... 4,650 0 0
 Young..... 4,647 0 0
 Nightingale..... 4,597 0 0
 Claridge..... 4,593 0 0
 Moore..... 4,525 10 0
 Curwin..... 4,339 0 0
 Win & Foster (accepted)..... 4,219 0 0
 Loveday (toolate)..... 3,854 0 0

For the erection of four houses and shops, in Belaise road, Wilbur, for Mr. J. Bishop. Mr. Douglas, architect. No quantities:—
 Backworth..... 2,790 0 0
 Waters..... 2,670 0 0
 Williams & Son..... 2,547 0 0
 Ebbs & Sons..... 2,437 0 0

For the erection of schools, master's house, &c., at Lyon's Down, East Barnett. Mr. G. Barnes Williams, architect:—
 Dove..... 23,075 0 0
 Scriven & Stephenson..... 2,937 0 0
 Turner..... 2,899 0 0
 Saunders..... 2,793 0 0
 Watton..... 2,599 0 0

DRAUGHTSMAN WANTED, by the Preston Local Board of Health. ...

PARTNERSHIP - WANTED, a PARTNERSHIP in an old or well-established Builder's Firm. ...

T. A. RICHARDSON, Architectural Artist. PERSPECTIVES OUTLINED, ETCHED, or artistically COLOURED. ...

THEODOLITE PRACTICE AND LEVELLING - A Gentleman of thirty years' experience will give a Course of Instruction in Engineering Fieldwork, ...

GILDERS, thoroughly experienced in House Work, Decorative Furniture, and Gilding in all its branches, ...

ROCHESTER HIGHWAY DISTRICT - The Highway Board for the above district, hereby give notice that their Meeting will be held on the 11th day of May, ...

REQUIRED, in an Architect's and Surveyor's Office, a competent JUNIOR ASSISTANT; also an OFFICE YOUTH, who must write a good hand. ...

SMITH, BELLHANGER, and GAS-FITTERS - A first-class JOBBING HAND WANTED for an Ironmonger's Shop. ...

WANTED, by a GENERAL FOREMAN, Charge of a Job - Carpenter by trade. ...

WANTED, by the Aston Board of Guardians, an efficient CLERK of WORKS, to take the charge of the erection of the New Workhouse. ...

WANTED, TWO or THREE good GLAZIERS. Well accustomed to church work. ...

WANTED, by an Architect in the country, an ASSISTANT. One who has been accustomed to Gothic and knows something of construction. ...

WANTED, a MANAGER for the DECORATIVE DEPARTMENT. Must possess considerable experience and be of good address. ...

WANTED, a Young Man, about 30 years of age, thoroughly acquainted with the TIMBER TRADE, to take part in managing a business. ...

WANTED, a good FOREMAN of MASONS, for a Job in the country, about seventy miles from London. ...

WANTED, by a thoroughly practical Man (Carpenter and Joiner) a RE-ENGAGEMENT as GENERAL FOREMAN. ...

WANTED, by BUILDERS, PAINTERS, &c. a Man, a SITUATION as WORKING FOREMAN of PAINTERS. ...

WANTED, by a Young Man, a constant SITUATION as a good PLUMBER, GAS-FITTER, &c. ...

WANTED, by a Young Man, aged 23, a SITUATION as BUILDER'S CLERK. ...

WANTED, by the son of a first-class ARCHITECT, an ASSISTANT in the West of England. ...

WANTED, by a Young Man, aged 29, a SITUATION as GENERAL CLERK. ...

WANTED, by the son of a first-class ARCHITECT, an ASSISTANT in the West of England. ...

WANTED, by an experienced M.n. just completing a Church, a RE-ENGAGEMENT as CLERK of WORKS in Town or country. ...

WANTED, an ENGAGEMENT, by a MEASURING and QUANTITY CLERK. ...

WANTED, by the Advertiser, aged 22, a RE-ENGAGEMENT as DRAUGHTSMAN, &c. ...

TO BUILDERS, CONTRACTORS, LAND HOLDERS, AND OTHERS. WANTED, by a Man who will shortly be DIS-ENGAGED, and has a first-class portable 12 horse power Steam Engine and all appurtenances for building purposes. ...

WANTED, a SITUATION as ARCHITECT'S ASSISTANT. Good testimonials. Salary moderate. ...

WANTED, by a Youth, a RE-ENGAGEMENT. Can trace and copy plans neatly, square dimensions, abstract line and materials, and put into bill; also measure up timber, &c. ...

TO BUILDERS, DECORATORS, HOUSE AND ESTATE AGENTS, &c. WANTED, by an experienced CLERK, a RE-ENGAGEMENT as COLLECTOR, BOOKKEEPER, or any other office of confidence. ...

WANTED, RE-ENGAGEMENT as SHOP FOREMAN of JOINERS. By an active, thoroughly qualified, and experienced man, accustomed to machinery and piece-work in connection therewith. ...

WANTED, by a respectable Young Man, a SITUATION where he would be able to obtain a general knowledge of all the building trade. ...

WANTED, a RE-ENGAGEMENT as a BUILDER'S CLERK. Good references in all the principal offices. ...

WANTED, STEAM BOILERS to SET, FIT, &c. Good references if required. - Apply, R. W. 59, York street, York, S.E. ...

WANTED, by an experienced DECORATIVE PAINTER, &c. a PERMANENCY. Has been used to all his time in painting, &c. - Address, E. S. P. No. 12, Coleridge-terrace, Dunsan-terrace, Islington. ...

WANTED, a SITUATION as PAINTER, GRAINER, and PAPERHANGER in Town or country. Address, W. H. 142, White Horse-street, Limehouse. ...

WANTED, by a respectable Youth, aged 18 (the son of a builder), a SITUATION in the Office. No preliminary duties. No salary required at first twelve months. ...

WANTED, a RE-ENGAGEMENT, as GENERAL MANAGING FOREMAN. In charge of a Country Job, or otherwise. Good references as to ability in the carrying on of work in general, also for writing orders. ...

WANTED, by the Advertiser, PLASTERING, PIECEWORK, &c. in any amount. Labour only. First-class references from London Builders. ...

WANTED, by a SURVEYOR, a SITUATION, in either of the above offices. Is a good draughtsman, surveyor, and leveller. ...

WANTED, a RE-ENGAGEMENT, as GENERAL OUT-DOOR FOREMAN. Good testimonials, and joined by trade. Will up in all branches. ...

WANTED, by a thoroughly practical, active, and steady Man, a RE-ENGAGEMENT as FOREMAN of JOB, or to manage a good Jobbing Business. ...

WANTED, by a steady Young Man, a SITUATION, as a BRICKLAYER, &c. - Address, W. M. GAPE, 45, Drevell-street, Dover-road, Boroagh, S.E. ...

WANTED, by an ARCHITECT in the West of England, a CLERK of WORKS to superintend the various buildings he has now in course of erection in the town and neighbourhood, and to prepare working drawings. ...

WANTED, by a good PLUMBER, a JOB, or a SITUATION in Three Branch Hall, in town or country. ...

WANTED, by a Young Man, aged 29, a SITUATION as GENERAL CLERK. Is able to make plain drawings, measure, and estimate, and is a good bookkeeper. ...

WANTED, by the Advertiser, a SITUATION as PAINTER, &c. or General Hand in a small shop. Two years' character from employer. ...

WANTED, immediately, a first-class GRAINER and MABLER, in an old established firm. One willing to sit up his time in polishing and paper-hanging if required. ...

WANTED, a SITUATION as JUNIOR CLERK. by a Young Man, aged 21. Has been nearly seven years with a London Architect, a good draughtsman, quick pen man, and can assist at quantities. ...

TO SURVEYORS AND BUILDERS. WANTED, a RE-ENGAGEMENT, by a Young Man, well acquainted with office duties, drawing, taking of levels, &c. ...

TO BUILDERS, MILL PROPRIETORS, &c. WANTED, by a well-educated, persevering Man, of many years' experience, a SITUATION as FOREMAN, or as Work General Foreman, or as Take Charge of a Job. ...

TO BUILDERS, PLUMBERS, &c. WANTED, a SITUATION, by a good practical PLUMBER, GAS-FITTER, &c. No objection to fill up his time in painting, or lead or sash-glazing. ...

WANTED, by the Advertiser (Carpenter by trade), a SITUATION as GENERAL FOREMAN, or as Take Charge of a Job. Town or country. ...

TO PLUMBERS AND BUILDERS. WANTED, by a good PLUMBER, a SITUATION, as PLUMBER and GAS-FITTER. Will up in both and erect work. ...

TO ARCHITECTS. WANTED, RE-ENGAGEMENT in London, as ASSISTANT. Good draughtsman, tolerably practical, and can assist at quantities. ...

WANTED, a thoroughly practical Man, Joiner by trade, a SITUATION, in town or country, as FOREMAN of JOB. Well acquainted with all branches in the building trade. ...

TO BUILDERS. WANTED, by the Advertiser, aged 40, a SITUATION as FOREMAN of PLASTERERS, or to take charge of a country. ...

WANTED, a SITUATION as ASSISTANT ARCHITECT, in a provincial town, or the superintendence of country work. ...

TO BUILDERS, CONTRACTORS, &c. WANTED, by the Advertiser, aged 40, a RE-ENGAGEMENT as FOREMAN of MASONS, roof masons (if required) from last and present employers. ...

WANTED, by a M. M., a RE-ENGAGEMENT as CHIEF of WORKS, GENERAL or SHOP FOREMAN. Is a good draughtsman; understands all branches of the trade. ...

TO FURNISHING IRONMONGERS, SMITHS, AND BUILDERS. WANTED, a SITUATION, as MANAGING or WORKING FOREMAN, by a first-class mechanic in the Smith, Bell-hanger, and Gas-fitter, Brass, Steam, and all kinds of Hot-water Work. ...

WANTED, by a good GRAINER, a SITUATION, or JOB. Can be well recommended, and specimens sent. ...

WANTED, a RE-ENGAGEMENT as a CLERK of WORKS, OUTDOOR FOREMAN, by a thoroughly practical Man. Middle age, Joiner by trade. ...

TO ARCHITECTS. WANTED, a RE-ENGAGEMENT, temporarily, a good practical, and a good penman, and a good draughtsman, also well up in coloring and preparing drawings for competition. ...

WANTED, a SITUATION as BUILDER'S CLERK, by a thoroughly practical Man, with a good knowledge of every branch of the business, measuring, estimating, and drawing, purchasing materials. ...

TO BUILDERS, ROAD-MAKERS, AND CONTRACTORS. WANTED, by a first-class practical Man, a Carriage-way Taster, Street Mason, Granite Dresser (Wood, Bricks, Dutch Chalkers, or Tiles), or TAKE WORK by the PIECE. ...

THE Advertiser, eight years in the profession, the two last with an eminent London Architect, will not mind to participate with a view to another ENGAGEMENT, although not yet disengaged. ...

TO BUILDERS, BUILDERS, AND OTHERS. THE Advertiser, a thoroughly good Three-branch Hand, wishes for a PERMANENCY. ...

TO TIMBER MERCHANTS. THE Advertiser, aged 34 (married), is in want of a SITUATION as FOREMAN and SALESMAN in a TIMBER YARD and SAW MILL. ...

TO BUILDERS or MASTER PLUMBERS. THE Advertiser, a thorough practical PLUMBER, wishes to take work with a JOB or a CONTRACTOR. ...

TO BUILDERS, &c. TEMPORARY EMPLOYMENT REQUIRED in Measuring up Work, Taking out Quantities, or Making Working Drawings, by a practical Man willing to take up an Engagement. ...

TO ARCHITECTS AND BUILDERS. THE Advertiser, three years and a half experience in an Architect's Office, fair draughtsman, good knowledge of quantities, and measuring up work, desires an ENGAGEMENT. ...

The Builder.

VOL. XXVII.—No. 1371.

*The Properties of Iron and its Applicability to Building Purposes.**



THE study of metallurgy is essential to the architect who desires to do justice to the interests of his clients. None of the mechanical arts have shown such progress of late years as the manufacture of metals. In the working of the iron improvements have been so great, that within the past ten years processes which before that time had been pronounced impossible have been practically demonstrated as easy of achievement, and the qualities of this invaluable metal have not only greatly improved, but the mysteries of its organization and inner

nature are daily becoming more clearly revealed. Castings in soft steel can now be made in contradiction of all past assertions, whilst the simple but most marvellous discovery by Mr. Saxby of the application of magnetic tests as a means of discovering unsuspected flaws in manufactured iron, promises to add a most important safeguard to the use of a material which is now so largely increasing. The Bessemer process of the conversion of iron ore into steel by a comparatively cheap and reliable process has, it is well known, introduced a new element into the manufacture of this metal, whilst the costly and long-continued experiments of Government have given to the world facts which engineers and practical men have not been slow to take advantage of.

The result is that we have now a supply of iron equal in its qualities to all the demands that the nature of its use may make upon it. The iron of the heavy armour-plate of our ships of war; the metal of our guns; the material of which girders and columns, railway tyres and rails, are made; and the iron of domestic use and for outlery, hardware, and the like, have all their one common origin, and yet differ so much in their qualities, that very little observation is needed to admit that the treatment by which results so opposed can be gained from the same basis must be one of great practical difficulty, and requiring thorough scientific knowledge. Workers of iron will tell you that every day convinces them there is something more to learn, and enormous as has been the stride made

in the past few years, each onward step only shows that the resources of art are illimitable, and the value of the metal so freely and abundantly given to man becomes the more appreciated, as its qualities develop.

There is at present a warm controversy on the respective merits of iron and steel for mechanical purposes; but, perhaps, the true and simple view of the question may be found in the opinion of Mr. Zerol Colburn: "Steel," says he, "is only iron in its best and most valuable form." Steel is, in fact, no more a different material from iron, than are wrought-iron or cast-iron from each other. The time may come when the distinctive name of "steel" will be discarded altogether, and the generic name iron, with some mineral or other distinctive prefix to mark its special quality, will express better what it meant.

The study of metallurgy will be seen to have especial interest for all engaged in the practical application of scientific researches. The engineer and the architect employ metals largely in the construction of their works, and as a conscientious practitioner would scarcely content himself with accepting the dicta of those employed in carrying out his designs as to the description and dimensions of the materials he may seek to use, but would wish to satisfy himself on so important a matter, a careful study of treatises on metallurgy becomes essential.

Our own iron-masters are a different race of men to what the last century produced; the immense improvements made by science in the treatment of metals has compelled an amount of study and patient experiment which none but enthusiastic, unprejudiced minds would find congenial. We in England may be proud of some of our enormous iron-works, and of the laborious processes so continually carried on therein, but we must not blind ourselves to what is going on abroad. The iron trade at home has had a blow, whilst within the past twelve years the same branch of industry in France has made an astounding commercial progress. We believe that a careful analysis of the causes of the seeming stagnation in our own trade, and the increase of that of the Continent, will show no real cause for alarm, and for reasons that may presently be seen. This popular belief, however, is widely spread, and there seem grounds for such belief in the indications that meet the public eye. There are genuine French locomotives to be seen running on our English lines,—as a few years ago there were American; and what is more, encouraging by their performance those who imported them. Krupp's tyres are required by English engineers to be used by their specifications, when the very best Bessemer steel can be obtained at half their price in this country. French and Belgian iron are largely bought by our merchants and shipbuilders, and Belgian shipwrights are getting contracts from English firms, and are expanding their works with English capital; whilst on the other side of the picture are seen our men "on strike," and hundreds of our furnaces silent and cold. To strengthen this alarm, came the Paris Exhibition, the display in which acted upon all superficial observers to the prejudice of this country. But, why we consider there is no real cause of alarm, and believe that accurate statistics of our iron trade at home will show no diminution, is that, in fact, the whole system of iron-working has, within the period alluded to, undergone an entire revolution. This seems the simple explanation of it, and this important revolution has been brought about by the introduction of the Bessemer process, and by consequent demand for hematite or spathic ore.

The result, then, is this: heretofore the great necessity of iron-working has been coal; and those localities which best supplied the fuel have been in the most flourishing state. The old centres of the iron trade were, therefore, natu-

rally placed in such localities where coal-fields abounded in the purest fuel: hence Yorkshire, Staffordshire, and Wales were in the foremost ranks. Moreover, it was well known that the quality of the iron manufactured depended almost entirely on its working; that is, on the amount of fuel burnt in producing and re-working it. In fact, quality of ore was secondary to abundance of coal in the old days of the puddling-furnace. But the introduction of the Bessemer invention has changed all this. The metal resulting from this process depends entirely upon the purity of the ore employed, and as the consumption of coal is not only enormously lessened, but, by the application of the invention known as Siemens's gas furnace, coal of inferior quality may be partially used, the choice of a locality for conducting the working of iron with adequate economy and success is dependent now on its supply of pure ore, not upon that of coal. Now we know how tardy we good folks of England are to adopt largely any new thing however good, and the simple state of the present question is, that new ironworks are slowly being established in new districts more locally favourable for carrying on the requirements of the new process, and the old furnaces are becoming disused. Again, observance of facts shows that at the present day there is a demand only for the cheapest kinds of iron, and for the very best. For the cheapest iron, our old-established Staffordshire ironmasters cannot remuneratively to themselves compete, and our best is not as yet made in sufficient quantities.

So these reasons will serve to show how the apparent retrogression in the commercial prosperity of our iron trade has been brought about, and what are the hopes of the future. Already in Wales the long-neglected purer iron ores are being reopened as the Bessemer process becomes introduced, and in time Wales will take a proud position, and be prepared not only to make the cheapest kinds of iron, but also the best qualities known now as steel. The vexed question of puddlers' strikes has also had much to answer for in the past, but happily the wider introduction of the new system will render ironmasters less dependent on such unfortunate interruptions of important works.

The wider use of Bessemer steel will afford architects an extended range for carrying out constructive and ornamental details. Its extraordinary malleability, in a certain state of manufacture, is a most valuable quality, whilst its great strength and lightness permit delicacy and minute finish.

The subject of metallurgy, some features of which we have thus far briefly sketched, is fully treated in the recently-published volumes whose names appear at the head of this notice.

For the first, on the "Elasticity, Extensibility, and Tensile Strength of Iron and Steel," we are indebted to Sweden. The work is, in fact, a report by the author, Knut Styffe, Director of the Royal Technological Institute at Stockholm, prepared by the instruction of a Royal Commission from the king of Sweden upon the fitness of Swedish iron for railway purposes, and embodies a series of protracted and interesting experiments of which the results are fully and impartially given. The tests applied for the purpose are minutely described, and the effects of temperature as modifying the conditions of the material are elaborately examined. The results of all the experiments are clearly set forth in tables, which will be found most useful to the student. On p. 70 is a résumé of the results of experiments made upon tension, which gives in condensed form so much valuable information, that we regret space will not permit quotation; the student is referred, therefore, to the volume itself. The second chapter is devoted to the application of the foregoing results, and the useful nature of its contents may be seen from the following sketch of its various headings:—

* "Iron and Steel, The Elasticity, Extensibility, and Tensile Strength of Iron and Steel." By Knut Styffe, Director of the Royal Technological Institute at Stockholm; translated from the Swedish, with an original Appendix, by Christer P. Sandberg, Inspector of Railway Plant to the Swedish Government, Assoc. Inst. Civ. Eng.; with a Preface by John Perry, M.D., F.R.S. London: John Murray, Albemarle-street, 1869.

"A Practical Treatise on Metallurgy," adapted from the last German edition of Professor Kopp's "Metallurgy," by William Crookes, F.R.S., &c., and Ernst Rühlmann, Ph.D., M.E. In three volumes. Vol. II. Copper, Iron, London: Longmans, Green, & Co., 1869.

"Iron and Steel Manufacture: a Series of Papers on the Manufacture and Properties of Iron and Steel." By Ferdinand Kohn, C.E. London: William Mackenzie, 1868 (Reprinted from "Engineering," revised and enlarged by the Author).

"Iron: its History, Properties, and Processes of Manufacture." By W. Fairbairn, C.E., LL.D. Third edition, revised and enlarged. Edinburgh: Adam & Charles Black, 1868.

1. Preference of steel to iron for such purposes as require a combination of strength and lightness. 2. And for such as require strength and hardness to resist wear. 3. Importance of extensibility in materials employed for machinery and buildings.* 4. Relative capacity of steel and iron to endure sudden shocks. 5. Best material for articles occasionally subject to severe shocks. 6. Choice of material for articles commonly subject to slight shocks or vibrations. 7. Most suitable degree of hardness for steel to be used for tyres, axles, &c. 8. Employment of iron, which has become stiff by mechanical treatment. 9. And of iron containing phosphorus. 10. And of iron containing slag. 11. Advantages of a pure iron for general forgings.

The next chapter is devoted to experiments on tensions at low and high temperatures, and contains a theory which it is fair to say the translator of the work does not endorse, asserting that although the experiments are most carefully and impartially performed, the conclusions arrived at are justly open to hesitation. These remarks are given in an appendix by the translator, and relate to the reasons assigned by the author for the breakage of metals during severe frost. Professor Styffe seems to assert that the absolute strength of iron and steel is not diminished by the influence of cold on the metal itself, but that the liability of fracture of railway tyres and rails, for example, occurs from the elasticity of their supports being destroyed by the freezing of the ground, and the hardening of the sleepers. On this opinion being contested, the author still asserted that frost could have no influence on iron in its resistance to blows, provided the elasticity of the supports was undiminished; so, to ascertain the real position of the case, experiments were made of a practical nature by Sandberg (the translator of the work) at Stockholm in the winter and summer of 1867. These experiments are fully detailed in the appendix, but the following facts may be briefly gleaned. Iron rails were supported on blocks of granite built up on solid granite rock, and were broken into halves, so that the conditions of each portion under experiment should be precisely the same. These were then tested by the falling of a heavy weight, one in winter at 10 degrees Fahrenheit, and the other in summer at 81. The result was, that the one thus tested in the winter would not sustain much more than one-fourth of the blow that it resisted in the summer.

The concluding chapter details experiments on Flexion at different degrees of temperature, and although short, is comprehensive.

The translation is clearly written, and the style simple and interesting. The tables are copious, and the illustrations exceedingly well drawn and engraved. The volume is a fitting companion to many others from the same publishing house, and, like all of Mr. Murray's issues, is handsomely printed, on good paper, and in large and readable type. It is a valuable contribution to the literature of metallurgy, and will be found of practical utility.

The "Practical Treatise on Metallurgy," by Crookes and Röhrig," thus forms the second of the series on our list, is a thick octavo volume of nearly nine hundred pages. It is in itself the second volume, and is to be followed by a third. The production of copper forms about a third portion of the work, the remainder being devoted to iron.

The scope of this present volume may be understood from the comprehensive table of contents, and the value to a reader is considerably enhanced by a very clear index at the end. This feature is one, the necessity for which cannot be too often insisted upon, and in this case it is given with commendable amplitude and intelligibility.

The work is an exhaustive and comprehensive treatise on metallurgy, and is so clearly written, and so well and intelligently arranged, that no student will regret obtaining it as a work for reference and study. The language is simple, and an immense amount of information is given in short, pleasantly fluent sentences, that render reading easy and convert a severe study into an agreeable task. A feature in the work is the separation of chapters into heads, and these into

shorter subdivisions, each one readily distinguished by its own heading in distinctive type, thus materially assisting the student in his search for special information. We have scarcely ever read a book arranged with so much judgment in this respect; the clearness of the construction, the classification of the subjects, combined with the simplicity and directness of the language, are the best possible proofs of the mastery of the matters treated on by Messrs. Crookes and Ernst Röhrig. The book itself modestly is called an adaptation from a German work, the metallurgy of Professor Kerl, and is put into a readable form that will largely commend itself. It is well printed, illustrated with upwards of 270 wood engravings, and is published by Messrs. Longmans, Green, & Co.

The last on our list, "Iron and Steel Manufacture," by Ferdinand Kohn, C.E.,* consists mainly of papers written by the author for the pages of *Engineering*, and added to these are further elucidations from his own pen, and some interesting descriptions of important ironworks by Mr. Zerah Colburn, C.E. The volume is of large quarto size, contains a great number of valuable engravings, and is dedicated to Mr. Henry Bessemer. In the preface the author modestly gives the reasons which induced him to present the work to his readers, and as these state in brief the whole scope of the work, we will let him speak for himself.

"In collecting into a volume a series of articles on the manufacture of iron and steel, which have appeared in *Engineering* during the last two years, the author believes that he has undertaken a work of utility rather than ambition. The republication of articles which have appeared in a widely circulated professional journal, and of which a considerable number have been reprinted, translated, and quoted in the leading professional papers in this country, in America, and on the Continent, may, perhaps, at first sight, appear uncalled for and superfluous; but the fact that in their original form these papers are irregularly scattered through seven different volumes, and that some of these volumes are out of print; the fact that no systematic record of the important progress made during the last five years in all branches of iron and steel metallurgy, is in existence at this moment; and the fact that the attention of the public has at no time been more closely and more generally given to this subject than is the case at present; these facts, the author believes, will be found sufficient to justify the compilation of the present volume."

In the work will be found full descriptions of all the most important ironworks, accounts of the processes employed, and illustrations of the machinery. There is much very valuable information simply and interestingly told, but the serial form is unpleasantly prominent, and we cannot refrain from the remark that we wish the writer had re-written and re-arranged the work in smaller form, with only a selection from the illustrations; then we should have had a most readable and handy book, which at this time could have been warmly welcomed.

Towards the end of the work is an excellent account of the iron and steel in the Paris Exhibition, and of the celebrated works of F. Krupp, at Essen, in Rhonish Prussia. The volume concludes with a description, with illustrations, of the machinery employed in testing metals for constructive and engineering purposes. It is published by William Mackenzie, 22, Paternoster-row, London, and is well printed and substantially bound. The illustrations are large and well executed, and the type and paper correspond.

The value to an architect of such volumes as the above, which afford a means for the study of metallurgy, need not further be insisted upon; the subject itself is interesting, and repays investigation largely. In excuse it may be urged that in an architect's practice there is not left much leisure for scientific study, but no man exists but may so methodise his time as to be continually learning, and the developments of improved iron-manufacture are so rapid and important, that none can safely rely on the unsatisfying information to be got from published tables such as are too generally hunted up when reference is made as to the dimensions of a requisite girder or a column. The good architect will, by keeping himself informed of what is daily going on, be able to intelligently direct the use of materials that are now so largely employed; the art-worker, too, and the art-designer, have a common interest in investigating the applicability of new results of metal

manufacture; and finally the important iron trade of our country will reach a more healthful state as knowledge becomes extended and prejudice removed.

COMPETITIVE DESIGNS FOR ST. LUKE'S PAROCHIAL SCHOOLS, GOLDEN LANE.

It is a difficult task for an architect to arrange a complete National School establishment upon a confined site in a crowded neighbourhood in the city of the metropolis. The regulations of the Committee of Council on Education are, under the most favourable circumstances of site, sufficiently exacting; but when these have to be combined with large requirements, low cost, difficulties as to rights of way, limited space and approaches, and circumscribed means of obtaining light and ventilation, the task becomes even more onerous. The trustees and committee of St. Luke's Parochial School, Golden-lane, have presented this puzzle. They offer premiums of 50*l.* and 30*l.* respectively for the best and second best designs for the new boys' and girls' schools, which are to include residences for a married master, the unmarried mistress, and the assistant master, each to themselves, besides committee-rooms, and various offices; and to this invitation thirty-three competitors have responded with drawings 199 in number, 32 being based on a Gothic treatment and 1 Italian. These have been on view in the old School-house, in Golden-lane, for the last ten days.

There is a remarkable feature in connection with this competition that deserves attention at once. By an omission in the instructions, or in the absence of a personal inspection of the site, nearly all the competitors have ignored the fact that the Metropolitan Board of Works forbid the re-erection of any building over the gateway at one end of the frontage of the new site. The site, which has a frontage to Old-street, on the Finsbury Prebend estates, is now occupied by old holdings, including a house built over a gateway leading from the street to a timber yard in the rear. It is proposed to clear away all the existing buildings, including the erection over the gateway, for the new schools. The Board of Works, however, step in, and prohibit the trustees from rebuilding on this private gateway, although the site is included in the lease to the trustees of the school by the Ecclesiastical Commissioners. The competitors, losing sight of this prohibition, have planned the schools to include the curtailed space. Excluding this important consideration, the designs exhibit a large amount of careful thought. The difficulties by which the subject is beset are exemplified by the various imperfect modes in which the accommodation is provided. In some of them the playgrounds are placed in the basement, as cellars, with absolutely little or no light; in some the entrances are to be used in common by the children of both sexes; in others but one staircase is employed for access in common to both the schools and all the residences; in nearly all, the schoolrooms are placed one above the other; in a few the residences for the masters and mistresses, married and single, are placed in the attic floor, on the flat-system, with kitchens, bedrooms, larders, and sanitary conveniences all in too close and most inconvenient proximity, and with wearisome approach.

Setting aside those competitors who are debarred from all consideration by failing to comply with the instructions as to the scale of the drawings, or by excess of expenditure, viz.:—"Health and Education," and "Dit," whose estimated cost is 5,000*l.* instead of 3,000*l.*, the average of the rest; and "Fides," who shows a wide street at the corner of his building which does not exist, and whose scale is 1.8th instead of $\frac{1}{2}$ in. to the foot; we come to nearly the only design whose external façade presents (as all buildings should), at a glance, the purpose for which it is intended. "Antonio Masa" places the schools as a centre, with high roof and bell-turret straddling it, rising above the residences which flank it on either side. If the ground-floor were raised to give more light to the kitchens of the houses, and to the playgrounds in the basement; if the girls' school on the first floor had more height (it is only 13 ft., while the boys' school, on the second floor, with better chance of light, is 16 ft.), and better provision were made for light and air to the sanitary conveniences, and advantage taken of the side-lights to be obtained from the unbuilt upon

* The meaning of the word "extensibility," which frequently occurs in the work, is explained to be as nearly translated as one English word could represent the Swedish, and to mean that property by which the metal assumes a greater or less permanent elongation, in opposition to elasticity, by which the metal comes back again to its original dimensions. Such, at all events, is our comprehension of the intended meaning of the author in using the Swedish word "tjånbarhet."

gateway, this design would be improved; already it has elements of success about it. Cost 2,750l. In the Classic design of "St. Luke" the second, or top story is devoted entirely to the objectionable arrangement of the whole of the culinary, sitting, sleeping, and sanitary apartments of the masters and mistresses, married and single, in one flat! The partitions dividing these numerous rooms rest upon the ceiling of the boys' school, a room 40 ft. 6 in. by 31 ft., and 18 ft. in height. The drawings show no sufficient provision for the construction of the partitions over this room of 31 ft. span. The playgrounds are in the basement, and the ground floor is raised a good flight of steps to give light to these; but the children have first to go up the flight of steps to the entrances at the ground floor, and down internal flights of stairs to reach the playgrounds. The street elevations are promising and neat, but have nothing of a scholastic character about them; they are alternative in design, the one to cost 3,290l., the other 3,275l.

"*Qui parit virgo odit filium*" is too ecclesiastically monastic, and too rich for such a plain prosaic parish as St. Luke's. The interior is sacrificed for the exterior, and we doubt whether such a highly adorned Early Gothic building could be erected for anything like the estimated sum of 3,000l. The partnership design marked "Work" is more to the purpose. The authors avoid all expensive decoration, they state, keeping the facade as plain as a public building, of the character would allow, feeling assured that the committee would prefer the money spent in sufficiency of accommodation and stability rather than frittered away in prettiness of design or needless ornamentation;" and this they contrive to do for an estimated cost of 2,976l. 13s. 4d.


The designs of "A. Z." are wrought out with special regard to the site. The author places the playground in the basement, the sitting-rooms for the master and committee-room on the ground-floor, the main domestic accommodation for the teachers on the first floor, the boys' school on the second floor, and the girls' school on the third floor, and a considerable space is reserved in the rear for light. In many respects this design is satisfactory, but the girls' school is sacrificed for the accommodation required in the provision of the committee and attendant rooms. The playgrounds in the basement must be very dark, as they are only 9 ft. high, and the ceiling of them is not raised more than a couple of feet above the pavement of the street. This author does not avail himself of side light from the gateway, and shows in his external perspective view the dilapidated house over the gateway as if it were to remain attached to the school.

"Education" has fallen into the common error of proposing to build over the prohibited gateway space, and hence, as the entire arrangements are affected by this mistake, the plans are impracticable. "*Dum Spiro Spero*" is bad in the following respects: there is but one staircase, to be common for the boys' and girls' school, and master and mistresses residences; and the playground is in a cellar. The superficial area of the boys' school is very large compared with some others, being 1,800 sq. ft.; the lowest area shown is 1,182 ft. There seems to be a general misunderstanding as to the superficial measurement required by the Privy Council for each child. One of the competitors naming it at 6 ft., and another at 10 ft. Under the figure of a Maltese cross, one competitor shows the trustees how to build for the low sum of 2,500l. a school without any playgrounds, and by using the space tabooed by the Board of Works, crowds a good deal of accommodation into the site, by an arrangement of giving the ground-floor to the girls, the first story, or middle flat, to the residences, and the second, or upper flat, to the boys. Another, "St. Luke," No. 1 in order of arrangement, would place the boys' and girls' playgrounds in a basement or cellar, lighted by a deep area 5 ft. wide in the back, and one 2 ft. 6 in. in the front; the boys' school and class-rooms on the ground-floor (the latter lighted by windows in the 5 ft. narrow back yard), the girls' school on the second floor, and the teachers' residences on the second floor; the kitchens being placed in the basement dark cellars. This is the author who states that 10 ft. are required by the Privy Council on Education for each scholar. "*Cum Marti Minerva*," in two alternative plans, arranges the different floors round an internal yard or well, about 80 ft. by 10 ft., and thus gives very imperfect light to every apartment lighted from

it. A sensible feature in them is that of the boys' school, in the upper story, which has an open roof 20 ft. high to the collar beams. "*Sagittarius*" exhibit a book containing a photograph of their perspective view, and lithographs from their plans, which have some good points. In this design the girls' school is on the ground floor, the boys' on the first floor. "*Ad initio*" places the playground in the basement,—that for the boys in the front, and that for the girls in the rear. The boys' school occupies the whole frontage of the ground floor. "Nature is my Guide" stows away the teachers in apartments in the attic, and makes the stairs to boys' school on the first floor common to both. "Fair-play" soars no higher in the architectural treatment of his exterior than the plain brick character which distinguishes the buildings generally in the parish of St. Luke.

"Anglican" builds over the private gateway, and even blocks up the gateway itself. The author has evidently not taken the trouble to inquire into the nature of the site at all. "*Utilitas*" is utility with a vengeance, without any convenience at all. The boys are to enter the school direct from the street, without any porch, lobby, or cap and cloak place; a regular old-fashioned, rough and ready, out-of-date,—one of the very old-school sort of men,—the author must be, surely. "Much for Little" crowds all the establishment into two stories only, besides the basement. The playgrounds are simply dungeons. The doors of entrance for both girls and boys are close together in the centre of the ground-floor, with only a mullion between them. If the boys and girls could assemble and be dismissed at separate hours, this arrangement might do. The assistant master is to have dreary and dismal quarters in the rear of the ground-floor. In "*Vive valeque*" we have a still worse contrivance for the non-separation of the sexes. There is but one entrance for both girls and boys; the girls have to pass through the boys' playground to get to the stairs to their schools, which said stairs are also, in fact, common to both boys' and girls' schools.

The author of the designs marked with a red quatrefoil, is distinguished from the rest, by dividing his frontage into four stories, thus: the ground-floor to playgrounds, with arches next the street; the first floor to the girls' school; the second floor residences in a flat; the third floor to the boys' school, which has six three-light tracery windows all gabled. The staircase accommodation and the sanitary provisions are lamentably deficient.

" Bonns" ignores the private passage, and adopts what we may call the dove-cot style—there are so many fanciful pigeon-house projections in the facade; and illustrates his plans in three shabby drawings.

There are always to be found, in a general competition like this, the works of inappropriate, slovenly, or 'prentice hands, and there is no exception of the kind here; these we pass by.

We come now to but one conclusion on rising from a careful examination of these designs, and it is this: the trustees demand more accommodation than the site can possibly admit of. If the new parochial schools are to be satisfactorily wrought-out, the trustees must forthwith abandon the provision of a committee and waiting rooms, and if they cannot obtain the sanction of the Board of Works to the restitution of that portion of their site from which they are to be deprived they must at least secure the right to have lights in the uncovered gateway. Where so very much is required to be crowded in a small place of the scholastic establishment proper, we cannot see why a school and class-rooms could not be used as a committee-room and waiting-rooms, seeing that the trustees could arrange to sit when these are not otherwise in use; and it is imperative that more space should be secured for light and ventilation by that offered in the gateway. The trustees will of course proceed to adjudicate the premiums offered, for there is ample and worthy material for their decision; but the first-selected designer will certainly have to rearrange his plans entirely to secure the above considerations before the drawings can be placed in the contractor's hands.

Since the above was in type, the trustees have adjudicated the premiums as follows:—To Mr. John Toner, of Furnival's-inn, the author of the designs "A. Z.," the first premium; to Mr. S. Hewitt, of Great Russell-street, the second, for his plans marked "*Cum Marti Minerva*;" and additional prizes of five pounds each have been

awarded to Messrs. Hill & Stevens for their designs, with the motto of St. Luke, and "Antonio Masa," in the person of Mr. J. Niblett, the parish surveyor. We are confirmed in our opinion, by the trustees' adjudication of the prizes, that the author of the accepted design will have to re-arrange his plans.

THE ARCHITECTURAL EXHIBITION, CONDUIT STREET.

RESUMING the notice of this Exhibition which we commenced in our last number, let us be gallant and first give *place aux dames*, for two ladies enter the field with the host of architects. In a little beautiful drawing (4 in. by 2 1/2 in.) by Lucy H. Bloxham, that might be taken for a page from a missal, entitled an "Illuminated Fly-leaf for Prayer-Book, on Vellum" (10), this lady unfortunately gives a Berlin-woolly character to her work by dividing the diapered ground on which the two figures of St. Peter and St. Paul lie, into little squares. In the more ambitious work of the Lambeth National Bronze Medalist, Helen J. A. Miles ventures boldly on architectural ground with her "Design for a Library Door" (162). At a first glance we mistake it for a drawing of the Ghiberti Gates, and we are not far wrong, for the lady divides her door into eight panels, containing subjects in high relief, with prominent busts between them, and surrounds them with pilasters and panels in many respects similar to the great Florentine work. Her subjects illustrate the works of eight Greek, Italian, German, and English poets to be executed in bronze, viz., Homer's "Iliad," Dante's "Purgatory," Tasso's "Jerusalem," Goethe's "Faust," Chaucer's "Griselda," Spenser's "Fairy Queen," Shakspeare's "Cymbeline," and Milton's "Comus," and an allegorical group of mosaic fills the arch. We should like to see the building that this contributor would make to correspond with her library door. It would be very costly, at any rate.

Proceeding now with the works of the sterner sex, we find an instance of that injudicious overcrowding of buildings on confined sites too frequent in the case of town workhouses, by referring to "Photographs of the New Poor-house, Southampton," by T. A. Skelton (264). The plans and views show a perfect sea of walls and wards intersecting each other, and such a crowding of the different ward-blocks for master, vagrants, receiving, and refractory, for able men and women, for aged and married couples, dining-hall, kitchen, idiots, lunatics, infirmary, and infectious, that the airing yards are woefully curtailed. All the buildings overlook a crowded church to which they are adjacent; the site cannot be cheerful or healthy. The classification is kept up throughout in the different blocks, and these are again planned on the central-corridor system. There are no wards for sick vagrants, and this is an omission. In the "Perspective View of the Residence of Mr. J. Greer, at Pinner" (34), Messrs. Walford, Donkin, & Evill show what can be done in a very artistic manner, by a careful arrangement of ordinary brickwork, combined with varied heights in the building, which give gables at different elevations; and a use of Taylor's ruddy ridge and farrow tile. At the artist's great summer and autumn rendezvous, Bettws-y-Coed, North Wales, there is to be built a new church of local granite, with Cefn stone dressings, to hold 300 persons, and to cost 2,000l., and Mr. Charles H. M. Milham shows the design for it in two external views (47, 48). The main part of the fabric is thoroughly English in tone, but a very eccentric bell-turret appears, which is an adaptation of an old Welsh one, if we remember rightly. "That is the best drawing in the Exhibition," we heard several persons exclaim, pointing to the "Promoted Design for the Bristol Assize Courts," by Messrs. E. Godwin & Chrisp (50); and certainly the authors have given us their work in a most careful brown ink elevation, that looks at a distance like an engraving. Young students, and all draughtsmen inclined to be slovenly, should look at this drawing carefully. Mr. John Foster, in his sheet of fourteen sketches of timber houses and churches in Normandy (4), and in his more finished set of eight well-known churches, also in Normandy (11), is an illustration of a slovenly commencement, and gradual progress achieved by care and finish. The mountainous Welsh districts offer fine opportunities of hold material and site for an architecture that should be, and often is, made cha-

characteristic of the locale; then why plant down a half-timbered Cheshire villa at the entrance to the least easy way up to mighty Snowdon, as Mr. John Ladds shows us he would do in his "Design for Glynrhonwy Lodge" (53)? It is a sound practical idea that dictates the illustration of a fine old parish church by large elevations to scale, like those of St. Nicholas's Church, Great Yarmouth, exhibited by Mr. J. P. Seddon (55, 56). The value of the illustration, however, is less when there is, as in this case, no scale attached. Besides the absence of a scale, the omission of a plan is frequently felt by those who would examine a design carefully. How, for instance, can the merits of Mr. T. H. Watson's design for Small-pox Hospital for the Metropolitan Asylum District, Homerton, be tested from his south view (57)? or such a matter-of-fact building as the Workhouse, Darlington, by Mr. C. J. Adams (181), from his perspective view; or, again, how can we ascertain whether the internal arrangements for the Fever Hospital for the Metropolitan Asylum District, Homerton (also an unsuccessful design), by Mr. T. H. Watson (177), are good, when we have nothing to indicate them in the isometrical view shown? Certainly there are labels on the grass, shown oddly in the drawing against the blocks, to indicate one to be for typhus, a second for scarlet, and a third for enteric fevers, but otherwise the view is absolutely useless.

Mr. J. W. Walton gives us two views of Lower Stoneham Hall, Flintshire, restored by him (109), and plenty of little instructive plans in the corners of the views, by which we can at once see the spirit of the whole design. The adoption of a style which admits of nothing but straight-headed mullions and transoms to the windows throughout, not a single arch of any kind being employed, gives a very prim aspect to the building; and it is a mistake to make the entrance to the house through a room jointly used as a "hall and library." Books suffer readily from damp; and they will suffer in an entrance-hall with an outer door, perchance, in it.

The "unsuccessful" designs of Messrs. Blackmoor & Withers (so they properly name them in the catalogue), for the Baptist Chapel and St. Mark's Church, Sheffield (92, 95, 101, 102), certainly do not meet our views; the one is not unlike a bazaar, and both are damaged by the flashy figures introduced. There is a certain class of drapers'-show-card-artists in all large towns, and Messrs. Blackmoor & Withers have injudiciously sought the co-operation of one of these to slash the figures into their drawing.

Photography is largely employed for this exhibition, and in many cases where taken from buildings completed, with considerable success. We will mention some of the best and largest of them, though they are nearly all well known:—St. George's Church, Doncaster (155, 156), E. Wormald, photographer; Mechanics' Institute, Leeds (191), and Town-hall, Leeds (190), both designed by Mr. C. Broderick. Mr. G. Corson has a set from buildings executed by him in or near Leeds, "Auction Rooms" (185); "Business Premises" (187), and a "Studio and Dwelling, of Edmund Wormald" (188), all in Leeds; the latter has a clever, acute-angled oriol, corbelled out from the first floor, and is an excellent street front, somewhat too Alhambresque in detail to be practical. He also shows the "Entrance Porch" (186), and a "View from the South" (189), of Fozhill, near Leeds:—a very fine mansion for a city magnate, designed by Mr. Corson, with intense Mediaeval fervour, even to the lamp-post.

Mr. G. Tenoffit exhibits one of his characteristic *multum in parvo* designs in "Fernbank, Tufnell Park, Holloway, lately erected" (205). There are few architects who get so much effect out of a plain brick villa for little cost as this author. In the "Designs for proposed Villas and Pavilions on the Manor Estate, South Fyning, and to which first premium was awarded" (207), Mr. A. G. Hennell shows seven little views of villas in the Italian, half-timbered, cottage orné, and what we may term the conservatory styles. Posterity will be sorely puzzled by such a mixture.

"The Middlesbrough Exchange—Interior of Hall" by Mr. C. J. Adams (200), and "Perspective View of the Colston Hall, Bristol," by Messrs. Porter & Wood (195), the interior so crowded with an audience as to make the hall appear about 150 ft. span, have both been illustrated by us. It is a pity that Mr. E. R. Robson has entrusted the "Perspective View of the Municipal Offices, Liverpool" (179), to a stranger to draw. The view, though large, is faintly and feebly shaded; the draughtsman can be neither

an architect nor a colourist; we forbear to give his name, though it is on the drawing. In three highly-finished drawings under one frame—one of entrance-hall and two of a drawing-room—Mr. F. Pantoniuss shows "Series of Designs for the Decoration and Furnishing a Gentleman's Seat in Ireland" (180), in the modernaphael style; an adaptation of the Louis Quatorze style. Mr. Ewan Christian contributes a careful drawing of "Trinity Church, Folkestone, as designed for the Right Hon. the Earl of Radnor, the nave, base of tower, chancel, and south porch of which were completed last year" (75). This is a design that must be seriously affected by the non-erection of the tower and spire. These are placed at the junction of the semicircular apse with the transepts. The lancet style is adopted with much taste throughout, and we have only one objection to make, and it is to the snow-traps formed by joining all the gables over the aisle-windows together. For "Police and Sessions Courts for the City of Manchester, now in course of erection" (77), Mr. Thos. Worthington gives us, in a red brick building, a Venetian tower at a corner, based upon that of St. Mark; varied, however, by the introduction of arched parapets and queer corner turrets at the summit, and by weakening the base in piercing it with a door and window too near the corner for safety to the fabric. It will be an effective structure, nevertheless.

Mr. C. Buckeridge shows some of his quaint and conscientiously wrought-out early Gothic designs, by means of prints by the anastasio process. Unfortunately the plates are so wavy that much of the dignity of the designs is sacrificed. This is notably in "South-west View of Avon-Dasset Church, Warwickshire, now in the course of erection" (91), where the waviness of the paper gives an appearance of the windows and buttresses being out of the perpendicular. In the interior of the same church (152), and that of "Chapel for the Convent (Anglican) of the Holy Trinity, Oxford" (153), Mr. Buckeridge throws his strength upon the ornamentation of the altar and retabulum at the east end. Messrs. Bell & Almond exhibit "Designs for Glass and Decoration for East End of St. Gabriel's, Bromley, Middlesex" (132), and "Design for Glass Decoration for the East End of Shouldham Church" (161). In both of these a very elaborate reredos and retabulum are shown; but as they are not shaded in the elevation it is impossible to tell whether they are to be in sculpture or mere wall-decoration; in the latter subject, some saints painted on the wall-space on each side of the windows look in every respect like stained glass; they correspond almost exactly in treatment with the glass in the window in a line with them. In their "Mosaic Reredos for St. Edmund's, Salisbury, now being executed" (163), the Ten Commandments are introduced. The "Decorations of the Gaiety Theatre" are so well known and have been so often described that we need only mention to those interested in the subject that they will find here a section of the theatre (165), the "Frieze over the Proscenium" (164), and the "Lunettes" (166), as designed by Mr. C. J. Phipps, with Mr. H. S. Marks, the painter, as his collaborateur.

Mr. A. Waterhouse has a considerably larger and finer view of the Manchester Town-hall (117) than that which he shows in the Royal Academy. The point of view is from Albert-square, and the building presents more of a town-hall aspect from this than any other front. In the "First Sketch of the Interior of the Church of St. Barnabas, Oxford" by Mr. A. W. Bloufield (61), we see that he has taken the basilica of San Clemente in Rome as his model, even to the row of apostles on mosaic ground in the upper part of the domed apse. A large cross is suspended by a chain from the second tie-beam of the roof from the East to mark the boundary between priest and people. The ciborium over the high altar is very rich, and the arrangements and decorations throughout are of the highest-church kind. Another author has gone to Rome for an example. The "Church of St. Bridget, Wavertree, Liverpool," now in course of erection; total cost, 6,600*l.* (exclusive of frescoes only); columns of Irish red and black marble; accommodation for 800 (204), by Mr. E. A. Heffer, is a miniature adaptation of the basilica of Santa Maria Maggiore,—flat panelled and coffered ceiling and all. There are two good Italian designs for a mansion to be erected at Mentone, South of France, by Mr. T. T. Smith (197, 202). They are both placed on the terrace of a mountain, both have loggie in towers, and seem to be so little varied as to make us doubt

whether they are not alternative designs. It is not clearly mentioned in the catalogue whether they are both to be erected. Mr. F. Chatfield Clarke sends a pen-and-ink view of a house now being erected at Blackheath for Mr. B. H. Hartley (183). It looks too much like a pair of semi-detached villas. His sheets of office details from works (140, 145) are a little too elementary for an exhibition like this. In the "Selected Design for New Baptist Chapel, Sheffield," sent in competition (110) by Innocent & Brown, we have a clever adaptation of an ecclesiastical building to a corner site upon a hill.

There is a pretty drawing, by Mr. E. S. Cole, of the rear view of the University College building at Aberystwyth, designed by Mr. J. P. Seddon (46). The building is well known on account of its strange fate, and castellated architecture. "Competitive Design for new Church at Walsall" (27), by Albert Hartshorne, is modest in design, and of a pleasing tone, for it is apparently proposed to be of red sandstone.

Selecting for commendation briefly the strictly archaeological or pictorial works,—*"Les Halles, Ypres"* (1*A*); *"Whitby Abbey"* (1*B*), by Mr. G. E. Street; *"French Châteaux, traced from original drawings"* (7) (excellent examples of the style); the *"Pen-and-ink Sketches of Boxgrove, Supton, and Clymping Cburches, Sussex"* (15), W. Young; *"Rue St. Jean, Gaen"* (21); *"Dol, Brittany;"* and *"Dinan"* (22), by A. Darlyshire; and the photographs and chromo-lithographs of Russian buildings and views, contributed by Mr. Wyatt Papworth,—we come to the photograph of the "New Central Station, Leeds" (now being completed for the Great Northern Railway Company (259), by Messrs. E. N. Hadfield & Son, and which we have before now described).

There are some good photographed specimens of Mediaeval sculpture, by Theodore Pfyffers, W. Theed, and J. F. Roulferr; also some elaborate coloured views by Mr. Thomas Allon; and completing our review by gentle reference to the series of designs for different subjects by members of the Class of Design of the Architectural Association, upon screen No. 3, amongst which should be noticed Mr. R. F. Deal's designs for a warehouse for a river front, we close in the assurance to our readers that though there is nothing very startling in the collection, there is yet a large amount of varied work, and that with Mr. Petit's collection it well repays a visit.

THE SITE FOR THE LAW COURTS.

MR. LAYARD, on Monday night, brought in the Bill for changing the site of the new Law Courts, and repeated the arguments advanced by Mr. Lowe on a former evening, when he first suggested the change. The Carey-street site, he stated, with approaches, would cost 4,000,000*l.*, while Mr. Tie's plan to separate the Offices and Courts would cost 2,710,000*l.*, and Sir C. Trevelyan's 3,250,000*l.* But the more moderate plan contemplated by the Government on the Embankment would only cost 1,600,000*l.*—600,000*l.* for the land, and 1,000,000*l.* for the building,—and that this would not be exceeded Mr. Layard pledged his reputation. The site was the plot of ground bounded on the north by Howard-street, on the south by the Embankment, on the east by the Temple, and on the west by King's College. It was six acres in extent, and on it could be built, in a line with Somerset House, eighteen courts with their offices, with the capacity of extending either offices or courts northwards as necessity arose. Mr. Layard explained the various advantages possessed, as he thought, by the new site; such as the facility of approaching it by road, river, and rail, &c., and he said that its adoption would lead to no delay. The plans and drawings for the Carey-street site would not be ready for a year, and by this Bill it was proposed to suspend the Standing Orders and proceed as if notices had been given in November last. The Government would be bound to exercise its compulsory powers by July, 1870, and there would be no delay, as the Duke of Norfolk, who owned most of the land, was understood to be anxious not to throw any difficulty in the way. Among other recommendations, he mentioned that he was negotiating for the sale of the Carey-street site for the price given for it, and that the style of the new building, for which the plans and drawings would soon be ready, would most probably be Italian Gothic, as Mr. Lowe's notion of utilizing Inigo Jones's facade had been given up.

Sir Roundell Palmer gave notice at once that

he would move the rejection, on the second reading, of what he characterised as the worst scheme yet proposed, and the certain ruin of a great public improvement. He warmly defended the Commissioners against Mr. Lowe's charges of extravagance and reckless inflation of the original estimates, and made an animated attack on the new plan. It had no approaches east or west; its levels were bad; it would advance to the very edge of the railway cutting; it would block up the Strand; and the building, put down in a hole where nobody could see it except from the river, would be no ornamentation to the metropolis. The profession was almost unanimously, and certainly by a large majority, against it; and finally he declared that there was nothing he would not do to upset the plan.

The bill was brought in.

The present plan of the Government offers no single excuse for the change of site: even the arguments that were used to support Sir Charles Trevelyan's original site disappear. If a smaller building than was at one time thought necessary will suffice, it can as well be placed on the Strand (or misnamed Carey-street) site, already in our possession, as next the Embankment, and with infinitely better effect with reference to the adornment of London than if it be buried behind the houses on the south side of the Strand. The land already bought offers a noble position for a noble building; and its superiority with reference to the greatest convenience to the greatest number is so universally admitted as to require no argument.

THE EXHIBITION OF THE ROYAL ACADEMY.

If there be no great increase in the number, no great accession of particular interest in the nature of the works exhibited this year by the Royal Academy in their splendid new home, compared with those of former times, when their local habitation was less worthy of their name, it certainly appears to be a longer day's work than ever used to be the case, to see all that is to be seen. This is partly attributable to the fact of every picture included in the collection asserting a right by its position to a thorough examination; so many are to be seen, and so well worth seeing, and of these a few of superlative excellence grace the fine galleries, though it happens that both members and associates are more generally represented by the numerical strength of their contributions rather than by examples that precedent would allow individual reputation to rest on.

To inaugurate the new era, to commence the second century of the Academy's existence with a production that will help to commemorate it, Sir Edwin Landseer has specially distinguished himself—even in comparison with himself—by the more than renewed power manifested in his chief work. "The Swannery invaded by Sea-eagles" (120) is a magnificent attestation of consummate skill; wonderful for the force of its representation. Its reality gives it that eloquence an Æsop would fail to impart to birds that speak in fable, if he attempted to describe in the epitome tyrannic and unexpected invasion. The peaceful swans have fought to the death in defending their "arch-necked princesses" and their little ones; it is almost possible to hear the flutter of blood-bedahled wings and the scream of the eagle struggling in its efforts to rise in the impotence of a broken pinion. Even whilst most admiring the unparalleled ability displayed in the depiction of savage onslaught, its very truthfulness exacts something like distaste with the astonishment at all its marvellous perfection.

Two slight but masterly studies of lions (30 and 32), and a brace of setters complacently watching a covey of birds on "The Parnigan Hill" (224), are further examples of Sir Edwin's wonderful dominion in animal painting, of the perfection attained in the use of the brush, never yet excelled, and of the aptitude for giving vitality to everything zoological he may select for his exercise.

Mr. Millais maintains his right to be considered thoroughly original; he is of those who recognise grandeur in simplicity: his full-length portrait of "Nina, daughter of Mr. Frederick Lehmann" (127), is a charming picture, a work of extraordinary heauty: the faculty of direct imitation chastened by rare taste in the adjustment of whatever is to be imitated, is evident in it. With him everything is paintable, any arrangement of colours perfectly practicable for the most agreeable results. He has been fortun-

nate, too, in his sitter,—a type of fair golden-haired childhood, who is posed in the most natural of attitudes, with innate grace enough to account for it. The little lady has become the gem of such an artistic setting as would enhance the lustre of the brightest. In direct opposition to this, the fancy portrait of "Vanessa" (357) has afforded him an opportunity of showing how he can manage to harmonise the most intensely positive of colours; for, in spite of the gorgeously embroidered drapery, the head is very life-like, and so forthily painted as to assume its right of being first considered; though the former work, with its exquisite refinement, derived in great measure from the inimitable combination of delicate hues and tones, is by far the greater achievement. Mr. Millais was quite independent of adventitious aid in making a picture of Mr. John Fowler, the engineer, and a very valuable one (225), for it is a likeness stamped with the simplicity of direct resemblance. "The Gambler's Wife" (104), in sorrowful contemplation as she stands in the lately vacated room at dawn, examining the cards, the instruments of impending ruin, is pathetic without being sentimental, and with two highly-finished water-colour drawings, well supplements Mr. Millais's more important contributions.

Mr. Macdonald is very conspicuous in a composition that exhibits some of his best characteristics,—*"King Cophetua and the Beggar-Maid,"* for whom he was "glad and faine" to stultify his expressed disdain for "lovers' looks" (171). The king, seated in his tent, or rather at the entrance of it, is regarding with novel interest the fair object of his very impulsive matrimonial intentions; for she is very fair and winsome, though in rags, and hiding his cup-bearer to fill him the wine, with which he prefaces the declaration that,—

"She shall be queen this beggar may do,
If she'll not say me nay."

His armed warriors, courtiers, and attendants, are variously influenced; some seeing at once, others unable to comprehend "what there really is to see in the young woman." As usual, minute elaboration pervades this picture; and the skilful drawing, wealth of accessories, and invention of ornamental detail, are as remarkable as in any preceding instances of their employment.

Mr. Frith has been diverse in his choice of subjects: one from contemporary domestic history, an episode of old, new, and ever-recurring events, for it happens to most men with marrying prospects. In "Hope and Fear" (82) are two subjects of the hind god's atonement in one frame—in a frame to become one, subject to papa's approval, which is being requested with a proper degree of earnestness by a very nice young gentleman of eligible appearance; but papa has arrived at that age to know that appearances are deceitful; he has long ago learnt the price of bread and butter, and babies' shoes, and hesitates whilst cogitating on the proposal, for he has too many hooks by the best authors in his well-furnished library not to be very clever and wise, and is one of the least likely to be addicted to sensational romances. Harriet Georgina—for she has a nominative expressiveness about her besides the nominal—fears he would hesitate, and has sought shelter and sympathy in the drawing-room and her mamma's arms. It need scarcely be told how nicely and naturally Mr. Frith has related this chapter from the volumes of every-day interest, or how much his relation with the two positions—the one awful, and the other fearful—has increased their intensity by illustrating them so admirably. His principal work "Altiadora, pretending love for Don Quixote, feigns a swoon at the sight of him" (123), is very finely painted; the figure of the impostor—though it appears rather disproportionately small from the waist to where the feet would be—and the imposing figure of the imposed-upon Don, are specially distinguishable for extraordinary technical value. Still more power is exhibited in a capital portrait of "A Man in Armour" (253), one of the very best portraits in the galleries.

"Nell Gwyn" (291) "selling oranges and pippins, with pertinent wit, gratis, to liberal fops who would buy the first and return the second with interest," as Dr. Doran says, will scarcely realize a conception of the archness and captivating charms of this "smartest and most audacious of orange-girls" she has not the look of the period to indicate her attractiveness for the swells who so

delighted in her impudence. The costumes are very brilliant and tasteful, with the exception of Nell's, which appertains more to the country than the town. A smaller picture, of the scene from "Twelfth Night" wherein Malvolio, married to the countess in imagination, soliloquizes (391), shows the same dexterity, the manipulative proficiency attained by the painter that has made him so popular.

Mr. Faed always secures a wide circle of appreciators by his appeal to common sympathies. The poor little crossing-sweeper, who, "Homeless," is sleeping in unhappy ignorance of rent and taxes on the steps of a porched doorway (73), whose unconsciousness of water-rate and of what the meaning of soap may be, have made him in his wretchedness and ragged attire, an object of interest to so many more than the policeman treading his beat at dawn of day, and blinking in the lamplight as creatures deprived of natural rest, and forbidden to take even forty winks on a doorstep, are wont to do,—is, by the aid of Mr. Faed's most fascinating style of depiction, raised to poetic significance. N.B.—Why have painters never made a hero of a policeman? Anybody in the class answering the riddle may "take us up."

Look, too, at the old pedlar-woman, who has "Only Herself" to care for, or take care of her, and sighs for social intercourse (119); "Alone with Her Thoughts!" As a song may awaken some scenes long forgotten—some haunts long forsaken,—so the laughter of childhood has brought back her home. But, alas! for the vision! she's alone—all alone. Mr. Faed has never succeeded better in enforcing the gist of his appeal, than in these expressive types of homelessness and loneliness. The command he has of executive means enables him to do wonders in the most ordinary appliances of them; as in "Letting the Cow into the Corn" (205) he represents a Scotch lassie indulging in a day-dream; or in "Faults on Both Sides" (231), a couple of peasant-lovers, who have quarrelled for the pleasure of making it up again; or in the impersonation of shrewd Scotch character (264), "Donald Mac Tavish;" all these indicate his capability of making much of very small matters.

Mr. Elmore is another who glories in a style: rich colour and strong opposing effects have given great force to his "Judith" (395); painted life-size, as standing at the entrance of the tent from which artificial light is illuminating the shadows cast by the stronger light of the moon, she appears stealthily approaching to wreak her vengeance on Holofernes. "Katherine and Petruchio" (164), however, are not lifted out of the ordinary level of their usual representation by any extraordinary conception; finally drawing has in some degree counteracted the worth of clever painting. "Home Life in Algiers" (229), and "Algerine Jewesses" (462) testify to their probable naturalness by their peculiarity of characterization, and are, besides, very carefully and cleverly portrayed. Mr. Elmore's other contributions are, a young wife "Watching and Weiting" at dawn, for her husband's return (95); "A Sketch from Nature" of a young lady sketching from nature, very bright and decided in its rendering (823); and a fine portrait of "John Simon, F.R.S.," medical officer of her Majesty's Council (879).

Mr. Leighton stands alone this year for the academic knowledge and ideal grace with which he qualifies his study and treatment of the nude. He has several large subject pictures conceived in classic taste, and although derived from dead language he invests them with sufficient vitality to realize them for general apprehension as facts. "Helios and Rhodus" (864) illustrates one of the mythic identifications of islands with nymphs who are lovely and of course loved, and gives a name and a purpose for a fine picture; "Dædalus and Icarus" (469), who revive the antique in form and physiognomy; and "St. Jerome" (377), his diploma work, with the saint kneeling in prayer before a crucifix; and, last and best for good drawing and agreeable colour, "Electra at the Tomb of Agamemnon" (705), are his other contributions.

Mr. Calderon has managed to give some novelty to his handsome pair of lovers, who are in a boat drifting down the stream, whilst the gallant rover is resting on his oars, gazing at the proud beauty who has enslaved him, and "Sighing his soul into his lady's face" (128), and she, with downcast eyes, trails a lily in the water, for the sake of having something to do, as they float along. The fifteenth-century costumes, picturesque boat, and the admirably manner in

which it is painted, makes this a very favourable example. "Catherine of Lorraine, urging Jacques Clément to assassinate Henri III." (67), is another and more ambitious performance by the same artist: the character and expression of both actors are very appropriate to the situation, which is a very dramatic one, and the work is distinguished by rich subdued colouring, and solid masterly execution, though the drawing is faulty in parts that would soonest betray it; the hands of the monk appear to be very large. (643) "The Fruit-seller," a water-colour drawing, would scarcely be taken for Mr. Calderon's.

Mr. Lewis is to be seen in unusual force; the marvellous intricacy of his pictures is positively bewildering. The interior of a baron at Cairo, with "an intercepted correspondence" to put into extra flutter its occupants, if their imperturbable natures could ever allow them to be in any flutter at all, is the most elaborate of them. A young girl has been detected in establishing communication, by means of flowers, with some one she prefers to the old Turk, her lord and master, and who is giving her a lecture on her impropriety, disclosed by a black slave with the last floral *billet-doux* in her hand as evidence in proof, while the other ladies of the seraglio are looking on with various degrees of interest expressed. Some think it good fun; others think the delinquent will not find it so, and are very glad of it—for there is such a thing as a jealous woman in Turkey, though they do live in such a united happy-family kind of way with cats and gazelles: one languid lady evidently thinks her a fool for being found out; but, after all, the wonder at the achievement is not created by the subject of it, but by the rendering of the accumulation of objects represented: the most opposite of colours in dazzling brightness brought in contact; the most elaborate embroideries, decorations, lattice-work, and a profusion of rich materials of all descriptions, with patterns it takes patience even to examine, are all precisely given with more than photographic fidelity.

Mr. Hook has painted, on rather a large scale, some "Cottagers making Cider" (124); the composition is as unpretentious as its title, for he has relied on the rare power he has of conveying absolute naturalness into all that he represents, in preference to a more sophisticated attempt at picture-making for gaining interest. However, the sturdy peasants engaged in the operation, the rude mill and press, with other implements used in the process; the apples of many a sort, and the landscape to be seen from beneath the cart-shed that shelters all the cider-makers and the cider-making, are of that picturesque nature that the result, as added by the artist, is a very agreeable one, besides being an example of Mr. Hook's peculiar forte. Two children perched on the rocks, "Caught by the Tide" (332), and signalling a distant boat, are surrounded by a sea that is a perfect triumph of representation; and a happy fisher family preparing for breakfast in "The Boat" (217), their fresh residence—"It served them for kitchen and parlour and all"—are delightful in their freshness, their pure natural truth.

THE DISTRIBUTION AND AGRICULTURAL USE OF TOWN SEWAGE.*

For the last eight years I have studied deeply and carefully the question how to dispose of the sewage of London; and my pecuniary stake in the successful solution of this question has been and is so large, that it is, perhaps, the best guarantee that I have left no stone unturned in my endeavours to ascertain the truth. The various experiments conducted by the Metropolitan Sewage Company, both at Barking Creek and on their experimental farm a little beyond Barking, as well as those conducted by myself on a smaller scale on my own land, have given me an opportunity of acquiring knowledge in this particular branch of agriculture, which, I believe I may safely say, no one else has enjoyed; and it is only the consideration of these exceptional advantages which has made me presume so far as to address the Institution of Surveyors on such a subject.

In considering the utilization of sewage by irrigation, we may usefully divide it into three heads;—first, *Conveyance* of the sewage from the town to the country; secondly, *Distribution*

throughout the district proposed to be irrigated; thirdly, *Application* of the sewage to the actual soil or crops.

Now, with regard to the first question I need say very little. An experienced surveyor will naturally avail himself of the readiest means at his command for conveying a large body of noxious liquid from one district to another. He will be guided by local circumstances and local materials in designing his work, and the nature of the work will, in some degree of course, also depend upon whether the levels of the ground permit of gravitation either by purely natural fall, or by means of a short lift, or necessitate forcing by expensive machinery. I will merely remark that there is of course a great convenience for distribution in what I may term the luxury of pressure. If the main culvert or sewer be an iron pipe of any description, through which the sewage is forced by powerful engines, it becomes a very easy and simple matter to attach a pipe at any point for supplying any land, no matter where situated; but if the main outfall conveys the sewage by gravitation only, then the sewage can only be distributed by the same means, and of course can only be taken to land on a lower level than the outfall, and this, in many places, becomes a most serious difficulty.

But this brings me in fact to the consideration of the second division of the question, namely, *Distribution*.

The distribution of the sewage of a small town of 10,000 or 20,000 inhabitants is a simple enough affair, for it is distributed on one farm only, and that farm is of course chosen so as to be more or less in a ring fence; but if it is desired to deal with the sewage of a great city, most more contriving is necessary. For short distances and low pressures, earthenware pipes may sometimes be used for the lateral channels, but they are not satisfactory; and it must always be recollected that the bursting or leakage of a sewage pipe is a somewhat serious affair, even in the country. Iron pipes are, of course, always the hardest and neatest things to deal with, but they are expensive. Earth ditches are perfectly effectual, and are, perhaps, the most convenient of all for communicating with other minor branches; but unless the lie of the land coincides exactly with the fall required to be given to distributing channels, the earth ditches soon become very expensive in construction, and wasteful in the space occupied. And in view of the several difficulties and drawbacks attending the use of either ditches or earthenware or iron pipes, I have devised a new method of distributing sewage, which, I think, is likely to prove useful in some localities. It is very simple,—consisting merely of sheet iron troughs, with a semicircular section, supported upon rough wooden legs of any required size and length. Such iron troughs, at whatever elevation from the ground,—and in most cases a very few feet are quite sufficient,—occupy no more space than a ditch would occupy when running with a fall coincident with that of the land itself. Therefore, there is no permanent waste of land in a broad embankment, and the outlay becomes less than the outlay in constructing a raised up ditch when a very few inches in height are attained. If any unusual height is necessary, to bridge over a hollow for instance, the section of the trough may be slightly altered, and, instead of being semicircular the diameter may be diminished, and to the prolongation of the sides of the smaller semicircular trough thus formed may be riveted stronger plates to act as girders, and so the original sectional area would be preserved. With troughs so constructed, having a few angle irons bent all round them outside, a very strong and durable kind of semitubular bridge would be obtained. I may mention that I have made an experiment with about a mile and a half of semicircular troughing far thinner than that which would be used in a permanent work, and that this troughing is placed at an unusual height, being for a great part of its length from 16 ft. to 22 ft. above the ground. It is, moreover, in a most exposed situation, and has, nevertheless, stood all the severe gales of last winter without the very smallest sign of giving way.

Difficulties for the first few years may arise in arranging for the distribution of the whole sewage of a large town over a wide area of land, if there are a few obstructive people in the area who fancy that they could make more by standing out and refusing to take the sewage, than by taking it, if compulsory powers have not been obtained. But, even in this case, it would be a pecuniary rather than a physical

difficulty; for, in the neighbourhood of any large town, the country roads are always numerous, and power may always be obtained from Parliament, on the precedent of the Metropolitan Sewage Company's Act, for conveying the sewage in pipes under and along the line of roads. There need, therefore, be no greater difficulty in designing the different channels by which the sewage of a large town may be distributed to any given number of farms, than there is in an analogous kind of work which has been executed by very many gentlemen now present, namely, draining several separate estates into one common outfall. It is simply inverting the process, and, instead of collecting the water from the various estates into one main channel by which it would run away, bringing the water down the one main channel, and then distributing it over the various estates.

Now, with regard to the purely agricultural question of the application of sewage to the soil or crops. I have seen and heard a great deal of vague and loose writing and talking on the different modes of laying out land for irrigation, but further experience has only served to confirm me in my original opinion, that the proper way of laying out land for sewage is, wherever the fall of the land will at all permit it, to lay it out in rectangular "panes," or lands thrown up to a ridge in the centre, a small carrier of say 8 in. or 9 in. wide being cut along the top of the ridge, by which to irrigate the land. This system combines many advantages, and so far as I see, presents no drawbacks. First of all, the rectangular form admits of easy and simple cultivation by horse and steam power, without turn-wrest ploughs, or any other special apparatus, and this of itself is so great an advantage as almost to outweigh anything that could be urged in favour of any other system. But this is also the cheapest way of laying out land; for it is manifest that from the ridge to the furrow there will always be a sufficient fall for the flow of the sewage; therefore the actual watering of the plants can be done with certainty and regularity, and all that requires to be attended to is the fall to be given to the carrier in the ridge, and to regulate this, unless the land is either very flat or very irregular in formation, very little soil need be shifted, except along the line of the ridge. Moreover, if, during the first year that the land is laid out, there may be a little too much fall from the ridge to the furrow in one place, or rather too little in another, owing to the shifting of the land to fill up hollows and level rises in the length of the ridge, this irregularity will be diminished every time that the land is worked, and so, in the course of a few years, will gradually disappear. Last year I laid out a small experimental field, of some nine acres, on this system under peculiar disadvantages, as the point to which alone I could bring the sewage was slightly lower than most other parts of the field; and although there was very little difference of level in any part, yet such difference as there was, was against me. The field was also irregularly shaped, one of its sides being more than twice as long as the opposite side, and one of its corner angles very acute, and another very obtuse; but, as I ran my lands so as to abut upon or tail off on the side between these two angles, this difficulty vanished; for, of course, it did not the least signify whether the end of each land was square or not. I also laid out the lands of slightly varying breadths and of an increasing slope, beginning with a very flat land and rising to a very steep one,—the last land having a fall of 1 in 10 from the ridge to the furrow. The most convenient size of land is 40 ft. or 45 ft. wide from furrow to furrow, with a slope of 1 in 20 from furrow to ridge. The best mode of conducting the work in laying out lands in this way is, after any small amount of cross ploughing or filling up old furrows, and other similar work that may be necessary, has been got through, to plough the land into ridges approximating to the desired height. These ridges should then be rolled very heavily, when it will be seen whether or not their fall is sufficiently continuous to admit of a carrier being dug in them as they are; and if it is found that any shifting of earth is required, the rolling of the ridge will have answered the purpose of making the carting lighter. You will observe that the simplicity of this mode of laying out land, as compared with attempting to alter the levels of the entire surface of a field, is very great; the labour is, in fact, minimized, and, moreover, for the future cultivation of each

* From a paper by Mr. William Hope, read at the ordinary general meeting of the Institution of Surveyors, on May 3rd.

individual crop, the form of lands which I have described is, I find, very convenient. Of course, the size of each land is known with accuracy; therefore, all the future cultivation, whether ploughing, or hoeing, or weeding, or harvesting, may be done by piece-work, and the quantities of sewage applied and the bulk of produce obtained can be checked and ascertained with very great ease; and thus the farmer has a better opportunity of finding out the exact profit that he makes upon any particular crop.

With regard to the cost of such laying out, this must, of course, depend upon the prior formation of the ground; but my friends, Messrs. John Fowler & Co., hit at any time be happy to undertake throwing up the ridges for 11. an acre; and of course the money, whatever it may be, spent in forming these ridges is practically in substitution of the ordinary ploughing that the land must receive,—so that this part of laying out the land may practically be done for the cost of, perhaps, one extra ploughing.

We will suppose, then, that as suitable a district as possible, both with regard to the quality of its soil and the general lie of the land, has been chosen for the application of the sewage of a town, and that the land has been laid out in ridges, as I have described. There remains, then, the question over what area and to what crops to apply the sewage; and, clearly, the area on which it is applied must depend, in some measure, upon the crops selected. One important crop must always be grass; because this is the only crop that is always on the ground, and always more or less in a growing condition. It is the only crop, therefore, to which sewage can be applied more or less usefully on all days in the year; and, wherever any large quantity of sewage is to be disposed of, there is always a population to consume grass, whether in the form of meat, or of dairy produce, or of horse-labour.

A very considerable quantity of the sewage of any town can, therefore, always be used in the production of grass, without any danger of overstocking the market. The experience that we have had, both at the Lodge Farm, in the occupation of the Metropolis Sewage Company, and on my own experimental field, shows that sewage is equally applicable to cereal crops as to grass, green crops, and vegetables; but, no doubt, a greater return per acre can be obtained by the production of the latter, because a greater quantity of sewage can be utilized by them than by cereals, and, therefore, it is desirable that the bulk of the sewage should be applied to either grass, green crops, or market-garden vegetables. But, in a case where sewage is carried to a considerable distance from a town, into a purely farming district, experience proves that sewage is quite as applicable to cereal crops as to any other during the periods of the year when it can be so applied; and in the early spring, before the summer green crops are sown, probably sewage may be more usefully applied to winter wheat and oats than to anything else. The third crop of wheat, on the same land, the third year running, can now be seen growing, and apparently very healthy, upon a poor gravel at the Lodge Farm; and this result has been obtained exclusively by the use of sewage, and of a surprisingly small quantity. Last year there was a very fair crop indeed of 5½ quarters to the acre, and the sewage applied was only about 500 tons,—equal, in round numbers, at a penny a ton, to about a couple of guineas; and the first year that we tried sewage upon wheat, it was put to one portion of the same field which looked particularly bad. Two portions of this field were carefully measured, and one was left as it was, and the other was sewage with about the same quantity of sewage as mentioned before. The result was very remarkable. The unsewaged portion gave 3 loads of straw to the acre, and 3 quarters 5 bushels of grain; the sewage portion gave, as was naturally to be expected, a large increase of straw, 4½ loads to the acre, or 50 per cent. of increase; and the figures of the grain were still more satisfactory, being inverted—namely, 5 quarters and 3 bushels to the acre.

We should now consider the quantity of sewage per acre which may be usefully applied to crops of grass, roots, and vegetables, to which the main bulk of the sewage must always be applied. With regard to grass, I have frequently had controversies with various persons, including some well-known agriculturists, as to the proper kind of grass to which to apply sewage, and also as to the proper time of sowing the proper quantity of sewage to be applied, and the result to be

looked for. Some persons have imagined that sewage can be beneficially applied to ordinary natural grasses year after year, and they cite the Craighintny meadows at Edinburgh as an example; and cases have been brought to my notice where I myself have been quoted as supporting this notion; but it is an idea which I am altogether opposed to. The water and manure, which together compose sewage, stimulate the growth of all the hardier and ranker kinds of natural grasses to such an extent that in the course of time they choke and kill out all the finer kinds, and the grass becomes the rank, nasty stuff that we see at Craighintny.

Many persons imagine that sewage cannot be applied to any crop, without positive injury, during hard frosts or snow; but this is not the case. The sewage is always above the freezing point, and more so than ordinary running water. The actual contact with the sewage must, therefore, be beneficial to the plants, in protecting them from cold.

The water supply of London, as proved by the official returns, exceeds thirty gallons per head per diem. This would give upwards of 48 tons of sewage per head in the course of the year; so that, if we take 50 tons as an easy calculation in round numbers for the quantity of sewage per head flowing out of any town, we shall not be very far wrong. In this way 5,000 tons would represent the sewage of 100 persons; so that, as the sewage of 100 persons is the maximum amount that can be properly utilized by a crop of Italian rye grass, and as the rye grass can be grown only once in two years, we should get fifty persons per acre as the maximum proportion of population which is at all safe to apply. But, of course, it never would suit the convenience of any farmer to grow nothing but a never-ending see-saw of Italian rye grass and potatoes.

With regard to other crops, we have grown 52½ tons of mangold wurzel per acre at the Lodge Farm from the application of 1,100 tons of sewage to land which was completely worked out by white crops. Now 1,100 tons would be equal, according to the same rough calculation, to the sewage of only 22 persons per acre; but I do not at all say that this is the proper quantity to apply to such a crop as mangold wurzel.

When I talk of 70 tons per acre as a weight of mangold which ought to be obtained every season by the use of sewage, it is not such an unreasonable thing as it at first appears. And if we apply 2,000 tons per acre to a crop of mangold, it would be equivalent roughly to one acre for every 40 persons; and my own opinion is, that some such proportion should be the very minimum of land which should be laid out for the utilization of the sewage of any town. And it would be greatly for the advantage both of the town and of the farmer if an increased area were put under, at all events, the possibility of irrigation; for, how often would not the farmer, if his land were laid out for it, be only too glad to give an occasional dressing to a crop of wheat that looked sickly after the March storms, to a crop of turnips that he was afraid of losing from the fly, or even to a crop of potatoes in such a summer as we had last year?

And now a few words as to the money value of town sewage. When used for market-garden vegetables its value is exceptionally great, as the vegetables produced are of the finest possible quality; being grown with maximum rapidity, on which the quality of vegetables specially depends. Now it is well known that market-gardeners apply from 10L. to 20L. worth of solid manure to the acre, around London, at all events; while, to produce the finest crops of cabbages, cauliflowers, or celery, only takes from 500 to 1,000 tons of sewage, according to the particular species of seed used, and the particular age at which it is desired to send the crop to market. Taking, then, the highest of these quantities, or 1,000 tons, as equal to the lowest value for a garden dressing of ordinary manure, or 10L. an acre, we should have a total value of 2,400 pence for 1,000 tons of sewage, or nearly 2½d. per ton; and I have no reason to suppose that this is at all beyond what a market-gardener could afford to pay, having regard to the superior result which he obtains. And it is somewhat curious that this value does not differ very considerably from the only reliable valuation that was ever made of the chemical ingredients in town sewage. To be on the safe side, I have always taken 1d. a ton as the standard price at which the Metropolis Sewage Company should sell the sewage to the farmer; and a very few

rough calculations will show that this is a very safe estimate indeed.

To take the case of Italian rye grass. We have seen that 90 to 100 tons of grass ought to be grown from 5,000 tons of sewage in the course of one entire growing season. Now, 5,000 tons at 1d. are equal to 20L. 16s. 8d., to which we must add, say 4L. an acre for rent and taxes; 1L. an acre for application of sewage, interest on improvement expenditure, and other small items; the mowing of ten crops a year by machine (for which I may mention the rye grass is particularly suitable) at 3s., 1l. 10s.; carting 100 tons to the homestead at 6d., 2l. 10s.; or a total of 29l. 16s. 8d.—say, 30l.

If we take such a crop as mangold-wurzel and apply 2,000 tons at 1d., we have a charge for sewage of 8l. 6s. 8d. per acre; taking the same figures of 4l. for rent and taxes, and 1l. for application of sewage, &c., 80s. for cultivation, 10s. for seed, 10s. for hoeing, and 70s. for harvesting 70 tons of roots, we have a total charge of 19l. 6s. 8d. per acre, and taking the same price of 15s. per ton for the value of the food obtained, we have a total yield of 52l. 10s. per acre, or a net balance to the farmer of 33l. 3s. 4d.; and I think you will all agree that, as we have produced 52½ tons of mangold at the Lodge Farm from 1,100 tons of sewage, I am not going too far in reckoning upon 70 tons of mangold from 2,000 tons of sewage.

It may be objected that I am dealing with the sewage of a great city, and not of a small town; but though the rainfall is less in London in proportion to the population, yet the water supply is greater, and the two together give 75 or 80 tons of sewage per head per annum instead of 50; so if this diluted sewage is of the value I have described, an acre of sewage equal to only 50 tons per head per annum cannot be worth less. Now, 50 tons at 1d. are equal to 4s. 2d.; at 2d. 8s. 4d.; and at 2½d. 10s. 5d.; so that as the urban population of England, living in towns of 2,000 inhabitants and upwards, exceeds ten millions, and as almost all these towns are duly polluting the rivers in conformity with the "Town Improvement Act, 1847," they are propagating scarlet fever and typhus at a direct cost to the towns of five millions a year, in addition to the indirect loss to the land and to the working classes; so that we may reckon the loss to the country in gold exported to pay for foreign manure, grain, beef, mutton, hides, wool, hagon, butter, and cheese, at not less than fifteen millions sterling annually.

GENERAL MEETING: INSTITUTE OF BRITISH ARCHITECTS.

The report of the council read at the annual meeting, on the 3rd inst., showed that the Institute, in regard to the steadily increasing numbers of its members, and the condition of its funds, continues to prosper. The present number of fellows is 264, and of associates 214, making a total of 508. In other classes of membership the numbers are as follow:—13 honorary fellows, 9 honorary members, and 78 honorary and corresponding members, making, with ordinary fellows and associates, a total of 608 members. There are also 10 contributing visitors, 9 students, and 10 temporary students.

We give two or three paragraphs from the report:—

"Several meetings of the Professional Practice Committee have been held to deliberate on important questions, both of a private and public nature. In December last they received a deputation from the London Builders' Society, who were desirous of submitting, for the consideration of the Institute, the details of an arbitration clause proposed to be incorporated with future forms of contract. In the course of the conference many points were raised, which rendered it desirable that the professional relations between architects and builders, as well as between builders and their employers, should be discussed *in extenso*; and, with this object in view, a sub-committee was appointed, who, after collecting from various sources sufficient material for their purpose, will shortly report the result of their labours."

"The Committee for the 'Conservation of Ancient Monuments and Remains' has, happily, had but few instances of threatened destruction or neglect brought before its notice within the last twelve months. It has, however, tendered its advice on some matters of importance, and generally with a satisfactory result. The preservation of the Church of St. Mary Somerset, in Thames-street, one of the works of Sir Christopher Wren, which was proposed to be removed during the recent alterations in the City, may be mentioned as an instance in which the timely intervention of this committee has been successful."

"The question of artistic education for architects, after a lapse of some years, was again revived at the last annual meeting of 1868. It is necessary to explain that, although the consideration of this subject originated with the members of the Institute, it was left, so long ago as 1862, in the hands of a general committee, consisting of members

of various art societies, &c., in which the Institute was only represented by delegates. A meeting of these delegates was therefore held in November, 1868, and the general committee was re-elected to assemble, and has since held several meetings."

"In regard to the library, now comprising what may be fairly described as the most valuable collection of works on architecture in London, the completion, during the past year, of purchases made with the president's donations (by adding about 170 volumes of English and foreign architectural works of great interest and value), has formed an important epoch in the history of the Institute. The supplementary catalogue issued at the beginning of the present year includes all these works, and their arrangement under the headings of 'Author' and 'Subject,' greatly facilitates reference; this catalogue also includes every work added to the library from the session 1865-66 to the end of the session 1867-68."

"The department of architectural drawings, prints, and photographs has not been forgotten. The librarian is now engaged in making a catalogue of this valuable collection, which will soon be conveniently arranged and made accessible to members. Attention is specially directed to a list, about to be reprinted, of works essential in such a library, but still deficient. Among others may be mentioned those required to complete the volumes of Piranesi, and certain editions of Vitruvius."

"The collection of casts possessed by the Institute, and hitherto preserved in one of the basement rooms, has been offered as a loan to, and as such accepted by, the authorities of the Architectural Museum, where they will be more accessible for inspection. The opening of the new buildings of the museum at Westminster is a matter for congratulation, not only to the zealous promoters of that undertaking, but to the profession at large, and the council trust that, while it will undoubtedly prove advantageous to the student, it may also tend, in conjunction with other institutions, to develop public interest, and educate national taste on the subject of architecture, in regard to its artistic as well as its antiquarian aspect."

The balance-sheet showed the sum of 2,382*l.* 8*s.* 3*d.* on the receipt side, and 86*l.* 13*s.* 6*d.* less on the disbursement side. The statement of assets and liabilities showed a balance of 8,318*l.*

The following office-bearers were elected:—

President, Mr. W. Tate, M.P.; vice-presidents, Messrs. C. Barry, Clarke, and L'Anson; honorary secretaries, Mr. Wyatt Papworth (in place of a gentleman proposed by council) and Professor Donaldson (foreign correspondents); ordinary members of council, Messrs. Christian, C. F. Hayward, Edmeston, Marzable, C. G. Nelson, Pearson, South; (new names) Blomfield, Curry, C. Fowler, E. W. Godwin, Hakewill, R. J. Johnson (New Castle-upon-Tyne), Worthington (Manchester), and Broyne, Edinburgh; treasurer, Sir W. R. Farquhar; honorary solicitor, Mr. F. Overy.

Mr. Henry Baker was placed on the District Surveyor's Examination Board in lieu of the late Mr. Ashpitel.

SALISBURY CATHEDRAL RESTORATION.

A REPORT from the dean and chapter has been laid before the cathedral restoration committee. The following is an abstract from it:—

"The restoration of the exterior of the cathedral, commenced by the dean and chapter in 1863, and continued since 1864 by the aid of a public subscription, is at length on the eve of completion.

The first operation was to consolidate the foundations with fresh concrete. The stonework was then repaired or renewed; a channel, coated with Portland cement, was carried round the building, and the whole was effectively drained. At the same time the earth, which to the height of between 2 ft. or 3 ft. had been heaped up against the walls, was cleared away. The plinth and base moldings of the edifice being thus uncovered, its architectural effect has been strikingly improved. The surface of the churchyard has since been lowered to the same level by the dean and chapter, from funds at their own disposal."

On a careful survey of the exterior, it was found that most of the flying buttresses were in a dangerous state. Some of them have been entirely rebuilt, and the rest have been substantially repaired. The finials, pinnacles, parapet copings, and mullions, throughout the building, many of them in a state of dilapidation and decay, have been made good. The decayed shafts, capitals, and bases of the numerous windows have been thoroughly restored. These were originally of Purbeck marble, a material peculiarly liable to decay. It was therefore resolved, by the recommendation of Mr. Scott, to employ in repairing them a variety of the Devonshire marble, as being more durable and less costly than the Purbeck. The juxtaposition of these two kinds of marble, differing as they do in external appearance, offended the eye. In order to soften the contrast a process of rubbing and oiling the surfaces of both is now being employed, under the sanction of Mr. Scott, with a view of assimilating, as nearly as possible, the colour of the new to that of the old material. The result of the experiment has, thus far, been highly satisfactory.

We next come to what was justly considered the most important part of our great work—the strengthening of the tower, and the ensuring thereby the safety of the noble fabric itself. The grand object was to strengthen and consolidate the walls of the lantern, without overloading the piers in the nave. This object has been fully accomplished by means of an ingenious and elaborate system of iron ties, devised by Mr. Shields, the eminent civil engineer, whom Mr. Scott had called in to assist him in this delicate operation."

The interior of the tower having also been restored,—

"Attention was next directed to the west front, every part of which stood lamentably in need of renovation or repair. The stone and marble work throughout have been restored, and the enriched moldings of the porches, on which a great deal of time and labour has been bestowed, are now far advanced. The restoration of the west front could not be regarded

as complete without an attempt being made to replace a portion, at least, of the statues that anciently adorned it. The late Professor Cockerell has stated that there were originally on the exterior of the cathedral 180 figures, of which 123 stood on the west front. From a minute examination of them it was inferred that the whole series of the west front formed what is termed a *Te Deum* or theological schema.

In accordance with this was the plan of restoration proposed by Mr. Scott, and by his advice entrusted for execution to a sculptor of rising reputation, Mr. Redfern. The work, begun about two years ago, and still in progress, may be thus briefly described:—In the panel of the great gable of the west front is a colossal figure of our Saviour, seated in majesty. Ranged in successive tiers below this grand central figure there will be in the first tier figures of angels; in the second, of prophets and patriarchs; in the third, of apostles and evangelists; in the fourth and fifth, of saints, martyrs, and founders. It will be observed that in this plan apostles and evangelists are placed below prophets and patriarchs. The remains of two figures, those of St. Peter and St. Paul, proved that this must have been the order in which they originally stood, as, in fact, both the number and distribution of the niches admitted of no other arrangement.

Of the entire number of statues required to fill the niches of the west front, about fifty will soon have been fixed in their places, exclusive of eight ancient mutilated figures which have been restored by Mr. Redfern. For the further prosecution of this portion of the work there are no available funds."

The surplus in the hands of the treasurer may be estimated at 3,900*l.* With so inadequate a sum at our command it would be idle to attempt so costly an undertaking as the entire restoration of the exterior. The lady-chapel may be considered the fittest part of the work to be first taken in hand, as the cost of its restoration, according to an estimate approved by Mr. Scott, will not exceed the limits of our resources."

The committee having, at the meeting just held, decided on the restoration of the lady-chapel, that work will be immediately commenced.

From the financial statement appended to the report we learn that the subscriptions for the general and special objects of the restoration, together with the interest, amounted to 16,525*l.* 15*s.* 8*d.*

THE CHAPEL OF ST. JOHN'S COLLEGE, CAMBRIDGE.

THE new chapel was opened on Wednesday last. St. John's College was originally a hospital for poor and infirm persons, and certain religious brethren under the rule of St. Augustine.

Bishop Balsham, of Ely, in 1280, attempted to add to the old institution a college for scholars on the model of that just then established at Oxford by Walter de Merton. This, however, failing, owing to alterations arising between the members of the old and new foundations, he removed, in 1284, his college to where Peterhouse now stands, and the old hospital of St. John, reverting to its former position, continued unmolested till the reign of Henry VII., when the Lady Margaret, the king's mother, determined to convert it into a college, which was effected under her will by her executor, Bishop Fisher, between the years 1509 and 1516, in which latter year the chapel was re-consecrated. This chapel—a not very decorative building—apparently of the sixteenth century, being found very insufficient for the present demands of the college, it was some few years back determined to rebuild it, and Mr. G. Gilbert Scott was appointed the architect.

Finding the old chapel to be in reality the chapel of the original hospital, and to be a building of the latter portion of the thirteenth century transformed into a sixteenth century structure, the architect proposed, as an alternative scheme to designing the new chapel, that the old one, restored, so far as possible, to its original design, might form an *aisle*. This, however, being considered hardly compatible with the practical uses of a college chapel, was not adopted, and a wholly new chapel was determined on.

The form adopted is one which, though frequent in Oxford, had not hitherto been adopted in Cambridge. It is that in which the ante-chapel forms a kind of western transept. This happened to be peculiarly suitable to the position of the new chapel; and, as it originated at Oxford in the incomplete cruciform church which forms the chapel of Merton, it may not be inappropriate (though the association was accidental) to a college in the sister University of which the earliest scheme was founded on the model of Merton.

The chapel proper is internally 143 ft. long by 34 ft. wide, and is terminated with an apse of five bays. The ante-chapel is 78 ft. by 32 ft. The extreme length of chapel from east to west outside is 193 ft. 1 in.; breadth, north to south, 52 ft.; extreme length of ante-chapel from north to south, 89 ft.; breadth, east to west, 50 ft. The exterior height of the chapel is

50 ft. to the top of the parapet, 80 ft. to the ridge of the roof. The tower is 42 ft. square outside; its height is 140 ft. to the top of the parapet, and 163 ft. to the top of the pinnacles.

In the demolition of the "labyrinth," the curious chapel of the Old Hospital of Canons Regular, founded A.D. 1134, to which the college succeeded, was revealed. Its stylo is the earliest type of Early English. An account of it has been published by Professor C. Cardale Bingham. The arches of its piscina have been placed in *memoriam* in the new chapel.

The stalls lately in the old chapel have been transferred to the eastern division of the choir.

The style of architecture adopted is not that of the period of the royal foundress of the college, but that of the age of its intended founder, Bishop Balsham; which is, in point of fact, the precise style of the earlier portions of the old chapel: for, though it is hardly to be supposed that Balsham erected the chapel during the short period of his abortive lordship of the college, 1280-1284, it is, nevertheless, probable that the impulse given by his intentions may have led the authorities of the Hospital of St. John to re-erect their chapel; for the character of the old parts which remain is just that of Balsham's time.

The closest types of the architectural details of the new chapel may be said to be Newstead Abbey, and the nave of Lichfield.

When the design was first made, no tower was contemplated, but only a *flèche*, at the intersection of the roofs of the chapel and ante-chapel,* but shortly after the commencement an old member of the college, Mr. Henry Hoare, who had laid the cornerstone of the building, made the munificent proposal—contingent on his living long enough to carry it out—to erect a tower similarly placed to that of Merton, at a cost of about 5,000*l.* Mr. Hoare's lamented death, the result of an accident, cut his generous intention short before the work was quite half complete, but the college undertook the perfecting of his undertaking.

Internally the chapel is roofed with an arched ceiling of oak, which has been splendidly decorated by Messrs. Clayton & Bell.

It consists of nineteen bays. In the central bay at the east end is a representation of Our Lord in Majesty. The other eighteen bays contain figures of illustrious of the eighteen Christian centuries after the first century, each bay being appropriated to a century. The centuries proceed from east to west: the even centuries on the north side, the odd centuries on the south side.

The known cost of the chapel up to the present date may be roughly stated at 53,000*l.*, not including the cost of the organ or of the painted windows.

The reconstruction of the organ, including the water-blowing apparatus, has involved an expenditure of 1,130*l.* The question of the case is not yet settled.

The painted windows are the gifts of various donors. The five windows of the apse are the gift of the Earl of Powis, High Steward of the University. The great west window is the gift of *Members of the College in statu pupillari*; and cost 1,510*l.*

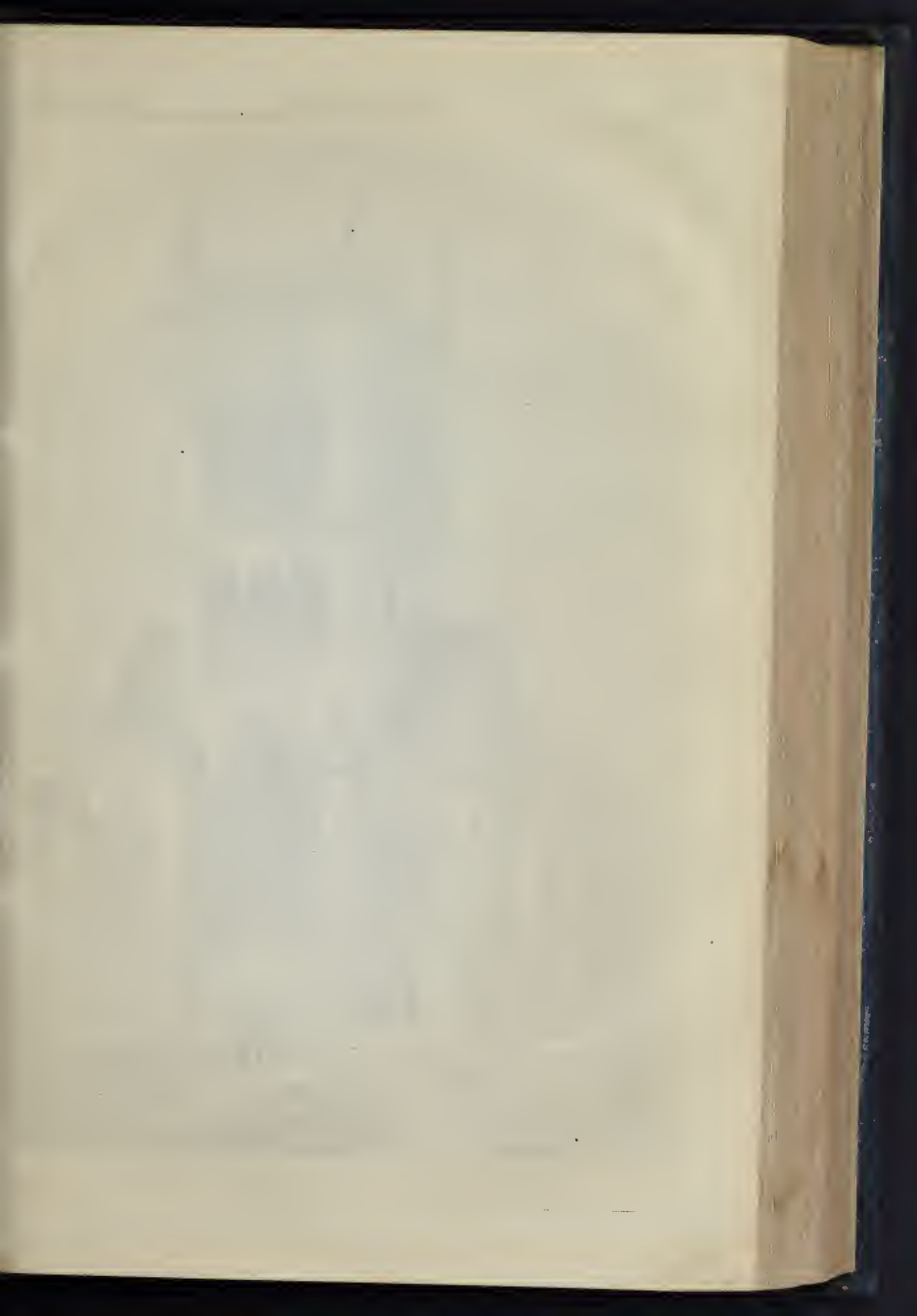
The six following side windows of the choir of the chapel are ordered at a cost of 276*l.* each.

The erection of the chapel has occasioned the erection of a new master's lodge, the extension of the Great Hall, and that of the old gallery of the college—a noble Jacobean apartment, henceforth to be used as the "Combination Room," or withdrawing-room of the fellows.

The following are the names of those who have been concerned in the erection:—contractors, Messrs. Jackson & Shaw, Westminster; stone carvers, Messrs. Farmer & Brindley, London; wood carvers, Messrs. Rattee & Kett, Cambridge; glass painters, of the apse windows, the great west window, and the side windows in the chapel, Messrs. Clayton & Bell, London; of the window in the north transept of the ante-chapel, in memory of Professor Blunt, Messrs. John Hardman & Co., Birmingham; of the two windows to be placed in the north transept of the ante-chapel, in memory of Dr. Tatham, late master, Mr. Wailles, Newcastle. Organ-builders, Messrs. William Hill & Son, London; clerk of the works, Mr. W. M. Cooper.

We have no hesitation in placing the interior of this building amongst the most successful achievements of Mr. Scott.

* The design as at first arranged will be found in our vol. xxi. (1863), p. 225. We now give an interior and exterior view of the building as completed.





THE CHAPEL OF ST. JOHN'S COLLEGE, CAMBRIDGE: WEST FRONT.
PROFESSOR G. G. SCOTT, R.A., ARCHITECT.



THE CHAPEL OF ST. JOHN'S COLLEGE, CAMBRIDGE: INTERIOR, LOOKING EAST.

THE TRADE-UNION REPORT AND THE BILL FOUNDED THEREON. WHOM DOES IT CONCERN?

Sir,—Since I addressed a few thoughts to my fellow-workmen on the dangerous tendencies contained in the Report of the Minority Commissioners, a Bill based on these conclusions has been presented to Parliament. Feeling great interest in the question, I have in my rambles about London made inquiries as to the opinions of workmen on the above important matter, and I have found in a majority of cases they did not know of the existence of the Report, or anything of the Trade-Union Bill. And yet we are supposed to live in a reading and thinking age. I therefore could not but ask myself the question, Whom does it concern?

Did I not know that this subject was one of vital importance to both master and man, I should not have troubled you again. It would appear that our country, which has been up to the present time so far ahead of all nations in the industrial arts, had determined to let other nations who are yet young in the race carry away the industrial prize. The apathy of all classes in relation to the trade-union question is a potent sign that Englishmen are oblivious to the consequences which will ensue on the passing of a Bill based on one of the most absurd and inconsistent reports ever presented to Parliament.

The apologists and supporters of trade societies would, if they were able, make them universal, and the Bill is at least a long step in that direction, and if carried in its present form will give power to a class of men who have disregarded liberty and justice when in opposition to their so-called interests.

One of the very strange things in connexion with it is that the promoters and supporters of the Bill class themselves as ardent supporters of civil and religious liberty, and yet offer to the House of Commons a measure to suppress all rights of a large portion of the people. It is high time the working men of this country were taught the true bearing of the labour question, as they now are pursuing the shadow and are fast losing the substance. The report of the minority informs the world that the operations of unions have had no depressing effect upon the trade of this country. In last week's papers I noticed the members of various working men's clubs had been visiting the new St. Thomas's Hospital, and an address was delivered on its special features. I have no doubt as to its being highly interesting, but one explanation appeared to be wanting to clear away the mist which now obscures the working men's industrial vision. In my opinion, no part of the address would have been of greater importance than that relating to foreign industrial competition, as illustrated in the progress of the building,—the ironwork for it is sent from Belgium, and the joinery from Sweden,—and the causes which have led to such results. There is nothing the working men want at present more than plain-speaking; they have been flattered too long, and their eulogists have led them to believe that they are and always will be at the head of the world in manufacturing productiveness, and that the labour of one Englishman is worth that of two or more foreigners. At any rate, an opportunity appeared to have been lost to enforce upon working men the necessity of being cautious in their dealings with capital, and not, like the calf, quarrel with "their feed of hay because it is not clover." The iron trade is, and has been for some long time past, in a depressed state; thousands of moulders and others have been out of employment; and, without some alterations take place, the ironfounders' trade society will not be able much longer to meet the demands upon it. The building trade is certainly not in a flourishing condition. Workmen in that trade have been led to believe there was no limit to their demands if they were well combined; and all they had to do when the society was consolidated, was to knock at the employers' door and receive an advance of wages, and exceptional circumstances have lent aid to that fatal supposition. How often is one obliged to hear from workmen who have never read or thought for a single moment on the causes which affect the rate of wages, or the forces at work to counteract their combinations, that if they were thoroughly united they could do whatever they pleased. It appears that whatever is granted to the demands of the unionists, it is but the prelude to other requirements. In fact, they are looking for the trade

millennium, when there is to be eight hours' work, eight hours' play, and 8s. per day. Unions are not defensive, but aggressive associations; and, if the destruction of the trade of the country is not aimed at by those who govern, and we do not exactly know what follies they will commit, this we know, they are frittering away valuable time upon a question which involves nothing in comparison with the education of the masses on industrial and economical subjects. Whilst they are quarrelling over the few millions of pounds involved in the disendowing a branch of the national church, the industrial sway is gradually, but surely, slipping away from us, and doctrinaires are proposing schemes to hasten it on, and Government, it is said, will not oppose. It is a fact not to be denied that not only are foreign nations supplying their own wants, but they are outselling us in our home markets, and are extending their forces to other countries. The strides they have made in all branches of industry are far greater than those of England. The Paris Exhibition showed that in most cases they were on a level with us, and where beauty of design was required we were far behind. It is said there are none so blind as those who will not see, and that appears to be the case with the Minority Commissioners, as most of the cases they have cited in support of their theory, and as hearing on production, are fallacious, and not founded on experience, and are still further calculated to mislead those who will not see the practical results of our past industrial policy and example. The glass trade is one chosen as illustrative of the advantages which unions confer. The members of that trade enforce their rules with great strictness, limit apprentices, and boast of how much they yearly pay to their members out of the wants of the community, regulate the demand, and fix an extra price for their produce: they at once clash with the demands of the public, whose interest is to get their article at a marketable price, and, if not produced here, the trade goes elsewhere. Under trade restriction, the glass trade languishes in this country, and a large part of the glass used is the product of foreigners, whose business is flourishing, and is daily enlarging its borders. I find I have again outrun my intentions, and have not said all I intended at the beginning of this letter; but feeling that this question does concern the nation, and is of vital importance to our good name and commerce; and as I know the readers of the *Builder* are thinkers; I hope a working man's plain-speaking will cause them to perceive the ultimate issue in regard to the above questions.

JACK PLANE.

THE SOCIAL POSITION OF THE PROVINCIAL ARCHITECT.

Sir,—The social position of the provincial architect "is a most trying one to that generally unfortunate individual. As one of the class, I wish to put upon record a few of my own experiences as some small contribution to the history of architectural revival in this nineteenth century of our Lord. I will pass over my preparation in London for the practice of what I considered the noblest profession, simply stating that I was regularly articled to a gentleman standing high in the profession—a gentleman, too, by birth and education. I had, I believed, made the most of my time: had attended Professor Donaldson's lectures; worked at the Architectural Museum when it found shelter in Cannon-row, Westminster; and had been a student of the Institute. One day in autumn I found myself some two hundred miles from the metropolis, with unlimited funds of hope, some amount of self-complacency, and the very highest opinion of my own calling. From circumstances over which I had no control, I did not set up my carriage; I did not even take the lease of a good-sized professional-looking house, and furnish it with that comfort, combined with elegance, which ought to have at once stamped me as one who could design an edifice possessing those attributes. Thus you will perceive, sir, that I had nothing but my profession to give me any social standing whatever. From the introductions given to me, I was soon thrown amongst well-to-do doctors, lawyers, and country squires, as well as yeomen, and that highly-intelligent class who enlighten their fellows when they sit in solemn council as aldermen. I was not long in discovering that I was looked upon as a queer fish,—neither one thing nor the other: am-

phibious probably. They could not get me to swim easily in trade, and they would not let me walk side by side with professions. John Jones, the mason, had two years before writ in bold characters on brass "architect." Truly John Jones wrote a peculiar hand: his English was oftentimes questionable; but what of that? There were two architects in the town, and were not their names William Surde and John Jones? Was it to be supposed for an instant that any father claiming any standing would have dreamed of making his son an architect, and only equal to John Jones? The thing was too ridiculous for a dream,—too horrible for a nightmare. Those who professed friendly feelings for me were candid enough to express their wonder at my following such a "business;" and one day whilst dining with an old gentleman headwinded in a most parental manner to give up my "trade" and take to medicine or law as more fitting for a man of any education whatever. I explained that a professor of architecture was no tradesman, that he was as good as any doctor, lawyer, parson, or independent gentleman; that from the nature of his profession his general acquirements were, or should be, greater; that as a rule his education had been as good; that travel should have enlarged his mind, and the study of the ancient monuments enriched it with a knowledge of the most enlightened peoples who had inhabited the globe. All this, however, went for nothing in the face of John Jones being an architect. Where was his education? Where was his travel lore?—and yet I could not unarchitecturalise him. The fact is, John Jones entirely put out my light socially, not by shining brighter, but by the density of his smoke; and at the present time there is a good deal of the same sort of smoke dimming many another professional light, not necessarily architectural. I fear, sir, we must for some time bear our evils patiently. It certainly is annoying to have to meet John Jones,—to have to listen to the chairman of a committee whilst he calls your attention to matters of detail in your plans which John Jones declares are mistakes; that your roof will not stand, because the tie-beam is not of sufficient scantling to keep up the king-post; that this beam does not require trussing, and that that chimney will not draw because it is too high. It is even worse if you are a young man, and happen to attend the hunt or Infirmary ball, to be coldly informed by Dr. Femm's pretty daughter that "Thanks; I'm quite full," and then to see that snob, Quillet, the conveyancer, lead her off in triumph. What use is it that you can talk Blacklows, the curate's, head off when his social status is looked upon as so superior to yours by both the wife and daughters of William Bohbin, esq., that you cannot get listened to. Besides, it is dangerous for a man who is so looked upon to show that he knows more than he is given credit for. Such a course ensures a certain amount of snubbing.

There are many arguments, no doubt, which might be used to prove that architects are no worse off than painters or sculptors; that they have no right to wish to take higher ground than either. Undoubtedly any one can call himself a painter or sculptor as easily as he can an architect; yet we do not hear any cry out from either of those professions, whereas it is a well-known fact that few men are so illiterate as a body—few men more egotistical. The reason is clear enough. Painters and sculptors have not to meet their patrons face to face as architects have; they fly at high game, fame and future, or obscurity and death; they choose to live in a world of their own, and they can do so—an architect cannot. He can no more live without seeing his client than a surgeon can perform an amputation without seeing his patient; hence the necessity of social intercourse, and hence his feeling of humiliation when treated otherwise than as a member of society whose acquirements entitle him to those amenities so readily accorded to the three acknowledged professions. I have found that it is only amongst certain classes that architects are looked upon as socially inferior to men who have chosen physic, law, or the Church; that class who really are able to give good commissions—the aristocracy,—those of the public who are better acquainted with the nobility of our calling than any other section, never behave otherwise than courteously, do full honour to our art and to us. Knowing this, we can either go on our way rejoicing, careless of the little slights of ignorance, doing our duty, and proving ourselves inferior to none by behaving like gentlemen, or we must firmly close our doors, diplomas must be granted, and

granted only after such a course of training as will convince the public that there is more in architecture than a name. But we cannot blame the public for the non-appreciation of a thing of which they know nothing. We must look upon ourselves as a small army who have flocked to the standard of a fair but unknown virgin. We have sworn to uphold her fame and to prove her fair, and we have chosen no easy task. We are often looked upon as simple enthusiasts, a sort of rabble without generals. Our leading men, except to a few initiated, are unknown, whereas a galaxy of famous and world-renowned men dazzles in any other profession. In time, and as we become a wealthy and striving portion of the community, our influence will be felt. When the wills of our most successful brethren shall have been proved at not less than six figures, as I have no doubt they will be, the moral influence in this money-getting country will be soon apparent. Most of us at present are looked upon as needy and seedy; but go to any town you like, be the population three thousand or three hundred thousand, you will find one or more wealthy men who have made their fortune by their profession. In how many towns do you find architects similarly situated. This sets me a moralizing; so I leave the continuance of the thought to others, and will close this by saying that, as a profession, we owe you, sir, much. The high character of the *Builder*, its wide circulation, and its readiness at all times to advance our just claims, have had great and due weight with the reading and learned community, and no doubt its usefulness to us will continue to increase, and thereby elevate our "social position." B. M.

THE FUTURE OF BRICKWORK.

I HAVE read with much interest the article in your last impression of the *Builder* on "The Future of Brickwork," and am fully impressed with the idea that a new era is dawning with regard to the internal and external decoration of buildings. I believe the time is not far distant when glazed surfaces in a rich variety of colours will supersede the present mode of "daubing" with cement and stucco, which not only in many instances offends the eye, but has to be renewed periodically, like a cast-off garment. I am further convinced of this from the fact that an indestructible glazed surface can at the present time be produced on bricks, in various tints, made of common red clay. I have myself been experimenting for several years with the various red and fire clays of England and Scotland, and have produced a durable red, black, white, blue, green, and yellow, which I have laid on the bricks in the clay state, by which means I save the cost of twice burning. I may also say, that the expense of producing bricks by this process will not exceed 10s. per 1,000 over the cost of ordinary pressed bricks. Doubtless others have been, and are now, experimenting in a similar way, which will probably lead to a complete revolution in the decoration of public and private buildings. The great point to be attained is to produce a glazed surface of varied colours on the same material at a price which will compete with the present mode of embellishment. When that is accomplished, I believe architects will only require to see it in order to adopt it universally.

ALPHA.

THE IMPERIAL GAS COMPANY'S BILL.

THE Metropolitan Board of Works, in a "Statement of the Course taken by the Board with regard to the Imperial Gas Company's Bill now before Parliament," after pointing out the objections stated on their behalf, and the amendments urged in committee on the Bill, go on to say:—

"The committee, however, found the preamble of the Bill proved, and at the same time intimated the extent to which they were prepared to amend the Bill, viz., to reduce the price to 3s. 9d. after the 1st January, 1871, making no alteration in the illuminating power; to limit the dividend on the additional ordinary share capital to 7 per cent., and on the preference capital to 6 per cent., and to strike out of the Bill the power to purchase or take on lease coal-mines and collieries."

On the committee declaring the preamble proved, and also adopting the somewhat unusual course of adding to it the express alterations which they intended to make in the clauses, and those amendments not comprising a public audit, an independent testing of gas, and proper provisions as to reserved fund and other important principles, it was obvious that the Board would have to present their views to the House of Lords; and, consistently with ordinary practice and prudence, it was important not to prejudice any step in the House of Lords by accepting a portion only of the required clauses in the House of Commons, but to seek the insertion of what might be

necessary in the House of Lords, where the whole question of preamble and clauses would be open. And the Board at once gave directions for a petition to the House of Lords, and this took place before the debate in the House of Commons on Wednesday last.

The Bill having now been referred back to the committee by the House of Commons, the Board propose to appear before them again by contract, to urge the same points as before, viz.,—the expediency and necessity of applying to the Imperial Gas Company the terms and conditions imposed by the Act of last session on the companies supplying the City; and the Board earnestly trust that the result will be such as will be acceptable to the consumers."

It is earnestly to be hoped that the Imperial Gas Company will be compelled to improve their gas. The quality of it has long been disgraceful, and such as this Company would not have dared to impose upon the public by charging for at the rate they do had there been any actual competition. Even the Company must have been ashamed of it, for when their Bill came to be under consideration they immensely improved its quality, as I by this flash process they expected to blind the eyes of the gas-consumers, or the committee on their Bill, to their past misconduct, and ensure a clear way for its future continuance. To present the public with infamous gaslight such as theirs, at the price they charge, is little short of obtaining money under false pretences.

THE ARCHITECTURAL ASSOCIATION'S VISITS.

THE works selected for the out-door practical lessons which have been wisely established as features by the Architectural Association have been from time to time noticed in the *Builder*. On Saturday last the new bridge at Blackfriars and the Holborn Viaduct were chosen, and were visited by a party of between fifty and sixty members, including some well-known names. They were received at Blackfriars Bridge by Mr. F. W. Bryant, the resident engineer, and after inspecting the drawings, were shown over the works. The bridge, as our readers know, is of iron, resting on piers of solid masonry, and crosses the river in five spans, the centre one of which has an opening of 185 ft., with a height of 25 ft. above high water level. Its length is 1,280 ft., and its total width is 75 ft., the roadway being 45 ft., and the two pavements each 15 ft. wide. It is expected to be ready for public use some time in August. We have so lately given particulars that repetition is unnecessary.*

After tendering their acknowledgments to Mr. Bryant, the party proceeded to the Holborn Viaduct. As this also has been so recently fully described in the *Builder* (see p. 320, ante), we will only remark that considerable time was spent, under guidance of Mr. Blashill, in viewing the subways and other practical features of this interesting work, and that the party separated at a late hour in the afternoon much pleased with the time so profitably employed. Since our last visit rapid progress has been made, and pipes are now being laid for the use of the Pneumatic Despatch Company beneath the viaduct. A new paragonage-house for the parish of St. Andrew, Holborn, is about to be commenced, Mr. Teulon acting as architect. This will stand close to the present church, and the site is now being prepared.

THE SEWAGE QUESTION.

ETON.—The Eton Local Board of Health have determined to adopt the report and plan of Messrs. Ripley & Simonds, architects, for the drainage of Eton College and town. The system adopted is the separate one, with the purchase of land for sewage utilization and irrigation. The cost is estimated at 8,000l.

MERTHYR.—The town of Merthyr Tydfil has fallen into the same difficulty which has entailed so much anxiety and expense to the local authorities of Cheltenham, Leamington, and other English towns—namely, not knowing what to do with its sewage. The Local Board of Health having expended 30,000l. in draining the town, discharged the sewage into the River Taff, but a Chancery suit was commenced against them by Mr. Nixon, a coal owner, and an *ad interim* injunction was granted to restrain them from discharging into the river. The suit is still proceeding, and the board have been discussing various schemes for getting over the difficulty. The valley at the point where the sewer discharges is so narrow

that not a quarter of the area of land necessary to receive the whole of the sewage is obtainable. Another scheme has been devised by the board's engineer, and adopted, which is, to continue the main sewer some seven miles further down the valley, to a point 4 miles above Pontypridd, where it widens considerably. Here there is a large tract of common land suitable for the purposes of irrigation, and which may be acquired on easy terms. About 400 acres will be required for the effective disposal of all the sewage of the town, and the cost of continuing the main conduit to this land, and preparing it for the sewage, is estimated at 20,000l.; but, on the other hand, it is calculated, from what has been done in other districts, that in the course of a short period the soil will have been so much improved by the application of sewage as to command good tenants at rents that will cover the outlay.

STROUD.—Mr. J. H. Groome, of Earl Soham, says, in a letter to the *Suffolk Chronicle*,—"My pastures, manured with 5 cwt. per acre of the Stroud sewage grass manure—a compound manure—of which the deposit obtained by the now well-known Stroud process is the basis, fully come up to their condition after like treatment in 1865 and 1866, and the experiment made in 1868, viz., laying down half an acre of land in permanent pasture, with the same amount per acre of the same manure and no other, is this spring quite as successful in its continuous growth as it was last autumn. The sewage of towns, treated by the process in use at Stroud, will be a cheap source of that which all farmers want—a really good grass manure."

PAVEMENT AND SLATE IN SCOTLAND.*

A SERIES of able and useful papers appeared, not long ago, in the weekly *Scotsman* newspaper, and we quoted from them at some length while they were in course of issue. They now form a goodly volume of about 500 pages, treating of coal-mines, the manufacture of iron and iron manufactures, shipbuilding, railways, plate and jewelry, manufactures in metals; woollen, cotton, linen, and jute manufactures; dyeing, sowing, muslin manufactures, fishing-nets, paper and paper-changings, floorcloths, leather, india-rubber, glass and earthenware, granite, freestone, pavement, and slate quarrying, brewing, distilling, sugar-refining, confectionary, preserved provisions, mineral oils and paraffine, printing and publishing, and fisheries. The volume is valuable.

We shall glean a few particulars from the paper on pavement and slate.

The pavement quarries of Caithness are of considerable extent and importance, and their produce has a world-wide reputation. The working of the quarries and the dressing of the stones constitute a considerable part of the industry of the county, employing more persons than any other kind of trade, exclusive of agriculture and fishing.

The Caithness flagstones belong to the middle formation of the Old Red Sandstone. Great numbers of fossil fish and plants are found intercalated among the flag-beds of commerce, having been buried in the ancient mud of the Old Red waters. These fossils appear on almost every slab of Caithness pavement, but although the fish remains lie by thousands, it is seldom that anything like a perfect specimen is got. However, they are beautiful in their ruin—their blackened, enamelled, and glistening scales and plates standing out in contrast with the sober grey of the matrix. The flag-beds have suffered much in geological ages from dislocations by "faults" and other causes.

Sir Roderick Macdonald says,—"The peculiar tenacity and durability of the flag-stones is due to the manner in which silica and alumina are cemented together by certain proportions of calcareous and bituminous (organic) matter."

As a proof of the durability of the Caithness pavement, a circumstance which occurred a few years ago is mentioned. A fire broke out in a building in Leith Walk, Edinburgh, and the hose for the engines was laid across the road. The ordinary traffic line being thus impeded, the cabs, carts, and wagons, some of the latter heavily laden, took to the footway, and the consequence was that for nearly 200 yards the sandstone flags—from the north of England and other places—were broken under the unusual weight, whereas a portion, several feet in width,

* "The Industries of Scotland," by David Bremner, Edinburgh: A. & C. Black, 1869.

* See p. 163, ante.

of the same road, laid with Caithness flags, here all the traffic without being injured.

The principal pavement quarries in the county are situated on a line extending from the parish of Orlig, on the shores of the Pentland Firth, to the parish of Reay, in the west—a distance of ten or twelve miles. Another run of pavement commences at the seaside four miles south from Wick, and extends westward to the parish of Halkirk, in the centre of the county. The first exportation of pavement was made from quarries on the Crown lands of Scarshater, formerly belonging to the bishopric of Caithness, and situated near Thurso.

The principal flagstone quarries in Caithness are those of Castlehill, which are worked by the proprietor, Mr. Traill, M.P., under the management of Mr. M. Benth, who has been in charge for nearly forty years. Although these quarries are the most important in the county, they are not the oldest.

The pavement quarries have had a marked effect on the wages of the labouring classes in Caithness, which have risen from 7s. or 8s. a week to from 12s. to 18s. There are no statistics of the quantities of pavement exported annually from Caithness, but it is roughly estimated that from 500,000 to 600,000 superficial yards are shipped every year, the value of which is from 70,000l. to 80,000l.

The date at which slate for covering houses came into use in Scotland is not known, but there is good reason for believing that it was at least three centuries ago. Though slate suitable for roofing purposes exists in various localities, the earliest used would appear to have been derived from the island of Easdale, which for upwards of 200 years has been one of the chief sources of supply. It is stated that among the ruins of a castle in the north of Scotland, which was built in the fifteenth century, fragments of slate similar to that obtained at Easdale were discovered. There is evidence that the Falconer's Castle at Appin was in 1631 roofed with Easdale slates. Ardmaddy Castle, a seat of the Earl of Breadalbane, built in 1676, was covered with slates of the same kind. In the latter case they were fastened with wooden pegs, and have withstood the tempests of nearly two centuries without requiring to be replaced. Of greater extent than the Easdale quarries, and of equal fame, though some years younger, are those of Ballachulish. The other slate quarries in Scotland are not of much account.

Easdale forms one of the group of small islands which skirt the coast of Argyll between Crinan and Oban, and lies close to the south-west point of the island of Seil.

Mr. John White, who was manager of the Easdale quarries for upwards of twenty years, gives an account of the disposal and character of the slates. He says:—

"The slates—bands appear in two seams, which are much contorted throughout the whole extent of the island. These seams are made up of different beds, ranging in thickness from a few inches to many feet, like our sand-stones and limestones, but frequently so closely united that only a practised eye can detect a line of contact; whilst the superinduced phenomenon of cleavage constitutes a distinct dissimilarity between them and the other rocks referred to. It may be noticed, as an indication of a sedimentary character of these slate rocks, that there is a decided difference in the quality of the upper and lower portions of the thicker beds, the former being fine grained and smooth, and the latter coarse and gritty—the feature which we recognise as ensigns to that exhibited by other rocks of sedimentary origin."

The slates—seams extend across the channel, 150 yards in width, which separates Easdale from Seil, and crop up on the shore of the latter island, where they are worked at two points, known locally as the Ellenabeich Quarries.

The principal quarry at Ellenabeich is about 450 ft. in length, 250 ft. in width, and 160 ft. in depth. The Windmill Quarry in Easdale is 250 ft. in length and breadth, and 120 ft. in depth. Two powerful steam-engines are employed for raising the material and keeping the quarries clear of water. About 300 men and boys are employed. The number of slates turned out annually cannot be less than from 7,000,000 to 9,000,000; the average from 1842 to 1861 was 7,000,000. Taking the value of the slates at the quarries to be 2l. a thousand, the total produce will, according to the lowest computation, be worth about 14,000l. a year. The slates are well known in the market, and command a ready sale—it being no uncommon thing to find above a dozen vessels, of an aggregate burthen of over 1,500 tons, waiting their turn for loading.

The Ballachulish slate quarries are situated in the north of Argyllshire, on the shores of

Loch Leven, about two or three miles from the scene of the tragic massacre of Glencoe. There are two quarries about half a mile apart. The slates are divided into four classes—viz., "duchess," "countess," "sizable," and "undersized." The first-mentioned are the largest, being 24 in. long by 12 in. broad; while the "countess" slates are 20 in. by 10 in. The other two classes are smaller. The number of men and boys employed is about 400, and 15,000,000 slates are turned out annually.

There are also slate quarries at Dunkeld, Luss, Aherfoyle, and Craiglea. Those of Craiglea are the most important. They are situated on the Logioilmond estate (the property of the Earl of Mansfield), and are about fourteen miles north-west from Perth. Under the skillful management of Mr. John White, who was manager of the Easdale Quarries, they are being opened up on an extensive scale. The slate vein is of excellent quality, and has this peculiarity, that, while one portion of it supplies slates of a dark blue colour, those obtained from the other portion are of a sea-green hue; but otherwise there is no appreciable difference between them.

CHURCH DECORATION.

ST. OLAVE'S CHURCH, Marygate, York, has been re-opened, after partial decoration. A design was prepared by Mr. J. W. Knowles, mural decorator, by whom the work has been carried out. Around the east window two borders have been painted, one on the face of the wall, and the other in a deep hollow which runs around the outer edge of the window. The former is composed of leaves and flowers alternately, buff and gold, on a sage-green ground, and the latter is of a pointed design, having one side brown and the reverse buff for a ground, and on which the pattern is red and grey. The wall spaces on each side of the window, as high as the cuspings of the lights, is covered with a quatrefoil diaper of sage-green, filled in with foliated crosses in red, and six pointed stars in gold. Across the top of this diaper work is a crested border of buff and gold on a deep red ground, and at the base a foliated one in buff and brown on a gold ground. The portion of the wall above this diaper is a diaper composed of lozenges of scarlet on a green ground, each lozenge being alternately covered with gold and pink *rose-de-lis*, and the cresting at the top of the window is picked out in gold. The wall all round the church is painted 6 ft. high of a dull red, with an ornamental border, and the top edge of green leaves, divided at intervals by gold Maltese crosses and grey flowers. One side of a pillar (the rest of which are at present painted stone colour) has been decorated, and it has been proposed to extend this additional embellishment to the whole of the pillars at a future time.

THE TRADES MOVEMENT.

Trade Unions Bill.—At a recent meeting of the trades' delegates it was resolved that a large public meeting should be held in June, to give an opportunity to the operatives and others for a full discussion and declaration of opinion on this question. A petition to the House of Commons on the question of trade-unions has also been agreed to, disclaiming any desire for a relaxation of the criminal laws, while urging the need of legislation to give proper status to their societies.

Wolverhampton.—This town is now numbered amongst those—nearly thirty in all—where the stonemasons are on strike. The conditions to which they object are payment by the hour instead of by the week (though they are the only class of men employed by Wolverhampton builders who are not already paid by the hour) for the settlement of disputes between masters and men. The labourers have given notice of a demand for a rise in wages of 4d. per hour, which would make 4½d., their present pay being 4d. per hour. The masters refuse to grant the request, but both parties have agreed to arbitration. The relations between masters and men in the other branches of the trade are of an amicable character.

Manchester.—The board of arbitration being divided as to the disputes between the carpenters and joiners and their employers, Mr. Kettle, as umpire, decided:—"That the wages of car-

penters and joiners, of fair average skill, shall be from the 1st of May, 1869, to 1st May, 1870, 7½d. per hour, excepting for men working upon unprotected buildings, under rule 3; and carpenters and joiners working under that rule shall be paid 7½d. per hour, from the 20th October, 1869, to 20th February, 1870." Mr. Kettle decided against the application of the men for a reduction of the hours of labour. Between 600 and 700 unionist plasterers were to cease work on Saturday.

Bolton.—Mr. S. Pope, recorder, has consented to act as arbitrator between the master joiners and the men in their dispute. The masters, to the number of about 150, are still out.

Sheffield.—A meeting of the Master Carpenters' and Joiners' Association has been held, and the following resolution was unanimously passed:—

"That the members of this Association still adhere to the notice given to the operative carpenters and joiners to pay by the hour for the future."

A meeting of the master huddlers was also held, Mr. Rodley in the chair. It was stated that there were 27 bricklayers, 136 masons, and 70 labourers who had refused to continue at work on the hour system. The meeting unanimously resolved to adhere to the hour system, believing it to be alike advantageous to the men and masters. As the men would really gain an advance of wages, the masters would be spared a great amount of inconvenience, and the wishes of the general public would be met by substituting the hour for the day system. There are two other grievances the masters are desirous of having redressed. At present worked stone is not allowed to be brought into the town. The masters wish to be able to have stone worked at the quarry or where it is going to be used, and either by hand or by machine at their pleasure. In the carpenters' and joiners' trade the men will take piecework from their masters; in the masons' and bricklayers' trade they will not, and the masters wish this anomaly to be done away with. They are, however, quite willing to have all the points in dispute settled by an arbitration, if the men will consent to that course being adopted.

Bradford.—The unionists locked out have held a meeting to consider their position. Pleasure was expressed that the number of masons locked out was only 139, and not 250, as had been supposed. It was also stated that thirty-four masters, three of whom were connected with the association, will, as well as others whose names were not given, continue to employ their men as hitherto, regardless of the notice given by the Masters' Association, on the ground that the contracts they have in hand will not permit their doing otherwise without incurring serious inconvenience and loss. These masters, it was said, were at present employing no fewer than 800 masons, while the associated masters do not on an average employ more than twelve men each, and at the present time in the aggregate are employing only 139. From these alleged facts it was contended that the lock-out would not be of long continuance.

Glasgow.—The operative house-painters have struck for an advance of wages, from 6d. to 6½d. per hour, to commence on the 3rd of May. The ship-painters have made a similar request.

Crieff.—Some time ago, the operative masons of Crieff intimated to their employers that, on and after the 1st of May, they would work only nine hours a day. It seems that none of the masters replied to the request made, but at five o'clock the men dropped work, having completed nine hours. The result of the demand made was, that all the journeymen working at the Hydropathic establishment, and other large jobs in Broich-terrace, were paid their wages and "locked out;" but the dispute has terminated much sooner than was anticipated. It seems that according to the union rules the men acted irregularly in regard to the nine hours movement, which, together with the determination of the masters to resist the demand, brought the dispute to a close. All the journeymen resumed work on the old terms.

Kirkcaldy.—The masons, who have for some time past been engaged upon several large buildings in town and neighbourhood, have left off working. The rate of wages of late has been 5½d. per hour; the demand is now 6d. per hour. Employers have refused this. The proprietors of several of the large buildings which have been in progress are not in present circumstances inclined to push the contractors, so that there is little hope of the demand being speedily

granted. This movement on the part of the masons is also affecting very materially a number of labourers, joiners, plasterers, slaters, and others.

RUSSIAN, &c., GREAT BELLS.

Str.—Mr. Walesby, in his interesting notice of Moscow bells, from Dr. Lyell, has omitted to mention the largest bell now in use; and mounted high up in the (Kremlin) Tower of *Ivan Veliki*, about 300 ft. high.

This is called the *Bolesoi* (Great) as the other is, the *Isor* (Royal) *Kolobok*. To the best of my recollection it weighs about 125,000 lb. English, and was re-cast about 1820, not many years after the wretched French retreat. (Is the asserted local "chime" to which the words "Those Evening Bells," &c., were adapted above forty years ago, forgotten?) There are many other bells in that tower; one of them called the *Belsotnoi*, weighing, if my memory serves me, about 27,000 lb., but the smallest except two or three.

In a penny publication I lately read of two large "turret bells" at *Cologne Cathedral*, giving their "Bonrdon" at funerals, as for Royal ones; at *Notre Dame*; weighing "two hundred and twenty cwt." This is, I presume, the united weight; and, if about equal, each would be a trifle heavier than our "St. Paul's."

Can any one guess the weight of the former "Siv" (in the time of Aldrich) great bells at *Christchurch*, Oxford, brought from *Osney Abbey*; to hear which chimed, it is said, foreigners had come down expressly from London?

Also, could Mr. W., as an accomplished campanologist, give us any cause for *five* being much the most accustomed (unless for small churches) or "orthodox" number before the Reformation? Almost the only instance of eight I have met with was in the "inventory" (of "goods") of *Peakesbury Abbey*.

J. D. PARRY.

TECHNICAL EDUCATION.

THE first annual meeting in connexion with the Manchester and Salford Building Trades Institute for Technical Instruction, which was established about twelve months since by the Amalgamated Society of Carpenters and Joiners, was held on Tuesday evening last in John's Schools, Garside-street. Mr. Isaac Holden, architect, presided.

The Chairman, in the course of his opening remarks, said that technical education at the present time was very different from what it was at the time when the axe only was used in the forest. Men had now to produce highly ornamental structures, not only in form and character, but they required skilful arrangement in order to give them strength and security. Technical education, therefore, became of the utmost importance to every artisan. Men pursued this knowledge not only for their own benefit, but for the benefit of their employers. Skilful mechanics were always in demand, and it was well that men should bear that in mind. He was pleased to find that this institution had been originated by the workmen themselves; and if they continued to work together they would form not only a powerful body of men of intelligence and ability, but a body of men capable of controlling their own destinies.

The number of members for the past year has averaged 62 per quarter.

THE ROYAL ACADEMY, BURLINGTON HOUSE.

Str.—On reading your description of Mr. Sydney Smirke's clever and well-arranged building of the new Royal Academy, it is to be regretted that, as shown by the plan, though there was a room assigned solely for architecture, the architects now should be deprived of that room, by having it appropriated to painting, although the painters have already the lion's share of the exhibition rooms. If the lecture-hall is for the future to be appropriated to architecture during the exhibition, I would ask whether the platforms could not be made moveable, as in the old Academy rooms and other buildings, as there is so much awatage room in the basement, and the architects would then have fair play?

A SUBSCRIBER.

GOOD DINNERS.

Royal Literary Fund.—The dinner in aid of this important corporation, which took place at Willis's Rooms on the 5th instant, under the presidency of Lord Stanley, was a brilliant affair. About 170 gentlemen sat down, and 60 ladies occupied settees at the end of the room. Lord Stanley pronounced a warm eulogium on the institution. The Hon. W. Egerton, M.P., Sir John Burgoyne, Capt. Sherrard Osborne, Viscount Strafford de Redcliffe, Mr. Reverdy Johnson, Lord Justice Gifford, Mr. A. Trollope, Sir John Simeon, Professor Blackie, and others, spoke. Mr. Godwin, as a member of the committee, announced that the donations amounted to about 980*l.*, and the Chairman informed the meeting that the late Mr. Brown, a member of the great publishing firm of Longmans, had bequeathed to the fund a sum of 3,000*l.*, being, with a single exception—that of the Newton bequest sixty years ago—the largest contribution ever made by a private individual.

The Artists' General Benevolent Fund.—The dinner on Saturday evening last, presided over by Lord John Manners, was a great success. About 180 persons sat down, and Mr. Hardwick, as treasurer, announced that the subscriptions amounted to over 1,500*l.* Mr. Millais, R.A., the new honorary secretary, had evidently worked well. The speakers, in addition to the chairman, were Sir Francis Grant, A.R.A., General Wood, Mr. A. Trollope, Mr. Frederick Taylor, Mr. O'Neil, Lord Malmesbury, Mr. Godwin, Sir Coutts Lindsay, Mr. Marcus Stone, and others. We understand the committee also offered a building for the reception and education of the children of artists. Unless to a considerable extent endowed, they should deliberate well before accepting it.

KIDDERMINSTER INFIRMARY COMPETITION.

THE committee have held a meeting to reconsider a resolution passed on the 23rd of December, limiting the sum to be expended on the building to 4,000*l.*, "with a view of rescinding the same, and of granting enlarged powers to your committee, this sum being found quite inadequate to meet the estimated cost of the approved plan, combining, as it does, all the requirements of the honorary surgeons."

In consequence of this a correspondent justly writes:—

"As the author of one of the rejected designs in the late competition for this building, I cannot allow this additional call to be made upon the subscribers without entering my protest against the action of the committee in having chosen, from out of eighteen designs, one which it was easily to be seen would cost 40 per cent. more than the sum to which competitors were restricted, viz., 4,000*l.* I made a careful survey of the whole of the drawings whilst they were on view in the Corn Exchange, and, therefore, I have no hesitation in stating that there were three (or more) designs there, either of which was more conformable with the 'Instructions' issued by the committee, than the selected one is, and that either of them could be erected for 1,000*l.* less than it can be. Had the committee taken the notice of an intelligent, professional man, and acted upon it, I feel sure that the competition would have been decided more by merit and less by personal friendships; and that those gentlemen, whose designs were returned to them *carriage to pay*, would have had the consolation of feeling that, at least, fair play had been awarded them."

THE PICTURES AT THE ACADEMY.

Str.—Is it possible that no better plan can be devised for hanging the pictures at the Royal Academy than the barbarous one of driving into the walls the large and unsightly nails visible in every direction?

The damage to the frames in several instances is perfectly apparent, and the state of the walls after a few years of such honeycombing is very easily imagined. Is it no one's business, moreover, to give the glasses a clean after the pictures are hung?

I cannot help thinking that, now the pictures are all hung a fair distance from the floor-line, a protecting bar, which would not interfere at all with the view, is very desirable, to keep the visitors a reasonable distance from the walls. In more than one instance, during my visit, I saw an individual, without the slightest compunction, pass in a crowded corner between the crowd and the pictures, brushing his shoulders right against the painted surface, and, I should imagine, by no means improving it.

CONDITION OF WATER.

Str.—In "W. R.'s" communication, which appeared in your edition of May 1, on this subject, he states, "it is not these salts, *per se*, which cause disease, but rather that their presence and derivation are indicative of some latent and subtle power, the nature of which we know not, but whose property is to generate and propagate certain forms of sickness when taken into the system." If this be the case, I presume it would be practicable to remove the insidious salts from impure water, at least temporarily, and still to leave the latent and subtle power, which is the real cause of sickness. Therefore, a system of filtration may be adopted which removes the indications of im-

purity, but leaves this "unknown power" to work its mischief the more subtly. Such a theory cannot but fill with apprehension the minds of those whose domestic water-supply is obtained from a river contaminated by the sewage of several towns whose collective inhabitants number more than 100,000, and by the refuse of a great number of worsted-mills.

Obtaining filtered water from such a source is, I hope, a sufficient apology for tendering these remarks, and calling attention to "W. R.'s" theory. X. S.

A BUILDER'S COMPLAINT.

Str.—Permit me through your valuable paper to call the attention of builders and contractors to an increasing evil which is damaging to the interests of both builders and architects. The evil to which I allude, is that of building materials—merchants who are frequently supplying bricks, sand, lime, ballasts, timber, &c., to persons not in the trade as builders, at prices as low and sometimes lower than to builders, the effect of which is, that many gentlemen who require buildings erected, get hold of a builder's foreman or ex-clerk of works, who may be able to draw a little, and thus with his assistance get out their own plans, employ their own workmen, purchase their own materials, and under a false impression of effecting a saving of money, dispense with the services of both architect and builder; and this is traceable to the temptation offered of cheap materials; and what is worse, in most instances when the building is completed, the proprietors think they have effected a large saving, and though it is a delusion, yet never having had any estimate from a builder, they remain happy in their ignorance.

If you will kindly call the attention of the trade to this subject, I think some of your readers will be ready to suggest a remedy for such an evil. A BUILDER.

THE OLD GRAVE-YARDS IN LONDON.

Str.—Many of your readers may have observed the neglected state of the disused burial places, which, once sacred when they paid, are now disregarded by clerical disease, disincanting disease, discontinued, disgraceful. Disrespect is heaped on the departed. Stacks of timber are the lot of some, but that is a deal better than what others have to bear; houses have been erected on our grandfathers' stomachs,—but will they bear up bodily against it? Another sacred resting-place is converted into a rubbish depository, a home for carts and harrows, refuse from fish-shops, and serves as a canine gallop, where poor Pinchbeck and his kindred are wont to play. I verily believe the owners (?) of these yards would sell the clay to make bricks, if an offer were made. Take precedent from "Old Toxy Philozer."

ROMAN PAVEMENT IN LONDON.

WITHIN the last few days a discovery has been made of a Roman tessellated pavement, in course of excavating at the corner of the Poultry, for the formation of the new street from the Mansion House to Blackfriars. The pavement lies about 17 ft. from the surface of the ground, and, as far as can be at present ascertained, is in excellent preservation. It is evidently of some extent. Adjoining the pavement are the foundations of Roman walls, with other evidences of extensive buildings.

THE COLOURING OF ARCHITECTURAL ARTISTS.

In examining Mr. Petit's sketches, at the Architectural Exhibition, one cannot help being struck with the great uniformity of colouring which pervades them. Whether it is a building in London, Rome, or Jerusalem that is represented, the same tints prevail. This mode of treatment, although very pleasing to the eye, gives a very unreal effect to the subjects; for what Londoner would recognise his smoke-dried St. Paul's under the garb which Mr. Petit has given it?

It is to be feared that many architectural artists are guilty of the same deception, and aim in their drawings at producing a pleasing effect rather than a true representation of the stern realities of actual building. E. W. T.

PHOTOGRAPHIC TELL-TALE.

Str.—I perceive in the *Builder* a suggestion for a photographic "tell-tale." In anticipation of the "smiles" which will greet its advent, let me state that I have often, in earnest fun, told, at the dinner-table, to the alarm of my present, that a contrivance was in embryo by which the whole of the proceedings of an interior might be made as plain as an illustrated book; that this would be done by a roll of sensitive paper released by clockwork, and set in some concealed spot commanding the fullest view of room or chamber, and so adjusted as to photograph every two minutes if necessary; and that, when the master returned, he could thus spread out before him all the transactions of the past time.

I claim nothing for the notion, having already been mischievously rewarded for the confirmation I have occasioned, and the cries of "Shame!" from some, and "What next?" from others, most seriously ejaculated. J. G. F.

THE KUNG CHERRY.

Some years ago Chinese seed chestnuts were introduced in a growing state by means of Vardian cases into India. Is it not possible to introduce the Kung Cherry-tree,—which perhaps may have been introduced into Russia from Tibet or Tartary by some recluse monks or anchorite,—into this country? Amongst the term-swept and almost treeless Orkney, or Western Isles, even in the Island of Lewes, the division of land is marked by rows of docks, whose stems make the creels or hedges in which the poor inhabitants carry out manure. Might not such a tree, if it could be introduced, be of great practical utility and benefit, as people go far and near to see a single tree?

Elder and sycamore stand the sea-breezes: is it not possible to introduce the seeds of these also?
CIVIS LONDINENSIS.

COMPETITIONS.

Hull.—*St. Silas's Church Competition.*—At the last meeting of the committee, the second premium was awarded to the plans bearing the motto "Well considered." The design is by Mr. F. W. Hagen, of Hull.

Lambeth Workhouse.—The premiums for the infirmary were awarded as stated in our last. We have now to add that the first premium for design for workhouse has been given to Messrs. L. & C. Harston, for design mentioned as "K," in our notice.

Miscellaneous.

Rossini's Last Work.—There has been a great struggle for Rossini's last work, the "Messe solennelle." It is now definitely understood that this great work is secured for England, the proprietor of the copyright (for purposes of publication in England) being Mr. Thomas Chappell. Rossini's Mass will be produced by the directors of the United Opera, London, in St. James's Hall, on the 19th inst. It will be illustrated by the talents of the first vocal artists; and the choruses will be sung by a body of chorists who are unrivalled.

Cardiff Free Library and Museum.—It is proposed by Mr. Price, the honorary secretary of this institution, to erect a new building for the Free Public Library, Museum, Gallery of Art, Schools of Science and Art, and Lecture Theatre, and to make application to the town council to appropriate to this use the piece of land in the rear of the new post-office, known as "Mr. Stockdale's Garden." The building, under the Libraries Act, would become town property, and no corporation might be asked to build a theatre, with entrance direct from the town-hall. Mr. Price estimates that the cost of the several buildings would be approximately as follows, viz.—The schools of science and art, 1,750*l.*; gallery of art, 540*l.*; museum, 2,500*l.*; library and reference room, newspaper and magazine reading-room, 4,740*l.*; lecture theatre, 3,370*l.*; total, 12,900*l.*

Metropolitan Tramways.—There is now a very fair prospect of improved street conveyance in large sections of the metropolis. Street tramways are likely to have a trial in London, under conditions carefully considered. The select committee of the House of Commons to which the three tramway bills were referred has accomplished its work. The bills, which will now be referred to the House of Commons, and most probably passed, provide for the establishment of three chief lines of tramway,—two on the south of the Thames and one on the north. The lines south of the Thames are one connecting Fimlico with Peckham and Greenwich, and another connecting the new thoroughfare of Southwark-street with Brixton and Clapham. The northern line is from Whitechapel Church to Stratford. In all cases the fares are fixed by the bill, and not more than 2d. is to be charged for any distance under two miles.

Metropolitan Improvements.—Southwark Park will be opened to the public by Sir John Thwaites on the 19th inst. On Friday the Metropolitan Board of Works decided to contribute 7,000*l.*, one-half of the cost of an improvement in Royal Mint-street, Whitechapel; and 306*l.*, one-half of the cost of an improvement to be carried out by the St. Olave's District Board of Works, by setting back the premises 60 and 61, Coley-street.

Towns Drainage and Sewage Utilization Company.—A new company with this title has been incorporated by special Acts of Parliament, 30 & 31 Vict., c. 173, and 31 & 32 Vict., c. 175. The consulting engineers are Messrs. James Beunles and G. B. Bruce, and the acting engineer is Mr. J. Bailey-Denton. The subject is one requiring a peculiar knowledge, which cannot be commanded without heavy expense, and which is scarcely available for small towns and local districts. Hence, says the prospectus, the necessity for some central authority on the subject, easily accessible, and possessed of the latest information;—and it is this want which the company seek to supply. It is also intended by the company to assist the local authorities of towns in disposing of their sewage with the least outlay and taxation, by acting as a medium between the sewer authorities and farmers. The company will be prepared to advise upon and to treat for the preparation of plans and the construction of works necessary for the supply of water to towns and districts at present insufficiently provided.

Fall of a House in Oxford.—Labourers in the employ of Mr. John Dover, builder, had been engaged in digging the foundation of a house about to be erected on land having a frontage to the High-street, in St. Clement's parish. The excavations were made close to a house, the foundation of which was so far undermined that the whole of the external wall, from the roof to the ground, fell. Fortunately, the men were engaged in digging the foundation of a second house adjoining, and escaped without being injured. On the previous evening the inmates of the house discovered that something was wrong, in consequence of their being unable to fasten the back door, but although the dangerous state of the outer wall became more apparent on the following day, nothing was done to shore it up and prevent it from falling. The inmates had left the house a short time when it fell.

New Indian Railway.—Operations in connexion with the survey and laying out of a new and important line of railway communication have just been commenced by a staff of British civil engineers. The line is designed to connect Carwar, on the Malabar coast, and the cotton districts of Hooblee and Dbarwar, with the probability of its being carried through into the Madras Presidency. The line is to be designated "The Southern Mahratta and Mysore Railway." There will be formidable difficulties to contend with in "carrying the line up the densely-jungled ghat," with an elevation of some 1,500 feet. The undertaking is to be carried out under the direct orders of Government. The Duke of Argyll has devolved the chief responsibility on Mr. Buchanan, C.E., London.

Building for Royal Society for Prevention of Cruelty to Animals.—The foundation stone of a new building, in course of erection for the purposes of this society, in Jermyn-street, St. James's, has been laid. A statistical record of the origin and progress of the society states that since its formation in 1824 upwards of 16,000 convictions in cases of aggravated cruelty have been obtained by means of its officers. The yearly income of the society is nearly 4,000*l.*, and the cost of the present building will be about 3,000*l.* The freehold for the site, contributed by Mr. George Wood, one of the trustees, is valued at 5,000*l.*

The South Staffordshire Industrial and Fine Arts Exhibition.—On Tuesday the South Staffordshire Industrial and Fine Arts Exhibition, Wolverhampton, was opened by Lord Granville in the hall which has been erected for the purpose in the grounds attached to Molineux House. The building, which is of iron and glass, forms a central nave 150 ft. long by 60 ft. in width, and 18 ft. high at the spring of the roof, which is semi-octagonal, and rises to a height of 45 ft. from the floor. Around the building is a Fine Arts Gallery, containing nearly 800 oil and water-colour paintings. The objects of industry exhibited are placed on the floor and outside the building. The architect and designing decorator of the Exhibition-hall was Mr. Bidlake, of Wolverhampton, and the contractors were Messrs. Clarke & Co., of the same town.

A Leper Hospital for Jerusalem.—The Marquis of Bute, says a Roman Catholic paper, in token of gratitude for his conversion, and as a thank-offering, is about founding and endowing a magnificent hospital for lepers in Jerusalem.

New Fever Hospital for Bradford.—The Board of the Bradford Infirmary have let the works for this building to the following contractors:—Excavators' and masons' work, S. Holdsworth; carpenters' and joiners' work, W. Crabtree; plumbers' and glaziers' work, J. Schofield; slaters' work, Hill & Nelson; painters' work, Brown & Pullen; the total cost being 8,500*l.* The building is arranged to accommodate forty-eight patients. The site, approaches, boundary walls, &c., are estimated to cost 4,000*l.* The architects are Messrs. Andrews, Son, & Pepper.

The late Sir Wentworth Dilke.—We record with feelings of extreme regret the death of Sir Charles Wentworth Dilke, intimately associated for many years past with International Exhibitions, the Royal Horticultural Society, and the Society of Arts. The deceased baronet has left two sons,—not one only, as stated in some of the newspapers,—namely, the present member for Chelsea, and Mr. Ashton Dilke, who had accompanied his father to St. Petersburg, where the event that many besides personal friends will deplore took place.

Memorial Hospital at Leek.—A memorial cottage hospital is about to be erected at Leek by Mrs. Alsop, as a gift to the town in memory of her late husband, Mr. James Alsop, J.P. The arrangements of the plan comprise, on the ground floor, a male ward, acute-case ward, waiting and committee rooms, kitchen, scullery, pantry, store, bath-room, and closet, with other conveniences, and a detached mortuary. On the upper floor are female ward, acute-case ward, operating-room and medical stores, nurses' bedrooms and stores, bath-room, and closet. Mr. Sugden, of Leek, is the architect.

Reminiscences of Authors.—On the 6th inst. Mr. S. C. Hall, P.S.A., delivered his now famous lecture on the Authors of the First Half of this Century, in the rooms of the Society for the Encouragement of the Fine Arts, Conduit-street, to a large audience. The chair was taken by Sir Digby Wyatt, and Mr. S. C. Hall commenced by stating that having had frequent and peculiar opportunities of intimacy with the distinguished men and women of his time, he was about to give portraits of some of those whom he had known, entirely drawn from personal remembrance. He then sketched graphic and interesting accounts of Hannah More, Samuel Rogers, James Montgomery, Ebenezer Elliott, Thomas Moore, Miss Landon, Amelia Opie, Charles Lamb, Samuel Taylor Coleridge, Leigh Hunt, Professor Wilson, Hood, and many others. The lecture was vividly and impressively delivered, and was listened to with the closest attention, now and then interrupted with bursts of applause.

St. John's Church, Croydon.—The artisans engaged in restoring the parish church at Croydon, which was destroyed by fire, as our readers may remember, on the 5th of January, 1867, are making progress. An oak pulpit is in process of construction by Mr. Ruddle, of Peterborough. An alabaster font, with stone base, and reeded with centre of alabaster and sides of Casu stone, and altar-rail in oak, all from designs by Mr. G. G. Scott, are being executed by Mr. Farmer, of Westminster-road, by whom the whole of the carving of the exterior and interior of the church will be done. The prayer-desk, also from a design by Mr. Scott, will be carved and presented by Mr. Gaskin, of Croydon. Messrs. Hill, of Euston-road, are engaged in building the new organ. The peal of eight bells and a clock have been designed by Mr. E. B. Denison, Q.C. The bells are being cast by Mr. Taylor, of Loughborough, and the clock is in the hands of Messrs. Gillett & Bland, of Croydon.

Death of the York City Surveyor.—The sudden death is announced of Mr. Thomas Pickersgill, the city surveyor of York. He was seized with illness in the street, and died in a few minutes in a shop. Fatty degeneration of the heart is said to have been the cause of his death. He had on previous occasions suffered somewhat similar attacks.

Proposed New Town-hall for Lincoln.—At the meeting of the town council it has been resolved that a new town-hall is required, and a committee has been appointed to select a suitable site, and to report to a future meeting. The County Court authorities are expected to contribute 8,000*l.* or 9,000*l.*, and Mr. Alderman Brogden proposes that the Corporation should add 8,000*l.*, and give the site, valued at 4,000*l.*

The Brighton Drainage.—At the last week's meeting of the town council, the Works Committee reported the receipt of the following tenders for the construction of a tubular iron outfall near the western boundary of the borough. The surveyor's estimate was 7,000*l*. From Mr. J. Phillips, London, 6,400*l*.; Messrs. G. Cheesman & Co., Brighton, 8,400*l*.; J. Harris & Son, Rotherhithe, 6,943*l*. 10*s*.; W. Webster, London, 9,900*l*.; J. Kirk, Woolwich, 5,324*l*.; T. Middleton & Co., Lindfield, 6,749*l*.; and Dickenson & Oliver, 8,500*l*. The committee recommended the acceptance of the tender of Mr. Kirk, and approved of his arreties. The proceedings were confirmed. The Borough Surveyor (Mr. Lockwood) then reported upon the appointment of a Clerk of the Works to superintend the new groynes and storm outlet opposite the Junction-road; and the Works Committee appointed Mr. Charles D. Rickards at a salary of 2*l*. 10*s*. per week.

Family Monument to the late Bishop Lonsdale.—A monument has just been erected in Eooseshall churchyard, over the grave of Bishop Lonsdale, by the members of his family. The monument is in the form of a memorial cross, of early architecture. It rests on an octagon base of grey Aberdean granite, rising two steps, and measuring 8 ft. 4 in. across. In the centre of this base is fixed a square block of the same material, with the sides sloped away from the top. Out of this block or plinth springs the shaft of the cross, the upper limbs of which are connected by a circle. With the exception of the octagon base, which is tooled down smooth and level, the whole of the monument is highly polished. The dark blue colour of the polished granite contrasts with the light grey tint of the unpolished base. The monument measures about 11 ft. 6 in. in height. The stone was wrought, polished, and engraved at Messrs. Fraser's Granite Works, Aberdeen, under the direction of the contractors, Messrs. Bevers, of Southwark. Mr. Gilfert Scott designed the memorial.

The Thames Embankment.—Most readers are aware that the Metropolitan District Railway Company, which obtained powers to make a line under the Embankment, have failed to carry out their powers up to the present moment, and have thus delayed, and are still delaying, its completion. This has involved a great expense on the Board of Works, and thus, of course, on those who provide the money; but the worst loss has not yet been reached, and there is great probability, not only of the final opening of the Embankment being delayed, but of a further outlay falling upon the ratepayers. A large staff of officials has been retained and paid which would have been dispensed with but for the delay. The public are also losing the interest on about two millions of money expended on the Embankment, which is lying idle, and has been (through the delay of the railway company) lying idle for two years. Moreover, the 200,000*l*. which the company was bound to pay to the Metropolitan Board for the privilege of making the railway in the Embankment has not been paid.

Memorial of the Slingsby Hunting Accident.—A monument is to be erected in York Minster to the memory of Sir Charles Slingsby and of those others who lost their lives in a late hunting accident. Hitherto there have been two proposals; an obelisk at Newby or a memorial bridge over the Ure on the site of the present ferry. The committee of subscribers have, however, determined in favour of a cenotaph in the Minster.

Monument to Dr. Whewell.—The Master and Fellows of Trinity College, Cambridge, have just decided to entrust to Mr. Woolner the execution of a monument to Dr. Whewell, which is to be placed in the ante-chapel of the college.

Exmouth.—The new docks have been thrown open to the public. The works were commenced in 1856 by a company with a capital of 60,000*l*. A new market, built at a cost of 6,000*l*., and a new hotel, which cost 8,000*l*., have also been opened. The principal improvements have been carried out by the Hon. Mark Rolle.

Rotherham.—Mr. George Jennings, late Assistant Surveyor to the Rotherham Board of Health, has been appointed to the offices of Surveyor and Inspector of Nuisances to the Rotherham and Kimberworth Local Board of Health, rendered vacant by the resignation of Mr. J. H. Jagger.

To Remove Old Putty.—Many persons destroy their window sash encasement to remove old putty. This may be obviated by applying a hot poker to the putty, which will then readily yield to the knife and leave the sash clean. Care must be taken not to touch the glass with the poker, nor even to let it stop too near it.

Query.—One of the "Things not generally known," is that steam will, by direct impact, ignite dry wood or other inflammable substances. The "Scientific American" mentions a case in which a portion of dry pipe was lighted by steam from a boiler 12 ft. off!

The Sewage at Barking.—Matters are looking serious at the northern outfall, as we have more than once expressed fears would be the case. Mr. Robert Rawlinson, C.B., has been directed by the Home Office to examine into and report on the circumstances.

To Stop a Leak.—Beat yellow soap and whitening, with a little water, into a thick paste. Rub this over the part where the leakage is, and it will be instantly stopped.

TENDERS.

For four cottages, Uttoxeter-road, Derby, for Mr. W. Halliday. Messrs. Thompson & Young, architects:—
 Bridgwater £389 0 0
 Cradock 811 15 1
 Riley (accepted) 782 9 8

For works, in Derbyshire, for the Right Hon. the Lord Vernon:—
 S. De Ville (accepted) £260 0 0

For erecting the New Prince Alfred public-house, London-street, Greenwich, for Mr. Hodges. Mr. J. Dudley, architect:—
 Morgan £2,158 10 0
 Windows 2,682 0 0
 Bamford 2,040 0 0
 Disney 2,900 0 0
 Sabey 1,969 0 0
 Pearson 1,900 0 0
 Seywell 1,953 0 0
 Turner & Sons 1,765 0 0

For building a house, at Burnham, near Barton-on-Humber, in the county of Lincoln, on the estate of the Right Hon. the Earl of Yarborough. R. G. Smith, architect. Quantities supplied by Messrs. Rake & Rawell:—
 Barritt £2,671 0 0
 Jackson 2,674 0 0
 Hutchinson & Son 2,400 0 0
 Bilton 2,338 0 0
 Stamp 2,234 0 0
 Clarkson 2,212 0 0

For the erection of a hotel at Finchley. Mr. F. Lett, architect. Quantities supplied by Mr. C. Poland:—
 Wheeler £1,847 0 0
 Henshaw 1,779 0 0
 Sharpleton & Cole 2,000 0 0
 Cooper & Cullum 1,650 0 0
 King & Sons 1,543 0 0

For the erection of a new dwelling-house at Farncombe, Surrey. Mr. H. Peak, architect. Quantities supplied:—
 With 26oz. Sheet. With Plate Glass.
 Mitchell £1,319 0 0
 Moor & Son 2,300 0 0
 Duke 1,270 0 0
 Lee 1,233 0 0
 Nye 1,212 17 4
 Goddard & Son 1,173 0 0
 *Accepted.

For alterations to the Crown Tavern, Clerkenwell-green, for Mr. Maples. Mr. W. Noon, architect:—
 Hyde (accepted) £2,650 0 0

For alterations and additions to a mansion at Wandsworth. Mr. H. Ford, architect:—
 Easton Brothers £5,577 0 0
 Dove Brothers 4,587 0 0
 Henshaw 4,317 0 0
 Gammon & Sons 4,239 0 0
 Simpson 4,106 0 0
 Conder 3,877 0 0
 Screener & White 3,751 0 0
 Kirby 3,675 0 0
 Avis & Co. 3,638 0 0
 Adamson & Sons 3,629 0 0
 Tongue 3,510 0 0
 Crab & Vaughan 3,425 0 0

For the erection of a school at Hanwell. Mr. C. J. Jones. Quantities supplied by Messrs. Richardson & Waghorn:—
 Tyrell £730 0 0
 Dugate 700 0 0
 Nye 700 0 0
 Adamson 687 0 0
 Hanson 675 0 0
 Gibson Brothers 650 0 0

For erection of shop and dwelling-house in Duke-street, Brighton, for Mr. Sandall. Messrs. Gonty & Gibbins, architects. Quantities supplied:—
 Dancy £1,240 0 0
 Garrett 1,240 0 0
 Cheesman & Co. 1,205 0 0
 Lockyer 1,195 11 0
 Patching & Son 1,120 0 0
 Dean & Dickenson 1,063 0 0
 Sater 1,058 0 0

For alterations to house at Crown-hill, Lower Norwood, for Mr. Josiah Temple. Messrs. Gouly & Gibbons, architects:—
 Deacon £115 0 0
 Boyer & Son 99 0 0
 Wards (accepted) 370 0 0

For erection of stables, &c., at Palmeria-mews, Hove, Brighton, for Mr. George Vaughan. Messrs. Gouly & Gibbins, architects:—
 Levett £796 0 0
 Cheesman & Co. 759 0 0
 Walsh & Co. 708 0 0
 Lockyer 698 0 0

For the erection of two shops on forecourts of Nos. 27 & 27A, Foston-road, for Mr. W. A. Baker, architect. Quantities supplied by Messrs. Richardson & Waghorn:—
 Stephens & Watson £69 0 0
 Birch 69 0 0
 Halcham 69 0 0
 Grover 69 0 0
 Tarrant (accepted) 55 0 0

For the erection of a workshop in Southampton-mews, Foston-road, for Mr. Hughes:—
 Abbott £533 0 0
 Cooper & Cullum 557 0 0
 Roberts 545 0 0
 Eaton & Chapman 523 0 0
 Kelly Brothers 523 0 0
 Blott & Co. (accepted) 519 0 0

For a tower and spire at Forest-hill, Surrey. Mr. F. Christian, architect. Quantities supplied by Messrs. Goodman & Pinall:—
 Hutchinson £4,655 0 0
 Wells 4,316 0 0
 Wright 3,446 0 0
 Mundy 2,978 0 0

For houses and schools, York-road, Battersea. Mr. C. A. Buckler, architect:—
 Nightingale (accepted) £4,736 0 0

For a memorial to be erected in the City of London Cemetery, over the remains of persons buried in the church of St. Mary Somerset, Thames-street, and recently removed. Messrs. Haywood & Blashill, architects:—
 Farmer & Bendley £329 0 0
 Dunlavy & Co. 290 15 0
 Drutt (accepted) 275 0 0

For three shops at Beckenham, Kent. Messrs. Haywood & Blashill, architects. Quantities supplied by Mr. D. Cubitt Nicholls:—
 Breeze & Emmett £2,631 0 0
 Emor 2,067 0 0
 Boston 2,000 0 0
 Hill, Keddel, & Waldram 1,998 0 0
 Colls & Son 1,978 0 0
 Gammon 1,951 0 0
 King & Son 1,840 0 0
 Tully (accepted) 1,375 0 0

For alterations to No. 69, Mortimer-street, for Mr. F. Robinson:—
 Saunders £525 0 0
 Ditto, revised (accepted) 372 0 0

For re-building premises, No. 65, Tottenham Court-road, Messrs. Vaughan & Son, J. Dudley, architects. Quantities supplied by Messrs. Richardson & Waghorn:—
 New For old
 Pennings. Materials.
 T'Anson £1,837 0 0 225 0 0
 Wagstaff 1,430 0 0 50 0 0
 Simpson 1,381 0 0 10 0 0
 Keeble 1,323 0 0 35 0 0
 Conder 1,257 0 0 5 0 0
 Eaton & Chapman 1,293 0 0 49 0 0

For farm buildings at Malmain's Farm, Alkham, near Dover, for Mr. W. F. Trotter. Mr. J. H. Andrews, architect:—
 Miller £1,323 0 0
 Sampson 1,293 0 0
 Richardson 1,140 0 0
 Harber 1,069 0 0
 Bushell 1,062 0 0
 Adcock (accepted) 1,048 0 0

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H. G. J.—H. A. & C. H.—E. F.—G. W.—B. R.—J. M.—W.—J. I.—J. D. F.—J. F. R.—W. R.—A. J.—H. P.—K.—W. G.—F. H. R.—R. W.—W. R.—F. A. R.—H. & Co.—F. W. H.—H. R.—O. C. H. Ltd. Society.—M. P.—P. & R. (in due course).—H. B. (we give no currency to innuendoes).—Mr. C. (received too late).—W. O. B. (this appears).
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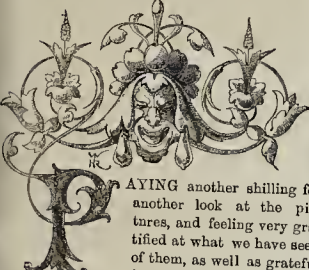
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The Builder.

VOL. XXVII.—No. 1372.

Royal Academy Exhibition.



AYING another shilling for another look at the pictures, and feeling very gratified at what we have seen of them, as well as grateful for the improved conditions under which we can see all, two thoughts occur in the turning of a turnstile, as some one more than whispered, "Oh, hang the pictures, I've come to see the rooms." Hang the pictures, indeed! Who is to do it to please everybody? We thought, how far the happier of the two must the Royal Academician be who is to be hung, compared with him who is to do the hanging; and what a delightful state of things would be brought about if everybody's individual notion of its necessary reform were some day to be realized in the future existence of an institution so strong in its present growth of a hundred years, as to be very well able to defy some very strong attacks from those who would prune and graft, with little respect for the stem, even, if they could get no new fruit from the old tree. But so long as visitors may come and visitors may go, the Royal Academy will go on for ever, if another aim be brooked. We cannot shut our eyes, however, to its shortcomings and mistakes.

Mr. Watts, in his impressive indication of almost entire obliteration and intended universal renovation such as he presents in his imaginative conception of "The Return of the Dove" (45) over the vest plain of subsiding water, to the mark that contains the little remnant of all that moved, breathed, lived or quarrelled; wept or made merry; worked or rested in the on-civing world, perhaps, allegorises the only real means of adjusting some difficulties. Mr. Watts is a poet as well as a painter; and though his other pictures of this year's exhibition, are not so well represented as on some former occasions, high qualities distinguish his embodiment of chivalry protecting innocence and virtue in "The Red Cross Knight and his" (125).

Mr. Herbert's most remarkable production is a large desert scene (184), "Gazelle Hunters of North Africa," in unexpected and too-close-to-be-pleasant proximity to a lion and lioness unmistakably intent on making game of them unless they are anticipated and made game of: the bare, sun-burnt waste of rock and sand with a sign of vegetation to deny its barrenness; the wide expanse of sky, with no cloud that would promise moisture—admirably convey the idea of parched desolation and an atmosphere in which a tight cravat would be intolerable. A richly executed study of a "Girl of Lower Egypt," descendant of Amron the Victorious, (36), too peculiar personally, figuratively and with regard to costume, to admit of a doubt of her being faithfully portrayed; and "Mary Magdalene" at the tomb of the Saviour on the day of his crucifixion (416), are at once to be

identified, by the clear and somewhat hard style of the manipulation, as emanating from one of the very best of British artists.

Besides a grand classic rendering of "Hero lighting the Beacon to guide Leander across the Hellespont" (108), wherein nude nature has been mystified by moonshine and fire-light into decorous dress, though the physical description of the heroine—to say the best and the worst of it—at least equals her poetical development, Mr. Armitage contributes a profile of an Egyptian lady, regarding with mixed concern and curiosity a sick chameleon (272), than whom, if Cleopatra were more beautiful, Antony must have been no weaker than big schoolboys could consider him. His chief work, however, is the smallest; for this is marked by great originality of treatment and of high value by reason of its subject. Mr. Armitage illustrates the Gospel of St. Matthew, iv. 21, "Christ calling the Apostles James and John, the Sons of Zebedee" (365), with a propriety of sentiment and a sufficiently realistic probability of scene and circumstances that conduce very much to gaining consideration and respect for the picture. He also exhibits two clever portraits.

To any one who needs food for reflection,—but who can need it, with their own pocket edition of the world's business troubles and trials for their own special and immediate cogitation?—yet to those so happily exceptional, an exhibition of pictures is a mine of inexhaustible resource; its varied contents offer a vein to the major part of imaginative misers,—gold to all.

Mr. Ward's telling picture of "Grinling Gibbons's first introduction at Court" (144) indicates a double lesson; one, to those whose common apostrophe is "What odds? It will be all one a hundred years hence!" Another, to the grumblers, who would have least cause to grumble if they had a real one, and gave less time to their pet propensity: there is far less hope for the hopeful, who found their too sanguine belief on a fortuitous show of early good fortune: disappointment in the long run awaits nearly all such, and it is far better to begin with failure than to end with it; and to recollect that platitudes is not always "foolish talk." Mr. Ward's picture illustrates a passage in "Evelyn's Diary," describing how Grinling Gibbons, having been introduced to Charles II., who has been astonished by his workmanship in a curious specimen of carving, has been commanded to show it to the Queen, who, from the fact of its being a crucifix, would, in his Majesty's opinion, have been likely to appreciate it as much or more than himself, and have bought it; "but when his Majesty was gone, a French peddling woman, one Madame de Boord, who used to bring petticoats, and fans, and habiles out of France to the ladies, began to find fault with several things in the work, which she understood no more than an ass or a moakie," very much to Evelyn's indignation, who summarily relieves the Queen of the cause of question, by ordering the porter who brought the work of art to take it away. The anecdote is very perspicuously related by the artist, who has found a congenial theme to expatiate on: his aptitude for characterization, knowledge of the costume and customs of the period, and fine taste for colour and effect, have conduced to the production of a thorough realization of the incident. The name of Grinling Gibbons will be associated with perfect skill in wood-carving so long as the art exists; his patient endurance is one example of many to encourage merit that waits for acknowledgment.

It will be all one, it may be supposed, with most of us a hundred years hence, so far as mundane relationships are concerned,—unless like the Pole of recent report, whose hair regained colour at eighty or ninety years of age, and who died comparatively youthful at 130;—and all one at last with those who, coming after

us, live to take their turn at the wheels that keep Time's clock going for them; for they will share the same senses and the same want of them; the same dispositions and proclivities; the same or similar chances of success or failure; the same fallacies and the same discontent, which is a virtue, for without it there would be no energy, no effort, and no such results as a steady determination not to be satisfied easily frequently obtains:—

"The time of life is short—
To spend that shortness badly, were too long,
If life did ride upon a dial's point,
Still ending at the arrival of an hour."

So grumble whilst you work, but strictly with aad at yourself—not loudly.

Did Luther ever dream of all the influence his dissent from Papal authority would have over the Christian world? Mr. Ward depicts him as the monk who, in his youth and interpretative genius found more than words in the Holy Book so long hidden from custom-bleared eyes. The painter could not show the thoughtful, wasted face and form of the student whose new belief was almost a terror to himself; and this he has done most successfully by means of fit apprehension of character and vigorous imitative painting.

Mrs. Ward has painted the Young Pretender (211) in his happier discontented days, recognising some poor exiled Jacobites, who are glad to kiss his hand extended with kindly grace to raise them as they kneel in homage to the shadow of royalty that has darkened the sunshine of their world's prosperity; but they are loyal gentlemen, and are well repaid as the princely boy expresses his grateful appreciation of their services. "He told them he had often heard of their valour, and that it made him proud, and that he had wept for their misfortunes as much as he had done for those of his own parents; but he hoped a day would come that would convince them that they had not made such great sacrifices for ungrateful princes." Miss Strickland is fortunate in having so powerful and so graceful an illustrator as Mrs. Ward to point the interest of her anecdote: one whose susceptibilities enable her to comprehend the full force of its touching nature, and whose fine taste and great skill give her so much command in securing the sympathy of others. In her many successes, she has never succeeded better in narrating any incident selected for recording than in this, of broken-down but still devoted loyalty; or in depicting the grief-worn ailing exiles in such strong contrast with the bright hopefulness of the boy; their cynosure and the picture's tone.

Mr. Marcus Stone is the Harrison Adamsworth of the palette and the brush; his dramatic representation of "The Princess Elizabeth obliged to attend Mass by her Sister, Mary" (60), has derived more romantic interest from his method of relating the incident than a less demonstrative and more probable version of it could possibly have given. The bigoted queen sits gloating on the all-sufficiency of ceremony and outward show to bring religious comfort whilst the princess at her side sits in quiet but determined disregard of priests, censuring acolytes and of the plotting Spanish and French ambassadors alike, who, in adjoining stalls, are signifying their observation of Elizabeth's behaviour as she trifles with her riags, and looks into vacant space—of which the painter has provided plenty—by stealthily exclaiming whispered remarks. Mr. Stone paints very boldly and precisely, and shows great discrimination in his choice of costume and accessories; but he shares in a prevailing mistake of giving his actors so much stage room that they lose their proper importance; the carpet is too often now made the first object for consideration in precedence of what may happen to be on it by rights. Mr. Orchardson is less amenable in this respect than usual, though his manner of painting is even more dexterous and fascinating than ever; so much so,

that the admiration it exacts condones the objection, if it exists. "The Duke's Antechamber" (103) is well filled with such an assemblage of applicants for patronage, favour, and assistance, as dependency, toadyism, and exigence, would be likely to bring together at the hour that his Highness might be most approachable. The first to have admission to his presence is the scrivener to provide means for the indulgence of His Greatness in his weakness; for there is show enough to indicate that the fawner and flatterer find a ready ear and an open hand. The poet, with his eulogy; the pharmacist, with his new drug or wash; the musician, with a pretty tune he hopes his ducal lightness will dance to, or maybe an opera dedicated in consideration of a high note that few besides his mellifluous-voiced grace could reach; the artificer in precious metals, with a design on gold that can never be carried out without his patron's assistance; the jester, the monk, the hilly and sneak, and an old retainer, or tenant, or soldier, who, with some real claim to it, is less sure of a welcome than any of them, although he has a pretty daughter. This is a very capital picture, and although it can boast no novelty of design, little invention, the skill that is manifested in its production gives new interest to an old subject, and individualizes it as a remarkable work.

In any desire Mr. Yeames may have had to concentrate attention on his excellent technical performance. "The Fugitive Jacobite" (148), he has absolutely and literally been floored, by himself. Why will so clever, so agreeable an artist make "his room to be preferred to his company?" The interior is a tapestried chamber in an ancestral mansion; the hunted man is about to clamber up the chimney, assisted by the means of a ladder—it must be a short one to have been placed where it is—members of his family anxiously cluster about him; one tall sister keeping watch from the window, whilst a younger one sits in serene unconcernedness of impending danger; for her worldly experiences might be amplified in half a "duodecimo" sheet, at the rate of one page a year; all she knows of territory at present is, that it bears flowers; and the toast, "Over the Water," has with her a mental connexion with butter and milk—never bloodshed—to make it at all comprehensible. May be it is the same little sister who comes pattering down stairs, and whose "Alarming Footsteps" disturb the lovers in a smaller and very pretty picture by Mr. Yeames, with a nice effect, but no cause; for little sister has Utopian views, and thinks it only just and proper, and a very natural state of things, for all to be fond of each other; and if anything like civil or unenvil strife were imminent, her advice would be, that everybody should kiss everybody else, and be friends (432).

Mr. Horsley, too, is fond of disclosing lovers' secrets; he takes a merry, mischievous delight and some pains to show how carefully the pretty damsel of a time gone by garded from sudden surprises "The Secret Interview" she gave her gallant swain (498), or to what advantage a daring, sancy youth turned the opportunity when the usually wide-awake guardian was "Caught Napping," to kiss the fair hand of her wicked, winsome charge (397). The tender passion again may have influenced "The Gaoler's Daughter," and have given her motive to cull the bunch of sweet blossoms she holds in her hand, as she confronts her father, whose office is less kindly than his cheery face, for he regards her as so much the more typical of bright golden sunshine to lighten his heart and light up his dismal home, from the very dismalness of that home when she is absent and the disagreeableness of his calling (176). These examples of Mr. Horsley's familiar style have the old qualities of luminousness and pleasant colour, and show incontestable evidence of great proficiency in a rather restricted practice of his art.

If Mr. Marks is at once to be identified with his works, it is not from repetition of their subjects, but from the repeated evidence they bring of his originality, and the aptitude he possesses of distinguishing all men he portrays as men of Mark's. His hand of musicians conducted by the supercilious "stick-in-waiting" to "The Minister's Gallery" (69) are each individualized by some physical peculiarity that is curiously indicative of what manner of men they are, from the pale nervous enthusiast whose soul is in his fiddle, to the drummer who knows he was born to make a noise in the world. Refinement and clever, careful workmanship help very much to give value to this painting.

Refinement degenerates to weakness in Mr. G. Leslie's snper-delicate and evanescent young lady in white muslin and "Celia's Arbour" (133). She is a dream of gracefulness—a phantom of prettiness; and her unreality is shared by the fair victim of "Cupid's Curse" (281), who it may be feared will be the greater sufferer of the two, for the deceiver who could have proved himself unfaithful to one so touching, so tender, and so trusting, must be a hardened criminal indeed. May he who has changed old love for new, find that he has changed for worse!

Mr. Creswick's landscapes have the same charm as ever: whether in avenues for shade and shelter in "Sunshine and Showers" (70), or in more open space to court fresh, soft breezes, one has but need to follow him in his pathways through homely scenes to feel as national and as convinced of their delightful nature as he himself must be. Whether it be "The Windings of a Rocky Stream" (107), or "An old English Village on the Banks of a River" (305), or such homesteads as "Moorland Cottages" offer to his view, he is equally at home in transferring them to canvas, and asserting that there is little travel wanted to prove the world to be beautiful, and that the humblest, even, may dwell in picturesque wealth, at all events.

ARCHITECTURAL SERIALS IN AMERICA.

We trust that the increase in America of the number of periodicals devoted to architecture and kindred topics, may be a proof of improved taste on the part of the people. Possibly no other country can show so enormous an amount of buildings of every description, yearly erected; and we can conceive that the inventive genius of a race so peculiarly gifted as the Americans in mechanical contrivances, has found abundant scope in the perfecting of all kinds of ingenious appliances to lessen labour, and add to comfort and convenience; but as yet we see more evidence of the improvement and skill of the builder than of the architect, more credit to be due to the constructor than to the designer. Americans are eminently a practical people; buildings they must and will have, and of the best; qualities of workmanship and contrivances for convenience they can judge of, and they have sense enough to insist upon these; but for artistic finish and for architectural taste they have no means of applying a standard, other than perhaps the last costly structure that has been put up, and so they have to content themselves with what their architect can best give them. What his best may be can be fairly seen in the illustrations of the many journals that are devoted to architectural art, and from the descriptions of unprejudiced visitors, as well as those of their own writers, so that we shall not be thought ill-natured in asserting that the general design of American buildings is, at present inferior to their construction. The causes of this are probably the very recent recognition of architecture as a profession, and the scarcity of properly qualified men as professors. Now, however, that there are American Architectural Institutes, and a plentiful supply of serials devoted to architectural literature, there is every hope that a sensible improvement will be seen.

We have at this moment on our table many numbers of publications devoted to the building arts, and may mention the *Manufacturer and Builder*, a *Practical Journal of Industrial Progress*, published in New York, a large closely filled folio of some thirty pages; the *American Builder and Journal of Art*, published in Chicago, a three-column quarto of twenty pages; and the *Architectural Review and American Builders' Journal*, published in Philadelphia, a large octavo of sixty-two pages. There are others, but these will fairly serve as examples of what our friends on the other side of the Atlantic are doing in the cause of professional progress.

The first on our list, the *Manufacturer and Builder*, is mainly devoted to practical details of constructional industry. Amongst its contents is an instructive article upon brickmaking, in which we should gather that more care is usually taken in the manufacture and selection of ordinary bricks than is attempted here, and that few others but moulded bricks are in general use. Machinery is largely employed, and manual labour as far as possible is dispensed with. A practical hint is elsewhere given which may be of use to our operatives, as to the hardening of cutting tools, which is, that if the point of the tool whilst in use is kept constantly moistened

with petroleum, the blunting of the edge will be prevented. "Steel tempered to a light yellow has been turned with the greatest facility by using a mixture of two parts of petroleum and one of oil of turpentine." Some papers upon warming and ventilation appear, and a sensible remark is made as to the absolute necessity of some motive power to give force to the adit of impure air, however heated, showing that holes alone will not always do this; however protected from downward drafts—as some adepts seem to think. The illustrations in this serial, which appears every Saturday, are not numerous, but they are generally unostentatious and to the point, and are well executed.

A facade of an iron church in course of erection by the Novelty Iron Works is exhibited, which, for the sake of truth in art, we hope will not be often repeated throughout the country. Iron buildings by the way are numerous in New York, and are often of enormous dimensions. They are generally painted white in imitation of marble, and are usually profusely ornamented. The editor seems very proud to be able to announce to his readers—in large capitals—that "Henry Ward Beecher is positively engaged as a regular contributor," and short articles accordingly appear from that gentleman's pen in the "Home Department." One is on "Too many Irons in the Fire," in which the writer says it is impossible for a workman to have too many, meaning that an artisan cannot make himself master of too many trades. He says,—

"A working man should be anxious to understand every trade that touches his trade. A man with a single trade is like a knife with a single blade. Every blade in addition makes it a better knife, up to the point when it becomes too bulky for convenient use. And this figure very well illustrates the benefit of being able to pursue several different vocations. If the blade of a one-bladed knife breaks, there is an end of it; but if it has two blades, it is serviceable yet."

The architectural designs in this serial are principally of cottages and villas, which seem simple and convenient, and are not noticeable in any special way excepting for the unaccountable omission of all external evidence of chimneys, although fireplaces of usual construction appear in their proper places in the plans (see pp. 56 and 69). From the details of cost we gather that expenses of building have largely increased in the United States, and that they must be in excess of our prices as now ruling here.

The *American Builder and Journal of Art* is somewhat similar in scope to the last mentioned serial. It appears once a month only, and contains a number of short, well-arranged papers of an interesting and useful nature. We find from them that, ingenious as American artisans undoubtedly are, they have not forgotten to apply their cunning to all sorts of tricks in building and that "scamping" builders and crafty land lords are to be found as plentifully there as here! The editor seems to feel this so strongly that he makes it the theme of his personal chat with his readers. Thus he moralizes:—

"And we would like to express an opinion here of the character of many men who build houses in Chicago to rent. In our opinion they are not saints. Their houses will not be preserved as miracle-working relics. When these men die, and they die slowly, their remains will not be disturbed. But where will their spirits go? Will their spiritual houses be constructed of green lumber, and will the poor souls pay exorbitant rent in a land where cobwebs pouring through chink and cranny will cause the naked souls to shiver? We hope these conscientious builders will yet reform; we trust they will repeat our builder's purgatory greets them."

The frequency of fires in America is often alluded to, and if the statements of the Fire Marshal of New York are to be relied on, two thirds of the fires in that city are traceable to the use of short hot-air furnaces.

A short practical paper appears on rat-proof buildings, beseeching the aid of skilled architects to contrive some reliable mode of rat-proof construction, and offering some startling statistics of the ravages in Chicago by these destructive rodents.

The illustrations are of large commercial buildings already existing in Chicago, which, though possessing but slight architectural character, seem commodious and serviceable, and country residences of moderate size. In the latter, Mansard roofs seem to be the prevailing features, with an odd jumble of details which we notice here and elsewhere, the designers a careful to claim as "French." In these decorations are principally wooden embellishments on brick walls. The execution of the illustrations is fairly good, and the buildings represented are undoubtedly useful examples for a practical people, but they are not very instructive.

tive as artistic models. The letterpress is, however, copious, and the articles are written in a pithy style. In fact, on reading the various publications now before us, we are struck with the agreeable absence of what the Americans themselves call "tall" writing, and congratulate the writers on their simplicity of diction as well as on the practical value of their remarks.

The *Architectural Review and American Builders' Journal*, is a magazine of considerable literary pretension. It appears monthly, is printed in large type, and is somewhat widely spread upon the page. The contents show rather more of the process called "padding" than the periodicals before alluded to, and the arrangement of the articles is not nearly so well preserved. The editor apologises for the difficulty in obtaining engravers of architectural subjects, and regrets that "American engravers have not as yet seen fit to pay much attention to the study of architecture, and especially in the minutia of details." He, however, seems to overlook the fact that something is required also of the draughtsman, and that the latter must do his part before the engraver can have a fair chance. The illustrations are inferior to some in the other similar publications we have looked over, and as most of them are designs by the editor himself, there seems less reason for their being carelessly or inefficiently produced. A portion of the magazine is devoted to descriptions of European examples, and a series of papers appears on "The Ministers of England," giving short notices of Canterbury and York, pleasantly and instructively written. Landscape gardening receives much attention in America, so accordingly papers are given thereon, which, like many on the same subject, are too theoretic to be of any real use. There are in fact but very few general rules that can be laid down as to the practice of this delightful art, and although no subject is more pleasant to gossip upon, or can be more agreeably and poetically treated by a ready and fanciful pen, it is very difficult to give any really useful directions excepting in the most general and cursory manner.

In an article upon Street Architecture, the editor deprecates the hypercriticism of his English brethren, who, he says, ought to be taken to task for at times undeserved severity. He says,—"Even the *London Builder*, usually disposed to be lenient to our errors of judgment, spoke in one of its leaders of the American tricky use of wood as a means of embellishment. Now no people in the world have more to answer for in the 'tricky' sense than the English builders. The most palatial terraces of the fashionable West-end of London are but mockeries, a sham, a composition of plaster on lath. And of such are the most of those grand compilations of London street-architecture." The writer forgets that it was not wooden buildings as such that were found fault with, or the wooden ornamentation thereof, but the imitation of stone by paint and sand upon the wood, and the almost constant use of wood for decorated portions of expensive stone buildings, for which there seemed no excuse. The editor's fellow-countrymen have pointed out, how even the Fifth Avenue itself is a sham as to much of its seeming stone work, and that the costly marble Grace Church has a wooden spire crocketed and elaborately decorated, but painted white to look like the rest of the material. But let this pass; we have plenty of our own shortcomings, and have no wish to toss back and forth unkind countercharges.

We are glad instead to be able to congratulate our American friends on a sudden outburst of architectural periodical publications, and to heartily wish them God-speed in the cause of industrial and artistic progress.

MATERIALS FOR A HISTORY OF OIL PAINTING.*

LADY EASTLAKE informs us she has been obliged to make some alteration in the first of the chapters of the second volume of "Materials for a History of Oil-painting," left in a state of preparation by the late president of the Royal Academy. Sir Charles Eastlake had followed Vasari in looking upon the Portinari chapel, in Maria Nuova, Florence, as an important centre of the productions of early effort in oil-painting, or that it had formed a kind of nursery of the art of oil painting in Central Italy.† Certain of some inaccuracies in Vasari, and suspicious of

more, he does not, however, seem to have discovered any error here. But the researches of Signor Cavalasolle have shown that the chapel was not the scene of the fresco by Andrea del Castagno and Domenico Veneziano; for though the records of the hospital attached to S. Maria Nuova prove that both worked there, they also show that an interval of six years occurred between the termination of Domenico's long labours and the commencement of those of Andrea. Moreover, it is ascertained almost beyond doubt, that they did not practise what is called oil-painting. They used oil, as the records also show, but this was in common use in processes of wall-painting, long before the invention of oil-painting. The Portinari family were not the less patrons of art, and, Lady Eastlake considers, as partners of the Medici and agents for them in foreign parts, and in their employment of Memling and Hugo Van der Goes, they occupied a position in Florence, with a corresponding influence on Florentine art that should not be unrepresented. She has, therefore, not plucked them from the page altogether, but simply suppressed such passages as later investigations have proved to be incorrect. Dante's Beatrice, Folco Portinari, who founded the hospital above mentioned, and employed Cimabue to depict of a Madonna for its chapel. With the exception of the omission, then, of the statement of the joint practice of oil-painting by Domenico Veneziano and Andrea del Castagno, in the chapel of this family, no alteration has been made in the materials edited by Lady Eastlake. They are supplemented, however, with a series of professional essays written by Sir Charles for publication, but which have hitherto lain by, notwithstanding some of them were written more than forty years ago.

The productions of the brothers Pollaiuoli are now believed to be the earliest examples of Italian oil painting extant. An account of these artists, with a notice of Antonio da Messina, the Sicilian, who visited Flanders to learn the secret, occupies a large portion of the first chapter. Their works are described, and the dates of them given; and the slow progress the new art made at first indicated. The Florentine artists could admire the drawings and designs of these masters, but their method found no great favour with them. The old preferred the manner with which they were accustomed to the innovation, and even young and rising men, influenced by these, doubtless, hesitated to accept the new practice. Domenico Ghirlandajo sentiment when he said that painting consisted in sure durability was mosaic. The experiments that with Hubert Van Eyck arrived at the result that was at first so little appreciated are next given with every technical detail. Resistance to humidity was one of the great points gained by his process; and for a long time this was the only quality the Italians allowed it to possess. They confined the use of it to out-door objects where its imperviousness to damp was a consideration, such as standards carried in processions, canopies, and, Sir Charles adds, caparisons for horses. But at the time that Pollaiuoli was painting his celebrated picture of St. Sebastian for the chapel of St. Sebastiano a' Servi, which was the first example of the application of the new mode to altar-pieces, there were three young men studying with Andrea Verocchio, who eventually embraced the new style with rapture, and created an enthusiasm in its favour. These were Pietro Perugino, Leonardo da Vinci, and Lorenzo di Credi. Their progress with that of the method and modifications they adopted are next minutely described, their movements followed, the society by which they were surrounded indicated, and their works enumerated. Here we have a sight of Leonardo as he went about Milan, quoted from a contemporary writer:

"He was wont to go early in the morning,—I have often seen and watched him,—and ascend the scaffolding (for the picture of the Last Supper is somewhat high from the ground); he would continue painting there from sunrise to twilight, forgetting his meals, and never laying aside his would not touch the work; yet, he sometimes stood for an hour or two in the day merely looking at it, and as if passing judgment on his figures. I have also seen him (as July sun, from the Corte Vecchia, where he was modelling what depends on horse in clay, and hasten to the Madonna delle Grazie, there, having ascended the scaffolding, he would take his pencil, and, after giving one or two touches to the figure, he would sit all at once quit the convent."

The next figure that is made to walk across

* About the height of a man; not more.

the canvas is that of Francesco Francia. In the notice of the works of this artist, as of those just mentioned, the most minute technicalities are elaborately dwelt upon. His treatment of the darker colours and deep shadows, the solidity and fusion of his flesh tints and other distinctions are explained with greater fullness than the subjects of his pictures. At every page we are impressed with the fact that this history of painting is the work of a painter, for painters. Sir Charles thus accounts for the fact that such technicalities have been hitherto unnoticed. He says the impressions which great works produce upon the mind are so removed from the consideration of their mechanical parts; but his attention is professedly confined to these material qualities. Hence he has shown us Francia, as indeed Leonardo, Perugino, and the other artists mentioned, not in grand reveries of visions of inexpressible beauty, but as busy with varnishes, distilling oils, grinding colours, determining grounds for shadows, vehicles for lights, hatching, scumbling, and covering too hastily considered work with "pentimenti" or after-thoughts. "There are several pictures under it, some better, some worse," said Sir Joshua Reynolds of his painting of the "Infant Hercules;" and many of the Italian masters might have made the same remark of their chefs-d'œuvre. Raffaele, Fra Bartolomeo, Mariotto Albertinelli, are next successively examined from this technical point of view. Then are arraigned Ridolfo Ghirlandajo, Granacci, Bugiardini, whose flesh tints are described as less thin than those of their predecessors, and their darks more prominent than lights; and after them Andrea del Sarto, and his friend and fellow-worker, Franciabigio, are examined, and the "transparent system" of the former noted, as expressed in thin flesh, prominent darks, and blues, and greens being protected with vehicle, as well as lakes in a less degree; and his ultimate practice of the "semi-solid system" as exemplified in his copy of Raffaele's "Leo X."

Correggio is treated at greater length than any other painter. First of all, the unpleasant association of his name with poverty is dissevered. "The great painter, though not wealthy," we are told, "was in easy circumstances, and was sufficiently well paid, as appears by existing contracts and receipts, for the works he undertook. The works themselves—among others, the cupolas of two churches—would not have been confided to an indigent professor; and, as Lanzi and others justly remark, the artist himself spared no time, study, or expense in the execution of the important commissions he received, and grudged no outlay on the materials of his pictures. Documents further prove that purchases of land were the result of his increasing fortune, and that his family inherited from him a considerable property." Thus removed from the once current tradition that he was a spectacle Seneca tells us the gods look upon with pleasure, a virtuous man struggling with misfortunes, Correggio still stands before us an unappreciated man. Art-critics are so absorbed with interest in the early Italian and Flemish schools, according to Sir Charles, that they have yet no sympathy for the great painters of Venice and Parma; and a representative of "the new German tendency" even goes so far in the path of depreciation as to date the moral decline of art from "the effeminate Correggio." His occasional trivial treatment of sacred subjects, his unsatisfactory arrangement of drapery, his want of attention to the leading lines of the architecture he was called upon to embellish, his "hot shadows," and other defects, are freely acknowledged; but the effect of these is overpowered in the warmth of the recognition of his fascinating and delicate powers of light and shade, the sweetness, richness, and homeliness of his "transcendent genius." The foreshortening of the human figure seems to have occupied this painter's attention and care. Some of the figures in his cupolas could not have been drawn except by the aid of clay models, as they are in positions it would be impossible for living models to sustain. Such assistance as he required in this matter was given him, Sir Charles concludes, by Antonio Begarelli, of Modena. A rapid glance at his works in their chronological order, with remarks on his technical methods and materials in each, follows:—

"Every method was familiar to Correggio; the drawings and studies for his frescoes, which are preserved in various collections, are generally executed, or at least completed, in red chalk, and exhibit the most profound knowledge of foreshortening, the most delicate feeling for roundness, and a thoroughly practised hand. His love of gradation

* Materials for a History of Oil Painting. By Sir L. Eastlake, P.R.A. Second volume. London: Longmans, Green, & Co., 1869.

and of the impenetrable union of half-tints led him to use the 'stump,' or some similar mechanical means. Among other materials, he appears sometimes to have employed coloured crayons, or, at all events, to have produced drawings similar to crayon drawings."

In a minute manner is Correggio attended throughout all his undertakings, till his death at the age of forty. His beautiful finish and softness are attributed in some degree to the perfection of the under-painting, the nature of which is also elaborately described. He is supposed to have used amber varnish; which supposition has been thought to be recently confirmed by the analysis of a portion of a damaged picture, by the late Professor Moreni, of Parma. But it appears to us there is rather an uncomfortable degree of uncertainty yet attending this inquiry, because, as related by Sir Charles, the particular fragment analysed was a part of the "Procession to Calvary" in the gallery at Parma, which, though attributed by some to Correggio, is by others supposed to be the work of Anselmi. The last chapter relates to Venetian methods, as practised by Giorgione among others; and here, says Lady Eastlake, "the manuscript of the second volume of 'Materials for a History of Oil Painting' stops short." To remedy this incompleteness the selection from the professional essays and memoranda, we have mentioned, was made. The first of these is upon colour, light, shade, and Correggio. Here we have the difference in the technicalities of the Venetian and Flemish schools again defined with a precision that must be grateful to students when first brought to a contemplation of their mysteries. This is followed by remarks on the necessity for definitions, on negative lights and shades, natural harmonies, contrasts, finish, space, and effect; some of them being expressed in a few lines. Chiaroscuro preparations are gone into at greater length: indeed, it would be unreasonable to require more exact descriptions of processes than are here given. The painstaking with which the essays on oiling out, on vehicles for shadows, on transparent painting, on warm outlines and shadows, on toning, texture, scrubbing and retouching, and glazing, is a remarkable feature. In an essay on "the gem-like quality," in which it is remarked, forcibly, that it is a defect in a picture for anything in it to be capable of being likened to something else, we have an amusing summary of some terms in use in art-criticism:—"A picture, for instance, is said to be golden, to be silvery, to be gem-like, to be mossy, to be woolly, to be wooden, to be tinny, &c.," out of which list the term gem-like is considered most laudatory, because it includes such qualities as nearly sparkling, velvety, glittering, pure, and definite. The mode of attaining this appearance is detailed. That no labour should be apparent is another truth impressed in these essays. "The idea of power is always conveyed when we have an impression that the actor, whatever he may be doing, can or could do more than he actually does, that the strength shown is only a part of the strength that might be shown." In support of this statement we are given Addison's reply to a reproach from a friend for having sent him a long answer to a letter, "I had not time to write a short one." How to compose and paint a single head is the subject of a strotfully professional paper. This is followed by one of more general interest on subjects for painting, in which it is laid down that though in descriptions the actors should be "morally interesting," in a picture it was necessary that what is being done, more than who is doing, should be of interest. Michelangelo, in his choices of subjects, disdained to paint cloth, and delighted to depict the human form nude, from a desire to express Nature in its grandest aspects. This feeling, in different degrees of intensity, has actuated, and will continue to actuate thousands. Human beings must ever be the most interesting subjects for paintings; and of these the youthful and beautiful will over be the more admired. The author says "the exhibition of female beauty will always first attract the eye. But although interest in the object and beauty in colouring may be thus secured, a picture may still need some moral interest—that is, the feelings must be interested; and, lastly, the intellect may be addressed by as much attention to costume or history as can be kept subordinate to more proper claims." The volume concludes with a fragment from a journal book of 1828, on the means and end of art, in which it is shown that the primary appeal made by art to the senses should be connected with another addressed to the feelings, prompting noble and ennobling aspirations and sympathies.

ON TECHNICAL EDUCATION IN FRANCE.

BY A GRADUATE OF THE ÉCOLE CENTRALE.

In describing the system of technical education as it existed in France in 1853, when I left the "École Centrale," I shall endeavour to show that our neighbours are better supplied than we are with schools or colleges for the study of the applied sciences, a branch of education almost ignored in England, as will be seen hereafter.

Technical education, as recently defined by Mr. Gladstone in a public meeting, includes professional education; in France, the expressions *enseignement technique* and *enseignement professionnel* signify two different things: the former implies just as much as it is necessary to acquire proficiency in the useful arts, the latter includes the higher branches of the applied sciences. It must not be supposed, however, that science and art are strictly separate; on the contrary, they are taught together, as one assists the other, and the rudiments of both are considered in France, and I believe justly, to form the basis of a serious education. Literary education is not considered or referred to in any way, for obvious reasons, in this paper.

The *enseignement technique* begins in the "Écoles primaires," or "Schools of Elementary Instruction," which are supported by the "Communes." In these schools young pupils learn reading, writing, grammar, arithmetic, mensuration on the metric principle, and drawing, more or less, usually ornament.

The instruction commenced in the "primary" schools may be completed in one of the four following schools, called "Écoles d'Arts et Métiers," viz.:—Châlons, Angers, Aix, St. Étienne. The three first are considered the best for foremen, and managers of works or manufacturers; the last is especially devoted to the training of colliery viewports, or managers of mines. This school is known as the "École des Mineurs" (not "des Mines"), and has acquired no little celebrity from the fact that Bousainguault, the eminent agricultural chemist, and Fourneyron, inventor of the turbine, studied there together.

The courses in these four schools include mathematics, drawing, surveying, and the rudiments of chemistry and physics.

The institutions reserved for the *enseignement professionnel* are so numerous that I cannot make an accurate nomenclature of them without referring to official documents, which are out of my reach at present; here is the list to the best of my recollection:—

Mathematics.—Collège Sainte-Barbe, Louis-le-Grand, Collège de France, Collège Chaptal, École Polytechnique (Paris).

Chemistry.—(Natural Science) Sorbonne, Jardin des Plantes (Paris).

Fine Arts (drawing, painting, architecture, music).—École des Beaux Arts (Paris).

Medicine, Surgery, Anatomy.—École de Médecine, École Vétérinaire d'Alfort (Paris).

Artillery and Military Engineering.—École d'Application de Metz (Moselle).

Navigation.—École Navale de Brest.

Woods and Forests.—École Forestière de Nancy (this school is only for the civil service).

Civil and Mechanical Engineering.—École Impériale des Pons et Chaussées, Paris.

Mines and Metallurgy.—École des Mines, Paris.

Practical School (Arts, Manufactures, Civil and Mechanical Engineering).—École Centrale des Arts et Manufactures, Paris.*

* THE ÉCOLE CENTRALE.—This unique school is due to the initiative of the late M. Auguste Perdonnet, our kind friend and adviser, whom the students were accustomed to call "Father." His life was spent in endeavouring, with variable success, and notwithstanding the most strenuous opposition on the part of the public functionaries, to introduce in France liberal, and especially English institutions. His greatest achievement, probably, was the foundation, with the assistance of the late Laval, and of several eminent professors, of the "École Centrale des Arts et Manufactures," on a plan and principles quite unprecedented in France. This school, which is entirely self-supporting, is at the same time "technique" and "professional," being equally efficient for manufacturers and for consulting engineers. The tuition costs about 32l. per annum for three years, and for out-door pupils—no boarders being admitted. In my time there were eighteen professors, many of whom were eminent men. The diplomas awarded by the Council of the École Centrale are generally recognised on the Continent as a sufficient guarantee of professional capacity.

The courses are divided into four departments, or *spécialités*:—

1. Builders (*constructeurs*), including railway engineers.
2. Chemists, or manufacturers.
3. Machinery.
4. Metallurgists.

The École Centrale is represented all over the world by engineers, manufacturers, townsmen, and professors. A free library for the working-classes has been added to this school within the last few years; and free courses of lectures, similar to those of the "Conservatoire des Arts et Métiers," have been instituted by M. Perdonnet,

Three of the institutions I have just enumerated are what I call special district schools; that is to say, they are placed in the districts best suited for the acquirement of the arts and sciences to which they are devoted. These special district schools are the Naval School, in the military harbour of Brest; the School of Forests, in the wooded valley of the Menrthe; and the School of Miners, in the coal-district of the Haute-Loire (St. Étienne). The School of Metz may also be considered a special district school, being surrounded by hills, affording good practice in military, and especially in "contour" surveying.

The above educational establishments are mostly maintained at the expense of the State; they are all under the control and supervision of Government.

Some of them are the exclusive property of the State, and admit only of in-door pupils, being destined to train students for the public services: École Polytechnique, École Forestière, and École d'Application.

Others are maintained by the State, but are open to all comers—students paying fees for examinations, but not for the lectures: École de Médecine.

Those of Châlons, Aix, Angers, and St. Étienne are supported by the State.

The École Centrale is entirely self-supporting. Most of the institutions enumerated above are of recent foundation, having been established since 1789. The École Polytechnique was instituted by Monge, by order of Napoleon I.

The schools or colleges are liberally supplemented and assisted, first by the numerous libraries and museums, which are maintained at the expense of the State in all the large cities; and, secondly, by several establishments, such as the "Conservatoire des Arts et Métiers," where courses of lectures are open gratuitously, to all students, for a season of three, four, five, or six months. These courses are very numerous. The evening lectures are especially organized for the working-classes, although no distinction is made in admitting students. In Paris the public lectures usually begin in November, ending in April or thereabouts.

But the most wonderful instance of Government liberality is in the chemical laboratories of the École des Mines and of the Jardin des Plantes. In the former, any person bringing a specimen of a mineral will receive an analysis of it, free of expense; in the latter, students of any class or age (provided they have a sufficient knowledge of chemistry) are initiated, gratuitously, in the mysteries of chemical analysis, under the supervision of eminent professors.

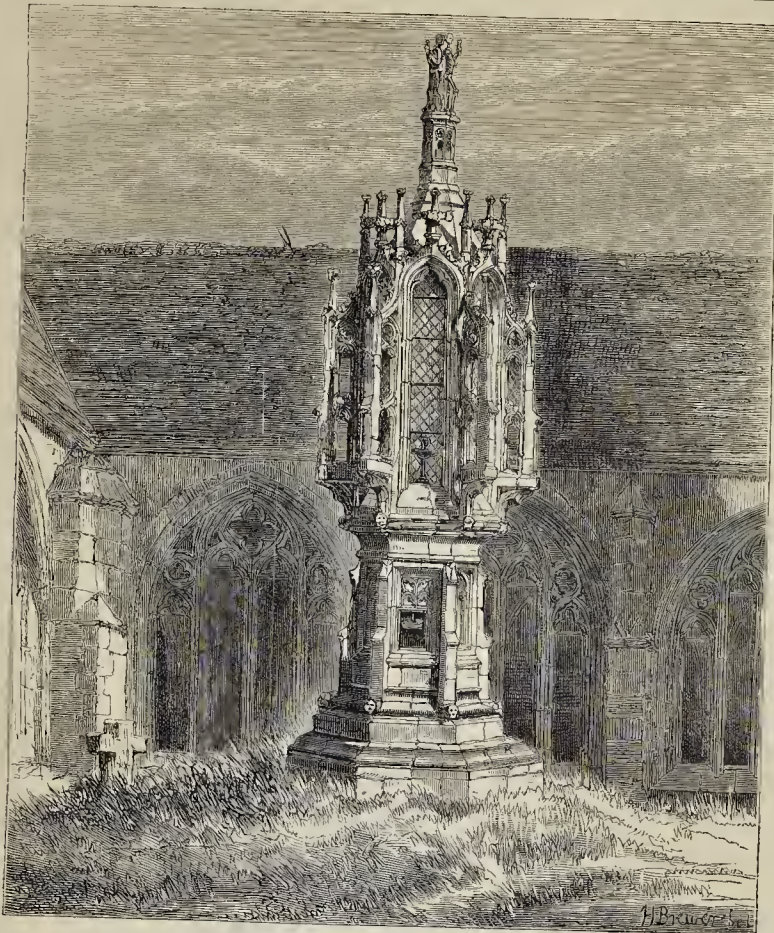
There is, probably, no country in the world, not even Germany, offering such facilities for studying the applied sciences as are found in France, and especially in Paris.

The French educational system includes art, pure science, and applied science. The strength of France is undoubtedly in the latter. If we inquire, with the assistance of a good biographical dictionary, which of the civilized nations has contributed the most to the progress of art and science, we shall find that in pure science England stands unrivalled; that our list of inventors is so long as to equal, probably, that of all the inventors of the European continent put together; whereas in the applied sciences we are far behind the French. As to art, we may not be on the top of the list, but we have schools of art, such as South Kensington, which ought to be sufficient to maintain England's reputation in that respect.

Bursaries.—In all the schools or colleges recognized by the State, a certain number of poor students are admitted to follow the courses or classes without paying any fee or subscription. These students (*boursiers*) are elected among the most talented and promising students in the junior classes; for instance, if a pupil has distinguished himself in the "École Primaire," he being deserving of assistance in other respects, he will be admitted to any of the upper classes without payment; on two conditions, however:—1st. He must be recommended by his previous professors; and, 2nd. He must pass a preliminary examination.

Results.—The following are the most palpable results of the French system of technical edu-

with the assistance of the professors. There are too many gratuitous lectures in France; the working-men attach little value to them, and frequently go to the lecture-rooms merely for the sake of warming themselves at the expense of the Government. Very few follow the courses regularly from first to last; and I have seen many bring their own newspapers to the "Amphithéâtre," and read them during the lectures.



ANCIENT CEMETERY LANTERN, MÜNSTER CATHEDRAL, WESTPHALIA, GERMANY.

education as described above, that is to say, "enseignement technique et professionnel".

1. The poorest and most obscure student may acquire reliable scientific information, and gradually raise himself to the highest positions in the world of arts and sciences.
2. The army and navy are constantly supplied with officers of first-class talent and ability.
3. Managers of manufactories, or of mines, and ironmasters, being accustomed to calculate forces and materials with precision, are able to work economically; that is to say, to obtain the greatest results with the smallest possible expenditure.
4. Graduates of some of the special schools, but especially of the Ecole Centrale, are disseminated all over the civilized world, spreading the arts and sciences, and furthering the progress of engineering, trade, and manufacture.

Conclusion.—The above suffices to show that the applied sciences constitute the strength of France.

We may take a lesson from our neighbours. We have schools of art, and unrivalled engineering works. What we are deplorably deficient in is schools for the applied sciences. There is no institution in England to be compared to the Ecole Centrale. We have few, if any, special district schools, such as that of St. Etienne.

I have no information on technical education in Germany. I expect it will be necessary to copy some of the German, and some of the French, institutions. I do not suppose it will be difficult to obtain information from Austria, Prussia, and Belgium. As to the French, I have

lived long enough among them to be assured that they will communicate all requisite particulars, and answer any reasonable request, without jealousy or *arrière pensée* of any kind.

I would suggest, however, not to copy foreign institutions too closely; and I think that the "special district" system I have alluded to could be extended in England with advantage. If my opinion on this subject were of any value, I should advise reserving London for the purely scientific schools, and placing the special establishments in the provinces; for instance:—*Mines and Metallurgy* in the Black Country, or in South Wales; *Mechanical Engineering* in Manchester; *Chemistry* in Glasgow; *Hydraulics* in the West of Ireland,—the foundation of a college in the West of Ireland would, perhaps, counterbalance, to a certain extent, the evil results of absenteeism; *Navigation* at Plymouth or Liverpool; and so with all the departments. The special district schools would offer the unquestionable advantage of being accessible to mechanics.

I see no reason why the technical schools of England should not be self-supporting, as the Ecole Centrale, though it might be expedient to apply to Government, in the first instance, to raise the required capital.

W. O'BRIEN, C.E.

Feversham Memorial.—On Monday the foundation-stone of the memorial of the late Earl Feversham, consisting of a market cross, was laid at Helmsley by his son, the present earl.

CEMETERY LANTERNS.

Our illustration represents a very perfect and beautiful cemetery lantern existing in the court of the cloisters at Münster Cathedral in Westphalia. It will be seen upon referring to our engraving that the glazing and pulley are still perfect, and we know of very few examples where this is the case.

It is highly probable that in the Middle Ages every cemetery possessed one or more of these lanterns, which were lighted upon All Souls' Eve and other anniversaries. Those who have lived in Roman Catholic countries will doubtless remember the illumination of the churchyards on All Souls' Eve. We remember seeing the cemetery at Würzburg, in Bavaria, lighted up by several hundred little glass lamps. In many parts of Germany the graves are supplied with metal and sometimes stone lanterns for this purpose. Ancient stone lanterns of this description attached to graves may be seen in the cloisters of Ratisbon Cathedral.

We are not aware of the existence of either cemetery lanterns or lamps attached to tombs anywhere in England, but some have been of opinion that the Irish round towers were used for this purpose.

Germany is very rich in cemetery lanterns, most of the churches in Bavaria possessing one or more ancient example. The most perfect ones we are acquainted with are to be found at Ochsenfurth, Grünfeld, Ratisbon, and Saltzfeld. At Hadringfeld is a cemetery lantern attached to an ancient stone pulpit in the churchyard.

ACOUSTICS AND BUILDINGS.

Two lectures on this subject have been delivered by Mr. W. Fletcher Barrett (of the International College, Springfield) to the Royal Engineers at the Brompton Barracks, Chatham. We print a portion of them:—

The reflection of sound has often been used as a valuable auxiliary in the acoustical arrangement of a building. One of the most remarkable instances of this kind was published in the *Philosophical Magazine* for 1830. A church had been erected in Sheffield in which the preacher was altogether unheard, however great his exertion. Various unsuccessful expedients were tried until the incumbent, happily in this case a scientific man, had a large parabolic reflector of light wood constructed and so suspended that the pulpit was in the focus of the parabola. By such an arrangement the rays of sound issuing from the focus of the mirror would be thrown forward as a parallel beam. The consequence of this was that every word uttered in the pulpit could be distinctly heard throughout the church; indeed, the speaker was more distinctly heard at the far end of the church than at the intermediate portions, because this parallel beam of sound was directly cast upon those in the distant gallery. Unfortunately, however, the reflector acted in both directions. If any one whispered in that distant gallery the sound of the whisper was gathered into the focus of the reflector. The preacher placed in that focus thus heard all the remarks that happened to be made by the people sitting in the gallery, and, as it was anything but pleasant to preach and listen to criticism on the sermon at the same time, the reflector after awhile had to be taken down. The inconvenience of this reverse action might in some measure have been obviated by placing the pulpit not perfectly in the focus of the reflector. In St. Paul's Cathedral a metallic mirror was successfully used to prevent the passage of sound into the roof, and thus removed the unpleasant reverberation which before ensued when the building was used for the evening services. The mirror here employed was of hyperbolic section, placed over the pulpit with the convex side downwards. The sound of the preacher's voice falling upon this convex surface was thus prevented ascending into the dome, and was reflected down upon the people below, who, in consequence, heard with much greater distinctness than those in the gallery on either side. Many other useful applications of the reflection of sound to remedy acoustical defects in buildings might be given, but these will be sufficient to show that, with judgment, you may either properly avoid, or safely seek, its aid in the structures you may be called upon to erect or acoustically to improve.

As already remarked, the reflection of sound explains to us the cause of echo, often so serious a defect in a building. In fact, upon the right use of reflection, or the wrong use of it, depends, to some extent, the right or wrong acoustical construction of a building. Bear in mind, then, that whilst any smooth surface will reflect sound, a broken or rough surface will disperse or absorb sound. Hence, when we wish to get rid of the echo in buildings, if the echo proceed from a distant wall, we may hang curtains or carpets over that wall, and the sound striking the wall will then be absorbed. If the echo come from the roof, hanging a sail-cloth or drapery overhead will cure the defect. Some such simple plan as is here indicated has been generally found to destroy echoes in badly-constructed buildings, and several instances of its success have occurred in my own experience. By breaking up the reflecting surface we accomplish the same end as by placing a curtain. If, therefore, the ceiling be broken up with rafters, or interspersed with hollows, or the end walls have recesses of any kind, we shall have echo, to a certain extent, prevented.

Owing, therefore, to the disturbance arising from reflection you will see why a room of a rectangular form, with a flat ceiling, a flat floor, and flat walls meeting the ceiling and floor at right angles, is a room constructed on bad acoustical principles. Within certain limits the more you depart from this principle the better will your building be for acoustic purposes. Make one of the dimensions of your room longer than the other, and curve the ends of your room and you will improve the acoustic properties of your structure. Make your ceiling not flat, but curved—as the ancients were fond of doing, and as Sir Christopher Wren has done in many of the churches he has built—and you will have a

better building to hear in. Acoustically speaking, it is better also to have a low ceiling rather than a high one, because thereby the decay of sound in one direction is lessened, and if your ceiling be very low your room practically becomes a huge speaking-tube.

I must now allude to an effect which has been very obscurely understood until recently, when the investigations of Mr. Scott Russell have thrown considerable light on the subject. It is found that if a speaker be placed very near a wall the sound of his voice is wonderfully lost, whereas if he stand at some distance from the wall he is heard very much better. Frequently I have noticed, when speaking close to a wall in some regularly-constructed hall, that the sound of my voice has completely traversed along the walls of the building and come back to me again, while I have felt an utter inability to make the audience hear. Now, the chief cause of this may be deduced from Mr. Scott Russell's experiments on waves. That gentleman has established the fact that when a wave of water meets a rigid unbroken obstacle, it is regularly and wholly reflected if the incident angle be greater than 45° . If, however, it make an angle of less than 45° , the wave will be imperfectly reflected; and if the angle of incidence be 30° , or less, the wave is not reflected at all. What then becomes of the wave? It rolls along the reflecting surface. If, then, a water wave strike a river-bank at a less angle than 30° —say at a quarter of a right angle,—instead of bounding

form of whispering-galleries, there is another, arising from the nature of the sound uttered. Loud open words are not propagated through such galleries with anything like the facility of a subdued whisper; in fact, to be heard at all you must speak softly. Now, it is the sibilant character of a whisper that gives it this peculiarity, and there is evidently much of interest and much yet unknown in the singular behaviour of sibilant sounds. Curiously enough, taken in connexion with what I have just been saying, the Astronomer Royal long ago arrived at the conclusion that the sounds of *s* or *z* resemble in their mode of propagation the rush of a bore on a river, and has compared them to a broken-headed sea, which meeting an embankment is not regularly reflected as the larger waves would be, but runs along the bank as a roller. The same authority also states that sibilants are not capable of being returned by reflection like an ordinary echo; and I may add a further peculiarity, viz., that it is this class of sounds which have the most profound effect on those recently-discovered and wonderful phosnoscopes, sensitive flames.

I wish now to direct your attention to a further illustration of the value of a curved over a flat surface for the reflection of sound. You will remember what I said in the last lecture regarding the loss of sound by rolling round the walls of a building, a phenomenon which occurs when the sound-waves meet the wall at a very oblique angle. Now, let S, fig. 1, be a speaker standing

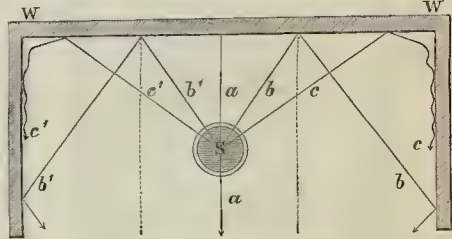


FIG. 1.

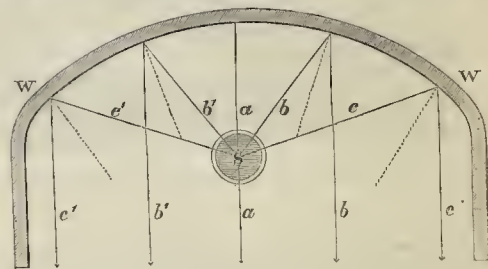


FIG. 2.

off on the other side, it will cling to the bank and thenceforward progress as a roller. You can often notice this effect when on board a river-steamer; the commotion produced by the paddle-wheels constantly diverges from the source, and when it reaches the banks frequently strikes them at an angle of less than 30° , and a long roller spreading along the shore is the result. Well, the wave of sound is in every way analogous to the wave of water. When that portion of my voice which reaches the wall strikes it at less than 30° , no reflection takes place, but a roller of sound proceeds around the room. Now you will understand why a pulpit placed near a wall is in a bad place; because you have the speaker's voice striking the wall at a very obtuse angle, a large portion at less than 30° , and hence the sound goes rolling round the building, often coming back to the speaker himself, so that he hears a distressing repetition of his own voice. If the acoustic defect of a building be of this kind, it may be obviated by placing the speaker farther from the wall, breaking up into recesses the wall behind, or fixing a suitable curved reflector behind the speaker.

This rolling of sound is undoubtedly the chief cause of the effect noticed in whispering-galleries. For here the voice is purposely directed along the wall, so that almost the whole of the sound strikes the surface at an angle under 30° . But besides this cause, and also the semi-tubular

near to a flat wall, W W. The sound diverging in all directions from S, will strike the wall at every angle. Let us consider the three rays of sound a, b, c; the first will reach the wall W W perpendicular to its surface, and will be reflected straight back in the direction of the arrow; b will strike the wall at an angle, but still, nevertheless, will be reflected; c reaches the wall at an angle approaching 30° , and consequently is not regularly reflected, but thenceforth propagated in part as a roller round the room. This of course occurs with all the rays falling on the two extreme ends of W W; and you will further notice that the nearer S is to W W, the greater the obliquity of the incident rays, and the larger will be the number of rays than abstracted from the total volume of sound.

But imagine the more distant portions of W W to be bent forward, the incident rays remaining the same, they will now meet the wall at a less oblique angle, and this is the point to be gained. Hence, as will be seen from fig. 2, those rays which before were not reflected are now sent forward with the others. Still more perfectly would this be the case if the wall had a parabolic curve, and the speaker were placed in what would be the principal focus of that curve.

* That is, 30° from the reflecting surface. I have put it thus for the sake of simplicity, but usually the angle is measured from the normal to the reflecting surface.

There is such a thing as a complete sound shadow, and there is a partial sound shadow, corresponding to, though not produced in the same way, as what in optics we should call an *umbra* and a *penumbra*. Hence, just as we require a clear line of sight to see a speaker well, so we require a clear line of sound to hear a speaker well. Architects have sought to obtain this by a proper arrangement of the seats in a building. Perhaps one of the most successful forms which has yet been adopted is that by which the seats in a building are not arranged in a perfectly straight line gradually rising upwards, but in a curved line. In this way the sound of the speaker's voice, unobstructed in any way, can reach the persons on those seats. Such a curved arrangement has been termed an "isocoustic curve," and I believe has proved successful in those buildings where it has been tried.

We must now turn our attention to another and most important point in the acoustics of buildings; viz.—The reinforcement of sound. Every one knows that in some buildings it is extremely difficult to make an ordinary voice heard beyond the vicinity of the speaker. The speaker labours and exerts himself to the utmost, but fails to make himself heard. A gentleman once said to me, after he had been speaking in the Rotunda at Dublin, "It appears as if some one were in front soaking up my words with a sponge as soon as the syllables had left my mouth." All the efforts of the speaker are thus exerted in sustaining his voice; his attention is diverted from what he is saying, and a miserable failure is often the result. On the other hand, we all know that in some places large audiences can be addressed with perfect ease, the reaction of the attentive listeners upon the speaker giving increased strength and stimulus to his utterance. Now, can we discover the cause of this difference? The loss of sound by improper reflection does not account for it by any means, for we may find buildings on precisely the same model, and yet with very different acoustic properties. What, then, is the cause? You will notice that if there be two buildings of equal size and similar shape, and one building be better for hearing in than the other, that building will in all probability have more wood lining its interior than the other. I could not adduce a better example of this than is to be found in the theatre of the Royal Institution of Great Britain. The shape of this theatre is semicircular, with the seats sloping upwards; but the great point in that this theatre is entirely lined with wood. Imitations in the shape of this theatre have, I understand, been made in England and on the Continent, and have in some cases failed, simply from the omission of this most important item of exposed wood. Again, the recently-destroyed Opera-house in the Haymarket was noticeable for its excellent acoustic properties, its structure interiorly was chiefly of wood; and so with many other buildings, both ancient and modern. The theatres of the Romans, for instance, were notable for their good acoustic effects; and these theatres were almost uniformly constructed of wood in the interior.

What, now, is the action of the wood? It is to reinforce by its own vibrations the sound of the speaker's voice. When the string of a musical instrument is caused to vibrate, by its own motion it can stir but a very small portion of air; but when this string is associated with a surface of wood, it throws that wood into vibration, and thus creates a vibratory area of much larger surface, which produces a correspondingly greater disturbance of the air. In a piano, or harp, or violin, we do not hear the sound of the strings of any of these instruments, but we hear the sound of the wood to which those strings are attached. I can illustrate this very convincingly, I think, by means of two wires which have been differently strung on to the bracket above. One is merely depending from a cord which is tied to the iron bracket. Thus arranged, this wire cannot throw any wood into vibration, for the cord completely cuts off the wooden floor of this room; the other exactly similar wire is first connected with this wooden tray, which is also suspended by a cord from the bracket. A weight of 25 lb. strains each of these wires. I now pluck the first wire; you hear no sound, for the wire by itself is incompetent to disturb the air around to any great extent. I turn to the other wire and pull it aside; immediately you notice a marvellous difference; the sound is loud and full. This increased loudness is simply produced by the wood overhead, which plays the part of an ordinary sound-board. Here, then,

as in all cases of stringed instruments, it is the vibration of the board that you hear, not that of the wire, although the latter is the exciting cause of the former.

I now wish to direct your attention to the fact that these inaudible sonorous vibrations can be propagated through a considerable length of matter, and be made to give rise to audible vibrations at the distant extremity. Here, for instance, is a wire firmly attached to that wooden screen. The wire, as we know, is a conductor of sound. If now I excite some slight vibration in the near end of the wire, by filing it, for example, the crepitation travels up the wire with the velocity of sound, reaches the screen, and there for the first time becomes audible; simply because it has thrown the wood of which that screen is composed into vibration. Now, just as that wire conveyed sonorous vibrations throughout its length, and just as that surface of wood made those vibrations audible, so the air can transmit the sound of my voice,—in one direction in the near end of the wire, and can there now be a doubt in your mind as to the action of the wood when these audible vibrations reach its surface? Not only are you aware of the fact that a sound-board behind a speaker will increase the distinctness of his voice, but you can visualize the manner by which this augmentation is produced.

Let us now inquire into the value of different materials as regards this reinforcement of sound. This important point we can at once experimentally determine by means of the apparatus before me. Here are a set of boxes, each provided with a little door at its side, which, together with the whole interior of the box, is thickly padded, for the purpose of rendering them "sound-tight." I now start this little musical-box, and, opening the doors, place it within the innermost chamber, shutting all the padded doors after it. The music of the instrument now ceases to be heard, for it has been utterly quenched by the absorbing surfaces through which it struggles in vain to pass. A small aperture, protected by little valves of felt, runs through all the boxes. Through this aperture I now thrust a light wooden rod; the wood is a conductor of sound, and as its extremity strikes the musical-box within, you hear a feeble sound of the music, apparently emanating from the free end of the rod. On the top of the rod I lay a disc of wood, and now you hear the music as plainly as if the origin of it were outside. The wooden disc reinforces the sound conducted up the rod by exposing a large surface, which can easily be thrown into vibration. Instead of the wood I now substitute this piece of slate, placing it on the top of the rod; now you perceive but little reinforcement of the sound. I take a tile, and you hear a feeble augmentation. I take a cake of plaster broken from a wall, and there is now, practically, no reinforcement of the sound. I take one of these tuning-fork boxes, made of very light wood, and containing an open mass of air in the interior, and placing it on the top of the rod, you observe this powerful reinforcement.

The extreme importance of this experiment in its practical application to buildings will at once be seen. Imagine the interior of a building lined with plaster, with wood, or with stone, and instead of this musical-box as the source of sound, substitute the voice of a speaker; further, let the air between the speaker and the walls around him. The walls of such a building, if covered with plaster, slate, or stone, would be almost or altogether unable thus to strengthen the sound of a speaker's voice; whereas if covered with wood the voice would be strongly reinforced. This, then, is the explanation why, in buildings lined with wood, speaking is so very much easier than in corresponding structures the interior of which is plaster or stone. Curiously enough, there is in the very room in which I am speaking an illustration of this fact. For this lecture-room was, I understand, most imperfect for auditory purposes, and most painful to speak in. An alteration was therefore made, and these side pieces formed of wood, were erected behind the speaker. Moreover, within these side pieces are air-chambers which, as we shall explain directly, further strengthen this reinforcement. Speaking within this room is now perfectly easy, simply from the fact that everything I say is taken up and reinforced by the vibration of the wooden screens behind me. Before quitting this subject, I would just allude to a fact which has often been noticed by architects; and that is, that in buildings which are newly plastered

there is more difficulty found in speaking, than in old buildings. It is noticed that as the plaster becomes dry, the acoustic properties of the building improve. The reason of this is probably to be found in the fact that the drying of the plaster makes that material more homogeneous, and thus increases the elasticity of its structure. When dry the plaster is therefore, to a certain extent, able to accept and give out these vibrations, which in its moist, unelastic state, it would have been altogether unable to do.

We are now in a position to advance a step further, and can investigate the reinforcement of the voice of the speaker, derived from quite another cause. If I speak in front of this membrane which is stretched over a frame, you will hear certain of my words reinforced, but you will not hear all of those words reinforced. When our musical-box was placed upon the table you heard every note reinforced. Here on the contrary when I speak, you hear this loud deep tone occasionally coming out. What is the cause of this strange effect? In the membrane we have a *sympathetic* vibration, which was not the case in the reinforcement by the wood previously. The apparent sympathy between the membrane and certain tones I will try to make evident. To the centre of this membrane I have attached a light concave mirror about the size of a sixpenny-piece. From this mirror I can reflect a strong beam of light on to the screen. You will find that every time the membrane reinforces the sound of my voice, that patch of light thrown by the mirror upon the screen will begin to quiver. This quivering is derived from the shaking of the membrane; thus showing you there exists a sympathy between the tension of the membrane and certain of the notes in my voice.

Important as are these considerations, some, however, may be inclined to say, "Of what use to us are they?" Gentlemen, the truest use of knowledge, its application to the benefit of mankind, is never seen at once; and a proper insight of the true value of scientific inquiry lies far below mere surface observation. Acquaint yourselves well with the principles of your study, and you will be at no loss to use them, for practical applications will constantly unfold themselves to the properly cultured mind. For example, from the facts already placed before you, it is easy to see how valuable an aid the resonance of the column of air contained in a building would be to a speaker's voice, if that air could be properly sub-divided and attuned. The ancient Greeks, whose theatres were built chiefly of stone or marble, sought to make up the lacking reinforcement, owing to the want of elastic materials in these structures, by employing the aid of resonance. A series of hollow bronze or earthenware vessels, of carefully graduated sizes, were placed beneath the seats of their theatres. These vessels, termed "echeia," were found greatly to strengthen the speaker's voice, more particularly when the speaking was intoned. For each selection from the speaker's voice a note which was in unison with itself, and by its resonance reinforced that note. Likewise there can be no doubt that the cavities which exist in the construction of buildings act in a similar manner. The air enclosed within hollow spaces below the floor, or above the ceiling, more or less, accommodates itself to the vibration occasioned by the speaker's voice. Hence, where there are these cavities, the resonance is powerful, and often very useful. Thus, in the theatre of the Royal Institution, to which I referred just now, there are open spaces beneath the seats, below the floor, and behind the wooden walls, all of which aid greatly to the resonance and good acoustic properties of that building. In the opera-houses of Italy it is, I believe, the custom to have below the orchestra hollow spaces, and the orchestra itself is constructed of thin wood. The acoustic success which must attend an orchestra thus constructed will, however, largely depend upon the fact that by placing the floor over a hollow space we give increased elasticity to that surface, and therefore bring the vibration of the wood more powerfully into play.

Now this strengthening of the voice by resonance differs from the prevention of its decay by proper reflection and condensation, inasmuch as whilst the two latter give increased loudness without increased smoothness, resonance, on the other hand, gives a musical character or richness to the voice of the speaker. This property, indeed, in some cases, as in the vaulted roof of cathedrals, may often be so great as to be a disadvantage unless the speaker intones his voice

so as to keep time to the musical resonance of the building. And here we have probably the philosophy of the origin and practice of intoning services in cathedrals.

The reason why resonance imparts a musical character to the voice I will endeavour to explain. Here is a narrow slit through which I blow, and you hear, as the result, an unpleasant rustling sound, nothing more. Over this slit I place this wooden tube; blowing once more you now hear a rich musical note. In fact, I have constructed an organ pipe, the philosophy of which you doubtless already perceive. The column of air within the tube placed over the slit, selects from the rustling sound a note to which it can respond. Entering into vibration the air reacts upon the confused rustle at the slit, and thereat urges greater motion with its own period of motion, and thus augments the volume of the sound. The music of an organ is therefore solely due to the resonance of its pipes. Pipes of varying length will respond to various notes, though placed over the self-same slit; because, as I have already said, the buzzing noise at the slit contains a mixed multitude of notes, from which the pipe selects and responds to the note proper to itself. Just as here, when I hold a number of tuning-forks of different pitch over one of our resonant jars you hear a loud resonance, but if I take away one, two, three, of these forks, you still hear the resonance equally loud. If, however, I restore the others and remove this one, the resonance is gone. Amongst the several notes sounding in its neighbourhood, the column of air can reinforce only that note whose rate of vibration is coincident with its own.

The effect of resonance in raising sounds to the dignity of music cannot perhaps be better shown than in the following experiment. I have here a tiny gas flame, which, whilst burning, originates a feeble vibration, chiefly from the inaudible explosions which occur during the combustion of the gas. If I enclose the flame within a tube, the draught thus created will render these explosions more pronounced, and at the same time the resonance of the column of air within the tube will impart to those explosions a musical character. Here, too, the vibrations of the flame, which apparently consist in its rapid extinction and re-ignition, are now forced into a rate which synchronizes with the rate of vibration of the resonant air within the tube. A longer tube placed over this flame gives, as you hear, a lower note; this tin tube, 14 ft. long, and nearly 4 in. wide, placed over a larger flame, gives this loud low organ note, forcible enough to shake the very floor of this room.

We must now inquire how the large volume of air in a building can reinforce the comparatively rapid vibrations of a speaker's voice. At first sight it would seem unlikely that this could be the case, the length of a building being so vast in comparison with the length necessary to respond to the sound of the voice. This difficulty, however, in a measure is removed by the fact that the general mass of air in a building can subdivide itself, can split up spontaneously into aliquot portions, and thus vibrating give rise to a resonance which would otherwise be impossible. The air inside this organ-pipe, for example, when I blow gently, divides itself into two vibrating parts; when I blow more strongly the air has divided itself into three vibrating parts with surfaces of comparative rest between. It would take me too far astray, and would besides be impossible in this limited time if I were to explain why this is. That such a division and subdivision do take place can be shown experimentally by lowering this little membrane into the pipe, when you hear it alternately silent, and sounding as I raise and lower it.

And there can, I think, be little doubt that the air within a building behaves very much like the air in the interior of a gigantic organ-pipe. The entire mass of air in a large room, if it could be thrown into vibration as a whole, would yield a note of a pitch so low as to be quite inaudible. By subdivision, its parts can, however, vibrate more rapidly, and give rise to that resonance which is often called the note of a room. This note you may observe by making a noise in a room; a sharp ear can then often detect a faint musical sound lingering after the noise. So in speaking it is desirable to find the note of the room, and endeavour to pitch the voice to suit that note.

This brings us to the question, what determines these subdivisions?—for as they determine to some extent the acoustic properties of a room, whatever influences them must be important. An altogether satisfactory answer I cannot give.

Two points, however, seem worthy of consideration—namely, the dimensions of a room, and the presence of rows of pillars in a regular series, recesses, &c., all of which, more or less, favour subdivision. In a flute, for example, the note can be raised by uncovering the holes, these holes determining the nodes of the vibrating column of air within the tube. Probably an action somewhat analogous may occur in a building. The dimensions, however, are also important. It appears that for good acoustic properties a building should be so constructed that its different dimensions shall be in some simple relationship to each other. An analogous effect is well known in music, for if two notes have the simplest possible relationship to each other's rate of vibration, as 1 to 2, or an octave, the combination of those two notes is more harmonious than any other combination. Next to this would be the rate of 2 to 3, or the fifth, and next the ratio of 3 to 4, or the interval of a fourth; the harmony decreasing with the simplicity of the combination. Further, in the case of three numbers a musical or harmonic proportion exists when the first is to the third as the difference of the first and second is to the difference of the second and third: thus, 2, 3, 6 are in harmonic proportions because 2 : 6 :: 1 : 3. And that an approach to an harmonic proportion between the three dimensions of a building is better than an unymmetrical arrangement gains some support by citing the following proportions of buildings famous for their good acoustic properties.

FREE TRADE HALL, MANCHESTER.

Height, 52 ft., or as 2; unit, 26 ft.
Width, 78 ft., " 3.
Length, 130 ft., " 5.

ROYAL INSTITUTION THEATRE.

Height, 30 ft., or as 2; unit, 15 ft.
Length, 45 ft., " 3.
Width, 60 ft., " 4.

WESTMINSTER CHAPEL.

Height, 50 ft., or as 2; unit, 24 ft.
Width, 67 ft., " 3.
Length, 120 ft., " 5.

In all you will perceive a very simple ratio of their proportions. The last quoted is a building recently erected, and has proved a great acoustic success. Besides its excellent proportions, this building has in its interior a smooth apex behind the speaker, which may assist by reflecting the voice, and certainly with the curved ceiling prevents the waste of sound arising from oblique incidence. Then the extensive wooden ceiling and other wood surfaces, greatly aid by their reinforcement; and finally the large hollow spaces above the roof and below the building afford cavities where resonance can take place. I am inclined to attribute to this form of ceiling great value in the acoustic construction of large buildings.

Such, then, is a rapid and confessedly imperfect outline of some of the more important points connected with the acoustics of buildings. Summing up what should be avoided, and what it is desirable to secure in the construction of buildings as regards speaking, what we have learnt can be comprised under three heads.

I.—We have to avoid the waste of voice: (a) by the production of rollers of sound from oblique incidence; (b) by echo and reverberation from improper reflection.

II.—We have to secure the prevention of the decay of voice: (a) by condensation of the sound; (b) by proper reflection; and (c) by a proper arrangement of the seats.

III.—We have to secure a reinforcement of the voice: (a) by lining the interior of a building with elastic materials, such as wood, and, where possible, having the ceiling of the same; (b) by employing the resonance of cavities within a building, having spaces above its ceiling and below its floors; (c) by endeavouring to obtain some simple ratio between the various dimensions of the room.

New Town Hall for Leicester.—At a special meeting of the Leicester Town Council held on Tuesday, it was decided by a majority of 37 (27 votes against 24), to devote 3,000 square yards of land, originally purchased at 30s. a yard, to the erection of a new Town Hall (about 2,000 yards to be appropriated to municipal buildings, and the remainder to a large hall to be built at a future time), the present Guildhall, which has been used for about 370 years, being inadequate for the requirements of the borough.

REPORT ON ARCHITECTURAL EDUCATION.

A COMMITTEE of members of the Royal Institute of British Architects, and delegates from various cognate societies have been considering for a long time past—first, the expediency of establishing a "School of Art accessory to Architecture;" and secondly, the question of Architectural Education generally. After many meetings, the following Report has been agreed on, and has been sent to us for publication:

The committee appointed by you to consider the propriety of establishing a "School of Art accessory to Architecture," in consideration of the advantages likely to be obtained in a short time by the reconstruction of the Architectural Museum, and by new arrangements at the Royal Academy and University College, have hesitated to recommend at present the foundation of a "School of Art accessory to Architecture;" but have deemed it expedient in commencing their labours not only to investigate that question, but to extend their inquiries over the whole range of architectural education.

Your committee considered that, in order to have a sound and accepted basis on which to work, they could not do better than avail themselves of the experience gained in establishing the voluntary architectural examination.

This scheme was undertaken by the Royal Institute of British Architects, the council of which body having been twice memorialized upon the subject by the Architectural Association, formally propounded the subject to the Liverpool, Birmingham, Edinburgh, Glasgow, and Northern societies, and to the Architectural Association in 1850. Upon their replies in 1851, a committee of twenty-six members of the Institute was appointed to prepare a curriculum and bye-laws. This committee, after an inquiry into the nature of the examinations held in the civil and military services, the medical and legal professions, King's and University Colleges, and the architectural schools on the Continent, submitted to the Royal Institute of British Architects a course and regulations of examination upon subjects with which it was considered that every architect should be acquainted. The Institute having given them its valuable consideration, accepted them as tests of architectural knowledge, and incurred great expense in carrying them into effect.

The Institute thus established two examinations, one in the class of proficiency, and the other, of a higher grade, in the class of distinction. The first examination took place in 1853, and twenty-two candidates have passed; nineteen in the class of proficiency, and three in the class of distinction.

The following are the subjects in which it was considered advisable to examine all candidates who presented themselves in the class of proficiency:—Design and Drawing, Mathematics, Geometrical Drawing and Mensuration, Professional Practice, Physics, Materials, Construction, and the History and Literature of Architecture.

The scheme of this examination, as is well known, has not yet achieved the success which was anticipated; but your committee, feeling that it was a step in the right direction, and from the commencement of their labours that by an more general or complete scheme should be based on that establishment. Your committee has carefully investigated the whole subject, and has arrived at the conclusion that its failure in deficiency of candidates is not due to any inherent defects in the examination, but, amongst others, to the four following important causes:—

1st. The absence of a formal certificate of having passed the examination.

2nd. The want of such a stimulus or pressure, as would make the passing of the examination professionally necessary.

3rd. Inefficient preliminary education.

4th. Want of system in architectural education.

* The committee consisted of the following gentlemen:—Royal Institute of British Architects—Messrs. W. Pite, M.P., F.R.S.; F. B. Cockerell; G. Godwin, F.R.S.; Owen Jones; A. Waterhouse; Professor T. Hayler Lewis. Royal Academy—Messrs. E. M. Barry, A.R.A.; E. W. Cooke, R.A.; P. Hardwick, R.A.; S. Smirke, R.A.; R. Westmacott, R.A. Architectural Museum—Messrs. A. J. B. Boreford Hops, M.P.; J. Clarke, F.S.A.; J. Ruskin, M.A.; G. G. Scott, R.A. Architectural Association—Messrs. L. W. Ridgway, R.A.; E. P. Spiers; E. J. Taverer; W. White, F.S.A. Architectural Exhibition—Messrs. W. Burgess; R. W. Edis; R. Plimbe; T. R. Smith. Added by the committee—Messrs. G. E. Howard; C. G. Nelson; J. T. Fry; J. P. Seddon; G. E. Street, A.R.A.; Sir M. D. Wyatt.

With reference to the certificate, the chief objections hitherto brought forward have been: 1st. That such certificate might be improperly used; and 2nd. That it might be possible for a student to work up the whole subject and pass through the examination without having received any practical training in an office. Now, although your committee doubt whether the first subject of the voluntary examination could be passed by any one who had not worked a long time in an office, they think that this latter objection could be remedied if a rule were laid down that no passed student could receive the certificate until he was able to produce a testimonial to the effect that he had worked for, at least, four years in an architect's office, this term to be committed to three years in the case of those who had continued their education at either of the universities, in the Science Schools of King's College, or any other recognized body.

The first objection does not seem to have any reasonable foundation. Your committee propose, therefore, "that a certificate be granted to all who pass the Voluntary Architectural Examination;" subject to the above regulations.

Respecting the second question, such stimulus or pressure can only arise from such a feeling on the part of the profession and the public as would induce students to submit themselves for examination. This must necessarily be a work of time, and would naturally develop itself when a more perfect system of architectural education became established; at the same time your committee have deemed it expedient to suggest—"That at some future period the Membership of the Institute be made dependent on the passing of the Voluntary Architectural Examination in the Class of Proficiency."

With regard to the third cause of failure, one which it is almost beyond the power of the architectural societies to remedy, viz., "the inefficiency of preliminary education," it is felt by many of those who take pupils, that a very large number of them come to their offices very inefficiently educated; not only are they totally unacquainted with drawing of any kind, but even their knowledge of mathematics and the elements of physics, is so exceedingly limited as to cause the greatest possible hindrance to their training in the office. Your committee, therefore, are glad to recognise the great efforts now being made by the Society of Arts and other bodies to enlarge the sphere of general education, so as to embody proper instruction in science and art; and they feel sure that these efforts will result in great service to the architectural profession.

It is, however, to the fourth reason given for the failure of the voluntary architectural examination scheme (viz., the want of system in architectural education), that your committee have given their most serious attention, because they believe that it will be possible, without incurring much expense, and without departing from the objects for which it was founded, for the Institute to adopt certain measures which, while raising the standard of the profession, will increase its own strength.

The complaint generally expressed by the students of the profession is, that there seems to be no curriculum laid down to indicate the progressive course of study by which the numerous subjects should be taken up *seriatim*; so that it often happens that at the termination of their articles or period of study they are ignorant of many of the most essential qualifications required for architectural practice. In consequence of the shortened period of pupilage and the increased number of subjects with which it is necessary that the student should be acquainted, it is found that sufficient time is not afforded for acquiring the necessary architectural knowledge by routine alone; more preliminary training, therefore, in elementary knowledge is required, in order that during the first and second years' study in the office the student should more readily understand what he is working upon, thus learn more quickly, and lose less time. It was assumed, that by establishing an examination setting forth the series of subjects with which an architect should be acquainted, and giving a list of books to be read and studied at leisure, there could no longer be any excuse for the student to say that he did not know what he had to learn, or where he could learn it. But the result has proved that books alone are not sufficient, and that without any of the progressive series of tests or examinations, such as are held in all colleges and schools, the student shrinks from taking all the subjects at one time to pass them in three days' examination. Your committee, to remedy this defect,

recommend, therefore, "that a preliminary examination be held in elementary subjects, open to all students who have been at least one year in an architect's office;" and that those who prefer to wait for the final examination be then required to pass also in these elementary subjects.

Your committee feel that the prescription of a curriculum of study for the young architect entails very important inquiry, and is one of the most serious questions which has ever been brought before the profession.

It is objected that, of some of the subjects demanded for the voluntary architectural examination, sufficient knowledge is obviously not to be obtained in any architect's office, and it becomes therefore necessary to see whether certain courses of instruction which exist outside the profession could be made subservient to an improvement in architectural education.

Taking up the subjects of the examination, it is found, in addition to office education, that in *Architectural Drawing* instruction is to be obtained at South Kensington.

In *Freehand Drawing*.—At South Kensington, South Lambeth, other Governmental, and private drawing schools.

In *Elementary Design*.—To a limited extent only, in the classes of the Architectural Association.

In *Perspective*.—At the above-named schools, and at the Royal Academy to their students.

In *Mathematics, Physics, Mensuration, &c.*—Complete courses at King's and University Colleges.

In *Materials and Construction*.—At King's College in the day time; and at University College in the evening.

And in *History of Architecture*.—At University College.

With all these extraneous courses of lectures existing, your committee were surprised to find that they are taken so little advantage of; there being but a very limited number who ever attend the Governmental schools of drawing, or the courses given at University College, and hardly any the valuable courses at King's College. These latter, however, are held in the daytime; and as yet no steps have been taken to allow of pupils attending them during office hours. With regard to evening classes, your committee are of opinion that it must be accepted as a fact, that in the architectural as well as in other professions no evening courses of lectures are likely to attract many of the younger members, unless there be some more serious advantage to be derived from so doing than that of simple improvement: thus they consider, whether drawing, construction, materials, &c., are amongst the parts of architectural education, and same in other professions; and the medical student would object to attend courses of lectures on chemistry or physiology if given in the evening. Your committee feel, therefore, that unless this be accepted as a fact, and opportunity be given to pupils, both in London and provincial towns, to attend certain day courses, the number of which should be recognised by the Institute, no very great improvement can be grafted on the present system of architectural education.

The next important question which your committee considered was whether any additions to, or modifications in, existing institutions could be made so as to bring them more effectually within the reach of architectural students, and improve their education. And here it is to be hoped that the Architectural Museum, in its new premises, will be able to hold out such advantages as can easily be made available. Instruction in freehand drawing from the ornamental casts of all periods and countries will be given there, and those who attend will be under the supervision of some of our first architects; whereby the objections made to sending pupils out of the office to draw at South Kensington or the British Museum will no longer hold good.

The Royal Academy, from want of room, have hitherto been compelled to withhold from architectural students the instruction afforded to painters and sculptors; but in their new premises, with a large and well-lighted room, they will be able to establish (and would doubtless be willing to do so, on the recommendation of the Institute) schools for architectural drawing, and for freehand drawing from the antique and the ornamental cast.

The complete courses of instruction at King's College are established for the special training of civil and mechanical engineers. There are, however, many architects who have profited

much by attending them, and there are few subjects treated there with which an architect ought not to be conversant. The authorities of the College would probably be glad to extend these courses so as to admit of the special instruction of the architectural student.

University College has the reputation of having established the only Art Professorship in England—that of Architecture; and there is now a Bill before Parliament to enable them to establish a Faculty of Arts, in addition to those of Science and of Medicine, which they now possess. The artistic education of the architect, therefore, which is so much required, it is hoped will eventually be obtained there. They have also just taken into consideration the establishment of an engineering school, somewhat similar to that of King's College, but in which a diploma (as a sort of incentive to work) will be granted in conjunction with the Institute of Civil Engineers. It is proposed to give the diploma only to those who have worked after leaving the college for at least two years in an engineer's office, and obtained the engineer's certificate as to practical knowledge.

With the science and art schools, therefore, which will soon be established at University College, and with the lectures on materials, construction, and history of architecture, in conjunction with the practical training to be received in the office, a complete course of architectural education might be obtained. But in order to turn all this to good account, it is requisite that, with the other opportunities for obtaining architectural knowledge, it should be reduced to a comprehensive scheme, to be readily understood by architects, students, and the public generally.

Your committee believe that the British Museum, the South Kensington, and other Museums might be turned to more account towards the furtherance of improvement in artistic education, if lectures could be given on the students' days, by competent persons, on the marvellous collections of works of art contained in them. The value of a course of lectures, for instance, on Athenian sculpture, with the actual examples of the Parthenon frieze to illustrate the lecturer's remarks, could not but prove of the greatest utility.

Your committee would be most unwilling that any attempt at a centralization of architectural education in London should be made; they recommend, therefore, that, upon the adoption of this report, circulars be sent round to all the *bona fide* architectural societies in Great Britain, to seek for their co-operation, as their support would be needed to establish throughout the country a complete and recognised course of architectural education.

Your committee have heard with pleasure that the Architectural Association are now taking steps to establish courses of lectures on subjects specially connected with the profession, not now sufficiently provided for in office instruction, for those students who are not able to attend other courses in the daytime; and your committee earnestly recommend the Institute to co-operate with that body, and assist it in its endeavours. A course of fifteen lectures on physics and chemistry has already been established, and others are forthcoming in statics and dynamics, professional practice, geology, descriptive geometry, with practical application in the cradling and centring for vaults, &c. The committee think also that the figure drawing class of the Architectural Association, which was established four years ago, might, with the assistance of the Institute, be extended and placed on a firmer footing.

Your committee believe also that, in order to recognise and promote attendance at the courses of lectures before cited, the certificates of having passed certain examinations might be taken into account when the student presents himself for the voluntary architectural examination.

Your committee beg to recommend, therefore, to the serious attention of the Royal Institute of British Architects, as the senior and only chartered body of the profession, the following propositions:—

1st. "That a text-book or pamphlet should be prepared, containing a complete curriculum of study for the architectural student, pointing out where and when (in addition to office instruction) courses of lectures specially pertaining to the profession can be obtained with advantage, and giving a limited number of books in which the best information is to be had in a condensed form. In this text-book the greatest possible publicity should be given to the course of lectures which are given by our architectural professors, and to

the imperative necessity of attending schools in which any instruction in freehand and figure-drawing is to be obtained. This hook should take into account the numerous honorary prizes offered by the Royal Institute of British Architects, by the Royal Academy, by University and King's College, and by the Architectural Association; it should suggest at what period these might be competed for with advantage; and, finally, it should set forth how all these courses of instruction should tend to the passing of the Voluntary Architectural Examination, which should be placed before the student as the goal to which he must of necessity attain. The committee are further of opinion that the Institute should ask for the co-operation of the Architectural Association, which, now numbering over 600 students, could materially support it in the furtherance of their scheme."

Your committee recommend that in this text-book great importance be attached to the advantage of travelling in England and on the Continent, as the best and almost the only means of becoming acquainted with the works of our ancestors, without which it is impossible to design; pointing out that those who have acquired the greatest reputations as architects and designers have done so in consequence of their knowledge, and not ignorance, of precedent.

2nd. "That a certificate be granted to all who pass the Voluntary Architectural Examination established by the Institute, and in addition, that some especial incentive should be given by the Institute, endeavouring, if possible, to found a money scholarship for the pupil who shall pass first each year; or if this cannot be at once managed, by giving one or more medals."

3rd. "That at some future period the membership of the Institute be made dependent on the passing of the Voluntary Architectural Examination in the Class of Proficiency."

4th. "That a preliminary examination be held in elementary subjects, open to all students who have been at least one year in an architect's office."

5. "That the Institute should assist the Architectural Association to carry out the drawing school which it was proposed by that Society to establish this session."

And 6th. "That an Architectural Committee be appointed, consisting of members of the Royal Institute of British Architects, of the Architectural Association, of the Architectural Museum, of the Architectural Exhibition, and delegates from provincial societies, to assist in the compilation of the text-book or pamphlet above recommended, and put themselves in communication with institutions outside the profession, to obtain their co-operation and assistance."

THE UNION BANK, HUDDERSFIELD. YORKSHIRE.

This building, for the Halifax and Huddersfield Union Banking Company, is amongst the most recent structures in this thriving and important town. Its erection was greatly retarded by a local strike of masons, which occurred in the summer of 1865, and lasted eighteen consecutive weeks.

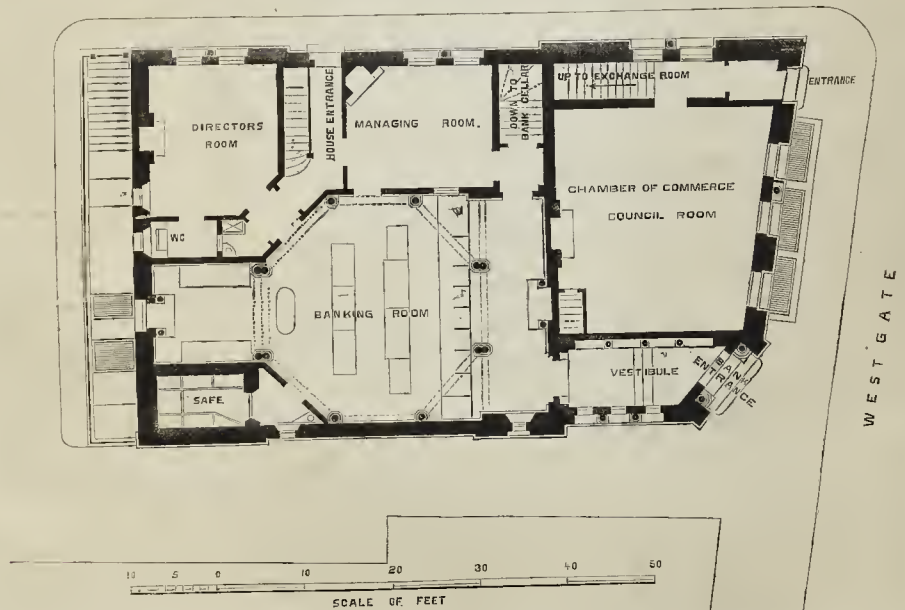
Designs were obtained in limited competition from three architects in 1864, and the plans of Messrs. Paull & Ayliffe, of Manchester, were selected. The works were in great part carried out under their joint superintendence; but after a dissolution of partnership, were completed by Mr. Paull. The walls are built of rubble stone, faced with fine-tooled ashlar wall-stones, in regular courses, and lined with brickwork. The front apartments on the ground and first floors were arranged for the Huddersfield Chamber of

Commerce, the upper room being used as an exchange and news-room, and the lower for council meetings.

The banking-room is lighted by a dome, containing stained glass by Edmondson & Son, of Manchester. This room is octagonal. It is well finished, the columns being of Aberdeen red granite; the carved capitals and bases, &c., of freestone; and the mouldings of Keene's cement. The fittings are executed in wainscot oak, with Spanish mahogany counter and desk tops, and ebony mountings, all arranged under the special oversight of Mr. James Bowman, of Halifax, the managing director. Vaulted cellars extend throughout the basement, warmed and ventilated for deposit of valuables, and two spacious safes are provided, fitted up with galvanized iron shelving and wrought-iron doors.

The arrangements include a residence for the cashier, the kitchen being on the first floor, same as the dining and drawing rooms, and communicating with the basement by a balance-lift. The external shafts in the elevations are from Messrs. Freeman's granite quarries at Penryn. The carving was executed by Mr. W. Green, of Manchester. Mr. Dovey, of Manchester, supplied the gas-fittings and other internal metal-work. The building was erected by local contractors as follows:—Masons' work by Messrs. Graham & Sons; carpenters' and joiners' work by Messrs. Fawcett & Sons; slating by Messrs. Goodwin; plastering by Mr. Jovitt; plumbing and glazing by Messrs. Lidster & Armitage; smiths' and founders' work by Mr. G. Scholefield; and painting by Messrs. Webster & Depledge. The clerk of the building and fittings, exclusive of site, was about 8,500l. The internal decorative painting is to be executed during the summer of this year under the direction of Messrs. Paull & Robinson.

THE UNION BANK AND CHAMBER OF COMMERCE, HUDDERSFIELD.



Plan of Ground Floor.



THE UNION BANK AND CHAMBER OF COMMERCE, HUDDERSFIELD.
MESSRS. H. J. PAULL & O. AYLIEFE, ARCHITECTS.

RECENT WORK OF THE ROYAL ENGINEERS.

The seventeenth volume of papers by officers of the Royal Engineers, on subjects connected with the duties of the corps, is now published.* The editor, Lieut.-col. Hutchinson, remarks that he expected it would have been enriched by a paper from Lord Napier of Magdala upon the Abyssinian campaign, but in this particular he has been disappointed. Two papers on this subject are, however, among the contents of the volume, though neither of them is from the pen of the great commander. One of these is a report by Lieut.-col. St. Clair Watkins, R.E., giving an account of the operations of the engineer department in Abyssinia, with details of all the works executed, accompanied by plans of the port, coast, depôts, camp of Zoalla, and the railway line. A stone pier, jutting out 900 ft. into the sea, with a tramway on it, and on to the beach beyond, to facilitate the landing of the army and its stores; a road, 50 ft. wide, through the jungle from this pier to the camp, 14 mile distant; the cleansing of the old village wells, and the construction of twenty new ones, for the watering of 2,000 men and 2,000 animals; a large store-shed; and a water-shot about half the length of the pier, raised on trestles above the sea, for conveying to the shore sweet water condensed by H.M.S. *Satellita*, were among the first works executed, and are minutely described here. Lieut.-col. Watkins states that the difficulties of constructing a railway with unprofessional labour were enhanced by the fact of five different descriptions of rails being sent out, calling for four different modes of fixing, and that five out of ten of the fish-plate bolts did not fit those on the rails. After this harassing experience, he comes to the conclusion that railways required for the operations of war should be carried out as a civil work, by engineers and contractors, who make it their business to construct them. An estimate by a contractor was given for this railway at 72,000*l.*, exclusive of rails and plant. The cost, as incurred by the Royal Engineers, was 6,000*l.*, exclusive of rails and plant. Out of this large margin the contractors would have had to supply labour and superintendence. The second Abyssinian paper relates only to the position and leading features of Magdala and its construction. Lieut. T. J. Willans describes one entrance into the place as a small double-storied hut, built of stone and mud, in which was a stout timber door, 4 ft. wide only, with a window over it for the defenders to guard it from; but the dwellings seem to have been built exclusively of wicker work and thatch. A paper relating to Prussian siege operations by Col. Lennox is of much professional interest, showing as it does the Prussian army organization, methods of construction, mining, &c. In this volume, too, are to be found the reports on the Paris exhibition, by Capt. Stotherd, describing the Austrian military equipment, system of submarine mines, telegraphic and electrical apparatus, and both naval and military visual and sighting apparatus. A sketch of the military proceedings in New Zealand, since tranquillity was restored in 1861, by Major-general Monld, C.B., has some important deductions in it. The first engineering work undertaken under the auspices of the new governor, Sir Geo. Grey, was the Great South Road, which cost 2,930*l.* per mile. The next proceeding was the construction of a court-house, for the erection of which a quantity of timber was brought to the site, when the natives got alarmed, fearing that something more than a court-house was intended, and removed the whole of it. To punish this proceeding fresh hostilities were commenced, which only terminated in 1866; and then, as we know, but temporarily. The natives resist the most urgent solicitations for the construction of roads, believing that this concession would involve their loss of right to the land. Good road-making is, however, the surest mode of conquest. The Romans made roads in Britain; the Highlanders were never settled till great roads threaded their most mountainous districts; the North American Indians are only subjugated by the pushing forward of roads through their almost impenetrable forests; and the only errors committed by Sir Henry Smith, according to the Duke of Wellington, was his omission to leave great military roads in the Kafirs' country. The

desirability of good modes of communication settled, Major-general Monld next considers the conditions under which they should be made. This able paper is accompanied by a map of the territory, a sketch of Waikato Delta, a plan of the Maori works, a plan of Paterangi, another of the native entrenchment at Pooipoo, plans of the most considerable Bays, and a plan and section of Pike Hina Hina, or the Gate Pa, Taranaki, showing the maze-like system of the rifle-pits, but dwellings, and palisades. Besides these graphic particulars of works of military construction undertaken by the English army in foreign parts and distant colonies, there are several good papers on such miscellaneous subjects as the application of photography to surveying, revolving musket-proof mantlets, and a diagram illustrating the course of promotion in the corps of royal engineers, which we must be permitted to say appears to be very zig-zag.

POTTS' SYSTEM OF VENTILATION.

The use of a hollow cornice communicating with the exterior of a room to bring in fresh air or take out foul is not an unknown arrangement. We have used it ourselves on several occasions, and at intervals ranging over some years. Nevertheless, the system patented by Mr. Potts is his own, and certainly deserves attention. In this the perforated cornice is formed into two passages, the one next the ceiling, and which communicates by valves with the chimney or other flue, is for the vitiated air, and the lower one, open to the external atmosphere for fresh air. The latter is not perforated near the entrance, so as to give the air a direction along the channel. We have seen the cornice in a billiard-room, where it is found very serviceable. The size of the channels, of the perforations, and of the openings of entrance and exit must of course be apportioned to the size and purpose of the apartment. Mr. Potts forms the cornice of various materials: zinc, or sheet brass, usually; sometimes partly of plaster, especially where old cornices are to be converted. Some houses in Kew and some taverns in the City are being provided with these ventilating cornices, and there is little doubt that as to the value and simplicity of the system become known, it will be more extensively adopted. It is likely to be tried, we are glad to hear, in the Justice Court at the Mansion House.

CHURCHES IN DEVON.

Clyst St. Mary Church.—This church was reopened on Easter Sunday after works of restoration. It had suffered almost a travestie in some alterations made more than thirty years since; Italian windows, cornices, &c. having, together with a thick coating of cement over the exterior, effectually disguised the originally Gothic church. The present improvements consist in inserting four traceried windows, one of which, in the chancel, has been filled with stained glass by Messrs. Lavers, Barrand, & Westlake. Some new open seats have been constructed, also a pulpit of wainscot, the chancel arch restored, and the avenues laid with Minton's tiles. The ceilings, of cradle form, have been divided into compartments, with ribs and bosses; copings and crosses erected on two gables. The works have been carried out through the exertions of the rector, Rev. S. Warner, under the superintendence of Mr. Ashworth, architect, by Messrs. Moass & Sons, builders, of Exeter.

Bishopscynmpton.—The parish church has been reopened for divine service, after considerable works of restoration. The work was commenced in July last, and the outlay has amounted to about 1,300*l.* The chancel has had a ceiling removed and the roof for the most part renewed, the old principals and arched braces doing duty in an open boarded roof. A new reredos of Bath stone has been erected at the east end; and a new two-light stained glass window from Mrs. Beer's establishment has been erected to the memory of the late Rev. Canon Hsherden. The south aisle has had its cradle-roof uncovered, repaired throughout, and related, and carved bosses fixed at the intersections of the ribs. Three new Bath stone windows have been put in, and the west wall rebuilt. The nave roof, a cradle plastered between the ribs, has been adorned with carved bosses. The church has been re-seated throughout with red deal open seats, the hench ends and fronts having tracery. The plastering has been removed from the walls, and the whole interior exhibits the stone, having

pointed joints. Two old windows on the north side have been repaired and reglazed. The floors of the avenues are laid with Haywood's black and red tiles. The font, a Norman one, has been restored by supplying four shafts in Purbeck stone. The tower of the church requires much repair, which has yet to be undertaken. The Rev. J. Thorne, the rector, has been the chief promoter of the work, aided by contributions of friends, the Bishop of Exeter giving to the amount of 500*l.* The work has been carried out, under the superintendence of Mr. Ashworth, of Exeter, architect, by Mr. Cook, of South Molton, builder; the Bath stone work by Mr. Gould, of Barnstaple; the stone carving by Mr. Hems, and wood carving by Mr. Sendell, both of Exeter.

NOTES FROM PARIS.

The exterior of the new Vaudeville Theatre, at the corner of the Boulevard des Capucines and the Rue de la Chaussée-d'Antin, is a simple semicircular pavilion, planted between two high mansions. M. Magné is the architect of this building, which does him much credit. The inside decorations are completed, the colouring being of a very harmonious clear tone. There is a profusion of gilding; but it is used to such good advantage that it does not appear tawdry or out of place. The lighting is a sort of partnership of the sunlight and the open chandelier; in fact, it is obtained by a lustre in demi-relief. On the front of the stage the footlights consist of a new species of burner invented by M. Sahu, which he calls reversed-flame burner (*bec à flamme renversée*), every light being under a glass shade nopen at the top; so that there is no possibility of the dress of an actress taking fire from that cause. Similar lights, our readers know, have been used in England. The ceiling has four allegorical paintings by M. Mazerolles—Folly, Mnsic, Drama, and Tragedy. Their conception is very poor, some jovial figures being seated on clouds and likely to fall through; still, it has a moral which the author never dream-d of; for how many new dramas and *opéras comiques* have lately fallen through the happy clouds and *réves* of a good reception never to be lifted to the skies of public favour! We may add that the circular *foyer* of this theatre is charming; the machinery in the house is of first-rate conception and power, and is worked by a six-horse power engine.

The ancient Vaudeville, on the Place de la Bourse, now in course of demolition, afforded much amusement to the *dilettanti* during the removal of the pieces of machinery, some of which are of large dimensions. The principal doorway had to be enlarged by taking down a portion of the walling.

The new Opera proceeds slowly but regularly, all hands being employed (there are not many) in putting the *salle* into shape for the decorators, and in finishing the dome. The façades are terminated, except the crowning statues, which have yet to be raised. There were circular refuges and candelabra facing the Opera, and in a line with the two footways of the Boulevard. These have been suppressed, and four others of smaller dimensions on each side of the axis of the Opera, two on each side of the Boulevard, substituted.

A few days ago the fifth pavilion of the Halles Centrales, intended for the sale of offal, was formally opened to the public. This pavilion completes this magnificent construction, the most perfect of all the establishments of this class throughout the world. To the first emperor is due the idea of the general reform of the Halles Centrales, a project the execution of which was only commenced in the reign of Louis-Philippe, under the administration of M. de Ramhuteau, whose name is affixed to a wide and well-built street leading from the Rue du Temple to the Halles. The excellent arrangements and magnificent structures which now form the group are, however, due to the actual administration, and the sum of money expended up to the present day, so as to complete the structure, has been 2,400,000*l.* To M. Victor Baltard, municipal architect, is due the creation of the special style of architecture, so completely and so perfectly applied to the modern exigencies of the supply, on an immense scale, of wholesome food of the best quality.

According to official returns, in 1816, Paris contained 710,000 souls; in 1826, 890,000; in 1836, 909,000; in 1846, 1,053,000; in 1856, 1,174,000 (at this period the population inside the fortifications was 1,525,942); in 1866 (after

* Papers on Subjects connected with the Duties of the Corps of Royal Engineers, contributed by Officers of the Royal Engineers. New Series. Vol. xvii. Printed by Jackson & Son, Woolwich, 1869.

the spread of Paris to the fortifications), 1,826,274.

From a statistical return just published, we find that the first omnibus circulated in Paris in 1653 by letters patent granted to the Duke de Ronbanc, and the Marquis de Crenan. During 1868 the General Omnibus Company had in service 694 carriages. Each performed, on an average, 91,260 metres; this, for 682 omnibuses daily at work, gives 22½ millions of kilometres for the entire year, or about 13½ millions of miles. The number of effective horses in stable was 8,227 per day; 12 were daily yoked to each of the 682 omnibuses; the average mileage done by each horse was 9·6 miles. The number of passengers conveyed during 1868 was 113,348,031. In Paris and the annexed communes the company possess 43 stables, coach-yards and forage-stores, and 4 carriage workshops: these latter, in 1868, employed a staff amounting to 591 men per day, the daily wages being, on an average, 4s. 5½c. 18m., giving an annual amount of wages of 32,155l. The whole working expenses of the company for the year amounted to 881,974l.; receipts, 928,824l.; profit for the year 1868, 46,850l. This, at 4 per cent., would represent a capital of 1,171,250l.

At the Louvre, on the four sides of the Salle des États, up to a convenient height, have been arranged nearly three hundred paintings of the Dutch and Flemish masters. This collection is a most valuable one, and appears to be worth at least half a million sterling. Owing to the loud complaints of artists and amateurs of all classes, the pictures temporarily stolen from the galleries of the Louvre have been given back to their rightful owner, the public. Now it is the turn of the miniatures. The portraits of Saint-Mégrin and of Balsac d'Entragues, of Sainte-Genève, and other marvels of the Savarot collection, have already reappeared in the Miniature Gallery. They have been wisely placed in a shady spot, whereas, exposed to the sun in their former place, many of these valuable pieces were being spoiled.

On the 1st of May the hawthorn kept up its annual name by showering into the streets of Paris cart-loads of "Mai," as the French call it also. Hundreds of hand-carts circulated for some days, laden with single white, single red, and double red, the latter being a most profuse clustering of microscopic roses. Every workman could provide himself, for one sou, with a bunch 3 ft. long, and, at the present moment, every young girl can have a respectable bouquet of lilies of the valley for the same sum at any of the markets. As these come from the provinces, the quantities of may and muguet brought in daily by train to Paris must this year have been enormous.

STEAM POWER IN LAND CULTIVATION.

An opportunity has been afforded by Mr. Webb, of Smallwood Manor, near Uttoxeter, of seeing in operation on his own estate the latest improvements in the application of steam power to the drainage of clay soils. He has just obtained from Messrs. Fowler & Co., of Leeds, a set of double engine tackle for ploughing, cultivating, and draining. The engines are of 14-horse nominal power, fitted with a large drum underneath the boiler, on which the steel rope which draws the implement is wound. For draining, double power is obtained by the wire passing over a pulley mounted on the frame of the draining plough, the opposite end being secured to the wheel of the engine, so that the rope travels at twice the speed of the plough. A draining plough made by Messrs. Howard, of Bedford, at work at Swansmoor, near Weston, is similar, except that the steel rope, instead of being drawn round a snatch-block in front passes round a large pulley on the frame. The plough on the first day of trial, says our authority, the *Staffordshire Advertiser*, did its work admirably. The mould which forms the drain is 4 in. in diameter, pointed in front, and is connected with the frame of the plough by a flat bar of steel, which cuts its way through the ground, the small orifice being closed again by rolling. The field in which the draining was first performed had been previously drained by pipes in the furrows, and the steam draining plough was used to run drains along the ridges. One advantage attending the use of the implement is that the land on each side the drain is slightly raised for a considerable distance, which admits of the aeration of the soil, a very important matter in heavy land. The drains were cut through in several places, and in each case the opening was

found to be perfect, and the inside firm and smooth. The drains are run at a depth varying from 2 ft. 3 in. to 3 ft., and the work will be done in the neighbourhood at 11. an acre, the drains being 16 ft. apart. We understand that in parts of Essex, where Mr. John Fowler conducted his first experiments fifteen years ago, the drains then formed in this way are as perfect as on the day they were made. It is hardly necessary to say that this mode is only applicable where the drain passes through a retentive stratum of clay. The cost of a pair of these engines, with all the tackle for ploughing, cultivating, and draining, is 1,600l. They require five persons to attend to them, and will drain from eight to ten acres per day, at the depth and distance apart stated above. The tackle was drawn by its own power from Uttoxeter to Smallwood Manor, along a road which has several steep hills, with perfect ease.

From 10s. to 18s. an acre was charged for ploughing or cultivating, going once over the ground, and from 16s. to 30s. for going over twice the depth, the nature of the soil and other circumstances determining the price. Mr. M. T. Bass, M.P., at the suggestion of Mr. Webb, joined the enterprise a few years ago. Two sets of their apparatus are stationed at Sleighford, in the northern part of Lincolnshire. Not only have the partners thus increased their plant, but many others in the district have been induced by their success to purchase the apparatus, and about thirty sets of Messrs. Fowler's double engine tackle are at work in Lincolnshire and Nottinghamshire. As the farmers become convinced of the value of the implement, and can reckon with confidence on getting their land worked by it, they are able to dispense with a large number of horses, and to effect a considerable saving, as well as to secure more efficient cultivation. It is the perfection to which the draining plough has been brought that has induced Mr. Webb to make another effort to try whether the apparatus cannot be profitably employed in the grazing district in which he resides.

The men employed by the firm of Fowler & Co. have from time to time clubbed their savings, and bought a set of tackle. The largest proprietor has gone out with it to a promising place, and hired it out, dividing the profits after receiving wages for himself. In this way no less than twenty sets of tackle have been purchased, and are now at work. A plan of introducing steam cultivation has been proposed, and is shortly to be put into operation, based on the following principles:—A steady, industrious man, of good sense and good character, is to be put in charge of a machine, receiving moderate wages, and after paying interest on the cost, the profits are to be equally divided, half to go to the purchaser and half placed to the credit of the man until the amount will repay the cost, when the apparatus will become his property. In this way his interest would be strongly enlisted in the work, whilst the purchaser has the security of possession for the original cost, interest on the outlay, and a share of the profits. No particular mechanical ability, it seems, is necessary.

It is a matter of surprise that so promising an investment as that offered by steam cultivation should be so little regarded, and it can only be explained by the early failures, and by the want of proper care in the selection of apparatus, and of prudent management in recent attempts to introduce it.

THE TRADES MOVEMENT.

Liverpool.—A correspondent writes: "It may interest you to know that the masons have determined to resist payment by the hour in this town and district, and that in consequence a general strike (called by them a lock-out) will take place here on Saturday next. The works affected will be very few in number, and the stoppage of little consequence. Trade was never known to be so bad in Liverpool in the memory of man."

Sheffield.—At a meeting of the associated masters in the building trades it was stated that an advertisement for men, which had been inserted by the masters in the local and other papers, was being freely answered. It was likewise stated that no difficulty had as yet been experienced by the masters who were in favour of the hour system, as they had sufficient men in all classes of the building trades to enable them to carry on the work which they

had at present in hand. In order, however, to guard against the possibility of their being in want of men, a deputation had been sent that morning to London, to arrange with Colonel Maude, of the Free Labour Society, for the sending down a number of men who were willing to work according to the system which the associated masters are desirous of introducing.

Stockport.—The dispute between the joiners and builders of this town, we are glad to say, is likely to terminate satisfactorily to all parties, the operatives being disposed to accept their employers' proposition of being paid by the hour. The only point waiting for arrangement now is the rate of wages for over-hours and the unprotected work in the winter season, which, there is reason to believe, will be amicably settled.

St. Helen's.—Mr. Harnett, general secretary of the Operative Stonemasons' Association, reports that the dispute at St. Helen's has been arranged, and that eighteen men out there had returned to work on the old terms.

Holland.—Strikes are beginning to be prevalent in Holland as well as Belgium. One is reported at Amsterdam. The ship-carpenters declined to continue work unless the masters would increase their wages from 1·80 fl. to 2 fl. a day, the working hours to be henceforth from six in the morning till six in the evening. The masters, however, refused these proposals, and the workmen have left the yards. Eight hundred men are now out of employment. The turf-cutters at Beets (Friesland) have also struck for higher wages. Here serious disorders have taken place, and some lives have been lost. The Dutch workmen want to expel the Belgians, who work for lower wages. The Dutch printers are organizing a league to obtain higher pay.

Berlin.—A Berlin letter says,—"The house-carpenters here are still out on strike, or at least a great many of them. A large public meeting of working-men was held here on Sunday week. Upwards of 3,000 persons attended it, and the speakers, who were of all trades, encouraged the carpenters to hold out. Two resolutions were passed, of which the first was to the effect that it was the duty of every working-man to help his fellow-workmen in their struggle with capital; and the second, that as the North German Parliament consisted of Conservatives and Capitalists, the working-men could not hope for any aid from them, and must therefore endeavour at the next election to secure the return of their own representatives."

Manchester and Salford Building Trades Institute.—The annual meeting of the members of this Institute for Technical Education has been held. There was a very numerous attendance, and the chair was occupied by Mr. Isaac Holden. Suitable addresses were delivered by the chairman and other gentlemen present. The report was read by Mr. John McLean, the secretary. The committee, in presenting their first annual report, state that, at the commencement of the movement, the objects of the institute were confined to the trades of carpenters and joiners, but it had been afterwards resolved to connect the building trades. The number of members for the past year had averaged 62 per quarter—58 carpenters and joiners, and of whom twenty were apprentices, three masons, and one a bricklayer. The students had generally shown their appreciation of the instruction furnished, by their regular attendance and diligence throughout the season. The committee, however, could not withhold expressing their opinion that the number of students for the first year had been very few compared with the number of members, and the importance of the building trade, in this locality. The total amount of subscriptions for the past year had been 25l. 5s. 0½d.; the expenses, including hire of rooms and teachers' salary, with other items, 41l. 3s. 6d.; leaving a deficit of 15l. 9s. 0½d.

Co-operation at Deptford.—A committee of workmen recently discharged on the closing of Deptford Dockyard has been formed to draw up the rules of a Co-operative Association, or partnership of industry, to carry on the trades of shipbuilding, ship-repairing, and ship-breaking in the unoccupied yard. The co-operation of several influential tradesmen in the locality, besides members of Parliament and others (among the latter being Mr. T. Hughes, M.P.), has been promised. The Government have expressed a willingness to treat with the men for the occupation of the yard on liberal terms, and the Admiralty have now a memorial from the latter before them, asking that the old and useless ships of the navy be sent to Deptford for breaking up.

RAILWAY MATTERS.

The Sheffield station of the Midland Railway is progressing rapidly towards completion. The whole of the station, both on the up and down line, will be covered in, and the span of the roof will be something more than 115 ft. On the down side of the line, which is the side nearest the town, the station will be 426 ft. in length, and the platform will be about 150 ft. longer at either end. The centre of the building will be set apart as hooking-offices. On either side there are large waiting-rooms for the three classes of passengers, and a first- and a second-class refreshment-room. The station on the up-side will not be so long as the other, but it will contain a refreshment-room, hooking-offices, and waiting-rooms. Both the up and the down platforms will be about 30 ft. wide. It is not intended to erect a goods station, as the one at present in existence will still be used, and most of the goods traffic will run over the old line to Mashborough and thence to Sheffield. The building on the down-line is nearly completed, and workmen are now engaged in fixing iron girders for the support of the roof, and in erecting the platform walls. The station on the up-side is not so far advanced. The site of the station is between Granville-street and Pond-street. The whole of one side of Granville-street has been pulled down to meet the requirements of the company; whilst on the Pond-street side, rows of cottage property have disappeared to make room for the entrances. The station will have a large open space in front, so as to accommodate cabs and other vehicles. That side of Granville-street which has been pulled down to make way for the line is supported by a wall stretching from the mouth of the tunnel nearly up to the top of Broad-street. Most of the station itself stands upon arches. The buildings are entirely of stone, and what architectural features they have about them are in the Italian style. There will be two chief approaches to the station, the most important being that which will commence in the Old Haymarket, near to the site of the new Post-office, which will occupy the eastern side of the approach. This approach will be 60 ft. wide, and will have an easy gradient to the station.

Much light is thrown on the interesting question whether railway travelling is injurious to health, by the statistical investigations of Dr. Wiegand, of Halle. His inquiries are based on the reports of thirty-eight companies, and the results for 1868 are as follow:—Of 11,125 engine-drivers, stokers, and other officials travelling with the train, 119, or 1.072 per cent., died; while of the 43,853 other officials employed only 408, or 0.931 per cent., died in the same period. It will be seen that the rate of mortality is somewhat higher in the first than in the second class, but the difference is not great enough to lead us to suppose that the occupation is more than usually dangerous or unhealthy.

MALTHUS AND THE POPULATION QUESTION.

The National Association for the Promotion of Social Science met last week in the room of the Society of Arts, Mr. Newman in the chair, when Mr. W. B. Hodgson, LL.D., read a lecture on "Population."

Dr. Hodgson said that it was to be regretted that the ideas of Malthus were always applied to on this question. Distress and destitution were not by any means to be found on the increase in proportion to the density of population. On the contrary, in many thinly-populated and fertile countries distress was much greater than in others which were as fertile, yet more densely peopled. Destitution was almost universal in thinly-peopled countries, even where the influences of climate and soil were favourable, while abundance might exist in countries densely peopled even without a fertile soil. No doubt the number of the rich and of the poor would be in proportion to the paucity and the density of the population. The application of the abstract theories of Malthus was, in fact, practically senseless at the present time, for the world was yet a long way from being under cultivation either to the extent or the degree which might be reached, and it was therefore unnecessary to reason on the results of an over-population which might never exist, and which, in any case, could only be anticipated in a very remote future. The present distress and scarcity were not due to over-population, but to over-specula-

tion. In Canada the want of population was preventing the development of the resources of the country. At the same time Dr. Hodgson admitted that it was the duty of parents to exercise due consideration, and to act with a due sense of their responsibilities, and not marry without some provision; for it was clearly wrong to bring up large families of paupers to be burdens on the community. The only remedy, however, which was possible seemed to be the diffusion of correct views on the question of individual responsibility, to which it must be left.

A discussion followed, in which the speakers seemed to be about equally divided, and a vote of thanks was unanimously given to Dr. Hodgson, who, in thanking the meeting, said he was of opinion that Malthus and his theories should be put aside altogether. The surface of the earth was not infinite, but it was not exhausted, nor all cultivated as yet, and it was unnecessary to speculate on a condition of things which might never arise. A large portion of the earth was now ready for cultivation, and general over-production was impossible. A large portion of the population grew up without being able to render any aid to society, and these must be taught the necessity of adding to the wealth of society instead of diminishing it. If we could qualify the mass of society, and make them all producers, we should not only make them all useful, but comfortable.

THE ARCHITECTURAL MUSEUM.

The honorary secretary writes,—"I should be glad to know those who are interested in the museum know, through your columns, that we are now busily engaged in arranging our collection. The task of sorting and finding suitable hanging-space for the various objects in so large a collection occupies, it is found, a longer time than was at first anticipated. Hence a slight delay has arisen, for which I should be glad to explain the cause to the public; and here I would remark that it is felt by those who are carrying on this work, that considering the advantages gained by architects for an annual guinea, and the very disinterested way in which art amateurs have come forward, we may fairly look for more general help from the profession.

STAGE NOTES.

The General Theatrical Fund Dinner.—The twenty-fourth anniversary festival of this excellent charity was held on Thursday evening, the 13th, at the Freemasons' Tavern, under the presidency of Mr. Angiolo R. Slous. Few recent anniversaries of this or similar institutions have passed off with more éclat, or have been more satisfactory in every respect. Mr. Slous made several admirable addresses, especially, of course, that in advocacy of the fund. To this, Mr. Buckstone responded in an amusing address, ending with the suggestive remark,—"When the stewards wait on you with their subscription-papers, write your names plainly, and let your figures be large." In reply to the toast, "The English Drama," Dr. Doran responded in an eloquent speech, a mixture of amusement and information, wit and pathos. Mr. Cullingford, the secretary, announced the subscriptions as 400l. The presidency of Mr. Slous will be remembered.

Princess's Theatre.—One of the most charming landscape scenes that has been exhibited for some time has been produced by Mr. F. Lloyds, for the new drama, "Presumptive Evidence," in which Madame Celeste is now playing at this house. The scene represents a cornfield in bright sun-light, a river, with bridge and other accessories, running near. It is as good as one of Vicat Cole's best works magnified.

Fluvial Realism.—A real river is to be introduced into the Munich Theatre in Wagner's "Rheingold." One of the scenes represents the Rhine (real water) flowing through a luxuriant country. Suddenly a nymph plunges into the water, and swims across the river to a rock. Mdlle. Mallinger, who is to perform this feat, is now taking lessons in swimming!

Another Theatre Burnt.—The Flora Theatre at Cologne has been totally destroyed by a fire which broke out just after the performance had been concluded. The catastrophe is supposed to be the work of an incendiary, and the more so that the Grand Theatre was burnt to the ground a few months back under similar circumstances.

The New Opera House at Vienna.—This build-

ing, although not yet completely fitted up, has just been inaugurated in presence of the imperial family, the ex-King of Hanover, Counts de Beust and Hohenlohe, the Duke de Gramont, and nearly all the foreign ambassadors. The house is lighted by an illuminated roof, as in some of the theatres of Paris.

CAMPANOLOGY: PEALS OF TWELVE BELLS IN ENGLAND.

The following list of twelve-bells peals is fuller than that published in "N. & Q." 3rd S. iv. 96. I give the date, the weight, and note of the tenor, also the founders. The earliest ring was at York Cathedral, dated 1631.

Date.	Churches.	Founders.	Weight. Cwt. lb.
1631.	York Cathedral Church.	Ancient.	63 0 0
	Melted down to a peal of ten, 1765, by Lester & Packe, of Whitechapel. Destroyed by fire 1899, after which a new ring was cast by Mears in		
1844.	St. John's, Cirencester.	Budhall.	C. 53 3 9
1715.	St. Bride's, Fleet-street.	Ditto.	D. 23 0 0
1724.	St. Nicholas's, Liverpool.	Dobson.	C. 41 0 0
1723.	St. Martin's-in-the-Fields.	Rudhall.	D. 23 0 0
1729.	St. Michael's, Cornhill.	Whitechapel.	C. 41 0 0
1731.	St. Mary's, Finsbury.	Rudhall.	D. 23 0 0
	(Two trebles added in 1821.)		
1735.	St. Saviour's, Southwark.	Knight.	B. 52 0 0
1739.	St. Leonard's, Shorehithe.	Whitechapel.	D. 30 0 0
	(Two trebles added in 1823. Tenor cracked by cloaking, February 27th, 1860.)		
1770.	St. Mary's, Cambridge.	Whitechapel.	D. 30 0 0
1771.	St. Martin's, Birmingham.	Ditto.	D. 35 1 24
1775.	St. Peter's Mancroft, Norwich.	Ditto.	C. 41 0 0
1787.	St. John's, Halifax (13 bells).	Ditto.	E. 25 0 0
1787.	St. Giles's, Cripplegate.	Ditto.	D. 30 0 0
1798.	St. Chad's, Shrewsbury.	Ditto.	C. 41 1 0
1828.	Quee Park, Isle of Thanet.	Ditto.	E. 15 0 0
1830.	St. Mary's, Oldham.	Ditto.	C. 30 0 0
1841.	St. Peter's, Leeds (13 bells).	Ditto.	C. 30 0 0
1847.	West Bromwich (13 bells).	Ditto.	E. 25 0 0
1867.	St. Mary le Tower, Ipswich.	Warners, Chesham	30 2 0
1868.	St. Peter's, St. Alban's, augmented by Warners.	E.	23 0 0
1890.	Worcester Cathedral Church.	Taylor.	D. 40 0 0
	(In the moulds.)		

The advantage of an extra bell, as at Halifax, Leeds, &c., is, that the key may be occasionally altered from a *major* to a *minor*, when less than the full number of twelve are rung. The grand ring of ten at Exeter Cathedral is most remarkable for this clever arrangement. It is to be observed that a ring of bells was the old phrase for a set of bells, and not a peal; this latter word being applied to the performance of ringing, whether one bell or more; and among change-ringers it means the performance of the full number of changes which may be rung on a given number of bells; a less number of changes is called a *touch*. H. T. ELLACOMBE, M.A.

HAND-PAINTED TILES FOR SURFACE DECORATION.

In the Paris Exhibition of 1867 there were exhibited by the French Imperial Manufactory at Sèvres two ceramic pictures, painted by the well-known artist Yvon, each composed of several pieces of earthenware, each piece having been painted and fired separately, and afterwards combined into one large slab; with a mosaic system of joints, similar to that ordinarily employed for stained glass, so arranged as not to interfere with the leading forms of the composition. These pictures, which have been purchased by our Government, and which are now in the South Kensington Museum, suggested to Messrs. Simpson & Sons the idea of applying a similar method of vitreous painting to the tiles manufactured by Messrs. Maw & Co., such as are in ordinary use, as a means of general decoration at once artistic, perfectly durable, and suitable alike for interior and exterior use.

They have now succeeded in perfecting the process, and have issued lithographs of the designs they have prepared. Some of their specimens are highly glazed, while in others the surface is perfectly free from gloss, and resembles fresco-painting. The range of colours available for this description of work is very extensive; and as it is applicable for designs in all styles, it should be largely employed.

Its cost, they say, would approximate to that of ordinary mural painting of a like character, with the expense of the tiles and burning in of the painting superadded. This is vague; the expense of mural painting is regulated by the terms of the artist employed; and so with these wall tiles, as the Messrs. Simpson say themselves out to execute the designs of architects and

others who may desire their co-operation. Using designs already in hand, 11. per foot is spoken of; and if ordinary encaustic or other cheaper tiles be used in conjunction with the hand-painted tiles, in the shape of borders and filling-in, the cost per foot of covering any given surface will, of course, be lessened.

The great point, however, is to obtain good art: it is not desirable to make a bad design permanent; and a pound a foot, unless it furnish something charming to look at, would be all too dear.

We quite agree with Messrs. Simpson in believing that ceramic painting will hold an important place in decoration hereafter; recurrent is setting that way; and we heartily wish them success in their praiseworthy endeavours to forward its introduction.

ON THE IMPORTANCE OF AQUEOUS VAPOUR IN WARMING AND VENTILATING DWELLING-HOUSES.

MR. CHARLES M. WETHERILL, PH. D., M.D., professor of Chemistry in the Lehigh University, of the United States, has written a paper on this subject, in the Journal of the Franklin Institute, in which he offers the following suggestions to practical men for an improvement in furnaces:—

1. Cease improvements of the stove, making it more complicated and expensive, and saving both coal and the trouble of charging it, until a good water supply capable of being regulated is obtained. This would not prevent the supply of moisture to any such complex furnaces if they be preferred.

2. Save the coal, as is done, by dampers in the fire flue and register, in the ash-pit and stove-door. Also, by attention to the quantity of air passing through the hot-air chamber governing it by dampers in the hot-air ducts near the stove, and in the cold-air ducts; paying also great attention to the air leaving the apartments, and regulating it as much as possible.

3. Seek some method of adding steam by the action of the fire, and in regulated quantities under control, to the hot-air chamber. Perhaps the water-trump for obtaining a blast by the fall of water or the stonizer may be made available. Perhaps some means for the evaporation or atomization of water in the apartment may render assistance in maintaining the proper relative humidity.

The admission of steam to the hot-air chamber does not rest upon theory only; it has been carried out in practice by Professor Henry at his dwelling in the Smithsonian Institution. An iron tube connected with the water vessel in the hot-air chamber, was inserted through the side of the furnace into the midst of the burning fuel; this device kept the water in the vessel in a state of rapid ebullition, raised the relative humidity of his apartments, and a quality of softness and salubrity were imparted not before perceived in the air.

The paper is accompanied with sketches representing a vertical and a horizontal section of a furnace improved for hydration. The supply tank, with half-cock, the author remarks, may be placed inside of the air chamber, providing for an overflow through the wall. The water hack should not be in the fuel, and devices should be present to prevent unpleasant results from derangement of the water apparatus. The water must boil at the rate of a gallon, or more, per hour, according to the ventilation, for a moderate dwelling.

Taking 100 as the saturating point, the atmosphere, he calculates, should be hydrated to a standard, ranging between 50 and 75, or to a mean of 67.5.

With respect to the rate of the renewal of the air, he says, "it has been found necessary in the halls of Congress to change it every eight minutes, i.e., seven times and a half each hour. This rate would not be required for an ordinary dwelling-house, nor could it be effected without powerful means; it would need the evaporation of nearly eight gallons of water per hour."

THE SUPPLEMENTARY EXHIBITION OF PICTURES OF 1869.

A COMMITTEE has been formed to arrange the proposed exhibition of a selection of the pictures returned by the Royal Academy, including the following names:—

Messrs. Samuel Solly, F.R.S.; George Chester; the Very Rev. D. Rock, D.D.; Dutton Cook, Mark Lemon, Captain J. W. Clayton, E. A. Foley, G. A. Sala, Frederick Chester, T. J. Golluck, T. Stuart Smith, G. J. Dumplin, Alfred Thompson, Walter Thornbury, Alexander W. Macdonnell, J. A. Sterry, J. W. Benson, John Hollingshead, A. Harvey Moore, Walter Severn, A. Baccani, R. Sayers, Charles Prater, Edwin A. Pettit, Charles Drury Fortnum, Frederick Smallfield, A. C. Stannus, Henry Weekes, &c.

The works of art, it seems, will be received at the Old Bond-street Gallery, from Wednesday, 19th, to Saturday, 29th instant, inclusive. It is proposed that the exhibition shall open early in June, and remain open until the 31st of August.

PARLIAMENTARY ART-PROBIA.

SIR,—May I be permitted to continue the subject so forthrightly commenced in your number for May last, by selecting a short extract from those voluminous reports of the Irish Church debates, in which a topic of much interest to architects might possibly remain buried out of sight from some of your readers? It appears that Mr. Gladstone had proposed to set aside funds for the maintenance of some important monumental churches, not to exceed twelve in number; but in consequence of the general taste and judgment of a British House of Commons, had consented to forego that purpose. On May 13th Mr. Vance proposed and Mr. Scourfield seconded a clause of similar tendency to the omitted clause, whereupon I quote the newspapers of last Friday, the Attorney-general for Ireland said that the proposal of the hon. member for Armagh could not be maintained for a moment. The negative had already been decided in one of the fullest Houses of the session. Mr. B. Hope supported the amendment, which was negatived without a division.

REGISTRATION OFFICE FOR WORKMEN.

SIR,—I was much pleased at seeing a letter from "A Builder" on the above, and am sorry that so little notice has been taken of it. More so as it is generally acknowledged that the mode of engaging workmen in the building trade is clumsy and unsatisfactory. I have heard very often lament because there was not an office similar to that proposed by "A Builder" in the building trade, and they agree as to the necessity of some better method for communication between masters and men. It was not known that work in the building trade is uncertain, and that but few are kept as regular hands. Every one month, slack the next, and for that reason a large number are always seeking employment. A registration office would be a great gain, and save both parties much valuable time.

The associated workmen and the frequenters of public-houses have an advantage in hearing of jobs over those who are not members of the list, and who do not attend the others. My employer being slack, I had to look for work; and I agree with "A Builder" that nothing is more disheartening than looking for work in London. I think it would be easy to form an office, and if supported by employers, I feel sure that a large number of men would try to make it a success.

JACK PLANN.

CO-RELATIVE STRENGTH OF BUILDING MATERIALS.

I SEND an extract from the *Zines* of the 7th inst., which may have escaped the notice of those who are unaccustomed to read the result of the experiments tried with guns at Woolwich, but which are always interesting, and in this instance instructive to builders and architects. The test was to try the powers of endurance of 30 in. wrought-iron gun, with a bursting charge of 210 lb. of powder, 1,114 rounds being fired; with the maximum penetration, as laid down by the Committee on Fortifications, as follows:—"Into earth, 40 ft.; into concrete, 12 ft.; brick-work and concrete on an equal level, 12 ft.; massive granite, 2 ft. (but with a fracturing and disintegrating effect to a much greater depth and over a considerable area); into iron plating, 11 in."

This is doubtless the severest test to which the relative strength of such materials can be subjected; and whilst giving a large pre-eminence in favour of iron, places brick-work and concrete on an equal level. The result certainly most favourable to those who advocate the use of the latter, both on the score of efficiency and economy.

J. S. W.

ROTHERHAM HOSPITAL AND INFIRMARY.

NINETY-TWO designs were sent in, and the votes were 17 to 3 in favour of the design bearing the motto "Æsculapius," by Messrs. Mallinson & Bakewell, architects, Leeds and Dewsbury, which was therefore selected. According to our correspondent,—

"The plan is so arranged that each department is separate and complete in itself, and yet at the same time in contiguity with the various offices and departments, each having a distinct entrance.

The hospital's entrance on the west side, with the porter's room, leads immediately to the waiting room, bathroom for cleansing, and examination of patients before admission to the wards, to the operating theatre and accident ward for patients that may have to be operated on, upon their immediate entrance.

The dispensary entrance is on the north side of the administrative department, with its lobby. The large hall for the patients to wait communicates immediately with the physicians' room, and with the surgeons' rooms, for the economy of time, the dispensary adjoining for prescriptions, medicine, &c., with hutchway or window into the hall, and one is also provided for the lobby."

SMOKY CHIMNEYS.

SIR,—Can any of your correspondents advise us what to do under the following circumstances:—About two years ago we built a village school-room 40 ft. by 20 ft. It has a high-pitched roof; the chimney is on the north side, and is carried up higher than the roof, but in spite of all we can do it will not draw when the wind is in the north or east. We have tried chimney pots and cowls of various kinds; we have also closed up the open fire, and replaced it by a Gill stove; still the wind rushes down, carrying the smoke and flame into the room; we have also tried various kinds of openings in the chimney, but without any advantage. There is no doubt the chimney is too large, being 14 in. or 15 in. square, and being on the north side, the fire has not power to warm it. We had some thoughts of trying to introduce an iron pipe to form an inner flue, as this could be more easily warmed if the fire could get to it; but of this there appears no chance, as the down draught is so strong, the fire cannot reverse it. We have already spent many pounds about it, and any practical advice would be most thankfully received.

ONE OF THE COMMITTEE.

COMPETITIONS.

THE design of Mr. Thomas Oliver, of New-onstlo-upon-Tyne, has been selected for the proposed New Congregational Church, Tosteth Park, Liverpool.

Baynor Sea Defences.—The Bognor Local Board, Sussex, recently advertised in this paper for designs for sea defences, offering a premium of 50*l.* for design selected. Forty-two designs were submitted to the Board, principally by engineers. The Board obtained the assistance of Mr. J. W. Grover, C.E., of Victoria-chambers, Westminster, to examine the designs, and report thereon. Mr. Grover reported that the best design, taken as a whole, was that bearing the motto "Canute defying the Waves," submitted by Mr. Green, of Lewes and Hertford (to whom the premium has been awarded). Mr. Grover also reported that the design "Experience," by Mr. F. A. Klein, of Cannon-street, London, was a good proposal, and deserved the consideration and commendation of the Board; as also the designs "Nil sine Labore," "Vis Consilii expers mole trivl sua," and "Zero," submitted respectively by Mr. T. I. Evans, of Gosport; Mr. Palmer Smythe, of Belsize Park, London; and Mr. W. G. Bennett, of South Villa, Hampstead.

House Architecture in Carlisle.—The premium of 20*l.* offered by the corporation of Carlisle for designs of elevations of houses proposed to be erected in Alfred-street and South Portland-square, in this city, has attracted sixteen sets of plans, which are now being exhibited to the public in the town-hall. Many of them have of a very unsuitable kind and have evidently been the work of "prontice hands"; but there are a few designs evincing both architectural skill and practical knowledge of building. A set, for example, bearing the motto, "Design with beauty, build with truth," seems to attract favour. Two or three others might be named. The committee have not yet arrived at a final decision.

KIDDERMINSTER INFIRMARY COMPETITION.

SIR,—As the author of another of the rejected designs, I was waiting for a few minutes leisure to send you my murmurs upon this despicable job. I am glad to see your number of last week that the subject has been taken up by a brother competitor. During a long practice, though happily very little experienced in competitions, except in noting in the pages of the *Builder* the many enormities to which they give rise, nothing more iniquitous than the management of this one has ever come under my observation.

In the interests of my fellow sufferers and myself, I will, with your kind permission, challenge the committee to answer the following straightforward questions:—

1. Did Mr. Bland, the author of the accepted design, deliver his drawings a day later than the date named in the conditions, viz., on the 10th of February instead of the 9th?

2. Had not Mr. Bland access to the room in which the designs were exhibited during the time certain members of the committee were inspecting and discussing such designs?

3. Did not the estimate for carrying out Mr. Bland's design amount to more than 5,000*l.* instead of 3,000*l.* (the limit fixed by the conditions)?

4. Is not the personal friend and architect of the honorary secretary to the committee?

REJECTED.

ACTION FOR COLOURS SUPPLIED.

ON Tuesday judgment was given at the Bloomsbury County Court, by Mr. G. Lake Russell, judge, in the case of J. Detenre v. Graham. Plaintiff, who resides at 29, Paradise-terrace, Islington, called, with his daughter, in July last, upon Messrs. Jackson & Graham, and submitted several samples of various colours to the firm; they were referred to Mr. Pugh, the surveyor to the firm, and he selected about thirty colours, and directed the plaintiff to send samples of each colour for the purpose of being tested as to quality, at the same time informing the plaintiff that the colours must be of the best possible quality, as none other were used by the firm. Plaintiff denied that anything was said about quality, and he said the goods were ordered for use and not as samples to be tested. He sent in thirty small boxes of colours, and received a bill payable at three months, signed by Mr. Pugh for the goods, but when it became due, Messrs. Jackson & Graham repudiated it.

Mr. Goddard, barrister, who appeared for the defence, contended that the action was a deliberate attempt to defraud Messrs. Jackson & Graham, and he called Mr. Edgar Graham and Mr. Pugh, who positively swore that they were not to be sent in as samples on approval; that they were tested, and were found to be worthless for the use of the firm, and they were returned. Plaintiff was informed that all colours must be of the best quality, and as regards the bill for payment at three months, Mr. Pugh signed it, believing it to be the usual delivery paper accompanying the articles. He had no authority to give promissory notes, and, in fact, the firm never paid in that way.

Mr. Clark, foreman of painters to Messrs. Jackson & Graham, stated that he examined the colours in question, and they were perfectly worthless to the firm.

Mr. Jervis, who acted as witness for the plaintiff, to show that the colours were supplied at a low price, and that it could not be supposed that colours of the best quality were to be supplied, but the witnesses stated that the colours were bad at any price, and

Another Bridge across the Mersey.—Messrs. William Low and George Thomas, civil engineers, have submitted to the Mersey Dock and Harbour Board a letter and plans, illustrating their scheme of crossing the Mersey by means of a railway suspension-bridge between Liverpool and Birkenhead. It will consist of three spans, the centre one 1,800 ft. in length, and the others 960 ft. each, and will be 140 ft. above high-water mark. The bridge would unite the various railway lines in Lancashire and Cheshire. It will be under two miles long, and the total cost is estimated at 1,750,000. This would be the sort of thing to try our engineering mettle before we venture to bridge the Irish and the British Channels.

British Archaeological Society of Rome. This society has wound up its proceedings for the season. The weekly lectures and excursions were continued as long as there were any English or American people remaining in Rome to attend them. Mr. Parker concluded with an account of the most recent excavations up to the present time, and announced that they would not be continued during the summer from want of funds. The latest discovery is the Remains of the Thermæ of Severus and Commodus, on the opposite side of the Via Appia to those of Antoninus (Caracalla). The "Lectures on the Ancient Streets of Rome and the Roads in the immediate neighbourhood" has been printed for the use of members, with an engraving to show the nature of the foss-ways or hollow-ways.

Ancient Remains in Jersey.—In a field near St. Helier's a tomb constructed of sixteen or eighteen huge stones roofed by three others, and closed at each end, the floor consisting of detritus and sand, has been discovered. There were eleven urns inside, some of them broken and imperfect, but others intact. They approach each other in size, and, standing from 6 in. to 8 in. high, are 9 in. or 10 in. in extreme width. Outside they are symmetrically shaped, and inside they are filled with earth.

City of London Museum.—The Chairman of the City Library Committee writes:—The Museum of the City of London is attached to the library at Guildhall, and consists of a very interesting collection of Roman antiquities, including several rare specimens of *fibellæ, stili, crepidæ, fibula, strigilæ, lamps, knives, and many articles of personal adornment in bronze and bone; the glass includes lacrymatories and parts of vessels of various descriptions, shapes, and colours. The Samian ware is particularly fine, consisting of howls, vases, &c., highly ornamented with emblems of war and the chase. It also possesses many varieties of tessellated pavements, and other building materials of the same date. Among the more important monuments may be mentioned the group described by Roach Smith, of the *Dea Matres*, found in Orntched Friars; and, of still higher value, a Roman hexagonal column, found at Ludgate, erected by Aneudetus Provincialis and his wife Martina; also a very beautifully sculptured-fluted marble sarcophagus, of the fourth century, recently dug up at Clapton. The Medieval department is far from despicable, and includes the finest collection known of the leaden *signacula* or pilgrims' signs.*

Over-papered Walls.—Our readers will recollect mention of a disgusting smell which drove so many officers from their quarters in Knightsbridge Barracks, and threatened the whole establishment with fever. Great pains had been taken by the engineers to remedy the evil. Drains were examined, and floors were taken up, but nothing was found. Since then ventilators have been inserted in every room, and the space beneath the floors has also been ventilated. The *Lancet* now mentions that the cause has been discovered. It was found that there were in one case, at least, fourteen layers of paper, some of them of a most expensive kind. Between these layers of paper stinking paste, fungi, and even maggots had accumulated; whilst the wall being hollow, the stench spread through the passages behind, and seriously increased the evil. "It is somewhat curious, that although the true cause was suggested by an officer of engineers some months ago, no real attempt seems to have been made to verify his suggestion until the arrival of the present regiment." Warnings against the injurious effects resulting from the practice of leaving successive coats of paper on the walls, will be found in the *Builder*, and on more than one page.

Monumental.—The statue of Mr. Mayer, of Liverpool, which the Corporation intend to place in St. George's Hall, as a memorial of Mr. Mayer's munificent donation, to the local museum, of antiquities, which cost over 50,000*l.* and half his lifetime in the collection, is now completed at Chelsea, by Signor Fontana, the sculptor named by Mr. Mayer, at the Corporation's request, to execute the statue. The figure is a portrait of Mr. Mayer as he appears in ordinary daily life. The proportions are of heroic dimensions, and the material is Carrara marble, of remarkable purity. It is said to be a good likeness. The pedestal of the statue of the Marquis of Westminster at Chester is now complete, and has just received the statue, which has been forwarded from Mr. Thornycroft's studio. The plinth, or base, consists of four blocks, and is, like the rest of the pedestal and capping, of a polished grey granite. The local *Chronicle* says of the inscription, which is in gilt letters, "The only objection to which this is open is the abbreviation of 'second Marquis.' We cannot understand why '2nd' should not have been used, which would have been far preferable to 2d, as the latter is liable to a funny ambiguity which will at once suggest itself."—An immense crowd assembled at Sydney, on the 28th March, to witness the laying of the foundation-stone of the statue in memory of Captain Cook, by his Royal Highness the Duke of Edinburgh.

Westmoreland Granite.—A new branch of industry has recently been established on Shop Fells. Some time ago Mr. Curtis, a gentleman connected with the Dalbattie Quarry Works and now residing at Penrith, directed his attention to a huge granite formation on a fell known as Wastdale Crag, about four miles from Shop railway-station and about two miles from Shop Wells. He obtained a lease of the property from the Earl of Lonsdale, and in the middle of July last began operations, and, in spite of many difficulties, by the aid of costly machinery has now made considerable progress. Wastdale Crag is the only granite ridge between Scotland and London, with the exception of minor deposits in Leicestershire, so that the cost of transmission from all parts of England and Wales will, it is expected, enable the lessees to compete successfully with the Scottish quarries in this respect. From its extent, too, the supply will be comparatively inexhaustible. The yield is 90 per cent. upon the workings, whereas in more than 50 per cent. The blocks are of immense size. One block was computed at 2,700 tons of pure granite, and blocks of from 20 to 100 tons in the solid are frequently blasted. The granite has three shades; one a light grey, another a dark red, and an intermediate colour, variegated and ornamental. It is harder than the Dalbattie granite. Lately 1,000 ft. of curh were finished and sent to London, the lessees having contracted with one of the metropolitan districts, and they have contracts for work in connexion with the New Town-hall at Manchester, and the Midland Railway hotel, in the New-road, London.

The Brighton Drainage.—The residents in Brighton are naturally anxious as to the result of draining it into the sea in front of the town, and unfavourable to the scheme. They have, therefore, had a public meeting, and have resolved:—

"That in the state of public opinion in reference to the system of drainage in Brighton, and in view of the injury caused by the existing prejudice against it, the town council be requested to confer with the neighbouring authorities and to receive a deputation from this meeting, with a view to instituting further inquiry into the practicability and expediency of removing the drainage away from the town."

That the Londoners and others who visit Brighton as a watering-place will acquire a prejudice against it on account of the fact that its drainage is disembogued in front of the town, and whether there be sufficient reason or not, as regards the relative purity of the water, seems to be but too probable. The case, as the chairman of the meeting, Dr. Carter, put it, resembles that of an aristocratic dining in a hotel at a table on which was a cloth which had been in use before. The cloth might be as wholesome as ever; but still the aristocratic visitor would not come again. It was something the same with the water in front of Brighton. Visitors would not believe it was fit to bathe in so long as the sewage was drained into it. Moreover, we would earnestly urge the adoption at once of more complete measures to secure an effective and unobjectionable system of drainage for the town.

Mr. Peter Cunningham.—We mention with extreme regret the death of Mr. Peter Cunningham, the author of the "Handbook of London," and other works, which took place on the 18th instant at St. Alban's. He had just completed his 53rd year, having been born on the 16th of April, 1816.

Newcastle-on-Tyne: New Slaughter-houses.—New slaughter-houses have been commenced in this town, on the principle of the abattoirs of France. Mr. Thomas Oliver is the architect. The contracts for erecting a large drill-shed have been let to Mr. Kennedy, of Jarrow. The building will be 130 ft. by 50 ft., and rooms for dressing, smoking, &c. are attached.

TENDERS.

For Congregational Chapel and School, Godalming. Mr. W. F. Poulton, architect:—

Loe	£3,318 0 0
Alford & Donlon	3,200 0 0
Ballet	3,600 0 0
Moon	2,595 0 0
Carter & Sons (accepted)	2,450 0 0

For alterations to Trinity Chapel, Reading. Mr. W. F. Poulton, architect:—

Wheeler Brothers	£390 0 0
Sheppard	355 0 0
Mathews	334 0 0
Barnicoat (accepted)	315 0 0

For alterations, &c., at No. 126, Newington-causeway, for Mr. J. F. Smith:—

Cunning & Mullins	£322 10 0
Falkner	321 0 0
Goodes & Clarke (accepted)	3 7 16 8

For new Wesleyan Chapel and School, Church Coppenhall, Cheshire. Mr. George B. Ford, architect:—

Cotterill	£512 0 0
Hodgkinson	81 0 0
Elson	738 10 0
Williamson (accepted)	670 4 4

For alterations to premises, South Andley-street, for Messrs. Wilson Brothers. Mr. J. W. Morris, architect:—

Shedfield	£532 0 0
Wicks & Bangs	352 0 0
Stevens	343 0 0
Abrahams (accepted)	338 0 0

For a house and farm buildings at the homestead known as Lower Cromer Hyde Farm, Lenford Mills, Herts, for Viscountess Palmerston. Mr. W. Wilds, architect. Quantities supplied:—

Castle	£1,607 0 0
Brit & Son	1,650 0 0
Raves & Blow	1,668 0 0
Lawrence	1,414 0 0
Wells	1,445 0 0
Elkins	1,298 0 0

For the restoration of Kimoote Church, Leicestershire. Mr. William Smith, architect:—

Law (accepted)	£1,065 0 0
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For the re-building Boyton Church, Suffolk. Mr. William Smith, architect:—

Toley	£1,510 0 0
Last	1,483 10 0
Cullingford	1,483 10 0
Hewitt	1,432 0 0
Carter	1,232 0 0
Cannold	996 0 0

For the erection of a residence, St. Godwald's, Finsall, near Bromsgrove, for the Rev. J. H. Bainbridge. Messrs. Payne & Talbot, architects:—

Wilson & Son	£1,780 0 0
Surman	1,667 0 0
Partridge	1,600 0 0
Jeffery & Pritchard	1,550 0 0
Matthews (accepted)	1,605 19 0

For additions to a private residence, Blackheath. Mr. J. H. Rowley, architect:—

Brass	£558 0 0
Homann	480 0 0
Snowden	378 0 0
Sharrington & Cole	379 0 0
Shepherd	365 0 0
Crabb & Vaughan	364 0 0
Beeton (accepted)	325 0 0

For the erection of two pairs of semi-detached residences at Red Hill, for Mr. Joseph Perron. Messrs. Holden & Triha, architects. Quantities supplied:—

Holdsaworth	£2,636 14 0
Marstrand & Sons	2,460 0 0
Futland & Holt	2,457 12 8
Gage	2,410 10 0
Regis, sen.	2,310 0 0
Room	2,283 0 0
Cook	2,255 18 0
Hooper	2,160 0 0
Grumant (accepted)	1,720 0 0

For taking down and rebuilding the parish church of Bishampton, Worcestershire. Mr. Frederick Freedy, architect:—

Wood & Sons	£1,877 0 0
Bennett	1,784 0 0
Warner	1,688 5 0
Inwood	1,684 0 0
Hearn	1,601 0 0
Collins & Collins	1,541 0 0
Griffiths (accepted)	1,509 10 0

TO COUNTRY ARCHITECTS. THE Advertiser is desirous of treating with an Architect in good practice for the PURCHASE of a SHARE in his business. Address, SOLICITOR, 4, Thornhill-road, London.

TO ARCHITECTS AND SURVEYORS. PLANS, VIEWS, & BILLS OF QUANTITIES, Conditions, Specifications, &c. LITHOGRAPHED on the shortest notice, and every description of list once required by Architects and Surveyors kept in Stock. SPOTTISWOODE & CO., 25, Parliament-street, Westminster. Telephone No. 60, 25, Abchurch-lane, London.

TO ARCHITECTS AND SURVEYORS. PERSPECTIVES, SKETCHES, ELEVATIONS, &c. artistically COLOURED and put in OUTLINE by Mr. GOWAR, of eight years' experience in the profession. Terms moderate, either by the week or per contract. First-class perspective and testimonials. Address, 2, Rotherhithe-road, Rotherhithe, W.

T. A. RICHARDSON, Architectural Artist. PERSPECTIVES OUTLINED, ETCHED, or artistically COLOURED. Every description of Architectural and topographical views. Highest references. Sixteen years' experience.—8, Seymour's-lane, Chancery-lane, London.

EDUCATION.—The Son of a first-class Builder can be placed immediately in a good school, on moderate and reciprocal terms. Address, OMBROD, Mr. Chamber's, High-street, St. John's Wood.

FOREMAN WANTED.—A thoroughly competent Man, to act as BUILDERS FOREMAN. He must understand building in all its branches, be able to set out work, measure, and take out quantities. State age, and salary, required. Apply, 2, Post-office, Redcross.

TO BUILDERS, DECORATORS, &c. GILDERS, thoroughly experienced in House Work, Decorative Furnishings, and Gilding in all its branches, may be OBTAINED at the House of Carl, Marlborough Inn, Blenheim-street, Oxford-street.—Address to the Secretary.

GLASS STAINERS. WANTED, an intelligent and experienced GLASS STAINER to superintend work and workmen, apply to BALANTYNE & SON, Edinburgh.

IRONFOUNDING, &c.—WANTED, a respectable YOUTH, of good attainments, active, and with an aptitude, as APPRENTICE in the London House of a Glass firm. He will have every opportunity of learning drawing and the general routine of a way-laying. Address, with full particulars, JUNIOR, Office of "The Builder."

TO SURVEYORS' DRAUGHTSMEN. TWO good MAPPERS' DRAUGHTSMEN and WRITERS are WANTED. The situations may be permanent ones.—Applications to BALANTYNE & SON, Newcastle, Nottingham.

TO BUILDERS' FOREMEN, ESTATE AGENTS, and all connected with the letting of houses in London and outside, a first-class commission is offered for securing the custom of occupying tenants for an article of early completion in Park-street. Address, A. B. care of Norton & Son, 1, Park-street, Liverpool-road.

WANTED, a YOUTH, in a Surveyor's Office. Small premium required.—Address, 232, Office of "The Builder."

WANTED, an experienced and clever CLERK OF WORKS, to superintend the erection of a number of first-class houses. Only persons of undoubted efficiency and unexceptionable character need apply. A good draughtman preferred.—Address, 132, Office of "The Builder."

WANTED, a good PAINTER; one who thoroughly understands his business. No other need apply. Address, Mr. G. R. PICKERD, 29, Union-street, Hackney-road.

WATER WORKS, PESTH.—WANTED, an ASSISTANT or RESIDENT ENGINEER, to superintend and construct and repair Machinery. Must have received scientific and practical knowledge of these branches of construction and be conversant with letter writing in French and Mr. W. LINDLEY, Engineer in Chief at Pesth. A knowledge of the German language would be an advantage. A good salary will be required; it is assumed at from 400 to 600 a year, dependent upon qualifications and experience.

WANTED, TO LET (Labour only), to Masonry, and Paving Workmen, the BRICKWORK, with a radius of seventy-five miles from St. Paul's.—Address, with reference, to No. 181, Office of "The Builder."

TO BUILDERS, &c. WANTED, by a respectable Young Man, EMPLOYMENT as CARPENTER and JOINER. Used to the bench. Was not so much an object as a permanent.—Address, W. W. Juller, Post-office, Reading.

WANTED, by a thoroughly practical Man, a SITUATION as WORKING FOREMAN of PAINTERS, well up in all kinds of house and church decorations. Wages moderate.—Address, E. W. Row-croftage, Church-road, Acton.

TO PLUMBERS AND BUILDERS. WANTED, by a Young Man, a SITUATION as TRENCHMAN HAND, a good plumber. State wage.—Address, 102, Office of "The Builder."

TO PLUMBERS AND BUILDERS. WANTED, by a first-class PLUMBER, well up in Gas fitting and Hot-water Work, a permanent SITUATION. Town or country. Wages, 7s. per hour. Good references.—Address, V. A. Beaumont, House, Mountmouth-street, Bath.

TO MASTER PAINTERS AND BUILDERS. WANTED, by a practical Man, a SITUATION as WORKING FOREMAN of PAINTERS, can do Gilding, Marbling, Gilding, &c.—Address, J. T. No. 2, Back's place, John-street, King's-road, Chelsea, S.W.

TO BUILDERS, PLUMBERS, and OTHERS. WANTED, by a respectable Young Man, a SITUATION, as PLUMBER. Good references, if required. Address, J. F. A. 4, South-street, Penzance.

TO ARCHITECTS. WANTED, by an experienced Clerk of Works, a RE-ENGAGEMENT, is well up in all the branches, and a good draughtman. First-class testimonials from town and country.—Address, S. W. B. George-street, Salway-lane, E.

TO SAW-MILL PROPRIETORS and TIMBER-MERCHANTS. WANTED, by a Middle-aged Man, a RE-ENGAGEMENT as SUPERINTENDENT of a Saw-mill, or Yard Furnace, &c. in East York. Twenty years' references.—Address, A. L. 3, Bywater-street, Bang's-road, Chelsea, S.W.

TO ARCHITECTS. WANTED, an ENGAGEMENT as JUNIOR ASSISTANT. Accustomed to the general duties of an Office. Address, Mr. M. B. 15, Lynton-road, Epsom-road, Peckham.

TO ARCHITECTS, BUILDERS, &c. WANTED, a RE-ENGAGEMENT as CLERK OF WORKS, General Manager, or Shop Foreman of Joiners. Thoroughly experienced in first-class works, church Gothic, and restoration, by eminent London architects. Good testimonials.—Address, H. S. 15, Upper Tube-hill, Epsom, Surrey.

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WANTED, an ENGAGEMENT, by a MEASURER, a QUANTITY CLERK. Twelve years' experience. A practical Joiner, &c.—Address, BUILDER, 8, Upper-street, Finsbury, E.W.

TO ARCHITECTS. WANTED, A Gentleman, of many years' experience, in duties of a RE-ENGAGEMENT as ASSISTANT. Perspective, working drawings, details, &c. Town or country.—Address, ARCHITECT, No. 33, Gloucester-street, Queen-square, W.C.

WANTED, by a good GRAINER and MARBLER, a SITUATION of JOINT or JOINTER. Good testimonials, and a spacious case. Clean estimates for all kinds of brick, Brompton.

TO BUILDERS AND PLUMBERS. WANTED, by a good PLUMBER, a SITUATION or Job. No objection to fill up time of waiting or clearing. Good references.—Address, A. B. 60, Charing-cross-street, St. James's, W.

TO BUILDERS. WANTED, by the Advertiser, a RE-ENGAGEMENT as FOREMAN of BRICKLAYERS, or Bricklayer of the River, in Town or country. Good references.—Address, G. O. 10, Park-street, Horse-church-lane.

WANTED, by a thoroughly practical and experienced MAN, an ENGAGEMENT as GENERAL FOREMAN. Accustomed to all branches. Carpenter by trade. Good references. Age 30.—Address, W. A. 7, Colinton-street, Avenue-road, Camberwell.

WANTED, a RE-ENGAGEMENT as BUILDER and CONTRACTOR'S MANAGER for a CLERK OF WORKS, by a thoroughly practical Man of five years' experience as an Estimator, Quantity Surveyor, and Draughtsman. Has carried out extensive contracts, both public and private, in town and country. Excellent references and testimonials. Accustomed to the entire management. Age 39.—Address, QUANTITY, 10, Chrysostom-road, North Brixton, London, S.E.

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TO BUILDERS AND PLUMBERS. WANTED, a SITUATION, by a PLUMBER, GASFITTER, and ZINCWORKER. Good testimonials.—Address, D. F. No. 13, Gloucester-street, Queen-square, Bloomsbury, W.C.

WANTED, a JOB, by a PLUMBER, of great experience. Fire-work or otherwise. Can do plan zinc-work and gasfitting.—Address, G. B. D. Plumber, 137, High Holborn.

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TO ARCHITECTS AND SURVEYORS. WANTED, an ENGAGEMENT (either Temporary or Permanent), by an efficient DRAUGHTSMAN. Can prepare either fair or working drawings, take out quantities, or measure up work. Also thoroughly acquainted with land surveying and levelling. Unexceptionable references.—Address, H. J. Meares, No. 4, Finsbury, 77, Westons-road, Brighton.

TO PLUMBERS AND BUILDERS. WANTED, by a thorough practical PLUMBER, a CONSTANCY at JOB, wages 6s. per hour, for a permanent. Will fill up his time in painting, &c. Good references.—Address, PLUMBER, 13, Newington Green-road, N.

TO BUILDERS AND CONTRACTORS. WANTED, by a Young Man, aged 29, a SITUATION as GENERAL CLERK. Can prepare plain drawings, measure, and estimate, and is a good book-keeper. Is accustomed to jobbing work, and would undertake the management of a small business.—Address, J. B. 7, Coling-street, E. Brompton, Chelsea, S.W.

TO ARCHITECTS. WANTED, a RE-ENGAGEMENT, temporary or otherwise. Is a good geometrical and perspective draughtsman, who will up in coloring and preparing designs for competition. Good references.—Address, A. D. 64, Southampton-row, W.C.

TO FURNISHING IRONMONGERS, SMITHS, and BUILDERS. WANTED, a SITUATION, by a first-class Mechanic, in the Smith, Blacksmithing, Galvanizing, Cloathing, Balis, Six-in, and all kinds of Hot-work. First-class references.—Address, W. X. Mr. Chapman, 3, Queen's-lane, Trafalgar-road, Greenwich.

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TO BUILDERS, ROAD-MAKERS, and CONTRACTORS. WANTED, by a first-class practical Man, a Carriage-maker, Street Mason, Granite Dresser (Wood Bricks, Larch or Oak), or Job, to TAKE WORK by the BUILDER. Labour only. Good testimonials and references.—Address, JAMES CURRIE, 7, Vance-place, North-street, Finsbury.

WANTED, a SITUATION as BUILDER'S MANAGER or SUPERINTENDENT. General knowledge of every branch of the business, measuring, estimating, taking orders, purchasing materials. No objection to conduct a contract abroad. First-class references.—Address, G. C. 8, Care of H. Unsworth, Esq. 1, Raymond-buildings, Gray's-inn.

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TO BUILDERS. WANTED, a SITUATION, by a Young Man, as CLERK or ASSISTANT. Has had bench experience, change of work, likewise a good draughtsman, with a fair knowledge of measuring and quantities.—Address, G. 10, Athelstan-terrace, Broad-green, Holloway.

TO BUILDERS, &c. WANTED, by a practical, steady Man, a RE-ENGAGEMENT as SHOP or OUT-DOOR FOREMAN. Has been employed by a general Builder, Alterations, and Charge of a Job; by trade a carpenter and Joiner. Has a good knowledge of all the branches of the trade. Good references. Age 38.—Address, A. B. 8, Brixton-road, Albert-road, Peckham.

TO SURVEYORS AND BUILDERS. WANTED, a RE-ENGAGEMENT, by a Young Man, well acquainted with all the branches of the trade, taking out quantities, measuring up and estimating works, &c. Twelve years' experience as a Surveyor and builder in town.—Address, A. B. 6, Foley-street, W.

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TO BUILDERS. WANTED, a SITUATION as JUNIOR CLERK, by a Young Man, aged 22. Has been nearly seven years with a good and experienced general Foreman, and can assist at quantities. Country preferred. Good references. Salary moderate.—Address, 170, Office of "The Builder."

TO ARCHITECTS, &c. WANTED, by a thoroughly efficient CLERK OF WORKS, a RE-ENGAGEMENT, in town or country. First-class testimonials.—Address, S. P. 5, Post-office, Uxbridge-road, Shepherd's Bush, W.

TO BUILDERS, PLUMBERS, and GASFITTERS. WANTED, EMPLOYMENT, as GAS and HOT-WATER FITTER, Brass Finisher, Bellhanger, and Jobbing Plumber. Modern ways. Contract or job.—Address, H. 4, George-street, Langham street, W.

TO BUILDERS. WANTED, by a practical BUILDER'S OUT-DOOR FOREMAN, a RE-ENGAGEMENT as SHOP, GENERAL, or FOREMAN. Has been employed by a general Builder, Alterations, and Charge of a Job; by trade a carpenter and Joiner. Has a good knowledge of all the branches of the trade. Good references. Age 38.—Address, A. B. 8, Brixton-road, Albert-road, Peckham.

TO ARCHITECTS, &c. WANTED, by a thoroughly efficient CLERK OF WORKS, a RE-ENGAGEMENT, in town or country. First-class testimonials.—Address, S. P. 5, Post-office, Uxbridge-road, Shepherd's Bush, W.

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TO ARCHITECTS, &c. WANTED, by a thoroughly efficient CLERK OF WORKS, a RE-ENGAGEMENT, in town or country. First-class testimonials.—Address, S. P. 5, Post-office, Uxbridge-road, Shepherd's Bush, W.

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The Builder.

VOL. XXVII.—No. 1373.

The Northern English Cathedrals.

N two triplets Mr. Murray has arranged the northern cathedrals to form two volumes corresponding in size and appearance with the rest of his cathedral handbooks. York, Ripon, and Carlisle make the first triplet; Durham, Chester, and Manchester the second.*

There are two modes of proceeding open to the handbook historian or archaeologist, as well as to the writer of history on a larger scale. He may either take up his subject from the most remote period of its existence, and trace its course downwards to our own time; or he may start with it from the present day, and wind it upwards to its earliest antiquity.

Both courses have been pursued by historians and genealogists, and have had their partisans. Mr. King, the compiler of

the Handbook before us, has chosen the former method in his treatment of the six cathedrals under notice. The dissimilitude in the aspect of the several buildings he has described, however, would impart startling differences to the impressions they produced on those who looked upon them, even if the facts in their histories were identical, instead of the mere manner of relating them being methodically the same. Looking at the first triplet, it is impossible not to be struck with the marked distinctions in the character of the three buildings. A glance at the illustrations we are enabled to reproduce will explain this.* First, there is York, laden as richly with ornamentation as an Oriental poem with metaphor; languid almost with wealth, luring with sumptuousness. Then there is Ripon, bold, bald, severe; conceived, those who looked upon it for the first time might exclaim, in the brain of an ascetic. Portions in each building, doubtless, could be picked out to neutralise this generalisation; such as the north and south transepts at York, which are as early as the west front at Ripon, or the two easternmost bays of Ripon choir, which are as choicely enfilong as some parts of Carlisle; but these are their leading characteristics. Thus, it comes to us, there is more Perpendicular work at York than in the other structures; most Transitional and Early English at Ripon; and that we are most struck with the Decorated work at Carlisle. Nevertheless, York is as ancient as Ripon, both retaining fragments of Saxon work; both are of older foundation than Carlisle, where, however, there is plenty of Norman work. Again, there is as great a distinction in the general aspect of the other three northern cathedrals, Durham, Chester, and Manchester. Durham, a bleached grey in tone, with black and green streaks and weather-stains upon it in damp, shady corner-places, is massy, sturdy, yet precious with stern enrichment; an exaltation of Norman art-power. Chester is more lightsome; reddish, neither hard, nor finical, nor coarse; but inviting, reassuring, refreshing; albeit, it is scarcely to

be seen otherwise than in snatches, from the crowding of houses around it; and Manchester is but a ripe, pliant Perpendicular church that is only a cathedral by architectural courtesy. Hence, there can be but little chance of a charge of sameness being brought against the narrator of the chief facts in the histories of these buildings, let the order in which he marshals them be ever so alike; and the facilities for contrast and reference which an identical arrangement confers are not to be overlooked.

Without finding any fault, therefore, with the manner of the Handbook, we will proceed to notice a few points respecting portions of the various fabrics that are open to question. We will begin with Ripon crypt. It would have been well if the position of this with reference to the rest of the building had been shown upon the plan. There is a plan of the crypt, and the entrance to it is marked on the plan of the cathedral; but its position beneath the upper structure is left to guess-work. If this had been shown, the point we are about to discuss would probably have struck others besides ourselves. Now, this hidden, hoary, priceless relic of Christian architecture in Saxon times, corresponds in age and general characteristics with that at Hexham; and the two taken together should yield us a clear and certain evidence of the ordering of the rite or ceremonies performed in them. At Hexham, it is plain that in rebuilding the Abbey Church the new fabric was planned with special regard to the position of the ancient crypt in relation to it. A more scrutinising reference to the plan of Hexham, mentioned by the writer, as consulted by him, published in Mr. Walbran's account of the fabric, in Raine's *Priory of Hexham*, edited for the Surtees Society, which plan was the result of a special survey made by Mr. F. R. Wilson, would have shown that the crypt stands due east and west in the centre of the commencement of the extreme eastern end of the nave; and that there are three sets of steps and passages to it; one on the south side, for the private use of the priest, to descend from the transept directly into the martyrium below; a second

* See p. 46.



CHESTER CATHEDRAL: CHOIR.

* Handbook to the Cathedrals of England. Northern Division. Part I. York, Ripon, Carlisle. Part II. Durham, Chester, Manchester. With illustrations. London: John Murray, Albemarle-street. 1869.

exactly in the centre of the nave, for the descent of the faithful, who, when at the base of the steps found themselves immediately in front of the door of entrance, whence they could view the relics without being permitted to enter the chapel; and a third, on the north side, for their ascent, without confusion, into the north transept. When dealing with Ripon, this arrangement is lost sight of; only two sets of steps are shown; and although the site of the third staircase is, doubtless, discoverable, no search has been made for it. The writers, however, quoted by Mr. King, have also failed to see the connexion between this relic and the old order in which it was visited, and its relation to the rest of the building. In any future edition we recommend the insertion, if only by dotted lines, of the plan of the crypt upon that of the cathedral, to show its exact position. It would add much to the interest of these crypts if we could learn particulars of the relics that were placed in them by Wilfred, or preserved in them afterwards, the sanctity of which, doubtless, led to the conservation of these rude places, mere oells,—that at Hexham being only 13 ft. 4 in. by 8 ft., and that at Ripon, 11 ft. 3 in. by 7 ft. 9 in.—in the face of the sumptuous rebuilding of the fabrics above them. Mr. Walbran, referring to the statement, in Prior Richard's "History of Hexham," that Wilfred constructed crypts, underground oratories, and winding passages below his edifice at that place, thinks it likely that at a future day the crypt which has been already discovered will be found to communicate with another. We do not follow him in this expectation; for we consider Hexham crypt complete in itself, and that its position in relation to the edifice above, with that of the flights of steps with which it is provided, explains to us with curious exactness the ordering of the manner in which it was served by the priest and frequented by the people. The crypt at Ripon was, most likely, served and visited in the same manner; but of this there would be no doubt if we found that there was a third flight of steps leading down to it from the centre of the eastern end of the nave to face the west end, as at Hexham.

Then we cannot agree with the writer and his authorities, who affirm that the Galilee at Durham was intended for a lady-chapel. This could never have been the case. We quote our author:—

"Bishop Hugh de Poitot (1153-1165) commenced (how soon after his elevation to the see we are not told) a 'new work,' probably intended for a lady-chapel, at the east end of the cathedral. Marble columns and bases were brought from beyond sea; but the walls had scarcely begun to rise when ruinous fissures appeared in them, a manifest sign that the work was not acceptable to God, or to His servant Gathbert." The cause was no doubt the same defective foundation which, in the course of the next century, produced the subsidence of the walls of the choir aisle, and the 'impending ruin' of its vault. Abandoning his first intention, therefore, Bishop Hugh (no doubt using the materials collected for his eastern chapel) began another 'work' at the west end, 'into which women might lawfully enter,' so that, although they could not be allowed personally to approach the more holy places, they might derive some comfort from the distant contemplation of them. This work was the existing Galilee, so called from a reference to 'Galilee of the Gentiles,' as somewhat less sacred than the rest of the cathedral. But it was specially intended that it should serve as a lady-chapel."

It is impossible that a portion of the edifice, "less sacred than the rest," could have been intended for a lady-chapel, then deemed the very centre or core of sanctity. There are foreign examples of parent monasteries in the same position that tell us precisely its use; and the intercourse with Continental ecclesiastical establishments was too intimate and constant for us to refuse to accept their solution of the question. Abbatial churches of the order of Cluny possessed ante-churches, or closed porches, exactly like this Galilee. At Cluny, Tournus, and Vézelay are corresponding examples. And in the ancient pontifical of Chalonsur-Saône their purpose is thus described:—*In quibusdam ecclesiis sacerdos in aliquo altari foribus proximiori celebrat missam, jussu episcopi, pontificalibus ante fores ecclesie constitutis.* In the earliest Christian ages we know converts were baptised in or near the porch, as not worthy to enter the sacred edifice till that rite was performed. But as the new faith prevailed over the face of the land, and only infants required baptism, these less sacred places then received penitents and pilgrims. In the abbey churches of the order of Cluny they were dedicated to the Archangel St. Michael. That at Tournus, divided, as at Durham, into a nave with two aisles, and opening into the main building in precisely the same manner, is of eleventh-century work; that at Vézelay,

on a still grander scale, with galleries, dates from the middle of the twelfth century; that at the mother church, Cluny, was built by the twentieth abbot, Roland I., in 1220. This last has a triforium. The Cistercians also provided *ant-eglises* to some of their churches, but the peculiar severity of their order prevented them from aiming at the luxury of the *Clunienses*, and their porches accordingly were less spacious, low, and simple. Any one familiar with French architecture and archaeology would see at a glance that the same currents of events and feeling in matters of ecclesiastical usage and discipline that prompted the renewal and erection of these vast vestibles, or *ant-eglises*, in the one country, must have been the occasion of their construction in the other, in the rare instances when the necessary funds admitted of the outlay. Those to whom the subject is yet unknown we would refer to M. Viollet-le-Duc's elaborate illustrated article on *Porches fermés, Ant-eglises, ou Narthex*, in his *Dictionnaire Raisonné*. The Durham Galilee may have been eventually used for a lady-chapel, but could not have been built for one. And whilst we are recalling the magnificence of Durham, the grandeur of its spaciousness, and majesty of its vistas, we must add a word of entreaty. The writer says:—

"And although the eye is now drawn up the long vista to the altar-screen, and beyond it to the windows of the nave altar, it is much to be desired that a screen between the nave and choir, such as that at Hereford or at Lincoln, should replace the heavier erection of Bishop Cosin, removed in 1848. Such a screen, whilst it would add to the beauty and intricacy of this great view, would neither interfere in reality with its extent, nor in any way prevent the use of the nave for congregational purposes."

We would urge, should a screen be ever determined upon, that those who sit at the council should see that it be light and low, if they are not able to overrule the proposal altogether.

Looking over the plan of the conventual buildings, which, with that of the cathedral adjoining, is a reduction from Mr. Gordon Hill's plan in the Journal of the Archaeological Association, we perceive that we can scarcely endorse the assignment made of several parts of the edifice. A room between the south transept and the chapter-house, said by Mr. Hills to be the ancient sacristy in the great parent establishments in France, is occupied as a small library, sometimes, as at Clairvaux, having a portion partitioned off, in which the monks could deposit their books; and a room south of the chapter-house, stated by Mr. Hills to be, with two others adjoining it, "of uncertain appropriation," is generally used abroad as the monks' parlour. Where, too, could the calefactorium be if not in one of these rooms of uncertain appropriation? Again, the spacious double-aisled vaulted apartment forming the south side of the cloister, Mr. Hills calls cellars which had refectories over them. In foreign ancient examples this is the position of the refectories, which have dormitories over them; and we submit this noble apartment is the refectory. Still we fully admit Mr. Hills's knowledge of these matters.

The feature of a catalogue in the Handbook of the chief relics in the sacristies and libraries of the cathedrals is a good one; for it makes it into a popular terrier, and will surely be useful as a cure for negligence and a preventive to abstractions. The days when nursemaids were allowed to cut out the illuminations from the choicest manuscripts in the Durham library, to amuse Dr. Dobson's children, are past; but it is not so long ago since some of the ancient pinnacles at York Cathedral were taken down and made into a grotto, poor spectral things being put in their place; nor have many seasons come round since the jellied effect of the ancient stained glass at York was utterly altered in the interior, and altogether withdrawn and effaced on the exterior, by the glazing in of an outer layer of coarse sea-green glass, whereby, too, the richness formerly produced by the depth of the millions is also lost. The figures in the niches on the different stages of the tower at Durham are not to be compared, we may say here, with the ancient ones they have recently replaced.

The plans of these six northern cathedrals are all drawn to one scale, 100 ft. to 1 in. By this arrangement it is easy for anyone to see at a glance that York is the largest of them all; Durham following its dimensions very closely when the Galilee is included in the measurement. Then Chester takes its place, Ripon follows, and Carlisle takes precedence of Manchester, narrowly, in length. The different periods of the various portions of the structures are all clearly indicated, with a key of reference on all the plans;

and we must say of the illustrations generally that they are admirably executed. Care, too, has been taken that the specialities of each building should be impressed upon the possessors of the Handbook, that they may not fail to see, exactly what they will be asked whether they have seen, on their return from their visit of inspection. At York they are reminded of the ancient Early English stained glass filling the five Sisters; that of the Perpendicular period in the eastern aisle of the south transept; the fourteenth-century Decorated glass in the nave, the great west window, filled with glass at the expense of Archbishop Melton, 1338; the glass in the vestibule of the chapter-house,—"*Ut Rosa flos florum sic est domus ista domorum*;"—and that of the great east window, second only to that at Gloucester in the world. The Gloucester window is not so high, but it is wider, the respective dimensions being, Gloucester 72 ft. by 36 ft., York 78 ft. by 53 ft. At York, too, they are reminded that the earliest brass of an ecclesiastic, save that of Richard de Hakeborne in the chapel at Merton College, Oxford, is to be seen. The fragment of Saxon work in the crypt is duly pointed out, as also are the treasures of the record-room, vestry, and treasury. In the vestry are the Horn of Ulphus, made of an elephant's tusk, and carved with beaked and winged beasts, and others with foliated tails after the manner of the early Apulian sculptor, which was lost in the civil war, but restored by the Lords Fairfax; a carved oak chest of early fifteenth-century work; a silver pastoral staff; the mazer bowl, of dark-brown wood, with a silver rim and silver feet of chorals' heads, on which is written "*Recharde archo beschope Soroce grantis on to alle tho that drinks of this cope x dayis to pardune; Robart Gubane Beschope musin grantis in same forme afore saide x dayis to pardone, Robart Strensall;*" three silver chalices, with patens; three rings taken from the tombs of Archbishops Greenfield, Sewall, and Bowet; and an ancient installation chair,—an interesting collection, but one of absurd poverty compared with the possessions of the treasury in the days of old.

At Ripon people used to be shown the crypt beneath the chapter-house, full of bones, arranged almost in a fancy-work pattern. These have been buried; but there are still some curiosities to be seen. "In the pinnacle of the south-east buttress is a remarkable place of concealment, or perhaps of imprisonment. (Every religious house had its '*Internis*,' or prison, for refractory members. Sometimes, as at Fontaines, there were several, of different degrees of severity.) On getting to the head of the stairs, which wind up the buttress, no opening is seen; but when what appears to be the roof is pushed against, a trap-door opens, through which the prisoner might be thrust into his narrow quarters. By the side of the staircase turret, is a garde-robe seat, inserted within the battlement of the roof of the "Lady-loft." At Ripon there is more ancient woodwork to be seen than glass, though there are some roundels containing heads of saints preserved in the library, that were once in the east window, and since then in the westernmost window of the south aisle. The chief of the ancient woodwork is in the choir. There is a quantity of tabernacle work. The carved subellia of the stalls bear the dates 1489 and 1491, and the finials are remarkable. "In front of the bishop's stall is an elephant, with a 'castle' on his back, in which are fighting men,—one throwing a stone, another behind with a horn. The finial of the opposite stall, on the north side, has a very grotesque monkey. The subellia are good and well carved. The spires with grapes; Sampson with the gates of Gaza; a fox preching to geese; and a griffin among rabbits, one of which has been seized, whilst the rest are escaping into their holes, are especially noticeable," says the Handbook. The two easternmost stalls have pierced quatrefoils with sliding covers, which, when opened, afford a view of the high altar. At Carlisle, over and above the general interest in the exquisite architecture, and the special interest in the Decorated east window, one of the most beautiful in the kingdom, we find the leading distinctive characteristic to be provision for turning the church into a border fortress, it being, as has been said of Durham,—

"Half house of God, half castle 'gainst the Scot."

Speaking of the south transept, Mr. King mentions,— "In the wall between the aisle and the chapel is a pointed doorway, formerly opening on a wall, which was closed during the late

restorations. The water was raised by a windlass, and the arch was protected by a door, with a massive bar. A similar well, regularly formed, and with sides of squared stone, exists in the north transept, but has long been covered. Besides supplying water for the use of the church, such wells may have been of especial service in border churches, which, like this of Carlisle, served as places of refuge for the inhabitants in case of sudden alarm or foray." On the capitals of the eastern arch over the Norman piers of the tower, are carved the badges of the dominant family in the north, the Percy crescent and fetterlock, probably from the circumstance of Hotspur having been Governor of Carlisle and Warden of the Marches at the time of the repair of the fabric; and on the west side of the tower are badges of two other families, scarcely less famous, the Dacres and Nevilles. The nave of this cathedral is made into a parish church, in which, as the Handbook reminds us, the great romancist of the North, Sir Walter Scott, was married to Margaret Charlotte Carpenter, December 24th, 1797.

Durham, in the account of which, we have reason to know, special care has been taken with special result,—the coaly city being a nest of antiquaries, and the chiefs among them, the Rev. W. Greenwell and Mr. W. H. D. Longstaffe, having been consulted, is remarkable, first, for its site. Only Lincoln and Ely are equally fortunate in this particular. Another extraneous source of interest beyond the power-frught architecture are the robes and relics taken from the coffin of St. Cuthbert. A Saxon stole and mantle of flat gold thread, wrought with figures with coloured silks, are identified as the gifts of Athelstan, in 934, when he visited the shrine of the saint at Chester-le-Street. They are about 2½ in. wide, and at the ends are the words *Alfred facti vestitus, et Pio Episcopo Frithestano*. The stole, now in five pieces, had a central quarterfold, including a lamb, with the inscription *Agnus Dei*, with full-length figures of prophets on either side of it; and the mantle, in the centre, has an outstretched hand protruding from a cloud, with the inscription *Dextera Dei* and figures of saints on either side. Part of a girdle and two bracelets are of a similar age. It is somewhat curious that accurate drawings have never been made of these relics of the early English embroidery that once enjoyed so extensive a fame. The gold cross, of Saxon workmanship, with twelve garnets down each arm, one at each angle, and a large central one, that lay on the breast of the saint, is also among these relics. The manuscripts in this library descended from the monastery to the chapter, and are still both numerous and important, notwithstanding the ravages of carelessness and destructiveness. Anglo-Irish and Anglo-Saxon Gospels are among them, and one copy of the Gospels, in majuscule letters, tradition says is the handwriting of Bede.

At Chester may be seen in the cloisters, at the south end of the west walk, a few of the carrels in which the monks studied. These small inclosures were common to all or most cloisters, but have disappeared in too many instances. But there are examples yet standing at Gloucester and at Worcester. An alms-house, containing the hooks in most frequent use, was placed against the cloister wall at Durham, opposite the carrels. At Clairvaux, an apartment between the south transept and chapter-house was provided for the deposit of the hooks most in use, divided from the small library behind it. The stone pulpit, with its arched staircase in the thickness of the wall, in the refectory at Chester, is also not to be passed over, though not belonging to the cathedral itself. Only the pulpit in the refectory at Beaulieu, Hampshire, is to be compared to this. The stained glass here is of different degrees of merit, and all modern. In the vestry, however, is some beautiful early ironwork.

At Manchester, there is some good perpendicular woodwork in the choir, tabernacled, hench-ends, finials, stall-arms, and misericords, with small figures of angels, and others of apes and foxes. The opening into the Late Perpendicular lady-chapel—now called the Cbetham Chapel, because Humphrey Chetham, a Tudor Manchester manufacturer and warrior, lies buried there—is of a much earlier character, suggesting that the remains of some previous building may have been used in its formation. And here, too, occurs one of those trifles of old times that we occasionally meet with in ancient buildings, a monumental rebus. The first warden of the

college was John Huntingdon, who built the choir, 1422—1458. On either side of the arch opening into this chapel is a rebus upon his name, copied from shields in the spandrels of the choir-roofs,—a hunter, with a stag and horned ram, and a man drawing liquor from a tun.

Mr. Murray has materially assisted a popular and rightful appreciation of our cathedrals by his Handbooks, and, consequently, has helped, in a corresponding degree, the great work of conservatism that should be the order of the day. And he has done more; for he has placed in the hands of the archaeologist and architectural student a work of easy reference that may generally be depended upon for its facts.

ROYAL ACADEMY EXHIBITION.

WITH no intention of giving a full and correct account of all the many capital pictures that this year's show at the Royal Academy includes, we resume noting some of the most noticeable. A clever and singular production tells that Mr. J. E. Hodgson has travelled far for his subject, and very forcibly shows that he is not likely to become a mannerist farther than his admirably honest method of depiction will gain for him the title. An "Arab Storyteller" (15) amusing a very attentive audience, grouped in semicircular line, with some narrative of absorbing interest, has afforded him an opportunity of recording how closely he has studied the people, their habits, customs, and costumes, outside or inside the gate of Tangiers: a testimony to his observation is provided in the variety of character and expression he has been able to impart to so many dusky faces; and some proof of the scene being a faithful transcript from fact exists in its unexaggerated yet peculiar naturalness.

A similar style of straightforward manipulation belongs to Mr. D. W. Wynfield. No executive dash is added to the charms of "The Rich Widow," who can boast of a sufficiency already, for she is "young, beautiful, and a great fortune," and beset by such admirers as her several attractions would allure (86); some as good-looking as herself and nearly as young, others older, and one very old, whose great advantage it is to wear royalty-conferred decoration. Fine painting is the chief recommendation of this work; for it means no more in subject than a clustering of bees would round a honey-jar. A second example by the same artist is still more convincing of the great worth a knowledge of the resources of colour arrangement bestows: "My Lady's Bonnet" (14) is resplendent with its tastefully expended wealth. The fair occupant of this gorgeous retreat is pouring water into a china vase, preparing it for the reception of flowers; draped in white she looks the pearl of a woman who doubtless is, with a gold setting from a Japanese screen against which she stands; a tablecloth, rich in its dyes, and a velvet chair, assist in this chromatic success, simple enough in its constituent materials, but extraordinary in their combination. Mr. J. H. Archer's children are, at least, a hundred years older than they used to be; and instead of playing at cards, they are playing at soldiers. A Royalist family are being drilled by the eldest boy of them, and are marching on in steady determination "Against Cromwell" (77). This, like all Mr. Archer's pictures of child-life, is very agreeable in its simplicity of treatment, and an excellent painting. Technical merit—more especially with regard to the landscape that is the scene of the tragic occurrence—distinguishes Mr. Archer's principal contribution that illustrates the ballad of "Fair Helen of Kirkconnel," who died in shielding her lover from the shot of his rival (129); though the figures are rather too tame and common in aspect and action to give full dramatic interest to so romantic an incident, it is a fine picture.

Mr. Pool's version of "The Prodigal Son," denotes his contrition (240), with some want of academic proficiency on the part of this able artist to make the figurative lesson as strong as the circumstantial—for the landscape is the fine portion of his rendering of the parable. Mr. Poynter's shows his Return and affectionate Forgiveness (100), with the father and son well represented so far as good drawing and sound painting are concerned; and Mr. Galt's his joyous Welcome celebrated by Feasting and Merrymaking (899), very carefully and perceptively told.

* See pp. 357, 381, 307, ante.

Mr. W. B. Richmond is a new aspirant for such high honours as few are competent to snatch, as few are earnest and patient enough to wait for. There is evidence of rare gifts and advance in their cultivation to justify a belief that the classic composition, entitled "A Procession in Honour of Bacchus at the Time of the Vintage" (277), is the precursor of such productions as will help to dignify the English School of Art. Greek art, that in its perfection of form is the acme of what can be attained in comprehending all that is to be imitated in dead stone of breathing human nature, may safely be accepted as the best exemplar of that form that wears a likeness to Him that made it. The older man becomes, the farther removed from origin he is. We honour Mr. W. B. Richmond for his high aspirations, and bid him God's speed in his efforts to achieve. "A Disputed Boundary" (319) is an excellent illustration, furnished by Mr. E. Nicol, of man's disposition to quarrel over an inch, perhaps, of questioned right; he has never painted anything better than the two Irish tenants at loggerheads about a hedge and a ditch grievance.

Mr. Pettie paints, from Shakespeare's description, "The Disgrace of Cardinal Wolsey," or rather the cardinal's conviction of his own fall (130). The likeness of Wolsey does not tally with that by which he is most readily recognised; no trace is left of the indomitable will and unbounded arrogance of the man,—

"Ever ranking
Himself with princes; one that by suggestion
Tied all the Kingdom!"

but he is here, too soon represented as "an old man, broken with the storms of state." His mild, unadorned appearance, however, is in favourable contrast with the more exaggerated action of the Duke of Norfolk, who is making sarcastic obeisance as he takes his leave. "The Gambler's Victim" (44)—too sleepy and tired now that the excitement of play is over, and too much overcome by the fumes of the wine that has assisted it, to be conscious of or to care much for what the game has cost him—is very cleverly represented by Mr. Pettie in a smaller picture, wherein the plucked pigeon is making his uncertain way along a wing-wall from the downier birds that are feathered at his expense.

With crowds about to suggest the appalling nature of such an event, Mr. L. J. Pott's exciting representation of a "Fire at a Theatre" (2), cannot come under the category of "pleasing pictures," although it is always pleasant to note heroism, and there could never have been a louder or better-merited outburst of applause to greet the clown's "Here we are," than when, half-choked with the smoke, and more than well warmed to his work after many a tumble, he restores to its anxious mother a baby it was not in his part to sit upon. The catastrophe has happened behind the scenes: it is to be hoped that the actors, to whom "All the world's a stage," found their safe exits as surely as their entrances; but it is such a catastrophe as the whole seven ages may become dreadfully interested in; for children in arms are not inadmissible everywhere, and from Exeter Hall to a "penny gaff" the chances are, death against life at very long odds.

It is a relief to find well-imitated water so close to its adversary, such as runs "Under the Walls of Maestricht," and floats a canal-boat, that Mr. C. N. Henry depicts so really (4). Mr. G. A. Storey is more perfectly satisfactory in his portrait-compositions of "Sister" (7) and two little well-behaved brothers "Going to School" (27), than in apostrophizing Sterne's lesson on the value of flattery that "The Old Soldier" had learned to such good purpose as a means of levying black mail from fair females by defending their own opinions against the invasion of dark doubts. But his "fair charitable" looks too truly good and humane; her eye far too sweetly bright to leave her at all a likely subject to be affected favourably by such gratuitous and gratitude-seeking acknowledgment. She is very pretty and innocent as she stands in the bright morning sunshine, helping very much, with the help of a well-painted background, to make "the old soldier" an agreeable as well as a humorous picture (62).

Mr. F. Sandys has shown how nearly he can approach the desideratum of making a portrait a valuable work of art, and apart from such worth, its close resemblance to the portrayed must have the effect of securing for it a very general appreciation. As a thorough example of the painter's chief excellence, the perfection of

zinta finish in his adopted view of copyism,—his "Portrait of an Elderly Lady" (714) may challenge comparison with the more astonishing display of it in "Medea" (99); for there has been less latitude for forcing into excessive brilliancy everything coloured to a gem-like lustre. The lady's mourning habiliments of vividly-white and jet-black crape have failed to detract from the purity of complexion and life-likeness of the face, but have made it necessary to emphasize colour, even in this case, to an unnatural brightness.

Unless to reach the extreme of possible finish, and in *no plus ultra* intensity, be but one and not the only aim, there may be some doubt whether any other end is attained than to create wonder at workmanship; and more doubt if excessive elaboration be not the means sometimes of destroying the propriety of appearances rather than assisting it. There is nothing at all mysterious in the presentation of the sorceress "Medea" engaged in mixing a spell-broth from the most innocuous of ingredients, so far as may be visibly suggested: there are lovely tints, so bright and beautiful in a clean delicacy that ugliness and venom can never be associated with wearing jewels not only in their heads but all over them; choice chemical compounds in pretty and curious shells; precious little images, such as the beighted heathen make gods of, and often fetch high prices at Christie's & Manson's; and the lady herself, exquisitely handsome and with remarkable hands, does not really deserve to be thought capable of much more harm than others as fatally gifted with beauty as herself—which all the world must know is harm enough—though the light reflected from her nefarious occupation is not a favourable one to regard her in. This is a very beautiful production, however, and only raises the question of how far Medea may be realized clear of the haze of mystery. Mr. Poynter's idea of "Proserpine" gathering daffodils in a classic vale and veil, will serve as an ideal to those who can form no conception of how lovely and winning she must have been (396); it is one of its most perfect and covetable of the smaller items in the present collection; delightful in its originality of treatment as well as for the grace of it.

Mr. Wallis has given "Marsyas" (442) a bath of golden sunshine to fine effect, but is more true to Nature and himself when he paints, from possible observation, "A January Morning" (745), with its chill of snow and fog to intimate the self-denial of true charity. A young lady has been attracted by the poverty-stricken appearance of a wretched mother waiting admission to the workhouse for herself and child; prompted by compassion, she leaves her companions to wrap her own covering round the neck of the poor little shivering creature, and in her own quiet way shows at once her commiseration and contempt for a sore throat.

But there is no poverty so hard to be borne as that which is of new and unexpected experience; of such, for instance, as "The Old Gate" suggests, which, thanks to Mr. Walker, will lead to the building of several stories (485). This is a picture that will talk for ages unless the artist tells its intention, and no longer leaves it to the canvas for canvas: the want of elucidation necessary to give it special significance rather adds to its interest than lessens it, for it invites conjecture to supply that want, taking such hold of the attention as good acting in a strange language might do. How the house was built; how its former tenants prospered and perished, and why its last should have to leave so sorrowfully attended, are some of the questions that occur. Ideas of fresh and fresh growth may crop up from the trodden foreground, and every step give a different footing in the tale that leads to the fallen old house: the old gate may typify the old gait that causes such effects, and effects such causes as ruin in its mazes of carelessness, trouble, circumstances, and sin, finds a centre in sooner gaid than got out of. Does she who looks so sad in her deep mourning, that she may have lost father, mother, husband, children, and all, see in the mock structure of a paper-built house the metaphor of her own fragile fortune; or does she envy the mother of the snarling, ruddy urchins who are the builders even of such weak promise; or does she behold in the labourer on his way to his work a type of what destiny will make of her in the need that will oblige her to become a labourer too? Or did Mr. Walker find "the old gate," just as he has represented it, before some disapidated old mansion that was all the more indicative as an

emblem of decay when seen in bright spring-time, and introducing such figures as in historical instinct he would select for a novel illustration of "The Past and the Future," paint a fine picture—as he could scarcely fail to do—that preaches in the eloquence of rare expressive power and poetic feeling a long sermon from a short text?

THE LATE MR. PETER CUNNINGHAM.

The death of Mr. Peter Cunningham, which took place at his residence in St. Alban's, Hertfordshire, in the evening of the 18th inst., was briefly mentioned in our last. He was born in Pimlico on the 7th of April (not the 16th, as elsewhere stated), 1816, and had therefore just completed his fifty-third year, and was the third son of Allan Cunningham, the well-known poet and assistant of Chantrey, and who died on the 29th of October, 1842. The subject of this brief notice was educated at Christ's Hospital, and in 1835 was appointed by the late Sir Robert Peel, as a mark of esteem for the talents of his father, to a clerkship in the office of the Commissioners for Auditing the Public Accounts. In 1854 he became chief clerk of that department, and retired, on the 4th of February, 1859, with a small pension. On the 14th of September, 1842, he had married Zenobia, second daughter of the late John Martin, the painter. Mr. Cunningham was a most industrious contributor to critical and historical literature, and produced a number of books, besides writing constantly for periodicals such as *Fraser's Magazine*, the *Athenaeum*, and the *Illustrated London News*, wherein his weekly column of "Town and Table Talk" was for some years an attractive feature. He will probably be longest known by his remarkable "Handbook of London, Past and Present," written for Mr. Murray, and first published in two volumes, 8vo., in 1849. This work, which displays a great amount of reading, especially of our earlier dramatists and anecdotists, was seven years in hand, written and re-written:—

"It has not only engrossed all my leisure" (the author says in the preface), "and cost me much thought and anxiety, but has imposed upon me a very painful amount of minute research amongst unsorted papers, often very difficult of access, and never very clear or legible, for the chance of opening up new sources of intelligence."

The second edition of it was published as one volume.

He edited the "Poems of Drummond of Hawthornden," 1 vol., 8vo., as early as 1833; "Songs of England and Scotland," 2 vols., 8vo., 1835; the second edition of "Campbell's Specimens of the British Poets," with additions, 8vo., 1841; and "Campbell's Essay on English Poetry, and Lives of the Poets," 12mo., 1848. The "Handbook to Westminster Abbey," 12mo., was published 1842; "Life of Inigo Jones," 8vo., for the Shakespeare Society, 1848; "Handbook of London, Past and Present," already mentioned, 1849; "Modern London," 12mo., 1851; "The Story of Nell Gwynn," 8vo., 1852. He edited the Works of Oliver Goldsmith, 4 vols., 8vo., in 1854; "Lives of the Poets," by Johnson, 3 vols., 8vo., 1854; "Letters of Horace Walpole," chronologically arranged, 9 vols., 8vo., 1857, 1858. Rewrote Jesse's "Handbook to Hampton Court," 12mo., 1842; "Handbook to Windsor and Eton," 12mo., 1843; edited an edition of Allan Cunningham's "Life of David Wilkie"; an edition of "Boswell" (in conjunction with Mr. J. W. Croker); an edition of Pope's works; wrote "Revels at Court;" and a prefatory life of T. M. W. Turner, the painter. After his retirement to St. Alban's, with failing health, his literary contributions were chiefly confined to the *Builder*, wherein will be found a large amount of curious and valuable matter, mostly in the shape of artistic biography, with his name attached.

Somewhere about 1846 and in the following years Mr. Cunningham acted as joint honorary secretary (with the writer of these lines) of a committee formed to present a testimonial to the late John Britton, the antiquary. What was called the "Britton Club" grew out of this committee, and at one of the genial meetings of that little society, the veteran, William Jerdan, sketching in hasty verses its various members, thus characterized the subject of our note:—

"And Peter Cunningham, of antique lore,
A hand-book and a head-book, both so pat,
Whose converse shows you it is not a bore
To mix the ancient speech with modern chat."

His social qualities at the best period of his life were eminent; he found friends on all sides, and went largely into society. For some years he was a Fellow of this Society of Antiquaries,

and a member of several social clubs. With the brilliant little circle which at that time provided London with *Punch* he was much connected, and at the head of the preface—dedicatory to a volume of that most admirable serial (one of the great things of our era), stands, if we remember rightly, "Petrus Cunninghamus."

His life fully written would not be without a moral and a warning; but this is not the moment or the place to point to weaknesses. Let us recollect only the good things and the useful work he did. He was buried at St. Alban's on the 24th, by the side of his daughter Nora, who preceded him on the 19th of May, 1863. The mourners were his only son, Walter, his two brothers, General Alexander Cunningham, and Colonel Frank Cunningham, and his brother-in-law and old companion, Mr. Leopold Charles Martin.

May we add an earnest word for one left behind him? Mr. Cunningham's pension ceased with his life, and his widow is unprovided for. A pension on the Civil List, on the ground of the contributions to British literature by her husband and his father, supplying the place of the pension that has dropped, would be a good and graceful act on the part of the Prime Minister.

EFFECTS OF DRAINAGE AND WATER SUPPLY.

The inestimable advantages which spring from an abundant supply of pure water, and a well-devised system of sewerage, are every day becoming more appreciated, and in proportion as these benefits are valued, so will the scientific works of the engineer be acknowledged. The Registrar-General has just issued his quarterly returns of the rate of mortality, in which he specially alludes to forty-six of the principal towns of the United Kingdom. There is one town quoted in the list which probably more than any other shows the beneficial effects of drainage and water supply. The town to which we now particularly refer, is Swansea, Glamorganshire, a town which in itself contains elements for a high death-rate, but which is now gladdened by the Registrar-General as the third healthiest of the forty-six towns enumerated. This town now contains a population of 65,000 inhabitants, and it is well known is the seat of the largest copper smelting works in the kingdom, something like two-thirds of the whole of the copper ores of the county being smelted in the immediate vicinity. Thus it has gigantic iron works, tinplate works, arsenic works, and other manufactories, which emit dense volumes of smoke, so much so, indeed, that the inhabitants may be said always to live in smoke, and the adjacent hills and districts are entirely denuded of vegetation. At one time high medical opinions were quoted, to show that the atmosphere, impregnated with the deleterious vapours and smokes from the works, must have a prejudicial effect upon health and life, and certainly the then rate of mortality seemed to bear out the opinion of the medical faculty. The inhabitants, however, and their representatives felt that if they lived in smoke they also lived upon or by smoke; that is, that the stability of their trade and commerce depended upon the prosperity of their large works. Impressed with this opinion, they did not make a crusade upon the proprietors of these works, compelling them to put the provisions of the "Smoke Nuisances Act" into operation; on the contrary, the whole town, in public meeting assembled, determined to reject the Act, for which they will see their error presently. It was, however, felt, upon the other hand, that the rate of mortality was higher than should be reasonably expected, notwithstanding the adverse circumstances to be contended with. It was determined, after much controversy in the Local Board of Health, that a perfect system of drainage should be carried out, and that an abundant supply of pure water should be obtained, at whatever cost. Some ten years since, therefore, the sewerage works were planned, and have since been carried out under the personal supervision of Mr. Edward Cousins, the present surveyor of the Local Board; and up to the present time upwards of forty miles of brick and pipe sewers, varying in size from 3 ft. 9 in. by 2 ft. 6 in. to 2 ft. 3 in. by 1 ft. 6 in. (egg-shape), and pipes varying in size from 18 in. diameter to 6 in. diameter, have been laid. The house-drainage is in process of being carried out, about 4,000 houses having been connected

out of a total of about 8,000 houses in the borough; and this drainage has been carried out at a cost of about 40,000*l.*, in round numbers.

During the progress of the work the most remarkable results have been noticed and carefully recorded by Mr. Ebenezer Davies, the Officer of Health. In the event of any outbreak of fever or epidemic of any kind, those parts of the town through which the main drainage had not been carried were invariably its hotbeds, and in some instances fever proved fearfully fatal where no drainage existed, whilst in the same locality, but where the drainage had been carried, there was a happy immunity.

But not only was drainage resorted to with such beneficial effects, the corporation, or rather Local Board of Health, determined upon seeing a most abundant supply of water, not only for domestic, but for trade and flushing purposes; and at an outlay of somewhere about 100,000*l.*, they have succeeded in constructing a splendid reservoir at the Liliw, capable of storing no less than three hundred millions of gallons, or a supply to the town of no less than four months, without any rainfall whatever. This water, according to scientific analysis of Mr. F. Crace Calvert, of Manchester, is exceedingly pure, containing only 2 degrees of hardness, whilst the London water generally contains about 12 degrees. The Swansea water is the nearest to that of the celebrated Loch Kathrine, Scotland. The water of the Liliw has been conducted through eight miles of graduating conduit, and about twenty-five miles of distributive mains have been laid. These works were designed by Mr. R. Rawlinson, C.E.

The distributive mains have been superintended by Mr. Cousins, the borough surveyor. At present about 7,000 houses in the borough are supplied with water from the reservoir, and there can be no doubt but that in a few more years the works will yield a very handsome revenue, far more than paying the interest upon the outlay made. The receipts from the water works now amount to about 6,000*l.* per annum. The combined effect of these two important works has had the most satisfactory, and we may say extraordinary, result upon the public health, and has enabled the Registrar-General to place Swansea in its present position of the third healthiest of the forty-six towns he has enumerated. Prior to the carrying out of the drainage and water supply, the rate of mortality in Swansea was about 26 per 1,000. The last return of the Registrar-General now shows it 18.37 per 1,000, and one month it was as low as 12.35 per 1,000, whilst the tables of sickness kept by the large clubs of workmen show that the general health of the borough has most materially improved. We can scarcely be wrong in attributing much of this good result to the improved sewerage and abundant water supply provided for the town.

AN AMERICAN SCHOOL OF ART.

It is an old saying that three shops make a market. We have never seen it attested how many artists are required to constitute a school.

To found a school, indeed, in painting, or in any other branch of art, the genius of one man may suffice. We are in possession of works attributed to "the school of Michelangelo." The expression cannot be taken to intimate that the immortal Florentine had any rival professors of his wonderful mastery over marble.

We are, therefore, it seems to us, fully justified in speaking of the establishment, in our day, if not in our country, of a new school of painting. The New World once more has provided a surprise for the Old World. Two works by American artists, are now exhibiting in London, on the walls of the Royal Academy, and one on the show-rooms of Mr. MacLean, in the Haymarket, which are such as to justify the claim to be considered as examples of a new order of landscape painting. We refer to Mr. Bierstadt's picture, called "Among the Sierra Nevada Mountains, California," which is No. 309 in the catalogue of the exhibition of the Royal Academy, and to Mr. Church's view of "Damasens."

Of this latter picture we can only speak, to some extent, from knowledge acquired from the study of the former. When we see how far the results attained by a painter of one of the most famous scenes of Oriental landscape, agree with those scored by a penetrator of the Californian deserts, we feel justified in assuming the adoption of a similar method by the two New World painters.

The main excellence of this pictorial school

may be said to consist in such a representation of nature as results from a very patient and careful study of details, which are afterwards combined in an imaginative *ensemble*. The aptest illustration of our meaning may be taken from the art of the orator. A subject may be very carefully mastered—a speech, or speeches, may be written and re-written on the theme,—and then, at the moment of delivery, something entirely original is thrown out by the excitement of the occasion, in which, however, the golden fruit of the past toil is apparent.

Thus numerous sketches of every romantic incident of a landscape, from distinct points of view, and under all varying conditions of incidental light, fill the portfolios of Mr. Bierstadt. With a wise appreciation of that confusion which creeps over a sketch from the shifting of the shadow, which is caused by the diurnal motion of the earth, this artist has bound himself by the admirable rule never to occupy more than twenty minutes in making a water-colour sketch. Thus his notes, so to call them, of detail and of incident, are characterized by unusual vigour and truth. In colouring they are bold to the verge, but not beyond the verge, of exaggeration; and the promptitude with which the sharp outline of light and shadow has been seized and stamped upon the paper, gives the force of actuality to the scene, however rough be the handling.

A wide landscape, thus studied and recorded in detail, becomes the mental property of the artist. He can choose at leisure whether to represent it in storm or in sunshine, by morning or by evening light. He has but to map the outline of the salient features, from the point of view which he may ultimately select, and he will then find in his portfolio all that he may wish to transfer to his easel. Nature has been his teacher, and has instructed him, as it were, *visu voce*. It is true that, if he is not within him that which responds to her teaching, the lesson will be in vain. But few would seek to listen to the utterances of Nature who were not, more or less fully, fitted to become her pupils. And Mr. Bierstadt is not one of such a group.

To perfect mystery of truth of detail, and imaginative grasp of the *ensemble* of landscape, this new school adds another rare element of excellence, that of *proportionate precision*. In accuracy of study the painter is hy turns a geologist, a botanist, and a portrayer of animal life. He gives a flower in the foreground with all the fidelity of a flower-painter. He draws a deer, or an eagle, or a red Indian, as if he had no eyes except for animal forms. But when these elements take their place in his landscape, it is as subordinate features. He does not give you a portrait of a buffalo or a stag, with a background of landscape. It is his aim, and we are bound to say his successful aim, to subdue the individuality of figure and of form. He equally avoids that vague ignorance, or carelessness, of specific forms which shallow people call generalizing, and that precise, monotonous, equal-handed, reproduction of image, which makes what is termed *peinture à l'huile* treatment so closely resemble mosaic. His deer are neither more nor less striking on his canvas than they are on the landscape itself. At the first glance they only want motion; but if you bring the glass to hear on their forms, they will certainly not look like live deer, viewed through the telescope. Nor is it proper that they should do so. When an object is focussed by optical means, it becomes, for the time, the main centre of vision. But if a precision of this kind be attempted on canvas, we lose entirely that subordination of the parts to the whole without which there can be no such thing as pictorial unity. It is not that the artist should not be perfectly familiar with the anatomy and detailed outline of the wild animal. This he must know, but he must also know something more; he must know how the creature appears at a given distance, how its outline will melt into shade against foliage, or soften when relieved against rock or water; he must know what it is, and be able to draw what it appears to be.

Three very large landscapes, taken from Californian scenery, have been brought by Mr. Bierstadt to this country. We are happy to have been able to trace a distinct and visible increase in artistic power, as the artist has advanced; and we have no hesitation in qualifying the picture now at the Royal Academy as the finest of the series. We hope, indeed, again to have an opportunity of seeing the midnight view of Vesuvius in eruption, which was in

London last year. It is a subject as to the absolute fidelity of which to nature many more persons can hear witness than in the case of the great American lakes. There are few visitors to the Royal Academy who have seen a cataract of 4,000 *ft.* in sheer columnar fall, parting as it descends into a cloud of mist, and finally flowing like a wreath across the face of the unveiled precipice. But there are very many who have scorched their boots at the infernal fires of the lava, and cut them to pieces on the scoria of Vesuvius; who have beheld the cloudy cap of the volcano red with the pulsing and reflected glare, and who can therefore admire, with instructed taste, the faithful rendering of Mr. Bierstadt.

The "Storm in the Andes," one of the earlier of these large pictures, has been reproduced as a chromo-lithograph. The prints have been long in course of preparation; which is not to be wondered at, for they are said to have required the use of nearly forty stones. The effect is very brilliant, and the diminution of the same appears to have been very correctly effected. But a question of no small importance here arises. It is one which affects not only the representation of Mr. Bierstadt's landscapes, but the very principles on which such reproductions should be attempted.

In reducing a picture to a smaller scale, the proportionate area occupied by each tone and shade of colour will be unaffected. A reduction of this kind takes place in the retina, so that, in point of fact, it may be said that we never actually see anything but a reduced picture.

But, though the relative area occupied by each colour is unaltered, the relative proximity of tint is very materially altered. A bright light and a dark shade will contrast very differently at a distance of 6 *ft.* or of 6 *in.*; and however minutely the intermediate grades of line may be simulated, the element of distance is materially altered. Therefore, if we look at a landscape, or at a large painting, and then look at a reduction, or miniature representation, of the same, in which the same scale of colour is employed, we at once become sensible of a very different impression on the vision.

This contrast becomes extremely palpable in the present case. From the large size of the original painting, and from the number of colours introduced, the task of the lithographer has been one of no ordinary hardship. A brilliant picture has been produced; but a certain want of repose, as compared with the original, is distinctly perceptible.

In the present state of optical and chemical science, the production of chromatic effect by photography appears to be hopeless. We can, therefore, hardly hesitate to form the opinion that a chromo-lithographic reduction of a painting can only be a true representation of the original when taken from a copy reduced by the painter himself, or by some equally competent hand. Of course, the expense and trouble of such a procedure would be very great. There are, however, instances in which it would be worth while to incur them. Every artist is instinctively aware that a miniature must not be painted with the exact tints of a full-size portrait. In painting, and even in sculpture, the eye instinctively teaches the hand to work to scale. But this is something extremely different from matching a tint. We think that not the least of the recommendations of the print now in course of publication by Mr. MacLean may be the illustration which it affords of the importance of studying the scale and subordination of colouring. It is probably from this very cause that many chromo-lithographs are so harsh and untruthful.

We have said little of Mr. Church's view of "Damasens." It is a very beautiful picture. The limestone rocks are lighted up with the fierce, but quickly shifting ray which falls in those southern latitudes, with far more intense force than when it glints on our Westmoreland, or Scottish, or Welch, or Irish mountains. Far off, the ancient city,—the pride and glory of the East, the metropolis of the nightingale,—is basking in the glorious light. The wealth of water of the noble rivers—the owner of the Rob Roy canoe would tell us which was Ahana and which Pharpar,—adds a sense of plenty to the beauty of the scene. We confess to a hesitation as to the foliage, which fills the greater part of the space between the foreground and the distant capital. The trees look knotty and stunted—almost like a cabbage garden. But we are far from mentioning this as a fault attributable to Mr. Church. So have we seen trees to look under similar circum-

stances. We are inclined to hold that this rather ignoble bit of detail is quite true to nature. The artist is not responsible for the flora of the country he visits, nor for the planting of its park-like scenery. No doubt, Mr. Church would have filled his canvas with weeping birches, and spiry cypresses, and storied, branching cedars, and lighted it up by the snowy lustre of the catalpa or the magnolia. But we incline to think that he has shown us the Vale of Damascus as it appeared to his own penetrating vision under that very sun-gleam which he has imprisoned on his canvas, and we thank him for his picture.

It is with true pleasure that we welcome this artistic success of the United States. In the hurry and jostle of the active life of our busy neighbours across the Atlantic, we have become accustomed to think that the art element has been neglected. When wealth has flowed in, in boundless and fabulous streams, we have thought it to be habitually applied rather in the pursuit of luxury, or of splendour, than in the cultivation of taste. We hail so effectively a protest against this view, whether as entertained by ourselves, or by the richer citizens of the United States. It must be remembered that an American artist, unless it be within his power to visit freely the Old World, labours under many disadvantages as compared with his European brethren. The great names of the past are less familiarly household words with him; or, at all events, the works that made those names great are less accessible to his study. The very pride of his young citizenship,—young in the life of nations,—may act as a bar to his progress. The names of the rivers of Damascus recall a memorable expression of this form of national pride. "Are not the lakes of the Sierra Nevada," the American artist may exclaim, "worth all the shores of the Adriatic? Who is Claude, or who is Titian, that I should learn the study of Nature, to sit at his feet?" But none the less it is true that this expression of self-reliance is the language only of ignorance. The human wit is not yet so bright that the best of us can afford to neglect the conquests of our predecessors. To know how the masters of the palmy times of art encountered those problems which ever recur to the artist, is an essential element of his education. To see how they succeeded, is at once an encouragement and an aid,—to see how they failed, may be, rightly viewed, of even greater value. Not that the study of Nature is to be neglected, even for that of the works of her most favoured children. But the road to excellence in art is proverbially long. Many are the byways, tempting enough in their aspect, that lead to the damp meadows brooded over by the mist of evening and the frowning towers of the giant. The lesson of those who have wandered from the path is not to be slighted without shame.

Nor must it be forgotten that landscape painting, charming as its results may be, is by no means the highest triumph of the painter's art. And when we ascend to portraiture or to historic composition, an intimate acquaintance, not only with the great masters of Italian painting, but with the works of Roman and of Grecian sculptors, is an absolute essential to any degree of excellence. Let an artist try to form his style on contemporary life; let him haunt the public assemblies of the day, the tribunals, the chambers of the Legislature; let him learn all that nature in her conventionalised garb there teaches, what will be his highest attainment?—a portrait limned with the fidelity of a photograph, with the same wearying and uninteresting result. Two requisites go to make a noble portrait,—a fit subject and a fit artist. Mere reproduction of feature, which is all to which the painter who has not drunk deep at the fountain of old art can hope to attain, taxes the mechanical skill of the draughtsman. It is one of the humblest exercises of the genius of the artist.

Dangerous State of a Wooden Viaduct near Huddersfield.—The town council of Huddersfield have unanimously passed a resolution drawing the attention of the Lancashire and Yorkshire Railway Company to the rotten and dangerous state of the Donley Dale Viaduct on their line, and threatening, unless one of stone be substituted, to complain to the Board of Trade on the subject. The traffic along this viaduct is very great, and it forms part of the highway between the Huddersfield district and the south, generally towards London.

THE (ALBERT) MUSEUM, SOUTH KENSINGTON.

BEFORE continuing my "Notes," I may as well state, for the satisfaction of lovers of art generally, and of "One of the Public" in particular—in case your correspondent should not have paid a subsequent visit to the Museum—that the strong remonstrance in the *Builder* of April 24 has been effective, and the objectionable panel on the wall of the beautiful staircase to the "Ceramic Gallery" has disappeared.

In my last notice of the loan exhibition I particularized various most interesting objects in the East aisle, or Oriental department of the South Court: I will resume my account in the same locality.

An extensive collection of Japanese objects, sufficient to fill two glass cases, is lent by Lady Boxer. The various items were gathered together by Captain C. R. Boxer, R.N. Among them are:—Two small bronze tea-kettles, each on a tripod, ornamented with dragons in high relief, very rich-looking; two similar, of still smaller size, and a hexagonal teapot, the sides chased with scrolls and floriated work; two bronze bowls in form of a lotus leaf, ornamented with buds, half-opened flowers and rolled-up leaves, the stalks forming the support to the bowls; two large teapots ornamented with dragons, and having serpent handles; two large bronze vases, inlaid with pattern of foliage in silver, with two handles, and a Greek fret border top and bottom; a small bronze vase and cover, damascened with silver, and having wing handles and a kylin—or dragon,—on the top; a singular "pricket" candlestick, the base of which is somewhat of a bell-shape, but is like a cage formed of strips of metal in imitation of plaited string, bound together by scrolls or tendrils; two graceful candlesticks, each in the shape of a crane, whose bent-down head holds in its beak the curving stalk of a lotus plant, the open flower being formed into the candle-socket: these are also of bronze, damascened with scroll pattern; six large shells called Venus's Ear (*Halotis*) set in lacquered wood with the bark on, and thus forming a series of dishes; a coral lac box, about 2½ in. square by 4 in. high, in four compartments, beautifully carved with foliage and flowers; an ivory vase formed of a piece of tusk in its natural shape, pierced with carving of birds and foliage, mounted on stand of gilt lacquer, studded with insects in their natural colours; and a larger vase, with landscape in gilded lacquer, on stand, inlaid with birds and foliage in mother-of-pearl; four small square trays in black lacquer, with bamboo basket-rims; two fine bowls of red and white porcelain, ornamented with foliage, and having a landscape in centre, inside; two bottles of the same red and white porcelain, with "interior" scenes, and one double handle on each; a plate of the same, with a garden scene; and a number of exquisite egg-shell cups, covers, and saucers, in varied sizes, that make one break the tenth commandment desperately; some pins for the hair, inlaid with the beautiful blue feathers that imitate enamel so well; a pair of very handsome large bronze vases, on stands ornamented with castings in high relief, admirably executed, of birds and foliage; a bowl of Chinese porcelain in Imperial yellow, with green dragons on it, and another of blue Chinese porcelain of rich deep colour; a green jado circular plaque, with a hole in the centre, carved with dragons in relief; an exquisite cup of Chinese egg-shell porcelain, with delicate deep blue ornamentation of sparse flowers and birds; two others of somewhat uncommon concave shape; and many more, greatly interesting objects, that must be passed over for want of time. Lady Boxer likewise lends two very fine incense-burners of bronze in form of a bowl, ornamented with multiplex Greek fret,—it is curious to see how partial the Japanese are, or have been, to this Classic enrichment,—and supported on bronze rockwork, with sea-dragons in high relief.

Not far off is the grand incense-burner lent by Mr. T. Hanbury. It is of turquoise-blue *cloisonné* enamel, with a landscape around the body containing swans, storks, lilies, foliage, and water. The burner is supported on the backs of three storks of white *cloisonné* enamel relieved by black and a little red; around the rim runs a blue border of hexagons, each enclosing a six-pointed star of red on white ground. The body of the vase has two handles of gilt dragons, each holding an open-work circle of enamel that looks like an inscription. The cover

is very bold, of flattened bell-shape, in equal parts of perforated gilt-metal scrollwork and *cloisonné* enamel, and is surmounted by an elongated knob of open-work gilt metal.

In the same glass case that contains this incense-burner stands an elegant work-table of carved sandal-wood, lent by Mrs. Hayllar: it has an elongated hexagonal top, supported by two bracket legs, which stand on a similar, but smaller, base, that rests on four kylin heads. This table is of modern Ahmedabad work, and is very carefully and delicately executed. Mrs. Hayllar also lends six plaques—which are to be found in the tall glass cases under the windows—and six cups and saucers of agate and other materials, of various sizes, all being modern Hindoo work, and very beautiful as specimens; four miniatures on ivory, and glazed,—a view of the Taj Mahal at Agra, modern Agra work; a view of the Khotab Minar, Delhi (a large tower or minaret); the Residency, Lucknow, after the siege during the late Indian mutiny; and the Cashmere Gate, Delhi, also after the siege. Was not this the gate before which Home and Salkeid performed their valorous and daring act of carrying up bags of powder, under fire of the mutineers, and laying them before the gate; by which powder it was blown open, and access thus gained to the city, which till then seemed hopeless of attainment? These three last-named paintings are all modern Delhi work, are extremely interesting, and are very minutely and carefully executed. There are, likewise belonging to the same lady, a large work-box of the well-known sandal-wood carving, modern Ahmedabad manufacture; and a good eight-fluted tray, of tortoiseshell and gold lac, modern Japanese work.

Some fine specimens of ancient Chinese *cloisonné* enamel are lent by Lieut.-col. H. Hope Crealock; they consist of a pair of large vases and covers, of the usual turquoise-blue, supported on three elephants' heads of gilt metal; a square coffer, with gilt metal mounts; a large deep salver, ornamented with a dragon and birds, fluted on the inside, and the rim to correspond; a pair of perfume-burners, Chinese enamel, turquoise ground, and the well-known designs in bright colours; they are like old-fashioned high candlesticks (but with a hollow ball at the top instead of a socket), and are surmounted by a perforated cover of gilt metal; a magnificent vase, about 2 ft. 6 in. high, of the same costly material; a large circular platter; a pair of pricket candlesticks; an incense-burner, of the ordinary type; and two vases, with covers and handles.

Two very large incense-burners and covers, with gilt perforated panels, elephant-head supports and carved wood stands, are lent by Mr. W. Hogg; and an octagonal cistern, or font, was bought by the museum for 39l.

In the glass cases against the north wall of this Oriental department, are collected numerous curious and extremely interesting objects; of these I must only mention a few, namely, a book formed of twelve leaves of thin wood, covered with lacquer, the writing black, the ground gold, with red filiated ornaments and figures of gods, the leaves inclosed in outer boards painted red, with gilt ornaments; it is 21½ in. long by 3½ in. wide, and has a wrapper of coloured cotton fabric, stiffened with interwoven strips of bamboo, and a cotton bandage 12 ft. 4 in. long, into which is woven an inscription in the same characters as the book. It is Burmese work, and was bequeathed by the late Mrs. Boyd Miller. A book of fourteen leaves of thin wood, coated with lacquer, the lettering black, on red and gold ground, inclosed between outer boards, ornamented with birds and sun in gold lacquer on red ground, 21½ in. by 3½ in., and given by Lady Campbell, with another of sixteen leaves; a book formed of nine sheets of thin copper, coated with lacquer, lettering black on red ground, ornamented with gold lacquer, 22½ in. by 4½ in., Burmese work; and another of two sheets of thin copper, 22 in. long by 4½ in. wide, both likewise given by Lady Campbell. A sword, worn by one of the three Delhi princes who were shot when that city was taken, during the mutiny, is lent by Lieut.-col. Maizey.

In the same cases are some law-books of the Burmese, written in white on blackened paste-board; also some of their sacred books, written on palm-leaves. There is, in a smaller case adjoining, a little model in crystal of a tope, or spūlichaal mound, found within a tomb near Bhalis, Central India; this model is presumed, from various circumstances, to have contained a relic of Buddha himself, and to hear date from

about the Christian era. There are also two caskets of steatite containing relics of two leading disciples of Buddha, found in a sepulchral mound near Bhilsa; the assumed date of these is between the third and sixth century B.C.; but why the disciples' relics should have been entombed so many hundred years prior to that of their master is a mystery. It is strange that the earliest and latest epoch ascribed for the death of Buddha should differ as much as 1877 years, the former placing it in the year 2120, and the latter in the year 543 B.C. A recent writer says, that "the Tibetan and Mongol account, which fixes his birth in either 1022 or 1027 B.C., and his death in 912 or 947, may come very near the truth. Buddha was the son of Suddhōdana, King of Magadha, in South Behar; his name was Sarvāthasiddha, and the title of Buddha, or 'the sage,' was not given to him until he had attained eminent sanctity as a teacher of religion. Soon after his birth he was presented before the image of a deity, in accordance with the custom of the country, when the image inclined its head towards him as a presage of his future greatness. He early developed mental faculties of the first order, and was also remarkable for his great personal beauty." At the age of twenty, he married a noble virgin called Yasōdharā Dēvi, by whom he had two children, a son and a daughter, and he died in his eightieth year.

To return to the Museum and the models of sepulchral urns from which Buddha's history has drawn me away. In the before-mentioned glass case, and in addition to the urns already noticed, are one of Steatite, containing wood and bone ashes, found likewise in a sepulchral mound near Bhilsa, assumed date between 500 and 200 years B.C.; and a smaller urn, or casket, of black steatite found inside the last-named urn.

In the corresponding aisle across the South Court, and on the site where Elkington's beautiful Victoria Trophy stood when I commenced these "Notes," is now to be seen a glass case containing a collection of bronze statuettes by the late Baron Marochetti, and lent by the Baroness. Of these, I much like the well-known "Emmanuel Philibert," a spirited equestrian figure, fully armed, and with the right arm raised in the act of returning his sword into the scabbard. He was that hero-ancestor of Victor Emmanuel who did good service to Venice three hundred years ago, and through whom—as a modern poet sings in "Venice Free"—the present king of Italy claims rank among her nobles,—

"As heir to that good duke of Savoy's race,
Emmanuel Philbert, to whom the grace
Was granted, for himself and heirs, to be
Nobles of this fair city of the sea."

The statuette of a man seated, and holding a large tablet, on which is inscribed, "Il Statuto," has a very fine head. Close by, in a table glass case, is a frame containing fifteen unfinished miniatures by Samuel Cooper, together with the pocket-book, in which they have been preserved. They are lent by Mr. E. H. Lawrence, of Hampstead, and are very interesting to see. There are, too, a Bible, London, 1682, in the English binding of the time, tooled in gold and colours, lent by Mr. R. H. Drewett; the Diploma of the Order of St. Hermangilda of Spain, dated 1816, written and illuminated on vellum, the page where opened being very carefully painted. It is lent by Mr. Beresford Hope, as is the "Horse," Dutch MS., and of sixteenth century, with illuminations, those where the book is opened representing the Annunciation—large; and the small one the temptation of Eve, wherein Satan is depicted, with a human head and neck, but horned; the body of a bird, the legs and tail of a dragon, and with brown arms to match. There is a grand modern Russian Bible, bound in red velvet, which is covered with a sheet of silver gilt, enriched with five medallions of enamel, containing a figure of the Saviour and the Four Evangelists, set round with large diamonds, either real or imitation, and the central plaque surrounded by rays of glory in diamonds. It is lent by Colonel Campbell, R.A. Proceeding up the large double staircase in the west corner of the north court,—and which bears on its walls some of the cartoons that were sent in, in answer to the Government invitation, as designs for the decoration of the new Houses of Parliament, and were exhibited in Westminster Hall in 1843,—to the new "Ceramic Gallery," which already wears a noble aspect, and will be nobler still when its large columns shall be each encased in its intended shell of maiolica. Each column seems designed to be dedicated to one world-famed potter. On those

already completed we read the names of Luca della Robbia, Palissy, and others, and where they appear, the cases contiguous contain the work of their hands and of their time. It is impossible to pass through the gallery, however hurried one may be, without being compelled continually to stop and gaze; for instance, at the terra-cotta bust of Flaxman, by himself, dated 1778, bought for 10*l.* 1*4s.*; the Wedgwood black basalt vase, with two square handles, cover, and pedestal (the base bears, in relief, a concert of Cupids, date about 1770); a statuette of the Farnese Flora, at Naples, Bow porcelain, ascribed to John Bacon, R.A., late eighteenth century; a female head, bundle to cane, middle of eighteenth century; a vase and cover, of Italian Faenza, height 24 in., cover formed by six trefoiled arches, date about 1480, bought at the sale of the Soulages collection for 80*l.*; a plaque of the Resurrection, with six guards, instead of the conventional four, Christ bearing a banner, and his feet supported by three cherubim, date about 1600 to 1610, very carefully drawn and coloured, price 12*l.*; a jug, with girl's face projecting in front, so realistic as to be quite startling, date about 1480, price 12*l.*; a plaque, Virgin and Child, under a slightly Gothic arch, dated 1489, price 14*l.*; a plate from the Bernal collection,—on it St. George standing with his shield, after Donatello's statue, 6*l.*; a fine plate, bought from the Soulages collection for 50*l.*; a procession of six warriors bearing banners; it is dated 1520. The manner in which this and other plates are exhibited, so as to show both back and front, is very thoughtful and ingenious too. It is interesting to see the real signatures of the various masters in their craft; indeed, I might say the "various signatures." One plate close by is signed "Ma. Go. de Ugubio," and dated 1526; another, "da gubio," 1526 also. Of the Sgraffiato, or incised ware, there are several specimens ranging from 1470 to 1694.

Next comes the small case of Henri-deux ware, only five pieces, but still a grand collection, and which cost the Museum the modest sum of 1,820*l.* This peculiar ware is likewise called "Faience d'Oiron," from Oiron, near Thouars, where it was made. The pieces consist of a noble high candlestick, price 750*l.*, date 1541; a large plate, 140*l.*, date 1535; a pedestal salt-cellar, 300*l.*; tazza and cover, 450*l.*, date 1535; and a tazza inlaid with black, 18*l.* In lustred maiolica there is a plate, with a pretty girl on it, from the Soulages collection, which cost 100*l.*; the bust is in natural colours on blue ground powdered with gold stars, and bears an inscription, "Amato chi me amato." A very early specimen of dated lustred ware is a plaque bearing a bas-relief of St. Sebastian, in a Renaissance niche, and below it "ADI 14 DELVGLIO 1501."

A plate with fluted border, date about 1540, bears a representation of the Laocoon; it is seen as three separate figures, not bound together by the snakes, as the group now is; a restoration of modern times; thus helping to confirm the opinion that it was not so intended by its classic sculptor. A very fine plate of maiolica from the Soulages collection, and which cost 200*l.*, bears a bust inscribed "P. Perugino." The green border has on it medallions of birds charmingly painted in their natural colours; and on another plate is represented a maiolica painter in his *al-fresco* studio painting, in the presence of two persons of distinction, on a plate he holds in his hand. On a low stool are ranged his colours and brushes, and a curtain of deep blue forms the background. It is thought to be Caffaggiolo manufacture, and the date about 1515. The price was 150*l.* An earthenware plate of lustred maiolica, dated 1537, which was bought for 24*l.*, has an interlaced Arabic pattern in white, heightened with lustre tints on black ground, and is also by Maestro Giorgio.

Ere we leave the gallery we must just glance at the specimens of oil-painting on earthenware, which was an Italian fancy of the seventeenth century; and at the very fine collection of Oriental porcelain.

Descending the handsome maiolica staircase and turning to the left, we come into the court of metal-work, and here, placed somewhat high up, but in a prominent position, hangs the noble mirror in frame of silver *épousés*, lent by her Majesty. It is of large size, and is ornamented with festoons of fruits and flowers; at the top is a shield bearing the cipher of King Charles II. It is English work, date about 1670, and is a right regal mirror.

Retracing our steps, we pass through the "food department" into the library corridor, in which are placed the plaster busts of noteworthy men; here and elsewhere about the Museum these busts, so far as I have been able to number them, amount to seventeen or eighteen; they are inscribed with the name, date of birth, and death of their subject, and are very interesting and instructive so far as they go; but there was a much more extensive collection at Sydenham in the olden days of the Crystal Palace, and I would venture to suggest to the authorities at South Kensington, that it would be a little money well spent to get *replicas* of all the known and credited busts, there and elsewhere, of men and women worthy to be had in honour and held in remembrance. To those who cannot see these worthies in the flesh, it is most desirable and advantageous to be able to gaze upon their counterfeit presentment. And now, having arrived at the entrance of the Museum, it must prove an *exit* to me; for I must, with great regret, discontinue my "Notes" at South Kensington. In doing so, I beg leave respectfully but earnestly again to bring before the notice of the authorities the name I have suggested for our beautiful Museum. Since I have made bold to use it now for a period of five months, no better name has been proposed, and therefore I venture to think no more appropriate—and I am sure no *better* name—than the Albert Museum can be found, and so I commend it once more to their august consideration.

ART-LOVER.

THE STYLE OF THE PROPOSED LAW COURTS.

Sir,—In passing through Paris on my return from Rome, I have just taken up a number of *Galignani's Messenger*, and I there see it stated that "It has been announced in Parliament from authority that the style of architecture to be adopted for the new Law Courts is the Venetian Gothic." Is it too late to stop this instruction from being acted upon, or modified, or explained? Has Parliament no power to prevent another example of, or repetition of, Lord Palmerston's folly in St. James's Park, the laughing-stock of all educated people all over Europe. Is not one such piece of folly enough for one generation? Must we always go on advertising the ignorance of our statesmen of a subject which they ought to understand? The architecture of every nation is a part of its history. The English nation is a great nation and has long been so. It has a grand and magnificent style of architecture of its own which grew with its growth, was developed along with its civilization, of which it is a part and a standing proof. It shows that the English nation was in advance of other nations at the time when the most genuine, the most real, and the finest style of architecture that the world has ever seen, was developed among us. If it was not actually brought to perfection within the British Islands (as I believe it was), it clearly was within the dominions of the Crown, or of the King of England. At that period one-third of what is now France was under the dominion of our kings, Henry II. and Richard I., whose dominions by inheritance included the whole of the west of France and a great part of the south, the old Roman province of Aquitaine. The eastern part of what is now France was then part of the German Empire, as it remained for centuries after that period; and that part was so much behind the rest in civilization, that it is out of the question to look there for any advance. The *Domäne Royale* of the king of France was more advanced than other parts of Gaul, but not ahead of the English; it trod close upon our heels, but we always kept the lead.

The choir of Lincoln Cathedral, built in A.D. 1192—1200, is the earliest building in the world in which our national style was fully developed in all its purity, and this was the style of the great diocese of Lincoln at that period. It was not an isolated example; but the earliest to be brought to perfection. Other buildings in that diocese approached it very closely. The French had no building equally advanced in style for more than twenty years afterwards.

But what is meant by the "Venetian Gothic style?" I suppose it is the style of the palaces of the Venetian merchant princes on the Grand Canal, the admiration of the Russian court. They are very pretty toys, a series of *shams*,—merely fronts, and nothing else!

There is nothing behind the front wall to correspond with it in any degree, and they were

erected for the Venetian merchants of the time of our Elizabeth and James I., in imitation of the English style of the thirteenth and fourteenth centuries,—imitations at second or third hand. Very pretty things in their way, because any tolerable imitation of the English style of that period must always be pretty; but what folly it seems to send our English architect to Venice to study their petty imitations of our own national style, instead of sending them to the originals, to Lincoln and York, and Salisbury and Wells, or even to Oxford and Cambridge, for the later examples.

The colleges of Wadham and Jesus in Oxford, and several of the Elizabethan and Jacobean colleges in Oxford or Cambridge, are of a better style of architecture than the Venetian palaces, because more genuine and real, and are more suited to our wants and our climate.

The architecture of Italy ever since the year 1000 has always been a century behind that of the Western nations. The Italian architecture is the worst in Europe, and difference of climate must always make it unsuitable for England. What is good for the one cannot be good for the other. Strictly speaking, the Italians had no style of their own. The Romans copied the Greek buildings, and the Mediæval Italians copied the Roman works of the Empire, and used up the materials, until they were at last exhausted; and then at a very late period they imitated the style of the Western nations.

I have drawings of the architectural details of the Venetian palaces, with the dates upon them, made for me on the spot years ago. Most of the dates are taken from inscriptions on the buildings themselves, so that there is no disputing them, and they are all of the sixteenth or seventeenth century.

Unfortunately, the leading facts of the history of architecture are unknown to the greater part of our educated classes; well informed as they are on most subjects they have never given their attention to this. They have travelled much, but with their eyes shut in this matter for want of a little preliminary information. Our schoolmasters are entirely ignorant of the subject, and they cannot teach what they do not know. The words of Professor Goldwin Smith should be dinned into the ears of every schoolmaster in England. "The buildings of every nation are an important part of the history of that nation, and a part that has been entirely neglected by all historians, because the historians themselves have been entirely ignorant of the subject." Why are they ignorant of it? Because the subject has never formed part of the English school education, as it ought to do. Happily a change has begun, but it makes slow progress at present; it has begun in the first-class ladies' schools, and it is now a good test whether a young lady has been educated in a first-class school or not to see whether she knows anything of the history of architecture or not.

Our young men will soon be ashamed of giving their whole time to gymnastics, taking care of their bodies and neglecting their minds altogether, and will not like to find their wives and sisters better informed than themselves on a subject which they discover they ought to know. It unfortunately happens that although our higher classes travel more than those of any other nation, and ought, therefore, to be better informed, they trust implicitly in this matter to "Murray's Red Books," called on the Continent the "Englishman's Bible," and their trust is misplaced in this matter. The *archæology* of the whole series of handbooks belongs to the time of George III. and Napoleon I., the date of the books from which the handbooks were originally compiled; and this part has never been corrected since, because the venerable editor was himself educated in the days of George III., and cannot shake off the ignorant prejudices of his youth. English travellers are lamentably misled in this manner. For instance, they are taught to believe that the buildings of the Pisan style of architecture, a very remarkable, original, and beautiful style, are contemporary with our Anglo-Saxon belfry towers of the eleventh century, instead of what they really are, contemporary with our Salisbury, and York, and Lincoln, our glorious English style of the thirteenth century. Take the cathedral of Pisa itself as an instance of the usual sort of blunder, the date of the original building is given as that of the existing structure. This is not exactly false, but it entirely misleads beginners in the study; the original building *does exist* in the middle of the existing fabric, but it has been added to in all directions, in length, in width, in

height, so that it is difficult to make out the original part. All that is visible is of a much later period. The nave has been lengthened one half, and the beautiful little light arcades and colonnettes at the end of it, all belong to the late work, the thirteenth century. All that people understand by the Pisan style is of that period.

It is possible that the Doge's palace is intended to be taken as a type of the Venetian Gothic style. If so, I have a word to say on that subject also. The only good and valuable part of that building is the arcade, which forms the substructure; this is assigned by Murray to the fourteenth century, and is in the style that would be of that period in England. Possibly it was begun at the end of that century, but the greater part of it is certainly of the fifteenth, as is shown by the costumes of the figures carved in the capitals, and at best, the celebrated arcade is a copy of similar arcades in England a century earlier. The whole of the upper part of the palace is of the seventeenth century, or the end of the sixteenth, rebuilt after the Great Fire on a totally different plan from the original building, as I showed years ago by engravings of the two for comparison. The original design had much merit, great boldness, and variety of outline, and the arcade supported only a fine balcony in front of the building, the wall being at the back of it. After the fire, the wall was brought out to the front of the arcade, and was built up as flat as a sheet of cardboard, with holes cut out of it for windows, at intervals varying in distance, according to convenience. The front is decorated with an imitation of the brickwork so much in fashion in the seventeenth century in Italy, the beautiful terra-cotta of Lombardy, which might well be copied in London. Singularly enough, it is imitated in Venice in pink marble, the whole front of the Doge's palace being veneered with a thin coat of pink marble, cut into the form of bricks, but rather larger.

Possibly our authorities intend our architects and builders to introduce really fine terra-cotta into London; if so, they may do an excellent thing; and if they propose that the surface of the wall of the great public building shall be veneered with glazed tiles of the Milton fabric, well cemented into a wall of concrete, after the fashion of the Roman emperors, that may be also a good and convenient mode of building in London; and if the cement is good, that is, if the lime is quite fresh, or has always been kept in air-tight vessels until required for use, and then used the same hour that it is opened, such walls are everlasting: they are as solid as natural rocks, and are impervious to sound, which is another great advantage. Possibly, also, what is intended in the way of taste is to copy the beautiful wavy lines adopted at Venice, chiefly of the form technically called the *ogee*. This agrees with Hogarth's line of beauty, and so far is an excellent recommendation.

Perhaps the authorities will condescend to explain that this is what they really do mean. If so our architects need not go to the sunny South to study these beautiful forms; we have scores of examples remaining in England of the originals, not copies only. If the construction of the Roman Empire is recommended to be followed (as I should recommend), we have plenty of walls of the Roman Empire remaining in England, without going to Italy for them. The construction of the Venetian palaces is by no means good, not nearly so good as that of the great hospital at Milan of the same period, and not better than that of our own Elizabethan buildings. Our young architects should be set to walk all over England, Scotland, and Ireland, and may thus learn every variety of construction and of style, from the rudest and most barbarous to the best, without any need to cross the Channel. Buildings which have grown up by instinct in our own climate are in general much better suited to that climate than those of any other climate, and the taste and skill of the English architects of the thirteenth, fourteenth, and fifteenth centuries have never been exceeded by those of any other country. On the contrary, those of other countries have all learned from us,—first the French, and from the French other nations, but after a long interval.

It is probable that our authorities received their own educations in Oxford, before the Oxford Society for the Study of Gothic Architecture was established, and before the great revival of taste began. We now see the results of that revival in our churches. Let any one com-

pare the churches in England of the present time, or in the last few years, with those of thirty years ago, and he cannot deny the immense improvement in every way. But the public have not yet learned that the same genuine old English style of building is just as applicable to public buildings of all kinds, or even to private houses, as to churches. The purpose for which a building is erected necessarily governs the plan, but not the style of ornament, nor this mode of construction. The windows of the hall of the Bishop's Palace, at Wells, built about A.D. 1200, are as fine windows as any at Venice; those of many of our Mediæval castles are equally good, without any reference to the chapels, or the churches connected with them, and the construction of many of these buildings is as good as it can be. For types and models for buildings of any kind, we have still abundance of examples remaining. The city of Wells alone affords a series. We have there, in addition to the fine cathedral, with its remarkable sculptures (the finest of their period in the world), its chapter-house, its cloister, with the library over it: the houses of the bishop of the thirteenth century, the archdeacon of the fourteenth, the dean of the fifteenth, the canons, the preceptor, the organist, the singing men, and vicars choral, all of the fourteenth or fifteenth century, and all sufficiently perfect to be made out by an architect, though sadly mutilated by the ignorance of the persons who reside in them, and much of this mutilation is daily going on. At Lincoln, at Salisbury, at York, at Ely, and Worcester, and Gloucester, and many other places, we have the houses of the members of the cathedral chapter, and their halls, more or less perfect, all sufficiently so for study. Here is the field to which our young architects should be sent to study, and to find buildings suitable for our wants and for our climate.

JOHN HENRY PARKER, Hon. M.A., Oxon.

THE ROMAN PAVEMENT NEAR THE MANSION HOUSE.

DR. SAUNDERS writes that 33,000 persons visited the Roman pavement at the back of the Poultry on Thursday, Friday, and Saturday last. Thanks to the arrangements made by Mr. Bart, the contractor, all were able to see this interesting relic in safety and comfort. By letting the visitors enter at one door, pass round the excavation, and out at another, all confusion was avoided. The pavement seems to be about 16 ft. below the present general level of the surface, and is wonderfully fresh in appearance. It is of a bold type of geometrical pattern, scrolls, circles, and interlaced squares; no animals or figures of any kind; the tesserae are of five colours,—black, white, yellow, red, and grey. It rests on concrete. The shape of the pavement is a parallelogram with a circular end, and it would seem to have been always under cover. Adjoining is a well, formed with square blocks of chalk. The pavement, we are told, will be carefully removed to the City Museum, where it will always be visible. Viewed in the excavation, the making of which led to its discovery, the interest it excites is great. Looking down into the hole, there it lies fresh and bright as when it was first put down, perhaps in the vestibule of a house occupied by some Roman official. What a story it tells, what reflections it excites, trite but none the less striking. At least 1,500 years have passed away since it was placed there: what were the habits and manners of the people who passed over it? It speaks of fires, more than one; of the fires of the Danes probably, and the fire of 1666, which serve to explain the rise in the general level: and it affords a text on which might be hung the whole history of London. It is to be hoped that some pains will be taken to trace, if possible, the remaining walls of the building to which this speaking pavement belonged.

The Northumberland Vase.—Among the many valuable articles either spoiled or destroyed at the fire in Northumberland House in October last, when the roof of the grand ball-room fell in, the Sèvres Vase, presented by Charles X., upon the occasion of his Majesty's coronation, to Hugh, Duke of Northumberland, then ambassador extraordinary from Great Britain to France, was shattered into fragments. Mr. Daniell, of New Bond-street, has now effected its complete restoration, so that the eye can scarcely detect the slightest trace of injury.

CORNISH HILL-CASTLES.

IN the present paper, I shall confine my remarks exclusively to the hill-castles in the Land's End district, Cornwall, reserving for a future opportunity an examination of those in the central and eastern divisions of the county.

This district, of small extent, is bounded on the east by an imaginary line drawn from Lelant Church southwards to Cuddan Point, on the eastern confines of Monn's Bay, and in other directions by the sea. Within the peninsula thus defined, of about twelve miles in breadth from east to west, there are no less than seven hills crowned with British fortifications, all of which, however, have more or less suffered from the ravages of time.

Without doubt the fortress of Chûn, on the summit of a hill overlooking the Atlantic and the mining operations at Bosallack, is in better preservation than the other hill-castles in the neighbourhood, if not in the entire county; and it is consequently an object of very great interest to the archaeologist. In the face of this, it is sad to see the continual deprecations now being made on its ruined walls merely for the sake of the smaller stones, which are generally used for building hedges, barns, and other houses on adjacent estates. So much has Chûn Castle fallen a victim to these spoliations within the last century, that some of its most striking peculiarities that were easily recognised in Borlase's time, cannot now be traced, and would probably have been entirely unknown had it not been for the labours of that indefatigable antiquary.

The plan of the castle may be thus described. First a ditch, 20 ft. in width, extends round the fortress. Then two concentric walls—the space between them forming another ditch, 30 ft. wide, which is now partially covered in with loose stones from the walls—enclose a central area approximately circular, although in reality a slight ellipse, the major axis measuring from east to west 125 ft., and the minor axis, from north to south, 110 ft. These walls are formed of dry-stone masonry, *i.e.*, a collection of loose granite stones heaped together with some attempt at order, but without the aid of cement. This class of work is found in many of the hill-castles and other primitive Celtic dwellings. Some good specimens of its general appearance when in a perfect condition may be seen near the outer entrance on the external face of the wall. The height of the outer wall is now on the average only about 7 ft., whereas Borlase considered it to have been at least 10 ft., and the inner one 15 ft., high. This decrease in height can be easily explained by the deprecations alluded to above. In thickness, the outer wall is 6 ft., and the inner one 12 ft. The continuity of the second ditch was broken by three transverse walls dividing the circular space into equal portions. Two of these cannot now be easily traced, although probably almost perfect in Borlase's time.

In the interior of the castle, according to the description of Borlase, was a third concentric wall of less strength, about 30 ft. from the inner wall. This space was subdivided into compartments by lines radiating from the centre of the interior area; and, although there is uncertainty as to whether these enclosures were originally roofed or not, they are supposed to have served as the habitations of those whose duty it was to reside within the fortress. Within the present century the principal traces of these compartments have unfortunately disappeared. On the north side of the central area within one of these enclosures was a well, but this seems to have become choked up, and hidden from view. At any rate, I was unable, on my visit last year, to discover its exact whereabouts; but I find that Mr. Halliwell was more fortunate in 1861, for in his work detailing his Cornish experiences, he says that the well was then visible, although the steps noticed by Borlase as leading down into it had fallen in.

The entrance to the interior of Chûn castle affords a remarkable instance of the military ingenuity of the old Britons. The opening through the outer wall faces the W. S. W., and on both sides is bounded by immense slabs of unworked granite. Thence, turning to the left, a passage nearly 40 ft. in length conducts us to the opening through the inner wall, where two jambs, each about 5 ft. high, still remain on the innermost side. This second entrance has a due west aspect, and measures in its widest part 16 ft., and in its narrowest 6 ft., spaying outwardly. For further protection, another wall was built from the right-hand side of the outer

entrance to within 3 ft. of the inner wall, where it turned at right angles towards the inner entrance. Besides this, one of the three transverse walls before mentioned was so adjusted as to extend from the left-hand side of the inner entrance to the outer wall. It has been truly remarked by Borlase that "the whole of this work, the neatness and regularity of the walls, providing such security for their entrance, flanking and dividing their fosse, shows a military knowledge superior to that of any other works of this kind which I have seen in Cornwall."

The next fortress I shall describe is that called Castle-an-dinas, on the summit of a hill in the parish of Ludgvan,* 735 ft. above the sea-level, and, with the exception of Carminis Hill, north-west of Towednaek, the highest spot of elevated ground in the district. The hill on which Castle-an-dinas stands is easily recognised from others by a modern building on its summit, in the Gothic style, generally known as Rogers's Tower. This watch-tower, or "folly," was erected many years ago by one of the ancestors of the present proprietor, Mr. Rogers, of Penrose, apparently of stones taken from the encampment; but from want of repair the entire fabric is now in a very dilapidated condition, and will probably before many years hence be in utter ruins. The description that Borlase has left us of Castle-an-dinas is full of interest. He says:—

"It consisted of two stone walls, built one within the other, in a circular form, surrounding the area of the hill. The ruins are now fallen on each side of the walls, and show the work to have been of great height and thickness. There was also a third and outermost wall, built more than 100 ft. from the inner wall, and was left unfinished. Within the walls are many little enclosures of a circular form, about 7 yards diameter, with little walls round them, of 2 ft. or 3 ft. high. They appeared to me to have been so many huts erected for the shelter of the garrison. The diameter of the whole fort, from east to west, is 400 ft., and the principal ditch 60 ft. wide. Towards the south the sides of this mountain are marked by two large green paths, about 10 ft. wide, which were visibly cleared by art of their natural roughness for the more convenient approach to this garrison. Near the middle of the area is a well, almost choked with its own rungs; and, at a little distance a narrow pit, its sides walled round."

All traces of this well have now disappeared, besides the circular enclosures mentioned in the foregoing extract. The outer wall is now about 12 ft. in thickness, and 5 ft. high; while of the inner wall scarcely a vestige remains, save its foundations, which are 12 ft. thick. The central area, bounded by the inner wall, has a diameter of about 180 ft.

About 1780 some relics were found within the inner circle of Castle-an-dinas. Among these were two granite blocks shaped like weights, with holes near the top of each, through which probably a rope was passed. One weighed 17½ lb., and the other 3 lb. 1 oz. They both bear a striking resemblance to weights dug up in 1756, at Bossens, in the neighbouring parish of St. Erth, which are engraved by Borlase in his *Antiquities of Cornwall*, plate xxviii., and in the *Phil. Trans.*, 1759, part I.

The castles of Caer Bran and Bartinney are on adjacent hill-tops west of Sancreed church-town. The former consists of an outer vallum of earth, and an inner wall of stone. The outer vallum sometimes attains the height of 15 ft., and is protected on each side by a ditch, so that there is an interval of 20 yards between the inner wall and the outer ditch. This wall formerly had a general thickness of about 12 ft., and enclosed a level area of about 70 yards in diameter. Near the centre of the encampment are the ruins of a circular enclosure possibly of a later date than the rest of the work. Only portions of the inner or stone wall now remain, the principal part having been destroyed within the last century for the sake of the stones. According to Borlase, the wall extended round the summit of the hill, and was in a perfect condition about the middle of the last century.

Bartinney Castle consists of a single vallum, but what now remains of it is almost entirely overgrown with furze. The circular enclosures in the interior, however, can still be traced; one has a diameter of nine yards, the other two only seven. This fort is 689 ft. above the sea, and is remarkable as being the only spot in England where the sun can be seen to rise and set in the sea on the same day, December 21st.

Treobhen Hill, between Castle-an-Dinas and Lelant Church, and Castles Horneck and Pencudjack, in the immediate vicinity of Penzance, were also the sites of British encampments. That on Treobhen Hill is in a fair state of pre-

servation, of an irregular plan, and occupies the entire summit.

It seems probable that these and similar hill-castles in Cornwall are the work of the aboriginal inhabitants, who thus sought to defend themselves from the attacks of their foreign foes. Although this is now the general belief of those who have paid particular attention to the subject, yet some of the antiquaries of the last century ascribed these works on the hills to foreign invaders rather than to the native Celts. Thus Polwhele, the historian of Devon and Cornwall, attributed them to the Irish; while Borlase thought them to be of Danish construction. Carew (about 1600) had adopted the latter idea when he wrote "And divers round holds on the tops of hills; some single, some donh, and treble trenched, which are termed *Castellan Denis* or *Danis*, as rayed by the Danes when they were destyned to become our scourge." But such a statement as this only shows how careful we should be before placing much faith in conclusions founded on the mere similarity of names, for it has since been shown that the word *denis* or *dinas* in Cornish signifies a bulwark or fortress; thus confirming the supposed original purpose of these so-called castles on the Cornish hill-tops, but destroying the theory that the Danes ever had a hand in constructing them.

E. H. W. D.

MEDALS AND PRIZES: INSTITUTE OF BRITISH ARCHITECTS.

The silver medal of the Institute is to be awarded to the author of the best essay on the following subject:—"On the best Principles of Arrangement for a Town Church, having reference to the usual Difficulties of Lighting." The Same medallion will be awarded for the best design, well illustrated by a sufficient number of drawings, for "A Metropolitan Railway Station of the dimensions of that at Charing Cross, showing the architectural treatment of the façade towards the Thames Embankment, and of the interior of the terminus shed, where the roof is required to be in one span."

Mr. Tite, M.P., president, offers a prize of fifty guineas to the author of the best set of architectural drawings, illustrating "A Design for the Treatment of the River Front and existing Terrace of Somerset House by any Alterations or Additions to the same, not destructive of the general character of the building, and connected with the Embankment-road now in course of formation, so as to produce the best architectural effect when seen from the Embankment-road and the river."

A list of other medals and premiums offered, with the conditions, is published, and may be obtained at the rooms of the Institute.

A FOUNTAIN FOR STOCKHOLM.

At the Stockholm Exhibition of 1866 M. Molin, who is a professor at the Swedish Royal Academy of Painting and Sculpture, exhibited the model of a design for a fountain which attracted some attention. This is now about to be executed in bronze (we should prefer it in marble) for erection in Stockholm, and we have engraved a view of it taken from the model. It is only fair to say that the sculptor contemplates revising and working on it some time before it is cast. The height of the fountain is 30 ft., the width 20 ft. The figures which form the pedestal and give the work its distinctive character illustrate a portion of the Northern mythology. The youth playing on the harp, and seen in the view, is the god of floods, lakes, and other inland waters, known as Næcken. Behind, and not seen in the engraving, is Agir, the terrible god of the ocean, with his wife, so to call her, the deceitful goddess Ran, who has a veil for her face. The other female figures represent their more or less gracious daughters, characterizing different waves. The belief is that, approaching for the purpose of carrying away the Næcken, as the Naiads, according to the Greek mythology, served Hylas, they, hearing his song, became enchanted and unable to execute their intention.

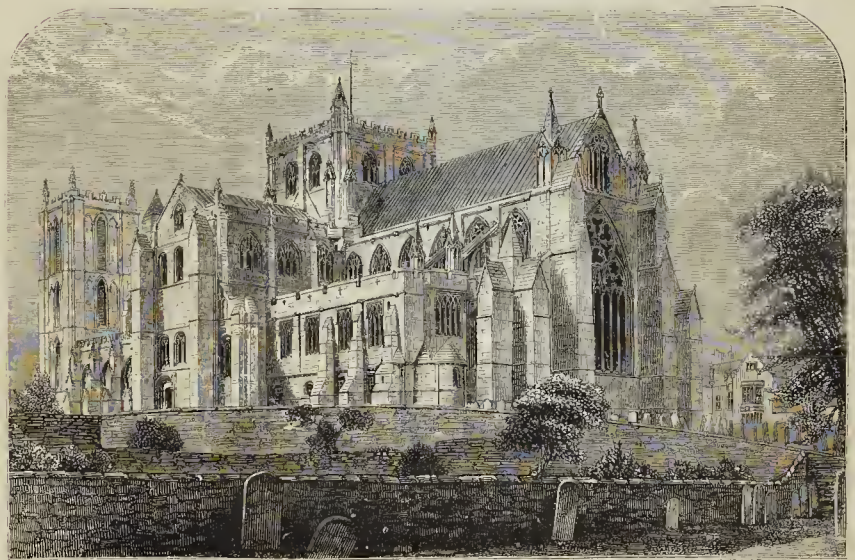
The figures, for the most part, are admirably modelled, and display considerable fitness and beauty.

Architectural Association. — On Friday evening, the 14th, Mr. G. H. Birch read a paper "On London, from the Sixteenth to the Commencement of the Eighteenth Century."

* Not to be confounded with a fort of the same name in the parish of St. Columb Major, in Eastern Cornwall.—E. H. W. D.



YORK CATHEDRAL: SOUTH-EAST VIEW.



RIPON CATHEDRAL: SOUTH-EAST VIEW.



FOUNTAIN FOR STOCKHOLM.—M. J. P. MOLIN, SCULPTOR.

HYDE PARK-CORNER FLORAL DISPLAY
AND KNIGHTSBRIDGE BARRACKS.

ALTHOUGH the hortalan decorations, extending from Apsley House to the Serpentine by Albert Gate, meet the approval and excite the admiration of the public, some murmurings have been uttered about the obstruction of view caused by plantation of flowering shrubs behind a mean range of houses in Knightsbridge.

A waste and squalid margin of about 80 ft. wide, extending 320 yards to Albert Gate, alongside the Drive, backed by a dingy wall and nineteen antiquated shops, has been decorated with varied mounds of pure verdure, and furnished with a gorgeous bloom of flowering shrubs; the opposing park border, and the hitherto waste dell at the Serpentine falls, have been adorned also with flowers, shrubs, and rockwork, in a style that reflects credit on the hortalan taste of the park managers; and yet five of the occupants of the park tenements, which are a blot upon the park surroundings, complain that their view of the promenade is obstructed by flowers! One householder and shopkeeper on the opposite side of Knightsbridge-road also joins in the outcry, and, with a deputation, waited upon the Chief Commissioner, who promised to consider their statement.

Now, as this selavage of waste, extending to Knightsbridge Barracks, was always a nuisance and a disgrace to the park, and especially as it has now become the most fashionable resort for promenaders along the Ladies' Mile, its reclamation and adornment have realized a great public benefit; and, in fact, the total exclusion by forest plantation of the Knightsbridge row would be a mercy to the frequenters of the walks, as well as to the crazy old tenements. It is true that there are two structures of more than ordinary pretensions on the line,—the mansion of the French embassy and a chapel of ease; but these do not complain, as, being of lofty proportions, they are rather benefited by a landscape garden, whilst the humble sheds (two of them only 10 ft. wide and 8 ft. high) are somewhat screened and protected from contempt. Indeed, this whole range, which is church property, and, like it in most cases, is in a ruinous, neglected, and disgraceful condition, ought to be wholly cleared away, together with Knightsbridge Barracks, and give place to buildings of better character, and more suitable to a site which ought to be the most valuable in London, but which is now in a disgraceful state, with its gin-shops and tenements that would have been a discredit to old St. Giles's.

There is abundant room for cavalry barracks close to the new Foot Guards at Chelsea; and mounted squadrons might surely make those quarters as easily as infantry. The accommodations at Knightsbridge are notably bad, as evidenced before in the *Builder*; and that district, which from position is the best in the metropolis, stands in the very worst repute, on account of the numerous public-houses, casinos, and other questionable refuges; but still, there are good dining-halls and reception-rooms for the Horse Guard officers, which command the richest views of park and gardens, and these, of course, will not be easily relinquished; for domestic and figurative soldiers require more of urban pretence and solace than campaigners of the line.

A great and invaluable public advantage would be completed by the transformation of all these park borders, and the high officials of our time who regard these concerns with a more national view will most probably persevere in improvements so earnestly begun. T. H. H.

EXHIBITIONS.

The South Staffordshire Exhibition at Wolverhampton.—The removal of the platform upon which the ceremonial of the opening took place, and the re-arrangement have added to the attractions of the interior of the main building. How the colouring and lighting add to the effect of the general arrangement of all the parts of the building are best seen in and from the gallery, which forms a good place for pictures. The success which attended the inauguration was considerably augmented by the large number of respectably clad artisans, who, with their wives, availed themselves of the privilege of visiting the Exhibition, after four o'clock on the opening day, at the charge of one shilling each. The day was observed by the majority of the tradesmen, and by many of the large employers of labour as a general

holiday. The receipts in money taken after the hour named, amounted to upwards of 30*l.*, representing a total of more than six hundred visitors. Since the opening day, however, the attendance has not been so large as the promoters were justified in anticipating, but it was the week before Whitantide, when both masters and men were busy at work preparing for the annual holiday. Notwithstanding these and other drawbacks the Exhibition has been well patronised, and many hundred artisans have found there a means of recreation and instruction. As an additional attraction the committee have arranged that a series of concerts and musical performances shall take place daily in the main building, and also in the grounds outside. The first of the series has taken place, and has proved a success.

The Industrial Exhibition at Charlwood.—This exhibition has been opened. The working men, women, girls, and boys in the following parishes and districts have contributed to it, namely,—Burstow, Charlwood, Crawley, Crawley Down, Horley, Ifield, Leigh, Ruspur, Newdigate, Sidlow, and Worth. The collection is multifarious, including works in straw, baskets, rustic seats, models, works in wood, drawings and paintings, stuffed birds, all descriptions of needlework, turnery, sticks for tying flowers, &c. &c. As an additional attraction, articles have been added in gifts by tradespeople and wealthy residents in the neighbourhood. On the opening day half a crown was charged for admission, and most of the *élite* of the neighbourhood visited the exhibition. There are altogether about 500 exhibitors, and 1,000 different articles exhibited, and three classes contrihuted to the exhibition,—first, the working classes, who sell for themselves; secondly, those who are exhibitors only; and thirdly, the upper classes, who exhibit and sell for the benefit of the exhibition.

THE TRADES MOVEMENT.

Bristol.—At a general meeting of the masons "for the purpose of hearing the opinions of the employers of masons, expressed by them individually, in respect of the changes required by a portion of them forming the Bristol Branch of the Associated Masters," the resolution passed by the masters at their meeting of the evening before was read and discussed, and the following resolution was unanimously adopted:—"That, the masters having closed all further negotiations and thrown down the gauntlet, and determined to enforce their original notice at the expiration of the month's adjournment, we accept the challenge, and resist to the uttermost all and every infringement of the existing working rules of our city."

Sheffield.—A meeting of the master builders has been held, at which, after some discussion, they came to a determination that it was necessary to draw public attention to a letter which had appeared in that morning's *Independent* from Mr. C. Cornish, in which letter several employers were mentioned as having commenced work under the old rules. In answer to this letter, the masters desired the public to be informed that, with the exception of Mr. Milner, they had been compelled to recommence work, in consequence of the pressure which had been put upon them by those for whom they were building. They did not wish it to be understood that they countenanced the old system.

Bolton.—The questions in dispute between the employers and operative joiners and carpenters were laid before Mr. Pope, recorder of the borough, for arbitration. Six employers and six operatives represented the respective sides of the case. The following are the terms of the settlement agreed to:—The men are to work 5½ hours per week at 30*s.*, the time to be reckoned as follows: 20th Oct. to 20th Nov., 6.30 to 5.30, 7*d.* per hour; 20th Nov. to 20th Jan., 7.30 to 5.0, 7*d.* per hour; 20th Jan. to 20th Feb., 6.30 to 5.0, 7*d.* per hour; 20th Feb. to 20th Oct., 6.0 to 5.30, 6*d.* per hour.

The Colliers on Strike.—The novel sight of men being escorted to and from their work by bodies of police is extending itself, and is to be witnessed not only in Yorkshire, but also in Lancashire. The men employed by the Tyldesley Company at their collieries near Manchester have been on strike for some weeks against a reduction of wages, and a number of colliers have been brought from Staffordshire to take their places. On their arrival they were vigorously attacked by the men on strike, and a large force of police has to be kept at the collieries to protect them.

The Trade-Unions Bill.—The various trade societies have determined to hold an aggregate meeting of trade unionists of London and the provinces in Exeter Hall, on the 23rd of June next. Mr. Samuel Morley, M.P., has consented to preside on the occasion, and Mr. Mundella, M.P., Mr. Harrison, and others will be present. The subject of the Bill has been warmly taken up by the various trade societies in the provinces, and at Carlisle, Warrington, Leeds, Burton-on-Trent, Northampton, Cheltenham, the Potteries, and, in fact, in most of the leading towns meetings have been held, at which it has been resolved to use every means to support the Bill now before Parliament, which has been introduced by Mr. T. Hughes and Mr. Mundella. In Birmingham, so desirous are the working men to give all the aid in their power to the measure, that the second annual Congress of Trades Councils and Societies, which had been announced for the 21st of June, has been postponed until the 23rd of August. In Glasgow and Greenock the same feeling prevails and has been expressed by the working men. In Dublin the strongest approbation of the Bill has been expressed, and at a public meeting held there, it was resolved to send deputations to wait upon the twenty or more members of Parliament resident in that city and neighbourhood to urge them to support the Bill. A large number of delegates from all parts of the country are expected to be present at the large meeting in Exeter Hall, which is to be held under the direction of the London Conference of Amalgamated Trades.

COMPETITIONS.

Bedford Public Baths Company.—We understand that the directors of this company have selected the plans furnished by Mr. Walter Robinson, of Furnival's inn, Holborn. There were twelve competitors.

The Proposed New Town-hall and Corn Exchange, Wareham.—Two architects competed for this building, Mr. C. R. Crickmay, Weymouth, and Mr. J. T. Lacey, London. Mr. Crickmay's design has been chosen. The plan provides a room for a corn exchange on the ground floor 40 ft. by 35 ft., lighted on two sides, with an entrance lobby and staircase. There will be on the upper floor a town-hall, 21 ft. by 35 ft.; a reading-room, 28 ft. by 16 ft.; a magistrates' room, 14 ft. by 13 ft.; with offices. The corn exchange-room will be 18 ft. in height. The cost of adopting this plan will be 1,500*l.* Mr. Crickmay has been appointed the architect of the proposed new building, and a building committee has been named and authorised to confer with him on the matter.

MONUMENTAL.

Monument to the late Duke of Athole.—A mural monument has just been erected by the Dowager Duchess of Athole to the memory of the late duke, in the aisle of the old Kirk of Blair, over the vault in which his remains are laid. The design, which is stated to have been suggested by the duchess herself, is allegorical, inasmuch as the principal figure in it is the trunk of a stricken oak, which is intended to represent the duke cut off, as it were, in the prime of life. At the point where the tree has been broken through, a branch of the ivy which entwined it has been loosened, and droops towards the ground. On one side of the tree a vigorous offshoot or branch (representing the present duke) remains in full blossom, and upon it hangs the plaid or mantle of the deceased. At the other side of the tree is the figure of one of the duke's retainers—a stalwart Highland Volunteer—leaning on the top of his reversed rifle, and lamenting the loss of his chieftain. On the base of the tablet, beneath the sculpture, is the inscription. The tablet is of the finest statuary Carrara marble. It is placed upon an architectural base, the whole rising to a height of about 9*ft.*, the breadth being about 5*ft.*

Inauguration of the Stowell School Memorial.—A monument erected in Christ-Church-yard, Acton-square, Salford, by the teachers and scholars of Christ-Church Schools, to the memory of their late pastor, Canon Stowell, has been inaugurated. The monument is in the Early English style of architecture, and is erected a few yards to the left of the entrance to Christ-Church from the Crescent. The structure, of which Mr. W. B. Sanders, of Epperstone, Notts, is the architect, is octagonal in shape at

the base, and rises to a height of 20 ft. The whole is constructed of Hollington stone, relieved at intervals with red Mansfield pillars. At the lower portion of the monument are panels, one of which contains the inscription.

Inauguration of the Oastler Monument at Bradford.—The monument of the late Mr. Richard Oastler, the "Factory King," erected in the open space in front of the Midland Station, in Well-street, at Bradford, has been unveiled by the Earl of Shaftesbury. The monument consists of a colossal figure in bronze of the late Mr. Oastler, and two factory children, surmounting a lofty pedestal of granite. The artist was Mr. J. Birnie Philip, of London. The entire cost of the work is 1,500*l.*, and has been contributed by the friends of the "Ten Hours' Bill" in Yorkshire and Lancashire. Large numbers of people came from all the factory districts of the two counties. Not fewer than a hundred thousand persons filled the streets, and a procession of some 30,000 persons preceded the ceremony.

PICTURES BOUGHT FOR THE ART-UNION OF LONDON.

The following works have been already purchased by prizeholders of 1869. Many others, including the chief prize, have yet to be selected:—

From the Royal Academy.—The old Priory Farm, G. Chester, 100*l.*; Dutch Landscape, A. Burke, 100*l.*; Moonlight, Capri, T. White, 50*l.*; The Close of Day, T. W. Hulme, 70*l.*; Evening, Canal, E. Havey, 60*l.*; "By the Waters of Babylon," W. E. Frost, A.R.A., 60*l.*; Spring Time, W. Luker, 50*l.*; Mending the Sleeping Sickness, J. Richardson, 40*l.*; The River Neath at Penbont, Mr. E. Gill, 40*l.*; Where the Trout lie, C. Smith, 35*l.*; Market Morning, A. DeBylandt, 35*l.*; Evening on the Veign, W. Williams, 30*l.*; Shades of Evening, G. S. Walters, 31*l.* 10*s.*; Detained, A. E. Embley, 21*l.*; Out of the Current at Rusewarp, E. S. Howard, 15*l.*

From the Royal Scotch Academy.—Loch Ness, A. Perigal, 20*l.*

From the Society of British Artists.—Left in Charge, J. Gow, 100*l.*; The Day of Rest, Marshall Clarton, 100*l.*; A Passing Storm, E. N. Downard, 75*l.*; The Way Across, E. Holmes, 60*l.*; The Wreath of Wild Flowers, E. J. Cobbett, 50*l.*; Pilot Boats, and other Crafts, E. Hayes, 50*l.*; The Front Stream, E. Holmes, 45*l.*; Low Tide on the Yorkshire Coast, J. W. McIntyre, 40*l.*; Mod. Sibald, Jas. Peel, 40*l.*; A Ghost Story, T. Roberts, 40*l.*; Senecite us da, E. Y. Hurlstone, 35*l.*; "There's but one Shirt," &c., A. Ludovic, 31*l.* 10*s.*; Plymouth Sound, H. K. Taylor, 25*l.*; Pensive Notes, M. Bancroft, 20*l.*; On the Ledge, G. Fringle, 15*l.* 15*s.*; In the Market, Miss E. Valentini, 15*l.*; Sappho, J. Physick, 15*l.*; Falls on the Llugwy, W. H. Foster, 15*l.*; My Neighbor Opposite, Miss Hunter, 10*l.* 10*s.*; Tattered and Torn, Mrs. Bach-house, 10*l.* 10*s.*; At Staplehurst, J. J. Wilson, 10*l.*; On Hayes Common, W. H. Foster, 10*l.*

From the Society of Painters in Water-Colors.—The Uri Rottebock, C. Davidson, 75*l.*; The Waltman at Sunrise, Collingwood Smith, 35*l.* 15*s.*

From the Institute of Painters in Water-Colors.—The Valentine, J. Sierra, 20*l.*; The Itinerary, W. Ke. Keeling, 15*l.* 15*s.*; Moel Sibald, J. C. Reed, 15*l.* 15*s.*; "Hail, Smiling Morn," &c., H. Mapleton, 10*l.* 10*s.*

From the Dudley Gallery.—The First Scent, Jas. Hardy, jun., 30*l.* 15*s.*; Lunch Time, Jas. Hardy, jun., 30*l.*; The Sunny Hours of a Hard Life, J. Carlisle, 15*l.*

CLERKS OF WORKS.

STR.—At the discussion at the Society of Arts, lately held, Mr. Jones asked Mr. Smith what amount of consideration would secure honesty in a clerk of works. Mr. Nash said that there were some good ones, as well as a good many bad ones; and by being drawn from the ranks of the workmen it could not be expected that they would always be all that was desired. Mr. Smith stated that no sum of money would purchase honesty in such functionaries; but he appeared to know how to select a good one. I was bred in the trade, and I have had considerable practical experience as a working man, as a builder's foreman, and as a clerk of works, and I have had a very good opportunity of knowing the difference between a good and a bad clerk of works, and how many have been made clerks of works. There can be no doubt that the very best clerk of works must have seen some years' service as a builder's foreman, and is rarely worth being called a clerk of works until about forty years of age, when, whoever secures his services *must* pay for them, as it is not so much his ambition to be a clerk of works as it is to have a little less labour to perform for the same amount of pay. Honesty and integrity have grown into such a man, and his rule will be strict without being offensive either to his employer or the contractor under him. A bad clerk of works will be found in this style:—"I wanted, by a thoroughly practical man (carpenter and joiner), a situation as clerk of works. Aged 26. Salary moderate." This means two guineas per week. Another can at any time be found in an architect's office, who is pleased to get out at

any price, who knows nothing of the practical part of any one of the branches or of the quality of the materials being used, but by some means contrives to know enough to keep the architect and the contractor in constant hot water during the progress of the works. A good clerk of works can always be found if a proper salary is offered him; but it must not be expected that he will take the responsibility of a job upon his shoulders for the same pay, or in some instances less, than is paid to a journeyman carpenter.

AN OLD CLERK OF WORKS.

NEW BUILDINGS, CEYLON.

The Bishop of Colombo has recently consecrated a new church at Wellevatte, and laid the foundation-stone of another at Cottachincha. Also, on the 7th of April, the foundation-stone of a new church at Haputale was laid by Major-General Hodgson. The designs for the above churches were furnished by Mr. James G. Smith, of Colombo, architect.

ARCHITECTURAL PUBLICATION SOCIETY.

The annual general meeting of the subscribers will be held at the house in Conduit-street, on the 31st inst., at two p.m. precisely, to receive the report of another A.C. committee, and the audited balance-sheets, and for the transaction of other business. The chair will be taken by Mr. William Tite, M.P. An important proposal will then be submitted requiring careful consideration. The report says:—

"If each of the present subscribers would at once personally enter himself and obtain the adhesion or guarantee the subscription of a new member, it would be possible for the committee to arrange for the completion of the 'Dictionary' without any further demand on the subscribers; the cost of the complete work (text and illustrations) would then be fixed at fifteen guineas. For a work undertaken without any capital and dependent solely upon funds derived from annual subscriptions, and assisted by unpaid aid for the management and production, and with but a limited circulation, this must be deemed exceedingly moderate."

Guarantees have already been received, and a little exertion on the part of the members will insure success. Something, at any rate, *must* be done.

KINGSTON-ON-THAMES: QUEEN ELIZABETH'S SCHOOLS.

COMPETITION DESIGNS.

ABOUT thirty different sets of plans have been received by the committee, and placed for examination in the Crown Court, by permission of the mayor.

The site of the new building is opposite to the present school, which has for many years been held in the fine old Gothic chapel, the sole remains of the once extensive scholastic group of buildings. Many of the architects ignore the existence of this chapel, most likely from not having visited the site, by showing on their plans arrangement for a new one, in connexion with the rest of their designs. Only 5,000*l.* are allowed for the cost of the new schools. Few plans, more especially those of a straggling character, are likely to comply with this important condition. As the committee intend to call in professional assistance, there is little danger of these "catch" designs bringing the committee into pecuniary difficulties. We are surprised that the title of the school did not suggest to more of the competitors the adoption of Elizabethan architecture, which is very suitable for such a building.

It is proposed to throw open the collection of designs for public inspection in a few days.

A BUILDER'S COMPLAINT.

STR.—In a builder's letter which appeared in the edition of the 15th inst. he complains of "building material" merchants employing others than builders at the same price.

I think it very difficult at the present time to tell what constitutes a builder; for instance, a common brick carpenter or paltry packing-ess maker binds into business by hook or by crook, and at once styles himself a builder, and by impudence and an immense amount of cheek procures jobs embracing many branches, all of which he is quite ignorant of, with the exception of his own bit of bodging. He employs other masters in their several lines, and cuts them to the lowest, puts on an immense profit for himself, but, when the work is done, which only increases the expense, and swells the job to such an alarming amount, that gentlemen, once bitten in this way, are compelled to have recourse to other means for the future.

I am not a builder; but, finding so many cobblers taking building work, I intend trying it myself.

R. P.

SOUTHWARK PARK.

STR.—The announcement that this park would be opened to the public last week was unfortunately not correct: judging from appearances, it will be many weeks before it can be opened. I went on the day fixed to the extremely ugly main entrance, and had a peep through the closed enclosure-gate, and no one else was visible inside the park. Outside, in the swamp of the miserable roads, parties of three and four were to be seen, workmen with their wives and children, who had evidently come to see the park that day. One respectable-looking working woman was in a fury; it appeared that she and her little ones were going somewhere else to spend their annual holiday, but having been informed that Southwark Park would be opened that day they had changed the renne and had come to the park instead, and so lost the day entirely. No wonder on a race-course who had promised to pay, and at the time promised refused, could he more mercifully handled than were the names of some of the members of the Board of Works.

I thought of the Whitechapel improvement, and how long that has been in hand. Since the Act for that improvement was passed, the well-abused Metropolitan District Railway has made and opened four miles of line, mostly through house property!

ABSQUE LABORE NIHI.

THE BELLS OF ST. NICHOLAS'S CHURCH, LIVERPOOL.

STR.—In the last number of the *Builder*, the Rev. H. T. Ellicombe gives a list of peals of twelve bells, among which he has St. Nicholas's, Liverpool, and the date, 1721. Allow me to correct this, for the information of those who take an interest in such matters. The date should be 1815, as the present tower was finished the 4th of August in that year. In 1725—not 1721—a new peal of six was put up, but the tower fell down on Sunday, February 11, 610, and when the present tower was completed, the peal of twelve was put up. A READER.

THE SECRETARYSHIP OF THE INSTITUTE.

STR.—As Mr. Robert Kerr is sending round for signatures to a requisition to Mr. Charles Fowler to allow himself to be proposed for the vacant secretaryship of the Royal Institute of British Architects, you will perhaps be so good as to allow me to say that our late secretary, Mr. J. P. Seddon, will be proposed for re-election at the meeting on Monday next.

GEORGE EDMUND STREET.

FROM IRELAND.

The church of St. Philip and James, Holywood, county Down, to which a nave, chancel, and north aisle have just been added at a cost of 5,000*l.*, has been consecrated by the Bishop of Down. The church, which is built of Scrabo stone, is in the Early English style. The edifice is built to accommodate about 720 people, and consists of a nave and two aisles, a portion of the old church serving as the northern aisle; but the south aisle is new. The nave measures 75 ft. in length by 30 ft. in breadth, while the dimensions of the chancel are 33 ft. 6 in. by 25 ft. 6 in. The total length of the church is 111 ft. 6 in., and the total width 72 ft. 6 in. The arches flanking the nave on either side are of redstone. From them spring the arches supporting the north and south walls, which are pierced by a row of windows on each side, overlooking the roofs of the aisles. The height from the floor to the springing of the rafters measures 36 ft., and the height from the floor to the ridge 53 ft. On the outside two porches are constructed, one on each side of the west gable, and at this end the old tower remains, the top of the spire standing 71 ft. above the base. The church has been designed by Messrs. Lanyon, Lynn, & Lanyon, of Belfast, architects; and its erection has been carried out by Messrs. Lowry & Son, builders, Great George-street, Belfast.

DECORATIONS AT ALNWICK.

A NOTICEABLE event occurred in the North on Wednesday, the 19th instant. Earl Percy took his bride to Alnwick Castle, and was received with every demonstration of welcome and congratulation by the Percy tenantry and inhabitants of the town. A triumphal arch of an architectural character was erected at the end of the winding street that skirts part of the castle walls, and opens into the wide space before the barbican, close upon the site of one of the gates into the town in the olden time, when it was surrounded with a wall. This was an ample four-centred arch, surmounted by an entablature constructed in wood, but painted with a clever imitation of the stone-work of the part of the walling of the castle that it adjoined. Upon the centre of the parapet was placed the Percy lion, with a reproduction of the effect of that, so well-known to Londoners, on Northumb-

berland House. The spandrels were filled with the crest of the Campbell family; and just below the embattlement, between two string courses, was a wide fascia on which was inscribed, "Welcome to the bride;" both spandrels and fascia being transparencies, which were lighted up at night. Flags and young trees—the last placed in the angles as though they had grown there—kept up a constant flutter. The ancient gateway, still standing at the entrance to the town from the south, which was built by the son of Hotspur, and bears his crest upon a panel over the arched way through it, was decorated with heraldic devices and overgreens; and a third arch, made entirely of overgreens, was erected in the course of the approach to the town from Bilton.

The mounted tonantry, riding three and four abreast, forming a cavalcade as long as a "quiet street," met the Earl and Countess at the station at this place, distant about four miles from Alnwick, and conducted them to the town, at the approach to which they were met by the Percy Artillery Volunteers, and a very striking procession. The spectacle was altogether out of the common order of things. A display of fireworks, on the north terrace of the far-famed stronghold, was the last act of it.

CHURCH-BUILDING NEWS.

Herston (Swanage).—The chief stone of a chapel-of-ease has been laid here. The structure is to be built of local stone, roofed with stone, and will consist of a nave, chancel, side aisle, with vestry and turret. The design was drawn by the late Mr. J. Hicks, of Dorchester, architect; and the work will be carried out by Mr. Crickmay, of Weymouth, who has undertaken to complete the works of the deceased gentleman. The building contract has been taken by Mr. F. G. Fooks, of Herston, assisted as clerk and manager by Mr. Linnington, of Swanage. Whilst excavating for the foundation of the church, Mr. Fooks discovered that there was a store of stone called "burr," which he got at to be used in the building, thereby saving considerable expense. Already 200 tons have been quarried, and its worth is estimated at 1l. a ton. The stone is being worked for windows, plinths, and other parts of the structure.

Burley.—It has been determined by the vicar, the churchwardens, and inhabitants of Burley, to make some improvements in their church. The chancel is to be extended, an organ gallery is to be erected, and a portion of the gallery is to come down. A new organ is to supply the place of the old one, a new warming apparatus is to be inserted, and the church is to be re-seated with open benches. Other changes are also to be made, including the insertion of a new east window. A subscription list was opened some time ago. The different contracts have already been entered upon, and the entire cost is estimated at about 3,000l.

Windsor.—The Queen has signified her intention to give a donation of 400l. to the funds for the improvement of Windsor Parish Church,—200l. towards the alteration of the interior, and other 200l. should the building committee feel at any time that they have sufficient funds to justify their commencing the exterior work, which her Majesty considers to be very desirable. The designs from which the renovating is to be made are those of Mr. Tenison. The cost of erecting a chancel and replacing the old-fashioned pews with open seats is estimated at 9,500l., and the ornamentation of the exterior at about 3,700l. It has been decided to alter and pay for the interior work before anything is done with the plain exterior of the church.

Driffield.—A new church is being erected on the Sledmere estate, in the village of Firbank, on the Wolds, at the sole expense of Sir Tatton Sykes. The site will be that of the old church at the upper end of the village. The cost will be between 3,000l. and 4,000l. The length of the edifice will be 70 ft.; width, 20 ft. The walls will be of dressed Whithy stone; the chancel screen of Whithy stone, and the floor of Minton tiles. The general style will be Gothic. The tower will be pointed, and will rise to the height of 60 ft. The architect is Mr. Street, of London, and the builder Mr. Cliphams, of Norwell, Newark. The old church, just razed, and apparently stood two hundred years, was a very small unecclesiastical-looking building, and had evidently been built from the material of a much larger and more ancient one. Portions of

columns of the style of the twelfth century were found in the church just pulled down, as in other ancient buildings in the village.

Weardale.—The new church of St. Andrew, at Westgate, in Weardale, being finished, has been opened for Divine worship. It consists of a nave and chancel, with a porch at the south-west, a spirelet or bell-turret at the west end of the nave, a vestry on the north side of the chancel, and is of the Early English style of architecture. The flooring of the entrance-porch, alley, choir, and chancel, is of particular tiles, arranged with design, and the semi-transparent glass. The nave and choir are fitted up with wood seats, simply varnished, as is also a lectern of antique design and a communion table, the gift of the architect, Mr. Withers. The pulpit, situated in the north-east corner of the nave, is of Bath and Prudham stone, and the font is of the same material. Messrs. MacAdam & Son were the contractors.

Hellingley.—The restoration of the parish church is now in the hands of Messrs. Aris & Roe, of St. Leonards, under the superintendence and according to the plans and specifications of Mr. E. Christian, architect. It is intended to repair the whole of the external masonry, to remove the tiling of the roof, and relay it on new lathing. In the interior new seating is to be provided throughout, and various other alterations will be made.

Little Marcle (Herefordshire).—The chief stone of the new church has been laid by the Countess of Somers. The style will be decorated, and the church is to consist of nave and chancel, with organ chamber, vestry, and porch (the latter on the north side). The walls will be of native red sand (from Pixley), given by Earl Somers (besides 200l.), with Bath stone dressings; the framework for the windows will also be of Bath stone. There is to be an octagonal bell turret, in which will hereafter be placed two bells; and the building will be roofed with Broseley tiles in patterns. The internal fittings will be, for the most part, of red deal, varnished, the seats being open, and there will be an open timbered roof, ceiled between the rafters. The chancel and aisles are to be paved with Godwin's encaustic tiles. The nave will be divided from the chancel by a moulded arch, springing from circular columns having carved capitals. The contract has been taken for 900l., by Messrs. Wall & Hook, of Brimscombe. Mr. J. W. Hugall, of Oxford, is the architect.

Hallow (Worcestershire).—The new churob of Hallow has been consecrated. The old one has been retained as a mortary chapel. The new site is in a field, near the entrance of the village from Worcester. Mr. Hopkins, consulting architect to the Diocesan Society, furnished the plans, but the necessary funds were not forthcoming, and the consequence was the abandonment of the tower and spire. The tower arch at the west end of the building is, therefore, bricked up. The building is in the Decorated style, and has a chancel, nave, aisles, vestry, and organ-chamber north of chancel, chapel on the south for the school children, and stone porch on the south side of the nave. The total length of the chancel and nave is 95 ft.; breadth, 45 ft.; the roofs are lofty, with open timbers, those of the chancel being ornamental; and the east window elevated. The chief constructional feature is the stone arch ribs of the nave roof, which are continued externally as flying buttresses, carrying the thrust of the roof into the masonry of the outer walls. Four pointed arches, resting on circular columns, divide each aisle from the nave; and the clearstory windows are circular. The east window is a three-light one, and there are two-light windows with head tracery in the aisles. A reredos has been presented by Earl Beauchamp. It was executed by Mr. Boulton, of Cheltenham, and is of stone-work, having for its central subject the Crucifixion *in alto relievo*, with the walls of Jerusalem in the background, surmounted by a canopy which consists of three arches, cusped, each having a pediment inlaid with marbles, &c. Upon the pediments, which are crocketed, and upon the intermediate columns of serpentine, stand seven sculptured figures of angels, representing the Seven Churches, all of alabaster, bearing cardinals in their hands. The reredos, from its height, hides a large proportion of the east window. The church contains about 450 sittings, and the seats are open. The gables of the roof are decorated with floriated crosses, or rather, that over the nave is not a cross, but a trefoil in the centre of foliations.

The stone for the church was got from Ombersley, and the builder was Mr. Inwood, of Malvern. The entire cost of the building, including the hot-water apparatus (about 90l.) will have been about 4,000l. The church is dedicated to St. Philip and St. James.

Staines.—It is said that a non-resident landowner of this town has presented the parish with an acre of land for the purpose of building a church. The land in question is situate in the Station-road, nearly opposite the Wesleyan Chapel. A subscription will be opened to receive contributions to the building fund, and a new church, which will be free in every part, will be erected.

Ashbourn.—The newly-erected chancel of Clifton Church has been consecrated by the Bishop of Lichfield. The new chancel has been entirely built by subscription.

Little Ellingham.—The parish church has been restored and re-opened for divine service. On Advent Sunday, 1867, after restoration, it was totally destroyed by fire, except a small portion of the chancel, caused by the over-heating of the flue, which was constructed in too close proximity with the timbers of the roof. The walls of the nave, as left by the fire, were considered unsafe; it was therefore found necessary to pull them down and to re-build them from the foundations, in the re-construction of which rubble stone and concrete have been used. The chancel, although not entirely destroyed by the fire, was very much injured, especially the roof, the scorched portions of which have been cleaned, and the charred parts restored, re-decorated, and varnished. The walls within the sacristy and the reredos have also been re-gilt, and received additional decorations in stencil work. This part of the work has been carried out by Mr. W. Nichols, of Watton, painter. The chancel stalls, which were fortunately saved from the fire, have been replaced, and fitted up for the use of the choir. The repairs and refitting of the chancel stalls, pulpit, &c., have been carried out by Mr. Clark, of Hingham, builder. The nave is covered with an open timber roof, stained and varnished. The nave has been re-seated throughout with oak benches, and the floor relaid with coloured Staffordshire tiles. All the windows of the nave are filled with "roller-tinted Cathedral glass." New stone parapets have been placed upon the tower, and which has also received other repairs. It is intended to relead the steeple and to place a new weather-vane upon the top. The floor of the tower is relaid with coloured Staffordshire tiles.

The whole of the work of restoration has been carried out by and under the personal superintendence of the contractor, Mr. J. Frost, wood-carver and builder, Watton. The seats are so arranged that the church will accommodate about 230. Messrs. T. H. & F. Healey, of Bradford, are the architects.

Hastings.—The honorary secretary to the committee for restoring All Saints' Church states that, at a recent meeting, Mr. Butterfield, the architect, exhibited to the committee drawings which showed what will be the effect of the restoration when completed. The work is estimated to occupy nearly a year. The committee appeal for additional subscriptions.

Bromham.—The church here has been re-dedicated after restoration. The nave and its north aisle, connected by three arches of the early Decorated period, have been cleared of incumbrances; the western arch thrown open, displaying a window in the tower; the font, set upon a new base and furnished with a raised oak cover, the gift of Lady Dynevor; the oak seats refitted throughout, superseding the inclosures which formerly blocked up a considerable portion of the area; the floor paved with red and black tiles; the windows re-glazed; these works, with the addition of an oak pulpit, made by Messrs. Rattee & Kett, of Cambridge, and an oak lectern, presented by the Hon. Miss Rice Trevor, comprise the chief improvements in the church itself. The former dilapidated chancel has been replaced (with the exception of a small portion of wall on either side, inclosing the leper windows, which have been retained *in situ*) by a new one of the same proportions raised upon the old foundations and opening from the church by an arch designed after those which separate the north aisle from the nave. The roof, covered with old tiles, is of open timber, the spaces between the rafters being plastered, as also are the panels into which the two bays above the sanctuary are divided. The stalls are of oak, their ends surmounted with poppy-heads designed after two which remain from the old work. The east window is a reproduction of its predecessor, and is to be filled

with stained glass by Lady Dynevor. The head of the leper window on the south side has been filled with fragments of early glass collected from other windows of the church, and the lights with quarries imitated by Messrs. Lavers & Barrand from a few old examples found in the course of the restoration. The recrodes is of white stone inlaid with red from Babicomb quarry, St. Mary Church, Devon. Upon the chancel floor, which is laid with Minton's tiles, is replaced the brass engraved by Lysous, originally intended to perpetuate the memory of Thomas Wideville and his two wives, about 1435, and re-appropriated by a descendant, Sir John Dyve, who died in 1535, his mother and wife. The contract for the whole of these and other works amounting to about 1,400*l.*, was taken and has been executed by Mr. Osborn, of St. Neots; the masonry being done by his brother-in-law, Mr. Whitehead, of Royston. Mr. Butterfield was the architect.

Mansfield.—The plans of Mr. William Smith, architect, for the restoration of St. Peter's Church, have been accepted, subject to any minor modifications deemed desirable by the restoration committee, and he is appointed architect for the restoration. The interior restoration of the woodwork will be of oak. The galleries will be dispensed with, and the pews in the body of the church will be open ones instead of the present pews. Promises have been given for sums amounting to 1,050*l.*

Books Received.

"ROADS, RAILWAYS, and Canals for India. By T. Logan, C.E., F.R.S.E. London: Spon." This is a reprint of two pamphlets by Mr. Logan, which were printed for private circulation about two years since. The author is executive engineer of the seventh division Grand Trunk Canal, and was formerly superintendent of the northern division of the Ganges Canal. As Indian subjects are beginning to be of more general interest than heretofore, the information here given will aid in the formation of a just appreciation of the relative value of roads, railways, and canals, in developing the resources of India, and also be of practical value to young engineers in India, and to those interested, especially in Assam, Cachar, and the eastern districts. The author urges the formation of a passable embanked road parallel to the hills passing through Northern Bengal, and extending on to the Brahmaputra, in order to promote a supply of labour in Assam.—"Tenth Annual Report of the Society for Promoting the Employment of Women in connexion with the Social Science Association. Office: 23, Great Marlborough-street, Regent-street." It appears from this report that the society has obtained permanent situations for 48 persons during the past year, and temporary employment for 46. During the year 2,061 visits have been made by applicants, 389 names registered, 1,087 letters received, and 2,106 written, &c. The indirect influence exerted by this useful society seems also to be considerable.—"The Journal of the Historical and Archaeological Association of Ireland, vol. i., third series: October, 1868: No. 4. Dublin: McGlashan & Gill." Besides a report of proceedings, this number contains interesting papers on Ogham Readings, by Mr. R. R. Brash; on the Contents of a Sepulchre of the Bronze Period, by Mr. T. O'Gorman; and on a book entitled "Beware of the Cat." There is also a list of the names and addresses of the many members of the society. The paper on the obscure subject of Oghams is an important one. The author is of opinion that the deductions to be drawn from the facts which have been accumulating for the last half-dozen years are quite sufficient to invalidate the opinions adopted by a section of our antiquaries, namely, that Ogham inscriptions were 'tricks of the middle ages,' and the invention of Medieval monks." Mr. Brash endeavours to elucidate the meaning of what is really engraven on the Ogham stones.

"County Military Training Schools. By W. Cave Thomas, Strangeways & Walden, Leicester-square." This pamphlet contains suggestions for improving the recruiting system meriting most careful consideration. It is a copy of a lecture delivered at the Royal United Service Institution, in March last, and relates to industrial training as well as military, and to general and scientific education. In concluding the exposition of his scheme, Mr. Thomas gives a summary of its salient points, from

which we may give a somewhat condensed quotation:—

"The County Military Training Schools are the basis of the system; the primary schools keeping up, according to the calculation adopted, and independently of any other source, 25,500 men in the reserve, and 25,500 men in the army. These men would, moreover, be skilled handicraftsmen in those special industries calculated to render an army independent. Then there would be the Middle School, supplying the Engineer, Ordnance, and other not-commissioned officers, whose numbers are not included in the estimated 25,500. Then there would be the High School, preparing men for commissions in all branches of the service, for the army, the reserve, the militia, and the volunteers, and not only designed to the military, but civil service; for it is important, with such extensive colonies and comparatively so small an army, that men holding civil appointments should have that amount of military education which would enable them, in any case of rebellion, to organize the countrymen and the available resources of the nation for defence to the best advantage. The high schools should, in fact, be seminaries where men should be prepared for important posts. The school system, too, provides for the promotion of talent from the primary to the high departments. The scheme also suggests the association, the identifying a regiment with a particular military district and its training-schools, the depot of that regiment being near to the military schools of the district and the head-quarters of the Reserve, as well as the recruiting staff and depot battalion. This is looked forward to as eminently calculated to promote recruiting in the district, and to develop an esprit de corps not likely to be so well fostered by other means. It also presents advantages superadd that of an army of thoroughly trained soldiers scattered through the land in civil employments, on account of the moderate term of service, who would stand the country in good stead in case of invasion, and who might not be proof against a good bounty in other cases of need. There is also the proposed extension of the system of military schools to the colonies. It also proposed, under certain contingencies, that the boys from the primary schools shall be passed annually to the reserve, and from the reserve to the army, so as to rapidly increase the strength of the latter, and from this source allow to 100,000 men. Finally, I have to mention that branch of the reserve which would be open to working men for a limited period of home service; the conditions would be similar to those of the militia, but the drill days distributed over the year, so as not to interfere with their industrial occupations. The institution of this branch of the reserve, would, I think, offer a more acceptable form of service to the artisan than that of volunteering or the militia. To this branch the pensioners of the school system would be returned, and from it many recruits would doubtless be sent up to the army."

"The Smoke Nuisance, and its Remedy by Means of Water; with Remarks on Liquid Fuel. By C. J. Richardson, architect. Atchley & Co., Great Russell-street." Mr. Richardson published his plan for remedying the smoke nuisance, by washing it with a spray of water, in our columns a good many years ago. He here gives it in detail, with diagrams; and he remarks that though it certainly is not possible to disturb the whole of the chimneys of London, the worst of them might be operated on, such as the chief kitchen flues of the great establishments which are continually sending out black inky smoke. If it were possible, as he observes, to cut into all the chimneys of London and apply the remedy, the whole of the soot which at present escapes into the atmosphere might be caught and passed into the drains: it would there deodorize them, and the sewage, when it arrived at the Abbey Mills, would be rendered doubly valuable as manure, and be largely increased in quantity. This would certainly be the best mode of remedying not only the smoke nuisance, but the sewage emanations also, because so long as the air is contaminated with these, the smoke is at least useful in the air as a deodorizer of them, however injurious to human lungs in itself, or unsightly in its effects on buildings. In the pamphlet under notice, Mr. Richardson gives the results of his important experiments with liquid fuel. The substitution of petroleum for bulky coal in steamers would be an immense improvement, both in our mercantile and our naval shipping. Mr. Richardson says that "any boiler having water space below grate can be fitted to burn oil, so as to obtain a result from 2½ to 3 times above that given by the best coal; 5 times, probably, of that given by common coal: no alteration will be required, only some additional plates in lieu of fire-bars."—"Our Mother Tongue and its Congeners. By J. A. Pictou, F.S.A." This is a paper read before the Liverpool Literary and Philosophical Society. It is full of interesting and curious matter, as our readers will know that anything on philological science by Mr. Pictou must be. At the close of his present paper, the author, speaking of the relative importance of the English language, says,—"Before many generations are past, our language will be the mother tongue of 200,000,000 millions of people. For this consummation the language has long been in a course of preparation by Providence. It is the language of freedom, of progress, of civilization, of vigorous life and action; and, may I not add, of religion also? How important it is that the literature of a language with such prospects before it should be pure and wholesome!"

Miscellaneous.

Metropolitan Board of Works.—At a recent meeting the Board received tenders for the completion of the low-level sewer of the main drainage scheme. For that portion extending from Tower-hill to New Earl-street, Blackfriars, 4,400 ft. in length, the tender of Mr. W. Webster, at the sum of 67,000*l.*, was accepted; for that portion of the sewer extending from the Westminster steamboat pier to near the Grosvenor Canal Basin, Chelsea, 9,710 ft. in length, the tender of Messrs. Hiscox & Williams, at 72,700*l.*, was accepted. For the deepening and improving a main sewer in Kennington Park-road, 2,200 ft. in length, the tender of Mr. W. Crockett, at the sum of 3,700*l.*, was accepted. Mr. Bazalgette reported the finding of the tessellated pavement at the back of the Poultry, and a letter was received from the City Corporation, asking that it might be handed over to them for the purpose of being placed in the City Museum, which was complied with.

Wells Cathedral.—A meeting in aid of the proposed restoration of the west front and chapter-house of this cathedral has been held in the chapter-house, under the presidency of the Earl of Cork. The Dean of Wells explained what had already been done, and said that prior to the meeting 3,500*l.* were promised, and now they had 1,500*l.* more, so that he considered the success of the undertaking certain. Mr. Ferrey has estimated the cost at 5,000*l.* The question now was how the work was to be done, and by whom. It was proposed to restore the canopies in certain instances, and in others to repair them. There were 4,700 ft. of column in the west front, and each foot cost 6*s.*, so that it was a question whether they should be restored in blue liais or marble. Lord Taunton moved that it was generally desirable to carry out the restoration of the west front according to the plan recommended. He remarked that it had been proposed to have coloured glass in the chapter-house, but he thought it better to have no coloured windows than to have paltry ones. Prebendary Scarth seconded the resolution, and hoped they would get the work accomplished before they were disendowed and disestablished. Mr. E. A. Freeman opposed the present scheme, as he thought it was their duty to place the cathedral in its position as the great motherchurch of the diocese. They ought, as at Lichfield and other cathedrals, to improve and clean the interior, and after that to talk of the purely ornamental things; not, however, to leave the latter undone. He wished them to take the advice of Professor Willis on the restoration. The resolution having been adopted, Sir E. Strachey moved that the chapter-house be restored to its original simple beauty. Prebendary Horner seconded the resolution, which was carried. A committee was then nominated.

Injuries to Buildings by Subterranean Movements.—Considerable interest has been raised in Halifax regarding upheavings of the earth which have occurred at Folly Hall, a cluster of houses on the face of Beacon Hill, lying a short distance below the New Southwram-road. This road, which commences in New-bank, will be about a mile long. At the commencement of the road at the New-bank side, a dry retaining wall, 15 ft. thick, strengthened by a center foot 9 ft. thick, placed in Crossley's brick-yard, is being built "to keep off the hill," as it is termed. Near this place several cracks of considerable length have appeared in the hill, which "is known to have been moving for years." Cottage walls are cracked, and threaten to fall, and a wooden floor has been lifted from its position, and now assumes the appearance of a mound, the centre of which is upwards of 1 ft. above its natural level. Flags below have been thrown upward, and some even overturned, and placed in many singular positions. Some authorities state that the phenomenon is caused by an accumulation of water in the hill; and the contractors for the Southwram-road are laying 2 in. earthenware pipes into it above Folly Hall, to carry off any water into the drain.

Discoveries at Herculaneum.—The *Giornale di Napoli* mentions the discovery of a large room, which must have served for a kitchen. In it was a wooden clothes-press, entirely carbonized; also fourteen vases, a candelabrum and a lamp, all in bronze, several vessels in glass and terra-cotta; a small marble statue of a Faun, and two broken tables, one in marble and the other in slate.

The Proposed Abolition of the Patent Laws.—A deputation of the members of the Inventors' Institute, the Delegates' Invention-right Committee, and other gentlemen representing numerous industrial associations, waited on the Attorney-General, as one of Her Majesty's acting Commissioners of Patents for Inventions, to solicit his attention to Mr. Machie's proposed motion in the House of Commons for the Abolition of Patent Rights for Inventions. The members of the deputation impressed upon the Attorney-General that the interests of the working-classes and the status of the country in regard to the mechanical and chemical arts would be greatly injured by the abolition of the Patent Laws, although they unanimously required that those laws should be simplified and rendered more efficient.

The Poetry of the Fine Arts.—A lecture on this subject was delivered by Mr. Henry Macmanus, R.H.A., professor of painting, in the theatre of the Royal Dublin Society. The lecturer having given a lucid definition of poetry, fancy, and imagination, of all the fine arts, he said, literature was the youngest. Eloquence, music, and acting were born at a more remote period, since which their lives had undergone certain vicissitudes. Music, in her maiden loveliness, was all melody, but in process of time was wedded to harmony, resulting in the numerous offspring, secular and sacred. Eloquence was united with oratory and rhetoric; and acting was wedded to the drama. Either of these arts was sufficient to entertain the most cultivated intellect, but the mind could obtain glimpses of all of them when the appreciative faculty was thoroughly brought out. After pointing out the special sphere of each of these arts, and showing how poetry in its widest sense was connected with all, Mr. Macmanus urged how important painting and sculpture were: in many cases they conveyed the ideas expressed by language.

Suicide of an Architect.—Mr. Day, an architect, residing in Worcester with his wife and niece, arrived at Pentrich Vicarage, near Ripley, Derbyshire, last week but one, with the intention of staying a short time with the clergyman doing duty there. Mr. Day had for a length of time been in a depressed state of mind. On Tuesday night deceased's wife accompanied him to his bedroom door, when he requested her to leave him alone for a short time. On returning she found the door locked, and asked him to open it, which he did, when she found that he had attempted self-destruction. Medical assistance was obtained, but deceased died on Thursday night. An inquest on the body took place, when the jury returned a verdict that the deceased had caused his death by cutting his throat while in an unsound state of mind.

Society for the Encouragement of the Fine Arts.—On Thursday, the 20th inst., Mr. Montgomerie Ranking gave a lecture "On the Renaissance Influence, as traced in the works of the Elizabethan Dramatists"—Mr. Cave Thomas in the chair. After a brief sketch of the various epochs that preceded the revival of the arts, with especial reference to the Greek and Gothic periods, the lecturer traced with considerable success the spirit of the renaissance from its earliest dawn down to the time of Marlowe, Ford, Massinger, and Webster, illustrating his subject with passages from "The Duchess of Malis," "The Broken Heart," and "Doctor Faustus," in which the passions of love and fear were powerfully depicted. Mr. Cave Thomas, Dr. Heinecann, Mr. Tacey, and Mr. Temple addressed the meeting.

The Projecting Entrance at Burlington House.—Attention having been called in our pages to this matter, it was ultimately brought before the Board of Works, who directed that a communication be addressed to the vestry of St. James's, Westminster, on the subject. The vestry, on receiving the communication, referred the matter to the Works Committee, and that committee has recommended that no steps be taken at present in reference to the porch and projection, which recommendation the vestry has approved. So long as the hoarding remains up for the new works, the porch may as well be where it is as not.

The Priory Church, Dunstable.—The work of restoring this edifice has been recommended. It is to be hoped that no suspension will be necessitated by want of funds.

The Royal Academy Floors.—Messrs. Arowsmith & Co. are not satisfied that we should speak of the new floors in the galleries of the Royal Academy as being of "Marqueterie." If they had remembered the descriptive particulars we gave of the rooms with plans in a previous number, wherein we said "the floors are covered with Arowsmith's solid parquet work of wainscot and walnut wood," they would probably have thought it unnecessary to write to us. Like every one else, they take no notice whatever of the statement that answers their purpose, but they consider we do them a scandalous amount of injury when we omit to repeat it.

Ornaments on Dinner-tables.—Following an early lead of ours against the error of placing large obstructive ornaments on dinner-tables, a writer in the *Cornhill Magazine* says:—

"One of the foremost political men of our time gave a great dinner party. I was honoured by an invitation. I must say that the guests had been most skillfully chosen. There were not only great political personages, but people who were eminent in science, in literature, in art. Nevertheless, the wheels of conversation drove heavily. The next day I met, in the street, one of the guests. I said to him, 'It was not a lively dinner yesterday; and with such a host and such guests it ought to have been more lively.' 'No,' he replied, 'it was not lively; but do you know the reason why? Our host is a man who has the keenest appreciation of works of art, and exhibited so many that we could not see one another. That explains everything.' I think it did explain everything, and I went away feeling I had gained what is called a 'wrinkle' in the art of dinner giving."

All ornaments on a dinner-table should be quite low, so as not to intercept either sight or sound, or if the head of the house must have something more lofty in the centre let it be elevated on a long thin stem, so as to admit of free sight beneath.

Archaeological Institute.—On May 7th, the Earl of Dunsare (in the chair) directed attention to a fine specimen of early Irish art, exhibited by him. It was a large two-handled chalice, the body of which was composed of a white metal, formed of an alloy of silver and lead, which seemed to be peculiar to Ireland. It was ornamented with bands of gold, or gilt bronze, in various parts very highly enriched, and with numerous enamels and precious stones. It had been found last autumn in a "rath" or fort at Ardagh, county Limerick, by a man digging potatoes. The chalice is inscribed with the names of the Apostles in letters of the early Anglo-Saxon form, such as prevailed from the seventh to the tenth centuries. Numerous other objects were exhibited. The Hon. W. O. Stanley read a memoir on further explorations of ancient dwellings and vestiges on Holyhead Mountain, with supposed remains of early metal-workings. This memoir was illustrated by a large collection of implements of stone and ancient relics, pottery, &c., found in the course of the excavations. Ground-plans of some of the dwellings were also shown.

Exeter Meeting of British Association. The local committee have addressed circulars to all who are likely to attend the congress, affording every information as to the best and most economical means of travelling to Devonshire, and of finding accommodation when they arrive. Arrangements are made with the railway companies for special facilities to visitors. The local committee issue cards which will entitle those who hold them to tourists' tickets at reduced rates. The manager of the new Exmouth Imperial Hotel intends to give free railway passes between Exeter and Exmouth for the week to all British Association visitors who may take up their quarters in that building. The new Victoria Hall, for the accommodation of an audience of 2,000, will be finished in time for the meeting. The scaffolding has been removed from the south wing of the Albert Memorial Museum, and the completion of the front adds to the general effect of the architecture. The mayor, Mr. Henry S. Ellis, is exerting himself greatly to ensure a successful meeting.

Fall of Masonry at the Abbey Church, Shrewsbury.—One of the large ornamental stones over the northern doorway of this church gave way recently, and fell at the side of the walk with great force, bringing down with it a portion of the wall, but doing no very great amount of damage. This is the side next the sewerage works, but, as the foundation of the church is said to be as secure as ever, it is thought that the mischief was occasioned by the loosening of the stones of the wall on which the piece of masonry rested.

Workshop Regulation Act.—In Dr. Whitmore's monthly report on the health of Marylebone, he says:—"Since my appointment by the vestry in November last to carry out the provisions of the above Act in this parish, I have caused inspection to be made of 37 workshops, some of which were visited in consequence of complaints having been made to me of an infringement of the said Act. The result of these inspections shows that in 26 houses of business the provisions of the Act were complied with, whilst in the remaining 11 they had been more or less disregarded. With regard to the latter, working over-hours constituted the only offence. The ventilation was usually found to be very good, the apartments clean, and the cubic space ample."

The Works at Sandringham.—Immediately after the last visit of the Prince and Princess of Wales to Sandringham the building of the new wing to the house was commenced, but the walls of the old house having been found to be rotten, it was resolved to rebuild the whole of it, and this work is now being carried on. The new lake, picturesquely provided with islands and grove work, &c., has been completed, and adds to the general charm of the grounds. The Prince has lately visited the works in progress.

Fatal Fall of a Bridge at Montreal.—An awful calamity has happened at Granby, a village about thirty miles from Montreal. While several prominent citizens were looking at a flood, from the principal bridge in the place, the masonry at one end, which had become undermined by the water, flood wood, &c., gave way, letting the end of the bridge fall about 30 ft., precipitating twelve persons into the water, which was running with a very swift current. A boy was saved, but the rest, eleven in number, were drowned.

Drying the Crops in Wet Seasons.—Mr. W. A. Gibbs, of Gilwell Park, Woodford, Essex, has lately, it is said, introduced improvements in the construction of his air-stove, so that without a steam-engine the desiccating process can be easily carried on by help of common horse-works driving a fan. Grass can be converted into hay without sunshine, by his desiccator, which dries corn in the sheaf and desiccates beet and mangold.

Poplar Board of Works.—The "inscription stone" of the new board-room and offices, at the corner of High-street and Woodstock-road, was laid on the 20th inst., by Mr. Edward Coleman, in the presence of a large assembly of the members of the Board and the ratepayers of the district. The contract has been undertaken by Messrs. Baker & Constable, builders, at 7,300l. The building is from the joint designs of Messrs. Hills & Fletcher and Messrs. A. & C. Harston, architects.

Civil and Mechanical Engineers' Society. On the 22nd inst., at an ordinary meeting of this Society, held at their Rooms, Whittington Club, the president, Mr. B. Haughton, in the chair, the first part of a paper "On Water Supply to Towns and Villages," was read by Mr. George W. Usill. The reading of the paper was followed by a discussion. The president gave notice, that at the next meeting of the Society, June 2nd, a paper would be read upon "The Building Stone used in the Metropolis," by Mr. A. F. Pain.

The Manchester Alexandra Park.—A number of estimates were sent in by contractors for the levelling, sewerage, road making, &c., of the Alexandra Park, Hulme. The committee selected six out of the number for consideration, and they ultimately decided upon accepting Mr. T. Worthington's tender, which was the lowest. The tender of Mr. Lowe, of Salford, was the next lowest, and between his and the third there was a difference of over 1,000l.

Institution of Civil Engineers.—The annual *conversations* of this institution took place on Tuesday evening in Great George-street, Westminster, when the president, Mr. Charles Hutton Gregory, received a large number of noblemen and gentlemen, the majority of whom are well known for their connexion with, or their patronage of, matters pertaining to literature, art, and science.

The Idiot Asylum, Earlswood.—The Prince of Wales will lay the first stone of the enlargement of the Earlswood Asylum for Idiots, Redhill, Surrey, on Monday, the 28th of June, and the annual fête and summer entertainment will take place the same day.

The Wellington Monument, St. Paul's.—A vote of 2,800, on account of the Wellington Monument is to be proposed to the House of Commons this session. The original estimate for the monument was 14,000l.—10,266l. had been expended upon it up to the end of 1868, leaving 3,734l. to be still voted. Considering that the work is not yet finished in plaster, it is evident that some further financial arrangements will be required before the marble monument will be found in the cathedral.

An Antique Bell.—A bell of the twelfth or thirteenth century has been found amongst the ruins of Croxden Abbey. A number of letters of the form peculiar to the period mentioned are stamped round it. No local person has been enabled to make out their intention, but they were supposed to comprise some legend in contracted monkish Latin. Those who understand the form of ancient characters, however, will know that if some of them are reversed they stand for other letters—E becomes B, and C is transformed into D, and so on with many of the other letters of the alphabet. The letters on the bell are as follows:—AEOC. KWNOI. AEOC. EFTHI. EFTHIK. Mr. Redfern has received a communication from the Secretary to the Society of Antiquaries, who consider the bell to be of very great interest, and are decidedly of opinion that many of the letters are stamped wrong side up, and when viewed as they ought to be are neither more nor less than an alphabet, as here:—ABCD. LMNOP. ABCD. EFGHIK. EFGHIK. Mr. Redfern has suggested whether they may not have been intended for a peal on bells, which the repetition of letters might seem to corroborate. There is also a cross, or mark of the founder, on the body of the bell.

The Kind-Chaudron Shaft-sinking Apparatus.—The principle involved in this system is that of sinking a large shaft on the Chinese plan of sinking artesian wells; that is to say, a tool suspended at the end of a rope is raised up, turned a little round, and allowed to drop. In another form the same principle is carried out in the practice of "churn-jumping" holes for blasting, adopted in certain quarries. The application of this principle to holes 7 ft. or 8 ft. diameter, however, required a total change in the details of the apparatus and the method of operation. The Engineer, by means of diagrams, gives the details of this method. It comprises a system of cast-iron tubing, consisting of super-imposed rings, and a peculiar stuffing-box of moss to establish a water-tight joint between the base of the tubing and the rock. Nearly all the operations are performed from the surface. A small central boring is first made with a small tool having a number of chisels all along its under surface. After this the boring is enlarged by means of larger and heavier tools having a number of chisels at each end, and a projection in the middle, which passes into the central boring previously formed by the smaller tool, and which serves as a guide. The boring with the tools of the smaller diameter is always kept so much in advance of the larger boring, that the debris from the latter shall always fall into the former, and for this purpose the teeth of the enlarging tools are arranged on an incline so as to produce a boring, connected to the smaller boring by an inverted cone. In the smaller boring may be suspended a metal receptacle, into which the debris falls, and which is withdrawn when full, or a metal cylinder, with valves at bottom, opening inwards, receives the debris and raises it, by working, down and up.

Local Taxation.—According to the annual returns, the total amount of property assessed in England and Wales in 1865 was, upon gross estimated rental, 118,394,081l.; and upon rateable value, 100,612,734l. The total amount of the local taxation borne by the country in this year (1868) was 16,660,469l. This amount was made up as follows:—Amount levied for poor-rate, 11,061,502l. Amount levied for the following separate rates, which, in some cases are not paid out of poor-rate—viz., county-rate, hundred-rate, borough-rate, and police-rate, 307,232l.; church-rates, 217,063l.; lighting and watching rate, 76,978l.; improvement commissioners, 446,431l.; general district rates under Public Health Acts, 1,736,247l.; rates under Courts of Commissioners of Sewers, including drainage and embankment rates, 695,810l.; rates of other kinds, 1,203,397l. This total includes a sum of 981,140l. for general and lighting rates levied in the metropolitan district.

The Diameter of Trees.—In a paper addressed to the Academy of Toulouse, M. Musset states that all the large healthy trees of the woods of Ville-d'Avray and St. Cloud are, in the immense majority of cases, thicker in the direction from east to west than in the contrary one. The same circumstance has been noticed elsewhere by other observers.

Associated Arts' Institute.—At a meeting held on the 15th inst., the question discussed was,—"Was the Renaissance Movement of any real benefit to Art?" It was opened in the affirmative by Mr. Woolbridge, and decided in the negative by S to 3.

TENDERS.

For roads and sewers, Sheerness, Kent:—

Sund	£2,770 0 0
Dover	2,733 0 0
Miller	2,991 0 0
Wigmore	2,900 0 0
Johnson	1,896 0 0
Young	2,049 0 0
Potter	1,818 0 0
Smith	1,812 10 0
Strickson	1,414 0 0
Cotter	1,400 0 0
Cole	1,366 0 0
Dickinson & Oliver (accepted)	1,350 0 0
Porter	1,110 0 0
Kely	1,110 0 0

For offices for Mr. F. Ellman, at Battle, Mr. R. K. Blessley, architect:—

Harrison	£1,901 15 0
Hatfield	1,800 0 0
Peerless	1,729 15 6
Howell	1,498 0 0
Yidler	1,414 0 0
Adams	1,312 10 0
Wood (accepted)	1,297 10 0

For the erection of new offices and warehouse, for Messrs. Jamieson & Co., Ganning-street, Hull, Mr. W. Botterill, architect. Quantities supplied:—

Hutchinson	£2,079 0 0
W. & J. Hall	2,069 10 0
Jackson	2,048 0 0
Marshall	1,885 19 10
Simmons	1,868 0 0
Frow	1,851 5 0
Musgrave (accepted)	1,850 0 0

For Conference-hall and dwelling, at Mildmay Park, Islington, Messrs. Habershon & Pite, architects:—

Hall. Dwelling.	
Grover	£2,800 0 0
Patman & Fotheringham	2,860 0 0
Cowland	2,700 0 0
Webb & Sons	2,750 0 0
Mansley & Rogers	2,600 0 0
Patinsons	2,600 0 0
Staines & Son	2,598 0 0
Shurman	2,544 0 0
Nutt & Co.	2,509 0 0
Blackmore & Morley	2,700 0 0
Goodman	2,625 0 0
Crabb & Vaughan	2,438 0 0
Temple & Forster	2,489 0 0
Baker & Constable	2,500 0 0
Forrest	2,103 0 0
Killy	2,213 0 0
Carter & Sons	2,489 0 0
Woods	2,900 0 0
Turner (accepted)	2,708 0 0

For erection of new wharf and granary, at Bermondsey-wall, for Mr. E. W. Roberts, Mr. Geo. Elkington, architect:—

Coleman	£3,020 0 0
Rider & Son	2,928 0 0
Webb & Sons	2,707 0 0
Browne & Robinson	2,895 0 0
Macey	2,584 0 0
Wells	2,567 0 0
Wells	2,448 0 0
Sugg (accepted)	2,198 0 0

For building house, shop, and manufactory, at 113, Shoreditch, for Messrs. Levy & Sons, Mr. Robert P. Notley, architect:—

Myers & Sons	£1,749 0 0
Bell & Russell	1,640 0 0
Macey	1,589 0 0
Cole & Sons	1,580 0 0
Browne & Robinson	1,528 0 0
Hart	1,520 0 0
Newman & Mann	1,468 0 0
Turner & Sons	1,459 0 0
Brett	1,450 0 0
Webb & Sons	1,410 0 0
Morter (accepted)	1,517 0 0

For building warehouse, for Messrs. Peake, Bros., West Bute Dock, Cardiff, Mr. J. Hartland, architect. Quantities supplied:—

V. Jones	£910 2 0
Slepton	772 0 0
Jones, Bros.	750 0 0
Seager (accepted)	750 0 0
Lock	748 0 0

For building two new receiving wards at the Milton Union, Mr. B. Adkins, architect:—

Gannon	£235 7 6
Tidy	799 10 0
Beaumont	798 0 0
Stratford	675 0 0
Seager	661 0 0
Sollitt	633 0 0
Moore (accepted)	653 0 0

For the erection of Baptist Chapel, with school-room and vestry, &c., in Grove-road, Victoria Park, Messrs. Searle & Son, architects. Quantities supplied:—

Patman & Fotheringham	£3,988 0 0
Dove, Br.	3,303 0 0
Brass	3,960 0 0
Myers & Sons	3,791 0 0
Perry	3,789 0 0
Emor	3,864 0 0
Wicks, Bangs, & Co.	3,549 0 0
Newman & Mann	3,490 0 0

For the erection of a house in Duke-street, Brighton, for Mr. Swain, Mr. G. Tupper, architect. Quantities supplied:—

Cheesman & Co.	£290 0 0
Holloway & Son	850 0 0
Dancy & Son	848 0 0
W. & T. Garrett	828 0 0
Lochyer	817 0 0
Dean & Dickerson	815 0 0
Fatching & Son	800 0 0
Kemp (accepted)	763 0 0

For the erection of a detached cottage, at Sitch-next-Guildford, for Mr. Henry Peak, architect:—

Bristow & Burdett	£245 10 0
T. & J. Lee	243 0 0
Bragley	226 0 0
Goff	226 0 0
Dickinson (accepted)	200 0 0

For finishing Nos. 9 and 10, Florence-villas, Feltham, Mr. Robert P. Notley, architect:—

Morter	£257 0 0
Fisher	467 0 0
Winterborn (accepted)	385 0 0

For building reading and billiard rooms, at Seaford, Sussex, for Dr. Tyler Smith, Mr. G. Major, architect:—

Dary	£625 0 0
Burgiss	620 0 0
Banks (accepted)	606 0 0

For English Presbyterian Church, at Beaumaris, Mr. R. G. Thomas, architect:—

Church. Boundary Wall.	
Thomas	£1,125 0 0
George & Co.	1,103 5 0
Chester	891 0 0
Rogers	927 0 0
Rowlands	895 0 0
Thomas & Son	890 0 0
Jones	797 0 0
Pritchard & Son (accepted)	767 0 0

For the erection of four pairs of villa residences and house, at Lower New-road, for Messrs. J. & J. Allen, Mr. Albert Bridgman, architect:—

King	£4,952 0 0
Dover	4,618 0 0
Morgan	4,500 0 0
Percival	4,350 0 0

For a house at East Dulwich, for Mr. Lander, Mr. Prim, architect:—

Minnard	£216 0 0
Wiles	698 0 0
*Dewell	580 0 0
Eustace	613 0 0
Shapley	590 0 0
Harnet	492 0 0
*Munday	418 0 0

For erecting cart-sheds at the parish wharf of St. George's, Hanover-square, Commercial-road, Fimlico:—

Haylock	£350 0 0
Morris	347 0 0
Wilson	336 0 0
Stonor	330 0 0
Fish	329 0 0
Sprake (accepted)	327 0 0

For alterations and additions at the Greyhound Inn, East-street, Brighton. Quantities not supplied:—

W. & T. Garrett	£416 0 0
Holloway & Son	401 10 0
Lochyer	397 0 0
Kemp (accepted)	344 0 0

For building gas works, at Walton, Surrey, Mr. Stereown, engineer:—

Sherwood	£2,728 0 0
Wright	2,435 0 0
Collings	2,235 0 0
Rigby	2,325 0 0
Quick	2,232 0 0
Rivett	2,271 0 0
Ladd	2,250 0 0
Farley	2,205 0 0
Harris	2,195 0 0
Bull & Sons	2,189 0 0
Nightingale	2,161 0 0

For the erection of a brick bridge, with accessories, across the river Wey, for the Farnham Local Board, Mr. Hector Harding, surveyor:—

Patrick	£489 7 0
Taylor	495 0 0
Brid	450 0 0
Harris	443 0 0
Perkins	438 0 0
Coker	436 0 0
Duke	410 0 0
Bennett	405 0 0
Dickinson & Oliver	402 0 0
Godard & Son	384 0 0
Yates & Ridgiers	375 10 0
Knight & Sull	371 18 0
Mesher	365 0 0
G. Godard	352 0 0

For forming and constructing certain roads and foot-paths, and the supply of materials for the erection of fences and walls in connexion with the roads for the Farnham Local Board. Mr. H. Harding, surveyor:—

Taylor	2,830 0 0
Perkins	771 0 0
Coker	710 0 0
Goddard	621 0 0
Bennett	597 0 0
Dickinson & Oliver	559 0 0
Bond	544 0 0
Bond	500 0 0
Knight & Stiff	498 0 0
Harris	495 0 0
Mosher	480 0 0
Bennett & Smith	475 10 0
Yates & Ridgiers	473 10 0

For new offices for the Hornsey Local Board, in Southwood-lane, Highgate. Quantities by Mr. S. J. Thacker:—

Baker & Constable	£2,257 0 0
Turner	2,270 0 0
Hookham	2,310 0 0
Taylor	2,150 0 0
Manley & Rogers	2,171 0 0
Kelly, Bros.	2,113 0 0
Mather & Read	2,109 0 0
Brass	2,069 19 6
Keable	2,041 0 0
Crockett	2,025 0 0
Southcott	1,997 18 0
Brass & Son	1,960 0 0
Nightingale	1,923 0 0
Whinship	1,912 0 0
Roper	1,900 0 0
Wood	1,825 19 6
Mundy	1,800 0 0
Foale	1,837 0 0

For rebuilding a warehouse, Philip-lane, London-wall. City, including part of fittings and Portland stone front. Mr. Herbert Ford, architect:—

Lawrence, Brothers	£17,432 0 0
Kiddie	17,402 0 0
Asby & Horner	17,362 0 0
Conder	17,079 0 0
Wells & Lomas	16,528 0 0
Meyers & Sons	16,515 0 0
Pritchard	16,745 0 0
Brass	16,429 0 0
Morley	16,317 0 0
Henshaw	16,397 0 0
Brown & Robinson	16,072 0 0
Moultrie	16,000 0 0

Mr. H.—V. R.—P.—J. G.—R.—F. R.—F. R.—F. R.—F. R.—D. C.—A.—R.—G.—M.—H.—S.—E.—W.—S.—I.—M.—H.—& P.—A.—C.—J. H.—E.—M.—W.—T.—A.—J.—H.—R.—G.—T.—J.—L.—R.—P.—N.—A.—S.—B.—R.—S.—T.—C.—M.—R.—A.—R.—G.—E.—S.—W.—R.—T.—M.—W.—S.—H.—H.—P.—W.—E.—& Co.—W.—G.—A.—E.—B.—N.—J.—O.—G.—T.—H.—F.—C.—W. (under our mark).—H. H. V. (two lines).—L. R. G. (scarcely press enough. What chance is made?—M. T. (received too late).—Expressed (in type).—L. G. (4 types). We are compelled to decline pointing out books and giving addresses. All statements of facts, lists of Tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication. None.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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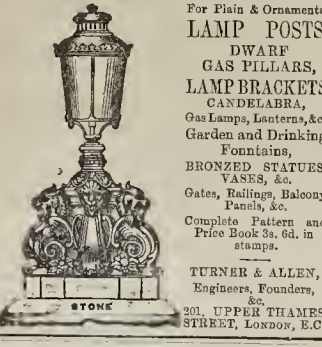
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THE ARCHITECTURAL HISTORY OF THE CONVENTUAL BUILDINGS OF THE MONASTERY OF CHURCH CHURCH, Canterbury, considered in relation to the Monastic Life and Rules, and drawn up from personal Surveys and original Documentary Research. By the Rev. ROBERT WALTON, M.A. F.R.S. Jacksonian Professor in the University of Cambridge. Printed for the Kent Archaeological Society, and to be had of the London Local Secretary, Mr. SMALLFIELD, 10, Little Queen-street, Holborn.

NEW WORK BY DR. W. ODLING, F.R.S. Just published, in Crown 8vo. price 4.6s. cloth. SIX LECTURES ON THE CHEMICAL CHANGES OF CARBON, delivered before a Juvenile Auditory at the Royal Institution of Great Britain. By W. ODLING, M.B. F.R.S. Fulkian Professor of Chemistry, Royal Institution. Reprinted from the Chemical News, with Notes by W. CROOKES, F.R.S. London: LONGMANS, GREEN, & CO. Paternoster-row.

Freeshold Building Land. MR. H. HUMPHREYS will SELL BY AUCTION, at the MART, Tottenham-yard, E.C. on TUESDAY, JUNE 15th, at TWO o'clock, numerous PLOTS of valuable FREESHOLD BUILDING LAND, with frontages to St. Mary's and Kirkwood roads, Peckham, varying in size to suit the wants of the neighbourhood, and being freehold, offer unusual advantages to builders and investors of building societies.—Messrs. Newnham, Lincolnshire; of H. A. ALEXANDER, Esq., Architect and Surveyor, 24, Mark-lane, Cannon-street, E.C.; at the Place St. Pierre, and Mr. H. HUMPHREYS, Auctioneer, Sun Fire and Life Offices, 10, London-street, Greenwich.

BERMONDSEY.—Surplus Plant and Stock of a Builder and Contractor. Timber Carriage, Spring Yarn, Cart, Barrow, &c. MR. HAMMOND is instructed to SELL BY AUCTION, on the PREMISES, in Greenway New-road, on TUESDAY, JUNE 15th, 1869, at TWELVE o'clock precisely, a Kettle, by Clayton & Shuttleworth's powerful steam boiler, with a handway and trundle to cut large-size timber; 1-ton cast-iron Jack; double purchase crane; portable force pump; cast-iron well; wrought-iron tanks; a pair of wrought-iron caps; circular iron stone in blocks and quarter, railway bars, nails, quantity of useful fittings, the square, plane, hatchet, chisels, various pieces, stials, carpenter's benches, window casements, sashes, drawers, fittings, the square, plane, hatchet, chisels, &c. &c. of other useful tools.—To be viewed on day prior, and catalogues had at the Auction Office, 33, Cannon-lane, W.C.

RICHMOND, SURREY.—Freeshold Building Land, about three acres. MESSRS. DREW & SON will SELL BY AUCTION, at the GREYHOUND HOTEL, Richmond, on TUESDAY, JUNE 15th, at TWO o'clock precisely, in 30 lots, about three acres of valuable FREESHOLD LAND, with frontages to the railway station, the town, river, the park and New Road, and some portions having frontages to the King's-road, with particulars, with plans, may be had of F. B. BENNETT, Esq., Solicitor, Giltner, near the office of late; and of the Auctioneers, George, St. Edmund, & W.

TO BUILDERS.—Messrs. BARNARD, THOMAS, & CO. have retained Mr. J. H. BARNARD to SELL the BUSINESS, with the valuable LEASE, of Mr. Joseph Harris, Car-carrier on the business, successfully for many years, and now retiring. The lease has seven years to run, and includes the yard, well-lighted sheds, and three shops, respectively tenanted, in Brick-pole. The purchaser will have to take the stock and plant at a valuation.—For all further particulars, application may be made to BARNARD, THOMAS, & CO. at their Offices, either in Bristol, Swansea, or Cardiff.—Dated Abingdon-shambers, Bristol, May 21, 1869.

WEST CENTRAL AUCTION MART, 19, Upper St. Martin-lane, opposite Abingdon-shambers, to Builders, Dealers, Country Dealers, the Trade, Parties Repairing, and Others.—Important and General Sale, by order of the Mortgagee.

MR. H. C. COOPER having received instructions, will SELL BY AUCTION, without reserve, on MONDAY, the 31st MAY, 1869, at ONE o'clock precisely, the large and valuable STOCK of a West and PAPER STAINER, consisting of about 40,000 pieces of elegant and costly PAPERS; comprising white and blue WHITE LEAD, painted DRIVERS, VARNISH, SHEET GLASS, and various articles,—a very interesting Sale. Catalogues at the Mart.

WOOLBRIDGE, SUFFOLK.—Important and very extensive clearance Sale, Brick Works, Woodbridge. H. W. COLLINS will SELL BY AUCTION, on WEDNESDAY, and day of TUESDAY, at TWELVE o'clock precisely, the very VALUABLE and EXTENSIVE STOCK of superior old-fashioned white and red facing bricks, quantity of red and white slips, aquino pipes, Bay's patent bricks, and other manufactured ware, the property of Mr. Joseph Kish, who retires in consequence of residing in the country for the present year. The whole will be divided into lots to suit the trade. Descriptive catalogues may be had of the Auctioneer, Woodbridge, Suffolk.

TO CONTRACTORS, BUILDERS, AND OTHERS. MESSRS. DAVIS & HAZLE will SELL BY AUCTION, at the RAILWAY ARCHES, Cambridge-road, Bournemouth, on TUESDAY, 1st JUNE, 1869, at TWELVE o'clock, the surplus STOCK and PLANT of a BUILDING CONTRACTOR, comprising a newly run 2-horse power and 2-horse power PORTLAND CEMENT MILL, with 2-horse power and extra fire-brick; a Mangle mill, with 2-horse power and extra gear complete; a circular saw-bench, with 2-horse power, pulley, &c. and set of saws; quantity of deals, flooring, battens, and general building materials.—Catalogues of the Auctioneers, G. P. BARNARD, & CO.

SOUTHEM, ESSEX.—Elizbetha Freehold Building Land. MR. J. TAYLOR is instructed to SELL BY AUCTION, at the ROYAL HOTEL, Southend, on MONDAY, 1st JUNE, 1869, at THREE o'clock precisely, SEVENTY-SIX lots of very valuable FREESHOLD BUILDING LAND, consisting of one acre and twelve plots for private houses, in the Leigh-road, and sixty three plots in Station-road, East and West, in the Leigh-road. Nine-tenths of the purchase-money may remain on mortgage or contract at 5 per cent. interest, to be paid in five years by equal quarterly instalments, or the balance may be paid at any time without notice.—Plans, particulars, and conditions of sale may be obtained at the Royal Hotel, Southend; and of the Auctioneer, No. 107, Fenchurch-street, City.

SURREY, SURREY.—Vote for the County.—Valuable Plot of Freehold Building Land, situate in one of the best parts of this valuable locality, only a short distance from the railway station, within ten minutes' walk of the Surrion Station, and twenty minutes' from the New Kingston Station, which is about half an hour by rail from London.

MR. HEDGER will offer for SALE BY AUCTION, in one or more lots, at the MART, Tottenham-yard, E.C. on THURSDAY, the 4th JUNE, 1869, at ONE o'clock precisely, the above valuable FREESHOLD LAND, forming the single and double lane and Grove-road, having a frontage to the former of 100 feet, and to the latter of 100 feet, more or less, and from Mr. Hedger's erection of first-class villas or superior shop property.—Particulars of the plan may be had of Messrs. DAVIS & HAZLE, 10, Pall-mall, or of Mr. HEDGER, at the Mart; at the Oaks Tavern, opposite the land; and at the Auctioneer's Office, 40, Pall-mall.

CITY OF LONDON.—Highly important and valuable Freehold Building Site, situate in the heart of the City. MR. HEDGER (in conjunction with Messrs. ST. QUININ & NOTLEY) is instructed to offer for SALE BY AUCTION, at the MART, Tottenham-yard, E.C. on THURSDAY, the 4th JUNE, 1869, at ONE o'clock, an important and valuable FREESHOLD BUILDING SITE, situate in Paul-belly, leading from Hart-court-street, with way into Brick-lane-street and Moore-street, and close to the Aldgate-street and Moore-street, and frontage of 66 feet, and is admirably adapted for the erection of warehouses, manufacturing premises, model lodging-houses, or for any purpose.—Particulars and plans may be had of Messrs. DAVIS & HAZLE, Solicitors, 29, Bedford-square; or of Messrs. ST. QUININ & NOTLEY, R. yd Exchange, E.C.; or at the HEDGER'S Office, 40, Pall-mall.

HARROW, MIDDLESEX.—A highly important Freehold Building Estate, comprising upwards of 208 acres, a portion of which adjoins the railway station, whence there is no direct communication with Broad-street, City, and which is well adapted for building most desirable opportunities for societies and other who sell parcels of land, with a view to the resale of the same, or for the erection of Freehold ground-rents, or as to portions for the erection of first-class tenement houses.

MESSRS. DEBENHAM, TEWSON, & FARMER are favoured with instructions to SELL, at the MART, on TUESDAY, JUNE 22nd, at TWO o'clock, in Four Lots, a valuable and important FREESHOLD PROPERTY, comprising portions of Headstone Estate, and Dunlough adjoining, occupying a most favourable site in the parish of Harrow. The lots will respectively consist of about 163, 8, 23, and 18 acres, descriptions of which will appear in future advertisements, and particulars to be had in due course of W. V. GEMMAY COOPER, Esq., Solicitor, 32, Lincoln's-inn-fields; and of Messrs. DEBENHAM, TEWSON, & FARMER, Auctioneers and Land Agents, 80, Chancery.

Greenhill Grove Park Freehold Estate, Berrett, being the one east Building Sites on the Ipsdown, Park, Gloucester, and Station roads.

MR. E. TEWSON is instructed to offer BY AUCTION, on MONDAY, 29th MAY, 1869, at 11 o'clock in the evening precisely, at the TEMPERANCE HALL, New Barnet, in Sixty-two Lots, the First Part of this richly-imbued and beautiful estate in Essex, comprising most desirable PLOTS of BUILDING LAND, well drained, and having gas and water laid on; with a few minutes' walk of the Great North Road, from whence there is a constant communication with the City and Westminster. The purchase-money may be paid by instalments, or in full, as the purchaser may think fit.—Particulars and conditions of sale may be obtained of Messrs. WOODALL, DONNELL, SOLLERS, & CO., Auctioneers, of Messrs. SHUTE & CO., Solicitors, No. 1, Field-court, Gray's-inn; or of Mr. HICK (the owner), and of Mr. TEWSON, Auctioneer, both of New Barnet.

Sale of Steam Engines and other Machinery, at the Cement Works, Hamlet, S.E. The following description has been taken for dock purposes.

MR. N. EASTON has received instructions from the Directors of the Hull Dock Company, to SELL BY AUCTION, at the CEMENT WORKS, Hull, on THURSDAY, JUNE 3rd, at TWELVE o'clock precisely, the whole of the valuable MACHINERY, in working order, lately used by the said Hull Dock Company, and consisting of a 2-horse power steam engine, and 20-horse power condensing, and 4-horse power high pressure steam engine, 4 Cornish boilers, 8 pairs of Freshet high pressure steam shafts, 2 large shafts, 2 sets of Newcomen, each having 400 lbs. weight of cast-iron, and various other machinery in connection with the above; 2 large wrought-iron punch chains, circular saws, old wrought-iron cast-iron; also several shafts, with iron columns, old iron ground and cast-iron, &c. &c. Catalogues may be had of Mr. HEDGER, at the Mart, or of Messrs. DAVIS & HAZLE, 10, Pall-mall, or of the Auctioneer, J. Rowallan-lane, Hull.

J. NEILL & SON, QUANTITY SURVEYORS, 11, COOKIDGE STREET, LEEDS.

Highest testimonials from several eminent architects. Terms on application.

QUANTITIES MADE EASY. A quick and accurate method of taking out quantities from plans of buildings, with or without a specification. Sent free by post for 30 stamps. Address, A. H. Newby-terrace, Brompton-road, Upper Leisham-road, New Cross, S.E.

T. A. RICHARDSON, Architectural Artist. PERSPECTIVES OUTLINED, ETCHED, or Artistically COLORED. Every description of Architectural Assistance on moderate terms. Highest references. Sixteen years' experience.—5, Seymour's Place, Chancery Lane, London.

WANTED, a PARTNER in Valuable STONE and LIME QUARRIES, or a Manager, with 2,000l. capital.—Address, W. B. Smith's, Stationer, Chipping Norton, Oxon.

PARTNERSHIP. — TO BUILDERS. — WANTED, a Gentleman in the above line, to JOIN another now in business as DECORATOR. Capital required.—Apply to J. FRICARD, Esq., Wellington-chambers, Doctors'-commons.

PARTNER WANTED in an old-established and successful IRON FOUNDRY and ENGINEERING BUSINESS in a country town. A capital of from 5,000l. to 10,000l. would be required.—Apply (by the first instance by letter) to Messrs. DEALE, MARSHALL, & DEALE, Solicitors, 19, Park-street, Westminster.

MIDDLESEX HOUSE OF CORRECTION. GOLDBATH FIELDS. — WANTED, an ENGINEER and CLERK of WORKS at this Prison. He must be well acquainted with the duties of his office, and must not be less than thirty nor more than forty years of age. Salary 200l. a year, increasing 10l. a year to 250l. Thereafter, as to the duties may be obtained on application to the Governor, at the Prison, on any week-day between ELEVEN and THREE. Persons intending to make application for the situation must fill up a printed form (to be obtained at the Prison), with the particulars required to be inserted therein, and send the same, with not more than three recent testimonials, under cover to me at the Prison, on or before THURSDAY, the 17th of JUNE next. The Visiting Justices will make a selection of approved candidates, who will be invited to attend and be interviewed, and the testimonials of those not selected will be returned post-free. The person engaged will be required to commence his duties at once, and he will be placed on probation for three months, at the end of which time, if his competence and conduct shall have been satisfactory, he will be recommended to the Court of Quarter Sessions for permanent appointment. No travelling or other expenses will be allowed. — JOHN S. SKAIFE, Clerk to the Visiting Justices. House of Correction, Goldbath Fields, May 24th, 1869.

AGENT WANTED. — W. TICKLE & SON, Fire-day Manufacturers, Maryport, wish to OPEN an AGENCY in LONDON, for the Sale of Fire-day Articles of New designs, suited for gardens, conservatories, &c. A respectable house, having a suitable connexion, will find this a profitable opening.

TWO GOOD MADRIPS DRAUGHTSMEN AND WRITERS to WANT. The situations may be permanent ones.—Applications, with full references and specimens may be sent (stamped), addressed "SURVEYORS," to J. B. Bell, Bookbinder, Nottingham.

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WANTED, immediately, JOINERS, for a few Months.—Apply to Mr. DUKE, Builder, Farnham, Surrey.

WANTED, immediately, a first-class ARCHITECTURAL DRAUGHTSMAN.—Apply to T. C. HOPE, Architect, Bradford.

WANTED, at once, an energetic industrious Man to WORK a STEAM TYPING MACHINE.—Address, with full particulars, to R. Office of "The Builder," 78, Abchurch-lane, London.

WANTED, a good DRAUGHTSMAN, for Mapping and Architectural, drawing, staining, &c. Terms and enclosing specimens and references, to CHARLES MUMFORD, C.E. Whitechapel.

WANTED, a large practical CARPENTER and JOINER upon a job in Essex. Permanent situation. A middle-aged and married man preferred. References will be required.—Address, setting wages, to Messrs. NICKOLDS & KING, Estate Agents, Saffron Walden.

WANTED, WORK, by a London Draughtsman, Colourist, &c. Design perspective quantities, measuring up, &c. Ased (inserted). Terms from 31s. 6d. weekly.—Address, 9, Canterbury-terrace, Ball's-pool, N.

TO ARCHITECTS AND SURVEYORS. WANTED, by the Advertiser, an EN-GAGEMENT in an Architect and Surveyor's Office. Is a fair draughtsman, has a knowledge of quantities and measuring, and is otherwise acquainted with office routine. Nearly five years' experience. Good testimonials and references.—Address, LORIC, care of Messrs. HICK & SON, Hill-street, Birmingham, S.W.

TO ARCHITECTS AND OTHERS. WANTED, by a experienced DRAUGHTSMAN EMPLOYMENT. Accustomed to prepare office working, and detailed drawings, to design, &c. and is well up in construction, having carried into execution some of his own designs.—Address, X. Y. Z. 6, John-street, King's Cross, N.

TO SURVEYORS, BUILDERS, AND OTHERS. WANTED, an ENGAGEMENT, by a thoroughly competent ASSISTANT. Well up in measuring, estimating, and building accounts generally, also very efficient in taking out and measuring quantities, &c. and disbursements, and a practical man.—Address, A. C. care of Mr. Lambert, 10, East-cheap, S.E.

WANTED, a RE-ENGAGEMENT, as FOREMAN and CONTRACTOR'S MANAGER (or a CLERK of WORKS), by a thoroughly practical Man of fifteen years' experience as an Estimator, Measurer, Quantity Surveyor, and Draughtsman. Has carried out numerous contracts, both public and private, in town and country. Excellent references and testimonials. Accustomed to the entire management.—Age 38.—Address, QUANTUM, 10, Chesham-road, North Brixton, London, S.W.

WANTED, by a Builder's Son, aged 21, a SITUATION. Can draw up specifications, take out quantities, measure up all kinds of work, and draw books; has been accustomed to superintend work, and the general routine of the office. Good security.—Address, FRIGGESSON, 5, Stanley-terrace, Church-end, Finchley, N.

TO PLUMBERS, PAINTERS, GLAZIERS, HOUSE AGENTS, &c. WANTED, by a Man, aged 33, Constant EMPLOYMENT in the above line, in the country.—Address, C. C. 36, Crown-street, Soho, London, W.

TO BUILDERS AND CONTRACTORS. WANTED, by a Builder's Son, aged 25, a SITUATION as CLERK, TIME-KEEPER, or any similar capacity. Town or country. Undesirable references.—Address, J. H. Post-office, Forest Hill, S.E.

WANTED, by a thoroughly Practical CLERK of WORKS, an ENGAGEMENT. Fully qualified to superintend the erection of the erection of a job. First-class references as to ability.—Address, Mr. E. TIMS, 7, Arlington-street, New North-road, N.

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TO DECORATORS, BUILDERS, &c. WANTED, a RE-ENGAGEMENT, in the Decorating, Painting, &c. as FOREMAN, Working Foreman, or to superintend a good job. Thorough practical knowledge of all the branches in the trade.—Address, H. GRAYMAN, 19, Pickering-place, Queen's Park, Hyde Park, W.

TO ARCHITECTS. WANTED, by the Advertiser, an EN-GAGEMENT in or near London, as an ASSISTANT DRAUGHTSMAN. Is accustomed to sketch, colour, and domestic work, and prepares drawings from rough sketches, and get out details. Good references given.—Address, ARCHITECT, Post-office, Mark Lane, London, E.C.

WANTED, by an ARCHITECT and SURVEYOR, a first-class FOREMAN of the principal accustomed to prepare finished, working, and detail drawings, perspective, &c. and well up in levelling and the general duties of an office. Seven years' experience.—Address, C. F. 43, New-street, St. John's, Southwark, S.E.

TO BUILDERS AND CONTRACTORS. WANTED, by a thoroughly practical Man, a RE-ENGAGEMENT as FOREMAN of BRICKLAYERS. Chief of Work, and to take the Charge of a Job. First-class references as to ability.—Address, Mr. E. TIMS, 7, Arlington-street, New North-road, N.

WANTED, a thoroughly good practical and energetic FOREMAN, to take charge of a job.—Apply by letter only to the Advertiser, in the usual routine of an office. Duties, references, and wages required, to BUILDERS, 3, Howard-road, Stoke Newington-street.

TO FURNISHING IRONMONGERS, SMITHS, AND BUTCHERS. WANTED, a SITUATION, as WORKING FOREMAN, by a first-class Mechanic, in the Smith, Hot-banging, Gas-fitting, Glass Range, Bath, Steam, and all kinds of Hot-water Work. First-class references.—Address, X. Y. 10, Victoria-grove, Marylebone, N.W.

WANTED, by the Advertiser, aged 23, a practical RE-ENGAGEMENT in an Architect's Office. Is a good draughtsman, and has had considerable experience in the principal offices. Can outline and so forth a perspective artistically. First-class specimens and testimonials. Terms moderate.—Address, L. 2, Southerton-road, Hammersmith, W.

TO BUILDERS FOREMEN, &c. WANTED, by a Young Man, a SITUATION as IMPROVER to the Carpenter and Joiners' line. Five years' good experience. No objection to work under a man that takes good plain work, &c. Can have good recommendations from last employer. Wages moderate.—Address, M. W. W. Post-office, Bond-street, Reading, Berks.

TO ARCHITECTS, BUILDERS, &c. WANTED, a RE-ENGAGEMENT as CLERK of WORKS, Managing General, or Shop Foreman of Joiners. Twelve years' continuous in first-class works by contract architects. General knowledge of all branches, estimating, accounts, &c. Town or country. Highest references.—Address, H. S. 16, Upper Kildon-hill, Brixton, S.W.

TO ENGINEERS AND CONTRACTORS. WANTED, a SITUATION, at home or abroad, in the Office, or upon the works of either the above. Can survey, level, draw, calculate, and perform such other duties as are ordinarily performed by Junior Assistant Engineer.—Address, D. T. F. 3, Southampton-place, Nine Elms, W.

TO BUILDERS AND CONTRACTORS. WANTED, by an energetic and persevering Man, a RE-ENGAGEMENT as FOREMAN of BRICKLAYERS. Chief at setting out work, and a good manager of men. First-class references. No objection to Town or country.—Address, T. J. 2, Luton-street, Portland Market, Marylebone, N.W.

TO ARCHITECTS, &c. WANTED, a RE-ENGAGEMENT, temporary or otherwise. Is a really good draughtsman and colourist, and can from rough sketches prepare finished drawings for competition, &c. Good references. Salary very moderate.—Address, W. L. 21, Great Russell-street, W.C.

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TO CARPENTERS. WANTED, to ARTICLE a Youth, aged 19, for two years, or an IMPROVER, to the above. Also an Apprentice to a Youth, aged 16 (under good control). A premium will be paid.—Address, C. ROBERTS, White House, Highgate, N.

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WANTED, by a good PLUMBER, a SITUATION as PLUMBER, or Plumber and Glazier. Five years' experience in a first-class office.—Address, G. 10, Tottenham-road, W.C.

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WANTED, an ENGAGEMENT, by a MEASURING and QUANTITY CLERK. Twelve years' experience. A practical Joiner, &c.—Address, BUILDERS, 21, Lupus-street, Finsbury, S.W.

TO MASTER BUILDERS AND BUILDERS. WANTED, by a Young Man, a SITUATION as PLUMBER. No objection, occasionally, to fill up time at other branches. Nearly two years at present place.—Address, H. C. 25, Kings Cross-road, B.L.

TO BUILDERS AND CONTRACTORS. WANTED, by a GENERAL FOREMAN, Charge of a JOB, Carpenter by trade. Age 44. Good references.—Address, H. F. 4, Lisle-street, Roman-road, Islington.

WANTED, by a good GRAINER and MILLER, SITUATION or JOB. Can be well recommended, and specimens sent. Cheap estimates given for all kinds of work, by job or yard.—Address, W. O. K. 3, Park-place, Knightsbridge, Grosvenor.

TO BUILDERS, ROAD-MAKERS, AND CONTRACTORS. WANTED, by a first-class practical Man, a Carriage-way FAVOR, Street Mason, Granite Dresser (Wood Block, Dutch Churner, or Tiler), to TAKE WORK by the PIECE. Labor only. Good testimonials and references.—Address, JAMES CRITCHLEY, 7, James-place, North-street, Poplar.

TO SURVEYORS AND BUILDERS. WANTED, a RE-ENGAGEMENT, by a Young Man, well acquainted with office duties, drawing up quantities, measuring up and estimating work, &c. Twelve years' experience from surveyors and builders in town.—Address, A. B. 6, Foley-street, N.

TO BUILDERS AND CARPENTERS. WANTED, to place a YOUTH as INDOOR APPRENTICE, to a joiner, in the above. Ready and suitable premium offered.—Address, F. H. 22, Bedford-street, Bedford-row, Holborn, London, W.C.

The Builder.

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Parisian Parks and Squares, with a view to the Improvement of our own.

URING the last ten years, while London has been but gradually improving in its parks and public places, Paris has been developing into Arcadia, and has left us far behind. Elysian fields, as one of the Parisian promenades is called, is not too extravagant a term to apply to most of them. Large sums have been spent on their improvement, and are annually expended on their maintenance; and, for a wonder, there are but few people who will not allow that they are worth the money. The French parks, promenades, gardens, and squares are all kept better than ours, though it is understood that it was our parks and squares that first induced the French Emperor with a desire to increase their number in Paris. The author of "Earnings from French Gardens" has recently enlarged the sphere of his observations; and has presented to our consideration a description of the Parisian parks, promenades, gardens, squares, churchyard-spaces, and boulevards, and a statement of the manner of their maintenance and their cost, with a view to our adoption of some of their best points.* One of his leading ideas under the present system we are expending too much upon a few parks, instead of increasing their number. Another is that our parks should be improved scientifically; that they, their special aspect and soil should be adapted to bear upon the kind of trees and plants most suited for them. Instead of every park having a hedge of privet and horders of yew, with a few trees all of a similar kind in the arrangement and contents of each should be entirely different. One square might exhibit the vegetation of the South Sea Islands; another a meadow and hill flora of cold and temperate countries; others, he urges, might be planted with grass, hardy shrubs, and flowers, and then people would have an object for which they would induce them to take this exercise more frequently than they are presently inclined to do, for want of one. In the manner our parks should be treated as naturally as possible: one might be bright flowers, the only besage being that necessitating shelter and set them off; and another with the forest trees of northern and central Europe. Want of variety is one of the most horticultural misfortunes; and the preparation for an annual display over permanent plantings is one of the mistakes of our Commissioners of Woods and Forests. These ideas are the result of his Parisian survey, and to that we will now turn.

There are four parks in Paris, eleven squares, and the Champs Elysées, the gardens of the Louvre, the Tuileries, the Promenades, and Gardens of Paris, and considered in relation to the Wants of our cities and of public and private Gardens. By W. Robinson, F.R.S. With upwards of four hundred illustrations. London: John Murray. 1868.

the Tuileries and the Luxembourg; the Jardin des Plantes, the Garden of Acclimatisation, several church gardens, and cemeteries; many long lines of boulevards, besides public nurseries, and great tracts of market gardens. All these open cultivated spaces, some of them occupying the site of narrow streets and filthy houses, cannot be without their beneficial influence upon the sanitary condition of the inhabitants, and we can see for ourselves the fresh effect, as of a newly-watered garden, they give to the city. Beginning at the west end with the Bois de Boulogne (of which we have spoken recently), we find 2,000 acres of land laid out as a combination of forest and pleasure garden, one half being wood, a quarter grass, an eighth roads, and some 70 acres being dug out into lakes. Some part of this park is cultivated with more than the finish of our own; the rest is left covered with scrubby woods and wild flowers; and further diversity is attained by water-falls, an enclosure for the deer; bold rock-work, attractive with conifers, rock-shrubs, and magnolias; a zoological garden; the race-course, known as Hippodrome de Longchamps; a large cascade near this, with the rocks about it, planted with ivy and rock-shrubs; and in the lakes are little islands of cypresses, bamboos, pampas grass, and other forms of pleasing vegetation, artistically arranged. Near the centre of the Bois and the lower lake is an enclosed space, called the Pré Catalan, where there is a cow-house, with eighty milch cows in it; some refreshment-rooms, and an open-air theatre; not forced, however, upon every one's observation, but sheltered, and carrying an ornamental aspect. The milk-house is frequented by the general company, but most especially by the horsemen who ride out early for exercise. And here, too, every August is held a gardeners' fête, with dancing, games, and fireworks. A curious system of removing the rain-water is adopted in this park, to which we referred in our recent notice of the Bois.* A number of tanks capable of holding from ten to twenty cubic metres of water, are placed under the foot-paths and in side alleys, to which the rains are conveyed by 4-in. drain-pipes, the first joint of which is imbedded in a monthpiece of Portland cement. Some of the tanks are circular in plan, and terminate in truncated cones; others are rectangular. Mr. Robinson describes the rectangular cisterns as measuring from 4 to 6 metres in length, between 1 and 2 metres in width, and 2 and 3 metres in depth, arched at the top, and being provided with trapped holes, by means of which they can be cleansed, and with harlequins in the footwalls for the escape of the water. The system of tanks was adopted as less expensive than the construction of sewers, which was estimated as being likely to cost 160,000*l.* The actual expenditure for the tanks is not given. The zoological garden mentioned as being within this park is the Garden of Acclimatisation, and is not to be confused with the famous Jardin des Plantes, where there are more zoological specimens. Its 200 varieties of vines removed from the Luxembourg, its oyster-beds and ostriches, Russian dogs and foreign ducks, and other curiosities of creation, are of scientific interest. There is a plan of the Bois given, and a dozen views of its streams, lakes, cascades, rocks, restaurants, and islands.

At the east end of the city is another noble park, the Bois de Vincennes, with a plain in it of 755 acres, where there are a drill-ground, 40 acres of water, 700 or 800 acres of forest, 110 of shrubberies, and as many of roads. Lakes, with islands and margins choicely planted, a fruit-garden belonging to the municipality, and a city nursery for herbaceous plants, rustic bridges crossing the waters, restaurants in the likeness

of Swiss chalets, and a plantation of Wellingtonias, are some of the chief features here; but everywhere turf, trees, and flowers are in refreshing contrast and freshness. The deep fresh green of the Parisian parks and gardens, as compared with the hay colour of the grass in London parks, varied with brown patches where it has been trodden away, as it often is in summer, is one of the most striking effects. This freshness is maintained by the system of watering. Even the race-course at Longchamps is watered. Long lengths of metal hose, made in joints about 6 ft. long, with junctions of strong leathern hose, each length of pipe being supported on two pairs of little wheels, are the means by which the process is effected, as we have before now mentioned in these columns. At a distance of about 3 ft. are perforations through which jets out a sprinkling fountain of water, not dense enough to convert everything into mud, yet of sufficient force to do the work required of it. Mr. Robinson has inquired, and finds that a man can water 1,500 square metres per hour, by the use of an apparatus 30 metres long, and that he need move the hose but three times. More than a mile of this kind of hose may be seen at work with hundreds of jets playing. For watering the streets the same kind of hose, running on little low wheels is used, only there is but one jet, which is at the end, that the man in charge can accommodate its use to the convenience of the traffic. One man does the work of ten when a garden is treated in this same manner. For roads and pathways a deliquescent salt is being tried. This is obtained from the residue of the manufacture of carbonate of soda. It is sprinkled over the roads by hand. Where there is traffic the salt requires renewal frequently, hence the cost runs up to twice that of water; but in places less frequented it is found to be much cheaper, because there is no cost incurred for pipes and hydrants.

The Parc Monceau stands the next on the list. It is more beautified than the others, though not so extensive. It was laid out, in the first instance, as an "English garden" for Philippe Egalité in 1778. Here may be seen the system of placing handsome plants singly upon grass, or in groups, to form one mass distinct and isolated, round which people can move without injuring them. The entrance avenue is of plane trees, with lines of roses of different colours on each side of the pathway, and in every direction are masses of foliage-flowers in superb contrast. There are not more than twenty-two acres in this park, which was improved at a cost of 48,000*l.* in 1861. The Parc des Buttes Chaumont is in quite a different style,—a Parisian Primrose-hill, with a bit of Hampstead-heath, thrown in, taken in hand and beautified without stint. The site was formerly a scene of desolation, abandoned clay mounds, and excavations. There was a quarry in it: this is retained as a cliff, 164 ft. high; and one of its bays is made into a stalactite cave, about 60 ft. high, into which water trickles through a gorge over ivy and other suitable plants. We give a view of it from Mr. Robinson's book.* At the base of the cliff there is a lake. Winding about on the grass are little streams, with Alpine plants placed here and there. One of the hutes, or high mounds, is planted with deciduous, which Mr. Robinson considers a mistake, as it is better to choose deciduous trees wherever possible in cities, evergreens being less likely to flourish. Another feature is artificial rockwork that is to be covered with plants. The approach to this park is only temporary, and is not satisfactory, though it is likely to be as magnificent as the rest when finished. The author was much impressed, in the course of his survey, with the extreme rapidity with which such works of improvement are carried on in Paris:—

* See p. 277, ante.

* See p. 446.

"I have seen acres of land removed to a depth of several yards without any fuss, and in a few weeks; miles of trees planted in the course of a single week; old suburbs blown up by hundreds of mines a day, and levelled into commanding terraces fit for princely mansions. One June day, bright, dry, and very warm, they were planting trees in this park, and large ones too,—trees that required great machines to lift them,—while they were marking the ground for fresh plantings. "Do you plant after this date?" I asked. "Every day in the year!"

The cost of turning this wilderness of plaster workings into a picturesque promenade, green with turf, glittering with water, and fragrant with floral triumphs, was about 140,000*l.* Of this sum 120,000*l.* were expended upon the bridges, roads, and gardens; and 20,000*l.* upon three restaurants, one double and eight single park-keepers' lodges, a rotunda, and the railings.

The gardens of the Luxembourg, concerning which such a tempest was raised a few months ago, are more concentrated than they used to be. Close to the palace is a basin flanked by balustraded terraces, above which are marble stairs and chestnut groves. The banks that rise to the terraces are planted with dwarf rose-bushes, and the borders of the squares of grass are full of a succession of occupants all the year round. In the borders, among the flowers, are lilac bushes, roses, and low bushes of honeysuckle—surely a treat to the people, whose road to their work may take them that way. The fountain, with its group representing Polyphemus discovering Acis and Galatea, and its long basin of water bordered with plane-trees, that make a green archway over it, and adorned with festoons of ivy and Virginian creepers stretching from tree to tree, is illustrated. M. Riviere, the superintendent at this place, gives free lectures, made very instructive with references to the examples he has at command, which are numerously attended. He appears to be especially clever in the cultivation of Woodwardias, which are seen to great perfection under his management, in the gardens in summer, and in the conservatories in winter.

To enable those who do not know Paris to picture the Place de la Concorde and the avenue of the Champs Elysées, the author bids them think of a wide pleasure-ground at the lower end of Regent-street, and to add to it a grand chestnut-tree-bordered avenue stretching through it and stalking on and on to the highest point of the broad walk in Regent's Park, and then to add to that the largest triumphal arch in the world. On the left side is the garden laid out in 1860, sprinkled with little sheds for the sale of cigars and gingerbreads, and dotted here and there with restaurants, concert-stands, and *cafés*; yet still sumptuous with belts of shrubs ringed round with flowers, the greenest of grassy carpets, great clumps of rhododendrons, weeping willows, banks and beds of azaleas and hollies, isolated specimens of rare plants, pampas grass, Wellingtonias, and weeping sophoras. The unobjectionable effect of these refreshment-stalls and chalets leads the writer to inquire why people cannot have similar accommodation, dropped down in the same quiet way, among the flowers and foliage of Kew. The two gardens in the Place Napoleon III., the enclosure formed by the new buildings at the Louvre, are quoted as being valuable lessons in inexpensive city gardening, and charming relief to the buildings and sculpture around. They are octagonal, small, and surrounded by railings with gilt spears, and contain only a circle of grass with an edging of ivy. Mr. Robinson's theory is that plenty of these simple squares, giving breathing-room in dense quarters of the town, are to be preferred to one or two large parks which can only be used by the comparatively small section of the community that lives conveniently near. The rows of orange-trees in tubs to be seen in the Tuileries, the Luxembourg, and at Versailles among other places, find little favour in his eyes. He calculates that each tree has cost as much as it takes to educate a surgeon or barrister, and when this unworthy expenditure has been made upon it, it never comes to anything more than a large tuft of not very healthy green leaves at the top of a tall stem. The orange-tree tub business comes in, therefore, for blame. And in many other instances the author shows he can see French mistakes as well as British shortcomings. Nevertheless, he brings up a large balance in favour of Gallic gardening for cities.

The first square on Mr. Robinson's list is that of St. Jacques, an open space in which once stood a church, of which only the very fine tower is standing. This, we need scarcely repeat, has been restored, and forms the leading feature of the square. Here, on one of the lawns, is a

specimen of the great Abyssinian *musa*, 12 ft. high, with leaves 8 ft. long, each having a red mid-rib tapering from the base to the point; backed with trees of our own latitudes, and in the foreground, is a mass of the edible *caladium* springing from a bed of mignonette, edged with guaphalium; and so on, in other nooks; a brilliant contrast to the clammy, slimy, dark places round some city church towers we might name, and, indeed, to its own former dilapidated and cheerless condition. This transformation was effected at a cost of 6,000*l.* Unlike the London squares, which are kept locked up, and rarely visited save involuntarily by the nurse-maids in charge of the children of nervous residents afraid to trust them out of their sight, the gates of the Paris squares stand open, invitingly, from six in the morning till ten at night; and they are furnished with seats. It is rather curious that while we are apt to think the populace of other countries less likely to injure public property, either trees, antiquities, buildings, or works of art, than our own, the French rightly impute to our people a similar propensity of behaviour. At one time, when the subject of planting these squares and places in Paris was discussed, a decided opinion was expressed that though such proceedings were practicable in London, they would never answer there, where the revolutionary tendencies of the people would be sure to assert themselves in the destruction of the plants and flowers. Rarely, however, is any damage done.

The Square des Batignolles, once an open space before a church, has a streamlet for its leading feature, instead of an old tower like St. Jacques. It resembles a charming vale, in which meanders a streamlet ending in a lakelet:—

"The margins of this streamlet are variously embellished with suitable plants; the rich grassy sides slope up till they end in dense plantations of the choicest shrubs, so well planted and watered that they look as fresh as if growing twenty miles from a large city. Let us walk round—the margin of the shallow, grassy vale to our right, the boundary shrubberies and the railing to our left. The walk expands from the breadth of ten or a dozen feet to forty, on the first corner of the square, so that the children find little playgrounds without going on the vividly green grass."

Where the gravel walks widen there are seats, and chestnut-trees to give shade, so that those in charge of the children can seat themselves while they play, and the general public can rest and enjoy the scene. Honeysuckles climbing up the stems of the trees, groups of tall maize springing out of dwarf phloxes, beds of variegated flowers, clumps of shrubs edged with flowers, groups of poplars and cedars, isolated specimens of the castor-oil plant, and bananas springing out of the turf, meet at the eye on all sides. The only fence used is a very low, light, open-work iron edging. The streamlet takes its source from a rockery covered with ivy and creepers, and shaded with trees. This little landscape extends only over three acres, was finished the year after it was commenced (1862), and cost 60,000*l.*

The Square de Montrouge is in an inaccessible locality, and is not so large as Leicestershire-square, but is full of "glistening, deep, and refreshing verdure," in the form of little lawns belted with low trees and shrubs. A group in bronze adorns one grass plot. The plants, too, are of the choicest; tropical grasses falling from tall stems like fountains, plants with huge leaves 3 ft. long standing in a broad mass not more than 4 ft. or 5 ft. high, and other contrasts and varieties.

In the Square du Temple there is more water, with water-plants, rock-work, and weeping willows, one specimen of which is considered to be 400 years old. There is a tall chimney of a manufactory in full view, and it has other every-day surroundings; but there are great masses of white and crimson and other hues among its deep green settings, that make it, nevertheless, very enjoyable. There are but 8,000 square yards in it. The cost of laying it out was 6,000*l.*

The Square des Arts et Métiers is one of the most frequented of the new improvements. Sometimes, indeed, of an afternoon, it is difficult to get across it, for the number of people taking the air in it. Here we part company with the idea of iron-railing, hitherto inseparable from squares. The inclosure is effected instead with a low balustraded wall, upon which are vases, at intervals, with aloe and similar plants in them. There is more gravel here than in most of the squares, because it was intended to serve as much as possible for a playground. In the centre is a Crimean monument; and besides

this there are two ornamental fountains, with oblong basins of water. This is considerably smaller than the Temple-square, for it covers but 5,000 square yards. The cost of it was, however, considerably more, 12,500*l.*

In the Place Royale we find another large open gravelled space, with an equestrian stat in the centre, shaded with a group of chestnut trees. In each angle of the square is a spouting fountain, the basin of which is bordered with grass, and then belted with flowers, and the grassy margin first mentioned are isolated specimens of the dark-leaved *Canna*. Mr. Robinson reminds us that Richelieu, Delorme, a Victor Hugo lived in the houses of this antique square. The garden of the Palais Royal is specimen of what a French square used to be before the taste for "English gardening" was set by the Emperor. It is a gravelled space with lines of clipped trees.

The Square des Innocents is another new one. In the centre of this stands the celebrated Fontaine des Nymphes, built by Pierre Les in 1550. This was made, in 1860, into a flower-shady, green, cool piece of pleasure-ground, the inhabitants of a busy neighbourhood at cost of 8,000*l.*

A nearly similar expenditure has made ground around the chapel that contains the mausoleum of Louis XVI. and Marie Antoinette in another square. This work was effected in 18 the exact cost not exceeding 7,500*l.* The Square de Belleville is an example of a small inexpensive square made in a poor neighbourhood, to its great improvement. The site was that on which the fûtes of Belleville were formerly held, which was planted with lime-trees trained in the form of an arbour. It has now been planted with flowers and shrubs, and converted into a beautiful pleasing spot, at a cost of 800*l.* Like it is the Square Vintimille, a pretty fresh green spot in the centre of an old *place* for less than 100*l.* The Square Montholon is, again, more ambitious. Here there is a grass plot sunk in the centre below the level; and there is also a running stream issuing from a rock into a miniature lake. The 5,000 square yards here embellished cost 7,500*l.*

We will give the author's description of another:—

"The Square Louvois is formed on the site of the Théâtre de l'Opera, which stood there until 1820, the assassination of the Duc de Berry, which took place in the February of that year, the theatre was pulled down, and a Chapelle Expiatoire was built on the spot. The building, however, was hardly completed when the revolution of 1830 burst forth. The chapel was pulled down, the ground was turned into a public square, and planted with trees. Later on, a beautiful fountain, from the design of Visconti, the architect, was built in the middle of the spot. The square consists principally of a grass which surrounds the fountain, and of two rows of trees, and a few simple ornaments; but notwithstanding the peculiar way—designed so as to form low pyramids, the place being planted. Usually, it is embellished with few ornamental exotics in summer, and is at all times a graceful spot."

In this way the author shows us the vigorous effort that has been made in Paris to open up and let in the sunshine and fresh air in all directions, especially in those that most needed. There is yet another square of which he speaks particularly; and as this is one connected with a museum, and consequently of a different character, we also mention it. It is that of the Hôtel Cluny and Palais des Thermes. The ruins standing in it, it will be remembered, and many of the objects of antiquity that were intended for the adornment of the exterior buildings are here displayed, and the plants and flowers beautify their surroundings, and withstanding the site adjoins a busy boulevard.

The fruit, flower, and vegetable markets of Paris form another department in this volume, and we are again impressed with the advantage the Parisians enjoy in this matter. The Central Market, their improvement upon Covent Garden, covers five acres of ground. There are streets of stalls in it with passages wide enough for purchasers to transact business conveniently, and the stalls are airy, and sufficiently large. We reproduce of Mr. Robinson's views of it, and append a description.

"It is constructed so as to be a protection against extremes of weather at all seasons: it is cool and shady in summer; the system of cellars underneath roomy and good, and many useful arrangements for storing away provisions, both live and dead. The roof is zinc, the flooring partly asphalt, partly sand, and, like every new building, or avenue, or

attract in Paris, trees adorn the margin of the wide footways around it, shading the scene of almost ceaseless animation beneath."

We shall return to Mr. Robinson's very useful volume, and refer to some of the many suggestions it contains.

THE CHROMATIC HARMONY OF THE INTERIOR OF WESTMINSTER ABBEY.

THE bold experiment to which, without any previous announcement, the tomb of the mother of King Henry VII. has recently been subjected, has called forth a series of explosions and counter-explosions, which many persons have read with amusement, and a few—the wiser few—with pain.

When we remember the position which, according to statistical comparison, England holds among educating or semi-educating nations, and especially when we reflect upon the very recent and limited development which art-education has experienced in our island, we shall hardly be surprised at the rarity, not to say the poverty, of writers in the English tongue who even attempt the *métier* of art-criticism. Whether we may put the effect for the cause is doubtful, but it is not possible to disconnect the fact that educated men are not ashamed to confess their entire ignorance of art, with the tone that is so frequently assumed by some of the few writers who have the field so much to themselves. On no point do men speak with such hesitating, unblushing, intolerant, dogmatism as on a question of taste. On any scientific difficulty some patient and long-unknown student may be expected to emerge from obscurity, and if he cannot at once throw the full light of explanation on the subject, he will yet place at the common disposal of scientific men the result of his investigations, and indicate the path by which he expects that the final triumph may be attained. Reasons may exist, indeed, of a commercial or of a nobler nature, that induce the scientific man to keep his own counsel for a longer or for a shorter time. But when he does speak, he does so clearly. He endeavours to tell others what he knows himself. He does not make use of a cramped and arbitrary phraseology calculated to veil his dogmas in so much obscurity as to preserve them from ready attack. He states what he knows, and how he has come to know it; what he expects, and what reason he has to expect it. He will use—and if he is a highly educated man probably plentifully use—technical terms. But he will only do so for the sake of precision, and he will be careful to explain the meanings of those terms with such lucid distinctness that no attentive hearer can misunderstand him. Such, we hope, is at least the method aimed at by our men of science. Such, beyond doubt, was the method of Faraday.

If we contrast this endeavour to carry the listener intelligently along with the speaker, or the writer, with that into which so many men seem, perhaps unawares, to fall when they speak of art, we shall gain a clearer insight into the cause of two not very brilliant phenomena, namely, why so few persons, even in their own estimation, know anything about art; and why there is such extreme, irremediable, and even undecided conflict about matters of taste. The writer on art, with the rarest exceptions, never explains a term. He seems, on the contrary, rather to lug himself on the facility with which he can throw the dust of a few hard words into the eyes of his admirers, or his opponents. With some men this may arise from natural infelicity of expression, or from the modest assurance that those whom they address know at least as much about art, its canons and its language, as they do themselves. At other times—we do not wish to be disrespectful to any one who can make use of the pen—we are put in mind of a poodle attempting to guard the entrance of the studio by shouldering a manstick.

Now, in the presence of a question of such extreme importance as the preservation or the neglect, the repair or the destruction, of some of the finest Christian monuments in the world, it is surely fit that the subject should be approached in the spirit of modest inquiry as to the best course to pursue, and of candid respect for all knowledge, or well-founded advice, that may be forthcoming. We might perhaps be accused of exaggeration if we were to say that, three hundred years hence, the destruction of such a monument as that which yet remains so perfect of the *chère reine* of the great King Edward I. would be considered as serious a

national misfortune as the loss of a great battle. One thing, however, is clear,—it would be more irreparable.

It is not then by sharp incisive letters, more fitted to raise a laugh than to carry conviction, that the thinking public will be enlightened on the subject. "We have had a most perfect success," says one gentleman. "What—touch the tombs!" replies another; "it is sacrilege."

"It is a housemaid's question," sneers a third. "Do you like to sit down in dust half an inch deep?" "A housemaid!" retorts a fourth; "do you wish to scrub up the old bronzes with ashes like a copper kettle?" Even this, if non-convincing, may be rational; but when one man lays down, in lofty language, his *ipse dixit*, on either side, not as an opinion, but as an oracle, why does not he see that he instantly prompts a hundred to contradict him by the mere anarchy of his tone. He may be right, but people will not believe him, unless he tells them in plain language why he holds his opinion, as well as what his opinion is. It convinces no one to call dirt "patina." It satisfies no one to say "the chimney-sweeper gives the tint which is respected by the preceding writer."

The first important question with reference to the condition of the grand bronze monuments of Westminster is the chemical one. It is a matter to be approached with some degree of delicacy when we consider what sort of workmanship we have produced in this material, in the full scientific blaze of the nineteenth century. When we compare our grimy Peela and Wellingtons or our serofulons lions with the purer metal cast by Bacon, even so short a time back as the reign of George III., to say nothing of the cannon taken from Russia, or of one or two of the elder bronze statues in the metropolis, we may well admit that dealing with the alloys of copper is not to present our *fortis*; and when we compare what has been done so recently and rapidly by man with what has been effected by the lapse of nearly six centuries, we may well take counsel to look before we leap.

After the question of the preservation of the monuments themselves follows the question, more properly architectural than sculptural, as to the harmonious aspect of the Abbey. Concerning this, we have a word to say with reference to the present appearance of the tomb *sub lite*, but we wish first to call the attention of our readers to another part of the Abbey, where an innovation bears the date of 1869, which may guide us in forming an opinion on this very serious question.

At the north end of the organ screen, during the alterations in the choir, a new end, of plain but not clumsy oak, has been added to the organ loft, which has not, even yet, assumed that mellowness of tone, the absence of which, when the woodwork of our churches is renewed, for a time grates upon the feeling. Under this gallery is the tomb of the last representative of one branch of the Carteret family—Sir Charles, who died in 1715. The tomb is a sarcophagus of marble, either built into the wall, or so executed as to represent such a position. To the right of the spectator a stout cherub leans on a diagonally disposed narrow slab of marble, which there is some reason to suppose to be intended to represent a sunbeam. The resemblance, however, is not clear. It is a plank, so to speak, of marble, placed at an angle of 45 degrees from the floor, and on it are inscribed the names of several of the family. In fact, it is of the date when the taste for allegorical sculpture was still prevalent, but when the artist hands which emblemed some of the early coconets were cold and stiff.

Above this quaint and ugly tomb, the whole space between the soffit of the organ-loft, the door giving access to the stairs, and the end of the same, is occupied by a new, bright, chromatic decoration. The space thus filled is some 9 ft. square. It is divided, by a light scroll work, into four compartments, each containing the coat of arms of a peer or peeress, with supporters, coronet, and motto. A border surrounds the whole, of the same dispersed or rather latticed pattern as the division between the quarters of the tablet, with gilded margins, and the initial letter C, and twelve shields of arms, brightly blazoned and illuminated.

The colours appear to have been chosen with care. The first effect of the memorial, new as it is, is rather glaring. But it can hardly be doubted that a comparatively short period will subdue the freshness of the tinctures, so far as to enable any judge of colour to form a correct opinion as to the effect of this mode of restoring

the ancient polychrome style of adornment. That the effect on the general repose and harmony of the Abbey will be far less disturbing than is that of the incongruous and rampant originality of many of the marble memorials which afflict our walls, we think there is a fair promise.

The ground of this memorial is a pale creamy white. The gold in the decoration is of a pale natural tint, neither reddened by copper nor whitened by silver. The red and blue of the illuminator, the gules and azure of the herald, are of that subdued tone which characterizes the coloured reliefs of many of the Egyptian tombs. The argent of the armorial bearings, and even the pearls on the coronets, are not tinged with silver or with the more drablike substitute, tin, but are merely indicated by outline on the self-coloured ground. The sable of the bearings, and the lettering of the inscriptions, are of a pale brown, and nothing so much detracts from the offensive glare of a perfectly new work as this undertaking of the inscription.

The arms will be valuable to the heralds of 2269 A.D., if arms and if heralds are extant at that date. It so happens that the supporters, which form the most prominent features of the memorial, are both brilliant and diversified in their colour. The first escutcheon, on the upper corner to the left, is that of Grace, Countess Granville, who died in 1744. It is not correctly blazoned, according to the best heraldic rules, as the field is not displayed as a lozenge. Uniformity is preserved by the use of four shields (of the heater shape), but as the memorials are divided, two to either sex, the appropriate form of field might have been adhered to with advantage in each instance.

The Countess of Granville's escutcheon, under an earl's coronet, is supported by a red-winged antelope to the dexter, and by a gold griffin to the sinister, with the grand motto beneath,—*"Loyal devoir."* The arms of John, Earl of Granville, who died in 1763, occupy the right-hand compartment on the same level, supported by two winged antelopes, gules. Those of Martha, Viscountess Lansdown, who died in 1689, are supported by the two brilliant winged monsters above named—the golden griffins; and those of Frances, first wife of the above-named Earl John, under the coronet of her husband, have supporters similar to those of her husband. A short inscription of the name, distinctions, and date of the birth and of the death of each of the above nobles, is clearly and distinctly painted, in Gothicized letters, beneath each blazon. Under and along the whole length of the tablet runs the following legend:—"All the above lie buried in the vault of their relative, General George Monk, Duke of Alhmarle, K.G.; and this record is inscribed by order of their descendant and inheritor, the sub-dean of this collegiate church. A.D. 1869." The sub-dean is Lord John Thynne.

We think his lordship is to be congratulated on the performance of this family duty. The thought that has been given to the subject has evidently been considerable.

Looking to the operation in the north aisle of the chapel of King Henry VII., we expected, judging from the announcement made, to see the effigy restored to something like the condition in which it left the hands of the sculptor. We do not think that such is the case. A gleam of golden yellow draws the eye at once to the spot. We cannot say that, in itself, this is objectionable. Yet, as the monument now exists, we fear that it must be so considered. The robes of the effigy, on which the greater part of the chemical cleaning has been bestowed, are not as they were once, brightly gilded over, but streaked and stained of copper, where fingers have constantly passed, and disfigure the restored gold. Different parts of the statue are in different conditions. Some parts, which have been gilded, are still black. The face and hands, by far the finest part of the effigy, appear to have been untouched. If they have undergone any cleaning the utmost credit is due to the operator. Although showing signs of age, they are in good preservation. But then, dark bronze contrasts too harshly with the gold of the robe, and the contrast is rendered more unpleasant by the rents and tears in the gilded sheath. The escutcheons beneath the tomb, let into foliate wreaths in the marble of which it consists, have a somewhat brassy appearance.

We fear that either too much or too little has been done to this tomb. We desire to speak with all modesty on the subject. We cannot doubt that the Very Reverend historian of the

Abbey has taken almost a paternal interest in the experiment. We think it possible that something more than mere washing and careful dry-rubbing may be advisable as to some of the monuments. We feel sure that a simple and safe process of removing actual dirt is loudly called for. But it would be with the utmost reluctance and hesitation that we should be disposed to lend a hand to anything more. And, although the memorial tablet erected by Lord John Thynne seems to show that the idea of gold and well-chosen colour being incongruous with the tone of the interior is erroneous, yet we cannot hold that the result of the operations on the tomb of the great-grandmother of the Non-heated Elizabeth is highly encouraging.

We suppose that we are correct in holding that the entire responsibility as to the preservation of these invaluable monuments devolves on the Dean of Westminster. From no one can we expect more loving and reverent care for so great a charge. We have been happy to echo the words of Dean Stanley when telling us what memorials are treasured in the Abbey. May we not be heard in our turn, when we say, although no advocates of either dirt or neglect, that the chemistry of bronze effigies may not be made a subject of experiment. One unlucky week may do mischief which five hundred years have been powerless to effect. Let us feel our way in a matter of so much national importance.

THE DICTIONARY OF THE ARCHITECTURAL PUBLICATION SOCIETY.

The early completion of this important work is so desirable that we give at some length a report of the proceedings at the annual general meeting of the subscribers held at the House in Conduit-street, on the 31st ult. Mr. William Tite, M.P., presided, and the report, to which we have already alluded, was laid before the meeting. The balance-sheet showed that the amount in hand available to pay the cost of production of the parts of illustrations and text then on the table and for future issues was 346l. 11s. 2d.

Mr. Cates, the hon. secretary, explained that this amount would not suffice to defray the whole of the expenditure, but that the arrears due from subscribers, and now in course of collection would suffice for this purpose; and further showed that for some years past the society had not been solely dependent on the annual subscriptions. The actual number of subscribers was about 300. In 1860, the receipts from subscriptions amounted to 341l., while from miscellaneous sources and sale of parts 170l. were received, and the expenditure was 456l. In the next year the subscriptions were 331l., miscellaneous receipts 203l., expenditure 452l. In 1862, the subscriptions were 351l., miscellaneous receipts 159l., expenditure 547l.; in the next year the subscriptions amounted to 332l., miscellaneous receipts 245l., expenditure 550l. In 1866, the subscriptions were 288l., miscellaneous 143l., and expenditure 398l.

Mr. Charles Mayhew having remarked on the desirability of hastening the time of completion, suggested that the remainder of the subscription to the Dictionary should be paid in three yearly instalments of three guineas, so as to get the work completed in that time. If the publication was to be extended over nine years more, some of them would not see its completion.

Mr. C. C. Nelson expressed his willingness to pay nine guineas down in order to expedite the completion of the Dictionary.

The Chairman remarked that the great point was to get a sufficient number of additional subscribers; he should be glad to hear the hon. secretary's opinion on that.

Mr. Cates thereon reported the very satisfactory replies he had received, expressing approval of the scheme for completing the Dictionary, several gentlemen coupling their approval, with the guarantee of an additional subscriber, or sending the name of one, while others expressed their willingness to contribute a larger annual subscription to secure the completion of a work which, even in its incomplete state, they had found to be of essential service and assistance in the practice of their profession. He also remarked it was a startling fact, that in London they had only 140 subscribers. Just before the meeting, he had jotted down the names of some few persons, as they occurred to him, who, he thought should be subscribers in London

alone—men to whom in their various vocations the Dictionary would be a great advantage. He had made out a list of such persons, amounting in the aggregate to about 250, who he considered ought fairly to be subscribers to this work; and if each subscriber would suggest to his friends how desirable it was that they should possess it, no difficulty could be found in obtaining in London alone the 150 new subscribers whose accession would enable the committee to complete the work for the fixed sum of 15l. 15s. for the whole, and without any payment from the present subscribers. The fifteen guineas need not be paid down at once; it would be sufficient that new subscribers undertook to pay that sum. He had also prepared a similar list of persons in the provinces, many of whom he believed would subscribe to the Dictionary if the matter were properly represented to them. In reply to inquiries, he said that a new subscriber paying the fifteen guineas would receive a copy of the work as issued up to the present time, comprising the text of the Dictionary A to L, and a large series of illustrated plates. If five guineas were paid, five years' publication would be supplied.

In reply to other inquiries by Mr. Hansard, Mr. Newton, and others, the Hon. Secretary said, leaving the question of time out of consideration, the great point they had to attain was this: they had a certain stock of copies in hand, and that was so much capital to the credit of the society, and the object was to utilize that stock by getting new subscribers. They could then provide funds for the completion of the Dictionary within the shortest possible period compatible with maintaining the character of the work. If they could at once bring in only a hundred new subscribers he would undertake to say before the Dictionary was completed he would be able from various other sources to get rid of all the surplus copies which would then remain.

Mr. Seddon suggested it would be better to keep the stock, and for the subscribers to pay down what was necessary to complete the work as quickly as possible. He also suggested that the payments by instalments should not be less than three guineas per annum, with the option of payment in advance by those who might be inclined to do so for the sake of helping the thing on.

Mr. Newton said they must not lose sight of the difference in the cost of the work in having a paid and a gratuitous editor. If the continuous services of an editor were secured, he had no doubt the work might be completed in three years.

Mr. T. C. Clarke said, supposing the present subscribers paid three guineas per annum for three years, and the work was completed, they would then have 150 complete copies of the Dictionary in hand, from the sale of which payment to an editor could be made. If they paid their nine guineas each, there would be a large capital in hand when the work was completed.

Several subscribers expressed their readiness to pay up the remainder of the subscription at once in order to expedite the completion of the work.

The Chairman, having commented approvingly on the scheme submitted, read a series of resolutions which had been prepared, and in his opinion placed the whole proposal in a clear light. They were as follows:—

1. That it is desirable to secure the early completion of the 'Dictionary of Architecture.'

2. To attain this end this meeting authorizes the honorary secretary to take such measures as may be necessary to obtain the immediate accession of a sufficient number of new subscribers, and pledges himself and the society to actively aid in making the work as widely known as possible, and in procuring fresh members.

3. That in the event of success attending these exertions, the entire cost of the Dictionary is to be fixed: for old and new subscribers, at 15l. 15s.

4. The number of copies available being limited, this arrangement and the advantages attendant thereon shall apply:—

a. To those subscribers now on the list who may, before the close of the year, pay up all subscriptions due or outstanding on December 31st, 1868.

b. To new subscribers who may pay down the fifteen guineas in one sum.

c. To new members who elect to pay the fifteen guineas by instalments, in the order of frequency of payment."

The Chairman, having expressed his full concurrence with the propositions just read, and several members having also stated their approval and made further inquiries,—

The Hon. Secretary, in reply, said he should feel obliged by subscribers then present making a selection from the lists he had prepared of such gentlemen as they were personally acquainted with, and submitting this matter to

them. He had great faith in the country architects; they had been the main stay and support of this society. He had received many letters from the country, expressing the highest approbation of their Dictionary, and their gratification at having become subscribers to it; some acknowledging that they had joined the society somewhat unwillingly, but had derived so much advantage from the information to be obtained in the Dictionary, that they would spare no effort to secure its completion. It was not simply amongst architects that canvassing was desirable: the large contractors and builders would find the Dictionary a valuable addition to their technical libraries, as well as to those of public institutions, and of amateurs and art patrons.

The resolutions were then unanimously adopted.

With a view to afford an opportunity of acting upon the plan suggested, the following resolution was also adopted:—

"That this experiment be immediately made, and that the meeting adjourn for a month or six weeks, to receive a report from the hon. secretary on the subject; and that Mr. Wyatt Papworth obligingly explain to the same meeting the time that the completion of the work would probably take if sufficient funds are found."

We shall hope to hear at this meeting that the required number of new subscribers has been obtained.

SPIRITUAL PHOTOGRAPHY.

AFTER spirit photographs we wonder what next and next. The spiritual is the newest phase of the photographic art and its latest development. This, it seems scarcely necessary to say, is a Yankee notion. There is at least one New York photographer who "calls spirits from the vasty deep" for the modest consideration of ten dollars ahead. And they come too, or something comes, very like the popular idea of a ghost. This clever artist takes the portrait of any person who may be desirous to sit, and also gives on the same *carte de visite* the shadowy picture of some deceased friend—husband or wife, parent, lover, or child. Thousands of persons believe, or profess to believe, that these likenesses are obtained by some spiritual force, and their credulity has enabled the "original spiritual photographer" to amass a handsome fortune. On the other hand, it happens that there are a large number of persons who have had spirit photographs taken, but are decidedly not satisfied with the result. They not only consider that in paying the sum of 2l. for their effigy in the new style they have paid "too much for their whistle," but they look upon the thing as a regular swindle, and legal proceedings were taken against the person in question, a Mr. William H. Mumler, of 630, Broadway. The charge against him was that by means of what he calls spiritual photographs, he had cheated many credulous persons, leading them to believe it possible to photograph the immaterial forms of their departed friends. Mumler was charged, in fact, with obtaining money under false pretences. The case being without precedent in the annals of criminal jurisprudence has excited extraordinary interest in New York. The trial lasted about ten days, and much of the evidence was of a most remarkable character. Mumler, it would appear, was originally a jeweller's assistant, and took to photography about seven years ago in Boston. His pictures brought him at once into notoriety, though it is only now that proceedings have been taken against him, at the instance of the Mayor of New York. The particular charge on which the spirit photographer was more immediately arrested was this. One of the officials of the corporation was ordered to investigate the business, which he did by assuming a false name, and by getting his photograph taken by Mumler. When the sitting was over, the negative was shown to the visitor. A dim, indistinct outline of a ghostly face stared out of one corner of the plate. He was told that represented the spirit of his father-in-law. He, however, failed to recognise the worthy old gentleman, and emphatically declared that the picture represented neither his father-in-law nor any of his relations, nor yet any person whom he had ever seen or known. Among the witnesses examined for the prosecution were several practical photographers, who stated that pictures similar to those produced by Mumler might be obtained through other agencies than disembodied spirits. The counsel for the defence also brought forward a large number of witnesses, all of whom testified to the genuine-

ness of the spiritual photographs taken for them by Mumler. They swore that they recognised the forms of departed friends—some of whom had been a long time dead—on the same card with their own likenesses. One gentleman even declared that not only himself but his friends distinctly recognised the features of his deceased wife in a photograph taken for him in this way. We find a Judge bearing testimony still more astounding. Judge Edmonds, who is known to be one of the most prominent advocates of spiritualism in the States, had two photographs taken by Mumler. The spirit form in the one he thought he could recognise, he said, though not the one in the other. This Judge declared his belief that the camera can take a photograph of a spirit. "And I believe also," he went on to say, "that spirits have materiality; not that gross materiality that mortals possess, but still they are material enough to be visible to the human eye." For Judge Edmonds has seen them. "Only a few days since I was in a court in Brooklyn, when a suit against a life assurance company for the amount claimed to be due on a certain policy was being heard. Looking toward that part of the court-room occupied by the jury, I saw the spirit of the man whose death was the basis of the suit. The spirit told me the circumstances connected with the death; said that the suit was groundless, that the claimant was not entitled to recover from the company, and further that he (the man whose spirit was speaking) had committed suicide under certain circumstances. I drew a diagram of the place at which his death occurred, and on showing it to the counsel, was told that it was exact in every particular." Parenthetically, we may observe, that for our part we should prefer a Judge without the very remarkable and peculiar power possessed by Judge Edmonds. The facts and arguments of corporeal beings are, as a rule, more conclusive evidence in a Court of Justice, we should say, than the manifestations of spirits so-called. Well, the real point at issue is whether spirits can have their photographs taken or not. Another witness examined in the case was Mr. P. T. Barnum, the notorious showman and prince of humbugs, who had bought a number of Mumler's portraits, and hung them on the walls of his museum as examples of humbug. Being anxious, he said, to find out how the thing was done, Barnum called on another photographer, and asked him if he could make a spirit photograph, telling him he did not want any humbug about it. The artist said he could do it. The showman was permitted to examine the glass, witnessed the process of pouring over the liquids, and then saw the glass placed in the camera. He could discover nothing unusual; but when the plate was produced it had Barnum's likeness and the shadow of Abraham Lincoln. "I saw the ghost of Lincoln as soon as it was developed in the dark room. It was conspicuous of any spiritual presence." Still this cute witness was as much in the dark as ever as to the *modus operandi*. But at a subsequent hearing of the case the material side of the question was presented. The counsel for the prosecution succeeded in showing "how ghosts are made." Mr. Bogardus, a practical photographer, said there were many ways of producing these so-called spirit photographs. He could produce the picture of an angel hovering over a man's head, or put a pair of horns on his head, without his knowing that anything unusual had been done. Of course it was a trick, and an acute photographer might find it out, but the witness had deceived some good ones. He could take an impression on a sensitive plate, put the plate aside, either in the bath or elsewhere, and afterwards bring it out and take a second picture on it. When the plate is developed, both pictures will be developed together. This method, however, sometimes does not cut up the desired spirits. For example, an artist once took the likeness of a person surrounded by the apparitions of Daniel Webster, Henry Clay, Calhoun, and Napoleon. But the sitter desired the disembodied presence of Washington, and this could not be evoked, the artist not having made the necessary preparation. As another witness on the same side put it, these photographs could be got by taking a negative, and making a positive from it, which was subsequently used to make a spirit picture. A small camera was produced in court, and the matter explained practically. In one of the processes the negative used was a piece of transparent mica having a figure upon it. The witness showed how, by manipulating this with dexterity, the impression

of the figure on it could be made on the sensitive plate, and you have your ghost. This exposition of the affair seems to have created much merriment in the court. The evidence was conclusive. But besides it was proved that the ghosts in some of Mumler's pictures, which were exhibited, could not have been in front of the camera at the same time with the sitter, because the lights and shadows of the one were opposed to those of the other. In front of the camera! of course not; whoever heard of a ghost paying a visit except in the dark! With reference to the alleged likeness of the spirits to deceased friends, it was proved beyond a doubt that persons had been deceived by their imaginations, the same spirit having appeared on different plates, and been recognized as that of different departed ones! The dimness of the portraits aided the deception, and occasionally an extraordinary likeness to some deceased person happened to exist, or to be imagined. In this manner, from his long experience in the business, had become extremely expert and successful at it. We have seen several portraits taken by him. They were of the ordinary *carte de visite* size, and there was in addition to the likeness of the sitter, the shadowy outline of a male or female head, more or less indistinct, or a half-length figure of a female done in the regular white sheeted apparition style. The pictures were clever enough, and might readily deceive the credulous and unsuspecting,—as, indeed, they have done; but now that the trick has been detected, and the swindle publicly exposed, notwithstanding that no verdict against him was obtained, Mr. Mumler is not very likely to dispose of any more spirits at ten dollars per head. That he has managed to carry on so successful a trade in the disembodied for so long, only shows that the gullibility of mankind is very great.

THE ARCHITECTURAL ALLIANCE.

The association so called, which for understandable reasons does not include the principal body of English architects, held a meeting in London on the 12th ult., including four delegates from the London Architectural Association, two from the Birmingham Architectural Society, two from the Glasgow Architectural Society, one from the Liverpool Architectural Society, and one from the Nottingham Architectural Association. They declined to admit reporters, and have since issued printed "Minutes of Proceedings," the noticeable feature of which is a series of short reports received from societies on the question of Architectural Education, and which are thus summarised by Mr. Rickman, honorary secretary:—

"The five reports which have been received from the allied societies in London, Birmingham, Glasgow, Liverpool, and Manchester, may be summarised as follows; but it would be unfair to any of them to consider such an epitome as this complete report, for each of the reports contains carefully condensed information, and views deserving of the most serious attention. I can, therefore, only call attention to the salient points on which information was requested, and to the suggestions as to a course to be pursued which are contained in these reports, with a view to assisting us in our deliberations respecting our future course of action.

1. The age at which architectural pupils usually leave school?—In London, seventeen; Birmingham and Liverpool, fifteen or sixteen; Glasgow, fourteen to sixteen; Manchester, fifteen.
2. The usual term of articles?—London and Manchester, three to five years; Birmingham and Liverpool, five; Glasgow, four or five.
3. What proportion of those who enter the architectural profession are articled to an architect?—London, 75 per cent.; Birmingham, all architects proper; Glasgow, no articles, but a course of service partly remunerated; Liverpool, one-third of practicing architects, but all the present rising generation of architects.
4. What proportion of those who enter an architect's office have passed through a school of art?—London, 5 per cent. have passed through a school of art; Glasgow, 80 per cent. attend a school of design; Liverpool, perhaps one-half, including those attending a school of design.
5. The steps usually taken during the term of articles for the improvement of the pupil?—In London seldom more than office routine and the suggested attendance on architectural societies and classes; in Birmingham, beyond office routine, perhaps left pretty much to themselves; Liverpool, very little; Manchester, insignificant, with a few honourable exceptions.
6. What facilities exist in your district for improvement to the pupils?—What schools of art, public or private? What lectures, casual or regular?—In London, very numerous lectures and classes at several institutions; Birmingham, the Government School of Art; Glasgow, the school of art and a public library; Liverpool, lectures and classes at two institutions, the Government School of Art, library and papers; Manchester, School of Art and Mechanics' Institute.
7. What means your society takes for the improvement of those who have not yet passed through their pupillage?—London, papers and classes, and prizes; Birmingham, none; Glasgow, free use of rooms and library; Liverpool, papers and prizes; Manchester, papers and classes.
8. To what extent is the practice of study and sketching from existing buildings carried, and how far is it encouraged by the principals?—London, encouragement of

the practice is neglected, and few facilities given; Birmingham, it is not done so much as it ought; in Manchester there is a sketching class.

9. How far could the existing facilities for instruction be modified or added to to increase the extent of architectural education? The gist of this question is: what, in the opinion of the societies, is to be done?

The London Architectural Association says, and in this all the other societies agree, students use only to a small extent the facilities afforded to them.

The Glasgow Society says that the necessary examination before entering their architectural institute is expected to produce more activity from pupils than kind advice can do.

The Liverpool Society urges increased library accommodation, and that architects should pay more attention to their pupils, but that a compulsory examination would afford the strongest inducement to architectural education.

The report of the London Architectural Association is supplemented by this resolution:—"And this Association, feeling strongly the desirability of obtaining a system of compulsory education and examination, in order that the profession of architecture may be established on a similar footing to other professions, would appeal to the societies throughout the country, through the delegates to the Alliance, to join with the Association in petitioning the Institute to take such steps as they may deem necessary to enforce a proper system of architectural education and examination, with the ultimate view of petitioning Parliament to make such examinations compulsory."

We have then before us the following considerations:—The importance of enlisting the architect's aid in the advance of the pupils' education.

The desirability of increasing in each town facility for self-help.

The necessity of a system pressed upon the pupils for self education.

The absurdity of a profession like that of architecture being without systematic examination for entrance, and the course to be pursued to render such examination locally necessary before an architect can practice.

I have to suggest then, that whatever course of action is taken by the Alliance, should be systematically directed to the above objects *seriatim*.

The following resolution was passed:—

"That, in order that the profession of architecture may be established on a similar footing to other professions, the societies throughout the country be invited, through the Alliance, to join with the Association in requesting the Institute to initiate such steps as they may deem necessary to enforce a proper system of architectural education and examination, with the ultimate view of petitioning Parliament to give a legal recognition to such examination."

Further, it was resolved that the report should be printed and distributed to the allied societies, "so as to obtain their views as to the necessary steps for obtaining the objects required."

Previously, the meeting discussed "the propriety of making the bills of quantities a part of the contract;" and ultimately appointed "their office-bearers as a committee to hear the representations of the General Builders' Association, and, in conjunction with any other bodies who may be interested, to endeavour to come to some agreement on the subjects submitted for consideration, and to report to the Alliance at its next meeting, or to the constituent societies at an earlier period."

THE TRADES MOVEMENT.

Liverpool.—The differences between the Liverpool builders and the operative masons concerning the introduction of the system of payment by the hour insisted upon by the former, has ended in the retirement of between 400 and 500 operative masons from their work. They refuse on various grounds to accept the plan of payment by the hour, and also object to a proposal of the masters for arbitration in all disputes, at least so far as to meet it with the proposal of a court of conciliation, composed half of masters and half of men. There are some 200 non-unionist masons still at work, and the masters will of course attempt to increase the number. A similar dispute in Manchester was, it will be remembered, settled in the space of a few hours by arbitration. There is every appearance, it is said, however, of a continued strike here. Both masters and operatives have issued circulars stating the terms upon which they will resume work, and these differ materially. Building operations have come to a standstill at some of the principal works in the district, including the church that is being built at Belmont-road, the new church at Kirby, the Lime-street railway station, the Exchange buildings, and the new offices in Prince's-street. A number of the non-unionists are employed in the construction of the new foundry, near the Great Float, Birkenhead, and at the works at the Sefton and Stanley Parks. The following

figures have been published by the secretary of the trade society:—List of the towns still on strike, with the number of masons out thereat:—Birmingham, 30; Cheltenham, 3; Liverpool, 18; Manchester, Hulme, and Salford, 294; Oxford, 2; Sunderland, 8; total, 355. The following are the numbers said to be locked out:—Bolton, 18; Coventry, 6; Liverpool, 334; Leeds, 105; Lynn, 4; Old Swan, 12; Wakefield, 9; Wolverhampton, 10; total, 525. The committee of the Liverpool society, in a letter to a contemporary, remarks on the 8th and last rule, viz., arbitration:—

"That this rule has neither been pressed nor opposed by either party, and it may be as well that attention should be drawn to it at once, as the primary and greatest point at issue, seeing that the acceptance of this rule by the operatives would be equal to discovering them from the only mode of protection to which they belong—viz., the union, there being no necessity for self-protection if the decision of all disputes is to be left to the arbitration of a disinterested person. They feel that they must still resort to strikes to obtain equitable terms."

Sheffield.—The dispute between the Master Joiners' Association and that of the operatives as to the adoption of the hour system, which has now extended over a month, remains unsettled. Each side appears determined not to give way, the one endeavouring to obtain men from a distance, and the other to induce them not to accept employment in Sheffield under the hour system. We are informed that there are now between fifty and sixty men on strike.

Manchester.—It is stated, on the authority of the master masons, that they have now 130 men at work, and that without any effort on the part of the masters the non-unionists are "coming in" at the rate of ten every day. The employers have resolved to take active measures with a view of securing the services of men not connected with the union. The strike promises, it is said, to become general in the building trades. The bricklayers' labourers a short time ago received notice of some sweeping changes in the existing regulations which have hitherto ruled their relations with the masters, and they resolved to resist the adoption of the masters' proposals. A special general meeting of operative bricklayers was held to receive a communication from the Master Bricklayers' Association with reference to the matters in dispute. The chief complaint of the men was that the masters wished "to thrust payment by the hour down their throats," the mode of payment in favour of them being by the day. It was moved that they should adhere to the practice of payment by the day, and an amendment to accept the proposition of the masters was received with cries of "Turn him out," and great uproar. The motion was carried by a large majority. In consequence of the opposition of the men to the hour system, the strike and lock-out have since commenced.

Leeds.—A meeting of the operative joiners and carpenters has been held for the purpose of discussing what they declared to be a "flagrant violation" of the decision given by Mr. Rupert Kettle, in the arbitration of the dispute with their employers last year. That decision was to the effect that men of fair average skill should be paid 6½d. per hour, and that this rate should be in force for two years. The men say that out of 600 or 700 joiners in the town, there are only about seventy receiving 6½d., and they therefore contend that the agreement has not been carried out. A resolution was passed by the meeting, deputing the chairman to request Mr. Jovitt, the umpire appointed at the arbitration, to call together the Board of Conciliation, and instructing the representatives of the joiners to demand a fulfilment of the agreement on the part of the employers, or the dissolution of the Board of Arbitration.

Wigan.—A conference was held at Wigan between the representatives of the master builders and the operative joiners, relative to some points in dispute, Mr. John Cross, alderman, attending as arbitrator at the request of both sides. The main point had reference to the demand of the men for an advance of wages. That fifty-five hours shall constitute the week's work was agreed upon. The masters were prepared to pay 6½d. per hour, which amounts to 11. 8s. 7½d. a week; while the men asked 6½d. per hour, which is equal to an advance of 2s. a week. At the conference, Mr. James Scott, in behalf of the men, cited the cases of Bolton, 55 hours, and wages 11. 10s.; St. Helen's, 55 and 11. 10s.; Oldham, 52 and 11. 9s.; Rochdale, 54½ and 11. 10s.; Southport, 55 and 11. 11s.; Manchester, 54½ and 11. 12s.; Leeds, 55 and 11. 10s. 4d.; and Warrington, 55½ and 11. 10s.; and he did

so to show that the wages paid in Wigan were lower than in any of those towns. He also dwelt upon the comparative dearth of provisions and the high rents in Wigan. Mr. Wilson, on behalf of the employers, referred to the depressed state of trade, and said that, unlike most of the towns named by Mr. Scott, Wigan had more regular and more constant work for builders. This dispute has been settled, the result being that, on the award of Mr. Cross, the joiners are allowed an advance of wages equal to 1s. 9½d. per week, while their rule as to the limitation of the number of apprentices is abolished.

EXHIBITIONS.

Worcester and the Workmen's International Exhibition.—Meetings of the Worcester manufacturers and employers of labour have been held to consider the desirability of holding a local working men's exhibition, from which specimens could be selected for exhibition in the Workmen's International Exhibition, proposed to be held in London in 1870. It was resolved that the working men of the various trades in the city be invited to a public meeting for the purpose of considering the desirability of taking part in the Workmen's International Exhibition, and that circulars containing the requisite information should be posted in the various establishments of the city for the information of the working men.

York.—A scheme for holding an Art Exhibition and Fancy Fair on behalf of the funds of the York Institute, has been set agoing. It will take place in November. A guarantee fund has been commenced.

The Great Industrial Exhibition at Altona.—We understand that Mr. J. H. Sillcoe, of the Trinity Works, Salford, has been appointed agent for Great Britain for the Schleswig-Holstein Industrial Exhibition, to be opened at Altona on the 27th of August.

PICTURES.

The Seven Churches of Asia.—Some time ago we mentioned a series of photographs of the seven churches of Asia,—Ephesus, Smyrna, Pergamos, Thyatira, Sardis, Philadelphia, and Laodicea,—taken by M. Svoboda during travels in Asia. The same artist is now exhibiting in the German Gallery, Bond-street, a number of large oil paintings made by himself of the same remarkable places. Without offering great claims as works of art, they are cleverly executed, and are evidently strictly truthful. The views of Pergamos and Laodicea are more particularly satisfactory. This exhibition ought to be interesting to a large number of persons.

The late Robert Martineau.—An interesting collection of works by the late R. B. Martineau, the painter of "The Last Day in the Old Home," is now on view at the Cosmopolitan Club, 30, Charles-street, Berkeley-square. The sketches and studies made for a still unfinished picture, "Christians and Christians," show the careful way in which he proceeded to build up a picture. "**Brighton in 1869.**"—Mr. James Webb has painted a very charming picture of Brighton, as seen from the new pier, a part of which, filled with gaily-dressed visitors, forms the foreground. The view embraced extends from "the Bedford," on the left, to the chain pier on the right, and the characteristics of the town are well preserved. The water and the sky are admirably painted, and constitute the chief charm of the painting. A fine engraving of this picture of our City by the Sea can scarcely fail to have a wide circulation. It is on view in the St. James's Gallery.

COMPETITIONS.

City of Carlisle.—The premium of 20l. offered by the corporation of Carlisle for designs for elevations of houses proposed to be erected in Portland-square; Alfred-street, in that city, has been awarded to the design bearing the motto, "Design with beauty, build with truth." The design is by Mr. F. W. Hagen, of Hull. There were sixteen competitors.

Intended New Town-hall at Bradford.—A short time ago the Bradford Town Council adopted a site of 2,000 yards of ground (acquired in dealing with street improvements) in New Market-street, as a very central point for the purpose of a town-hall. The council has just now issued printed instructions to architects as to the character of the building required on the site,

and giving a schedule of particulars as to the extent of accommodation to be provided for the several departments of the corporation. The cost of the building is not to exceed 40,000l. The architect whose design is selected as the best will be entrusted with the execution of the work, receiving in payment a commission of 5 per cent. on the actual outlay. The architect whose design is the second best will be paid 200l., and the architect whose design is third best will be paid 100l. The designs are to be delivered to the corporation not later than the 1st of September next.

THE VIENNA OPERA HOUSE.

The New Opera-House in Vienna, which has been in course of construction for seven or eight years (it was half-way up when we saw it in 1862), has at last been opened. The *Times* correspondent gives an interesting account of its part of which we condense. The outside of the theatre built of a yellowish sandstone, is of that fanciful nondescript style which has its home in Imperial Paris. A product of study rather than of inspiration, it helps itself liberally wherever it can find something to suit its wants, regardless of any little incongruity which might arise from a mixture of Italian renaissance, Norman scroll-work, slender Saracenic columns, bastard rose windows, and a high French chateau-like roofing. Still the general effect is not displeasing, because the general proportions are fair enough, and the great difficulty of harmonizing the necessary height of the central part, the house proper, with the four wings which enclose it has been more successfully overcome than in the new Grand Opera-house in Paris.

The entrance-hall, and the grand staircase, which stands in another lofty hall reaching up to the third tier of boxes, are perhaps the most successful part in the building, and undoubtedly the finest thing of the kind in existence. The idea seems taken from San Carlo at Naples, but the original has been far surpassed in every respect. The walls are covered with gray marble-like stucco, and the ceilings are painted everywhere with frescoes, rather pale, but perhaps just on that account more in harmony with the general soberness of ornamentation, in white and gold. From the gallery which runs round the hall on the first floor a pretty *foyer* occupies the side towards the street, and opens out on a wide balcony supported by columns.

After the lofty hall the passages seem very low, which is owing to there being four tiers of boxes; for the same reason the boxes themselves are very low, although wide enough to contain three persons in a row. As in the late Opera House in the Haymarket, people in the boxes look as if they were pictures in a frame. The monotony of so many small boxes running side by side is relieved by the large Imperial State box in the centre of the house, which ramps up to the fourth floor, and the large Imperial boxes in the proscenium, which architecturally are perhaps the most successful feature of the inside of the house, the lowest being on the same level as the ground-floor tier, the middle one extending over two tiers, and the upper one being on a level with the boxes on the fourth tier. The lines which connect the horseshoe-shaped house with the stage are anything but graceful, and present moreover the incongruity of pointed arches, which clash with the rest.

As for the ornamentation, it is exquisite down to its minutest details. Especially the balustrades of the boxes, painted a pale drab and relieved by gold ornaments, are charming. All the draperies and curtains are in dark crimson, which harmonizes admirably with the general tone of colour. All round the grand tier, which, however, is of the same size as the others, medallions of renowned singers are placed as part of the ornamentation. All along the ceiling every large surface is painted with allegorical pictures, while over the stage are medallions with *Venus* and *Amourettes* in white stucco relief.

The Ladies' Sanitary Association.—The annual meeting is fixed to take place at 44, Berkeley-square, on Tuesday, the 5th inst. Lord Shaftesbury will preside, and several gentlemen well known in connexion with sanitary matters will take part in the proceedings.

ON ART AS APPLIED TO MANUFACTURES.

I HAVE BEEN asked to address to you a few words about Art; and I have great pleasure in complying, being sure that the subject interests greatly all those who are here met together.

What is art? It is the representation of the beautiful; the holding the mirror up to nature, impressing its loveliness, adopting its forms, borrowing its colouring.

How beneficent are its influences, how humanizing, how pleasurable, how valuable! It is a mine of intellectual wealth to those who study it, and a most important source of material wealth to the country where it flourishes. By art the sculptor chisels from the block of marble a form thrilling the heart with admiration of its beauty. By art the painter records the noblest acts of our country's history, or inspires the keenest sympathy by his able portrayal of a domestic story. By art things the most ordinary are made objects of admiration and of real value; and it is this application of art to common things which is of such importance to the manufactures of a country, and it is upon this branch of art that I propose to speak to you to-night. The practice of art, to be of real value, should ever be regulated by sound taste. The great French minister, Colbert, has said that "*Le goût est le plus adroit de tous les commerces*,"—a good truth which may thus be rendered,—"Taste is the most subtle and powerful of all the elements of commerce." But what is taste?—a question difficult to explain. It is a word that has many meanings; most people pretend to have taste; none like to think they have had taste. I often hear the expression "That is my taste;" and how tastes differ,—

"Talk what you will of taste, my friend, you'll find Two of a face, as soon as of a mind."

So says Pope. A countryman has a taste for fat dumplings, and some ladies have a taste for chignons. The word "taste" is often, I think, misapplied, and the word "liking" might generally be substituted for it.

Taste, applied to art, I should express as a keen perception of the beautiful, regulated by experience and careful cultivation. Art, guided by taste, is never more satisfactorily employed than in adorning objects of utility, for utility and beauty should always be associated. I say art guided by taste, and not, as it often is, sadly misapplied. There is a hook by a very able man, an honour to his country, Mr. Owen Jones, called "The Grammar of Ornament;" the book is, I hope, familiar to all of you,—it contains a multitude of examples of every period of art, all well classified, from Nineveh downwards: this is a valuable boon to all thoughtful art-workers, but it is distressing often to see how these examples are misapplied by ignorant designers, and ornaments of various periods and diverse styles commingled together. By true art, then, things the most ordinary are not only made objects of real beauty, but become specimens of real value.

The magnificent collection of terra-cotta vases in the British Museum shows how the art-workmen of Etruria gave beauty to the most refined character to his vase of burnt clay. In those vases are combined purity of form, elegance of ornamentation, and exquisite design and finish in the outlined figures: that is more than can be said of the costly productions of the Imperial Porcelain Manufactory of Sèvres, at the present day.

Side by side, however, with those Etruscan vases may be placed the productions of our noble-hearted countryman Wedgwood, aided by the genius of our English Flaxman; glorious examples of what the unaided energies of one man can accomplish, when warmed by the true spirit of devotion to his art. Think of old Bernard Palissy too; think of his struggles through poverty, almost through starvation, to the realisation of his discovery. He made nature serve him for models of his work. He modelled in clay snakes, lizards, fishes, frogs, insects, all like life itself, enamelled in their natural colours by the process invented by this admirable enthusiast. Nor must I forget the lovely terra-cotta work of Luca della Robbia, whose productions, as far as I am aware, are not known in any other material. At the South Kensington Museum are valuable specimens of his work in bas-reliefs, of Madonnas, children, figures, &c., teeming with gentle beauty and natural sweetness.

I think that in our modern productions of earthenware and porcelain, we are not sufficiently

careful in the arrangement of the design: greater simplicity and greater purity are to be desired, especially in the ornamentation of common objects; for if the designs on these are in simple good taste, it would be an effective mode of diffusing the feeling for art among many. I allow that progress has been made within the last twenty years, but there is a dreadful mistaken opinion in the minds of many manufacturers, that in making for the million they must employ vulgar, shabby patterns, as suits the prevailing taste. In this I think they are entirely in error. They have no occasion to descend into dull colouring and meagre ornament; that does not constitute purity or beauty: a design may be simple, of good drawing, in fresh and harmonious colours, and cost no more than dull or gaudy patterns.

The firms of Messrs. Minton and Messrs. Copeland have worthily supported the character of this country for excellence in porcelain and earthenware, both for ornamental objects and for common things in daily use.

In the manufacture of metal-work immense progress has been made of late years, and instead of heavy, clumsy works cast in moulds of outrageously incongruous design, beaten work is often substituted, and thus the skill of the clever artificer can be impressed on the object. In metal-work of Medieval design our art-workmen of the present day are pre-eminent, in my opinion. I saw none superior to it at Paris in 1867. In mechanical work also, such as in steam-engines and locomotives, the harmony and general outline of the parts, as well as the finish of the work, are the best in the world. But in bronze cast-work, and in the art-quality of general objects, our art-workmen are far inferior to the French; in fact, English bronze-workers are few in number. In the British Museum will be found many specimens of bronze working, which should be carefully studied by English artisans, and at the Museum in Naples is an immense collection of bronze implements of all kinds found in profusion in the ruins of Pompeii; that City of the Dead which has reproduced to us the homes, the works of art, the objects of every-day life of a people existing 1,800 years ago. There you may see the forum, the theatre, the great amphitheatre, the soldiers' barracks, the houses of the patricians, the houses of humble shopkeepers—all roofless indeed, but the walls still glowing with their beautiful colouring, the elegant tessellated pavements fresh as last trodden by the owner, the garden enclosure painted in perspective, the fountains, the grottoes, the tracks of the chariot-wheels indented on the paved streets; all the details of domestic life, and the end of all things, their tombs. The excavations still proceed; they are not difficult, for the filling-in is partly of mud, partly small pieces, which is easily shovelled out, and in almost every house are found objects most interesting and instructive to the tasteful student.

All this great mass of discovered objects is collected in the great museum at Naples, the most interesting for this class of work in the world. There are arranged, properly classified, all the various objects of domestic use. I do not speak now of the specimens of high art, which are magnificent; there are the various culinary utensils, lamps, tripods, stately, surgical instruments, jewelry, toilet requisites, even to the rouge in the pot, for the fine Roman lady of her day;—everything, even of the commonest kind, stamped with a touch of elegance and tasteful thought. It seems as if the metal-worker in those days was not content in fashioning a simple stewing-pan, unless he gave it a touch of art, either in the form of the handle, or by an engraved outline pattern of tasteful ornament,—all simple and quiet, however; nothing overloaded or disproportioned. Their goldsmith's work, too, was most elegant, showing great skill as well as refinement of taste in those art-workmen of Pompeii.

Descending to our own times, most of you must have noticed in the Exhibition of 1862, in the Indian collection, metal bottles of elegant form, and inlaid with silver in ornamental patterns of great beauty; and in Paris, in 1867, I remarked some exquisite specimens of metal-work, of chased work, bordered in parts with inlaid silver ornament, made by an Italian artist for Mr. Layard.

I must not let my fancy, however, wander from my subject in descriptions of fine art, but confine myself to urging on the workmen of common things to study art, so as to throw into objects of ordinary use a pleasing form and a

touch of beauty; above all, avoid the evil, too common in our day, of overloading a work with inappropriate and redundant ornament. That is nauseous.

Let me next say a few words on textile or woven fabrics. These are of various tissues, and made for various purposes, but all are influenced more or less by this leading principle—that the fabric itself should, as far as possible, be the fundamental element of the design. In grass matting, for instance, the nature of the material and the kind of work oblige a certain simplicity of lines or of geometrical angular pattern. In the ancient tombs of Egypt figures are shown mat-making, exactly in the same way as I have seen them worked at Cadiz and Seville at the present day. In the various kinds of carpets it is especially desirable that the design should be adapted to the nature of the material and its uses. In all it is essential that the design should be flat, and none of the objects represented with cast shadows. To walk upon ornaments in relief is as perplexing and disagreeable to the eye as it is objectionable in taste. The colouring of the carpets should not blaze away in bright contrasts of all the colours; a certain sobriety and harmony is particularly desirable in a floor-covering on which furniture is to be placed, and in a room on the walls of which are probably works of art. Not that I object to bright colours in carpets, for if they are properly brought together, a very quiet harmony may be produced. Take, for instance, the Persian carpets, which are always cheerful and bright, and never gaudy; the so-called Masulipatan carpets, made in India, are also excellent examples of most harmonious colouring, elegant and appropriate design, and good fabric. These are worthy of very particular study to the artist designer; he will find in them symmetrical arrangement and pleasing forms exactly adapted to the nature of the fabric. I think the designs for carpets are much improved of late in this country. I have a vivid remembrance of the chamber of horrors at Marlborough House about twenty years ago, and I think the errors of those days are better understood now; but still the manufacturers cling too much to the notion that in making for the million the products must be vulgar and gaudy. I think they are wrong, and that the million have better taste than they give them credit for.

The manufacture of lace by machinery has opened a wide field for a beautiful fabric, especially as applied to window-curtains; it is a very important manufacture, nevertheless it is exceedingly difficult to obtain appropriate and good designs in it. Plumes of feathers, large spreading ferns, or gigantic flowers are pressed by manufacturers to suit popular taste; they seem to ignore altogether beautiful existing patterns of guipure, or point, or other styles of lace, which have, however, been well imitated of late by some French manufacturers. I should weary you were I to go too distinctly into the various branches of woven fabrics; in all of them this principle should be observed, "That the design should be appropriate to the material."

I will now allude to cabinet furniture; it is a most important manufacture, in the superior branches of which art is a most material aid. I think the fundamental principle should be "truth in construction;" that this construction should be as simple as possible, and be evident,—afterwards ornament if you please, but let the ornament be appropriate in style and not redundant, let the carving be from the surface as far as possible, and avoid *appliqué* or stuck-on ornament. In the cheap, commonly-made furniture of the present day, the proportions are often faulty, the mouldings too strong, and, above all, they are overlaid with coarse, ill-executed carving, a hodge-podge of a bit of scroll, a bit of shell, and a bit of foliage, all grossly abused. But in most of the better class manufactories of cabinet furniture, I think, the taste is very good, fully equal to that of the French in the more ordinary objects; and by no means open to the sententious criticisms of some modern authors, who, to corroborate their peculiar arguments, appear to have studiously avoided the more respectable houses, and taken their standard of the prevailing taste from the cheaply-made rubbish to which I have alluded; then they exercise their wit, and compare it, as the best existing furniture, with their own designs, which they have the modesty to describe as quite the proper thing.

However, I will say no more on this subject, but return to the principles which should guide us in carrying out good cabinet work. We know

that good work must be costly, because it takes more time and care than common work: the great aim, then, should be to obtain a good effect at as reasonable a price as possible, by adopting good form in the readiest way, and giving just sufficient ornament to have a pleasing effect, and no more. I think we have not hitherto paid all the attention it deserves to the Etruscan style of ornament for general purposes. It is a style which associates well with simple forms, and may be carried out with sufficient plainness not to be expensive; but the more simple the outline the more perfect must be the drawing; every contour must be well proportioned and graceful, and the workman who executes the work must have a feeling for it. The features of each particular style should be carefully attended to, not only in the general design, but in the details, especially in the mouldings, both carved and plain. A careful study of early Italian work will show that the mouldings are very delicately wrought, and great beauty and finish may be given by attending to this. In the form of chairs the outlines should be simple and adapted to the curves necessary to give comfort; much carving is not desirable, and it should never project beyond the surface.

There is probably no manufacture which may be made more easily available for diffusing taste among the people, than paper-hangings. They are now so cheap that the home of the mechanic can be made to look tasteful and cleanly at small expense. About five-and-twenty years ago there was no manufacture in which good taste was so outraged, but the style has gradually much improved, and now neat, pretty papers can be had for one penny per yard. In paper-hanging great effect may be given by good borders of correct, quiet design and harmonious colour. There is a deficiency in borders of this class.

I have thus rapidly brought before your notice some of the manufactures which are directly influenced by the application of art, and have, I hope, shown how important it is that this great aid to manufacture be properly understood by the designer who composes each work. But the greatest assistance is given to this art-designer when his work is carried out by intelligent and capable workmen, who can appreciate the art-work, have taste for it, and above all if they can draw themselves. Therefore I say to every man around me, learn to draw. Every man can draw: how he will draw must depend upon the thought and labour he bestows upon it. Examples for his study are not difficult to find: the common thistle, the wild flowers, the foliage of trees, the hop with its elegant and drooping foliage clustering around the pole; Nature, in all its forms and colourings, afford a never-ending series of studies: once the first difficulties conquered, it is a most pleasing as well as profitable employment; and, as I have already said, a workman who can draw understands art-work with better feeling. It is by such aid that the natural taste and talent of a man are developed; from the simple workman he may rise to be the art-worker of fine things himself—of those productions that live from age to age, and are valued and loved by those who possess them; for, in the words of a true poet,—

"A thing of beauty is a joy for ever;
Its loveliness increases; it will never
Pass into nothingness."

JOHN G. CRACE.*

STEEL BRIDGES FOR STREET CROSSINGS.

IN 1863 plans were submitted to the Commissioners of Sewers of the City of London, by Mr. Williams, for bridges over, and by Mr. Newton for subways beneath, the crossings of the main thoroughfares of the City, for the accommodation of foot passengers. Similar projects have been frequently under discussion in the Court of Common Council, and elsewhere, before and since that time, but no fair trial has ever been given to either one or other of these descriptions of crossing. The alarming number, and constant increase in the number, of fatal and serious accidents from contact with vehicles in the streets, has never allowed the important problem to slumber of the best means of abating the perils of the streets to foot passengers. For years past the number of persons killed by

horses or vehicles in the streets of London has been more than ten for one of all the passengers by railway killed while travelling, or at stations, by accidents beyond their own control, upon all the railways in the United Kingdom. Of late the weekly returns of the Registrar-General have repeatedly shown that six, seven, and eight persons, or about one daily, have been killed in the streets of London by being, to quote a weekly return for the current month, "run over by a wagon," "run over by a water-cart," "run over by a Hansom cab," "run over by a horse and cart," "run over by an omnibus," &c.

The urgent necessity, becoming daily more urgent, of providing, at any cost of money to the public, and of time to foot passengers, means by which it will be, to say the least, possible for aged, infirm, and timid persons, to cross crowded thoroughfares with absolute immunity from the danger of being knocked down, trampled upon, run over, and killed, from contact with horses and vehicles in the carriage-way, has forced this subject once more upon the attention of the Court of Common Council, and the designs of Mr. T. P. Ivison, C.E., for steel bridges for street crossings, are now before the police committee of the court, by whom Mr. Ivison has been instructed to prepare a model for a crossing for the intersection of Ludgate-hill and Fleet-street with Bridge-street, Blackfriars, and Farringdon-street; the model to be accompanied by an estimate of the cost of the proposed bridge. The model is in course of preparation, and will be ready for exhibition in a few days. In the form of the model the completion of the intended crescent at the intersection referred to will be anticipated, and the contemplated altered disposition of the foot-paths, rather than their present form, will be provided for. The bridge proper will be near, and run in the direction of, the centre line of Bridge-street and Farringdon-street. There will be eight stairs, one from each *traverse*, which will curve inwards in the direction of the centre line of Fleet-street and Ludgate-hill, to each of which the side view will be presented. All passengers between Farringdon-street and Bridge-street, and from one side of Fleet-street and Ludgate-hill to the other side of the same line of thoroughfare, will require to pass the centre of the bridge, but passengers desiring to keep to the same side of that line will not require to do so. The curves of the stairs will be so arranged as to afford a cover that will make the use of them unobjectionable to ladies.

Mr. Ivison's design, which is applicable to the intersections of the widest thoroughfares in London, admits of various modifications in form and construction. In its principal features, the structure may be described in general terms as consisting of arched trough girders of wrought iron or steel, crossing the streets diagonally, and which are joined in the centre, and at the ends both upon the stairs, which rise from the outer edge of the footway and, in part, over the gutter, which is covered in front of the stair, and is carried under it. The stairs are of easy ascent, and rise 11 ft., with one intermediate landing. The remainder of the ascent is by steps and inclines to the centre, where the bridge will be 18 ft. clear above the carriage-way. The merits and advantages claimed as embodied in the design are, compactness, convenience, and strength, and also elegance in appearance. Eminent professional men, who have examined the design, have readily admitted its claim to the possession of these advantages.

The principal objection to the proposed street crossings, and it is a serious one if well founded, is that the people would not use them, and could not be compelled to do so. The last part of the statement is indisputable, but it may be worth while to try whether the first is true. Passengers are not compelled to use the foot pavement, but, finding it to their comfort and safety, they do use it wherever it is possible; and no one who has noticed the anxious groups waiting at the corners of intersecting thoroughfares, until the time comes for them to make the plunges, and attempt the perilous exploit of rushing from the one foot-walk to the refuge, and from the refuge to the opposite pavement, can reasonably doubt that many of them would gladly undergo, for safety and comfort's sake, a degree of bodily toil little greater than the ascent and descent between the ground and first floors of an ordinary dwelling-house.

The idea of this crossing thoroughfares on foot is only simple, but a skilful embodiment of the idea in an actual structure is surely worth the experiment. In proportion to the extent to

which such crossings might be used important advantages would be secured. The present level crossings would be left undisturbed; the refuges, useful to a certain extent, but obstructions at those precise points where the carriage-way should be widest, might possibly be dispensed with; the carriage-ways would be further relieved by the diminution in the number of foot-passengers; fewer policemen would suffice to regulate the traffic; such means of passage would save the old, infirm, timid, and feeble from danger and apprehension; would save precious time wasted in waiting during the busiest hours of the day; would make city life easier and less harassing, by giving increased protection and facility of action.

NEW BANK, BURY, LANCASHIRE.

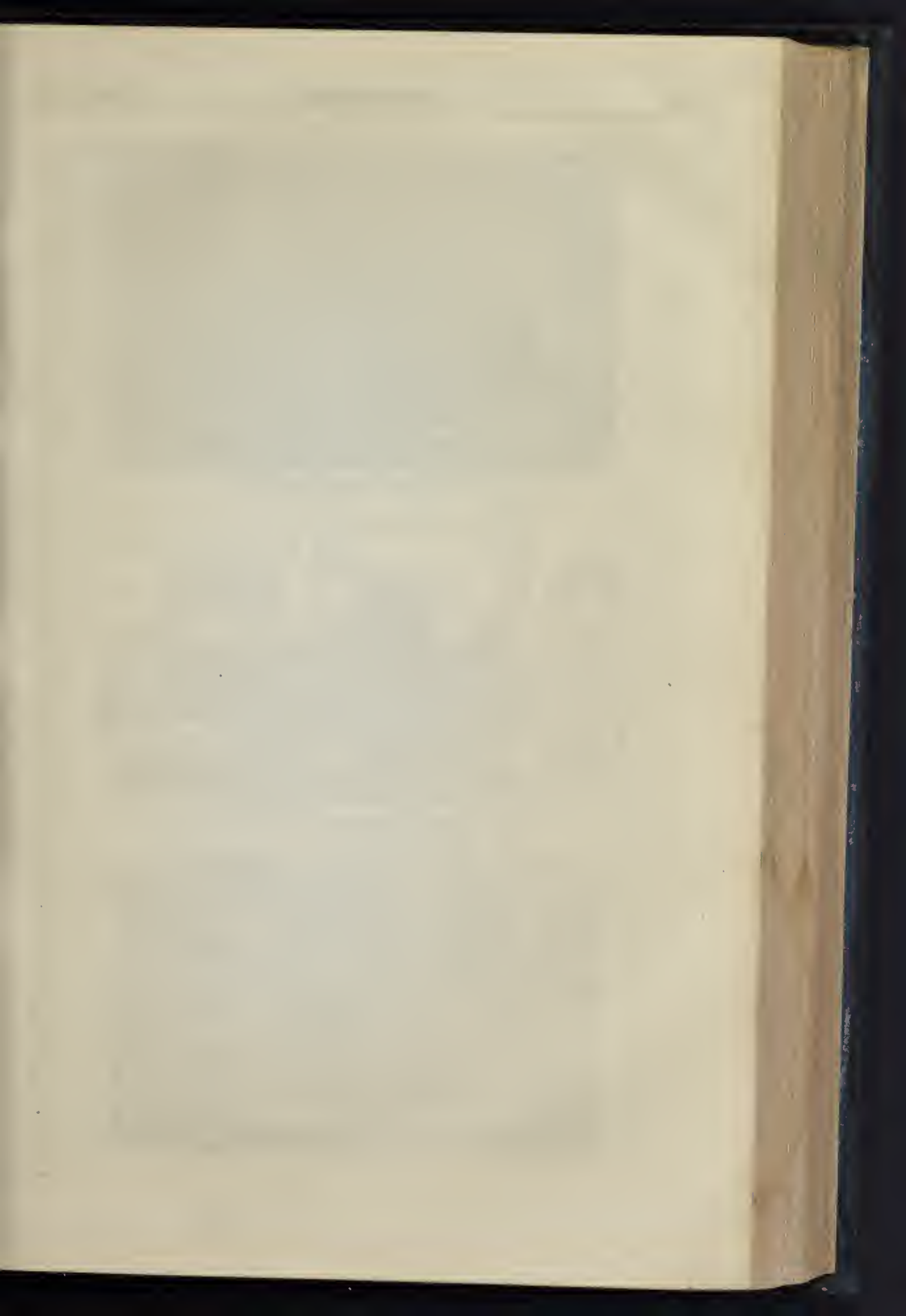
The Bury Banking Company was established in 1836, and some years ago erected banking premises in Silver-street, where its business was conducted until recently, when increased accommodation became necessary and the old buildings were pulled down, and the new buildings, which form the subject of our present illustration, were erected on the same site, and were opened for business in the autumn of 1868.

They provide the following accommodation for the company's own business operations:—Banking-room, 46 ft. by 28 ft.; manager's room, 24 ft. by 22 ft.; entrance-hall, waiting-room, clerks' room, and residence for bank porter; three strong rooms in addition to the one containing the bullion-safe, which latter is worked on the hydraulic principle. The whole of the first floor and a portion of the ground-floor are appropriated to offices (the entrance to which is in Bank-street), and these offices are let in suites to tenants as required. All the floors are of fire-proof construction on Phillips's principle. That over the banking-room may be taken as an example, and consists of three rolled iron girders, with laminated flanges supporting rolled iron joists 2, on which are laid small iron bars 1 for the support of concrete 4 in. thick. The concrete forms an excellent ground for the plaster ceiling, without any intermediate battens or laths.

The banking-room is 21 ft. in height, and has a ceiling divided into four compartments, in each of which are circular and other panels, and also three centre flowers. There are double windows to the rooms on the ground-floor: those to the outside are of iron, and those to the inside of oak, and they are all enclosed with Clark & Co.'s patent steel shutters. The wainscoting, doors, and all other woodwork of the principal rooms, and also all the bank counters, desks, and screens, are of Dantzic oak, with pillars, mouldings, &c., of ebouisé oak. Haden's warm-air principle has been adopted for the warming of the banking-room, safes, &c., and ventilation has been secured by lateral flues formed in the curved ceilings communicating with two vertical shafts carried up above the balustrade, and having each a small gas-stove therein for occasional use. All the safes and the fire-proof and burglar-proof doors have been manufactured by Chatwood's Patent Lock and Safe Company. The first story of the building is faced with Fletcher Bank stone (millstone grit), and has a string-course of hacked grey granite at the level of the window-sills; and the upper story is faced with Darley Dale stone, and has polished red granite plasters over the principal entrance. The arms of the several directors are carved in the capitals of the angle pilasters, and the pediment over the principal entrance is filled with a sculptured group of figures, typifying the various operations in banking. The iron gates and all the gasfittings were specially manufactured by Messrs. Joseph Ratcliff & Sons, of Birmingham; and the stone-carving was done by Mr. Joseph Bonhill, of Manchester. The general contractors were Messrs. Henry Southern & Son, of Salford. Mr. James Catterall officiated as clerk of works. Messrs. Blackwell, Son, & Booth, of Manchester and Bury, were the architects.

The Lighting of Coasts.—England has a light for every 1½ miles of coast, Scotland one for every 30½ miles, Ireland one for every 3¼ miles, while France exhibits one for every 12.3 miles. The light-houses in France are more than three times as numerous as in Scotland, compared with the amount of coast, and nearly three times as numerous as in Ireland.

* Read to the members of the Artisans' Club on the 27th ult.



PARIS PROMENADES.



Lake and Cliffs in the Park des Buttes Chaumont.



View on the Boulevards near the Chateau d'Eau.



Interior of the Halles Centrales.

[See ante.



NEW BANK, BURY, LANCASHIRE.—MESSRS. BLACKWELL, SON, & BOOTH, ARCHITECTS.



ARCHITECTURE IN MADRAS.

At a meeting of the Senate of the University of Madras last month the establishment of professorships was discussed. Amongst other subjects named for professorship,

Mr. Chisholm proposed that "Architecture" should be added to the list of subjects. In the course of an address he observed:—It has been said that architecture is a branch of civil engineering. I would most respectfully protest against architecture being considered in any way a branch of civil engineering; indeed, were a lecturer to lecture on both subjects, he would teach you to forget in the one a great deal that he taught you to remember in the other. In his capacity of an architect, he would teach you perhaps to imitate the buttresses and pinnacles, the props and counterpoises, of the thirteenth century; he would point with admiration to the clustered shafts and groined roofs of a Gothic cathedral; he would grow eloquent on the curves and proportions of a Grecian portico. In his capacity of a civil engineer, on the other hand, he would remorselessly scarp down the buttress, dismantle the pinnacle, and show how an inch-and-a-half iron tie-rod would replace these counterpoises; he would sweep the cathedral of its clustered columns, and point in triumph to a lattice girder spread from wall to wall. He would smile at the marble shafts of the Parthenon as he placed in your hands Hodgkinson's formula for cast-iron columns.

In the race of construction the artist has unfortunately been left behind the man of science; he has been left behind to contemplate and reproduce the works of hy-gone ages; but, let us hope, to dream of some glorious future when a Britannia Bridge will not be erected without the requirement of a Grecian portico,—when the works of a complicated engine will express as much art-thought as an elaborate tracied window. I would advocate the endowment of a professorial chair of architecture on several grounds, and, as I cannot possibly fill that chair myself, I have no hesitation in advocating its endowment. I would advocate a chair of architecture, in the first place, because I conceive it to be a duty we owe to the natives of this country. All the art with which this country has teemed still lies dormant among the people; it is scattered, perhaps, but recognisable in the carved wood lintel or plaster temple in villages remote from civilisation; but have not we, the conquerors, scattered it? Have we not, like all conquering nations, robbed the people of the architectural art they once possessed; but have we, like all conquering nations, given them anything in exchange? Have we engrafted any art on to theirs? There is hardly a work in the country which expresses the least sympathy between the conquerors and the conquered,—scarcely a structure which will enable future ethnologists to place us in the scale of civilisation above the level of barbarians. It is true we labour under great disadvantages. We cannot bring Gothic to this country,—it becomes parched and shrivelled; but we can teach its principles. The principles of all true art we can teach: the arrangement of buildings appropriate and convenient; and when all has been arranged, with the least possible sacrifice of convenience, we can take him outside and teach him to ornament his structure,—not with the so-called five orders of architecture, but with the 500 orders to be found in the columns of his own temples, with the ornamentation of his own country, with the ornaments most grateful to his eye.

I would take a still higher view of the advantages likely to follow a more cultivated taste among the natives of this country. I allude to the morality of art. The science of aesthetics, although but of a century's growth, has already taken its place as one of the favourite themes of the polite literature of the day, and no branch of philosophical or semiphilosophical literature (I quote from a recent article in the *Westminster Review*) has occupied so many writers, and interested so large a public, as the literature of the fine arts. Hence, then, we have a subject which is not only of a practical nature, and from the study of which the most important practical results are likely to follow, but which opens up a new branch of philosophy, a branch of philosophy into which almost any branch of knowledge may be pressed for service; and it is in our power to bestow this on the natives of this country.

I would advocate the endowment of a chair of architecture on still graver grounds. We have

arrived at a most important period in the history of architecture in this country, and it will be decided in the course of the next five or ten years whether we are to have a style suited to the requirements of this country, or whether we are to have the mere copyists of every bulble which breaks on the surface of European art, and import our architecture, with our beer and our hats, by every mail-steam which leaves the shores of England. I have stated that the orders of the Romans have defaced every modern structure in this country, but we are threatened now with an invasion fifty times worse and more destructive to the cause of art than if every had imitation of a Greek temple throughout the world had been re-copied in plaster in this country. I allude to the invasion of Gothic. I trust I may not be misunderstood; I am almost a worshipper of Gothic in its right place; I acknowledge its principles to be the only true principle of architecture for all countries; but I object to the introduction of mere familiar forms and details, without the life, the soul, the vigour of the art; the mere copying of details, without the acquisition of the inventive faculties of the originators. The endowment of a chair of architecture would do much to stem the current of this invasion.

In advocating the endowment of a chair of architecture, I would give it as my opinion that the chair should be filled neither by the Principal of the Civil Engineering College nor the Consulting Architect to the Government. It should be filled by the very best man you could induce to leave England for India, a man combining the qualities of a fearless critic, an able lecturer, a well-read archaeologist; and he should possess a knowledge of construction at least equal to that displayed in the best modern works on architecture; and if you can get your man, no salary you could give him would be too large, and no dignity this university could afford too great. Apart from his professorial duties the amount which such a man could save Government annually by judicious criticism would be enormous. And in this way he would become a public benefactor; for if he who makes two blades of grass grow where one grew before is a public benefactor, surely he who makes one brick suffice where two or three were laid before may have claims to that title!

After some discussion, the Vice-Chancellor put Mr. Chisholm's amendment to the meeting, when it was lost, not a single hand being raised in its defence.

MR. THOMAS COOLEY, ARCHITECT.

SOME captious critics in the literary, architectural, political, and even in the comic world, have been employing their pens latterly prospectively and retrospectively, on the building of Blackfriars Bridge. There seems no reason why I should not fall into the same vein, and have my say for what it is worth. It must be stated, however, for the information of all whom it may concern, that I am unable to say when the present structure will be finished. So while awaiting that wished-for consummation, let me say something of it in the past, and of the career of those whose genius took root at its original arches. The architect of the original bridge, which the present is intended to replace, was Mr. Robert Mylne, and serving under him as an assistant was one Thomas Cooley, whose name afterwards in the sister kingdom, Ireland, rose to fame. Thomas Cooley served his apprenticeship as a carpenter to a Mr. Reynolds, of London, and subsequently, by his aptitude and ability, became a clerk to Mr. Grenell, a carpenter of the Board of Works. Like the late Peter Nicholson, Cooley gave up all his spare time to the study of architecture, and became in course of time a respectable draughtsman. When a Society for the Encouragement of Arts and Manufactures existed in the last century, they gave premiums to aspirants under twenty years of age. Thomas Cooley became a candidate, and furnished a design for a Temple of Victory. He did not obtain the first prize, though in such competition he was generally a successful competitor. In the year 1769 a committee of Dublin merchants offered premiums for designs for a Royal Exchange. Mr. Mylne, the architect of Blackfriars, recommended Tom Cooley most powerfully, and though Cooley's plan was inferior in architectural beauty and utility to that of James Gandon, another Englishman, but who shortly afterwards became the Irish architect *par excellence*, yet the design of Cooley was accepted; the interest of Mr. Mylne secured the job for his

assistant. Thomas Cooley passed over to Dublin, and while arranging for the carrying out of his design he had the opportunity offered to him of examining the several designs of others, which enabled him to make many alterations and improvements in his own. The design of the Exchange, as carried out afterwards, was a wonderful improvement on the original, and as a finished piece of architecture externally, notwithstanding the nature of the ground, which rendered a flight of steps and a balustrade necessary to its north or main front. The form of the Royal Exchange is nearly a square. It has three fronts of Portland stone, in the Corinthian order. A dome crowns the building. Its north front is the most imposing and beautiful. A range of six columns, with their corresponding pilasters and entablatures, are here presented. The pediment is a noble one, and is highly decorated. At each side in the Lano range are two pilasters. The balustrade in the front, which rendered a flight of steps necessary from the inoline of Cork-hill, is a drawback. In this front, between the columns, are three entrances with iron gates hung to Ionic pilasters. Immediately over the gates are three windows, between the columns, that assist in lighting what was once the coffee-room. On each side of these windows are two others richly ornamented with architraves. The west front varies somewhat from the north front; it has no pediment. The interior of the Exchange would need too much description, as it presents a somewhat curious arrangement. Some changes have also been made since its first construction. The dome, as seen from the inside, is lofty, and is supported by twelve Composite fluted columns. The entablature over the columns is ornamented in an enriched manner, above which are twelve elegant circular windows. The ceiling of the dome is richly decorated with superior stucco ornaments in Masonic taste, divided into hexagonal compartments. A large window in the centre illuminates the building. Such is the *chef-d'œuvre* of Thomas Cooley. I must say, however, there is a lack of taste and judgment displayed in the ornamentation in the inside, and by its minuteness there is a confusion created. Much of what is to be seen would be effective in the drawing-room of a mansion, but in a large public building its effect is altogether lost. Alas for Dublin! the extinction of a separate legislature rendered the objects for which this noble building was designed no longer sought after. Of late years, the building has been converted into a Town Hall, where the Corporation hold their meetings, and other civic business is transacted.

Thomas Cooley also contributed other designs for buildings of public utility in Dublin;—the building known as Newgate, the Record Office on Inns Quay, the Marine School, and a small church in the Park; the Primate of Armagh employed him for his different buildings and improvements; and while our architect was in Ireland he did a large private business.

The craftsman architect of London, whose career began on the cradling of Old Blackfriars Bridge, on the Thames, laid him down to rest on the banks of the Liffey, in the city whose architectural taste he elevated, along with Gandon. His memory is still respected and his name spoken of with pride in Dublin, thousands of whose citizens still claim him and Gandon as Irish architects. Irish architects, so far as the professional fame and practice were concerned, they undoubtedly were, but they were Englishmen by birth.

Thomas Cooley died in Angelsea-street, Dublin, in the 44th year of his age. He was a widower for some time previous, and he left behind him a son and a daughter. Perchance this brief record, which I have hung on to the history of Old Blackfriars Bridge, will possess some little interest for others besides those who are interested in the completion of the New. If so, this little bit of neglected architectural biography will not have been written in vain. C. C. H.

Ventilation of the Metropolitan Railway.—Regretting with others the evil condition of parts of this line, Mr. W. Benson addressed a communication to the directors, pointing out how the ventilation might be improved by means of shafts at various positions. Since then we find the company have, with great advantage, removed the copolas which covered the two shafts at the Portland-road station. Something more, however, in the same direction must still be done.

THE BELLS OF OXFORD CATHEDRAL, AND OF OTHER EDIFICES.

The tower of Christ Church Cathedral is now furnished with a peal of ten bells in the key of C, rather sharp; the reputed weight of the largest, or tenor, being about 42 cwt. There is also a small one called the Latin bell, which, it is presumed, was formerly the Sanctus bell.

The bells forming the peal are severally inscribed as below:—

1. Abra. Rudhall, Glouc., Bellfounder. 1698.
2. God prosper the Church of England. A.R. 1693. A.R. 1757.
3. Prosperity to all our benefactors. A.R.
- [1.] 4. The Grace of our Lord. 1640.
- [2.] 5. This bell was made 1611. W + Y.
- [3.] 7. + In multis annis tunc campana Johannis. [This bell bears a shield charged with a chevron between three trefoils.]
- [4.] 8. Stella maris maris surunt pissina nells. [Two shields, one like that on the 7th; and the other charged with a chevron between three lave-cups or ewers.]
- [5.] 9. Prosperity to this College. A.R.
- [6.] 10. + Sanctus sacra sat hinc campana trita. W.L.M.H. [Rose and crown between two griffins, as supporters.] A. 1589.

The inscriptions are copied from the Rev. W. C. Lukis's "Account of Church Bells," 8vo., 1857.

The figures which I have placed between brackets indicate the old bells which came from Osney Abbey, and of which Dean Aldrich sings in his famous *Round*,—

"Hark! the bonny Christ Church bells, 1, 2, 3, 4, 5, 6."

The fifth of that peal was, however, recast at the celebrated Gloucester foundry by Abraham Rudhall, who in 1698 added four new bells, the third of which was subsequently recast by his son Abel.

W + Y, on the [2.] 6 bell, stand for William Yare, of Reading. He made the bell now used at the Bodleian Library in the same year, 1611.

The old Sanctus, now called the Latin bell, has no inscription or mark of any kind. Its diameter at the mouth is 1 ft. 8½ in.; height, 1 ft. 5½ in. This is the bell referred to by the dean when he says,—

"Tinkle, tinkle, ting, goes the small bell at nine."

The "mighty Tom," of which he also speaks, is suspended in the tower over the college gateway, as most people know, and is now tolled at about 9½ p.m. A few words on this bell may be given on some future occasion.

I may here remark that formerly the "small bell" rang at nine, by the cathedral time, for five minutes, to call the members of the college to evening prayer. This consisted of a short Latin service, lasting for about fifteen minutes. The Latin service was, however, I believe, abolished by the present dean a few years ago, and an English service at 5:40 p.m. substituted in its stead. The small bell therefore no longer rings at 9 p.m., but at about 5:40. It also rings for prayers at 7 a.m. in summer, and at 8 a.m. in winter. These services are strictly collegiate, and partake of the nature of family prayer. They consist of the morning and evening services of the church, with the omission of the greater part, if not the whole, of the Exhortation and the "Lessons." The "first and second bells" mentioned in the *Round* are sounded for cathedral service—i.e., a service open to all comers, at 10 a.m. and at 4 p.m.

The cathedral clock is kept five minutes in advance of common clocks, and all college arrangements are regulated by this cathedral time. For much valuable information relating to the services and the bells, I have long been indebted to a well-known member of the Cathedral Establishment whose name I am not for the present at liberty to mention.

The foregoing notes may be interesting to some campanologists, if not to other readers; while the account of the old bells from Osney Abbey will, it is hoped, be acceptable as a reply to one of Mr. J. D. Parry's queries in the *Builder* of the 15th ult.

As to the "Bolshoi Kolokol," or Great Bell, in the tower of Ivan Velikii, Moscow, it is considerably heavier than the weight given by Mr. Parry. It was cast from an old bell, with additional metal, in 1817, by Bogdanof and Zibialof, elevated to its place in 1819, and it weighs, according to Lyall (p. 211), 144,000 English pounds.

The statement respecting the bells at Cologne Cathedral is also partly erroneous. The great bell alone weighs upwards of 220 cwt. It is therefore evident that Mr. Parry has been misled

in the instances under notice, by the mistakes of other writers.

With reference to our bells in England, Mr. Parry asks if I can "give any cause for five being much the most accustomed (unless for small churches) or 'orthodox' number before the Reformation?"

Now, in ancient times scarcely any of our churches had more than two or three bells. But at length peals of five were introduced, and the bells were generally heavier than at present. "We know of no regular peal being hung in England," says the Rev. Dr. Alfred Gaitly, "before the year 1456, when Pope Calixtus III. sent a peal of five to King's College, Cambridge, where they hung for about three hundred years, and were considered for some time the largest peal in the kingdom: the tenor weighed 57 cwt." These bells, I may note in passing, were hung in a temporary wooden tower standing near the western door; and when this building fell into decay they were removed into the ante-chapel, where they incumbered the ground till they were sold, about the middle of the last century. In the course of time, however, the interest in the subject of ringing increased, and peals of six and eight were put up in various places; and at last we find ten and twelve, the latter being the largest number of bells that it is possible to ring in a peal. My answer, then, to Mr. Parry's last query is:—The music of five good bells tuned diatonically, and descending from the dominant to the tonic, or key note, is more satisfactory to the ear than that of any smaller number.

THOMAS WALESLEY.

THE SOCIAL POSITION OF THE ARCHITECT.

SIR,—Your recent article on "The Position of the Architectural Profession in the Provinces," and the letters it has evoked, seem to me to leave the subject incomplete until reference is made to certain other causes which prevent architects from attaining social position or public recognition as *professional men*.

Provincial practitioners are painfully aware of the number of untrained pretenders pursuing the calling of an architect, and depriving them of their due emoluments. Unsuccessful joiners, hinders' clerks, plasterers, landscap-gardeners, clerks of works, bankrupt hindlers, who have graduated in the colonies or on the Continent, house-painters, even tailors and drapers, crowd into the motley ranks of persons calling themselves "architects," until we are in danger of occupying the position assigned to the school-master in the old saying; that, namely, "When a man is fit for nothing else, he may turn architect! And the analogy is more complete than is at first sight expected; for as ignorant parents cannot select an efficient teacher for their children, so an uninformed public cannot distinguish an architect from a builder.

We need hardly wonder that, in the face of this fact, the real professional man, duly educated and highly refined as he often is, is looked down upon, and cold-shouldered, by the *real* professions and by educated people in general. The prevalent condition of things works towards such a result in many ways: of these two or three may be here alluded to. This unwholy army of interlopers, whose qualifications frequently consist only of prolix copies of architect's drawings and specifications, and such information as they can pick up, united in most cases with practical knowledge of some particular branch of the building trade, having succeeded in obtaining works to execute, which they do to an astonishing extent, naturally produce results which bring contempt on the profession whose name they have adopted, and that contempt spreads its baneful influence on the other hearers of that name. The consequences are clear; dissatisfaction in the client's mind and a natural repudiation of the utility of any architect.

Again, there is indeed by these worthies a most unfair competition. Being themselves originally little more than working men, entirely devoid of any approach to a liberal education, and capable only of a little (usually very bad) writing, and some unreliable "drawing" with tee square, &c., the usual fees of architects form an enormous increase in revenue in comparison with those to be derived from their usual avocations. Having no capital sunk in education, no long years of toil and study to be remunerated for, they are enabled to "work low"—very! The position of a *quasi* professional man offers them every temptation; for they have only to

maintain the mechanic's rank. Accordingly, they rush in; and although their work is generally dear at any money, they manage to "pull through," profiting mainly by the ignorance of their clients, and dependent partly upon the advice of hindlers. If they carry competition too far for their own purposes, abundant opportunities occur, by the old-fashioned process of a "tip," of remedying the defect—a remedy against which neither education nor the *esprit de corps* forms a safeguard for them when their individual consciences do not interpose a defence. Whence there comes more contempt, and some obloquy, on the name of an architect.

It would hardly be credited that architects themselves frequently help this vulgar and ignorant herd to attain the honours and emoluments of their own profession; but it is so, and many of them repent of it afterwards. Actuated by desire of momentary gain, they are occasionally induced to take persons of this class into their offices, thereby saving, perhaps, a junior clerk's salary after a while. I speak from actual experience; knowing instances where utterly ignorant, rude, coarse young men, who have been brought up in trade, have been received at their own request into offices, generally without premiums, and placed amongst clerks who have been brought up respectfully, and amongst pupils who have paid the usual *honoraria*. Such proceedings I consider to be as unfair as they are impolitic,—unfair towards the persons thus thrown together; and impolitic as producing that degradation of the profession in the provinces which tends to drive every qualified architect who respects his calling, into London, or to adopt some other vocation.

There is still one more cause which in some of its phases has been already touched upon, both by yourself and by your correspondents—and that is the want of thorough technical education in the profession. I would not add one word to weaken the force of what has already been said on this point; but it has come within my own observation that architects do not easily find assistants capable of giving them real assistance as juniors. Experienced assistants are to be had, but the employers shrink from engaging them, excepting on emergencies. Finding that they have to teach the junior assistants, they logically conclude that they may as well teach pupils, pocket the premiums, and get their work done (we will not say *how*) without paying salaries, excepting to a managing clerk. They therefore take in (rather too liberally, in a Pocklington sense) large numbers of pupils. Some of these find their way to learn and work; others, who have joined the profession as an item of their own respectability, pursue their architectural studies during the intervals between dress occasions and pleasure parties, and in combination with billiards, shirt-collars, and the "right thing" in boots and trousers. They are all turned out, however, with redundant testimonials as to everything but knowledge, ability, or industry, to annoy any brother practitioner who may be so unwise as to employ them. Yet they "must live" (that final appeal of vitality overrides all economics); and if their friends be influential or fortune favours them, their ignorance and their vagaries contribute to the sum of contempt heaped upon "architects."

For the industrious and studious amongst pupils and juniors, the prospect is cheerless enough. They present themselves to our view as well-educated gentlemen, qualified for the better grades of society, well-informed, often highly accomplished apart from their profession. The mob of interlopers renders the chance of private practice unnecessarily remote, unless the individual have influential friends; and the crowds of pupils (I should think no architect in decent practice has less than two) in various stages of development (from the chrysalis, which is the premium, to the testimonial, which is the full feather) shut him out from salubrious employment, excepting at a rate of remuneration inconsistent with his education and antecedents. If he fall back upon competitions, he must be very lucky as well as very industrious before he obtains the desired recognition of his abilities; and yet no other means appear to be available to raise him.

As regards the question of dignity and social precedence, an architect loses nothing by being excluded from society incapable of distinguishing real power; and however rarely he may meet with people who can so distinguish, let the young architect be content to enjoy that rare boon, and let his cultivation, his study be his own exquisite reward.

EXPERIENTIA.

NEW LAW COURTS.

The site and structure of the projected courts and offices have now become a question of interest to the whole population, and to every frequenter of the metropolis. Long since, the project had been decided on, the location fixed, competitive plans submitted to public inspection, and the assent of a parliamentary commission, together with the approval of the judges, and of the legal profession in general, was expressed in favour of the central position, as chosen, between Carey-street and the Strand; that site, then covered with a comparatively valueless mass of mean and antiquated buildings, was purchased, and cleared in the course of three years, and is now ready for the realisation of what is vitally needed for the accommodation of the metropolitan public, and of the whole nation. It is a fine position and elevated, the lower side being 50 ft. above the Embankment, and open to the widest portion of the Strand; occupying the most central and convenient position for professionals and the public. It could be easily made accessible from the short gorges of the two Turnstiles; but, above all, it rests upon a solid and dry foundation.

A sufficient space for the erection of all the Law Courts having been thus acquired, and paid for, and whilst only some considerations of style and of construction remained for discussion, a sudden light burst in upon officials in high position, revealing visions of rival, though unrivalled magnificence on the Thames Embankment; and—will it be credited?—economy in outlay forms the assigned motive for transferring the location to a site 50 ft. lower, insufficient in scope, trebly expensive in regard of purchase value, and, above all, or rather below all, needing excavation and solid concrete foundation to a depth of 20 ft. or even of 30 ft. beneath the range of high-water mark; and superimposed thereupon a substructure of 30 ft., in at least two stories, up to the floor range of the Courts of Justice!

Well, the plot recommended as more economical extends from "a street called Howard-street" to the Embankment causeway, between Surrey-street (24 ft. wide), and Arundel-street (25 ft. wide), Howard-street being 33 ft., and Norfolk-street, which bisects the block, 48 ft.

The extreme width from east to west, inclusive of Norfolk-street, is only 290 ft., and the depth from the north to the Embankment on the south is but 196 ft. in the mean; to which might be added of reclaimed slime, a margin up to and clear of the 100 ft. drift wall—at the end of Surrey-street—of 60 ft., and at the end of Arundel-street of 80 ft. As the range of these streets does not quadrate with the new quay-wall and causeway, no fine structural facade could be erected to square with that block of ground. The Somerset House front, which has a river range of about 650 ft., on the west angle next Waterloo-bridge impinges some 12 ft. upon the rival causeway, but at the other extreme it is distant about 10 ft., and so the reclaimed space increases up to a width of about 200 ft. near Essex-street.

No building ought to advance beyond the line of a curve drawn equally with the line of Embankment wall, and from the south-east angle of Somerset House, and every frontage should have a central tangent to that curve.

It will be seen, therefore, that the proposed block is only 290 ft. by 256 ft., and if any further space is needed it must be obtained by purchase of the whole Strand frontage, and the other two blocks between Surrey and Arundel streets; for, in point of fact, the courts would be there stowed away in concealment and seclusion, but too much assimilated to the approaches already existing to the Chancery and Rolls Courts, as also to the Temple and other Inns.

There might certainly be an extension of the Embankment site in the direction of the Temple, by the purchase and clearance of Gwynne's extensive engineering premises and offices, besides numerous other large and small warehouses, stables, and premises, filling up the interval to the Temple Gardens; in which latter case the foundations must be all upon the alluvial river-bank, requiring structural outlay, which might be fairly estimated in three parts, viz.—the superstructure or ornate courts, the substructure of two stories to the Embankment level, and under these massive foundation walls to the London clay.

Now, as to the economical part of the question, it needs no argument to show that the cost of every house on the Norfolk estate would be treble that of each house cleared off on the

Carey-street site, while the Strand frontage, if bought, must be of tenfold value.

In addition, as to approaches to Mr. Layard's contemplated law centre, surely the lateral streets cannot be allowed to remain of only 24 ft. and 25 ft. width; or, would it be possible to withdraw the court frontages 20 ft. on all sides, thus reducing his Howard-street front to 250 ft.? But, in fact, it would be wholly ridiculous to select the proposed location, unless the grand façade were placed on the Strand; and even in that case, as along the course of Holywell-street the width of the Strand is only about 30 ft., an additional work of demolition and enlargement should be here carried out, at an expense that would be difficult to estimate.

It is easy to say that 1,600,000£ shall not be exceeded, and for that sum, no doubt, plain structures or refuges might be erected. The ground must, however, be paid for, and the expenditure must altogether depend on the sites selected, and the character of architecture adopted; but the Clement's Danes site being already cleared, two years might be gained by its adoption, on the outset of the works; and, perhaps, as much more by securing a good foundation instead of the river side, which, as at Somerset House, would require more of the solid structure below than above the court floor level.

Placed in this position on the principal leading thoroughfare, the courts would be ornamental to the metropolis and more easy of access. In that street, or that the Embankment be chosen, then a street of at least 60 ft. in width must be formed in continuation of the Strand, and from Lincoln's-inn to the Strand; and this will make that plot a speculation, dependent upon building leases. How, therefore, the Government is to be repaid for their outlay is matter of doubt.

On the grand consummation of the building, there will be, perhaps, in five or six years, the old deserted courts for disposal or conversion into offices for other departments, now hired at annual rentals; those at Westminster Hall being of inestimable value. All this may turn out profitable, but must be left for future contingencies.

T. H. H.

A TOWN-HALL FOR LEICESTER.

SIR,—The town of Leicester is one of the most flourishing in the Midland Counties, from its vast staple trade of elastic wool, worsted hosiery, and shoe manufactures, and its something like one hundred thousand inhabitants, costly buildings for the conduct of the trade, as well as the princely residences of the nobility; yet, not more strange than true, this wealthy town, with its rich hives of industry, has a very glaring defect. I allude to the Town-hall, which is a structure of wood and plaster, only one story high, erected many centuries ago; the largest room will hold about 400 people. In this our petty and quarter sessions are held. At the farthest end of it is the magisterial bench; at the back of this, on the other side, the hall, and adjoining is a public-house stable; and it is to be assameter of course that we have them on the one side and the horses on the other. The police-station is a part of this old dilapidated building, and is under 8 ft. in height. The cells are quite close to the sergeant's office, and the prisoners can hear nearly all that is going on. There is frequently a stench so unbearable, that the prisoners have to be taken out of their cells into a small yard attached, to obtain fresh air, and this is allowed to continue. Even more, the town council have been driven from their deliberations into the yard for the same purpose. These are no exaggerations; I refer you to our mayor, Mr. J. Baines (should the fact be doubted) as to the correctness of this statement. The sergeants that officiate in this department find it injurious to their health, and some of them are looking very unwell in consequence.

The whole town has been talking continually for upwards of twenty-five years about the necessity for having a new town-hall. The town council have frequently had the subject before them. At a special meeting a few weeks back, both aldermen and councillors were compelled to beat a retreat into the yard, as the stench was beyond description. About twelve years back, one of her Majesty's Judges compared the building to "an old boat, kept up-wards." This I consider to be a very good comparison, and I only hope his lordship saw that his appropriate remark has reached the columns of your well-known paper. For a number of years the judges upon circuit have refused to hold the borough assizes there, it being such an inconceivable abominable hole, as well as disagree to the town.

The assizes have been held (upon a surerance) in a court belonging to the county. The grand jury, after being sworn, have to turn out, as no room could be found for them there, the county grand jury requiring their own room.

Several times have been on the borough grand jury, and we have had to turn out, marshalled by our worthy town serjeant, Mr. Hodson, carrying his rod of office, and parade through the street to the town-hall (which is little better than a barn). Before leaving the Castle we have been desired to let them have each bit as soon as ready. When the first bill has been ready, I, with one or two others of the jury, have walked down with it, and on our return we have found some of the jury absent seeking to moisten their lips, and on our second return others had wandered away to lunch with one of the members. I made remarks of this to some of the jury at the time, feeling assured that the judges were aware of what really takes place, instead of paying a high compliment to the jury, he would ensure them severely, and the town also for not furnishing the required accommodation.

And this, Mr. Editor, is how things are done in this our industrious, wealthy, and prosperous town of Leicester.

During twenty-five years that the discussion has lasted as to the erection of a new town-hall, many of our noblest men have risen from the ranks, and built for themselves princely mansions, in addition to mighty factories, warehouses, and other great and costly buildings.

The committee of the whole council for selecting a site for the new town-hall, held on the 8th instant, the Friar-lane site was carried by a majority of three votes.

The meeting was then resolved into a special town council meeting, and the Friar-lane site was again carried by a majority of twenty-six. The reason for so great a difference between the numbers is, that the minority (a clique) were so astounded and crestfallen, that gloves, hats, and umbrellas were seized with the greatest avidity, and they all rushed out pell-mell, as though they should be too late for train without that great effort. The clique are again shuffling the cards, in order to obtain another postponement of the erection to an indefinite period.

The minority are very stubborn about the matter, and will not even admit that they are beaten. If a majority is not to rule, and the minority bow to their decision, then all law and order are lost, and the disordered minority, in the eyes of all honest, fair-thinking men, are nothing better than tyrants.

One of her Majesty's judges, who was for many years recorder for this borough, some few years ago complimented the grand jury on the propriety of their town, and stated that on his way from the railway station that morning he beheld a magnificent building, and on his inquiring what it was for, was informed for a shoe warehouse; and, in continuation of his address, said—"Surely, gentlemen, if private individuals can erect such noble edifices as the one I have seen, this town ought to have better accommodation for her Majesty's judges to hold their courts in."

A meeting was convened by requisition, the object of which was the postponement of the building of Assize and Sessions Courts; it having been agreed upon by the town council that the erection of a large hall should be for a future generation, the speakers declaring the town too poor to furnish the requisite accommodation for her Majesty's judges. There is plenty of proof that the requisition contained names obtained by misrepresentation, as also the names of young men in shops, at a very meeting it was proposed, seconded, and carried, that the whole of the rate-payers be polled before anything further be done in the matter. Nothing could be more preposterous. How many rate-payers will vote for an increased taxation? If this be done, we may wait a long time before we have a new town-hall.

CLEMENT PERITY.

MAY MEETINGS AND MAY PARTINGS.

SIR,—If the life of the poetical author of the "Seasons" had extended down to our time, it is possible that his description of the publications which occur during the month of May would have included at least two things which were unknown in his time—namely, May meetings and May partings. With May meetings I do not at present propose to interfere, but on May partings I wish, with your permission, say a few words.

And first let me explain what partings I mean. I mean that separation or divorce which four times with capital, which now takes place periodically, and if at no other time, yet always in the spring. Instead of the circumstances being that "Now is the winter of our discontent—made glorious summer," it seems that the feeling of discontent is most intense on the eve of "glorious summer," that these words become of no avail; and men who have all along complained that they were by their employment unable to satisfy their wants, and that the system that object by the very Quixote method of refusing any employment at all. But it may be urged that conditions might be imposed upon the workmen which would make his employment uncertain, and, without seeming to decrease his remuneration. Let us examine this statement in connexion with the present strike (or lock-out, as they will have it) among the masons in Liverpool and its neighbourhood. Up to the 22nd May just past, the unit of time upon which their labour has been calculated, was a quarter of a day. If this unit had been a first quantity, change to a shorter period, such as a day, would have been necessary, as it is usually found that, among good and honourable men, long engagements are best. But this quarter of a day was not a fixed quantity, being subject to three variations. As work did not commence on Monday till 7 a.m., the length of that day was nine hours only; consequently a quarter of that day would be a quarter of an hour shorter than a quarter of any one of the four succeeding days, which were of ten hours each. On Saturday work ceased at half-past twelve, which gave six hours' work only for that day, and as the quarter of any other day so nearly corresponded to the half of this day, it was usual to work from each half. The whole of the middle quarters of the first five days of the week were again subject to additions and deductions on account of the hour for dinner not dividing the day into two equal parts, so that in making up the account of labour done, it was necessary to know not only the number of days and quarters, but also what days and what quarters of those days, as each variation in time had its separate value. A bookkeeper who could calculate all this without mistakes, would be a clever fellow. To put an end to this anomalous state of things, the master builders determined to adopt the system which has been found to work so satisfactorily to all parties in London and elsewhere, and as they untidely gave the usual six months' notice that after the 21st of May they should pay by the hour. At the same time they intimated that any dispute which might arise upon this or any other question, ought to be settled by arbitration without resorting to the old barbarous plan of striking. To both these propositions the men refused to agree, and alleged as a reason for declining to allow arbitration that no one man can be found who, in their opinion, fulfils the necessary conditions. It seems strange, at least, that the trade of a mason should be so peculiar, and the relations of the masters and men such, that the very plan, and indeed the very men who have by their influence and efforts during the last few weeks brought about a satisfactory arrangement in not a few places, should in this instance not have the qualifications to do the same thing among the masons. The allegation is untrue, and will be as damaging to their side as the strike will prove damaging to their.

With regard to the payment by the hour, the reasons given for rejecting the proposal are either absurd or invalid, and would apply with equal force to the late arrange-

ment. There is one reason for accepting it which ought to have great weight with the men, and that is the much greater ease with which an advance of wages may be obtained.

As an instance, a change from a day payment to the hour system has just taken place among the joiners at Bolton, and they are to receive 7½d. per hour. What an easy thing it would be to get the 3-16ths necessary to make up the farthing, and have paltry a thing it appears to the public who have it to pay; yet it would make 10d. a week additional wage to the workman. Again, by the hour system, a workman having, say, overstepped the time to sleep in the morning, may commence at the next half-hour, while by the quarter-day plan he must lose a quarter, which was often the prelude to a lost day or more.

The change, then, it appears to me would be most favourable to the men, and would simplify bookkeeping by the masters; but the men say they will not adopt it till they are beaten.

In Manchester 400 men are on strike for a reduction of the hours of labour to nine, with the pay of ten hours. It is impossible at this time that they should succeed, and even if they should, what would be the result. Stone will be superseded by brick, and other materials. Artificial stone and iron are taking its place. An order for plate tracery in href has recently been given in Manchester, which, but for the strike, would have been in stone; and a Liverpool architect pointed out recently in a local paper that the stone was intended to erect a large building in which, if the strike took place, not a stone would be used.

When will my countrymen be more sensible? E. G.

SCHOOLS IN GLASGOW.

The schools at the corner of Renfield and Renfrew streets for St. Stephen's parish, in Glasgow, have just been completed. They are two stories in height, and consist of one school-room, 30 ft. by 27 ft.; two class-rooms, 20 ft. by 13 ft. 6 in.; hall and stairs, 11 ft. wide; lavatory, &c. for teachers, and three shops to Renfield street, on the upper floor,—one room, 50 ft. by 27 ft.; another, 45 ft. by 23 ft. (ceilings 18 ft. 6 in. high), with master's room over hall. The boys and girls have separate yards, with drinking-fountains, &c., in each. All the inside walls are lined to the height of 5 ft. with yellow pine lining in narrow widths, and the whole woodwork is stained and varnished. The total cost, including fittings, is 2,250l. The architects are Messrs. Cowan & Smith, under whose superintendence the works were carried out.

THE RECORD OF HISTORICAL TOMBS AND MONUMENTS.

SOME little time ago the First Commissioner of her Majesty's Works, Mr. Layard, invited the council of the Society of Antiquaries to furnish him with a list of such regal and other historical monuments and tombs existing in cathedrals and other buildings as in their opinion it would be desirable to place under the protection and supervision of Government, with a view to their proper custody and preservation. The council accepted the invitation, and appointed a special committee, called "The Sepulchral Monuments Committee," who have met and laid down certain regulations. They have limited the date to which the inquiry shall be conducted to the year 1760. The monuments are to be tabulated by counties from county histories (not from general books), in a form agreed on, various members of the committee and others each undertaking a separate county or counties.

SCHOOLS OF ART AND SCIENCE.

The Croydon School of Art.—This school, which is conducted by Mr. Wiggall, is said to be progressing well. The results of the examination have been announced by the Department. It appears that out of sixty who were examined, forty-seven passed. There are two degrees of proficiency attainable, viz., passed and excellent; a fair share of the pupils have gained the latter, and out of the forty-seven members who have passed, a great many were artisans.

Proposed School of Art for Burslem and Tunstall. A meeting of manufacturers and other principal inhabitants of Burslem and Tunstall has been held at the Wedgwood Institute to deliberate on the formation of a school of art in connexion with that institute. The attendance was select and influential. Mr. H. T. Davenport presided, and in opening the meeting pointed out the advantages already enjoyed by Hanley and Stoke, where schools of art are in vigorous operation, and said there was no reason why the manufacturers, workmen, and general public of Burslem and Tunstall should not enjoy similar advantages. After some discussion, a treasurer and committee for Burslem were appointed, and a meeting is to be held at Tunstall to elect a committee for that town. An annual subscription-list was also opened.

Education in Science and Art at Millers-brough.—Under the auspices of the Middlebrough Mechanics' Institute, a public meeting has been held in the Town-hall, to promote education in science and art. The chairman explained that it was intended to establish science and art classes at the Mechanics' Institute. The committee had decided to raise their building in Durham-street a story higher, and build suitable rooms. This would involve considerable outlay, and he trusted the public would lend a helping hand. Mr. Buckmaster, of South Kensington, explained the assistance the Government would give to such classes. Other gentlemen also addressed the meeting.

DECISIONS UNDER METROPOLITAN BUILDING ACT.

A RAILWAY A PUBLIC HIGHWAY.

At Greenwich Police-court Mr. Charles Brown, of the Railway Tavern, near Nunhead Cemetery, appeared before Mr. Maude, on an adjourned summons charging him, at the instance of Mr. Snooke, the district surveyor, with an infringement of the Metropolitan Building Act.

Mr. Liley, barrister, attended for the defence. Defendant has seventeen acres of land, which he uses as a cricket-ground and for pigeon shooting. On one side it is bounded by the London, Chatham, and Dover Railway, and on that side there are three sheds. Such buildings, within a specified distance of a "public highway," must be built of incombustible materials. The question was whether the railroad was a "public highway" within the meaning of the Act. Without the sheds the land would be useless, and they had been erected at a considerable cost.

Mr. Maude said that the fact of the land being bounded on one side by a cemetery, and on the other by a railway, it might have been imagined that the Metropolitan Building Act would not have applied to anything placed upon it in the shape of a building. The owner of the land, however, might eventually let it out for building purposes, and if the present structures were allowed to remain, there would be danger, as the Metropolitan Board of Works had stated it, from the sparks of engines passing along a line of railway, such railway being deemed a public highway. The Metropolitan Board of Works having refused its sanction to the buildings remaining, he had no alternative but to put the Act in force, and to order that the buildings be demolished within a month, with payment of 23s. costs.

PROPOSED ALBERT INSTITUTE, WINDSOR.

PROFESSIONAL ETIQUETTE.

Srs.—It will be within the recollection of some of your readers that about three years ago our designs for the proposed "Albert Institute," Windsor, were selected, in a limited competition.

Our drawings have been ever since with the committee, and several sums of money have been received towards the erection of our design; but the subscription has fallen short of the sum which would warrant a commencement of the work, and nothing has, therefore, as yet been done.

One of the unsuccessful competitors, a resident in Windsor, now seeks to set aside the selection of the committee by offering to advance one half the estimated cost of the work—securing it by a mortgage on the property—on condition that the committee to prepare the "plans and drawings" be given to him.

Of course the committee cannot accede to this ingenious suggestion, which, however, is so far useful in that it sets the whole competition system before us in a new light.

In order that you may have complete information on the subject, we beg to hand you a copy of the *Windsor and Eton Express* of the 20th ult., containing the curious proposal. BACON & BELL, Architects.

THE ATTEMPT TO ROB INVENTORS.

THE Patent-laws are bad enough, certainly, as regards the interests of inventors; but the fact that inventors suffer from their defective action is no right reason why the property of inventors should be left without any protection whatever. Inventions, the fruits of the labour and ability of inventors, are quite as much their property as the money which they seldom have in their pockets; and it is about as reasonable to deprive them of the protection of law to prevent selfish and greedy manufacturers or others from appropriating their inventions, as it would be to deprive them of the protection of law to prevent thieves from appropriating the money in their pockets. Were it now proposed to repeal the law of copyright, the gentleman who thrust his paw into such a bee-hive, to steal the honey, would meet with the reception he richly merited. Inventors, however, are not celebrated for the power of the pen, nor for their ability to defend themselves; so that he who has a greedy eye upon their property and their rights may pretty safely, so far as regards punishment, try his hand against them. Such has just been the case in the House of Commons, where, "in the interest of trade and commerce" ostensibly, but by no means in the interest of inventors, Mr.

Macfie moved that the granting of patents for inventions should be discontinued. Sir R. Palmer seconded the motion, and expressed himself in favour of the total abolition of all rewards for inventions. The discussion was continued by Lord Stanley, who was in favour of the motion. Mr. J. Howard, Mr. Mundella, Mr. Stapleton, and Lord Eloho opposed it. The Attorney-General said he believed that the *Patent-law should be amended rather than abolished*, and that it had done much more good than harm. The motion was ultimately withdrawn,—but, let inventors depend upon it, not for the last time. It is to be hoped, however, that no further delay will be allowed in urging the Legislature, with a will, to amend the law, so as to deprive its opponents of all excuse for attempting to get rid of it in order to get at the profitable exertions of inventors without paying for them.

THE SECRETARYSHIP OF THE INSTITUTE OF ARCHITECTS.

ON Monday evening last a special general meeting of this Institute was held for the election of an honorary secretary for home duties, when, after some discussion on the subject, Mr. J. P. Saddon, late honorary secretary, was unanimously re-elected to that office.

Srs.—In recognition of Mr. Street's "proclamation" in your last number, I feel bound to remark that I see no need for it having been made. The proper course was to resort to a party whip privately; and this was done, and with all success. At any rate, Mr. Street has been restored to that authority which some of us had hoped he would have been persuaded had lasted long enough. Under his management the yearly transactions appear now to have dwindled down to about seven papers (good, bad, and indifferent), two biographical memoirs, and six inconsiderable notices. So be it: as he himself very frankly tells us, he holds the secretaryship on altogether different ground. "*I hold it for the purpose of my party, and so long as my party keep me in, so long I will remain.*" The operation of keeping in such an official, against the wishes of an uncontested although indignant majority, is well known to be easy enough to such as are actuated by no higher motives; but I venture to think the scandal has now reached a head. ROBERT KEAR.

PAYMENT FOR TAKING OUT QUANTITIES.

At Wolverhampton County Court, on the 23rd ult., before Mr. A. M. Skinner, Q.C., judge, and a jury, Mr. Samuel Johnson, surveyor, of that town, sought to recover from Messrs. Trow, of Wednesbury, builders, the sum of 20l. for taking out the quantities for a house proposed to be erected at the Wergs, according to plans prepared by the late Mr. Banks, architect, for Mr. H. H. Fowler, solicitor. It appeared that the plans and specifications having been prepared by Mr. Banks, four builders, viz., Mr. Cockerill, Messrs. Higham and Mr. Horsman, of Wolverhampton, and Messrs. Trow, of Wednesbury, were invited to compete for the execution of the work, Mr. Fowler not hindering himself to accept any one of the tenders. The builders arranged that the "quantities" should be taken out by Mr. Johnson, who was to be paid (at the rate of 1¼ per cent. on the lowest estimate) by the lowest or successful tenderer, who, however, by custom, includes the cost of the quantities in his estimate. Copies of the "quantities" were supplied to each of the builders, and Mr. Johnson was to be called upon to guarantee their correctness, but it appeared that, in consequence of the estimates exceeding the amount which Mr. Fowler had resolved to spend upon his house, and also of the death of Mr. Banks, the first plans were abandoned, and Mr. Bidlake, architect, who succeeded to Mr. Banks's business, prepared fresh designs. The estimate of Messrs. Trow was the lowest, and in consequence they alone were applied to for a tender for carrying out Mr. Bidlake's plans, with the intimation that if the tender was satisfactory they would be entrusted with the work. They accordingly sent in a tender (the quantities being taken out by Mr. Bidlake, for which he received about 70l.), and the house was erected by them. Mr. Johnson consented to accept 20l. in discharge of his claim. The matter remaining unsettled, Mr. Johnson's solicitor wrote to Messrs. Trow, claiming the amount, and he received a reply stating that they never employed Mr. Johnson. They, however, paid 5l. into court. For the defence, Mr. Young contended that, because his clients were successful upon a totally distinct design from that of the late Mr. Banks, it was inconsistent with custom or equity to call upon them to hear more than a proportionate share of the quantities prepared upon plans that were abandoned. His

Honour having in the course of the case expressed his astonishment at the letter of the defendants, denying the employment of the plaintiff, Mr. Young said it was written upon the understanding that the arrangement with Mr. Johnson was made by Mr. Cockerill on behalf of the four builders, and not with the desire to escape from their part of the responsibility. The jury gave a verdict for the defendants. The judge said he quite agreed with the verdict, but, after the letter to which he had alluded, he should allow no costs against the plaintiff. He considered that Mr. Johnson had behaved very handsomely in reducing his claim as he had done, and that, therefore, the builders ought to have behaved more liberally towards him.

MONUMENTAL.

At a recent meeting of the Court of Common Council it was announced that a private gentleman having undertaken, at his own cost, to erect a memorial of the late Prince Consort, in the form of an equestrian statue, provided the Corporation would grant a suitable site, and would construct the pedestal, which they had agreed to do, the engineer of the committee had indicated as a singularly desirable site the circus at the western end of the new viaduct, where he said such a memorial would be visible, in some instances at a distance of from 500 yards and upwards, from every one of the thoroughfares converging upon that point. The statue is to be entrusted to Mr. Bacon, the sculptor, subject to the approval by the Corporation of a model to be prepared by him.—A long-talked-of monument at Paisley to Wilson, poet and ornithologist, is likely soon to be set up. Mr. Mossman, the sculptor in Glasgow, some time ago was commissioned by the committee to execute a bronze statue; and he has submitted to these gentlemen a model in clay. The statue is a colossal figure of Wilson, representing him in an American herd, looking earnestly at a Jay, his favourite bird, which he is supposed just to have shot; while his portfolio lies at his feet.—A monument is about to be erected in the grounds of the English Cathedral, Montreal, to the memory of the late Bishop Fulford, first metropolitan of Canada. The fund required, viz., 5,000 dollars, has been subscribed by a number of the principal residents.

THE YORKSHIRE ARCHITECTURAL SOCIETY.

An excursion of this society took place on Tuesday before last, the district visited being Easby Abbey, Richmond, and the Valley of the Swale. The party left York with aspects, so far as the weather was concerned, of anything but a cheering nature. At Easby the excursionists at once made their way to the church, which had been recently restored under the direction of Mr. Gilbert Scott. Here they were received by the Rev. J. Thompson, the vicar, who read a paper explanatory of the antique wall paintings illustrative of Scripture history, which were brought to light on the removal of the whitewash during the process of restoration. The party next proceeded to the ruins of the Abbey of Easby, which they minutely examined. The Rev. G. Rowe, one of the honorary secretaries, here read a paper on the "Early History and Present Aspect of the Abbey," which the late Dr. Raine had told them was founded by Rold of Barton, the constable of Richmond Castle, in the year 1152. On leaving the ruins the party proceeded by the footpath along the banks of the river to Richmond. The parish church, which has also been recently repaired under the auspices of Mr. Scott, was visited, as well as the castle and ruins of the Friary. Then, by the invitation of the Mayor of Richmond, who, along with Mr. E. Wood, the clericone of the party, had met and received them at Easby, the members were invited to the town-hall, where a luncheon was provided by his worship. The rain having shortly after partially cleared up, the excursion to the Valley of Swale was persevered with, and consequently a number of open coaches were at once placed at the disposal of the visitors, and a delightful ride of some six miles through some of the most beautiful scenery in England amply compensated them for the inconvenience which they had sustained during the early portion of the day. At five o'clock upwards of fifty of the members of the society and their friends dined in the Assembly-room of the King's-head Hotel. The Lord

Mayor of York, Mr. A. E. Hargrove, was in the chair, and he had on his right and left the Mayor and Mayoress of Richmond. The vice-chair was occupied by the Rev. George Rowe. The party left Richmond soon after six o'clock, and reached York by nine.

FROM SCOTLAND.

Edinburgh.—The restoration of the ancient cross of the city is now almost complete. The shaft, supported on a new pedestal, was erected a few months ago within the railings on the north side of St. Giles's Cathedral, not as representing the original position of it, but with the view of preserving it as a valuable relic, close to the ancient site, and where it would be comparatively safe, and cause no obstruction. Upon the erection of the shaft a want of effect was perceived, and it occurred to Dr. David Laing that a unicorn, as a crowning ornament, would not only give the desired effect, but help to give a more complete representation of the cross as it existed in its original form. This suggestion has now been carried out. The addition of the large stone basin which formed part of the original cross, and which is now at Abbotsford, would have rendered the restoration still more perfect, as the *Sootsman* remarks; and it must be regretted that an endeavour was not made to obtain this portion of the relic. This is the basin "fra the quihilk," in holiday times, "the wyne ran out at the spoutis in greit abundance," when "their wes the noyis of pepill casting the glassis with wyne." The drawings for the unicorn were presented by Mr. James Drummond, R.S.A., and from these Mr. John Rhind, sculptor, has executed the work.—A new mission church and school are being built in Canongate. The edifice, which is from designs by Mr. Robert Paterson, architect, is half completed. The style is Early Pointed, and the front of the building is plain, with a moulded central doorway, flanked by small triplet windows, which light the vestries. Over these are a central and two side windows. The school occupies a sunk floor, partly beneath, and extending backward beyond the body of the church. Provision is made for a gallery, which, however, is not to be erected in the meantime. Including the gallery, there will be about 600 sittings. Messrs. Berry are the contractors for the mason-work, and Messrs. Smith & Son for the carpenter-work. The cost will be about 2,000l.—During the last few years a considerable number of houses for workmen have been built at Fountainbridge, in the south-western suburbs of the city, where several extensive industrial establishments are situated. At Dalry, a large space of ground has recently been laid off in fens for houses of the class referred to, and building operations have been in progress for some months. Mr. McEwen has built a large brewery, and there are to be four blocks of houses, from designs by Mr. John Paterson, architect. In the meantime, only the south frontage of two blocks on the south side of the ground is being proceeded with; but that will embrace about 463 separate dwellings, arranged in four stories. The elevations are in the Scotch style of architecture, the chief features being stepped gables and corbelled chimney-stalks. There are railed flower-pots along the front. Nearly 100 of the houses will be occupied this month: these have been built by Mr. Mackenzie and Mr. Rutherford.

CHURCH-BUILDING NEWS.

Holloway.—The foundation-stone of a new church has been laid in Poole's-park. Seven Sisters-road. The building will contain accommodation for 1,053 persons, and one half of the sittings are to be free. The amount paid for the site was 1,000l.; the builder's charge will be 3,500l.; and the internal finishings will cost 1,500l.; making a total expenditure of 6,000l. Towards this outlay there has been granted from the Bishop of London's Fund 1,000l. for the site, and 1,000l. for the building; a sum of 100l. has been received from the Diocesan Church Building Society; and 1,350l. have been promised by private donors; so that the total receipts hitherto amount to 3,350l., and leave 2,550l. to be still furnished for the completion of the edifice. The church will meet the wants of a locality which is rapidly becoming so populous that it has been found necessary to form a new district out of St. Mark's, Tollington-park. The materials will be partly stone and partly brick. The nave will be 93½ ft. by 29 ft., and will be

separated from the aisles (86 ft. by 16 ft.) by a range of circular shafts supporting six arches, above which will be a clearstory. The chancel will be 27½ ft. by 18 ft.; the organ chamber 11 ft. by 8½ ft., and the vestry of similar dimensions. The tower will occupy the south-west angle of the structure. The architect is Mr. A. D. Gough, and the style will be Lombardic. It is proposed to convert the present iron building, when the new church is consecrated, into a school-room for the use of the Sunday and day schools, thus affording accommodation for 350 children, while the present day-school cannot conveniently receive 100.

Shanklin (Isle of Wight).—The church of St. Saviour has been consecrated. The parish church has been repeatedly enlarged in order to meet the requirements of this growing town, but it has barely sittings for 280. A new church is now in progress of erection. It is being built from designs by Mr. Thomas Hellyer, of Ryde, in the Early Decorated style. It will consist of a nave, 78 ft. by 25 ft., and a chancel 30 ft. by 19 ft., with two side aisles 11 ft. 6 in. wide, under lean-to roofs, and a tower and spire at the west end of the south aisle 115 ft. in height. The nave is 25 ft. high, and the roof is 20 ft. in addition. The chancel is approached from the nave by a single step, and is separated from it by an arch with moulded corbels. The foundation-stone was laid on the 28th of June, 1867, and the length of time which has been occupied in its erection is attributable to the bankruptcy of the builder who took the contract. The committee themselves took the management of the work, employing Mr. Jolliffe, of Ryde, as clerk of the works, and under his superintendence the erection of the nave and chancel has been completed.

Salford.—The Stowell Memorial Church, Regent-road, Salford, has been consecrated by the Bishop of Manchester. The foundation-stone of the edifice was laid on the 19th of October, 1867, by the bishop, the church being erected to commemorate the life and labours of the Rev. Canon Stowell. The site had formerly been a pit, and was found to be filled up to many feet with material of a far from solid description, so that in some parts the walling is as deep below ground as it is high above it. The steeple is so placed that on entering the Regent-road from Water-street it is at once seen in the distance, and appears from that point of view as if in the centre of the street, with the rows of houses on either side. The church is of stone, designed in the Geometrical Decorated style. It consists of a broad nave, flanked by comparatively narrow aisles, and lofty. On the north side of the chancel, almost detached in appearance, and entirely so in reality, from the main building, stands the steeple, about 150 ft. high. The western wall of the nave is pierced by an arcade of three arches. The outer, and are respectively to north and south porch, and are provided with double doors. There is another principal door to the tower porch, so that by three wide doors the congregation may quickly disperse. The whole of the floors of the porches and passages are laid with red and black tiles in patterns, and that of the chancel with Maw's ornamental tiles. The chancel stalls and communion rail are all of oak, moulded and carved. The seats in the nave and aisles are all alike, and are of simple form. The three-light baptistery window is filled with ornamental glazing made by Messrs. Edmundson & Co. The great west window is divided into six compartments, and is ornamented with tracery in the upper part. The chancel window is about 25 ft. by 13 ft. It is of five lights, and the head is filled with a central rose and other tracery. There are five equal arches on each side of the nave. The clearstory windows are in pairs, alternating in design. The aisle windows are also all traceried, and are all of different designs. The gasfittings have been made by Messrs. Thomason, of Birmingham. The chancel lights are brackets bearing a sort of crown of gas jets. In the nave, a little above the capitals of the columns, are other somewhat similar but simpler brackets. There are also brackets in the aisles and elsewhere. The bell and its fittings, Haden's heating apparatus, and everything else to render the church complete for service, have been included in the contract. The church will seat 700 adults. The contract was taken by Mr. Mark Foggat, at something under 7,000l. Messrs. Medland Taylor & Henry Taylor, of Manchester, were the architects.

Wootton Bassett.—The trustees of Sir H. Menz have offered to restore the parish church, at a cost of between 4,000l. and 5,000l. The re-

atortions comprise a new nave, the reparation of the chancel, a new vestry, raising the tower, and some new screens. The old galleries will be done away with. The architect is Mr. Street. The offer has been accepted.

Haygrave.—The small parish church of Haygrave has lately undergone considerable renovation and enlargement. The principal feature of the recent works is a material enlargement of the church, which has been effected by the removal of the old vestry on the north side, and the erection in its place of an aisle about 30 ft. long by 15 ft. wide, accommodation being thus afforded for about ninety additional persons. The new aisle is connected with the nave by three arches and circular columns of Ancaster stone, the latter having moulded caps and bases. The roof is boarded with unstained pine, and slated, and the aisle is lighted by three two-light Early English windows, also of Ancaster stone. The walls are built of Dalham stone, faced with flint, and with stone coirns, &c. A gallery at the west end was pulled down about a year and a half ago, but the tower still remains partially blocked by a smaller gallery, which affords accommodation for the school children. The pews which covered the floor have for the most part given place to benches of unstained pine. The architect employed was Mr. Ralph Chamberlain, of London. Mr. James Drake, of Osuden, was engaged as builder. The stonework has been executed by Mr. Hopson, of Bury. The total outlay was something in excess of 3000l., and was raised by voluntary subscriptions.

SIX YEARS' SANITARY LABOUR AT LIVERPOOL.

MR. NEWLANDS, the Liverpool borough engineer, has just submitted to the health committee of the town council a report which embraces the work in his department for the last six years. From this report it appears that since the 31st of December, 1862, there have been constructed within the borough 24 miles 490 yards of sewerage, at a total cost of 86,114l., or a small fraction over 2l. per yard. Since December 31st, 1862, the great work of converting privies into water-closets has been going on, and the engineer records 13,229 such conversions, and the cost of the drainage connected therewith was 37,719l.: 162 slate urinals, and 35 of iron, with in all 447 compartments, have been erected. Not less than 26 miles 1,153 yards of streets have been paved during the same period.

Everton takes the lion's share in both of the departments. During the period 10,007 new dwelling-houses were erected, of which 48 per cent. were in Everton and Kirkdale, 23 per cent. in West Derby, and 26 per cent. for the Toxteths, leaving only 3 per cent. for the parish. The report embraces a great variety of other matters. On the subject of the utilization of sewage, the reporter states that the works of Messrs. John Noble & Co., under the Liverpool Sewage Utilization Act, are nearly completed at Sandhills outlet sewer, where the company mean to set to work as a preliminary test. The steam-roller purchased in 1866 cost 1,069l., weighs 30 tons, and has been worked five days in the week at a cost of 301l. for sixty-one weeks. It rolls macadam roads at a cost of 4d. per yard. Nothing is said as to its doing any injury to gas or water pipes sewers, &c.

Books Received.

A Few Remarks on the Crystal Palace and People's Park. By FRANCIS FULLER. Boot, 8, Eastcheap, 1869.

In this pamphlet Mr. Francis Fuller paints in strong colours the miserable condition into which the Crystal Palace, according to his view, is falling,—the gradual disappearance of everything elevating, and the exaltation of eating and drinking. He urges that the character of the institution has been disgracefully lowered; that it is most important it should be raised for the advantage of the public; and to this end that it "must either be rescued from the hands of the present Direction, or the Direction must be revised and strengthened, and made capable of performing new duties with vigour," that the debt must be paid off, and new capital raised; the institution be worked solely for the original objects; and the building and park ultimately become the property of the nation."

VARIORUM.

"Military Work by Military Labour, with a few Remarks on Mr. Hanbury Tracy's Motion before Parliament, by an Officer of Royal Engineers" (Buck, Paternoster-row), contains, besides the preface, an extract from "Hansard's Debates," vol. xciv., the debate on the introduction of the measure by Mr. Tracy; together with reviews of the press extracted from the *Times* and other daily papers, the *United Service Gazette*, *Saturday Review*, *Builder*, &c.; and abstract of a return to Parliament on the subject of soldier labour on repairs of barracks, and on new works. In the preface the author (O. E. W.) says of Mr. Tracy's plan for causing regiments to do their own repairs and other work:—

"There is as little interference as possible by any other department in the arrangements for carrying on the work. In a short time after a uniform system had been adopted, the standard of the quality of the work required would become known. Regiments would be found to emulise one another in the neatness and perfection of execution;—and any neglect or carelessness could be easily checked by a deduction from the payments, which in time might be left to the regiment itself to decide.

This work on repairs will afford constant occupation to a certain number of men, probably about 2 per cent. It will therefore rest entirely with the commanding officer to arrange his work, so that every deserving and competent artificer will have the opportunity of earning a small weekly wage. Casual special services, on which soldiers have generally hitherto been employed, need then only be carried out by their labour, when there is a surplus employed on repairs. The economy will be greatly to be gained quite wrong to suppose that the greatest saving can be effected on new works, any one with practical experience knowing that the contractor's profit is much less on the latter than on repairs."

"It is believed, from experience gained in making incidental repairs under the Royal Engineers by the troops at Portsmouth, that the required number of artisans could exist in the ranks. If an officer and four or five such men from every regiment at home were placed under the Royal Engineers for six months—say at our camps, four in number—they would acquire the necessary knowledge for carrying on a very simple system of work. A trifling permanent increase of pay would give the men on qualification the status of master tradesmen, and the seed would be sown for future development in proportion to the maintenance given by commanding officers. Probably before long we should find in some regiments that all utensils would be returned into store in a good state of repair."

—Mr. Meiklejohn's "River or Equator System of marking London or any large City with a River, or other main dividing Line, for Postal Purposes, Directions, Cab Routes, and general Guidance (Stanford, Charing-cross)." The title of this pamphlet explains its purposes. London would by this plan be marked off into small squares of a quarter of a mile each, with numbers running north and south from the river or median line, in connexion with alphabetical letters running from west to east. Thus the exact position of a quarter of a mile, with reference to all the others, could readily be known, and directions, cab fares, &c., facilitated. A letter, for example or direction, to "Mr. John Smith, 24, Clarendon-terrace, Sussex-square, Alina-road, Kentish-town, London, N.W.," would simply be to "Mr. John Smith, 24, Clarendon-terrace, K 6;" and, after all, gain and not lose in definiteness and precision.

"Letter to the Chairman and Members of the Mersey Dock and Harbour Board, on Proposed Liverpool and Birkenhead Railway. By William Low, C.E., and George Thomas, C.E. (Advertiser Office, Wrexham). Our readers who may wish to know more as to the proposed new hedge across the Mersey, spoken of in our issue for the 22nd May, will find it in the pamphlet under notice.—*Cassell's Magazine*, the *Quiver*, the *World of Wonders*, the *Popular Educator*, all from the same firm, contain monthly full value for the money they cost. The writing, besides being amusing, has usually a good purpose. We take a paragraph from the current number of *Cassell's Magazine* on "Nohody's Children":—

"Half-sentimental synonyms, whatever may have been their original strength and adaptability to a certain purpose, are like other epigrams. They cannot continue to be applied without being taken for expressions of truth where they are only indications of truth; they falsely assume the appearance of the inevitable, and ultimately help to undo the work for which they were at first intended, by seeming to relieve us from a responsibility which they once usefully reminded us. Already we have changed our synonym for the homeless children of the streets from 'Street Arabs' to 'Young Ravens,' and even to 'Gutter Children' and there is no telling how many notes of this sentimentally descriptive gamut may be sounded to very little purpose in reference to the general harmony, while we persuade ourselves that those on whom we bestow the pitifully evasive epithets are Nohody's Children. The truth is, that these forlorn boys and girls—these street Arabs—whom we are so ready to relegate to the great London desert as a race apart from ourselves, are of our own heritage, and we have no brighter day that does not also belong to them, inasmuch as they are indivisibly connected with us for future good or future evil. They will be the men and women of the future time to come—the bread and salt, the help and the riches, of the little ones who now sit round our tables, and who belong to us by the ties of close and loving relationship."

—A Treatise on Dwellings for the Labouring Classes. By Captain E. R. Read. Layman,

Covent-garden." The author of this pamphlet here propounds a somewhat Utopian plan which is to provide improved dwellings for the working classes, under national or Government auspices, and on a basis so profitable that a large surplus revenue is reckoned upon, available for a variety of purposes, including a sick fund, an educational fund, and a fund for the reduction of national taxation. At the same time it is considered that pauperism will be reduced within the narrowest possible limits. The organisation of this State scheme would resemble that of the present Poor-law, with a central board and local authorities. No doubt, proper education, decent dwellings, and a well-managed sick fund, would greatly benefit the working classes and render them less dependent on the ratepayers; but whether in ten years the system either can or will be brought into full operation at a cost of 20,000,000l. annually; or in twenty years at an annual cost of 10,000,000l., as Captain Read says it could, is quite another question.

Miscellaneous.

Scientific Slanging.—An owner, who has made a rock-work, planted with ferns, in the front of his house, near Winchester, has set up the following notice, and finds it efficient:—"Beggars beware! Scolopendriums and Poly-podiums are set here." This will remind some readers of O'Connell's famous passage of tongues with a fishwoman, when he replied to all her epithets with scientific terms, and ultimately shut her up by calling her an hypobesous.

Society for the Encouragement of the Fine Arts.—On Thursday, 27th ult., there was an exhibition of the series of designs by Mr. H. C. Solous, illustrative of Mr. C. Kingsley's story of "Hereward the Wake," and which obtained the premium offered by the Art Union of London in 1867, together with an equal number of partially shaded drawings—the best of the unsuccessful series—illustrative of Lord Byron's "Lara," by Mr. C. B. Birch, the sculptor. Mr. Godwin, F.R.S., presided. Mr. T. R. S. Temple, in a short paper on the subject, after noticing the slow growth of art societies in England, their importance in raising the standard of art, and their utility as well to the veteran as to the youthful artist, gave a rapid sketch of the rise and progress of the Royal Academy of Painting, of the Society of Arts, of the British Institution, and of the Royal Academy of Music; and more especially congratulated the Art Union on being the only society at the present day that professedly encouraged historical composition, one of the highest branches of art yet strangely neglected in England. He next drew attention to Mr. Solous's designs, remarking on the judicious choice of subject, and on the freedom and elegance of his pencil, and regretting that a country which had such a noble history should have so few great historical painters. Mr. Solous felt highly gratified at the notice taken of his designs, and, whilst wishing they had been better, said it was an arduous task to go through so many; each design, as far as the idea is concerned, requiring as much thought as a finished picture. The chairman addressed the meeting. Mr. H. Tidy, Mr. Mapleson, Mr. Gilks, Dr. Heinemann, and other gentlemen spoke, and the proceedings terminated with votes of thanks.

Ely Local Board of Health.—At the last meeting of the Board the chairman (the Rev. G. Hall) said: The Board and the town at large had every reason to be proud of the very healthy state of affairs detailed. These benefits could not be accomplished without the aid of excellent officers, and the town had every reason to be proud of the manner in which the duties were performed. The statement made by Mr. Marshall was so plain that every one could understand it. The great reduction in their expenses might be fairly ascribed to Mr. Mather, who performed his duties admirably, and with a sharp eye to economy.

The Small-pox and Fever Hospitals at Romerton.—A correspondent says:—At a meeting of contractors held at the Westminster Palace Hotel, on Monday last, Mr. R. Trolope, in the chair, Messrs. Richardson & Waghorn were appointed the surveyors to compute the quantities of the proposed works on behalf of the builders, in conjunction with the surveyor appointed by the Asylum Board. The other surveyors who were nominated at the meeting, were Messrs. Arding & Bond, Messrs. Franklin & Andrews, and Mr. Jas. Barnett.

Mr. James Shepherd, of Rome.—The death of our countryman, Mr. James Shepherd, long a resident in Rome, will be heard of with great regret by a large number of persons. Mr. Shepherd was well known, both in Rome and England, for his energy, probity, and social qualities, and is looked on as a public benefactor in Rome, since it is owing to his untiring exertions and able direction that the city is lighted by gas, and that by the end of this year the most pure and copious of all the streams formerly brought to the capital by the ancient Romans, the Marcian water, will be again introduced by means of an ample aqueduct, and restored to the use and comfort of the public and the salubrity and ornament of the city. Not only will every one interested in the Anglo-Roman Gas Company and the Marcian Water Company deeply deplore the demise of their director, but a large number of friends will lament his exit from their social circle, and offer the sincerest tribute of condolence to his bereaved widow. Mr. Shepherd had been indisposed for several days in consequence of a fall resulting from momentary suffocation caused by swallowing an orange-pip. This accelerated heart-disease, from which he died. His funeral was attended by a large body of the English residents.

Co-operative Congress.—A co-operative congress of representative working men and others is being held in the large room of the Society of Arts. There was a large attendance at the opening proceedings. Among those present were Mr. T. Hughes, M.P. (who was called upon to preside), the Comte de Paris, M. Morier (Chargé d'Affaires at Darmstadt), Mr. W. Morrison, M.P., Mr. Mandella, M.P., Sir J. Bowring, Mr. Hodgson Pratt, Mr. G. Potter, Mr. G. Holyoake, Mr. J. Plummer, Mr. Lloyd Jones, Dr. Travers, &c. Among the subjects to be discussed were:—What further steps can be taken to give effect to the resolution of the Trades Congress held in Manchester in June, 1868—"To utilize the organization of the trade-unions for co-operative purposes"; the best means of making co-operative societies mutually helpful; in partnerships of industry, what division of profits, as between capital and labour, is the most likely to produce perfectly harmonious action, and therefore the arguest measure of success; and the best practical means of promoting a knowledge of co-operation among the people. During the sitting of the congress an exhibition of specimens of production by co-operative societies and partnerships of industry was on view.

Builders' Benevolent Institution.—Last week a general meeting of the subscribers to the Builders' Benevolent Institution was held at Willis's-rooms, King-street, St. James's, for the purpose of electing two pensioners—one male and one female—on the funds of the institution. There were fourteen candidates. Mr. G. F. Trollope (president) occupied the chair. Since the foundation there have been 104 male and female recipients of the fund,—the men receiving 244 and the women 207 per annum. The moneys are invested in the Three per Cent. Consols,—11,706l. 9s. 8d. being for the relief fund, and 2,951l. 12s. 7d. for the building fund. The chairman, in opening the proceedings, said their duty was a very simple one, having only to elect two candidates out of a list of fourteen. They all knew that the present number of pensioners was forty-six—twenty-three males and twenty-three females. The society had hoped to increase the number of pensioners, but he was sorry to say their wishes could not be carried out, as the funds would not permit it. He, however, trusted that they would in future obtain a greater number of subscribers, so that they might obtain their desired wish, viz., the relief of those who were in need. The poll was then declared open.

Metropolitan Police Returns, 1868.—The usual criminal returns have been printed. From these it appears that in 1868, 45,848 males and 21,022 females were taken into custody; 24,943 males and 9,784 females summarily disposed of, or held to bail; and 2,623 males and 661 females tried and convicted. Of those taken into custody, 9,756 males and 5,506 females could neither read nor write; 33,475 males and 15,950 females could read only, or read and write imperfectly; 2,535 males and 164 females could read and write well; and 82 males and two females had had superior instruction. Of those tried and convicted, 560 males and 177 females were of the first class, 1,889 males and 47 females of the second; 174 males and 13 females of the third class; and 6 males and no females of the last class.

The History of Alnwick.—Mr. G. Tate having completed his "History of the Borough, Castle, and Barony of Alnwick," a number of his fellow-townsmen and friends from other parts entertained him at dinner on the 21st of May, under the presidency of Dr. Collingwood Bruce, and presented him with a testimonial, in the shape of a silver tea-service, a purse of money, and an address. The service was handsome, and bore the following inscription on the coffee-pot:—

"Presented to George Tate, Esq., F.G.S. (together with one hundred guineas and an illuminated address), at a public dinner held in the Town-hall, Alnwick, on the 19th day of May, 1869, as a token of esteem for his private worth, and admiration of his eminent literary and scientific attainments."

The address bore in the corners small paintings of Alnwick and Hulme Abbeys, and the Barbican and Abbot's Tower of the Castle. Alnwick is entitled to our warm commendation for showing its appreciation of a townsman's labours.

The Kent and Canterbury Hospital, Canterbury.—At a special general board of governors held to receive and consider a report of the Board of Management relative to the proposed alterations and improvements in the hospital buildings, Dr. Lochee stated that it was found that the existing water-closets and tanks for patients, situated as they are inside the building, are calculated to give rise to disagreeable consequences; that the ventilation in all the wards is inefficient; that, from the impossibility of getting a temperature anything up to the required degree in winter, efforts to treat successfully lung diseases were rendered almost futile; and that the accommodation to out-patients and casualties needed to be much more extended. The faults of the building had not been exaggerated, and they could only be rectified by adopting and carrying out such plans as would be submitted to them. He did not hold out any hope that they would have a model hospital, or one that would even suit the ideas of modern constructors of such edifices; but serious inconveniences would be removed. The architect (Mr. Thomas Henry Watson, of London) then read a report of the proposed alterations and submitted plans of the work. He said he estimated the cost to be 3,800l., or, allowing for extras, 4,000l. It was finally resolved that the plans produced be adopted, and that an appeal be made to the governors and the public for a building fund.

Sanitary Condition of Salford.—The ninth annual report of the medical officer of health for Salford, Mr. E. J. Syson, has been printed. From this report it appears that the death-rate of the borough for 1868 was 30.53 per 1,000 per annum, or 1 in 32. Of the total deaths, in a population of 118,213, 1,893, or 52.43 per cent., were children under five years of age. The chief causes of death were scarlatina, by which 404 deaths were caused, the most fatal period being between the ages of 2 and 5; next follow bronchitis and diarrhoea; then phthisis. From convulsions, 193 died; from typhus, 117; from typhoid fever, 125; from old age, 128. There was an increase in 1868 of 33 deaths from typhus, and 72 from typhoid fever, compared with 1867.

Incorporated Church-building Society.—At the annual meeting of this society, the secretary read the report, which stated that from jubilee services the society received 8,000l. There was a large increase in the amount of funds held by the society in trust for the repairs of churches, the total being now 48,865l.; in March, 1868, it was 42,249l. During the past year the number of applications had been greater than in any former year; the grants made were 170 in number, and 8,475l. in amount. The accounts, as audited by Messrs. Johnstone, Cooper, Wintle, & Evans, showed a total income from all sources amounting to 13,757l. 17s. 10d. Some very considerable reforms are needed in this society.

The Park-lane Improvement Bill.—At the meeting of the Metropolitan Board of Works, Mr. Newton, in answer to a question, said the select committee of the House of Commons had refused to insert special clauses in the bill to remunerate persons for making the thoroughfare through Hamilton-place whose property would not be required, and in consequence of that refusal Mr. Gore, the Commissioner of Woods and Forests, had told the committee that he should consult the Lords of the Treasury as to whether they would consent to the third reading of the bill. It has, however, been read a third time.

New Park at Hampstead.—We understand that a plan has been set on foot by which, if carried into effect, the inhabitants of Marylebone, Kilburn, Beisize, Camden Town, Haverstock-hill, and St. John's Wood, will be greatly benefited. It was proposed in a vestry meeting at Hampstead the other day, to take on lease, at a moderate rental, with option of purchase, an area of between fifty and sixty acres in the neighbourhood of Finchley-road. It is expected that the new lord of the manor, Sir John Maryon Wilson, will not be indisposed to meet the wishes of the inhabitants of Hampstead thus far, especially if, as is very probable, the parish of Marylebone should unite with that of Hampstead, and both with the Metropolitan Board of Works, in forwarding the success of the scheme.

Paper Houses.—We have in former notices referred to the numerous uses to which paper is now being put, especially in America, where hats, buckets, and many other useful articles have for some time been made of it. The *Chicago Journal of Commerce* now informs us that houses are being built of paper, and that they are warmer, and cost one-third less than houses built of wood and plaster after the usual fashion.

The Sheffield New Post-office.—The contract for the new post-office has been let to Messrs. Robert Neill & Sons, of Manchester. The surveyor representing the post-office authorities in London and one of the contractors were in Sheffield on Thursday, staking out the building, and the works will be immediately proceeded with. The contractors are the same that are engaged in the erection of the new South Yorkshire Asylum at Wadley Park.

Lead Poisoning.—At an inquest held at Poplar respecting the death of Mrs. Elizabeth Christopher, a beershop-keeper in the Commercial-road, the doctor who attended the deceased said that her death was caused by drinking beer which had been drawn from new lead pipes in the bar of the beershop. The jury returned a verdict of "Accidental death from lead-poisoning." Dr. Schwarz, of Breslau, suggests a simple method of protecting lead pipes from the action of water, by forming on the inside surface of the pipes an insoluble sulphide of lead. The operation consists in filling the pipes with a warm and concentrated solution of sulphide of potassium, or sodium, which is left in contact with the lead for a quarter of an hour.

Important to Patentees.—The Lord Chancellor has decided a point of interest to the registrars of patents. An intending patentee had lodged a provisional specification, when another inventor filed one of a similar description, and procured his patent to be first sealed. The former complained of this, and argued that under the circumstances the Attorney-General should not have allowed the second person to file his patent. The Lord Chancellor, however, pointed out that there was no law to compel a person who had filed a provisional specification to proceed with his invention, and if the applications of other parties were to be uniformly rejected, the country might be deprived of the fruits of the ingenuity of many minds which were working in the same direction.

Completion of the Great Pacific Railway.—As the public by this time know, the Atlantic and Pacific Railroad is completed, and America, big in everything else, can now boast of the longest single iron highway in the world. At Promontory Point, in the State of Utah, where the last rail was fixed, the telegraph was kept actively at work, communicating with every important city in the States, and messages in rapid succession exchanged details of each step in the process of completion, with responsive congratulations sent by distant sympathisers. Of every incident as it happened all Americans were informed at the instant. It was really a grand event; and, as the London *Telegraph* remarks, "few will think the monster processions and rejoicings, or the special religious services, at all out of place in celebrating one of the greatest steps in the march of civilisation that the century has witnessed." As an appendage, we may add, Brigham Young, the Mormonite head of a hundred wives and children (all told), has broken the first ground for the Utah Central Railroad, below Ogden. The road is to connect Salt Lake City with the Pacific Railroad, and it is said will probably be finished in October.

Great Northern Railway Church at Peterborough.—On Friday, 27th ult., the Bishop of Peterborough consecrated this church, which has been built for the locomotive establishment of the Great Northern Railway Company at New England, about a mile north of the Peterborough station. Mr. Teale, of Doncaster, is the architect. The church is 104 ft. long and 48 ft. wide, and has a low central tower, but no transepts, a pyramidal roof covered with the stone slates of the country, and a semi-circular apse.

Overcrowding in the Borough.—In the course of an inquiry before the coroner for East Surrey, into the cause of the death of a child two months old, it came out that in a small room a man and his wife, with deceased, and a grown-up son and daughter, all lived and slept. There was nothing put up to part the two beds in the room. The coroner said it was most disgraceful that such a thing should exist. Overcrowding could not continue if a thorough house-to-house visitation took place, and the landlords were severely dealt with if they infringed the law. The child appears to have been suffocated while in bed.

A Big Blast.—At Shap Granite Works last week, a huge blast took place. With 75 lbs. of powder, a solid block of granite, measuring 40 ft. by 30 ft. by 15 ft., and weighing 1,500 tons, was blown from the monster deposit of Wastdale Crag. Probably such an immense mass, in one block, has never been blasted before.

The Sewage Question.—The Eton Local Board of Health have determined to adopt the report and plan of Messrs. Ripley & Simonds, civil engineers, for the drainage of Eton College and town. The system adopted is the separate one, with the purchase of land for sewage utilisation and irrigation. The cost is estimated at £8,000.

TENDERS.

For Kidsgrove sewerage. Messrs. R. Scrivenor & Son, architect. Quantities supplied:—
Pain £1,600 0 0
Taylor 1,340 0 0
Rowson 1,250 0 0
Lunn & Heynes 1,170 0 0
Pearce 1,031 17 7
J. & S. Smith (accepted) 1,020 11 0

For the erection of shop and premises, Gun-lane, Limon-house. Mr. T. C. Clarke, architect:—
Kilby £886 0 0
Abraham 684 0 0
King & Sons 668 0 0
Hoskins 620 0 0
Fletcher 574 0 0
Hopewell 553 0 0

For additions to the Lock Hospital, Harrow-road, Mr. F. W. Porter, architect:—
Hill & Keddell £3,114 0 0
Patman & Fotheringham 2,875 0 0
Dove, Brothers 2,775 0 0
Mansfield & Price 2,768 0 0
Abby & Sons 2,743 0 0
P'Anson 2,675 0 0
Ebb & Sons 2,544 0 0
Conder 2,508 0 0
Macey 2,413 0 0
Henshaw 2,375 0 0
King & Sons 2,294 0 0
Browne & Robinson 2,217 0 0
Longnivre & Barge 2,117 0 0

For various works, St. Paul's Church, Mill-hill, Hendon, Mr. Parkinson, architect:—
Patman & Co. £3,164 0 0
Adams & Sons 3,160 0 0
Foster 3,080 0 0
Cooper & Cullum 2,950 0 0
Wheeler 2,873 0 0
King & Sons 2,858 0 0
Crab & Vaughan 2,736 0 0
Deards 2,554 0 0

For the erection of three houses and shops, at Ventnor, Isle of Wight, for Mr. Gibson. Mr. Francis Newman, architect. Quantities supplied:—
New Buildings. Old Materials.
Wickens £1,884 10 0 £38 10 0
Ingram & Son 1,897 0 0 38 10 0
Newham 1,893 6 0 37 1 8
Moses & Wallder (acc'd.) 1,749 0 0 100 0 0

For plumber's, glazier's, and painter's work, to eight houses, at West-hill, Hastings. Mr. Alfred Cross, architect:—
Nave £197 2 3
Pickwell 480 0 0
Jarret 385 17 4
Vidler 382 0 0
Brown (accepted) 397 5 6

For new house, Adelaide-road, South Hampton, for Mr. Gale, nurseryman. Quantities by Mr. W. Todd:—
Simpson & Son £585 0 0
Ehls & Sons 816 0 0
Thomas 789 19 0
Hackworth 777 5 0
Longnivre & Barge 777 0 0

For Walton-on-the-Hill sewerage works. Contract No. 1. Mr. George W. Goodson (Reade & Goodson), engineer:—
Anderson & Co. £13,900 0 0
Hunking 12,819 12 2
Thomas 12,154 13 1
Lee 11,035 0 0
Dixon & Sleigh 11,464 13 0
Martin, jun. 11,238 0 0
Hartley & Co. 10,689 2 3
Mitchell 9,998 9 8
Fawkes & Mansel 9,867 15 9
Herdacre 9,868 0 0
Moore 9,628 0 0
Winnard, jun. 9,500 0 0
Thane (accepted) 8,324 1 6
Ford 8,235 0 0
Messrs. Smith 7,150 0 0

For house, Duke-street, for Mr. A. M. M'Dougal, Mr. Charles E. Davies, architect. Quantities supplied:—
Wood £8,500 0 0
Hill 5,347 0 0
Shurmut 5,144 0 0
Johnstone 4,620 0 0
Thomas & Son 4,300 0 0
Morgan & Lovell 4,283 0 0
Nightingale 4,140 0 0
Nixon & Son 4,120 0 0
Rudkin 4,000 0 0
Carter & Son 3,973 0 0
Myers & Sons 3,984 0 0
Blackmore & Morley 3,840 0 0
Hill & Sons 3,790 0 0
Conder (accepted) 3,673 0 0
Wigmore 3,675 0 0

For schools at Watford. Mr. Thos. Pearson, architect. Quantities supplied:—
Taylor £1,764 0 0
Hubbard 1,650 0 0
Stans & Son 1,696 0 0
Hamphrey 1,683 0 0
Nightingale 1,633 0 0
Waterman 1,498 0 0
Raper 1,480 0 0
Foss & Co. 1,477 0 0
Snowden 1,468 0 0
Cooper & Cullum 1,436 0 0

For rebuilding 40 and 41, Haymarket, for Mr. A. Binnie. Mr. H. Lauderjone, architect. Quantities supplied:—
Greig £2,926 0 0
Nightingale 2,917 0 0
Patman & Co. 2,810 0 0
Myers & Sons 2,687 0 0
Mitchell 2,570 0 0
Scrivenor & White 2,468 0 0

For the supply and delivery of about 214 tons of 24-in. cast-iron pipes, in 9-ft. lengths, and 8 tons ditto, in 3-ft. lengths, for outfall sewers, for the Ryde Local Board. Mr. Francis Newman, C.E., borough surveyor:—

Table with 3 columns: 9-ft. lengths, 8-ft. lengths, 3-ft. lengths. Rows include Starvelly Iron and Coal Co., Woodstables and Rye, Garrett & Co., Sharpe, Coker, Spittle, Boland & Co., Laurie & Co., Fry, Laddaw & Son, White, Clarke, Newton, Chambers & Co., Claridge, North, & Co., Christie & Co., Begg, Deace, Bolekew, Vaughan, & Co.

For the erection of eight houses, at West-hill, Hastings. Mr. Alfred Cross, architect:—
Longhurst £3,452 0 0
Jones 3,330 0 0
Vidler 3,245 0 0
Hughes 3,108 0 0
Roddie 3,093 0 0
Howell 3,069 0 0
Bourne 3,049 0 0
Farka (accepted) 2,787 0 0

For re-construction of old premises, No. 3, Cherry-tree-court, Aldersgate-street, for Mr. T. H. Ellis. Mr. William Smith, architect:—
Kilby £1,190 0 0
Selsby 1,184 0 0
Henshaw 1,130 0 0
Fletcher & Caughay 1,128 0 0
Crab & Vaughan 1,109 0 0
Blackmore & Morley 1,058 0 0

For alterations, &c., to Elm Villas, Leytonstone, for Mr. D. T. Leroni. Mr. William Smith, architect:—
Henshaw £3,909 0 0
Blackmore & Morley 3,297 0 0
Arber 295 0 0

For finishings to the Clarence Hotel, Hastings. Mr. Alfred Cross, architect:—
Howell £728 10 0
Parks 724 0 0
Vidler 714 0 0
Bourne 695 0 0
Hughes 655 0 0
Longhurst 618 0 0
Roddie 609 10 0
Russell 450 0 0

For a house in High-street, Saffron Walden, for Mr. G. B. Gibson. Mr. Frederick H. Johnson, architect:—
Wright £1,419 0 0
Bell & Sons (accepted) 1,380 0 0

For the new Barnsbury Railway Station, North London Railway Company:—

Table with 3 columns: Estimate A., Estimate B., Estimate C. Rows include Hill, Sharnam, Hill & Sons, Mill & Co., Goodman, Bennett, Hill, Keddell, & Waldron, Wood, Wenship, Merritt & Ashby, Keeble, Crab & Vaughan, King & Sons, Mansfield, Price, & Co., Axford & Co., Watts, Hedges, Webb & Sons, Sawyer, Wickes, Bangs, & Co.

For alterations and additions, St. Paul's Church, Mill-hill. Mr. R. Parkinson, architect. Quantities by Mr. George Lansdown:—

Table with 3 columns: Estimate A., Estimate B., Estimate C. Rows include Patman & Fotheringham, Adams & Sons, Foster, Cooper & Cullum, Wheeler, King & Son, Crab & Vaughan, Deards.

For reseating, &c., the parish church, Mitcham, Surrey. Mr. Edwin Chart, architect. Quantities supplied:—

Table with 3 columns: If in Deal, If in Chestnut, If in Wainscot. Rows include Lawrence & Sons, Dove, Brothers, Mills & Son, Lawrence, Chapman, Jackson & Blaw, Gulland, Myers & Sons.

TO CORRESPONDENTS.

E. C. - J. G. R. - F. N. - G. H. G. - R. & H. A. C. - B. - E. R. N. - T. H. K. - C. E. - W. S. - G. P. - S. & S. - A. W. - T. W. - H. A. B. - A. J. S. - C. P. - R. C. M. - R. - E. G. - H. P. - R. S. - J. G. C. - F. H. J. - F. W. H. - S. M. - R. C. - L. B. - H. & E. - Young Clerk of the Works - J. B. W. San Francisco (sent as an example) - A. Constant Reader (the architect, usual recy. ty, has been considered responsible for his clerk of the works. Now that committees and other bodies appoint their own clerk of the works, the position is altered) - Kidnapper's lottery (next week) - West-India Sewage (next week) - W. C. B. (in type) - M. U. (in type) - several papers and communications are unavoidably postponed.

We are compelled to decline printing out books and giving addresses. All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. Note: - The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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The Builder.

VOL. XXVII.—No. 1375.

The Improvement of our Gardens and Open Places.

ANY useful hints may be obtained from Mr. Robinson's book on the Paris Parks and Gardens, spoken of in our last,* and we therefore return to it.

The spaces in front of several of the Parisian churches are very agreeably adorned in much the same manner as the squares, even to the fountains, little cascades, and statues. The church of the Trinité is a case in point. Here the garden extends in front of the church to about three times its width. It is in form of an oval, surrounded with a white stone balustrade, outside of which is a carriage-way up to the church doors. "From the garden to the church ascent is gained by two flights of steps, and between these steps three curvilinear cascades fall from three groups of statues, the waters uniting in one semicircular basin," says Mr. Robinson, adding, that the effect is quite sparkling, even for Paris. St. Clothilde has another garden approach,—not a stiff, straight gravel-walk through a church-yard, but a bright green sweep of grass and foliage, margined with the low iron edging that seems to be in general favour now in Paris, and which is only an interlacement of semicircles, in imitation of the rustic edgings, probably, formed with bent twigs. Fresh from a contemplation of this care and its happy effect Mr. Robinson thinks of the recent attempts at church-yard gardening in London. Speaking of the churchwardens who have already set to work, he says—

"Evergreens are to be substituted for headstones, and lamentable bits of Cockney gardening for the memorials of the dead. The most notable instance of this kind with which I am acquainted is around the church in Bishopsgate-street. Tombs and headstones appear to have been cleared out of the way, and all obstructions removed, so that a level surface might be obtained on which to set a few hundred evergreens, which have little more chance of flourishing in Bishopsgate-street than if planted in the Salt Lake."

And to churchwardens who have not yet taken any fatal steps, he says,—

"It would be a great advantage if the churchwarden mind could get rid of the idea that before making a garden in a graveyard it is necessary to level the space and make it like any commonplace bit of ground. Instead of pursuing such a course they should procure a few pounds' worth of advice from a respectable landscape gardener acquainted with the subject, and say to him, 'finabellish the spot without destroying its memorials or associations.' If you want it levelled, mutilated, and planted with a few formal beds and shrubberies, confide its execution to an intelligent navvy."

We should have been glad if the author had been as clear as this upon every point. On this same page we notice, he says, "Evergreen shrubs are proverbially fond of London smut," and points out their luxuriance in front of Tattersall's. While on page 161, when advocating the superiority of deciduous trees for cities on account of the ravages of the "black," he calls attention to the same spot as a witness on the other side. "The once handsome and healthy araucarias, planted in front of Tattersall's, at

Knightsbridge, and now draped with filth and soot," he describes as being, with the young pines and evergreens in the Regent's Park, and elsewhere, victims to the violence of the atmosphere. However, he makes amends for this contradiction by giving a long list of trees that will grow in London, headed by the plane, which gives such vivacious green to Berkeley-square. The last on the list, we may add, before we return to the Parisian improvements, is the lime. This is planted in large numbers in our suburban gardens, where the early withering and fall of its leaves make us fear the winter is approaching before the summer is half over. Every lime-tree in every small garden, says Mr. Robinson, ruthlessly, should be cut down. And Irish ivy should be trained up the railing to keep the dust out, and give a fresh green aspect.

Returning to Paris, we will take to the spacious streets and approaches, to see what municipal effort has done in this department. We find, in truth,—

"The city swims in verdure, beautiful As Venice on the waters, the sea-swan."

Around, across, and through the city stretch the wide, open, tree-bordered streets called *houlevards*, from the circumstance of the most ancient of them having been built upon the site of the *bulwarks* of old Paris. And not content with this, others, with footways on each side of them, it must be borne in mind, as wide as some of the old streets, pierce it in every direction, radiating from circular open *places*. Hence, not only is overcrowding an impossibility, as far as it relates to houses, in the present day, but it will be one for several generations. We inserted a view, in our previous notice, on the *Boulevards* near the *Château d'Eau*, as an example of their spaciousness, lightness, and attractiveness. The *Boulevard Richard Lenoir* differs somewhat from the ordinary type, for it is built to a large extent over a canal, and has eighteen pairs of ventilating and lighting shafts in the course of its 2,000 yards run, which features are made almost ornamental on as many little *parterres*, with central fountains, and flowers and grass in each. And on both sides of these *parterres* are wide footways, rows of plane-trees, and good roads. Then there are besides the *houlevards* that every visitor sees stretching from the *Madeleine* to the *Bastille*, those of *St. Jacques*, *d'Italie*, *d'Enfer*,—where there is a new name wanted, surely,—*du Mont Parnasse*, and the *Avenue de Breteuil*, on the left bank of the *Seine*; and as many on the right, among which we may count over the *Boulevards Pereire*, *des Batignolles*, *Clichy*, *Rochechouart*, *de la Chapelle*, and *de Belleville*. And again, treated in the same way are many *avenues*, of which the *Avenue de l'Impératrice* is the most gardenesque, according to our author's taste. The suns spent upon these works must have exceeded those *Cæsar*s laid out in the rich presents he made to the temple of *Delphi*; but when we consider the magnet that the magnificence of the city is to strangers, and the beneficial sanitary result, it will be seen they are, for the most part, wisely invested. The *avenue* mentioned was formed to make a wide, direct, and good approach to the *Bois de Boulogne*; 20,000l. was the amount of the first cost, to which the sum of 4,000l. was added for the enlargement of the *Auteuil Railway-bridge*, drainage, plantations, and flower-beds, and the length does not exceed 1,300 yards. The *Avenue de l'Empereur* cost 82,000l. Large excavations in some portions of its length, and embankments at others, account for the largeness of this charge. One portion runs along the *Seine*, and will form a terrace. The construction here is thus described:—

"The method which seemed to promise the greatest amount of safety combined with economy was to spread the pressure of the vast mass over a large extent of sur-

face. For this purpose a wide area was formed of concrete, on which was erected a wall nearly of the same size. This wall was hollowed out on each side by large spaces forming on the front turned towards the observer a series of vaults supporting a row of shrubs, which allowed the eye to wander through them into the neighbouring gardens. On the other side, where the embankment had been formed there were two rows of vaults, in order that the weight of earth resting on them might be added to that of the arcade itself, so as to counterbalance the effect of the tendency of the embankment to throw the wall outwards."

At any cost, with all care, and with every contrivance requisite, has Paris, in such matters, gone through an Augustan change. The pavements to the new streets and boulevards are of asphalt, and in a few narrow streets the paving-stones forming the once noisy roads have been taken up and laid with asphalt; while, on the other hand, in some of the widest streets where there is much traffic, there is a border of these paving-stones on either side of the macadamized centre, that this may not be cut up by wagons. It does not do to think of such places as the old *New-road* and *Leicester-square* after recalling Parisian improvements.

The public nursery gardens of Paris are one of the wonders of the place. The thousands of trees and hundreds of thousands of plants required for the public ways and places recently improved or formed by the city are all reared in the civic nursery gardens. Each of the gardens of the state rears its own stock, as our parks do. The *Jardin Fleurié*, where all the tender plants are raised, is in the neighbourhood of the *Bois de Boulogne*. It is nearly covered with glass houses, of which Mr. Robinson gives plans and sections, on account of their economy of space. He also gives a view of the wonderful caves under this garden for the storage of tender plants in winter. The establishment is a sort of horticultural college. Students over eighteen years of age, who have spent some time in the practice of horticulture, are admitted to improve themselves; and, we may record, half the books in the library arranged for their use, and that of the officers, are English. Then the nursery for the trees for the *Boulevards*, some forty-five acres in extent, is at *Petit Bry*, near *Nogent-snr-Marne*. That for shrubs is near the race-course in the *Bois de Boulogne*; and that for pines and rhododendrons in the same park, near *Anteuil*. A fifth establishment, for herbaceous plants, is in the *Bois de Vincennes*, where five or six acres of *chrysanthemums* may be seen, and other providings on the same wholesale scale for the city gardens. Mr. Robinson gives a figure of the machine used for transplanting trees of a large size, which is considered to be an improvement upon that in use with us. M. André, known to us for his work at *Sefton Park*, *Liverpool*, thus describes the mode of operation, taking for his specimen tree one of thirty years old, having a stem circumference of 3 ft. at a height of 3 ft. from the ground, and a total weight, with its earth-ball about the roots, of nearly two tons:—

"The operation is commenced by staking out, round the stem, the circumference of the earth-ball, which will be, on an average about 4 ft. in diameter for most spaces, and larger according to the size of the trees to be removed. A second concentric circle is then made about 2 ft. outside the first, the space between which will be the place for the trench to be dug for preparing the tree. The soil is then removed from this trench to the depth of 8 ft., and the small delicate roots are drawn out of the earth, left hanging, and carefully preserved. The earth-ball is then undermined, to prevent the roots from adhering to the subsoil; two thick planks 11 ft. wide, and a little longer than the ball, are placed underneath, parallel with the width of the cart, so that they sustain the weight of the earth when the tree is lifted. Pricket stems are now placed vertically close together all round the earth-ball, tied at the top and bottom with ropes, so as to prevent the earth from crumbling away, and also to protect the small roots from the inclemencies of the weather.

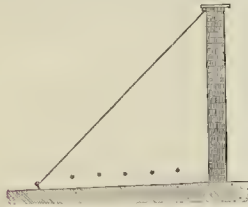
The removal of the tree is then commenced in the following manner:—Two stout thick planks strong enough to support the cart with the tree slung in it, and a little longer than the entire excavation, end having iron plates about 2 in. higher than the surface, bolted on each side so as to prevent the wheels from slipping off, are placed parallel to each other across the excavation, with the exact width existing between the wheels. The moveable bars are then put in their place again so as to strengthen the back of the wheels, which do not run on an axle, but are fitted in wrought-iron frames."

Passing the chains attached to the rollers beneath the planks below the earth ball, four men wind it up to the necessary height, when

* See p. 437, ante.

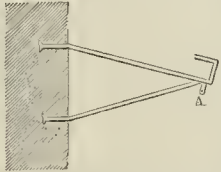


horses are placed to the cart, and away it goes to its destination. The trunks of some of the large trees newly planted in Paris are protected with a coating of moss enveloped in canvas; and round their base are discs of iron gratings, so that the earth may not get trodden down too hard. The cordon system of fruit-growing is worth more attention than it has yet received in England. It must not be confounded with the ordinary spur system. The word "cordon" applies exclusively to a tree consisting of a single branch bearing fruit-spurs only, and never allowed to ramify. One of the illustrations we reproduce shows the cordon on the front wall of a plant-house, in which position all the finer apples may be grown to perfection. The most popular form of cordon is the little line of apple-trees acting as an edging to the quarters in the kitchen and fruit garden. A border may be cropped with trees trained on this principle, and protected when necessary.

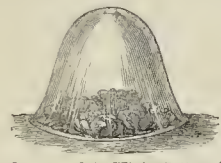


Peach Wall and Border, with Five Lines of Cordons, the whole protected in Spring.

Here is a galvanized iron bracket, more than 2 ft. wide, for supporting a temporary coping of bituminized felt. A wire passes through at A to support curtains where these are necessary:—



The large cheap bell-glass, called a Cloche, used in every French garden, gives great facility in the production of winter and spring salads. Acres of them may be seen round Paris; they are about 16 in. high, and the same in diameter at the base, and cost in France about a franc each. They are useful for many purposes, and every garden should be furnished with a few of them.



The Cloche, as used in Winter Lettuce Culture.

All the appliances and contrivances used by the best Parisian gardeners are illustrated by the author. We give one more modern invention,—the light iron trellis-work now in general use in the most advanced fruit-cultivation.* He goes minutely into the question of how we are to improve our fruit-culture, both in quantity and quality; advocates the use of many of the sunny banks of our railway embankments; and, indeed, says all there is to be said upon the subject. Instead of following him through this now somewhat beaten track,—beaten, though, by his own efforts as much as by those of others,—we will turn to a more novel branch of culture, from which we may and should take a lesson.

We allude to the cave culture of the mushroom. Picture a wheat-field on the south side of the city, with a deep well or shaft gaping among the waving corn, furnished with a pole pierced with sticks just large enough to afford footing and holding. Then descend this primitive ladder for 60 ft. At the bottom you find yourself, not in a coal-pit, but in a quarry, from which the stone has been picked out just as in our coal-seams, leaving long alleys of

workings propped up by pillars of the stone left here and there for the purpose, as pillars of the coal are left in our pits. And these workings are laid with low ridges of suitable soil, and turned into mushroom beds. In these long subterranean galleries, so low that you must stoop every now and then, and occasionally widening out from a narrow passage into a space wide enough to admit of several rows of beds, but everywhere dark and still, a crop of nearly 400 lb. weight of mushrooms is gathered daily. And there are many other mushroom caves around Paris. Mr. Robinson describes one that he visited, about an hour's ride from the city, that gave him the idea of a gloomy subterranean cathedral. In this one 3,000 lb. of mushrooms were gathered per diem, from beds measuring twenty-one miles in length. Another large cave mentioned has sixteen miles of beds. Mushrooms are curious things as well as delicious. They have their legends, and whims, and peculiarities, like more important objects. One tale told of them is, that they will not grow after being seen by mortals. This imputed blight is disproved every day; but the origin of the statement is clear. They soon exhaust their powers of growth in one place, and every now and then they cease to thrive, and the quarries have to be cleaned out and left to rest. It is believed, too, they will not grow in coal-pits, nor where there is any iron, even the neighbourhood of a rusty nail they will not endure; but experiments might be made before this need be taken for granted. Of course, it is not the interest of champignonists to assert they will grow anywhere; but it will be our own fault if some of the hundreds of miles of subterranean workings in this country are not utilized. A reference to Mr. Robinson's work will reveal the process of the culture. We give a view of the mushroom cave first mentioned, where it widens out into a large chamber.†

Our author has taken the trouble to sketch and compile particulars of the gardens of Versailles, Fontainebleau, St. Cloud, and Mondon, and we will accompany him to the first, called by the French the queen of geometrical gardens. There are in his book ten views, besides a plan of this palace and garden; consequently a very clear idea may be obtained of its beauties by those who have not visited it. And those who have walked on its Tapis Vert, trodden its labyrinth of gravel walks, heard the splash and sprinkling of its fountains, and admired its etaines and orange-trees, its clipped hedges, long canals, and peaked groves, will learn more by a glance at the plan than they could in an afternoon's ramble. We insert a view that includes the palace and a portion of the garden. The author does not, however, hold this place up for admiration. Its stiffness and formality are defects in his eyes, for which only the natural treatment of the gardens of the Petit Trianon compensates. In this there are "quiet and refreshingly voidant glades, a tiny streamlet, picturequely meandering through them; a well-designed piece of water, a little Swiss village, dairy, and so on, erected by Marie Antoinette;" and to pass into it, after expending some time in the Versailles gardens, or in those of the Grand Trianon, he says, is like being suddenly transferred from some gigantic cottonopolis to a green and sunny Piedmontese valley. A garden should appear in city eyes like unto a bit of the country, beautified by cultivation and taste. Those who have catered for the Parisians in this department, have borne this truth well in mind. We trust that the example they have set us in improving both the artistic appearance and sanitary condition of their city, will not be lost on those who have grand opportunities to do as much for London and the Londoners.

FREE PUBLIC LIBRARIES AND MUSEUMS.

ALTHOUGH a number of admirably conducted and highly useful institutions have been established in various parts of the country under Mr. Ewart's Public Libraries and Museums Act of 1850, and the several amended Acts passed subsequently, it can scarcely be disputed that the full capabilities of these measures, as stepping-stones to important educational agencies, have not been as yet, and are not now in process of being, worthily developed. It is a quarter of a century since Mr. Ewart commenced his public labours in connexion with this question,

and the first-fruit, so far as legislation is concerned, was the Museums Act of 1845, which enabled local authorities, with the consent of the ratepayers, to establish public museums, and to maintain them by local rates. Only two museums were established under that Act—the Royal Museum of Salford, and the smaller yet useful and creditable collection at Warrington. The first Act to promote the establishment and extension of Public Libraries, in addition to, or in conjunction with, Public Museums of Art and Science, was passed in 1850, and has since then been superseded by the more complete and practical Act of 1855, which has again been amended, and has had its provisions, extended by other Acts, in which Scotland and Ireland, as well as England and Wales, have been embraced.

The results of this enlightened policy have scarcely been satisfactory. The city and borough constituencies of England and Wales send 301 members to Parliament; the Scottish cities, burghs, and groups of burghs, send 24; the Irish cities and towns send 39. It would not be more surely than the constituents need, to keep them *au courant* with the literature, art, and science of their day, for them to have at least one well-appointed public free library, reading-room, and museum, for every city and borough member sent to the Commons House of Parliament. The number established falls, however, very far short of this. Prior to 1850 three museums were established, Salford and Warrington, already referred to, under the Act of 1845; and Winchester, in 1847, upon the voluntary principle, which failed as a support, and led the inhabitants, in 1851, to adopt Mr. Ewart's Act of 1850. In addition to these three museums, the total result up to the present time has been the adoption of the Free Libraries and Museums Acts in 34 other places, 28 in England and Wales, and three each in Scotland and Ireland. In many instances the inhabitants owe the benefits brought within their reach by the establishment of free libraries and museums to exceptional and accidental circumstances, rather than to their own appreciation of such advantages, or their desire to possess and profit by them. Liverpool owes its splendid free libraries and museums to the munificence, to a large extent, of Sir William Brown. Manchester, in a like manner, is mainly indebted to the personal liberality and energetic and persevering action of Sir John Potter, for the establishment of its original free library, which now has grown so great in its central reference department, and its five lending libraries, each with a museum attached. So it has been in Scotland also, with such places as Dundee with its Baxter, and Paisley with its Coats, men whose beneficent liberality has rendered it impossible for the rate-payers to reject the bounty of such donors, and all the benefits of the Act. In other cases, again, the proposal to establish free libraries has been carried by the tact, persistency, and ability of enlightened and collective agitators; in some cases by "management;" more clever, perhaps, than scrupulous, in packing the room in which the vote had to be taken with the supporters of the proposal to the exclusion of the opponents.

The comparative supineness of communities to avail themselves of the facilities the legislature has provided for the establishment of free public libraries and museums should not be a cause of surprise. Hitherto their introduction would have been, in many instances, as an inversion of natural order. General and efficient elementary instruction and training take precedence of the higher culture such institutions are fitted to impart. A certain degree of preparation is necessary before the books accessible in a public free library, or elsewhere, can be objects of desire, and sources of solace, delight, refinement, or strength. To the untaught and untrained visitor the objects presented in museums are mere images reflected upon the retina of the eye, which may excite a momentary ignorant wonder, but which, failing the equipment of the eye with intelligent messengers to the seat of thought, pass away like the picture reflected in a mirror, leaving no trace behind,—suggesting no reflection or comparison,—exciting to no attempt to understand the relations, correspondences, adaptations, or purposes of objects and combinations. Decided progress has happily been made, in the lifetime of the present generation, in popular instruction, and a more thorough system, with much larger results, may confidently be expected in the immediate future; this consideration invests the subject of free

* See p. 468.

† See p. 468.

libraries and museums for the people with greatly augmented importance.

Among the social as well as artistic and scientific subjects that occupy from time to time the attention of the Society of Arts, it is gratifying to know that this problem,—“How the Society may aid in promoting the establishment of Free Libraries and Museums of Science and Art,” is at present engaging their attention. A committee of the Society has been appointed to consider and report upon the subject. The committee met on Monday afternoon last at the Society's rooms, and may be said to have fairly commenced business. Mr. Henry Cole, C.B., presided, and there was a numerous attendance of the other members, including Sir Daniel Cooper, bart.; General Eardley Wilmo, R.A.; Messrs. Sannol Rodgrave, Seymour Teulon, George Godwin, J. T. Ware, Hyde Clarke, J. F. Isehn, James Hole, &c.

Mr. Cole opened the business in an appropriate succinct review of the important subject, and properly urged that either the Society, or some other authority or organization, should take action to stimulate public feeling on this important question. He also suggested the propriety of the committee being strengthened by the addition of a number of their own members who were also members of Parliament.

After a conversational informal discussion of the motion, and of other points involved in the general question, it was resolved, on the motion of Mr. Godwin, seconded by Gen. E. Wilmo:—

“That Dr. Lyon Playfair, Mr. Albert Pell, Lord F. Cavendish, Mr. E. A. Bouverie, Mr. Chas. Bunton, Colonel Akroyd, Mr. Thos. Bazley, Mr. G. C. Bentinck, Sir Frank Crossley, Mr. W. H. Gregory, Mr. A. J. Beresford Hope, Colonel Jervis, Mr. Walter Morrison, Mr. Edmund Potter, Mr. B. Samuelson, Mr. Wm. Tite, Mr. Muscicella, Mr. Ed. Baines, Mr. Geo. Dixon, Mr. I. Melly, Mr. Archibon Herbert, and other members of Parliament, members of the Society of Arts, should be added to the Committee.”

Also, on the motion of Sir Daniel Cooper, seconded by Mr. Seymour Teulon:—

“That the small number of the places which (as is shown by the following list) have adopted the system of rates for the support of free libraries and museums is a proof that the present system of proceeding is insufficient to secure the intended object.”

The following is the list of free libraries and museums established by means of rates authorised by existing Acts of Parliament, referred to in the resolution:—

- Ashton-under-Lyne—Public Library.
- Birmingham—Public Reference Library, Reading-room, and Galleries of Art, Schools of Art and Science.*
- Blackburn—Public Library and Museum.
- Bolton—Public Library and Museum, and School of Art.
- Cardiff—Museum and Library.
- Coverham—Library, School of Art.
- Dover—Public Museum.
- Exeter—School of Art.
- Hertford—Public Library.
- Ipswich—Museum, School of Art.
- Kidderminster—School of Art, Public Library.
- Leeds—Act adopted, but not yet in force.
- Leamington—Act adopted.
- Leicester—Museum.
- Lichfield—Public Library, Reading-room, and Museum.
- Liverpool—Public Library and Museum, two Schools of Art.
- Malton—Public Library and Museum.
- Manchester—Reference Library, District Libraries, and Museum.
- Northampton—Museum.
- Norwich—Public Library, School of Art, and Museum.
- Nottingham—Public Library and Museum, and School of Art.
- Oxford—Public Library and School of Art.
- Salford—Public Library and Museum.
- Sheffield—Public Library, School of Art.
- Stockport—Museum.
- Sunderland—Public Library and Museum.
- Walesl—Public Library and Reading-room.
- Warrington—Public Library and Museum, Schools of Science and Art.
- Warwick—Public Library and Reading-room.
- Westminster (St. Margaret's and St. John's).—Public Library and Reading-room (also a branch Institute).
- Winchester—Library and Museum.
- Aldridge—Public Library, under Act of 1850.
- Dunfermlie—Public Library (Museum in progress).
- Foley—School of Art, Public Library and Museum.
- Cork—School of Art.
- Dundalk—Public Library and Science Classes.
- Embs—Public Library (unfinished).

The important topics to be discussed in future meetings are indicated, in part at least, by the following notices of motion that were given:—

By Mr. Cole,—

* That free libraries and museums should be regarded as part of a system of national education, and assisted by funds voted by Parliament, in addition to local rates.*

* In some instances Schools of Art are maintained by their own separate and independent resources, although they are conducted in premises connected with Free Libraries.
 † 8 and 9 Vic. c. 43. § Special Act.
 ‡ 14 Vic. c. 65. || 13 and 14 Vic. c. 65.

And by Mr. Hyde Clarke,—

“That various old public libraries, as that of Archbishop Tenison, having been dispersed, it is expedient that legal provisions be made for the security, as national property, of all libraries and museums which are appropriated to the public use.”

The contemplated State assistance in the establishment of free libraries and museums may be taken to refer mainly to building grants. The local rate of from a halfpenny to a penny would, in many instances, suffice for the reasonable augmentation, from time to time, of public free libraries, and to maintain them in an efficient state; but the capital sum needed for a home for the institution is often an insuperable difficulty in the way of its establishment, which Government might remove with great public advantage.

It is much to be desired that this committee may fully accomplish the objects for which it has been appointed, and prove instrumental in securing the greatest possible “university reform,” by providing universities for the great body of the people. “The place where we are to get knowledge,” says Thomas Carlyle, “over-theoretic knowledge, is the books themselves! It depends on what we read, after all manner of professors have done their best for us. The true university of these days is a collection of books.”

THEATRICAL SURROUNDINGS.

THERE seems always to have been a kind of whiff of brimstone, a suspicion of sulphur, hanging about the stage, and whatsoever appertains to it, in the judgment even of many respectable persons, who are by no means included unconditionally under the number of the “elect.” Among those who have duly renounced the pomps and vanities of this wicked world, there are many who go with good courage to a concert, put a bold face upon a ball, but aver that there is to be a line drawn somewhere; and that line they draw just in front of the foot-lights. The theatre is to them a place of a doubtful reputation, which will not bear looking into; a haunt of dissipated sinners, where stage oaths are occasionally vented which would be shocking in a drawing-room, and where there is an indecorous exhibition of moral and physical semi-nudity, or nudity without the *sems*. And on this last head, perhaps, our scrupulous friends have just now a fair excuse for their grumble, though the matter may not be so bad as they make it out, and though we have by no means attained to the anti-drapery prejudices of our neighbours across the Channel. But waving the prevalent taste for the exhibition of—angles, and other illegitimate sources of effect, and looking only to that class of theatrical performances which approach to what is currently called “legitimate” drama, those who sit in the seat of the soorners are perhaps not wholly without excuse. It can scarcely be denied that there is a certain something, not very easily describable, about the air of the theatre, which renders it possible to divine why people of refined feeling, especially sensitive women, often give a very half-hearted and reluctant support to it; why some careful parents do not encourage their children to acquire theatrical tastes early in life. The fact is, that we retain about our theatres, in minor matters, a considerable relish of the taste and appreciation of a former generation. We have indeed purified the house in essentials; the theatre is no longer, as a rule, a place for disreputable assignations, more than any other place of public amusement; *procul hinc, procul inde puellas* of a certain description, has been long the verdict alike of the magistracy and of the public. But in the accessory attractions which, even in a good theatre, cluster round the principal piece of the evening, there is often something of the twang of the old school remaining, agreeable perhaps to veteran enthusiasts, but not welcome to the more fastidious of the present generation. The decorations have a faded gin-palace air about them; a gaudiness and want of solid and permanent character which we do not find in other respectable places of amusement, and which suggests the idea that the principle of sham that necessarily reigns behind the curtain has taken possession of the front of the house also. Even in recent theatres, where more artistic care has been given to the decorations; in such houses as the Gaiety, for instance, where we have the further attraction of Mr. Marks's clever, but rather unsatisfactory paintings, there is still perceptible something of the same over-gaudiness, which seems to be a

tradition with the theatrical decorator; as if anything sober and quiet were out of place here. And then the music,—is not theatrical music (bar the opera, of course,) proverbial? Thackeray, indeed, professed to enjoy it; nay, pitied the individual who “could not appreciate a pantomime overture;” and, of course, the great novelist was welcome to his taste. But is there not something entirely *per se* in the crazy tinnny sound of a theatre band, with its cracked cornet-piston, its three violins, and one “bass,” flourishing away at some threadbare waltz, in order that afterfamilias Popkins and family may not get too wearied during the necessary intervals between the acts? Does any one except Popkins ever listen to it? And would not most of us prefer a quiet talk, un-interrupted by the noise? There has been a little more attention attempted lately to this part of the entertainment in some quarters; music is to have a soul to be saved, and we are informed in the playbill that the band, “under the direction of Herr Von —,” will perform the following pieces, &c., and wretched stuff it is, generally. Have any of our readers happened to hear the *entr'acte* music written by one Schinbert for a certain German play, “Rosamunde”? If so, they may form an idea of what might be made of musical illustration in this way. But our heaviest charge is against the minor performances on the stage itself—the “first pieces,” so to call them. Why, if we go to see such a play as Lord Lytton's “Money,” recently so fairly put on the stage by Mr. Sullivan, must we, if we chance to arrive a little too soon, be edified by such a piece of indecorous twaddle as the “Mistress of the Mill”? Why, if we go to admire Mr. Alfred Wigan's fine acting at the Gaiety, are we to be bored by such preposterous rubbish as the “Two Harlequins” or the “Eligible Villa”? Why, if we take children to the pantomime at Drury Lane, must we be insulted with an objectionable farce such as was played there last Christmas and the Christmas before? The managers would consult their own interests, as well as the interests of dramatic art in general, by breaking through some of these time-honoured but utterly unnecessary observances, which really furnish ground for a great deal of the stigma so perseveringly thrown upon the theatre by a certain class of religionists. The theory, no doubt, is that it is the policy of a manager to consult all tastes, if he would fill his house. We much doubt the policy of attempting to consult all tastes in the same house. The “rip” who comes to grin at the indecorous farce is bored by the play; and those who are attracted by the latter, if it be really good, would be thankful not to be put in the way of having more vulgar associations thrust upon them. And we are convinced that many of the best and most educated class of English men and women, who at present almost entirely eschew the theatre, would give their cordial support to it, could they find a house where for certain *their* taste alone would be consulted, where the accessories and surroundings of the play would be pervaded by the same artistic spirit, and where they could give their tribute of tears or laughter to the Tragic or Comio Muse, without fear of being annoyed by tawdry decoration, contemptible music, and vulgar or (possibly) indecent farces.

THE PROPOSED LAW COURTS.

BLOCK plans for new courts on the proposed site between Howard-street and the Thames Embankment, and for new courts on the site already purchased between the Strand and Carey-street, without the purchase of any additional land, prepared by Mr. Street, together with a report addressed to the First Commissioner of Works, have been issued, and are before us. It would be waste of space, however, in the present unsettled position of affairs, to publish them. Suffice it at present to say that Mr. Street has given up the views he expressed so strongly to the Society of Arts Committee in favour of the Strand site, and has arrived at the conclusion “that the Embankment site affords by far the best opportunity for a great work now that the reduced scale of the building is accepted by the opponents” to the scheme:—

“In the case of both sites I may observe that as the area to be covered with building is so much smaller than was originally proposed, it will be necessary to omit many departments which were included in my former plans. On neither site would there be any possibility of finding space for all the offices of the Probate and Divorce department; and probably the Appellate Court, the Bankruptcy department, the Admiralty offices, the Land

Registry and Middlesex Registry, or some of them, might also have to be omitted. It does not come within my province to suggest which of these departments should be included and which omitted, but they would be about the same on either side. I propose also to reduce the number of courts to sixteen in all, with the addition, if required, of a large spare court. The Court of Appeal would then have to remain in Downing-street, and there would be no provision for a Bankruptcy Court."

We regret that we are unable to find any sufficient reason for the change of opinion in the report. Our own views remain unchanged, and we sincerely hope that the House of Commons will yet prevent the wilful waste of public money and public convenience that the new site would involve.

The building, as planned for the Embankment, would project about 75 ft. before the front of Somerset House, at the south-east angle of that building.

Mr. G. Pownall has surveyed the property required to be purchased in order to carry out Mr. Street's design for building the New Courts on the Thames Embankment site, as recommended by Mr. Lowe. Mr. Pownall estimates the cost of acquiring all interests in this property, after allowing for the re-sale of surplus land, at \$12,415.—212,415. more than the estimate of Mr. Layard. Mr. Pownall has also surveyed the Carey-street site already purchased by the Government, and is of opinion that the utmost that could be obtained for the property, if used for ordinary building purposes, is 364,320L. If this be correct, the proposed substitution of sites involves a loss at the outset of 448,095L., without considering the cost of continuing Essex-street to the north, as shown on Mr. Street's plan, or any compensation which the Metropolitan Board of Works might claim in the name of the ratepayers of London for the embanked land proposed to be taken. The Carey-street site cost 765,440L.; the difference of 401,120L. between this sum and its present estimated value arises chiefly from trade compensations.

ON THE CAM.

THE University of Cambridge may indeed claim justly the character of elegance. Noble benefactors have not forgotten it: princely revenues it still possesses, and many, very many, specimens of the arts. A truly Gothic town: like everything characteristic of our country, it has been the creature of necessity and utility rather than that of theory and art. Its walks and gardens, as scenes for retirement and study, are nowhere surpassed, and we are sorry to notice the noble avenue of lime-trees belonging to Trinity in so sad a state of decay. Age and close planting are surely doing their work, and the beauty of this famous drive will soon, we fear, be numbered with things of the past, and live but in pictures and the memories of the aged.

But it is not with the "backs" our duty and our pleasure lie to-day.

The nineteenth century, feeble and vulgar as some would fain deem it, will nevertheless leave to its successors works of art unexcelled even by any gone before; and for beauty and elegance, combined with thorough scientific construction, few will surpass the noble chapel just erected and consecrated for the College of St. John. The art of fault-finding, though doubtless most useful, brings but little pleasure to its acquirer; and were it not for the demands of professional duty, praise alone should employ our pen at this time. Old friends and kindly greetings are chery influences, and the vast amount of excellent design in St. John's new chapel ought alone to possess pleasure enough to counteract what little of error we may be able to find therein. And we do not fear incurring the charge of presumption in pointing out the but one or two faults, as we deem them, in Mr. Scott's latest and by no means least successful work.

The extreme height of the gables and roof being upwards of 80 ft., and the immense solidity of the tower when seen from below, create an almost general impression that it has not proportionate height enough; and this is perhaps the more striking from a distance where the four pinnacles belonging to the chapel of Kings, resembling an inverted table, still show the most prominently amid the trees. The tower is seemingly of a good proportion, 42 ft. square and 140 ft. in height, till we reflect that the general view will not be from the west, as depicted in the excellent illustration given in the *Builder* of May 15, but from the sides and eastward—

coming from the "Union," for instance, where the immense roof and the gables detract considerably from its apparent height.

The external pilarell niches, too, seem somewhat too light and finical to assimilate well with the rest of this really fine structure, and we fear are never destined to be filled.

A good general description has already been given in these pages in the number alluded to, so that a repetition of the details and figures there given is unnecessary.

We would we less seldom met a building deserving as little censure as this; and at such a time especially, when the bright May sun lights up the exquisite tracery of the windows, and the noble organ, with its more than half a hundred stops, sends its pealing tones rolling down the chapel as the choristers practise their glorious anthems, and the rich full tones, both of music and colour, delight and impress the soul. With the tracery of the windows, Mr. Scott is peculiarly happy, and the donors of the stained glass must indeed be gratified with the framework in which their gifts are set.

The five windows of the apse have this inscription running beneath them:—

"In majorem Dei Gloriam et in honorem Divi Johannis Evangelista fenestras hujus apsidis vitreis ornari curavit Edwardus Jacobus Comes de Porle, LL. D., Sannus Academicus Seneschallus, A.S. 1868."

and represent the following subjects (the windows proceed round the apse in order, beginning on the north side):—

- | | |
|---|---|
| I. Christ the Light of the World. | |
| 1. Patriarchs contemplating the Saviour. | 1. Kings contemplating the Saviour. |
| 2. Our Lord washing the Disciples' Feet. | 2. Agony. |
| 3. St. Mary Magdalene washing the Feet of Jesus. | 3. Betrayal. |
| II. Christ the True Manna. | |
| 1. Prophets contemplating the Saviour. | 1. Priests of the Old Dispensation contemplating the Saviour. |
| 2. Jesus before Caiaphas. | 2. Behold your King! |
| 3. Jesus captive. | 3. Jesus scourged. |
| III. Christ the Spottless Lamb. | |
| 1. Apostles contemplating the Saviour. | 1. Apostolic Men contemplating the Saviour. |
| 2. Crucifixion. | 2. Descent from the Cross. |
| 3. Bearing the Cross. | 3. St. John leading away the Blessed Virgin Mary. |
| IV. Christ in the Apocalyptic Vision. | |
| 1. Martyrs (men) contemplating the Saviour. | 1. Martyrs (women) contemplating the Saviour. |
| 2. Faith. | 2. Entombment. |
| 3. St. Joseph begging the Body of Christ. | 3. Nicodemus bearing Spices. |
| V. Christ the Good Shepherd. | |
| 1. Bishops and Doctors contemplating the Saviour. | 1. Priests and Deacons contemplating the Saviour. |
| 2. Resurrection. | 2. <i>Noli me tangere.</i> |
| 3. St. Peter and St. John at the Sepulchre. | 3. St. Mary Magdalene looking into the Sepulchre and seeing the two Angels. |

The principal donors of the side windows are the friends of the late Rev. A. V. Halley, Fellow and Tutor; the exhibitors of Sir Ralph Hare; Mr. C. Bamford, M.A.; Mr. F. S. Powell, late M.P. for the borough of Cambridge; the Rev. A. C. Haviland; the Rev. S. Parkinson, D.D.; and the widow and family of Professor Blunt.

The fine coved ceiling will, we trust, undimmed by the gas, long maintain its beauty and long convey its historical associations to the mind of the spectator. Here we find nineteen heads richly decorated with full-length portraits of remarkable men who have flourished in each of the nineteen Christian centuries, with the inestimable advantage of having each his proper name depicted underneath. Here we find in the first bay Our Lord in Majesty, who most properly represents alone the first grand century of the Christian era. The next is lightened up by St. Ignatius, St. Polycarp, and St. Cypryan, whose doctrinal teachings still survive.

The fourth century is represented by St. Athanasius, patriarch of Alexandria, and St. Ambrose, bishop of Milan. Next we notice St. Chrysostom, or the golden mouth, and St. Augustine, bishop of Hippo, in Africa.

The sixth century glories in many celebrities, five of whom we find noticed in this richly decorated bay:—St. Gregory the Great; St. Ethelbert, king of the garden of England; St. Columba; St. Benedict; and St. Augustine of Canterbury.

Would that space permitted of a detailed account of the whole of this glorious roof. As a work of art it is fine, but as a piece of consecutive history it is invaluable. The curious we refer to the *Cambridge University Gazette* of the 19th of May for particulars too full to be noticed here.

We are constrained to mention the illustration of the fourteenth century, however, which may be not inaptly termed the founder's bay, as the loved name heads the list, the pious William of Wykeham, founder of the two noble colleges of St. Mary of Winton, at Winchester, and New College, Oxford. Another founder of an Oxford college—Oriel—faces the Bishop Wykeham, King Edward II., the first English Prince of Wales. Maria de Valence, Countess of Pembroke, the foundress of the ancient college in this university, which bears her name, separates him from Bateman, bishop of Norwich, founder of Trinity Hall. The only one in this bay who may not claim the position of a founder is Bradwardine, the "profound" prelate of Canterbury. There is another founder, however, close by as the leader of the figures of the fifteenth century—Archbishop Chichele, who founded All Souls' College, Oxford, and who, when Henry VI., husband of Margaret of Anjou (whose figure comes next in order), was about to turn his attention to the spoliation of church property, urged him into a war with France, in order to save him from the sin of sacrilege, doubtless hoping that the end would fully justify the means.

Wednesday, the 12th of May, will long be remembered by all members of St. John's College as a red-letter day. The consecration service which took place on that day was most impressive. Assisted by the Duke of Devonshire, the vice-chancellor, Dr. Atkinson, and many heads of their respective houses, the bishops of Oxford, Rochester, Lichfield, Hereford, and Gloucester, the Bishop of Ely commenced the service.

The Rev. E. B. Sparks read the sentence of consecration, the bishop signed it, and Mr. H. R. Evans, the registrar, took possession of and duly registered it. Professor Bennett composed an exceedingly fine anthem for the occasion, which was sung immediately following the sermon; Dr. Garrett's execution on the organ being here, as throughout, perfect. The offertory, amounting to more than 500L., will be devoted to the further decoration of the chapel.

Quick to follow so good a lead, several of the colleges have already begun dabbling in bricks and mortar, stone, and cement.

New keeping-rooms to King's are nearly finished, under the hands of Messrs. Trollope, and in general effect will be extremely good. Pembroke talks of erecting a new court, and sundry minor additions are already rumoured. Downing-street Chapel, too, formerly under the pastorate of Mr. A. Norris, is spoken of as about to leap to the corner of the street, and to be rebuilt anew. The architect is as yet in the dark, though that same all-wise bird, "Rumour," points to Kingston as his probable professional birth-place; and we hear that at last Mr. Woolner has been intrusted to execute for the master and fellows of Trinity a monument to Dr. Whewell, which is to be placed in the ante-chapel of the college. May it be as great an ornament and addition to the works of art as he was during his whole career to the University of Cambridge.

The heat and work of the day are over. Let us once again stroll down to the river side and enjoy with unabated zest the May boat-racing. Now is a universal holiday, and the whole town and county world, his wife and little ones, are assembled on each side the sluggish stream. Grass is full, and not a few bright dresses and fair faces gleam amid the darker masses of non-rowing men. The towing-path is full from the Gut to the railway bridge, and a goodly number who mean running are already far down at the Loch, with their respective club crews.

Here, too, are we unfortunately bound to find fault. The river being too narrow to admit ordinary racing, humping races are the only possible form of testing power and endurance. The old distance start given to the boats might perhaps have been somewhat too short; but the present one, two boat-lengths and a half, is absurdly long. The whole distance is but one mile and a quarter; so that, unless the pursuing boat be mightily superior, it has no chance of catching up this excessive distance. Fewer humps and more rows over have been known this year than in any previous one, and much of the interest is thereby lost.

How contagious is excitement! As the last gun fires, and every oar is dipped into the water, the cheers are taken up from point to point, and with waving handkerchiefs and deafening cries, "Well rowed! well rowed!" the spectators on each side testify their pleasure. Trinity Hall

one night made an especially fine race, steadily gaining upon their leader, surely and surely gaining; with measured strokes and a wonderfully steady crew they are skilfully "coxed" round Grassy. The Longreach is before them. Rowing well indeed,—gaining, gaining faster. Now put it on; half a length!—a quarter!—a yard!—a foot!—the bump surely! but no, with one of the many proverbial "slips" an oar smashes with sheer pulling, and No. 5, we think, with the pithy sentence, "Go on, you fellows," plunged out of the ship into mid-stream. No easy feat to perform when the boat is going full speed, closely pursued by half a score of racing eights; a clever dive beneath the oars, and a few strong strokes, fortunately bring the hero safely to land; and, strange to tell, the boat, though of course missing to make the bump, yet in consequence of the plucky lightning of the ship by the loss of what would have been but a dead weight, pulled over the course, with her seven oars in a most gallant manner, and saved her place for another night.

Though we fear the spectators will lose somewhat of pleasure by the removal of the "Grassy" corner, nothing will rejoice us more than to report the progress and completion of the Cam improvement works. We are truly pleased to be able to state that the funds for the purpose are steadily rising; and we trust that no half measures will be adopted, but that the authorities will do all in their power to encourage the manly and healthful exercise of boating.

The cool walk home in the evening is not the least enjoyable part of this bright May-day, and the clean bright appearance of the running stream through the streets of the town set us thinking how few who daily traverse them know even the name or origin of their benefactor, the founder. Hobson, the founder of the conduit, a celebrated jockey, gave rise by his conduct to that commonplace expression of "Hobson's choice, that or none;" for in letting out his horses he strictly followed that rotation which gave each one his equal share of work, and refused, it is said, to let any other than that which stood next.

These, too, made us ask ourselves the question, why not arrange and carry out a new and complete system of drainage? In a town so full of fine buildings and inhabited by so many respectable and learned people, a town so rapidly improving and increasing, a town so rich and prosperous, should not health be one of its first considerations? We cannot but fail to be struck with the present impartial state of the drainage works, and we feel sure that, if properly pointed out to the authorities, some system might be devised that would enable a not unmanageable and picturesque river to be made and kept wholesome and bright.

The warning is surely needless that thousands spent merely in dredging the Cam will lessen the evils for a time. Sewage with years will roll on, and the same expense must again be entailed. In the mean time how much will be suffered! Let us remind them of an old motto, peculiarly applicable in the case of drainage and sanitary works:—

"That which is worth doing,
Is worth doing well."

S. S.

THE LATE ORLANDO JEWITT.

The works of Orlando Jewitt, architectural wood-engraver, have been before the public for nearly half a century, and at his death, which took place on Sunday, 30th May, the last of the old school of wood-engravers passed away. We believe we are correct in stating that he was virtually a self-taught man; and that his work did not attract much attention till he left Derby, many years ago, to live at Headington, near Oxford. Here he was busily engaged in the production of the illustrations for the "Glossary of Architecture" and other books, for Mr. Parker, the archaeologist and publisher, of Oxford. The whole of the drawings on wood for the "Glossary" were made by Mr. Jewitt's own hand, as well as many of the original sketches from which the drawings were taken.

About 1857 he left Headington for London, on the promise of having the whole of the wood-engraving placed in his hands of a weekly paper then about to be illustrated for the first time.

His earlier works were not equal in value to his latter, and some old engravings of landscapes and trees we have seen do not foreshadow the extreme beauty and accuracy of his later productions. For the last eight or nine years

he has been at work on "Murray's Guide-books to the English Cathedrals," many specimens of which have been published in the *Builder*,—some only a fortnight ago. Amongst his later works are the illustrations to Mr. Scott's "Memorials of Westminster Abbey," and Mr. Street's books on Venice and Spain. The majority of the drawings in the latter books were made on wood (as well as engraved) by Mr. Jewitt himself, or by artists in his employ; but the best of all elaborate and highly-finished illustrations for a forthcoming work on "Ancient Rome," by Mr. Parker. These illustrations have never been exceeded for beauty and minute accuracy of detail, and will remain a lasting monument of Mr. Jewitt's excellence as an artist and wood-engraver.

He was thoroughly well acquainted with architecture and perspective, was equally at home with the pencil and the graver, and was accurate to a degree, as his works well testify. As may be imagined, a man with his amount of business could not possibly get through it all with his own hands, so he was willing to obtain assistance in drawing and engraving wherever he could find it; but this was no easy matter, for the ordinary work of artists and engravers he regarded with contempt. Amongst many others who lie under a deep obligation to him, for hints in perspective drawing and engraving, we may mention Mr. P. H. Delamotte, professor of drawing at King's College; the late Mr. I. S. Heaviside, who engraved for the *Builder* for a long time; and Mr. W. G. Smith, all of whom were his assistants for many years.

Mr. Jewitt was a great lover of nature and an accomplished botanist. He illustrated one of the editions of Professor Harvey's "Seaweeds," executed the drawings and engravings of the living animals for Mr. Reeve's "Land and Fresh-water Mollusks," and many of the engravings for Bentham's "British Flora." He was a practical naturalist, as well as a student, and might often be seen in Oxford or London, not in hand, in the pursuit of moths and flies, or dredging in pools for plants and animals. Nearly all the living slugs and snails were procured by himself or his assistants for Mr. Reeve's book. At all times and places he was on the alert,—sometimes at the cleaning out of a reservoir, sometimes on a roof or in a cellar; for all places produced him something.

Although seventy years of age he worked at his business to the end of his life. On the Thursday before his death he was about to begin drawing when his arm fell powerless by his side, his head fell forward on his work, and he never spoke again. During the last few weeks he had been suffering under a severe domestic affliction, which probably hastened his end.

Mr. Jewitt will long be remembered by those who had the privilege of knowing him as one of the most kind-hearted and admirable of men.

ON THE BUILDING STONES USED IN THE METROPOLIS.

At a meeting of the Civil and Mechanical Engineers' Society, held on the 2nd of June, a paper was read by Mr. Arthur C. Pain, "On the principal Building Stones used in the Metropolis." The author confined the subject of his paper to the building stones proper, excluding paving stones and granites. It was illustrated by a map of England and Wales, showing the position and distance of the various quarries, and their means of communication with the metropolis by railway or sea; also a table giving the name of each quarry in the county, name of owner, and agent in London; also the mineral and geological designation, component parts of stone, weight, chemical analysis, number of feet to the ton, average size of blocks, suitability for various purposes, the cost of working, colour, mode of working, price at quarry and at the various termini in London, as well as a few of the principal buildings in the metropolis and country constructed of each stone, with remarks on the beds, &c. He then described chronologically as they came into use, Kentish rag, Gattou fire-stone, Caen, Purbeck, Portland, Bath, Painswick, Bramley Fall, Mansfield, Chilmark, Ancaster, and Douling. Specimens of each bed were exhibited from the quarries of Messrs. W. H. Bensted & Sons, of Maidstone; Mr. W. Carruthers, of Gattou; Mr. E. Foucaud, of London and Caen; Mr. W. H. P. Weston, and the Portland Stone Company, both of Portland; Messrs. Randell & Saunders, of Corsham; Messrs. Pictor & Sons, of Box; Messrs. Husler

& Co., of Headingley; Mr. Robert Lindley, and Messrs. S. Fisher & Sons, both of Mansfield; the Wardour, Chilmark, and Tisbury Stone Co., limited, of Tisbury and London; the Ancaster Stone Quarries Co., of Ancaster; and Mr. C. Trask, of Douling, all of which have been used extensively in London. He also brought before the notice of the society and exhibited specimens of the Hollington, Little Casterton, Forest of Dean, and Minera. The decay of stone, its cause and prevention, having particular reference to London, was next considered. The decay, he believed, was caused by bad selection; as a proof of this, he drew the attention of the meeting to the fact that nearly all the principal buildings in the immediate neighbourhood of each quarry were in an excellent state of preservation, while buildings in London of the same stone, which had been comparatively recently built, were more or less in a state of decay. He attributed this, first, to the fact that the masons who worked the stone for the local buildings understood the material, and knew which quarries and beds were good, and rejected the bad, while the masons who worked the stone for the London buildings knew very often nothing about it, and put in good and bad without proper selection; or, secondly, the architect or engineer in his multifarious duties could not afford the time to study each class of stone at the quarries, so that the specifications were very often loosely worded, which was constantly taken advantage of. He did not wish to throw blame on them, as there was no place where detail or reliable information could be obtained. The author then gave as a proof of the difficulty of obtaining information that he had devoted all his spare time for over six months in getting the results which he had laid before the society that evening, notwithstanding that the respective quarry-owners, and the officers of the Geological Museum and Mining Record Office, had afforded him every facility. He then pointed out to the meeting how much this country was behind France in these matters, for M. Michelot, chief engineer of roads and bridges, had recently made a report by the direction of the French Government, on the building materials of that country, giving very detailed information, while the only works we have on the subject were the Commissioners' report, 1839, which treated generally, and not in sufficient detail, a few of the principal freestone quarries, leaving out hundreds of important quarries, notwithstanding which, to prove how much a work of this kind is wanted, the report, originally published in 6d., is now worth from 10s. to 1l. The specimens of building stones at the Geological Museum was a step in the right direction, but the information concerning them was meagre in most cases, and in some nil; besides which it was easier to judge of the quality of a stone if the specimen was a rough lump than if squared and faced up. The *Mineral Statistics*, part 2, for 1855, published by the Mining Record Office, was a very valuable work, but it did not go deeply enough into the subject to be of great use to professional men. In conclusion, the author considered that until the heads of the professions of architecture, civil engineering, and the trades connected with the same, took the question up, and appointed an architect, engineer, chemist, geologist, builder, and practical stonemason, and an appointment of the same by the Government as royal commissioners, to report fully, and collect specimens from all the principal quarries in the United Kingdom, to be put in the public museums in every large town, we should still see the stonework of our public and private buildings decaying away.

THE LATE MR. J. SHEPHERD, OF ROME.

An esteemed correspondent writes:—In reference to this gentleman, whose lamented decease you notice in your last number, a curious and authentic anecdote is related. On one occasion he found himself short of coals for his gas-works, in consequence of the non-arrival of three vessels at Civita Vecchia. In this emergency, to avoid a great public inconvenience by cutting off the supply from the gas-lights in the streets of Rome, he wrote to the governor, stating the fact, and asking his permission to request the inhabitants not to use gas for their private purposes for a few days. Monsignore immediately wrote to a very eminent official countryman of ours in Rome, requesting him to call, without, however, stating the object. Our countryman forthwith attended the summons,

* This only applies partially.—Ed.

and Monsignore immediately entered into conversation with him on various topics. At length, by chance, he asked the character of Mr. Shepherd, and whether his word was to be relied on, and so forth. To this most satisfactory reply was given, and the frankest testimony borne to the honourable principles and undoubted truthfulness of Mr. S., who could be trusted in whatever he undertook. After the interview, while our countryman was pondering during his return home as to the purpose of his visit, he met one of his many Roman acquaintances, who said to him, "So you have been to the governor's. Do you know what for? Ah, we know all about it, and Marfioro will tell you more to-morrow on the subject." The next day the following pasquinade appeared:—"The Holy Father is in a fright, that Mr. S. should have a key by which he could throw all Rome into darkness at once; for he does not like any one but himself to have the power to keep his loving subjects in the dark."

THE VENTILATION AND TRAPPING OF DRAINS.

AFTER a paper on this subject read recently by Mr. James Lovegrove at the Society of Arts, a discussion was opened by the Chairman, Earl Ducie, which has not had sufficient publicity. The Earl said the subject was of vital importance, and none the less so that a great deal more attention was generally paid by engineers and others to the treatment of sewage itself than to the gases to which it gave rise. Mr. Lovegrove, however, had treated of air, which might be either man's best friend or one of his most dangerous foes, and had shown that it was not exempt from one of the conditions of humanity, inasmuch as it was exceedingly liable to be contaminated by evil communications. It had been shown that there were many schemes—of, he might almost say, diabolical ingenuity—for admitting to houses, under the guise of fresh air, that which really came from the immediate neighbourhood of the most corrupt materials, and that many of the sanitary improvements of recent times had led to evils before unknown. Great trouble and expense had been gone into in London in connexion with a system of main drainage, which was the most magnificent, probably, in the world; but it must be borne in mind that the strength of a chain was only that of its weakest part, and while the main sewers were so grand a scale, the system of house-drainage was often radically defective. The appliances, which had been described by Mr. Lovegrove, for remedying these defects, were particularly valuable, if, as seemed to be the case, they were efficient. He thought that in the discussion the distinction should be borne in mind between the ventilation of the sewers and that of house-drains. It was to the latter that Mr. Lovegrove's paper principally referred.

Dr. Alfred Carpenter, who had paid particular attention to the subject of the ventilation of drains for many years, could not agree with all the principles laid down by Mr. Lovegrove, because they seemed to go to the end of endeavours to keep in drains that which wanted to get out of them. The true principle of ventilating sewers was to let out everything, and abolish all traps in connexion with houses, except those communicating with the water-closets, which were necessary. His attention had been drawn to this subject through observing, as a medical man, the enormous amount of evil arising from the introduction of foul air into houses, and ultimately, he believed, he had been able to show how proper ventilation of sewers might take place, so as to leave the houses and drains perfectly safe, without any of the ingenious contrivances which had been displayed. Looking to nature as a guide, they found that in a tree or in an animal there were innumerable openings by which the foul gases which were generated were thrown out of the system. The true principle was to prevent the production in the sewers of the foul atmosphere, which was to be accomplished by keeping a continual current of fresh air running through them; and in this way, and this only, would they be safe; because, however perfect might be a system of traps, valves, as they knew, were always liable to get out of order, especially when they came in contact with the materials that passed through drains, and then there was an efflux of foul air. The principle he contended for was the prevention of foul air being formed in the sewers, by providing abundant openings for the admission of fresh air, by which the foul air would be oxidised or neutralised as

soon as formed. There should be no communication between the house and the drain, except in the water-closet, and the soil pipe should be carried up as straight as possible above the roof; there would then be no pressure on the water-valve, nor any entry of foul air into the house. This principle had been carried out by a local board of health with which he was connected, within the last few years, and with the most perfect success. The openings from the sewers should, of course, be provided with charcoal to neutralise the foul air without any danger to the inhabitants in the neighbourhood. These openings might be placed at intervals of 50 or 100 yards, and by this means all stagnation of air in sewers would be prevented. The same principle was applicable to mines, where it was found necessary to keep up a constant current of air.

Dr. John Tripe said there could be no doubt that the best system of ventilating sewers so as to prevent injury to the public health was to let in as much fresh air as possible, and change it rapidly. Nothing would be better than the system proposed by Dr. Alfred Carpenter, if it could be carried out; but unfortunately this was not the case, and they must deal with matters as they actually were. Most persons would agree that if they were going to reconstruct the whole drainage system, there should be no direct communication between the sewers and the houses except the water-closets; in fact, the surface-drainage should be altogether separated from the closet-drainage, and by this means small pipes would do instead of the enormous sewers now constructed; but this was not their position. Those who, like himself, were constantly engaged in sanitary work, and had to investigate the cause of the presence of foul air in dwellings, must be aware that, in a great majority of cases, the evil arose from some defect in the traps, such as had been described in the paper; and there was no doubt that a vast improvement would be effected by the introduction of the syphon-trap or something similar in house-drains, particularly at the sink. When he took the house in which he now lived he was told that it was thoroughly trapped, but in a few days the sink was abominable, and, on examination, it was found that there was no syphon to the trap underneath the sink: one was put there, and the smell ceased immediately. This defect was very common in kitchens, and was the cause of an immense deal of mischief. He quite agreed that, if it were possible, all sink drainages should be carried off to an open yard, thus avoiding direct communication with the sewers; but this was impossible in the vast majority of houses in London and elsewhere, where the kitchens were below the ground level, and therefore it was necessary to adopt the best system of traps which could be devised. He had not seen anything to equal some of the plans which had been described that evening; and he could speak from his own practical experience that they answered the purpose for which they were intended.

Mr. Botly said he was not so conversant with the subject as to be able to judge of the superiority of one plan over another; but, from his own experience, he could illustrate the great importance of the question. Some years ago he was for some time honorary governor to a hospital in the West of England, in which there were four wards. One of those wards had been for many years subject to skin diseases and erysipelas, and at length a committee was appointed to investigate the matter. It was then found that the closet-drains from nearly the whole building went along the wall of that particular ward; this was altered by the introduction of some such arrangement as had been described to them, and there was scarcely a case of erysipelas or cutaneous disease afterwards. It was often found to be the case that skin diseases were very prevalent in houses where the drainage was defective, and, therefore, too much attention could hardly be paid to the subject.

Mr. Baldwin Latham remarked that the paper which they had heard was rather on appliances by which drains were trapped than on their ventilation. There could be no doubt that the secret of success of the water-closet system of town sewerage depended on the ventilation of drains and sewers; but much more mystery was made of this subject than necessary, many persons conceiving that it could not be carried out without some special appliances for furnishing fresh air, or exhausting the sewers of foul air, but no greater mistake could be made. From the very nature of sewage action there was a constant fluctuation in the supply and flow of

matter through the sewers, which might be running at one period of the day three-quarters full, and at another only one quarter; and this fluctuation might be made the means by which perfect ventilation could be secured. Of course, the augmentation of the flow caused a displacement of the air, for which an escape must be found somewhere, and, as the flow declined, fresh air would come in to supply its place; so that if this were only encouraged by making a sufficient number of openings, which must be supplied with ventilators for oxidising or deodorising the foul gases, a perfect system of ventilation would be secured. The general plan, on the contrary, had been to trap every possible opening into the sewer, and to lead the sewer to a point below the water-line of the river; this was just like draining into a bottle. If at one period of the day the sewer was nearly dry, and at another half full, the result would be a quantity of foul gas condensed to the extent of one atmosphere, which must find an outlet somewhere, and all the traps in the world would not prevent it. Mr. Lovegrove had shown one method by which the ordinary bell-trap would discharge itself; but there are several others. If, for instance, the housemaid poured a whole bucketful of water down the sink at once it would act as a syphon of itself, and every drop of water would be drained off; and, again, it was a very common thing, if there were matters in the sink which would not readily pass away, to pull out the bell-trap altogether, and then there was a free communication with the drain at once. It had occurred to him, as the simplest method of guarding against these evils, that as the sink was generally placed against the external wall, the pipe might be carried through and allowed to discharge itself outside over an open grating fixed in the area, and then, if there were any escape of gas from the sewer, it would be outside the house, and not within. Stand-pipes for the admission of fresh air had been recommended, but, as he had already stated, no forced supply was required; the air must enter the sewer without pressure. Wherever a valve was used there must be a certain amount of pressure before the air would take that direction, and he could not conceive of what use it would be during certain periods of the day, when the current would be outwards from the sewers, and any valve arranged merely for the admission of air would be simply inoperative. With regard to general principles, in laying down a correct system of drainage, they must begin at one beginning; when the water was flowing in one direction the gas would be flowing in another, and, therefore, the arrangement described by which the gas was to be made to go in the same direction as the water when there was a flush appeared contrary to natural laws. Any system of sewers ought to be broken up into short lengths, which should be disconnected as much as possible, so that the foul gas from one portion could not pass to another. Before a town was drained the low-lying parts were always the most unhealthy; but after a system of sewers was constructed this condition of things was frequently reversed, and the higher parts became centres of disease, showing that by the system of impervious drainage, which was often adopted, the foul gases containing spores of disease were carried from one district to another. The ventilating openings in the middle of the streets had been much objected to, but they were not so injurious as the system recommended by Mr. Verley for carrying off the gas in close proximity to a chimney; for it often happened that there would be down-currents in chimneys, which would thus draw in the foul air into the house. Foul air was rendered innocuous in two ways, by dilution, and by oxidation or destruction. The former took place when the gas escaped in the centre of the road, becoming, of course, more dilute every foot from the opening until it ceased to have any power for evil. The other plan, oxidation, when successful, was more complete and far preferable. Mr. Latham then exhibited a diagram, showing a new construction of charcoal basket for this purpose. Around the charcoal chamber was a deep receptacle for the rain or falling water, communicating with the sewer by an overflow outlet below the level of the charcoal, which was thus kept constantly dry; in the centre, under the charcoal, and communicating with it, was a spiral chamber, up which the gas ascended. He might mention, in conclusion, with regard to the town of Croydon, to which Dr. Alfred Carpenter had alluded, that when the sewerage system was first constructed, a few ventilating holes which were made

were soon stopped up because of the stink which arose from them; but the result was that the town at particular periods became subject to attacks of low fever, which did not, however, appear in the low, but in the high-lying districts. It occurred to him that this was due to a lack of sewer ventilation, and in order to test it, when one of these epidemics was rife, he took a long line of road, and instead of beginning to ventilate at the upper end, as he should have done, if his object had been to do the work quickly, he began at the lower end and worked upwards. The result was, that as ventilation went on in that road, there was not a single fresh case of fever, and the patients began to improve rapidly; above the point of ventilation there were still fresh cases, and so it went on until the whole road was ventilated, and then the fever disappeared.

Mr. Glass did not consider trapping necessary, if drains were properly ventilated. If there were no traps there would be a constant influx of fresh air into the drains, and thence into the sewers, and there would be no nuisance, whatever, provided there were a sufficient number of ventilating shafts to the sewers. The plan of carrying pipes up the sides of houses was never really effectual; the proper method was to have special shafts with disinfecting agents.

Mr. Edward R. Cook said the discussion seemed to have wandered from the ventilation of drains to that of sewers, both being highly important; but the paper had dealt rather with the former. One important point which Mr. Lovegrove had seized seemed to be this, that, whenever there was a current of water down the feed-pipe of a house-drain, there would be a draught of air back again from the drain; and, therefore, it was necessary to provide against the water which lay in syphon or bell-traps being accidentally drawn off. He could not help thinking that the plan which had been shown for carrying the foul air through the drain by the rush of water was, at any rate, a step in the right direction. He could not agree with all that had been said as to the free ventilation of drains. If nothing were requisite but free access of fresh air, then an open ditch would be the best drain they could have, and was evidently not the case. If an open ditch were offensive, so, and much more so, must be a brick sewer, which at one time would have in it 3 ft. of sewage and at another only 1 ft. There were there present the three essentials to putrefaction, damp, heat, and air, and the generation of impure gas must consequently go on very rapidly. He hoped that by the attention of scientific men being called to the matter some means might be devised for preventing the generation of these gases, or for neutralizing them before they reached the atmosphere, for he could not think that their mere dilution by admixture with a large quantity of air was the proper method of treating them.

Mr. James Marr said the question before them was one of immense importance, for the returns of the Registrar-General showed that a large proportion of the deaths in London, especially those in crowded courts and alleys, arose from the constant breathing of impure air coming from ill-ventilated sewers. The Board of Works, the local boards, and vestries, all had most extensive powers, which were generally very properly exercised; no one could build a house, lay out a street, or construct a sewer, without their approbation; and one of their powers was to stop up or cover over any offensive drain, water-course, or pond, and to require the removal of all offensive matters. The 71st section of the Metropolitan Local Management Act was to this effect:—"Every district board or vestry shall, by providing proper traps or other coverings, or by ventilators, or by such other means as shall be practicable for that purpose, prevent the effluvia of sewers from exhaling through the gullyholes, gratings, or other openings of the sewers in any of the streets or other places within their district or parish." Now, the way in which sewers were commonly ventilated was by having openings in the middle of the streets, and by allowing the man-holes in various places to remain open for several hours at a time, and also by means of untrapped gullyholes, which ought to be hermetically sealed. In his opinion, the Board of Works should compel every builder to construct a ventilating shaft, direct from the drain leading from each large house, or, in the case of small houses, one to every ten or twelve. This shaft might be carried up inside the wall of the house close to the flues, and taken to the height of some feet above the chimneys. This

would only apply to new houses, but those already built might be treated in much the same way, only the pipe would have to be carried up externally. He could not condemn the system of trapping, because in many instances it was found to do its work well, but he at the same time agreed with Dr. Alfred Carpenter that a thorough system of ventilation would obviate the necessity for such appliances.

Mr. Ford regretted that the question had been limited to the ventilation of drains, as he considered the ventilation of sewers was the first and most important consideration; but he could not let the discussion close without bearing his testimony to the evils of the traps in one parish, in forty-nine of which the traps were uncovered. This was the great evil, that the tenants would constantly uncover them, and consequently they were of no service at all. It would be much better, therefore, in his opinion, to abolish bell-traps, and go back to the old-fashioned plan of a deep trap, because when that got choked with silt, the water would not run off, and it was obliged to be cleared out.

Mr. Lovegrove, in reply, said that the proposal of Dr. Alfred Carpenter to abolish all traps would, in the present state of things, be, in his opinion, a most suicidal policy; they were everywhere in use, which was a sufficient proof that they had their work to do, and it was, therefore, important to see that they did it properly. The next speaker rather supported the same view, but as his own experience showed the evil consequences of badly-trapped drains, he need not enlarge further on the result of abolishing such appliances. Mr. Latham had made some valuable observations on the subject of ventilating sewers, which, no doubt, was one of the most important questions of the day. It was quite a distinct matter from that of the ventilation of the drains which connected the house with the sewers, and this latter was, in reality, the more important, since the total length of drains in London was probably equal to ten times that of the sewers, and they were in immediate connexion with the houses. He could not conceive of such a state of things as would admit of doing without traps at all. He had heard it suggested that such a fall might be given to the drain that all sewage matter would pass off so rapidly that no small amount would arise, but still there would be a large surface which would soon become coated with slimy matter, which would contaminate the air. There were two systems recommended for ventilating house drains, one being an outlet trap with a water curtain, which had been stigmatised by Mr. Latham as opposed to natural laws. He could only say that notwithstanding these supposed natural laws, he had found the air escape that way, having tested it over and over again, both by the anemometer and by the flame of a candle, and he had found the current of air as frequently passing in a contrary direction to the stream of water as with it. He believed the stream had nothing to do with the direction of the air currents. The fluctuation in the flow of sewage was, no doubt, a most important element of power in the ventilation of sewers, as he had suggested some sixteen years ago to the Commissioners of Sewers. The same thing might also be utilised in the ventilation of house drains, which were but small sewers. The other system was to have outlets for the foul air at a considerable elevation. He saw no reason why both methods should not be adopted. With regard to the ventilation of sewers, he had had it under his attention for a long time, and now had a considerable length under experiment upon the principles shadowed forth in the paper he had read, the results of which, at some future time, he hoped to be able to communicate.

Value of a London Mansion.—The freehold family mansion of the late Earl of Wicklow, No. 2, Cavendish-square, with a garden in the rear, leading to a range of stables and coach-houses, was disposed of by Mr. Phillips, at his rooms in New Bond-street, by direction of the trustees of the will of the late earl. The sale excited considerable interest, and was very largely attended. After a long competition the property was adjudged to Mr. Samuel Leo Schuster, of Queen's Gate, Hyde Park, at the price of 20,800*l.*, being nearly double what was paid for the property by the late owner some twenty-five years ago.

THE WORCESTER MODEL DWELLINGS ASSOCIATION.

VICE-ADMIRAL HASTINGS, of Bourboorne House, near Worcester, who died on the 21st of May last, was the Chairman of the Worcester Association for Building Dwellings for the Labouring Classes, and had given much time and thought to the work of the society. The governors of the association, at a meeting held at the Town-hall of Worcester, on Tuesday last, passed the following resolution:—

"That this meeting desires to express to Sir Thomas Hastings, and to the other members of the Hastings family, the sincere regret felt by all the governors of the association at the death of the late lamented Vice-Admiral Hastings, who for so many years was an active and zealous member of the committee, and for the last few years fulfilled the duties of chairman with so much ability and such advantage to the association."

At the same meeting, Mr. G. W. Hastings was elected chairman in the place of his late relative. He is the third of the family who has filled the office, the late Sir Charles Hastings having been the first.

ACCIDENTS.

Oldham.—The coping-stones of the Albion Hotel, in this town, fell into the street below, and killed a police-officer and his child, who were passing at the time. Another person was so seriously injured that his leg had to be amputated. At the inquest on the dead bodies, Mr. Robert Lynam, the borough surveyor, produced a sketch of that portion of the premises which had given way. He said that so far as he could ascertain, the upper part of the wall was faced with stone without any fixings. The stonework was 6 in. thick, and the brickwork behind it 18 in., but the veneering was not tied to the brickwork. On the top of the veneering there was a cornice of heavy stones, each weighing from 13 cwt. to 15 cwt.; and on the top of the cornice a row of upright stones stood, weighing from 5 cwt. to 6 cwt. each. He found one of these stones lying on the foot-path before the hotel, and it was the one which had fallen upon the deceased. The cornice projected beyond the facing 12 in. towards the street, and 7 in. on the top of the wall behind the veneering. The height of the cornice from the street was 35 ft. The shop-fronts adjoining the hotel projected from the building, and his idea was that a part of the veneering, in consequence of the settling of the building when the shop-fronts were brought out, had thrown upon it a greater weight than it was able to sustain. There was not a perpendicular wall in the building, as they had all curved inward at the middle. The settling of the building had taken place, in his opinion, since the putting in of the shop-fronts. The wall of the building was then supported above the shops by wooden beams without pillars, and the settling had taken place over the whole building if the beams were properly attended to and made good. One of the beams was very rotten, and had it been allowed to remain much longer the whole of the fabric would have come down. Mr. George Healy, builder, stated that he had examined the building, and found the lower part of it quite safe. The facing underneath the cornice had not sufficient base to support the weight of the cornice, unless there had been cramps to fix it to the brick wall. The brick wall was itself of sufficient thickness to support itself, independent of the stone. His opinion was that the beams over the shop had given way a little in the middle, and the settling of the building had caused the cornice to get over-balanced. After some other witnesses had been examined, the jury returned a verdict of accidental death, accompanied by a recommendation to the corporation to appoint a competent person to examine the building, and see to its being immediately put into a proper and safe condition.

Bursting of a Canal Embankment.—An alarming accident has occurred on the Grand Junction Canal, between Cheswardine and Little Souldley, near Market Drayton. The embankment burst in two places, on opposite sides, and the water dashed across the adjoining fields. Sad havoc has been made with the gardens and fields in the neighbourhood, and two cottages were flooded.

Fall of a Cross in Bedfordbury.—Part of the large cross which surmounts the mission-house in Bedfordbury has fallen. The fragments struck several persons, but killed none.

Petersfield.—At that portion of the town adjoining the London and Portsmouth-road, a shop 40 ft. in length, brick-built and slated, in the occupation of Mr. J. Caplan, wheelwright and builder, adjoining College-street, has fallen inwards. Six men were employed in excavating a pit alongside, but had left shortly before. The premises were about being converted into a steam brewery and malthouse; and old store buildings having been removed; and a great part of the ground excavated at considerable depth for cellars, &c., a portion of which ran alongside of the building in question, and, as it seems, too near for its stability, the foundation gave way, and the whole pile, with the exception of the front wall, fell.

Nenagh.—At the slate-quarries near Nenagh, three men were at work under a projection of stone several tons in weight. The constant strokes of the hammers while they were preparing a rock for blasting seem to have shaken the immense stone overhead, which came down like a thunderbolt, breaking one man's legs and arms into splinters, and crushing the body and head in a frightful manner. The other men were more or less severely injured.

Brighton.—While workmen were engaged in putting on the roof timbers of three or four houses just being built at the top of Southover-street, the party-wall of the corner house and next adjoining suddenly bulged and gave way on the ground-floor, bringing with it the wall above, the roof timbers, and scaffolding, precipitating the workmen to the ground, injuring two of them,—one especially receiving a fracture of the ribs,—and necessitating their removal to the hospital. An eye-witness ascribes to the accident to evident haste in construction, the materials of the party-wall on the ground-floor being composed of three parts mortar and rubbish; and while in a green state the wall above was carried thereon all in bricks, causing too sudden a weight before the work had sufficiently set.

Bolton.—A serious fire has occurred in the Bolton Market Hall, a fine structure, 294 ft. in length, and 215 ft. in breadth, and costing upwards of 50,000*l.* The fire originated in one of the lock-up shops underneath the gallery, occupied by a provision dealer. The ornamental ironwork of the doors had to be smashed in. By that time the shop was one mass of flames, and the fire had also communicated to adjoining shops, as well as to the canvas covering of shops in the gallery, which were filled with drapery goods. There being a plentiful supply of water the fire was speedily arrested. The damage is estimated at 500*l.* or 600*l.*, partly covered by insurance.

PHILOSOPHICAL HISTORY OF ARCHITECTURE.

In a recent letter to Professor Donaldson, M. Cesar Daly (of the *Revue Générale de l'Architecture*), who had been running after him on the Nile without success, makes some observations which have a general interest. M. Daly says,—

"The Viceroy has named me Commander of the Medjidie. I have collected a considerable amount of data on the Egyptian monuments of all periods (old Egyptian and Arabian). I will forward to you shortly the most important document written by me since I held a pen. Now, our writers, without an exception, to my knowledge, have written volumes on the different styles of architecture, without ever giving a really scientific definition of what constitutes a style, and consequently nobody has undertaken to show scientifically in what genealogical, rational, and æsthetic relations the styles stand to one another. The consequence is the utmost confusion in the language, and a thorough want of philosophy in the expoundings of the history of our art. It is certainly, to all first appearances, rather bold to speak in this apparently hard manner; but I think that I am fully justified in doing so, and the more so because I have attempted the two things myself, and written what I might call a syncretical and philosophical sketch of the history of our art, from the oldest historical times until the present day. I have attempted even a step more: I have tried to discriminate, in the midst of modern confusion, the elements which are destined to combine together and to constitute the basis of a future style of architecture. Of course, in a labour like this, a great deal will be contested; but as these opinions, or rather strong reasoned convictions, have governed my architectural judgments since thirty years, it is

just that I should make them known. I have hesitated a long time about it, being fully aware of the prejudice existing among all artists against the immixture of science in the department of art. The prejudice is not without a cause, and a strong and good one even; nevertheless it is hind to a certain degree, like all prejudices, and acts sometimes against the interest of art itself. Excuse this apparent boasting, but the pamphlet is already in print, and I only wait to read over the proof-sheets on my return to Paris, before giving *le bon à tirer*; you will receive it, consequently, in all probability, in the month of August next—of July, perhaps. If the matter excites any interest among the English confraternity, I will perhaps go over to give explanation *vis-à-vis*. From Jerusalem I go to Beyrout, Damascus, Balbeck, Cyprus, Rhodes, Smyrna, Ephesus, Constantinople, Athens (a point or centre of several excursions), and I will come back to Paris, traversing Naples and Rome, giving a fortnight to them. I calculate that with all this I shall still be in Paris in the middle of June. I shall thus have seen, in a sort of moving panorama, the antique world, and have compared occidental and eastern art, and I have new data and new conclusions to produce on that subject: you will see shortly. In the meantime, I am sorry not to have met you somewhere abroad."

SEWERAGE AND SEWAGE.

Horne Bay.—Mr. Bazalgette, the engineer of the Thames Embankment and London Main Drainage, has visited the Bay at the invitation of the committee. He inspected the present imperfect outfalls, and will shortly submit a plan to the committee. He expresses a strong opinion that the authority ought not to be content with having a scheme for the Old Town only; but that this opportunity should be taken of having one scheme of drainage for the Old and New Town, by which the sewage of the latter should also be conveyed away to the eastward, instead of being sent out opposite the middle of the town to defile the foreshore, and gradually create a nuisance.

Gainford.—Mr. Lamb, surveying clerk to Mr. Ross, architect, Darlington, has been employed by the Sanitary Committee to prepare plans and estimates for the works required for the sewerage. He considers that a sum of 750*l.* will be required for drainage purposes, exclusive of any cost of water supply.

Purification of Sewage.—A paper has been read at the French Academy of Science, by MM. Mille and Durand-Claye, civil engineers, on the chemical analysis of the liquid matter of sewers. Their experiments were conducted at the expense of the city of Paris, and under the direction of a special commission. It was ascertained that the waters of the sewers of the capital could easily be purified by means of sulphate of alumina, at a cost of one centime per cubic metre of liquid. The 190,000 cubic metres of the latter, which are daily allowed to run to waste, contain a quantity of useful matter the value of which amounts in the course of the year to about 250,000*l.* The operation of purifying the waters divides the fertilizing substances as follows:—The phosphates remain in the sediment; the potash is in dissolution in the liquid; one third of the nitrogen is absorbed by the water, the two other thirds by the sediment.

Lills Gonerby Local Board.—Upon the recommendation of the drainage committee, this Board has determined to adopt and carry out the plan and report of their surveyor, Mr. Jas. Marsh, C.E., for improving the drainage of the district. The first part of the work will be commenced shortly.

"**A Bishop among Architects.**"—A late bishop being desirous of enlarging his palace, caused an architect to prepare plans of the proposed alterations; but when he came to know the estimated cost of the works, he declined to proceed. "What excuse shall I draw for your fees, sir?" said the bishop to the architect; who told him that, as the plans were abandoned, his charge would be a hundred guineas. "A hundred guineas! Why, sir, many of my carriages do not get so much in the course of a year." "Possibly," said the other; "but your lordship must remember that I am a bishop among architects."—*Church Review.*

THE NEW ISLINGTON WORKHOUSE.

We illustrate this week the new workhouse for the parish of St. Mary, Islington, now in course of erection in Upper Holloway. The foundation-stone was laid in July last by the chairman of the board of guardians. The site of the new workhouse (which contains about seven acres and three quarters of land) is in the St. John's-road, and very near the Alexandra Orphanage. Being on the "Hornsey Rise," the ground is very much higher in the rear than it is in front, a circumstance which has been turned to advantage by introducing a lower or basement story under the main building, for stores, permitting further of the formation of a wide double terrace its entire length, which, as a platform for the building, enhances its general appearance. The fall of the ground towards the front has facilitated the drainage, and a thorough system is being constructed with the view of rendering every part of the building and yard perfectly dry. Underground vaults for coal have been provided.

The buildings externally are all of bright yellow stocks, relieved by bands and arches of red and white brick; Portland stone being sparingly introduced where other material would soon perish owing to the elevated and exposed situation.

The general arrangement of the several buildings will be seen on reference to the plan, and is as follows:—

- A. Casual wards.
- B. Porters' rooms and receiving wards.
- C. Board-room and offices.
- D. Outdoor relief offices.
- E. Main house.
- F. Dining-hall and chapel over.
- GG. Refractory wards.
- II. Stores.
- I. Kitchen building.
- KKKK. Infirmary Wards.
- L. Administrative block.
- M. Separation wards.
- N. Doctor's residence and dispensary.
- O. Laundry.
- P. Storeyard and shed.
- Q. Yard closets and sheds.
- R. Dead-house, stable, &c.

The main building possesses a frontage of about 420 ft., and a corridor 8 ft. in width extends its entire length on every story, communicating on either side with wards about 18 ft. 6 in. wide. It is proposed to obtain a proper classification of the inmates by means of iron gates and separate staircases at certain intervals.

The entrance is in the centre, with a vestibule conducting to a principal staircase, behind which is placed the dining-hall, with the chapel over. The ground story of the main house will be 13 ft. 3 in. high in the clear, and the one and two-pair stories 12 ft. each.

The dining-hall is 70 ft. by 45 ft., and 16 ft. high, and the chapel will be finished internally in coloured brick, with an open-timbered roof.

The infirmary, which is placed centrally in the rear, is on the pavilion principle, and will consist of wards 96 ft. long by 24 ft. wide, those on the ground floor being 13 ft. high in the clear, and those on the one and two-pair stories 12 ft. high. They are lighted by windows on both sides extending to within 1 ft. of the ceiling, constructed in three heights, the two lower being double hung, the upper hung to hinges opening inwards for ventilation. It is intended to warm the wards by the "Galton" stove placed in the centre, two to each ward, by means of which pure warmed air will be introduced; the side walls will consequently permit of the uniform arrangement of the windows and beds. At the further end is a large window, which will contribute much to the cheerfulness of the wards, and at the same time assist the ventilation in connexion with louvres or fanlight over the door, which is at the opposite end.

A nurse's room, with inspection window, and separate scullery, fitted with a small cooking-stove and washing sink, will be provided to each ward. Each ward will contain 32 beds, affording consequently between 850 and 900 cubic feet to each occupant. Two large day or convalescent rooms are provided, communicating with spacious airing grounds.

The administrative block is placed centrally, and will consist of kitchen and scullery, apartments for the superintending matron, stores, and bedrooms in the upper part for the nurses.

The "separation" wards form a detached building, consisting of ground and one-pair stories, similar in its general arrangement to the infirmary, but providing 1,200 cubic feet per inmate, and reached by means of an enclosed corridor from the infirmary.

Access to all parts is provided by means of cartways up the two sides of the site, and enclosed corridors afford communication to every portion of the building under cover. Lifts will be provided in the several buildings. The right-hand front-wing building contains the board-room, with clerks' offices over, tradesmen's waiting-room, also a large waiting-room, 70 ft. by 45 ft., and three offices for out-door relief. The corresponding building on the left hand contains porter's lodge and rooms in connexion, two large receiving or probationary wards, each

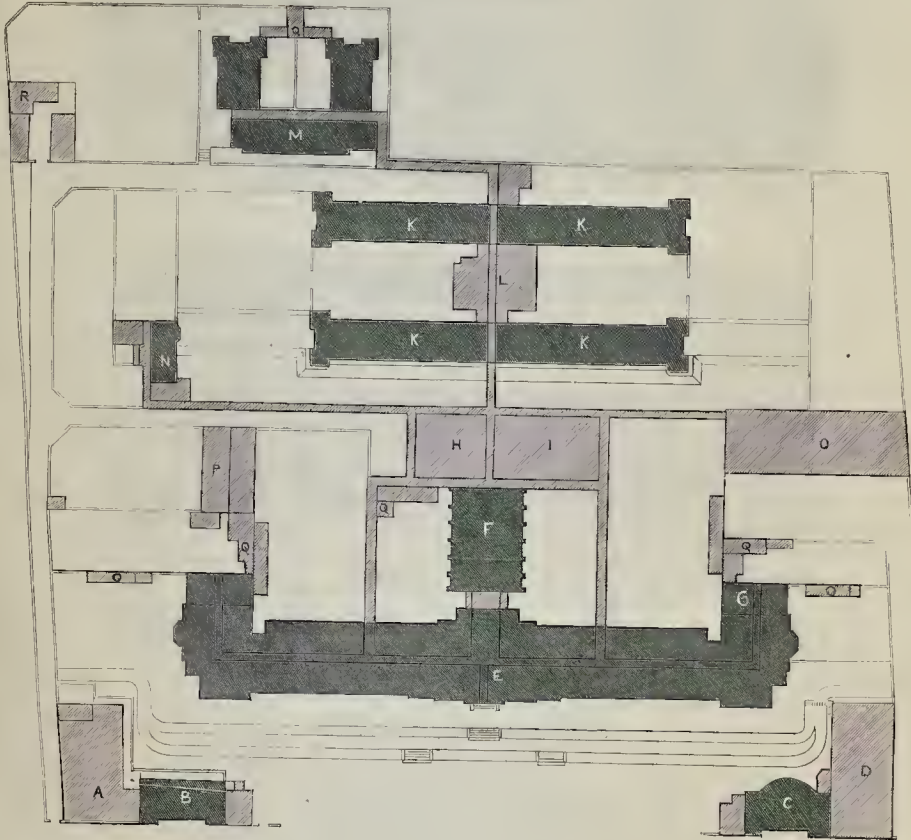
25 ft. by 16 ft. and 12 ft. high, with attendants' room adjoining; also the casual wards, one of which is 50 ft. by 20 ft., and the other 55 ft. by 18 ft. 6 in.; they are 14 ft. 6 in. high to the springing of the roof, and 21 ft. to the apex of the roof-light. The beds for the casual wards will be after a design by the architect, and so arranged as to turn up bodily against the wall when not in use, leaving the floor clear for the purpose of cleaning. They are also very inexpensive as to cost.

The buildings will be supplied throughout with

hot and cold water, and warmed by ventilating grates and stoves in all wards and rooms, and by hot water in the corridors.

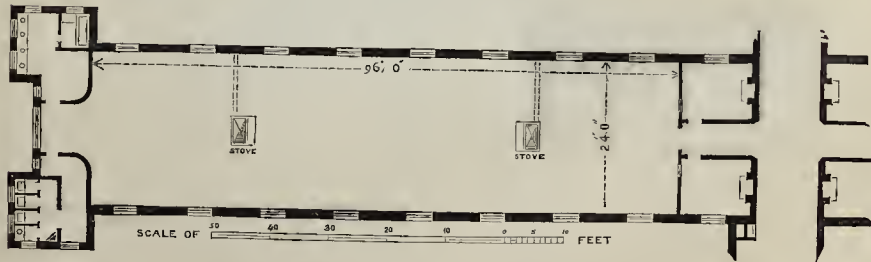
Mr. R. H. Burden is the architect. The contractors are Messrs. Nutt & Co., the contract amount being 63,300l. The engineer's work is being executed by Messrs. James & Co. The gasfitting by Messrs. Faraday & Son. The baths are from Messrs. Rufford & Finch. The bells will be on the electric principle. Mr. Barrett's fireproof flooring has been used for the main corridors. Mr. Lewis is the clerk of works.

ISLINGTON WORKHOUSE.



Block Plan.

Scale, one inch to 100 ft.

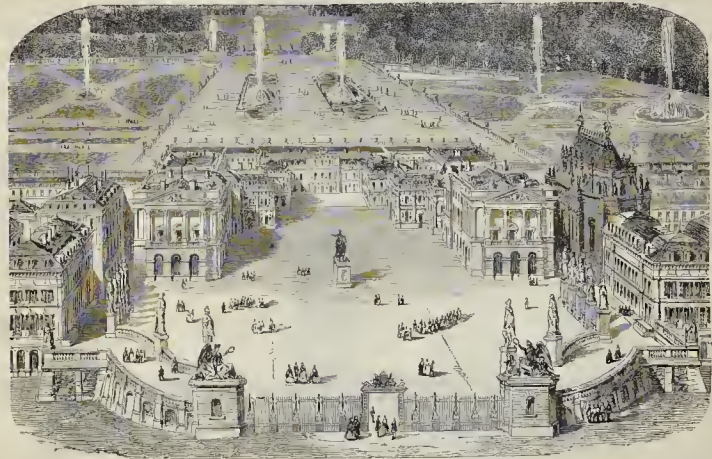


Plan of One of the Infirmary Wards.

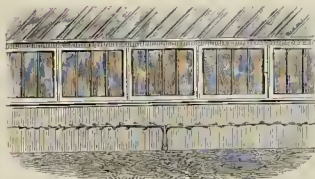
GARDENS AND PROMENADES.



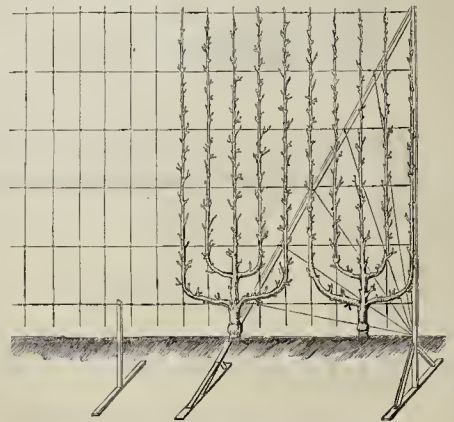
View in Mushroom Caves under Montreuve, with Beds in full bearing.



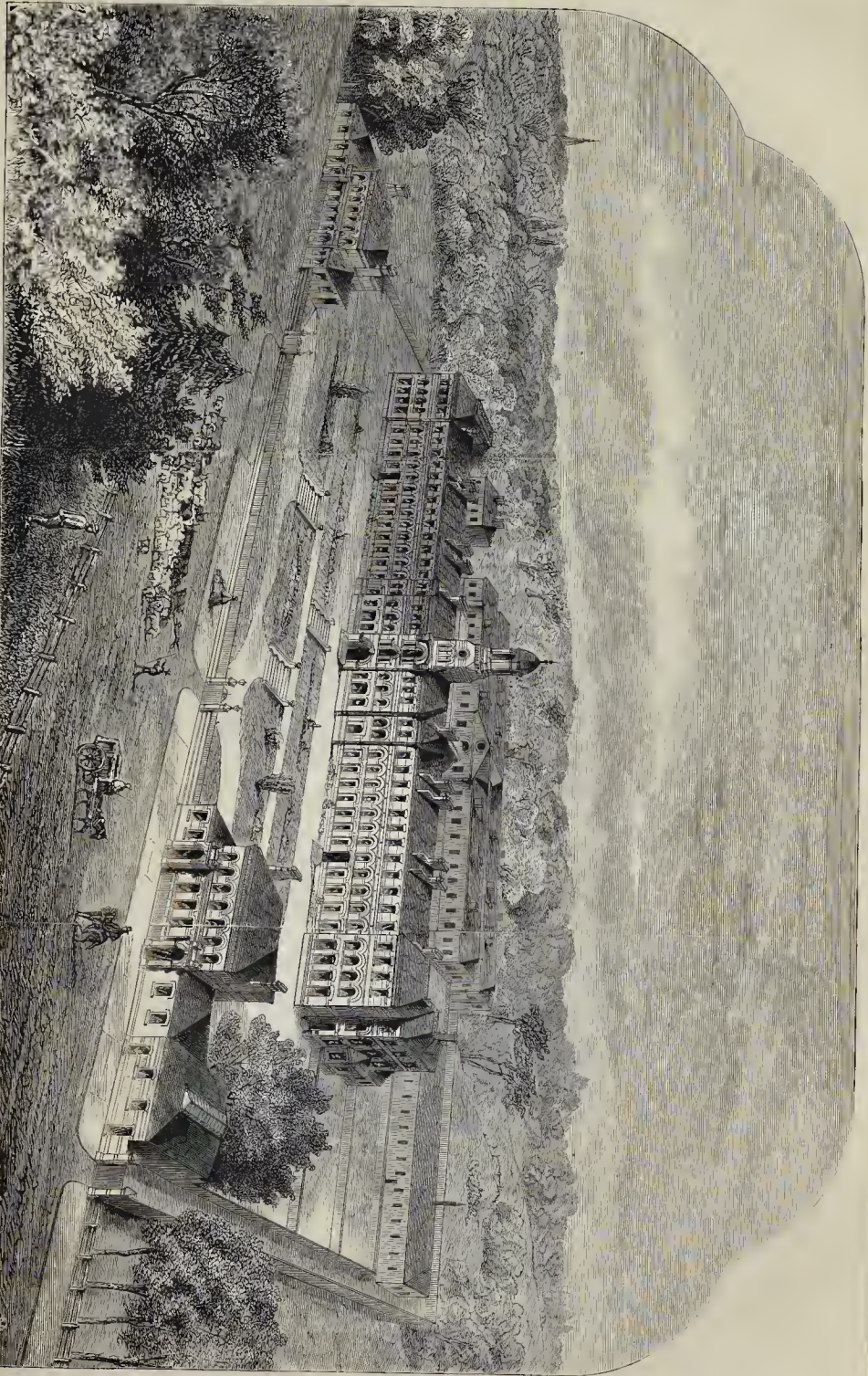
The Palace and Gardens of Versailles, France.



The Cordon on low sunny Wall of Plant-house.



Trellis for Pear-trees, 10 ft. high.
[See p. 457, ante.]



ISLINGTON WORKHOUSE, UPPER HOLLOWAY — MR. R. H. BURNEN, ARCHITECT.

TO MEASURE HEIGHTS.

Mr. STANLEY, of Holborn, is now making a very compact and useful instrument, called the Apomeometer, that can be carried in the waistcoat pocket, for ascertaining the vertical heights of towers, spires, and other buildings. It cannot be better explained than by quoting the description given by Mr. Millar, the inventor. "The Apomeometer is constructed in accordance with the principles which govern the sextant, viz.—As the angles of incidence and reflection are always equal, the rays of an object being thrown on the plane of one mirror are from that reflected to the plane of another mirror, thereby making both extremes of the vertical height coincide exactly at the same point on the horizon glass; so that, by measuring the base line, we obtain a result equal to the altitude." The instrument we have tried, testing several heights up to 50 ft., worked very accurately. We consider it to be a valuable acquisition for the architect, traveller, and sketcher. A small ringed handle might be added with advantage.

HERTFORD.

Rebuilding of St. Andrew's Church.—The chief stone of the new Church of St. Andrew has been laid by Earl Cowper. Mr. J. Johnson is the architect, and Messrs. Dove, Brothers, are the builders.

The New Workhouse.—The local *Mercury* says of this building:—"The new workhouse, in the Ware-road, will be one of the architectural attractions of Hertford. There are some things which might have been different, with advantage to the general effect, but the building is nevertheless an agreeable object, and we prefer it greatly to the barrack-looking structures which usually serve as workhouses. We hope that the rooms are sufficiently large and lofty, and the ventilation good; and it is not too much to expect that space will be found somewhere for the leather and other materials used in the house, elsewhere than under the men's dinner-table. The policy of making the arrangements of a workhouse attractive may be questioned; but there can be no doubt that it is as much with a view to the benefit of the ratepayers as of the poor that the Legislature and the Poor-law Board require that they shall be of such a kind as to conduce to the health of the inmates. The *Villa Residence Company's Estate at Bengoe.*—Two of the houses erected by the *Villa Residence Company* on the site which it acquired on its formation, have been let for the purpose of a preparatory school for Hailybury and the other public schools. A residence for the minister of the new church in Port Vale has been erected on the same estate, on the brow of the Warren-hill, overlooking the valley of the Lee.

COMPETITIONS.

Cirencester Cemetery.—During the past week, on the walls of the Corn Hall, have been suspended a large number of designs, for the proposed obelisk and lodge at the Cemetery. Nearly seventy architects competed. The Board eventually accepted, we are informed, the designs of Messrs. Medland & Son, of Gloucester.

Bishop's Sea Defences.—The design selected for commendation, as second, was marked "Experience," and not "Experience" written upon a flag, as at first stated. It was the work of Mr. Joseph J. Bennett.

THE SEWERAGE OF WEST DERBY, LIVERPOOL.

THE West Derby Local Board, having applied to the Secretary of State for powers to borrow 22,000l. for the construction of an outlet sewer to the sea at Rimmel Bridge, an inquiry was held by Mr. Arnold Taylor, of the Home Office, at the Public Offices, West Derby village, on Saturday, the 15th of May, and on the following Monday and Tuesday, when evidence was given in favour of the proposition of the Board, as also in opposition and in favour of a rival scheme prepared some time since by Messrs. Reade & Goodison, the engineers to the Walton Local Board.

It appears that the townships of West Derby and Walton lie on the same watershed, and that several hitherto ineffectual attempts have been made to attain joint action by both boards in the construction of a main outfall. The West

Derby Board is desirous of carrying the sewage direct to the sea, and wasting it in the estuary of the Mersey; while Walton, desiring to utilize its sewage by irrigation, and having ineffectually attempted to persuade West Derby to join in an irrigation scheme, has already obtained borrowing powers for a separate system, which is now on the point of being carried out. In addition to this complication, a memorial, signed by some of the leading men in the township of West Derby, opposed to the course taken by the Board, was presented to the Home Office, praying for a thorough investigation: hence the inquiry.

Mr. G. F. Lyster, engineer to the Mersey Docks and Harbour Board; Mr. James Newlands, borough engineer of Liverpool; Mr. Orridge, engineer to the West Derby Local Board; and Mr. Lea, C.E., gave evidence in favour of the sea-outlet; while the memorialists were supported by Mr. M. O. Tarbotton, engineer to the corporation of Nottingham; and Messrs. Reade & Goodison, the originators of the utilisation scheme. A printed report in favour of the utilisation of the West Derby sewage, by Mr. Chalmers Morton, of the Rivers Commission, was also circulated at the inquiry, but could not be received as evidence, in consequence of that gentleman's non-attendance.

Mr. Lyster's evidence was to the effect, that the proposed outlet would not be injurious, nor prove a nuisance to Tenforth and Waterloo, the sewage being swept away seawards by the tidal current, and also that the Dock Board were willing to enlarge the Rimrose culvert sufficiently to take the proposed influx of sewage at the expense of the West Derby Board. He emphatically disclaimed any intention of appearing against utilisation.

Mr. Newlands supported the views of the Board, considering the proposed culvert a safety-valve to take storm water, and stating that the scheme was almost identical with one he proposed some years ago. He considered that the river Alt could not be used to take the effluent waters from irrigated lands, as it was a dammed-up and sluggish stream, and that the effluent water would ferment and prove a nuisance. It was also his opinion that the water would be worse as it flowed off the land, than when it went on in the state of sewage. He considered that the Liverpool outlets do not pollute the Mersey, as they are carried down to low-water mark, and all offensive matter is swept away by the tidal current, and when fermentation sets in, must be somewhere near the Isle of Man.

Mr. Orridge gave evidence of a somewhat similar nature; and Mr. Lea, that the sewage would not foul the Mersey and the shores at Waterloo. None of the witnesses could give an opinion on the opposition scheme, not being familiar with its details, and, in fact, avoided it altogether.

Mr. Tarbotton had studied both the plans of the Board and the utilization scheme, and had inspected the ground, his views being embodied in a printed report. He had also examined the estimates and the relative cost of the two schemes. The adoption of the inland route, combined with irrigation, would, he contended, save the Board 20,000l., as the outlet at present proposed only provided for the western sewage and the eastern main it was intended to connect with the outlet at an expense of 10,000l., making 32,000l. in all for outlet works; while the proportion to be paid by the West Derby Board, if they joined with Walton in irrigating, would, for engineering works for both mains, be only 12,000l. He considered the river Alt, which discharged 20,000,000 gallons per day in dry weather, with a velocity of 60 ft. per minute, a perpetual safety-valve, and by the provision of storm inlets into it, the sewers could be reduced in diameter. Was decidedly of opinion that the sea outlet would damage the shore at Waterloo. Considered Reade & Goodison's scheme simple, efficacious, and economical, and correct in principle.

Mr. Goodison unfolded all the details of the utilization scheme, and produced the detailed estimates, stating that the prices were bigger than those of the accepted tender for the Walton works. The Walton sewage would be disposed of by gravitation, and by enlarging the outlet they were about to construct, the whole of the western sewage of West Derby could be disposed of by it in a similar manner. The eastern sewage could be readily dealt with by pumping. Knew the Waterloo shore well, and considered it was already suffering by the sewage of Liverpool. Mr. Reade confirmed the facts and details spoken to by his partner. Tide-locked sewers

he thought, should always be avoided where possible, as the gases were bottled up and driven back by every recurring tide. Pointed out that the extension of the dock works northwards, which had increased the tidal current, had damaged the Waterloo shore, whereas, if the theories of Mr. Lyster and Mr. Newlands were correct, they should have improved it.

The Waterloo Board opposed the construction of the sewer, and brought witnesses to prove that their property would be materially damaged if it were carried out. The inquiry then terminated with a eulogium on Mr. Taylor for his impartial mode of conducting it.

THE SECRETARYSHIP OF THE INSTITUTE OF ARCHITECTS.

Sir,—It hardly appears consistent with the courtesy which binds society together, or with the generous fairness to which Professor Kerr doubtless lays claim, that he should avail himself of a public opportunity to recall a hasty (and doubtless indiscreet) expression used by Mr. Seddon long ago in a private house and on a private occasion. The Professor forgets to add that Mr. Seddon at once explained that he did not intend it to convey the meaning of his intention to use his official position for party purposes; and Professor Kerr, having withdrawn his opposition to Mr. Seddon, ought not to have let this Partisan arrow at the adversary he had sought unsuccessfully to offend.

Yours, &c., D. G. DAVENPORT.

"We have received two letters commencing caustically on the unfortunate expression referred to; but we decline printing them: let bygones be bygones. There should be only one "party" in the Institute.

CLERKS OF WORKS.

Sir,—The securing of honesty in clerks of works being of very great importance, I was glad to see the subject taken up in your paper by "An Old Clerk of Works;" but, while believing that the class of men he points out to be men in whom honesty and integrity have "grown," I think it just to add that there is another class not drawn from the ranks of workmen, or from an office, who can claim to be honest, able clerks of works, though under forty,—viz., those trained for the work.

It was indeed I should be a Joiner; only about four months before I attained the age of fourteen I was taken by a permanent clerk of works to assist him in any way I was able, with the promise of being "put forward;" so that at an early age I could make a working drawing (such as could be worked to) for ordinary work. I remained with him a number of years, and obtained step by step, under his tuition, on churches, schools, warehouses, and residences—in fact, buildings of almost every description and style,—such a practical knowledge of the nature and cost of work and materials employed in every branch of the trade, as can be obtained only on the actual work properly explained at the time. Add to this, the just firmness that a like training must—or ought to—produce, and I have no doubt your readers will acknowledge the above claim on behalf of a small class of clerks of works to be just and well-considered. A YOUNG CLERK OF WORKS.

FIXTURES IN SCOTLAND.

An important case as to fixtures has been decided in the Sheriff Court, Westwickshire. Mr. David Barr Lindsay occupied the mansion-house of Oxendale, on the estate of Dunso Castle, with the garden, offices, and certain parks, as a yearly tenant, since 1861. He had erected at his own expense a vinery, greenhouse, peach-house, and forcing-house. Mr. Lindsay received a legal warning to remove from the premises at the present term of Whitsunday. The proprietors, the trustees of Mr. William Hay, of Duns, claimed the glass-houses, and interdicted the sale of them by auction for Mr. Lindsay. After examining the premises, along with Messrs. Duns & Dods, holders, the Sheriff-Substitute issued an interlocutor, in which he finds that the respondent, Mr. Lindsay, has been occupying the house and premises at Oxendale as a yearly tenant, and without a lease; that the greenhouse and other glass houses in the garden there have been erected by the said respondent at his own sole and considerable expense; that their removal will occasion no damage to petitioners' property; that the respondent is ready and willing to restore the garden forthwith to the condition in which it was before the said structures were erected; that, in these circumstances, and under these conditions, the respondent is entitled to remove the said greenhouse and other glass houses and appurtenances; that the respondent is not entitled to remove any of the trees or shrubs growing in the soil; therefore, continues and confirms the interdict as regards the said trees and shrubs; and *quoad ultra* recalls the interdict, refuses the prayer of the petition, finds the petitioners liable in expenses, &c.

THE KIDDERMINSTER INFIRMARY COMPETITION.

Sir,—I noticed too late in the week to reply in your following issue, a letter from "Rejected" relative to the Kidderminster Infirmary Competition. Other letters I have seen, but scarcely thought it worth while to reply to them, as they appeared to be written by disappointed men smarting under defeat. "Rejected's" letter is, however, so gross in its expressions, as well as false in its insinuations, that I cannot let it pass. Now, supposing that each of the four questions asked by "Rejected" were necessarily answered in the affirmative, it must be evident to your readers that no man in his proper senses would think of applying the terms "despicable job" and "iniquitous management" on such slender grounds; because it does not necessarily follow that there should have been any unfairness or partiality. But what becomes of the insinuation conveyed in the questions of "Rejected," when those questions are answered, I leave your readers to decide, and as briefly as possible to do so.

Mr. Bland's plans were forwarded on the evening of the 9th, and delivered with a number of others at nine o'clock on the morning of the 10th. He had access, on one occasion, to the room in which the designs were exhibited, by right as a subscriber, many others being present; but he did not discuss the merits or demerits of any of the designs with any member of the committee, some two or three being present, but not in their official capacity, as the exhibition was for the inspection of the designs by the subscribers.

As to cost, it was the belief of amongst parties well able to judge that none of the designs which gave the stipulated accommodation could be executed for the sum named, although some of the competitors, I believe, intimated as usual in their reports to the contrary.

Lastly, Mr. Bland was not at that time the architect of the honorary secretary, neither could he be called his personal friend, as up to the time of the competition his acquaintance with the honorary secretary was of the slightest description.

In conclusion, I beg to call the attention of "Rejected" to the fact that the committee having selected from the 19 designs exhibited, two of those which they considered best met their requirements, they called in an entirely disinterested architect to report upon the merits, demerits, and probable cost of the two designs; and he having strongly reported in my favour on all the counts, the committee decided on accepting my design.

JOHN GEO. BLAND.

BAKERS' OVENS.

Sir,—Will some of your numerous readers oblige me with particulars of a well-tried smoke-consuming furnace for bakers' ovens? I have no doubt that in most London bakerhouses some such apparatus is used; my wish, however, is to secure a thoroughly well-known and effectual smoke-consuming furnace.

B. A.

METROPOLITAN BOARD OF WORKS.

LAW COURTS' SITE.—DISTRICT RAILWAY.

At the usual weekly meeting of the Metropolitan Board of Works, Mr. Phillips, the representative of the Strand district, complained of the great delay in proceeding with the New Law Courts Site Bill, and said the uncertainty was most ruinous to the inhabitants.

The Chairman said the delay did not rest with the board, but with the Government.

Mr. Shaw asked the engineer, with reference to section 6 of the Metropolitan Railway Act, 32 and 33 Vic., whether, in his opinion, the works of the Metropolitan District Railway Company were proceeding at such a rate as to render it probable that that portion of the railway which is connected with the works authorised by the Metropolitan Improvement Act 1863, and also the remainder of the railway from Westminster-bridge to Cannon-street, would be completed and opened to the public by Jan. 1, 1870.

Mr. Bazillette replied that he did not think the works would be opened by the date named, but the company had applied for a Bill to raise funds to complete their works.

The engineer was requested to report weekly to the board on the progress of the works.

A report was read stating that the Thames Embankment works were proceeding satisfactorily.

THE DANGER OF DISINFECTANTS.

Sir,—A short time ago suggestions appeared in a medical paper, and were reprinted in a leading journal, with reference to the use of "green coppers" as a disinfectant. The idea of the writer was that the germs of fever-poison penetrate into the wells from the drains, and contaminate the water. Now it may be worth while asking whether there is not danger in the plan proposed. Is the disinfectant that is recommended a poison? If so, the remedy would be as bad as the evil that is sought to be cured, unless it can be proved that the two poisons act and re-act upon each other, and are both thus rendered innocuous.

This seems to me a question suitable for discussion in your columns, and you will oblige me by inserting these brief remarks.

SANITARY.
* Sulphate of copper is blue; sulphate of iron green; and as sulphate of copper has been called blue coppers, sulphate of iron has sometimes, stupidly, been called green coppers. If, therefore, by green coppers he meant protosulphate of iron, that cannot be regarded as a poison, used in the way indicated.

INTERNAL ADORNMENT OF BUILDINGS.

At the meeting of the London Artisans' Club, when Mr. Crace's paper, printed in our issue (p. 443), was read, Mr. Layard, M.P., said there was nothing, in his opinion, more calculated to raise taste in this country, and to create a high intellectual and moral feeling, than the internal adornment of public buildings. This country he considered almost entirely ignorant of what constituted internal decoration, and the kind of impression it produced on the mind of the beholder. A great deal had been done in outward decoration, but very little in internal. Very few public buildings were decorated in a manner worthy of the nation. The National Gallery, of which he was almost ashamed to say he was a trustee, had a very fine collection of pictures; but in respect to internal decoration little better—indeed, he might truthfully say it was a little worse—than auction-rooms. The case was very different on the continent. There the internal decorations of public buildings had done very much towards elevating the popular taste. Some few years ago it was said of the English people that they

had no ear for music. The reason why they had not was that music was not placed within their reach. Now, he believed the English were the most musical people on the face of the earth, not excepting Germans and Italians; and he believed it would be the same with the arts. He observed in Paris, in all matters of detail where the skill of the working-man was exhibited, we were very much behind the French,—in such matters, for instance, as area-railings, street-lamps, garden-enclosures. Our lamps in London were a perfect disgrace. Search the world over, and you could find nothing more ugly. Our area-railings were mean in the extreme.

REOPENING OF THE CHARLES MUSEUM, MAIDSTONE.

THE new wing of the Charles Museum, Maidstone, has been opened to the public for the first time, on which occasion the mayor invited a large number of the working-classes to a *conversazione*. The idea proved successful, nearly the whole of the possessors of tickets, numbering several hundreds, being present. The archaeological, geological, and fine art specimens are collected in Chillington House. The nucleus was got together by the late Dr. Charles. It is through the liberality of Mr. Alexander Randall that the institution has at last been placed in an efficient state, and its contents displayed in a manner which make them accessible to all. About a year ago Mr. Randall made the purchase of one of the wings at the side of the building, which at that time was in a dilapidated condition, and was used as a coal-shed. He then presented it to the town on condition that it should be restored. The town council have accordingly restored the building, with regard for the architecture: the whole of the old oaken beams, which were quite sound, and other materials having been used. The architect employed was Mr. Habert Benstead. The new wing has added two rooms to the building, one of which has been devoted to the library of works of reference which the town possesses, and the other to a picture-gallery. This has enabled Mr. Lightfoot to make a new disposal of his materials. The Brencley collection from the islands of the South Sea has been brought to light for the first time, and the building itself has had windows opened up, and oak wainscoting cleaned.

SUPPLEMENTARY EXHIBITION OF PICTURES.

A SELECTION of pictures and other works of art, partly from those which had been submitted to the Royal Academy and returned, is now on view in Bond-street, nearly opposite the end of Burlington-gardens. It consists of 524 paintings and drawings, 23 pieces of sculpture, and 5 miniatures. Fear of seeming to oppose the Academy, dislike to proclaim a grievance or even to let the fact of rejection be known, and various other reasons, have doubtless led many artists to refrain from submitting their works to the committee who have arranged this exhibition. About two-thirds of the whole, it is stated, were rejections of the present year. The collection includes a number of excellent pictures, and deserves a visit from all who are interested in art-matters or fond of pictures. We shall take an opportunity to return to it.

The catalogue, which is very dear at a shilling, and so shows no step forward, should contain a list of the exhibitors and their addresses.

CHURCH-BUILDING NEWS.

PRESSURE of matter, and the very large number of new churches and church restorations we have always to record, leave us somewhat in arrears for the present.

Rotherhithe.—All Saints' Church, Rotherhithe, has been re-opened, after having undergone a restoration and decoration, under the superintendence of Mr. G. Legg, of London, architect. The former small chancel has been taken down, and a new one constructed in its place. It is paved with encaustic tiles, and fitted with carved benches of pitch pine. A painted east window, by Messrs. Powell & Co., has been fixed, and the whole of the glass of the nave has been replaced with coloured glass. The organ has been removed from the gallery, and placed in a new organ-room, constructed on the north side of the chancel. The pews and free seats have been

replaced in the church by open benches, with carved ends. The roof has been remodelled. New pulpit, carved in pitch pine, and standing on a stone base, has been erected on the south side of the chancel, but in the body of the church. New fronts have been made to the children's galleries, and the galleries round the church have been decorated with architectural designs. The whole of the works have been carried out by Messrs. Harrison & Edwards, Rotherhithe.

Tattenhall.—The church is about to undergo rebuilding and restoration. The contractors are Mr. George Woolmans, builder, Tattenhall; and Mr. S. Dutton, stonemason, Burwardsley. The estimate for the whole restoration is 2,600*l.*

Watford.—It is intended to have the parish church restored, more or less thoroughly according to the subscriptions. Mr. Scott is spoken of as the architect to be employed.

Lewisham.—The foundation-stone of a new church, to be dedicated to St. Mark the Evangelist, has been laid by the Earl of Dartmouth. The church, in the Decorated style, will be divided into nave, north and south aisles, chancel, and organ chapel, with vestries for clergy and choir, and a narthex and tower with ashlar spire rising to a height of about 100 ft. at the western front. The dimensions of the edifice are,—Nave and aisles 80 ft. by 60 ft., chancel 28 ft. by 39 ft. The walls will be of Kentish rag with Bath dressings. The church will seat 750 persons, and owing to the nature of the site (from its inclination eastward) schools may be formed under the chancel. The present contract, about 7,000*l.*, embraces a portion only of the building, the contractors being Messrs. Carter & Sons. The architect is Mr. Wm. C. Banks, of London.

Wisebech.—The new church of St. Augustine has been consecrated by the Bishop of Ely. It consists of a nave 61 ft. in length and 24 ft. 6 in. in width, with four arches on each side, opening into north and south aisles 11 ft. wide, and a chancel 32 ft. by 22 ft. The seats are plain open benches, those in the chancel made in oak, and the whole will accommodate 500 persons. The pulpit, prayer-desks, and lectern were a special gift, and are therefore of rich character. The pulpit is a stone one, with alabaster top, and red marble columns. The walls of the church are built of brick, with stone for piers, windows, doorways, &c. The whole of the works have been carried out by Messrs. Law, of Lutterworth, from the designs of the architect, Mr. William Smith, of London, at a cost of over 3,000*l.*, raised by subscriptions.

Hereford.—The new district church of St. James has been consecrated by the Bishop of the diocese. The church is cruciform in plan, and consists of nave, north and south aisles, transepts, chancel, sacristy, and south porch. The aisles are continued eastward of the transepts, and form an organ-chamber on one side, and an additional space for seats on the other. The nave is 72 ft. long internally, and is divided from the aisles and transepts by arcades of four arches on each side. The width of the nave and aisles in the clear is 44 ft., and the width across the transepts is 68 ft. The nave from the floor to the ridge is 42 ft. high. The chancel is 35 ft. long and 20 ft. wide, and 40 ft. high to the ridge. The south porch is constructed as the substructure of the future tower and spire, and contains the first few steps of the cork-screw staircase to the ringing-loft and belfry. The style adopted is Early Geometrical. The west front is pierced with three windows, one of three lights and two others of two lights each; the chancel by a three-light window at the east end, and by two two-light windows at the side; the transepts by four-light windows, and the sides of the aisles by seven two-light windows. The clearstory is pierced by light sexfoiled circular windows. All the windows contain foliated tracery in the heads. The building has been constructed with Three Elms quarry stone, with Box-ground Bath stone dressings; the interior throughout being ashlar with random-ranged Bath stone, axed on the face, and set in wide joints, and relieved with bands and voussoirs of blue stone. The roofs are framed with pitch pine, boarded and felted, and covered with Whitland Abbey slates. The timbers and boarding are left their natural colour. The sittings are also of pitch pine varnished over. The aisles and chancel are tiled, Godwin's ornamented encaustic tiles being used throughout the latter. The works have been carried out by Mr. Gough, builder, Bishop's Castle, from the designs and under the superintendence of Mr. T. Nicholson, of this city, the diocesan architect.

Vesthoughton (near Bolton).—The corner of the new church of St. Bartholomew has been laid. The contemplated structure will be the third built upon the same site, the first being erected in the fifteenth century, and the second in 1731. It is to be of stone, and the design is Early Gothic, with a tower at east end. The cost will be from 5,000l. to 7,000l., which is borne by Mr. J. Seddon.

St. Morden (Cants).—The church here has been reopened. The first thing which attracts observation on entering the village is the new tower and spire, the base of which is of Bath stone and forms a porch for the north aisle, the spire being covered with oak shingle, capped with a vane. The wall of the north aisle of the church has been refaced, and the west gable rebuilt. The wall on the north side has also been restored, and a parapet formed on the top. About 200 years ago, it is believed, the tower of the church gave way, destroying in full the chancel, which up to the present day had not been replaced; but the patrons of the living having offered 400l. for its rebuilding, work has been carried out, and has added no less than 16 ft. to the length of the edifice. A lancet arch now appears in the Perpendicular style. The architecture of the church is Early English, although there is a mixture here and there of a later style. An entirely new roof has been put on, and the windows (several of which are fresh) are filled with the green tint cathedral glass. The walls of the nave and north aisle have been plastered; that of the south being refaced with clunch. The new seats are of deal (stained and varnished), those of the chancel being of oak, with carved heads. The flooring of the chancel is composed of Staffordshire tiling, whilst that of the chancel is laid with Collis's (Westminster) encaustic tiles. The improvements have been carried out by Mr. J. W. Lacy, of Norwich; the architects being Messrs. Elmslie & Frayne, of London. The cost of the restoration amounts to about 2,500l.

Louth.—The works in connexion with the restoration of the parish church are progressing. Workmen are now engaged in fixing an alabaster pediment. A new stained-glass memorial window has been placed at the west end of the south aisle by Mr. L. K. Lucas, and another one, we learn, is to be placed at the west end of the north aisle. The interior of the nave will soon be ready for the reception of the seats, and the pews are being laid with tiles.

Eling.—Mr. Frederick Hobson has laid the memorial stone of a church, which he and his father are about to erect on a portion of their estate at Homington, not far from the Hamlet Inn. The designs of the church and parsonage house are by Mr. Benjamin Ferrey. The foundations of the structure are laid, and the walls built up about 1 ft. throughout. The edifice will be in the Early Decorated style of architecture, and consist of a nave, chancel, and apse, having a bell-turret at one end, about 20 ft. high, shingled with oak. Flint is to be the material used, with Bath stone dressings; the roof will be open, and the seating stained deal benches. The builders are Messrs. Goddard & Co., of Farnham, who have just carried out an extensive work at Mr. Ibbotson's mansion at Eling, and a schoolhouse and dwelling near Mr. Ingrove's residence, at the foot of the hill leading to Hunter's Inn, all from designs by the same architect, and at the expense of the same lady and gentleman.

Newcastle-upon-Tyne.—In the new parish of St. Philip, Newcastle, it is proposed to erect a plain and suitable church, at a probable cost of 5,000l., to contain 700 sittings, all of which shall be for ever free. It is also proposed that the church shall be built to the memory of the late Archbishop Longley. The site has not yet been decided upon, but it is not improbable that the Archbishop Longley Church will be erected on a plot of ground, situated at the end of Pitt-street, near to the old quarry.

Bradley.—Recently the rector, the Rev. E. R. Hampden, restored the chancel of the parish church at his own expense, when the walls were decayed, and the work was done in the Decorated style, under the direction of Mr. Scott. Following the example of the rector, the neighbouring parishes, parishioners, and friends resolved to take the matter in hand. The walls of that part of the building are in a very bad and dangerous state, especially on the south side, which is out of the perpendicular and rapidly decaying. This wall will be rebuilt of the old material as far as possible, and its Decorated windows reinserted; the wall on the north side will be pierced for six

arches, in order to add an aisle on that side. These arches will be supported by Decorated pillars, the caps of which will be moulded, as also the arches. In the new north wall of the aisle the old Decorated windows removed from the old north wall will be inserted. There will now be sittings for about 400 people. The removal of the gallery will open the tower to the church, and bring into view a little Perpendicular window in its western wall, as also the late Norman arch of the tower, underneath which will be a screen of open work. A roof of timber will be placed on the nave—a tie-beam roof on the Decorated principle. A new porch is also to be added to the north side; it will be of stone, and connected with the hot-air chamber (which is partly underground) for warming the church. It is likewise contemplated as soon as possible to restore the tower. The upper part is much dilapidated, having been badly repaired from time to time. Sandstone from Ombersley is to be used in the restoration of the nave. Mr. Perkins, architect to the Dean and Chapter of Worcester, has prepared the plans and drawings for the work.

Mole Brace (near Stroudbury).—The new church was consecrated on the 19th inst. It consists of a wide nave, with north and south aisles, south porch, chancel (the width and height of the nave, terminating in a three-sided apse), north and south chancel aisles (one of which is used as an organ-chamber), and vestry. There will also be a massive tower at the west end of the north aisle. The seats and stalls are of oak, and provision is made for 500 persons. The pulpit, of stone, inlaid with coloured marbles, stands at the north-east angle of the nave. The font has also alternate panels of marbles and carving. The chancel pavements are from Messrs. Maw & Co. A rearedos of marbles, with central cross of white statuary, is provided. The arcade caps are alternately moulded and carved. Messrs. Morris & Co. have filled the altar-window with stained glass. In the centre light is the Crucifixion, with the Virgin and Child underneath; the two side lights contain double figures, in three rows, representing angels, apostles, martyrs, prophets, and kings; and in the head is our Lord in glory, surrounded by angels. Another window for the apse, by the same artist, is in progress. The carving is by Mr. Boulton, of Cheltenham. The style of the church is Early Decorated. Red Hill stone has been used for the walling; Shelvocke for dressings; and for the shafts to arcades and chancel arch, Bedfordwood stone and blue Pennant. The interior is ashlined with Shelvocke stone. Mr. E. Haycock, jun., of Stroudbury, is the architect. The contractors are Messrs. Bowdler & Darlington; and the cost has been about 4,500l. This sum does not include the pulpit, font, east window, and rearedos, which are separate gifts.

Chipping Sodbury.—The parish church of St. John the Baptist, Sodbury, has been re-opened for divine service, after having undergone a restoration. The roughtcast that formerly covered the exterior has been removed, and the stone-work exposed to view. The bell-stage stone lunvres have been taken out, and the spaces filled in with tracery. The west window of the tower has been restored. The tower was separated from the church by a wall, which was built up between the tower-arch piers, but it is now thrown into the church. The old ringer's wood floor has been taken out, and the groining which was commenced when the tower was built has been finished. The south porch has been entirely rebuilt from the foundation, after the style of the original. The canopies and figures have been executed by Mr. Earp, of London. A new vestry has been erected. The walls, arches, and columns of the church have been freed from whitewash. The old high pews have been taken away, and bench seats, with traced and panels of varied design in the fronts and backs, substituted. The number of sittings has been increased by about 130, or to 415. The chancel with its screens, filled with tracery, to part off its aisles, and also the clergy and choir stalls, have been executed in oak. The tiling in the floors is of varied design and colour, from Mr. Godwin's works at Lugwardine. The rearedos, which is of alabaster, is by Mr. Earp. The side panels are of Caen stone. The east window is of stained glass, and is the work of Messrs. Clayton & Bell, of London. The church has been refitted with a new organ, by Mr. Fowles, of Bristol. The roof of the church has been replaced by a new one of Baltic fir. The restoration has been carried out from the designs of Mr. G. E. Street, of London. The contractors

were Messrs. Wall & Hook, of Brimscombe, near Stroud, and Mr. Reddin was clerk of the works. The restoration has cost about 4,000l.

Shrew, near Oldham.—The old Church of Holy Trinity, at Shaw, near Oldham, having become somewhat dilapidated, it has been resolved to build a new one near the same site. The new church, which has been designed by Mr. Drew, of London, is to be in the Early Decorated style. It will have a nave with aisles, and chancel with aisles, and a central tower of two stories, and 90 ft. in height, rising over the chancel. There will be a large east window of five lights; and at the west end there will be three large windows of two lights each. The building is estimated to cost from 7,000l. to 8,000l.

DISSENTING CHURCH-BUILDING NEWS.

Clerkenwell.—A new chapel, belonging to the Baptist denomination of Spencer-place, has been opened in Charles-street, Goswell-road. The entire cost of chapel, schools, and land, according to the *Clerkenwell News*, is 5,000l., 3,400l. of which yet remain to be raised. The chapel is constructed to seat 800 persons. The edifice has been commenced and completed in the course of eight months.

Leicester.—The memorial stone of a church for the United Presbyterians has been laid here. The new edifice is being erected on the London-road, in close proximity to St. Paul's Chapel. It is planned to seat nearly 800 persons, and will be galleried on three sides. A minister's vestry and a session-room are provided, at the north-east angle of the site. The style is Early English. The building generally will be faced with rock-faced Bulwell stone, which has been preferred to the granite rubble of the locality, as being in itself equally durable, and forming sounder masonry. The dressings will be of Bath stone. The tower and spire occupy the south-west angle of the site, at the junction of London-road and Station-street. The total height of the spire will be 120 ft. The north front of the building will be brick-faced, and finished in a temporary manner, it being intended shortly to erect a lecture and school room on this side of the church, and closely adjoining it. The contract for the building has been taken by Messrs. Osborne Brothers, of this city, builders, for 2,741l.; and the cost of heating, lighting, and other charges, will bring the total expenditure to about 3,200l., exclusive of the cost of the land. The architect is Mr. Tait, of Leicester. The walls of the church are already several yards high, and the stone was laid inside the building, at the further end of the church; and when the works are completed, the front of the stone bearing the name of the gentleman by whom laid and the date of the ceremony, will be seen. The church will accommodate about 750 persons. The building is well advanced.

Leigh.—The corner stone of a new chapel and schools for the Primitive Methodists has been laid at Leigh. The building will be of a semi-Gothic style of architecture, having its principal front towards Bradshaw-gate. It will be constructed of brick, having Eidge Fold stone and blue and white bricks for door and window dressings, and a pressed-brick front on north elevation. The means of ingress to the chapel are by two porches, one on either side of the principal front. The principal window to the north elevation will be of large dimensions. The building will stand partly on the site of the old chapel, and cover an area of about 2,700 superficial feet, the ground-floor having school-room, minister's vestry, three class-rooms, and boiler-house. There will be separate entrances to the schools for boys and girls. The chapel will be amphitheatre form, and will be above the school, classrooms, &c. It will occupy the entire space above them, having open pewing, and will accommodate from 400 to 500 persons. The architect is Mr. Edward Pritchard, C.E., of Leigh, and the builder Mr. Thomas Bathell, of Earlestown. The building is estimated to cost 1,512l.

Derby.—The memorial stone of a new Congregational Church now in course of erection in Derwent-street was laid on the 1st inst. The new church, as arranged at present, is to accommodate 350 persons, but the accommodation can be increased to 500. The style of architecture is thirteenth century Gothic. The contract has been taken by Mr. Stoddard, of Derby, at 1,258l. The architect is Mr. Tait, of Leicester. The United Presbyterian Church has been opened. The building occupies a site at the junction of Green lane and Gower-street.

The plan is arranged to accommodate about 500, with minister's vestry and session-room, heating chambers, and other offices in the rear of the church. The style is English Gothic of the thirteenth century, and the material for the walling externally is white Coxbench stone, the window tracery being of Hollington stone. The principal front towards Green-lane has a high-pitched gable, containing a five-light window, with tracery geometrical in design, and is flanked on either side by the entrance-porches. The doorways to these have moulded arches supported on shafts with moulded caps and bases. Between the centre gable and the north porch an ornamental spire rises to a height of 70 ft. The front next Gower-street is divided into five bays, the easternmost bay projecting as a transept, and containing a two-light traceried window. Each bay in the body of the church contains a couplet of cusped-headed lancet windows. Internally the church is divided into nave and side aisles by two rows of light iron columns supporting the arched ribs of the roof. The ceiling of the roof is divided into panels by timber ribs stained and varnished. The contract for the building was taken by Messrs. T. & H. Herbert, of Leicester, at the sum of 2,150l. The architect was Mr. J. Tait, of Leicester.

Sunderland.—The foundation-stone of a new United Presbyterian Church at Sunderland has been laid. It is in the Gothic style of architecture, and will be built entirely of stone. Accommodation is provided for 800 persons; and the total cost will be about 3,500l. Mr. Thomas Oliver, of Newcastle-on-Tyne, is the architect.

Salford.—The foundation-stone of the new lecture-hall and schools connected with the Richmond Congregational Chapel has been laid. The new buildings are in the Gothic style; and comprise on the ground-floor a lecture-hall, 59 ft. by 35 ft., and 45 ft. 6 in. to the ridge, with vestibule and entrance giving access to eight class-rooms. The infants' school will be 42 ft. by 28 ft. 6 in., with separate entrances. Each school has lavatories, &c. The external walls will be faced with stock bricks, relieved with blue bricks to the arches of the doors and windows, and moulded bricks to the string-courses, with stone dressings to the doors and windows. The principal elevation will comprise two entrances; the gable pierced with large window of five lights with elaborate tracery. All the roofs are of high pitch, with open-framed principals and covered with Welsh slates, with ornamental ridge tiles and iron cresting. The buildings will be warmed and ventilated by Messrs. Haden, of Trowbridge. The cost will be about 3,500l. Mr. W. Southern is the contractor for the whole of the works, under the superintendence of the architect, Mr. John Lowe, of Manchester.

Ashbourn.—The Countess of Huntingdon's Church has been reopened, after restoration. The entire outlay will be between 800l. and 900l. The works comprise the erection of a new orchestra and vestry, the introduction of new windows, glazed with tinted glass, and an alteration of the arrangement of the window openings throughout, which have received stone arches and imposts, in lieu of the old brick arches removed, and plaster arches and imposts interiorly, and stone dressings have been suitably introduced in other parts of the building. A new portico has been erected. The roof has been restored and re-slatted. The old horizontal ceiling has been removed, and the roof timbers, now exposed, have been wrought or cased, and the appearance further improved by the introduction of carved braces, cantilevers, and pendants. The internal alterations comprise entirely re-seating the body of the church with open benches. The organ has been removed from the gallery to the new orchestra, and the gallery rearranged, re-seated, and re-fronted; new stair-cases have also been put to the gallery. Through neglect to provide for any ventilation of the ground-floor the timbers were so decayed as to render necessary a new floor, which has been laid 18 in. below the level of the old floor, and the approaches improved. The woodwork throughout is stained and varnished, and the building warmed by the apparatus of Messrs. Haden & Son, of Trowbridge. The contractors were Messrs. Stonier Brothers, of Rochester, near Ashbourn. Mr. W. Sngden, of Leek, was the architect.

Brighton.—The new Wesleyan Chapel, Norfolk-road, the foundation-stone of which was laid on the 24th of June last, from the designs of Mr. C. O. Ellison, of Liverpool, architect, is now completed. A stone spire rises over the south

porch to a height of nearly 120 feet. The style of the building throughout is Early Gothic. Light to the chancel is obtained by a large of ornamental window filled in with stained glass a geometric pattern, by Messrs. Forrest & Co., of Liverpool. The gas lighting is from coronas, with white glass halls round the columns of the galleries, and by brackets beneath. There is an organ-chamber at the south-east side and a minister's vestry at the north-west side. School, class, and examination rooms are provided below the chapel; and the whole is supplied with two rows of iron heating pipes. This part of the work was done by Messrs. Smith & Son, Brighton. The ornamental wrought iron-work was executed by Mr. Smith, of Birmingham; and the gas arrangements by Messrs. Banfield & Reed. The chapel will accommodate 1,200 persons. Mr. Chappell, of Skyping, was the contractor; and the personal supervision of the works, in the absence of the architect, being given by Mr. A. Loader.

Books Received.

"PAINTED WINDOWS: a Lecture by the Rev. Frederick Burn Harvey, M.A., on the New West Window in Berkhamsted Church." Longmans. This lecture was delivered in the Town-hall, Berkhamsted, and has been published by request. The introduction treats of painted windows generally, and from various sources, including our own pages. The rev. author has also made good use of Mrs. Jameson's volumes, and has altogether formed an interesting and excellent lecture. The west window in Berkhamsted church was presented by the late Mr. Thomas Whately, and has quite recently been erected.—"Tables of Roman Law. By M. A. Fauton, Docteur en droit: Translated and Edited by C. W. Law, Barrister. London: Wynn & Sons, Lincoln's-inn-fields." Here, in 15

Tables, we have the four books of the Institutes of Justinian, as to the ancient Roman law regarding persons, things, and actions. The first book gives some general notions respecting the meaning of the words *Justitia* and *Jus*, and treats of persons. The second, relating to things, treats of the means of acquiring particular objects, of successions to deceased persons, legacies, and trusts. The third deals with inheritances and obligations. The fourth treats of obligations and actions. The tables seem to be well translated and clearly arranged.—"A Course of Six Lectures on the Chemical Changes of Carbon. By William Odling, M.B., F.R.S., Fullerian Professor of Chemistry, Royal Institution. London: Longmans & Co." This course of lectures, by Professor Faraday's able successor, was delivered before a juvenile auditory at the Royal Institution during the Christmas holidays of 1868-69, and has been reprinted from the *Chemical News*, with notes, by Mr. Crookes, F.R.S. Carbon, as the basis of organic chemistry, is a highly-important subject, and it is here treated of in a way that renders it intelligible to non-chemical readers; for the meaning of every chemical term used is defined as it occurs, and the real definition is supplemented by a clear and decisive experimental illustration. Carbon is treated of in the lectures not only as the basis of all vegetable and animal tissues, but also in its mineral relationships. The first lecture treats of marble, lime, and carbonic gas, and there is one on graphite and diamond, solid and liquid carbonic acid gas, &c.—"Casell's Primary Series: Our Bodies." By Ellis A. Davidson. "An Elementary History of Britain." By the Rev. W. E. Littlewood, M.A. London: Casell, Petter, & Galpin. These are two very good little treatises for little people. That on Our Bodies, especially, forms a useful elementary text-book of human physiology, with 100 questions for examination; and, of course, the subject of health is not overlooked: the lessons are digests of lectures given in the City of London Middle-class Schools.—"Abstracts of Two Papers on the Geography of Disease. By Alfred Haviland. The important papers on the geographical distribution of heart-disease and dropsy, and of cancer, in England and Wales, already familiar to the readers of the *Builder*, are here made accessible to the public in a separate form. The author is turning his attention to the intimate relation between the prevalence of rheumatism and excess of heart-disease in certain parts of England; and to the remarkable prevalence of cancer in tertiary and post-tertiary districts subject to inundations.

Miscellanea.

Money for Public Buildings.—In the present financial year the outlay from the public purse for new buildings, sites for new buildings, alterations and maintenance of buildings, and construction of harbours, is not very likely to be less than 900,000l. The item of purchase of sites will include 55,000l. for space for enlarging the National Gallery northwards, and 45,000l. for more room for the offices the centre of which is in Downing-street; to say nothing of 25,000l. for ground adjoining the Victoria Tower, and of possible payment in respect of the new Court of Justice. Among new buildings we have demands for nearly 65,000l. towards providing "accommodation for various learned bodies" in the court-yard of Burlington House; 32,000l. for proceeding with the new Home and Colonial Record Repository; 30,000l. towards a building for the London University; 29,000l. for erecting, improving, and maintaining sheriff court-houses in Scotland; 20,000l. towards new buildings for the University of Glasgow; 10,000l. towards the extension of the Industrial Museum at Edinburgh. The Post Office department requires this year 50,000l. towards the erection of new offices in St. Martin's-le-Grand; 21,850l. for purchase of a post-office site at Birmingham; and various other sums for new post-offices, alterations, repairs, and maintenance, amounting up to a total of 165,000l. Ireland must have 100,000l. for new works and alterations in public buildings and harbours, and for their maintenance. Embassy houses, as usual, make their appearance in the building programme of the year. To this must be added 135,000l. for alterations, repairs, and maintenance of palaces, public offices and buildings, and the Houses of Parliament.

The Glass of the Romans.—The Slade collection in the British Museum is exceedingly interesting, and contains a great variety of Roman glass. Mr. Franks has made a report on it, in the course of which he says:—"Of cut glass, an art which it was formerly denied that the Romans possessed, there are good examples; such, for instance, is a boat-shaped vase of deep emerald hue, and of the same make apparently as the Sacro Catino of Genoa; a bowl cut into facets, found near Merseburg in Germany; and a cup, similarly decorated, found near Cambridge. Two vases exhibit designs in intaglio; one of them a subject with figures; the other, a bowl found near Merseburg, exhibits the story of Diana and Actæon. Of vases decorated in cameo, fragments alone are to be found in the collection, but as only four entire vases are known, this is not surprising. One of the fragments seems to be part of a large panel which has represented buildings, &c., and has on it remains of a Greek inscription. One of the rarest specimens in the collection is a circular medallion of glass, on which is painted a gryphon; the colours appear to be burnt in, and it is therefore a genuine specimen of ancient painting on glass, of which but three other instances are known."

The Brighton Drainage Question.—It is satisfactory to be able to state that the town council have decided to carry the sewage to a distance (either east or west) from the town by an intercepting sewer; so obviating all objection to the disembowment of the sewage in front of the town. It was merely by the casting vote of the mayor, however, that the decision was come to, there being 21 for and against an amendment to the effect that the plan already adopted be persisted in. Immediate steps are to be taken to carry out the resolution of the council; and the General Purposes Committee have been empowered to employ a competent engineer to advise as to the best course under the circumstances.

Preservation of Ancient City Records.—At a special meeting of the Court of Common Council last week, Dr. Saunders brought up a report from the committee for establishing a library in the Guildhall of the City of London, stating that they had provided a fireproof receptacle in the library, and they had the pleasure to report that the valuable manuscripts, &c., in the keeping of the committee were deposited therein, and that the records of two parishes in the city, replete with valuable information as to the citizens of the seventeenth century, have already been confided to the custody of the librarian. The report was agreed to without discussion.

Pre-historic Remains in Northumberland.—The Rev. Canon Greenwell, of Durham, accompanied at different times by Sir William Armstrong, Captain Noble, R.A., Captain West, R.N., and Mr. J. Hancock, of Newcastle, has concluded for the present an interesting survey and examination of the ancient rocks, camps, cairns, Druids' circles, and pit dwellings of Northumberland. The whole district abounds in remains of pre-historic times. Various implements of bronze and iron were found in cists along with urns and human remains. The whole of the northern slopes of the hills in the neighbourhood of the two camps of Tossen and Lordenshaws (and the same feature occurs at other places in the district) is furrowed by the most enigmatical road-like hollow ways, which run up to the crown of the hill, in some places cut at a considerable expense of labour through the ground. The roads, or whatever they are, remain an archaeological puzzle. Large stone cairns crown the ridges of the hills, most if not all of which have been opened to a greater or less extent, probably by shepherds in search of treasure. Close by the camp at Lordenshaws are several rocks with the cup and concentric ring markings so abundant in Northumberland, and also found in Dorset, Argyleshire, and Ireland. Two places of sepulture were examined on the North side of the Coquet upon Cartington Fell. One was a flat bowl-shaped cairn of large size, in the centre of which were a cist, and some human remains. About a hundred yards north of this cairn was a circle of large stones. The inner diameter of the circle was 14 ft. These stones were partly enclosed within a cairn 28 ft. diameter and 3½ ft. high, and it is probable that at one time the inner space of the circle had been filled with stones, since removed for walling purposes, and that the circle was within a cairn. At the centre was a hole, which contained the bones of a burnt body. Canon Greenwell and his friends have commenced a series of investigations on the Howardian Hills in Yorkshire.

Alexandra Orphanage.—A bazaar is being held in the Royal Horticultural Gardens, now in full health, in aid of the Alexandra Orphanage for Infants, Hornsey-rose, and will remain open until this Saturday evening. In our volume for 1868, we gave a view and plan of the buildings intended to be erected by the charity. In the space of four years freehold land has been purchased at the cost of 3,367. 17s. 3d. Eight cottages have been erected on it at the cost of (with the lodge), 5,100.; and the central building is completed, at the cost of 6,000.; besides which the committee have had to provide sewers, make their portion of the road, and otherwise do a great deal of ground work, rendered necessary by the orphanage being on the side of a hill. The schools have yet to be built. At the present time there are 100 infants under the care of the charity. It may be worth while one of these days to inquire if some cheaper course could not have been adopted.

The Brighton Sanitary Association.—The annual meeting of the friends and subscribers to this association has been held at the Royal Pavilion. The report stated that during the past year 90 courts and streets had been visited by the agent of the association, and that 133 tracts, 98 papers, 7 almanacs, and 18 bottles of disinfecting fluid distributed. A number of houses had been white-washed, and each month the increased list of brushes and syringes lent showed that the people were in some degree waking to the importance of cleanliness. The library of the association contained 114 books and pamphlets, useful works on sanitary subjects, and the committee, who appealed for increased help, hoped speedily to make arrangements for lending out these works. The balance-sheet showed the funds in hand to be 257. 7s. 2d. The report was adopted and ordered to be printed for circulation. In connexion with the association there is, in two rooms at the Pavilion, an interesting museum of inventions, &c., relating to sanitary science. There is also a collection of various articles of food, by which persons may be taught to discriminate between the adulterated and the unadulterated.

Archaeological Society of Norfolk.—An excursion has been made by the members of this society to several of the county churches. The attendance was pretty good. Yarham, Mattishill, North Tuddenham, Hockering, East Tuddenham, Brandon Parva, Barnham Broom, and Coston and Kimberley were visited.

Oxford Architectural Society.—On Wednesday, May 26th, a meeting of this society was held in the Taylor Building, by permission of the curators. Mr. James Parker offered some remarks on the churches of Shipton and Burford, and upon the early history of those places. Mr. E. A. Freeman gave a short account of the battle between the Mercians under Egelbald, and the West Saxons under Cuthred, which is recorded to have taken place at Burford. Mr. J. H. Parker spoke upon the question of the Fairford windows, arguing against the probability of their being the work of Albert Dürer. A few members of the society and their friends made an excursion to Fairford on Friday, May 28th. At Burford Church, by the courtesy of the vicar, they had full opportunities of examining all the parts of this most difficult and instructive building, important alterations seeming to have taken place every fifty years from the twelfth to the sixteenth century. At Fairford, they visited the church, and there, of course, much discussion ensued as to the windows; and the remains of the older church, which was not destroyed, but made use of in building the fifteenth-century one, called for considerable attention. The discussion on the glass seemed to show that it was not all of one period or of one country, much less the work of one artist. Some portions seemed to fit the windows better than others, as if in the one case the glass were made specially for the windows, but in the other cut out of larger pieces to the size of them.

Unveiling of the Palmerston Statue in Southampton.—The Southampton statue of Lord Palmerston has been placed on its pedestal and inaugurated. The height of the figure is 8 ft., and the pedestal rises about 9 ft. from the ground. The basement is of concrete, 10 ft. square, with three tiers of brickwork above it, each 6 in. thick; and these are surmounted by a granite plinth and a marble base. The statue is that which was exhibited at the Royal Academy last year, and was executed by Mr. Thomas Sharp, of London. Lord Carnarvon unveiled the statue, which bears the following inscription:—

PALMERSTON, K.G., G.C.B.,
BORN, 1784; DIED, 1865,
A BURGESS OF SOUTHAMPTON.
ERECTED BY PUBLIC SUBSCRIPTION.
FREDERICK PERKINS, MAYOR, A.D. 1869.

The leading noblemen and gentlemen present were "grouped" near the statue at the unveiling, to enable Mr. Sache, photographic artist, to take a picture, proofs of which are now on sale. On three hearty cheers being given in honour of the deceased, and of Lady Palmerston and her son, the Hon. W. F. Cowper, M.P., who was present, Mr. Cowper responded in an address of thanks, on Lady Palmerston's behalf and his own. Earl Fortescue, the mayor, Earl Carnarvon, and others also addressed the assemblage on the occasion.

Art Schools National Competition.—The following gentlemen have acted as the examiners of the works sent up in competition from the schools of art throughout the United Kingdom:—Sir Francis Grant, P.R.A., Sir M. Digby Wyatt, Messrs. J. C. Horsley, R.A., F. Pickersgill, R.A., R. Westmacott, R.A., and E. J. Poynter, A.R.A., assisted by Mr. Redgrave, R.A., and Mr. Bowler. Upwards of 61,000 works have been examined in this competition.

Newspaper Press Fund.—The sixth anniversary Dinner of this association took place on Saturday night at Willis's Rooms, Lord Honghton, the president, in the chair. The company present were about 200 in number. The musical programme was, as on former occasions, of an attractive character, and formed a leading feature of the anniversary. A departure from the usual order of proceedings on occasions of this nature took place in having the whole of the singing and instrumental music in the early part of the evening, and during the time when the usual loyal and patriotic boasts were given. The subscriptions announced in the course of the evening amounted to about 700l.

The Telegraph Transfer.—The Chancellor of the Exchequer has stated, in the Commons, in answer to Mr. Hunt, that as the arrangements for the purchase of the telegraph lines by Government were not yet completed, it would be premature to make any announcement regarding them.

Stratford-on-Avon.—Ann Hathaway's cottage and garden have been advertised for sale by private contract.

Roman Decoration.—The Roman correspondent of the *Morning Post* says a very interesting discovery with regard to the state of preservation of the decorative paintings now revealed, has just been made on the Palatine-hill. During the continuation of the excavations, under the direction of the Chevalier Rosa, two chambers have been brought to light, about 50 yards westward of the temple of Jupiter Victor, which, from the style of their construction, the elegance of their mosaic pavements, and the artistic colouring and design of their mural paintings, evidently belonged to a portion of the imperial palace, dating from the Augustan period. The preservation of these specimens of the interior decorations of a part, at any rate, of the vast fabric, inhabited for centuries by the rulers of the Roman world, is owing to the fact that these chambers, with probably several others which will gradually be cleared out in the same manner, served, after being filled up with rubble, as substructions to an edifice constructed at a posterior date, a portion of which—a foundation wall, indicating masonry of the fourth or fifth century, is still standing within the original area of the principal chamber, which it divides longitudinally, hiding one side of the mural paintings; on the other, however, are several admirably-preserved specimens of Roman house painting, the most remarkable subject being the favourite fable in which Argus, Io, and Mercury are the protagonists.

Experimental Erection of Concrete Cottages.—Cottages being required in connexion with the newly-sunk colliery at Carberry, says the *Scotsman*, the experiment is being tried by the owner of the estate, Lord Elphinstone, of building them of concrete. A plan has been laid down for a village of 40 houses, with church and school-house, to occupy a space of about 5 acres, between the Inveresk railway station and the colliery. Twenty cottages are already in course of erection at Elphinstone, but these are being built of stone, the experiment with concrete not having been resolved upon at the time they were begun. A commencement has been made with the new village, the operations being in the meantime confined to one of the corner blocks. Mr. Tall, the patentee of the moulding apparatus for forming the walls, is down to give the work a proper start. The cost of the experiment cannot yet be ascertained, but it will be fairly tested by comparison with the cottages which are being built of stone on another part of the estate. The experiment of coal-dust is being tried as part of the material in this instance. Should it succeed, the name of Coaltown will probably be given to the place.

Improved Dwelling-houses for the Industrial Classes.—A meeting has been held in the Guildhall, Newcastle, for the purpose of promoting the formation of a company to be called "The Newcastle-upon-Tyne Improved Industrial Dwellings Company (Limited)." Mr. James Hall, the originator of the scheme, stated that the Corporation had kindly placed the professional services of Mr. Lamb, the property surveyor, at the disposal of the company, and from an estimate he had made, a building capable of containing 200 persons would cost 4,000l. Mr. Lamb estimated that such block would, basing his calculation upon the rate paid for inferior dwellings, yield a return of 5 per cent., allowing 25 per cent., for a reserve fund. To make this experiment it was proposed to form a small company, with a capital of 5,000l., in 500 shares at 10l. each. One-third of the amount had already been subscribed. Resolutions were unanimously passed in favour of the scheme.

Building for a Week.—Orders have been given at Ismailia for the construction of the palace to be occupied by the Empress of the French during her stay in M. Lesseps's newly-built city. Twenty contractors from Alexandria and Cairo sent in plans and tenders. The sum to be expended must not exceed 27,000l. It must be completed by the 1st of October. Twelve pounds per day is the fine if the palace be not completed in time, and 12l. premium for every day it be completed beforehand. The building will be 150 ft. by 120 ft.

Women's Wages.—The working women of Boston (America) have organized a league, among the objects of which are to educate women until their labour shall be as valuable as that of men, and to secure an equality of wages between the two sexes.

Suggested Memorials in Trafalgar-square.—Some suggestions have been made for the improvement of Trafalgar-square. Mr. Sang proposes to make use of the water-supply of the existing fountains and to substitute two of the existing fountains and to substitute two memorials, the one in commemoration of the deeds of the army and the other of the navy. Both are similar in outline, but differ in their mode of embellishment and detail just sufficiently to indicate the special attributes of the two services. The memorial consists of two large square fountains, the sides of the basements of which are moulded and rest on a triple plinth, all of Sicilian marble, enriched with panels, or square serpentine tablets, intended to receive the names of the officers and men who fell or distinguished themselves at the various actions in their country's service. Out of one fountain rises a block of white marble, with four high reliefs in bronze, representing the deeds of valor of British warriors. This pedestal is surmounted by a group of war-trophies, and with its candelabra-shaped base forms the footing and hold of a Venetian mast or standard-pole, of a great height. One of the suggestions in the treatment of the square is the substitution of terrace balustrades, with a flight of steps open along the width of the northern side of the square, immediately facing the National Gallery. We have not heard at whose instance these proposals are being made.

The Surbiton Sewage.—A memorial has been presented to the Home Secretary from the Surbiton Improvement Commissioners, setting forth the nature of the difficulty in which they are placed as to the disposal of their sewage. By the Thames Conservancy Act, 1867, they are forbidden from allowing the sewage to enter the Thames after September next; and the Commissioners are desirous of having the time postponed, in order that a combination of townships may be effected, with the view of carrying the common sewage between Staines and Richmond, inclusive, to Woking Heath, on the plan prepared by their surveyor, Mr. Herritage. Such a union, they state, can only be effected by Government intervention, as attempts to bring it about have already failed. The case of Surbiton is one of peculiar hardship, as a system of sewerage has already been carried out under the Surbiton Improvement Act, which ordered the sewage to be emptied into the Thames.

Proposed Local Workmen's Exhibition in Worcester.—A meeting of working men and their employers has been held in the Guild-hall, Worcester, to consider the desirability of holding a local working men's exhibition from which suitable specimens could be selected for exhibition in the Workmen's Industrial Exhibition, proposed to be held in London in 1870. The Mayor (Mr. F. Woodward) occupied the chair, and appropriate resolutions in favour of the object in view were unanimously carried. The local exhibition will be held next year, previously to the London Exhibition.

Wisbech Museum.—The Townshend collection at this museum has been opened with a *conversazione*. The donor of this collection was the Rev. Chaucey Hare Townshend, of Park-lane, London, and Langsme in Switzerland. The bequest was of so great an extent that the directors of the museum have had to incur an outlay of nearly 400*l.* to provide suitable cases, &c., for the reception of the valuable articles which it comprised. The porcelain and glass have been arranged by Mr. William Smith, of Wisbech.

New Docks for Fleetwood.—There have been great rejoicings at Fleetwood, the occasion being the cutting of the first sod for new docks. The docks will be 600 ft. long and 400 ft. wide. The excavations will be only 16 ft., by which 23 ft. of water will be obtained from the dock sill at high water with an ordinary spring tide. The engineer is Mr. Cox, of London; and the contractor, Mr. Chambers, also of London. Above where the docks will be formed, considerable improvements by embanking have been made.

Fortunate Discovery of Coal.—A vast coal-field, extending for 300 miles, has been discovered on the line of the Union Pacific Railway. As regards the "opening up" of the Far West, this coal deposit is of the greatest importance, but to the Pacific Railway Company it is of special value. Six mines have already been opened. One of these yielded 4,000 tons in three weeks.

Value of Land in London.—We hear that the Merchant Taylors' Company have paid 90,000*l.* to the governors of the Charter House for five acres and a half of the land lately occupied by the Charter House Schools, and intend to remove their school from Suffolk-lane to it. They have let a portion for building purposes, but they retain three acres and a half for the school and its playground.

Alleged Discovery in St. Gervais Church, Paris.—A discovery has, it is said, just been made in the old church of St. Gervais. Some persons who were repairing the woodwork at one of the sides of the nave discovered a secret door, giving access to a small chapel, hitherto not known, the walls of which are entirely covered with excellent paintings in the Renaissance style, in good preservation.

Exmouth Improvements.—The completion and opening of a new and commodious market, extensive docks, and a family hotel, are announced in the local *Journal*. The market is light in structure, and has an area of about 120 ft. in length, by 60 ft. in breadth. The docks will prove to be one of importance to the trade of Exeter, as well as of Exmouth.

New Post-office for Birmingham.—The miscellaneous estimates contain a vote of 21,550*l.* for the purchase of a site for a new post-office in Birmingham. The land selected, according to the local *Post*, is at the corner of Paradise-street and Hill-street, opposite the Town-hall, and close to the intended site of the corporate offices and assize court.

Works of Albrecht Durer and Lucas van Leyden.—The members of the Burlington Fine Arts Club have collected a number of the works of these artists in the rooms of the club, 177, Piccadilly, where they are now on view to members' friends and others.

Fires caused by the Heat of the Sun.—Two fires that occurred on Monday are reported to have been caused by the excessive heat of the sun. One was in Lambeth, the other at Millwall.

York City Surveyor.—Mr. George Styan, architect, has just been elected by the York corporation as city surveyor, successor to the late Mr. Pickersgill.

TENDERS.

For erecting a new wing and making alterations to No. 20, Mornington-road, for Mr. W. Brookes. Mr. Alex. J. C. Scoles, architect:—

Ransom	.....	£900	0	0
James	.....	875	0	0
Rigby	.....	720	0	0
Falkner	.....	778	0	0
McKiville	.....	770	0	0
Fletcher	.....	697	0	0
Robson	.....	684	0	0
Heath	.....	682	0	0
Mills	.....	648	0	0
Kelly Brothers	.....	638	0	0
Gina	.....	627	0	0
Bull	.....	618	0	0
Hutchinson	.....	603	0	0
Lowdon	.....	603	0	0
Till	.....	609	0	0
Knight	.....	677	0	0
Castle (accepted)	.....	598	0	0
Cubitt (withdrawn)	.....	458	0	0

For the English Presbyterian Church, Leves, Mr. F. Poulton, architect:—
Carter & Sons £1,870 0 0
Savayr (accepted) 1,838 0 0

For pianoforte manufactory, Wood Green, for Mr. H. A. Ivory. Mr. Geo. Loe, architect:—
Eustace £3,738 0 0
Kist & Brown 2,480 0 0
Cooper & Cullum 2,475 0 0
Hart 2,450 0 0
Blackmore & Morley 2,390 0 0
Crabb & Vaughan (accepted) 2,320 0 0

For villa residence at Addiscombe for Mr. J. O. Cullid. Mr. Geo. Loe, architect:—
Cooper & Cullum £1,530 0 0
Idenden 1,330 0 0
Crabb & Vaughan 1,480 0 0
Blackmore & Morley 1,490 0 0
Eustace 1,467 0 0
Marriage 1,380 0 0
Hart 1,380 0 0

For the erection of St. David's National Schools, Birmingham. Mr. Edward Holmes, architect. Quantities supplied:—
Ravenscroft (accepted) £1,400 0 0

For new stabling and billiard-room, &c., Royal Hotel, Sutton Coldfield. Mr. Edward Holmes, architect. Quantities supplied by Mr. Thomas Mansell:—
Parton £1,938 0 0
Sapote 1,865 0 0
Jones 1,572 0 0
Parker & Son 1,569 10 0
Jeffery & Pritchard (accepted) 1,338 10 0

For the erection of new workhouse, Penkridge, Staffs. for Mr. Edward Holmes, architect. Quantities supplied by Mr. Thomas Mansell:—

Holt	.....	£2,399	0	0
Debbay	.....	2,290	0	0
Gold	.....	2,200	0	0
Yates	.....	2,190	0	0
Gough	.....	2,684	0	0
Bell & Son	.....	2,635	0	0
Bennett	.....	2,625	0	0
Hunter & Bennett	.....	2,580	0	0
Wilkes	.....	2,536	0	0
Horsman	.....	2,455	0	0
Gedray	.....	2,400	0	0
Thompson	.....	2,280	0	0
Hilton	.....	2,250	0	0
Mathews	.....	2,232	0	0
Bennett	.....	2,128	0	0
Lilley	.....	2,012	0	0
Espley	.....	1,983	0	0
Nelson	.....	1,880	0	0
Horsley Brothers	.....	1,873	0	0
Gilbert	.....	1,810	0	0
Trox & Sons	.....	1,600	0	0
Farnell & Son (accepted)	.....	1,510	0	0

For Engineer's Work.
Benham £1,150 6 0
York 637 7 6
Taylor 610 12 0
Gedray 567 0 0
Bennett 555 0 0
Cartwright 467 0 0
Smith & Son 475 0 0
Parker 462 0 0
Jeakes & Co. 463 0 0
Carter & Co. 330 0 0

For new warehouse and shop-front, Grove-street, Wantage, for Mr. J. Dickey. Mr. J. P. Spencer, architect:—

Whiting & Toalson	.....	£247	10	0
Partridge & Aldworth	.....	247	0	0
Wheeler	.....	241	10	0

Accepted.

For works to warehouse, Great Dover street, Southwark, for Messrs. Cohen & Co., Messrs. Jarvis & Son, architects. Quantities supplied:—

Thompson	.....	£597	0	0
Marsland & Sons	.....	575	0	0
Richardson	.....	553	0	0
Bagley	.....	436	0	0
Tarrant	.....	424	0	0
Kent (accepted)	.....	416	0	0

For drainage works, Devises:—
Contract No. 1. Contract No. 2. Contract No. 3.
Randall & Baxter 2,968 3 2,366 6 2,287 0
Bloomfield 831 0 815 0 838 0
Ash 795 0 325 0 240 0
Mullings 791 0 320 0 245 0
Jones & Jessop 770 0 216 0 337 0

The following were disqualified through not having complied with instructions in specification to divide into three contracts:—
Ambrose £1,170 0 0
Foster 1,135 0 0

* The tender of Mr. Mullings for Contract No. 1, and those of Mr. Ash for Nos. 2 and 3, have been accepted.
† Subsequently stated they had made errors.

For alterations and additions to a villa residence at Lee, Kent. Mr. Herbert Ford, architect:—

Henshaw	.....	£3,523	0	0
Gorman	.....	2,511	0	0
Candler	.....	2,315	0	0
Scrivener & White	.....	2,37 0	0	0
Kilby	.....	2,139	0	0
Tongue	.....	2,125	0	0
Francis	.....	2,050	0	0
Perry	.....	2,041	0	0
Morter	.....	2,016	0	0

For the erection of a pair of semi-detached villas, Tufnel Park, for C. Head, esq. Mr. Denison, architect. Quantities supplied:—

Mann	.....	£3,645	0	0
Warne	.....	3,510	0	0
Wicks, Bangs, & Co.	.....	3,450	0	0
Carter & Sons	.....	3,350	0	0
Ennor	.....	3,170	0	0

TO CORRESPONDENTS.

G. R. S.—E. M. B.—O. S.—Y. T.—H. H.—H. B.—H. S.—H. R.—A. J. C. S.—R. R.—R. F. D. C.—E. A.—T. D.—E. G.—Z.—J. P. B.—A. C. F.—E. B.—G. W. H.—T. H.—E. E. R.—N. A. R.—Mr. R.—J. M.—G. L.—Mr. R.—W. P.—R. B.—R. D. H.—W. J. L.
Builder (he can charge for his time if employed to make the drawings).—H. P. (he cannot interfere or part).—Birmingham Architectural Association (in type).—R. L. R. (in type).—C. G. (should look to previous numbers).

We are compelled to decline pointing out books and giving addresses.
All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.
Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the author.

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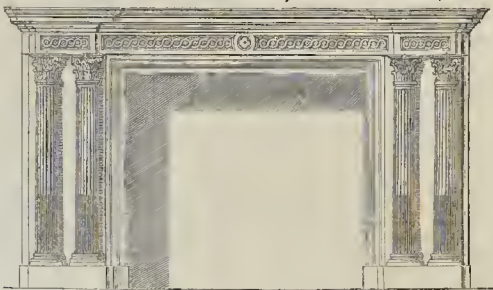
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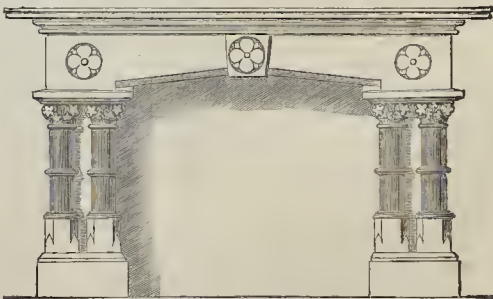
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The Builder.

VOL. XXVII.—No. 1376.

The Position of Labour and Capital.

THE *Builder* declares itself weekly to be a journal for the architect, engineer, operative, and artist; and weekly, we are naturally prepared to hold, does it justify its profession of purpose. Whether in advertisement pages or in the pages they envelope, we have reason to believe that the operative, no less than the classes he is associated with, habitually looks, and not in vain, for amusement, for instruction, for aid, and advantage. Employer and employed here find themselves, therefore, face to face, each in search of subjects of special interest,—side by side in search of matter of common interest; but what is the attitude in which they are confronted by our columns when the topics of the



day inevitably bring forward a conflict of interests?

For the publication itself, at least, there is then no position open or desirable but independence,—independence, not indifference; a position not so much out of the dust of the dispute as above it; from this position it will often, nay, we would boldly say, it will always when best taken advantage of appear that the conflict of interests does not in reality exist, or has only been superinduced by disarrangements and mistakes that either one or both parties ought to learn how to correct,—as purely the consequences of blind impulse or false reasoning as any of the errors in diet or medicine that are sufficient to put into opposition even the typical co-partnership of the belly and the members.

This is a principle, indeed, that should be held to be transcendental,—axiomatic, when large interests are considered largely,—when anything is in question beyond a personal struggle for a particular limited benefit that only one can enjoy, and that the defeated must be deprived of, and when consequences are regarded as affecting entire classes and extending broadly over space and futurity. Industry is an organization of which the healthiness depends on harmonious co-operation of all its parts; and this is so certain, that no proof of the bearings of a particular case can overturn it—can contravert the conviction that desperate mischief lurks in chronic quarrels and recurrent outbreaks, in unfair restraints or overbearing oppression, either on one side or the other.

This axiom we lay down in perfect confidence, not merely in its abstract philosophical truth, but as one of those maxims which any one who has to deal with mankind on a broad scale

should have ever in his mind, and will be made the best use of by those who are least likely to neglect the appreciation of the motives that have a really actuating force in the business of the world. By whatever clumsy compromise it may be necessary to patch up the dispute of the hour, the complete reduction of a difficulty can never be hoped for from an arrangement that does not announce itself as the best for both sides.

But if this be so, we can scarcely escape from the inference that many of those who speak and write most fluently on the claims and duties of labour and capital know but very little of the subject they are so diffuse upon. It is, indeed, comforting to be able to think so, however much hope of assistance in a difficult subject is forfeited in consequence.

Unionism—the principle of trade-unions as avowed and acted upon—is certainly one of the most definite expressions possible of conflict of interest between class and class. The union, by its own declaration, is in most definite antagonism to the employing capitalist on the one hand, on the other to the joint mass of labourers unassociated, whether the skilled in the craft who will not join the union, or the unskilled who would fain acquire the craft, but are excluded by union conditions. Now, having in view the axiom which has just been laid down, we enter upon the consideration of the position of an individual operative—of an operative in all the rights of an independent point of view—with the conviction that his most prudent and advantageous course, apart from the pinch of a casual dilemma, will be perfectly consistent with the best interest of employers, and of skilled and unskilled competitors.

The considerations involved in these questions have been recently put before the world with great fulness, and in a most readable form in Mr. Thornton's work,—“Labour: its Wrongful Claims and Rightful Dues; its Actual Present and Possible Future.” In a review of this work Mr. J. S. Mill has taken occasion to set his own position on the subject again before the world with certain corrections, without, however, as it seems to us, bringing much new light to the dark passages. In considering the relation of labourers and employers, he says,—“I agree with the author that conduct may be ‘grovelling and sordid’ without being morally culpable.”—p. 691; and so at once cuts through the sympathy with his argument of those with whom ‘grovelling and sordid’ are terms of moral imputation, and of nothing else whatever. The enunciation prepares for the strabismic distinction a few pages onward:—

“As between themselves and their employers, unionists are under no obligations but those of prudence. The employers are quite able to take care of themselves. Unionists are under no moral duty to their employers which the conditions they may seek to impose on them can possibly violate. But they owe moral duties to the remainder of the labouring classes, and moral duties to the community at large; and it behooves them to take care that the conditions they make for their own separate interest do not conflict with either of these obligations.”—p. 695.

This is to make sacrifice of a perfectly operative restraint,—the feeling of what is honourably due to the immediate party to a contract,—in reliance upon a vague world-wide reference to the influence which no mathematics could calculate upon an infinite outlying world, of which the immediate contact is scarcely perceptible at all.

The question at issue as regards all parties,—masters, men, and outsiders,—is in truth one of free trade, merging ultimately of necessity in the still higher questions of personal and political freedom. As regards fundamental legality there can be no dispute. Masters have an admitted right to agree together what terms they will offer; men have the same right to agree together what wages they will accept; Neither men nor masters can have a right to secure the effect of their agreement by means which

infringe the independent rights of any who may choose to be dissentient. Masters may combine if they can, and men may combine if they can; men to protect themselves against masters, masters to protect themselves against men; nay, masters and men may combine together, if they please and if they can, to protect themselves against the public, and the public in self-defence may have a counter combination if it is able.

If any of these rights are not sufficiently protected by law there can be little doubt that advantage will be taken of the flaw by the competitors interested, and it would be vain to hope to restrain them as a body from making the most of the opportunity by lectures on a moral duty owed to the community at large or to any section of it. But such an exposition may be fairly addressed to the arbiters of legislation and to the public opinion which in its process of development is not above the aid of moral considerations in groping its way to the prudential as identical with the just,—to a rule likely to be abiding as manifestly based on fair play.

When the rights of all—masters and men, unionists, non-unionists, and public—are duly guarded by law, all else may be left to the settlement of competition, the struggles of self-defence, the course of the market. When free trade has opened the accesses of the market so widely, we cannot fear lest free competition should not have fair scope. Competition is the sharpener of the wits and the spur of industry; and sorely as it may pinch individuals, its ultimate effect must usually be the enhancement of the gross produce divisible among the parties to its production. Every class will have food for discontent, no doubt. The discontent, however, of one class is the sign that another is not a hopeless victim. Industry is not gambling; it is not a juggling process for distribution of a value derived independently; it is no struggle of robbers over a booty; it involves what is equivalent to creation as well as distribution; it devours to reproduce, and forfeits its most characteristic quality and dignity when squabbles over proportionate shares of results destroy or even seriously impair the vitality on which the amount, not to say existence, of a result depends.

The first book of Mr. Thornton's work is introductory, and treats of Labour's causes of discontent. The exposition is truly serious enough to make a statesman serious, but is scarcely expanded to the completeness of other portions of the subject. The class below the lower class has itself several subdivisions; and how far the conditions of hardship in each of these may be directly alleviated or sweetened by gleam of hope is an inquiry that would lead us direct to the relations between them and the class above them—the class next above them, but separated by a chasm wider than separate commoners from the peerage.

Book II. treats of Labour and Capital in debate, from the most unregulated chaffering that leads to an agreement for wages, to the spirit of organization—the origin of traditions. Book III. treats at large of Labour and Capital in Antagonism, as exemplified in the operations of trade-unions for good and evil, and the writer asserts the good as enthusiastically as he frankly admits the evil. This book may be taken to present a picture of unionism in its present phase, which we cannot consistently with the axiom we started with be content to regard as its best, healthiest, or ultimate development. We pass, therefore, with interest to the last book,—Labour and Capital in Alliance; and here we have a review of the various attempts that have been made to accomplish a peaceful and mutually advantageous alliance between forces that are mutually indispensable, and never can be working to best advantage when not working in harmony. It is at this point that we may be well excused if we

are less confident than Mr. Thornton as to the subject being at present so fully elucidated as to enable a positive solution of all its difficulties to be yet obtainable; and, moreover, so far as good lights are at present provided—may, even—by the guidance of the very beacons that are provided in his own pages,—we turn our most hopeful looks towards a different haven from that in which we seek rest.

The first chapter treats of the attempts to reconcile labour and capital to hearty co-operation on the plan of industrial partnership.

On this system the employer nominally—for virtual case, to be out of the question—takes his workmen into partnership. The favourable example is a colliery in which the annual profit made in excess of a certain amount is divisible among the regular workmen rateably according to their respective earnings. The incentive to steadiness and industry is said to have been most effectual; and where the profit mainly depends on the steadiness and industry of the wage-earning workmen, no principle could be more legitimate; but the system violates all the rules of a trade-union. It is equivalent to pay for piecework, to encouragement to "chasing" and overtime. As administered with wisdom and fairness, the system has answered, but when the estimate of divisible profit rests with the capitalist, and the surplus is dependent on his arbitrary reckoning "of fair and usual reservation for redemption of capital and other legitimate allowances"—partnership is scarcely the word to use. From another instance cited, Mr. Thornton appears to be quite unaware of the extent to which the principle of a percentage on profits to the employed obtains throughout general business. In the form of premium upon amount of sales, or, at least, of sales of particular classes of goods, it is in operation in half the large establishments in London. To such establishments as those of the hilling trade, Mr. Thornton does not pretend that this scheme of conciliation of the claims of labour can be applicable; he has most confidence in co-operative societies, the subject of his third chapter.

The principle of co-operative societies is for the labourer to be a part owner; business is to be carried on by associations of capitalist workmen. It strikes one at once that this is very like a proposal to improve the condition of dock-labourers by making them skilled workmen. That a workman should have more or less capital—that is, a fund of savings—is, we have no doubt, the enthusiasm of very much of the misery that from time to time afflicts him and his belongings. We doubt not that every skilled workman may, by common prudence and self-restraint, get beforehand with the world in this way; but it is then a question very open to debate whether his most prudent course will be to make such an investment of it as is implied in his partnership in a co-operative society of whatever trade. There can be no doubt that by this path certain workmen, of unusual capacity and of thorough principle,—of tenacity of purpose and just confidence in each other,—may gain for themselves an improved position. This has been shown in the celebrated case of Rochdale; but with what result? Workmen who were capitalists have become capitalists who may or may not be workmen, and who employ others who are in no sense capitalists. So it is now branded as false to its principle, "the Iscariot of the tribe" (p. 403). Desertion on the one hand, and difficulties and failures on the other, make so much havoc with the examples adduced in favour of this panacea, to which we have ourselves a leaning, that it would be tedious to dissent upon it further. To obtain more cheering encouragement we must turn back to chapter ii, which we passed over, on Co-operative or Associative Stores. Into the details of these we have not space—it is, indeed, unnecessary—to enter. Their principle and working are well known. They are the very anchor of a workman's home, making easy to him the commencement of habits of economy by immediate reward of improved comfort, and inducting him into the faculty of association, of watchfulness against fraud, with frank reliance on the truly reliable. They secure genuine articles, just weight and measure, moderate price involving great economy,—freedom from debt. But the workman is bound to be far more beforehand with the world than will just enable him to qualify for participation in a co-operative store, by paying ready money for the current week. He has the contingencies of marriage, the emergencies of accidents, of sickness, of

funerals, of age, to provide against. Against all these his only safety lies in insurance, whether in a benefit society that will really insure what he bargains for, or in whatever other form. His own prudence must be the judge of the trustworthiness of the hands in which he places these hard-earned resources,—a trade-union or post-office savings-bank.

No man should be debarred from striking if he chooses for a grand advance in life, and if he knows his own capabilities—his own nature well—he may take his chance for opportunities; for if they do not occur, he will make them. But for the multitude of any class, the best policy will be to grasp firmly at the nearest rounds of the ladder. Those within reach of the workman are not to be despised. The long care for a remote future that over oppresses the capitalist he need not know. He may marry early; he may hope to see his children married early, providing for themselves; and thus the sweetest of all morsels on the board of nature is before him at an age when others higher up have not begun to allow themselves to dream of it. Intellectual pleasures are now well within his reach, and leisure of a purity unknown to other classes. But the basis of all must be not only industry, but forethought, and such bestowal of his surplus earnings as will secure with certainty comfort for himself and family.

ARCHITECTURAL REVIEW IN SCOTLAND.

EDINBURGH ARCHITECTURAL ASSOCIATION.

At the closing meeting on the 9th inst., Mr. Alexander Ballantine, the president, delivered a valedictory address, of which we give the pith.

In proceeding, first, to the consideration of ecclesiastical architecture, I find that at present none of the different religious persuasions possess any distinctive architectural character. For instance, who can, in passing through a town, say, that is a Roman Catholic church, and that an Episcopalian, or Presbyterian? A lettered tablet over the door may sometimes enlighten one, but I think that—externally, at any rate—any distinct expression does not exist, in the sense of a religious devotional feeling.

That such has always exercised some considerable influence upon the art of a country cannot for a moment be questioned. I do not say that it always exercised a beneficial effect; for sometimes it so jealously and mercilessly asserted its convictions, that art, strong only in the generous and gentle impulses of our nature, was ruthlessly trampled on and discouraged.

The patronage of the brilliant artists of the fifteenth and sixteenth centuries by the heads of the Church is pre-eminently honourable.

The work of restoration is active amongst the fine old cathedrals and abbey churches of England, and in Scotland we have the same movement afoot. The Scotch Church, however, is poor. There are no large diocesan revenues, and the sectarian interests are so numerous and scattered that comparatively insignificant buildings are erected. Nevertheless, the expenditure upon new churches during the last few years is by no means discreditable.

Our ecclesiastical art has had to contend with even a stronger enemy than poverty. I allude to that national prejudice against all admixture of places of worship. The rapidity with which that feeling has subsided is remarkable. Now, it is only heard of amongst a few old women, who are proverbial for retaining all the expiring prejudices of their representative generation. The kindly shelter of his native glen, or the heath and bracken of the trackless moor, were in beautiful though sad sympathy with the worship of the hunted covenanter; but, mean and affronting were those barns of whitewash and musty pews which people from choice erected as churches.

Happily, these are of the past, and our day is more auspicious. We need scarcely expect to see churches erected upon the grand scale of our old cathedrals; yet, largeness is by no means an essential of the beautiful. As we are passing to the more general adoption of the organ, and the cultivation of choral singing, corresponding features and accommodation will be required in the architecture; so that, no longer restricted to the limited area of a preacher's voice, we may have churches,—

"Where through the long-drawn aisle and fretted vault,
The pealing anthem swells the note of praise."

Still never for a moment let the great apostolic charge to preach the Gospel be undervalued. Is

it not the indispensable duty of a Christian place of worship to aid the minister in being distinctly heard by the congregation? "A moderate voice," says Sir Christopher Wren, "may be heard 50 ft. distant before the preacher, 30 ft. on each side, and 20 ft. behind the pulpit, and not this unless the pronunciation be distinct and equal." He does not give the conditions under which he came to these conclusions; but surely if the principles of acoustics are properly studied by the architect, and those of elocution by the minister, we might safely venture beyond such a circumscribed area. Indeed, we have statesmen who, by that power of presence, musical cadency of voice, compass of intellect, and felicity of expression, can so wrap the attention, that they are audible over a very much larger space; and why should not such faculties be more fully cultivated by the clergy?

With the increased difficulty of obtaining space in the midst of our large towns, the chances of removing those unsightly galleries will be lessened, and together with their advantage in seating a larger number of people within closer radius from the pulpit, I question if the architect may succeed in preventing their future use. We must bear in mind that the applied sciences and their effect upon building materials, give the present day great advantages, and architecture must brace up to overcome gracefully all requirements; and who knows but that some touch of genius, like the invention of the arch or the cupola, may alight upon a successful church gallery?

Having thus alluded to ecclesiastical, I now pass to civil architecture.

Comparisons have frequently been made between them, generally to the depreciation of the latter. High Church enthusiasts talk of it slightly, and place its aim and employment in a very subordinate light. . . .

In practice there may seldom be much thought expended upon the beauty of the duties which a building is meant to perform. Architects have requirements, site, cost, &c., to consider, and these may so occupy their attention that the mind will not readily wander over a vast range of thought, such as from purpose to destiny, in quest of some ideas rarer and better than those that are gathered by the passer-by. But in such reflections exist an unspeakable charm, and they originate the reverent humility and the lofty aspirations with which all great art ought to be imbued.

To be more practical, civil architecture is such an immense and rapidly-extending field that it demands great attention.

The changes effected by the growth of a city, and also their rapidity, may be seen from what has taken place in Edinburgh and Glasgow. Our new town was only projected a century ago, and so recently as 1848, Daniel Wilson, in his "Memorial of Edinburgh," speaks of Gabriel's-road, on the west side of the Register-office, where many of the venerable citizens then alive remembered having "wended their way between green hedges that skirted the pleasant meadows and cornfields of Wood's Farm, and which was in days of yore a favourite trysting-place for lovers, where they breathed out their tender tale of passion beneath the fragrant hawthorn."

In Glasgow, the same enlargement of town towards suburbs, and suburbs to green fields, has taken place; for in 1807 many objected to the erection of St. George's Church in George-square, now the site of the most central railway station, because it was too much in the country.

Nor is this confined to these two cities. All are more or less extending. The population of Edinburgh and Leith, according to the 1861 census, had, since 1801, increased from 81,404 to 201,749, or about 2½ times. Glasgow within the same period—60 years—has increased from 77,058 to 391,864, or more than five times; and London, from 958,863 to 2,308,989, or nearly three times.

Although a considerable deduction may be made for the smaller neighbouring villages gradually merged into these cities, and their population now included with them, still Great Britain—exclusive of Ireland, whose population is just about the same as 50 years ago, and not taking into account the emigration which during 1851 to 1861 amounted together to 2½ millions—had increased 2½ times, 10,764,591 in 1801; 23,522,321 in 1861. Thus, we learn, and learn but to wonder at the crowding.

The character of the streets and buildings of a town indicates at once the condition of the inhabitants. The dwellings must keep pace with the progress of the people. The older

buildings, originally the mansion-houses of the aristocracy, become gradually more and more deteriorated. Literally a standstill results in their degradation and ruin. By judicious change they may, for a time, retain their reputation amongst their new and popular neighbours; but ultimately comes the modern Cyclopean idea of scavengery, and says, "Your streets and closes are too narrow, steep, and crooked; your dwellings are unfit for pigs." It is in vain to plead that they are no worse than long ago, that the number of occupants might be more restricted, or that all that is wanted are cisterns and water-closets. You must change with the times, and away sweeps the broom of reform, obliterating alike the good and the bad of our architecture, the dark and the bright associations of our history. If this must be so, let us hope that some consideration will be given to preserve "the lines where beauty lingers;" and that the new work will be intrusted to architects who possess the veneration of the antiquary with the appreciation of the artist. They may meet modern demands, and yet linger a while in reverence over the old fabric, which may have associations worthy of recording and features of preserving or engraving upon the new.

Accompanying the power-loom, the burrowing, the blast furnace, and all large manufactories, are huge masses who must be housed in the very cheapest manner. The great extent of this renders complete architectural success impossible, and often in a great measure injures most praiseworthy embellishment.

For example, what church spire can appear to advantage amid masses of belching chimneys,—obelisk-shaped or ornamented,—and how often do octon-mill-like tenements jam public buildings? All the greater need, then, to multiply the beautiful. The responsibility of the welfare of the city rests with the citizen. In duty we must act, and in pity we must help, by introducing amongst the dense and poorer population as much as we can of the beneficial effects of good architecture.

In Edinburgh, however, we do not experience the same disadvantages as our so-called go-ahead cities. Our grandly picturesque position, spacious streets, garden squares, and our fine free-stone, are all eminently favourable to architectural progress. Public buildings, monuments, and statues, occupy the best positions. Churches, houses, banking and insurance companies, all vie with each other in the grandeur of their architecture. Private enterprise shows a liberal spirit; and the result is that our town is selected as a most attractive place of residence by people from all parts of the country and colonies.

Let architect and employer, therefore, bear in mind their city's reputation, and that even the subordinate parts of Edinburgh are no common places. The stingy speculator is about, and architects should beware of being identified with his shame. The profession may be their means of livelihood; but unless there is some higher incentive than fee, their art will be poor indeed. Remember the remark of Michelangelo, "I think that he will be a poor fellow so long as he shows such an extreme eagerness to become rich."

With the wider cultivation of matters of art and taste, we may hope to see the touch of an artistic hand really have a more appreciable value. Petty elaboration will never touch the sympathies of the people. In street architecture, we must have a certain economy; but in our greater works, if we could enlist the co-operation of our highest artists, then we would have the highest results.

Their influence would tell powerfully upon the people, and it would infuse a new life into the pallid conventionalities of both Classical and Medieval art. To those who think that incompatible with the production of easel pictures, I would point to Leonardo da Vinci's sketch-books, with a drawing of a new gun-carriage, hydraulic machine, or apparatus for lifting heavy stones, on one page, and a beautiful ideal female head upon the other; to Michelangelo, constructing the fortifications for the defence of Florence and painting the Sistine chapel, in addition to his grand works of architecture and sculpture. I might also instance Raffaele designing architecture,—and street architecture, too,—as seen in the well-known house in the Piazza of Florence. Then, Albert Dürer, Quintin Matsys, and very many others.

And in our own day, less versatile but still illustrative of the highest art being engaged upon architectural decoration, Paul de la Roche

painting the famous hemicycle in the *École des Beaux Arts*, in Paris; and Duprès, perhaps the most perfect modern sculptor of Italy, executing the tympanum of Santa Croce, in Florence.

I believe that when the public give the proper encouragement, some such helpers will come forward. Indeed, we have seen the lamented Dyce's ability in that way, and we have no lack of able sculptors who would gladly more frequently be associated with the architect. I need not dwell further on this point. You must know how much nobler your art would thereby become.

The question of style will possess its influence, but it scarcely comes within the province of this address. I would, however, remark that in reviving, or I may now almost say practising the Medieval style, there may be rather too great a tendency to retain the old type, which, if persisted in, will be apt to produce a repetition of errors similar to those committed in the classical revival, such as importing temples to do duty as picture galleries, dwelling-houses, or shop-fronts. Architecture, whatever may be the style, must not rest satisfied with reproducing, but must go forth free, amid the freshness of nature, and the enterprise of the city, welcoming all progress of our fellow-men, and aiming at the bettering of humanity.

THE HEALTH OF BRIGHTON.

The town council of Brighton have at last decided to intercept the town sewage, and to carry it beyond the municipal limits, instead of emptying it at their own doors, to be thrown back upon them by each advancing tide. The council have at the same time been able to publish some facts relating to the health of the town during the first quarter of this year, which show that at all events during those three months the defects in the drainage, which, if maintained, would ere long have seriously affected the popularity of that favourite town, did not neutralise its natural healthiness.

The Registrar-General, in his quarterly returns for the first three months of this year, showed that 711 births and 490 deaths were registered in Brighton, which is estimated to contain at the middle of this year little short of 90,000 inhabitants. The annual birth-rate for the quarter was 32.2 per 1,000, and 5 per 1,000 lower than in the aggregate of forty-six large towns containing nearly three millions of population. The death-rate per 1,000 was only 18.2, and 6.4 below the average rate in those forty-six large towns. This difference in the death-rate is remarkable, and signifies that were it maintained for a year, more than 500 persons would survive in Brighton who would have died had the same death-rate ruled as that which prevailed in the aggregate of the forty-six towns.

We are often more sensitive as to the healthy repute of a town in which we intend to spend a holiday, than of the neighbourhood in which we live; the Brighton town council, therefore, acts wisely in wishing it to be generally known that the town has recently enjoyed such good health. Comparison has been made in the return before us with the death-rate at various ages, and from different causes, in London, for the same period, which, after making full allowance for situation and constitution of its inhabitants, which both tell unfavourably for the metropolis, serves a useful purpose in helping to show how and in what manner Brighton enjoys a lower death-rate than most other large towns.

The borough of Brighton includes an area of 2,320 acres, of which 340 are water; excluding these, the estimated population for the middle of this year shows a mean density of 45.1 persons per acre; while in London, within the limits of the bills of mortality, the density is 40.7. The natural increase in the population of the town during the first quarter of the year by excess of births over deaths was 311, against 191, 154, and 270 in the same quarters of the three years 1866-8. This may be taken as evidence that the Registrar-General's estimate of the present population is not over-stated, the probability of which might be suggested by the low birth-rate. It is shown, however, that in St. Peter's registration sub-district the birth-rate was 38.5, which somewhat exceeds the average town birth-rate; while in other parts of the town it was only 26.6 and 21.6. This difference is accounted for by the fact that St. Peter's contains most of the natural and resident town families, while in the

other sub-districts of Palace and Kemp Town the proportion of visitors and domestic servants is large. A low birth-rate is usually shown in Bath, Cheltenham, Leamington, and other pleasure towns, as well as in the fashionable suburbs of London, Manchester, Liverpool, and Birmingham.

In the first quarter of this year the death-rate in the whole of England and Wales was 24.8 per 1,000; and among the eleven largest English towns furnishing weekly returns, the lowest death-rate for the quarter was 20.7 in Birmingham. Brighton has, therefore, reason to be well satisfied with the rate of 18.2 per 1,000 for the same period. In the return before us, the rates of mortality in the different registration sub-districts of Brighton, calculated for the purpose of comparison, exclusive of deaths in institutions, are shown to have been 9.9 in Palace, 17.8 in St. Peter's, and 19.0 in Kemp Town. Each of these rates would be raised 12 per cent. if the deaths in institutions were ratably divided among the sub-districts; and as both the work-house and the hospital are situated in St. Peter's, it would be unfair to this part of the town to calculate the rates without this correction.

The 400 deaths in Brighton included 119 of children under five years of age, showing 29.7 per cent. of the deaths at all ages. Of the 20,088 deaths registered during the same three months in London, 7,894 were of children under this age, the proportion being here 39.3 per cent. of the total deaths. In Brighton 41.3 per cent. were of children and adults between 5 and 60 years of age, and 29.0 per cent. of persons aged 60 years and upwards. In London the proportion of deaths at these groups of ages was 38.1 per cent. between 5 and 60 years, and only 22.6 per cent. at 60 years and upwards. Principally through the much lighter infant mortality in Brighton, the mean age of death in that town during the first quarter of this year was very considerably higher than in London.

The death-rate from zymotic causes is one of the strictest tests of the sanitary condition of towns; and in this Brighton is not found wanting. The 400 deaths in the first three months of the year included only thirty-three which were referred to all diseases of a zymotic character, showing an annual rate of 1.5 per 1,000 persons living; whereas in London it was 4.9, in Liverpool 5.6, in Bradford (Yorkshire) 4.7, and in Exeter 2.6. Of these thirty-three deaths in Brighton, fifteen resulted from scarlatina, which epidemic disease can alone be said to have been at all prevalent, eight from different forms of fever, three from croup, two each from whooping-cough, diphtheria, and diarrhoea, and one from dysentery. Of the fifteen deaths from scarlatina, ten occurred in St. Peter's sub-district in the centre of the town. In examining town death-rates, the next class of diseases in order of importance as affording an index of the general health of the inhabitants, is that containing all affections of the respiratory organs, including phthisis. Unhealthiness of dwellings, from faulty construction, want of ventilation, and over-crowding, is sure to result in a high death-rate from these diseases. In Brighton, the 141 deaths referred to these causes during the first three months of this year showed an annual death rate of only 6.4 per 1,000; whereas it was 8.2 in Bradford, 9.0 in London, 10.9 in Exeter, and 12.0 in Liverpool. It is thus conclusively proved that the low death-rate in Brighton was principally due to three causes,—the comparatively low death-rate among infants, the small number of deaths referred to zymotic diseases, and the lighter mortality from inflammatory diseases of the respiratory organs.

Brighton, not being a manufacturing or a trading town, has many advantages in the constitution of its inhabitants, in addition to its natural advantages of situation and climate, and ought, therefore, to be healthy; it is, however, satisfactory to find that it has recently been so healthy, and now that the town council seem fully alive to the importance of appearing before the public with a clean bill of health, we shall hope to see in future returns a continuance of this low death-rate, and immunity from epidemic diseases. Not only the Brighton people, but the whole metropolitan population, have a strong interest in the health of this favourite sea-side resort.

The "Bermuda Dock."—Mr. John B. Day has published an interesting chromo-lithograph of the "Bermuda Dock," concerning which much has been lately said.

THE SELECT SUPPLEMENTARY EXHIBITION OF PICTURES.

WE return, as promised, to the collection of pictures in Bond-street, made under difficulties, and note some of the works that left the strongest impression after a visit.

Processional compositions are now of such frequent recurrence that there is need of more than an ordinary capability to secure attention and respect for them. Mr. J. S. Cuthbert has partly surmounted the many difficulties that beset an embodiment of allegory: his illustration from Spenser, "The Masks of Cupid" (5), is a notable work for the discrimination with which the several passions, vices, and frailties are shown in type, as well as for the technical merits that distinguish it. "The Evening after the St. Bartholomew" (26), by Mr. A. Baccani,—fugitive Huguenots,—wants but a little more decision and force to make it a fine and interesting picture; it has the advantage of quiet impressive treatment and appropriate effect. Mr. E. Hughes has found a good subject in "An Incident in the Life of Paganini" (51), that tells of the great musician's sympathy and benevolence. The story goes that, walking in the streets of Vienna one day, he saw a small brother of the how who scraped to support his mother, brothers, and sisters: compassionating the poor little itinerant, and after giving all the money he had about him, "Paganini took the boy's violin and commenced playing, gathered a crowd, and taking off his hat made a collection, which he gave to the lad amid the acclamation of the multitude." If more can be said of the matter than of the method of its elucidation—though there is very careful workmanship brought to bear upon it, and the monarch of a one-stringed melody deserved a more appreciative and numerous audience,—Mr. Hughes merits praise for leaving beaten tracks.

What a very clever picture Mr. J. Auld's is, of "The Death of Robert Greene, 1592" (66), but what a repulsive one. Lamartine's "History of the Girondists" has become a very favourite text-book for painters; and Mr. T. Davidson appears to have been inspired by a very pardonable admiration of Mr. E. M. Ward as much as by the words of his author. The "Condemnation to the Guillotine of M. and Mme. De Sartes, together with the Family of Mdns. De Sainte-Amaranthe, the counter-Revolutionists whom Robespierre had pretended to befriend" (72), shows some real executive power, though upright lines appear to be hard ones, and the head of Mme. De Sartes, which should have been the chief point, is the worst feature. The figure of the husband, firm in his convictions and ready to die for them, and that of the seated brother burying his face in his hands, are excellent.

Mr. R. Dowling's rendering of an incident from Clarendon's "History of the Rebellion" (75) wears an appearance of probability that condones to a great extent its shortcomings. Charles I. is receiving the answer to his summons for the Roundhead authorities to surrender the "good city of Gloucester;" the marked difference between Cavaliers and Commonwealth men leads to a very decided conclusion with regard to the artist's political opinions. "The Secret Message," by Mr. S. Sidley, has admirable qualities of workmanship, if least displayed in the heads of the lady and messenger (76). Mr. F. Smallfield contributes a very clever representation of "Colonel Newcome at Gray Friars: Grace after Meat in Pensioners' Hall," wherein much of the pathos of Thackeray's description is realized (110). Mr. W. Hemsley's "Competitive Examination: the 'Clever Boy at Fault'" (129) is painted with the precise, clean finish that bespeaks its author; and Mr. C. Hunt's children in "Training the Fairies" for Christmas pantomime (200), if less comically expressive than on some former occasions, are earnestly engaged in their own and the artist's work. "Children of the Sea" (145), some naked urchins bathing from a boat, by Mr. F. Underhill; "An Unexpected Visitor," by Mr. H. Carter (166); "The Captive," a powerfully painted head by Mr. E. Sharpe (205); a lady ruminating sweet and bitter fancies relative to the loved one "Far Away" (215), by Mr. F. Wyburd; an old *bon vivant* who has loved to live, not wisely, but too well, and whose *gout* has brought gout to check it (222), by Mr. W. M. Wylie; "The Boar's Head, Eastcheap," when frequented by Prince Hal, fat John, and companions, by Mr. R. Farren (238); "The Present," by Mr. J. A. Fitzgerald (259); and "A Study" of a gray-

bearded elder, by Mr. V. Crome (316), are among those first to be noted.

A capatially painted composition of a horse helping yokod oxen with their load up a hill on "A Tough Bit of Road, Coast of Brittany: Storm passing off," by Mr. R. Beavis (20); and Mr. J. Brett's very truthful, to all appearance, but singular rose-hued sunset effect on a rippled sea, "Evening off the Menni Straits" (51); with Mr. L. W. Desanges's idealized portrait (187)—

"All honour to woman; to her it is given
To wreath the dull earth with the roses of heaven,"

lead their several departments, of which the last is first.

"Love's Messenger arrested" (241), though the angry papa who has caught the black Mercury by the ear is over-much demonstrative of his wrath, is cleverly represented by Mr. A. H. Weigall, telling an old story in a new way. In "Thwarted" (280), the lady is the detective party, and the story rather harder to be understood—nearly as hard as the painting, which, however, is forcible and brilliant, and by Mr. W. M. Egley.

There are force, colour, and character to recommend Mr. W. G. B. Browne's jovial anchorite, who expresses the adage "It is not the Cowd that makes the Monk" (3); and careful nice painting in Mr. A. W. Cooper's arrangement of the three sixteenth-century personages interested in "The Broken Arrow" (7); and so there is, on a larger scale, in Mr. F. Chester's episode from Sir Walter Scott's never yet equalled historical romance—after "Kenilworth"—of "The Fortunes of Nigel"; the "Imprisonment of Margaret Ramsay and Nigel in the Tower" (10), when the hero is apostrophising her—"Poor child, the dew is yet wet on thy eyelashes, and thou hast fairly wept thyself asleep."

Mr. J. A. Vinter's boy indulging in a prolonged study of his father's picture as he rests his head and crossed arms on the table, is pretty and childlike in attitude, and more at ease in his opportunity of observation than most are at "A Private View" (33): the drawing of the head is not quite up to the mark of an Academy gold-medal winner, but it is a pleasant picture.

Mr. F. Weekes's small productions, such as "Troopers crossing a Morass" (37), and an elaborately finished armed "Trumpeter" (43), are attractions, in spite of their size. Mr. A. L. Herford's knickerbockered boy and naturally posed girl playing at "Jackstraws," or spell-cans (115); Mr. J. Payton's two fashionable ladies taking such steps in "Ascending and Descending" as he can best account for, as he has not made it quite clear how the portentous title applies to a daintily-executed picture of eighteenth-century modes (123); Mr. C. Lucy's "Shylock and Jessica" (183); Mr. E. L. Aldridge's noble wife consoling herself with her children in the recollection of what glory her husband is achieving whilst absent from her (193); Mr. R. Hillingford's depiction of James, one the second British king of that name, allowing his nationality to prevail "During the Battle of La Hogue," which induced an involuntary exclamation of "See my brave English Sailors"—very much to the surprise and, it may be supposed, the gratification of the French officers around him (310); and a very dark "Bivouac in the Crimea," in a rather dark corner of the room, by Mr. G. Regamey (325), are all sure to obtain their need of admiration.

Among the landscapes, Mr. J. Dochart's spring scene, "The Bursting of the Leaves, Cadezo Forest" (176); Mr. H. Weekes's "Hampstead Heath, looking towards Finchley," with some well-drawn sheep and donkeys to give more reality and vital interest to its representation (209); Mr. E. A. Pettitt's "Mont Bianco, from the Flégère" (1); "The Haunted House" (23), by Mr. H. Shirley; a clever classic-looking composition by Lord Ribblesdale (79); "A Glade by a River," by Mr. G. Mawley (92); "The Old Pump Well," by Mr. W. M. Taggart (251), are, with some others, noted in our catalogue; and the water-colour drawings and sculpture include a few excellent works.

There are clever portraits by Mr. A. Baccani, Mr. W. Crawford, A.R.S.A., Mr. T. J. Gnllick, Mr. J. E. Williams, and others; and Mr. J. R. Dicksee contributes some of his series of idealized and always graceful heroines, that may be termed portraits of familiar friends.

SIB.—With reference to your remark that the catalogue of the Supplementary Exhibition is dear at a shilling, and should contain a list of the exhibitors and their addresses, I shall feel much obliged if you will allow me to explain

that the words "price one shilling," originally printed on the wrapper, were a mere mistake of a clerk, which was rectified as soon as my attention was called to it, sixpence being returned to all persons who were known to have paid the higher price. I have only to add that a list of the exhibitors, with their addresses, has been appended to every catalogue except a few marked as "imperfect," which were compelled to issue, for want of perfect ones, on the morning of our opening day. Thanking you for your kind promise to return to the subject of the Supplementary Exhibition,

MOT THOMAS, Hon. Sec.

THE ARTISTIC TREATMENT OF PIERS, PILLARS, AND COLUMNS.*

Few subjects have received less attention from architects than the artistic treatment of piers and columns, although few will so well repay a careful study; and few hold so important a position in the great art of architecture. Numerous and valuable works have from time to time appeared on windows, mouldings, arches, doorways, &c., and yet so important a study as that of the decoration of so essential a feature in building has been neglected, or treated of only in works embracing many other subjects. And yet, scarcely any architectural member has employed so much artistic talent for its decoration, scarcely any have existed so long, or are so necessary to a building; and from the inexorable twin columns of the porch of Solomon's temple, to the equally mysterious pillars of a Pimlico portico, we find that they have themselves been employed through all changes in art, and in all countries, as decorative adjuncts to an edifice.

It is necessary before commencing any historical account of our subject, to inquire into the uses of the column, and to define exactly what were the necessary parts of which it consisted. This done, the lecture will consist solely of an account of the different modes of treatment employed in the purest styles arranged in chronological order, with such deductions therefrom as may be of use to us in our own practice.

Whatever might be the nature of the country in which the first builders commenced their work, it is evident they could not have advanced far before the necessity of constructed supports for their roofs was forced upon them. Where caves had been formed for dwellings or quarries, large masses of masonry were left to sustain the weight above; and in the fragile structures of the plains a wooden post was sufficient to carry the beams of the roof. In Egypt the two modes of construction may for a while have been carried on side by side, and we there see features peculiar to one of the styles obviously reflected in the other. When the habit of using the column had at last made it a decorative feature, and thus brought it in range of our subject, we find its most essential parts are the capital and the shaft, with the base, omitted as an ornamental member in one or two of the perfect styles, but generally present in some crude form. The capital, except only in a few quarried examples, is to be found universally, and must always be considered a member necessary to the completion of a perfect column.

The oldest columns which the world can show are perhaps those of the rock-tombs of Beni-Hassan, or the quarried tombs of the neighbourhood of the Pyramids, with which they are contemporary. The latter, like the majority of rock-cut examples, are simple, square, or oblong masses left to sustain the superincumbent weight, while those of Beni-Hassan are polygonal on plan. These were their natural outcome of the square pier which had first its angles worked off, making it octagonal, and then again reduced to a figure of sixteen sides. These, in this example, are further wrought by having the sides channelled, except in one case only, which has been left to receive painted hieroglyphic inscriptions. But this simple relief of fluting was not sufficient for Egyptian taste, accustomed to rich and gorgeous colouring, and too much interfered with their love of large flat spaces for pictorial decoration. Hence grew up another form of column more suited to their taste and requirements, while the simpler and severer form was left to inspire foreign artists, and be worked out by a people capable of appreciating its more refined beauties. The custom of painting the papyrus and lotus plants on the square sides of the piers soon suggested the rounding out into high relief of the stem and the bud. This, step by step advancing, ended in the background of the pier being cut quite away, and a pier, quarter-form on plan, resulting, as at first sight seems

* By Mr. J. Tasson Perry. Read before the Architectural Association, Friday, June 11.

most unlikely, from the square. To keep up the illusion of the new-formed pier representing four lotus-plants, bands tying the whole together beneath the buds were painted or sculptured round it. From this form, the change to the circular single shaft was very easy, and though it seems strange that a circular column should have been evolved, by apparently such roundabout means, from the square pier, a careful attention to the subject will show the correctness of the statement. In the earlier examples of the clustered shafts a slight entasis had been given to their outline; but when, of increased diameter to allow for the decrease in horizontal section, the plain circular shafts came into common use, they were made to diminish considerably at their lowest diameters to give them as far as possible a compensating appearance of lightness. The bands under the necking used in the clustered shafts were retained in the single ones, and give additional proof of their origin. Five was, according to Dr. Lepsius, the usual number employed, and five is the number of bands below the echinus of the Greek Doric order. The next change that they made was in the form of the capital, a memorable one in architecture, although the origin of the alteration goes far to prove that the Egyptians were in it more influenced by natural forms than constructive necessities. The conventional imitations of the bud alone suggested the idea; and the open flower, bell-shaped, the prototype of all the best forms of capitals in all future styles, suddenly appears in its full-blown perfection. That this was not the result of any rounding off of the angles of an abacus, or bringing out in graceful curves the lines of the shaft to meet it, is evident from a most cursory examination; for the same square block which served as an abacus in the bud capitals retains in this the same form and proportions, and is, for all practical purposes, as useless. The first abacus we find is in the examples already mentioned at Beni-Hassan; but it then, though in a rock-cut example, is a much more complete and useful member than when later employed in constructed columns. It was usually of the same size across as the upper diameter of the shaft below, so that the spreading form of the bell-shaped capital, apparently so suitable for the fulfilment of all the requirements of a complete capital, had its utility destroyed by the interposition of this square and unmeaning feature. Thus, although we owe to these earliest builders the very first suggestions for the essential parts of a capital, and find in their examples the commencement of all the leading characteristics of later styles, we find the Egyptians themselves quite unable to understand the value of the discoveries they had made, or to apply them in such a manner as to render them other than mere ornamental accessories.

This direct study of nature not only produced these new and beautiful forms, but at the same time prevented the artists from making such blunders in the arrangement of the columns as might, perhaps, have happened among a people less mindful of its beauties. They were very particular when using together columns with the bud and bell-shaped capitals always to make the latter the higher, just as the full-blown flower is taller than the one only in bud. This is well seen in the great hall of Karnak, where the avenue of columns down the centre has open bell-shaped capitals, while the side ones, supporting only the lower roof, and of scarcely two-thirds the height, are arranged with capitals of the bud form. The great fault of this arrangement is, perhaps, the want of height this gives to the centre building, where, had the columns been of a similar character to the side ones, or had others been superimposed upon them, the eye would be better able to appreciate the increased height. The diameter of these columns is very great, and considerably detracts from their elevation, being almost half the total height of the story. But massiveness was so important a feature in the piers as in all other parts of the Egyptian style, and this is not to be wondered at, when we remember the small amount of skill possessed by the builders, and the enormous space they sought to cover with their roofs. The mode of decorating employed tended rather to increase than diminish the effect of massiveness. The carved flutings and painted papyrus-stalks early gave place to broad bands of hieroglyphs, or figure subjects ranged horizontally round the shaft, and bringing out its circular form in a happy and emphatic manner. The bell-shaped capitals were further decorated with perpendicular lines, and leaves

running from the shaft upwards, and producing a fine contrast with the lines of the shaft. The bright rich colouring of a group of these columns of the earlier dynasties was most brilliant and harmonious, and the majestic appearance of a single shaft was worthy of being compared with the finest example of Grecian or Mediaeval beauty.

It has been suggested that the different positions of the bud and full-blown capitals were arranged with a view of conforming better to the clearest mode of lighting usually employed; but if this be the case, it seems difficult to account for the peculiar case of the hall of Tothmes III., at Thebes. There, with the same mode of lighting, the bell-shaped capitals are employed, but inverted; so that, although they may be in a good position to catch the light, the effect could not possibly be seen from below.

In the later styles the bell-shaped capital superseded the other form, and the ornaments painted or carved thereon became much more intricate. The endless varieties of lotus-flowers, palm-leaves, &c., with which they were adorned, presented a most marked contrast to the simple painted decoration of the earlier times. But there was another feature, most distinctively Egyptian in its character, which at the same time became very common. This was the leaf-headed column. It appears to have been first employed as early as the eighteenth dynasty, but it scarcely came into ordinary use until the time of the Ptolemies. As a rule it was usually surmounted by a temple form in place of the square abacus-block, and in some cases it was united with the ordinary capital. The columns of the Temple of Denderah, which are the finest examples of this peculiar treatment, are among the best preserved, but the style can only be regarded as a mark of decline, and a sign of that sad falling off from the grand and simpler ideas of earlier times which so seriously affected the great epoch of building activity under the Greeks and Romans.

But while this grand and massive style of Egypt was passing through its various changes, on the plains of Shinar, a different race, with different wants and materials, was in a different manner working to the same result. The great cities of Assyria are perhaps more famous in history than those of Egypt, and the earliest records we have tell of the founding of Calah, Rezu, and Nineveh. In the means at their disposal these new builders were certainly not so fortunate as the others we have described; but with brick, and alabaster, and cedar, they raised gorgeous and ephemeral buildings, which, exciting the amazement of the ancient world, left scarcely a wreck behind to tell of their ancient beauty. With brick walls of enormous thickness, veneered with the richest sculpture, the great palaces were covered with roofs of timber, supported on wooden posts, which have in every case disappeared; but throughout all the heaps of ruin scattered through the country, no fragment remains to show how this important feature was treated. In Koyunjik Mr. Layard found something that appeared to him to be a pedestal, but from its peculiarly bulbous form, so un suited for bearing a weight, as well as for its want of similarity to the bases used in a later phase of the style, we should hardly be safe in concluding that his surmise is correct. On the other hand, it must be remarked that the Chinese form the bases for their wooden posts to this day in a manner not unlike this. A course or two of bricks, or a large tile with a deep stone rounded very much top and bottom, bearing a strong likeness to this Assyrian example. That columns were used by the Assyrians in their ordinary construction is certain, although no traces may remain in the buildings themselves. We know that Solomon, in building the House of the Forest of Lebanon, had a roof of cedar beams supported on three rows of cedar columns, with a porch of columns before it. And in the fine series of bas-reliefs brought over to the British Museum, are several instances of columns for the support of coruices, sometimes arranged as a temple in ante, and generally with the distinct Ionic volute and well-developed bases.

In the ruins of Susa, Persepolis, and Passargada, to which, after the destruction of Babylon and Nineveh, we must look for a continuation of the Assyrian styles, we are fortunately able to find considerable remains of columns to help us in our conjectures of the older cities. But, far better situated than the older cities for materials, they substituted stone for wood where practicable, and though the roof was still formed of beams

of cedar, the columns were built of a material better adapted to support the superstructure and resist the action of fire, to which those eastern palaces so often fell a prey.

The columns of the hall of Xerxes at Persepolis are exceedingly graceful in form, being in some cases as much as eleven and a half diameters high, covered with flutings, and with capitals and bases complete. The contrast between these and the examples we have given from Egypt is very strong, and shows how much the materials and forms of the first efforts of the builders throw their influences forward over all succeeding phases of their particular style. The baseless, capless piers reflect unmistakably their simple stone-constructed models, while the more complete orders, with their perfect capitals and bases, prove as conclusively their wooden origin. The rough brick or stone base of the post would early be looked upon as means of decoration not to be neglected when stone was substituted for wood, and the boldly projecting capitals having their outgrowth from necessity and not the result of taste merely, could not but be continued as the artists advanced their work towards perfection. The form assumed by the capital was peculiar, and consisted doubtless at first of simply a short wooden template, such as those now constantly used in ordinary warehouse construction, to increase the bearing space of the top of the post, or allow of the great beams passing each other on a level. Compare this crude form with the perfected hull-headed Perseopolitan capital, and you will see at a glance how the latter, by constant use and artistic influence, has been evolved out of the former.

The changes, which in Egyptian work we find bringing about the circular shaft from the square pier, are missing here. The earliest examples we find of the style are already as perfect as they will be, for in all variations of treatment a material was used requiring no great difficulties to be overcome, and one in which the simplest form was round. But the flutings, with which the shafts were always relieved, it would be interesting to find in some less perfect state. Whether the result of direct imitation from Egyptian example, or whether the reflection of the simple mode of decoration employed in China of binding reeds and matting round their posts, it is now impossible to say. But it would be fortunate to discover the origin of a mode of decoration which so much influenced the later styles of Greece and Rome.

We shall find that the short time we have spent in dwelling on the peculiarities observed in the Egyptian and Assyrian modes of treating the column will help us considerably to understand the forms employed by the Greeks throughout the period of their art. In that art, which inherited all the beauties of the former styles, we find the chief characteristics of Egyptian and Assyrian architecture welded together, though never completely fused; so that to almost every feature and ornament can be assigned an origin in one or other of the earlier schools. But the imitations are never complete, but always adapted with that skill and taste so characteristic of the people, and the derived forms appear not seldom to be rather recollections of a model not present for actual copying.

It is an unfortunate thing that the links in the progress from the earlier examples of native art to the time when these new and unaccounted forms were first introduced into their architecture should be wanting. The Persian invasion and the rebuilding of more fortunate epochs have almost completely swept away all remains antecedent to the time when the Greek style reached its perfection, and it is nearly as difficult to trace it up from its beginnings as it would be to study the relations existing between our own Pointed styles and the works of Roman times, were all the remains of Romanesque architecture completely effaced.

The first example we find of the use of the column is rather as an ornamental accessory than for a practical purpose, namely, in the bas-reliefs over the entrance to the Treasury of Athens at Mycenae. It is interesting, as it contains one or two peculiarities, which the Greeks ignored through the heat periods of their art, and which do not reappear till a much later time. These are the base and plinth, which are here unmistakably present, and show that it was not for want of precedent that the Greeks omitted them in their Doric works. The capital seems like a rough copy of the Ionic order, more akin to those in the Assyrian bas-reliefs than to the finished examples of a later period. The carving of the whole seems to have more alliance

with the Romanesque work of Western art than the beautiful styles of the country in which it is found. The whole was the work of the Pelasgi, a people perhaps of Celtic origin, or more closely allied to those of Asia than the Dorians and other settlers who afterwards peopled Greece, and to whom, either pure or incorporating a large number of the Pelasgi, we owe the finest works now extant.

Wanting, as I have said, the steps that led up from this example to the more complete forms, we must turn at once to the study of the Doric column. The earliest specimen we can find is as perfect in all its parts as the latest, and there is no feature of any kind to be detected which gives the least hint at a connexion with our last example. But its Egyptian origin is undeniable. The Doric column as we find it at Corinth is stunted in its proportions, has no base, a fluted shaft, a square abacus, and below, the echinus moulding the great peculiarity of the Doric capital. The fluting differs from the Beni-Hassan examples, particularly in the number of the channels. And this point goes far to prove the imitation by unaccustomed hands of an exotic style, since in the Egyptian examples the flutings always number 4, 8, 16, or 32, as the natural outcome of the square, while in Greece the number is by no means certain; and this column at Corinth, with its twenty flutes, could not have been evolved therefrom by the ordinary process of cutting off the angles. At the same time, the absence of the flat fillet between the flutes tends to prove that this form of column was not the result of a channelled ornamentation applied to a circular shaft. Except in this particular, and in the presence of the peculiar echinus which here appears in architecture for the first time, the column of Beni-Hassan were perfect prototypes of the Doric columns at Corinth. This new feature, however,—the echinus,—had its origin, too, on the banks of the Nile; and in its adaptation the Greeks showed that they were no servile imitators, but capable of appreciating the excellence of the style they sought to reproduce, and of separating from it its accidental defects. We have seen that the real constructive value of the capital was never understood by the Egyptians, and although they spread out and perfected this feature, yet the actual bearing surface was never increased. But the Greeks, no doubt already accustomed to value the capital for constructive as well as aesthetic purposes, could not so far stultify themselves as to adapt without modification a feature so useless. Taking, therefore, one of the best capitals, they cut off the upper and meaningless part above its broadest part, where often there was some definite line, as in the example at the British Museum, and sometimes possibly a joint. On this the square block abacus was flattened down to a size sufficient to cover the echinus, or one of the abaci from Beni-Hassan was bodily transferred. This origin of the echinus, first pointed out as possible by Sir Gardner Wilkinson, becomes most palpable to any one who will examine the example of a column of the eighteenth dynasty in the British Museum, the section through the lower part of which in effect, and allowing for difference of climate, is almost identical with the earlier Doric specimens of Greece.

The characteristics of the Doric order remain unchanged as long as the order is itself employed by the Greeks, although it goes through some considerable modification in its proportions. The column, as found at Corinth, was only 4½ diameters high, while those of the temple at Delos are seven. In this latter place the Temple of Apollo has some shafts, with the peculiar addition of a sheath, smooth and circular, covering up the flutings, with the exception, perhaps, of an inch top and bottom. The old entrance of the fine Sun Fire-office, in the City, by Mr. Cockrell, has two columns thus treated. In the portico of Philip, in the same place, and the Temple of Heronius, at Cori, are shafts fluted for two-thirds their height, the parts below being cut into twenty flat sides. But the Temple of Segeste, in Sicily, throws some light on this mode of treatment, and gives an example of the means employed in the construction of the order. The temple was never completed, having been in course of erection at the destruction of the city, and remains to this day only the bare shell of a building. The capitals are finished, except at the angles, where rough corners are left to be finished last to ensure sharp arrises. The shaft is inclosed in a sheath, as at Delos, but perhaps more strongly marked, the line of the shaft showing above and below. From this it would

appear that it was left, here and in the cases of Halicarnassus and Delos, for the flutings to be worked when the rest of the building was complete. There is also at Segeste a squared block forming a constructive base, but this would in all probability have been incorporated in the steps had the work been finished, and not made an ornamental feature, as later in the great Temple of Agrigentum. The small thin slab of stone left on the top of the abacus at Segeste, to prevent the risk of the edge flawing, is the beginning of the evil which later threw back the capital to its original uselessness by reducing the bearing surface to the size of the shaft below. Later examples of the use of this peculiar feature are found in the Tombeau de la Chrétienne, in Algeria, illustrated by Professor Lewis, and, strangely shaped, like the abacus of a Corinthian capital, in a capital figured in Flandrin & Costo's "Voyage on Perse."*

THE VELOCIPEDE MOVEMENT OF ENGLISH ORIGIN.

ALTHOUGH neither the English, the French, nor the Americans, have as yet come up to our idea, as regards either the utility, or the improvement of the velocipede,—or *traveller*, as bicycles, tricycles, and four-wheelers of the kind might all be called, and whether worked with the feet, the hands, or any other motive power;—we suppose it is not necessary that the *Builder*, the pioneer (as we shall now show) of the movement, should any longer chronicle its surprising progress.

It is the fate of pioneers sometimes to be so far ahead of their projected movement that, as Coleridge remarked of a higher class of pioneers, they look small in the perspective, and get out of sight altogether, occasionally, by the time the movement they originated reaches any point of vantage. So is it with the *Builder* in this instance. Overlooking, too, the progress made in the movement in England before it was ever heard of either in France or in America, our countrymen seem willing to give up their own prior claim to foreigners; who have now, however, certainly gone ahead of them. But that is no reason why the revival of the velocipede in England within the last ten or twelve years, and long ere it reached either America or France, should be ignored; and we shall accordingly devote a small space to what has really become a question of some little importance.

As we recently remarked, our purpose in originating this movement was chiefly utility, as was likewise the case with us in the beard or "moustache movement," as we named it, many years ago; and although our friends the French and the Americans, as we have said, seem to have gone crazy about the velocipede, and we in England are fast following their example; still they have not even yet, as to it, come up to the mark, which a few quotations from old volumes of the *Builder* will show that we have long and steadily held in view, and urged, over and anon, upon the public attention. To quote all we have said on this subject is far beyond our limits; but in giving a few examples, we shall also note the consequent result, in the gradual revival of the velocipede in this country, previously to its transfer to America and France.

On the 23rd of October, 1858, to go no further back, or upwards of ten years since, the following paragraph (and by no means the first of its kind) appeared in the *Builder* :—

"*Velocipedes and Self-moving Vehicles.*—The utility of such miniature "carriages" to metropolitan and other workmen, living at some distance from their employment, —to enable them, in fact, to live in healthful localities, though at a distance from their employment,—has frequently been suggested in the *Builder*. We feel pleasantly to observe that some little progress is being made in the suggested direction, as a workman, here and there [readers of the *Builder*, no doubt], may occasionally be seen on his way to work, mounted on such a vehicle. A postman has just been provided, by subscription, with one at Bangor, which greatly facilitates his labours along the country roads. Why does not some ingenious mechanic invent a self-moving vehicle of this sort, impelled by a powerful spring that could be wound up with a crank-handle, or by compressed air, indiarubber accumulators, or some such means, so as to save the perpetual movement of feet or hands? Some cheap form of self-moving miniature carriage, it is to be hoped, will ere long make its appearance, and it will then only require the exercise of a few strong-minded sensible workmen to overcome that repugnance which the least novelty is so apt to excite, in weaker minds, against the adoption of even the most manifest improvement in the present and prevalent mode of doing things."

* To be continued.

The application to velocipedes of india-rubber "accumulators" was suggested in 1856, by a correspondent of ours, and alluded to in the *Builder* of 5th April, 1856, in an article entitled "Self-moving Wheel-chairs, Gigs, Droskies, Cabs, &c.," in which we say, as we have often taken occasion to do in nearly similar words :—

"We have more than once urged the immense utility to the million of some simple, light vehicle, self-moving, or by means of some spring power easily wound up, whereby London workmen, tradesmen, clerks, &c., could go about their lawful calling, so as to be enabled to live in the suburbs, and to run along in all directions, independent of omnibuses, which, moreover, traverse only the main thoroughfares, and are, therefore, unsuitable in thousands of instances."

In this article, too, (of 1856) we note the circumstance of "seeing a workman bowling along on a small velocipede, with his tools in a box before him." In reference to "accumulators," we may here remark, by the way, that our correspondent, "Urgeo," stated that these instruments (suggested from seeing an African negro lift an enormous log of mahogany by help of the resilient force of tree branches, applied by means of wild vine withes), were at that time made of even 100-horse power. The precise form of "accumulator" suggested by him was that of a barrel fixed to the axle, and round which the "accumulator," or series of stretched india-rubber ropes, or bands, in fact, was to work.

Our correspondent concluded by suggesting that others should contribute their thoughts to the *Builder* on the subject.

Thus we see that the velocipede movement was begun, or revived rather, in England, at least as far back as 1856, or some years before it reached either America or France; and in that interval it had made pretty good advance, too, in England. Thus we find that journeymen such as those of the other day, from London to Brighton, and others, recently, were by no means unprecedented in England since the modern revival of the velocipede movement in this country. In the *Builder* of October 4th, 1862 (or nearly seven years since), a paragraph will be found titled "Velocipedal Progress," in which it is recorded that "Mr. Harris, landlord of the Fox and Crane, Bristol, had accompanied his brother in a journey by velocipede to London, on a visit to the International Exhibition." They went the 118 miles in twenty-one hours and a half, and returned comfortably eighteen hours. During the same interval, too, hundreds of French and American, as well as thousands and tens of thousands of English, visitors to the Crystal Palace at Sydenham, must have seen the staid velocipedes there, long before the new movement reached either France or America. The fact that the movement seems to have appeared or become popular in these two countries simultaneously, or nearly so, itself corroborates the idea that it extended to both of them from its one common source in this country.

Even Ransome's "Rantonee," a word which many Londoners must remember the walls being placarded with, before its meaning was ever hinted at, had assumed shape, as an improved velocipede, before either the French or the Americans adopted the movement; and for some time before they did so we took occasion, when correspondents asked us, as the known originator of the movement, where they could obtain velocipedes, to refer them to manufacturers of the article, at that time, in Cheapside and in Leicester-square. In country towns, too, such as Hull, velocipedes are said to have been getting common of late years.

In an amusing little volume on the velocipede,* recently published, the author states that it was in 1862 that the first American patent for an "automatic horse," or "cantering propeller," was taken out; but that it was not until the fall of 1865 that velocipedes appear to have excited much popular attention in America. By that time the movement was also in progress in Paris; for we find a paragraph in the *Builder* of 17th of August, 1867, in which, as usual, we were urging the improvement of the velocipede into a self-moving vehicle for behoof of those who cannot afford to "keep a gig," and especially of workmen, clerks, and others; and wherein we note that—

"In Paris the extension of the velocipede seems now to be taken up in earnest, and not like with us as a mere toy. . . . In America, too, the *Builder's* idea is taking root. A new style of carriage appeared in Boston recently. It was a light open buggy, carrying two men, and had no

* Velocipedes, Bicycles, and Tricycles; How to Make and How to Use Them; with a Sketch of their History, Invention, and Progress. By Velox. Routledge & Sons, London, 1869.

visible means of locomotion save a slight apparatus under the box . . . and was guided as easily as if a horse had been attached."

Now, does not this show that the movement in America was even specially connected, in its origin, with our idea of a self-moving velocipede? We observe, too, from an article on "Compressed Air for propelling Vehicles," in the *Builder* of November 23rd, 1863, in which we refer as usual to velocipedes, that compressed air, as we have shown that we had years before suggested, in connexion with this movement, had then been successfully applied at New Orleans to street-vehicles or cars. The air was compressed into light but very strong vessels, of a sort of paper mash, at a station, by means of steam power.

Of course, nothing we have said is to be held as calling into question the origin of the bicycle. That may have originated in France, in America, or in England itself, for all that we know. It seems to be doubtful, however, how or where the bicycle originated. The Americans have bicycles as well as the French; and the author of the little volume already noticed says that the claim of the American patent of 1862 "embraces all the essential points of the modern bicycle." Yet he somewhat incoherently, as well as quite mistakenly, expresses his opinion that "the re-creation [of the velocipede movement] is due to the *petits cravats* and *coquettes* of Paris;" although he also says that the French bicycle was "a thing of the future" "as far back as 1866" (only two or three years ago), when "the *Scientific American* recorded a patent for the two-wheel velocipede with treadles and guiding arms." One would think this author has himself pretty clearly proved that both the new velocipede movement and the bicycle were known in America sooner than in France, as they were in England sooner than in America. We have, at all events, shown that several years previously to 1866, and even to 1862, the movement had already been originated in England, and that the pioneer and originator of it was the *Builder*.

We may conclude these notes by recording a few circumstances as to recent "velocipedal progress." Not only has the velocipede been adapted to locomotion on ice, but also on water; and a member of the Aeronautical Society, as reported in *Scientific Opinion*, suggests it as a basis for locomotion in the air!

An "Imperial Velocipede and Loco-Machine Institute" is being formed in London. Recently a conference was held at the Inns of Court Hotel, Holborn, for the purpose of explaining the objects of the proposed Institute.

Two great improvements, says the *New York Herald* of the 14th ult., will be perfected this week in velocipedes, and both are just the improvements that had far to make it a machine of every-day utility. The first is a means of doing away with the tarring sensation when riding over rough pavements, and the second is a device that triples the speed with less than the ordinary power and one-fourth the velocity of treadle movement.

When the novelty-hunters are quite done with the velocipede, as we have already said, we trust that one result of the movement may be that the vehicle will be improved out of mere velocipedism, in the way we wish, and made useful, as a *traverser*, to those who cannot afford to keep either horse or chaise; enabling them to live healthfully in out-of-the-way corners of the old skirts of London and of other large towns, while obliged to be daily in town on business.

THE TRADES MOVEMENT.

THE FEND BETWEEN masters and men, we regret to say, is believed to be getting more general than ever. Throughout the whole of Lancashire and Yorkshire the relation between them in nearly every trade is most unsettled. In Liverpool the master builders are said to be making strenuous efforts to bring the unfortunate difference which has arisen in the building trade to a close, while on the other hand the operative masons seemed equally determined not to come to the terms of the masters as embodied in the new rules. In consequence of the strike, the principal works in the town have been suspended; though it is said that sufficient masons have been obtained from other towns, chiefly London, to enable operations to be resumed. By our last account there were 65 masons working in Liverpool under the new rules, and 76 apprentices and "improvers." There were from 80 to

100 non-society men also at work. The Operative Masons' Society is an exceedingly strong one—it is said they have at least 27,000, in hand.

The strike on the part of the Manchester masons begins to show signs of feebleness in its funds. In another month, if men come in as rapidly as they have done since Whitsuntide, the masters, it is said, will have hands enough to carry on all works without any of the hands now on strike—some 600 or 700 of them.

At Leeds, a meeting of the masters has been held, and the following resolution unanimously adopted:—

"That this meeting, feeling the importance of the present struggle for the true principle in calculating time and arbitration in cases of dispute, fully resolves, along with the principal towns in England, to determinedly hold out, and rejoice in the fact that so many men have agreed to our terms, and commenced work in this and other towns."

At Blackburn a strike in the building trades is imminent. The secretary of the Masters' Association has received a letter from the operatives' union, intimating their intention of proceeding with their notice of a reduction of the working-hours from fifty-four to forty-nine per week. The masters are firm in their determination not to submit to the reduction, and the men will therefore go out on strike.

The joiners of Over Darwen on strike, in consequence of the refusal of the masters to comply with the request of the operatives for a reduction of the working hours, have refused to abate their demands. An attempt is being made to extend the strike to other towns in the neighbourhood.

At Wigan, where the fight has been about the hour system, the men have had an interview with the masters, but no arrangement was come to.

The masters have given in at Leamington. The builders acceded to the demand of the men for an advance of 6d. per day, and the men on strike were to resume work immediately at the new rate of 6s. per day.

A number of the operative painters of Worcester are on strike. They sent in a request to their employers in March, asking them to adopt the hour system, and to leave work at one o'clock on Saturdays—that being the custom in the other branches of the building trade in Worcester—and also asking a slight increase in their wages, to come into operation on June 1st. The men further requested their employers to meet them to discuss their request. The employers, with one or two exceptions, took no notice of this application. The men met on the 5th inst., and decided to be at the shop at one o'clock on the 12th inst., and demand payment by the hour. A circular was sent to the employers on Monday the 7th inst., informing them of this resolution. A number of the employers then met and resolved not to alter their time of working or payment. About six shops, however, paid upon the new system. The men struck at the other shops, but at one shop the men (numbering fourteen) have gone in again, after the principals had given an interview to a representative of the men. The men desired to submit their case to arbitration, a good opportunity being afforded by Mr. Rupert Kettle's presence in Worcester on the 6th instant, but the employers refused arbitration.

The bricklayers connected with the union in Leicester have turned out on strike. The rate of pay has been 6½d. per hour, for 58½ hours per week, and an advance of ¼d. per hour, and a reduction of the hours to 56 in the week, are asked for, which, owing to the badness of trade generally, the masters are unwilling to grant. A strike of the bricklayers' labourers for similar objects is anticipated.

The joiners in Glasgow and its vicinity have given their employers notice of their intention to shorten their present hours of labour to nine hours per day on and after the 1st of July, and have issued voting-papers to all the shops and squads,—the returns showing a majority of 6 to 1 in favour of the proposed change.

Mr. Richard Harriot, general secretary of the Operative Masons' Association, has issued the following report:—

"The only new feature, in connexion with the strikes and lock-outs this fortnight, is the appearance upon the walls of large towns of huge placards and counter-panels side by side, the one inviting to accept the employers' terms, and the other dissuading from accepting such terms. The strikes now pending, with the numbers on each respective strike-roll, are as follow:—Birmingham, 23; Birkenhead, 3; Bigglesy, 5; Manchester, 257; Sunderland, 7; total, 300. Partial lock-outs will exist in fourteen towns, viz.—Bolton, 3; Bristol, 95; Coventry, 6;

Didbury, 2; Fishford, 23; Halifax, 61; Liverpool, 235; Leeds, 69; Lymm, 3; Old Swan, 9; Sheffield, 25; Wakefield, 9; Wigan, 7; Wolverhampton, 9; total, 569—making, with those on strike, an aggregate of 839, showing a reduction of 21 members upon the funds since our last return. As the gross total of members of the society is 18,281, it will be seen that both strikes and lock-outs do not throw out of employ a twentieth of the actual members of the society."

Mr. Rupert Kettle, of Wolverhampton, who has already settled by his arbitration so many quarrels about wages between masters and men in the Northern Counties, has just effected another arrangement of the same kind among the cotton-spinners of Oldham. On this occasion *Punch* says:—"All our readers will remember the opening of a famous domestic quarrel in one of Dickens's Christmas Stories: 'Kettle begun it.' Let us hope henceforth all stories of trade-quarrels in the North will run 'Kettle ended it,' and that, encouraged by the success of this voluntary conciliation court, masters and men, instead of striking, will strike up the popular chorus, 'Polly put the Kettle on.' *Punch* begs leave to offer them a version of the song for such occasions;" and a very good song too: the refrain of it is:—

"Better put the Kettle on,
Better put the Kettle on,
Better put the Kettle on,
And let's agree!"

An American paper, in allusion to the progress of the "eight hours movement" in the States, says—"We have adopted the eight-hour system in this office. We commence work at eight o'clock in the morning and close at eight in the evening."

THE BRITISH MUSEUM.

You have recently devoted much space to interesting notes on the (Albert) Museum, South Kensington. How often do architects visit the British Museum? too often, or twice in their lives? Yet, beyond the old collection of undying interest, much which is new has lately been added. Many of your practical readers will be glad to know that there is in the Botanical Gallery an excellent collection of cabinet and coniferous woods, prepared and named by Mr. Edwards. The pines and firs are specially instructive to those who desire to acquire information touching the appearance of the several kinds, a matter in which, however elementary, much ignorance is sometimes manifested, productive alike of confusion to the young practitioner and of injury to his clients.

The art-student will be strikingly impressed by the haughty grandeur, specially in the pose and tournure of the lofty head, of a half-rummed colossal lion, from a Doric tomb on a promontory near Chidias, Asia Minor. Wandering here, in the Egyptian and Nimrod Galleries, and wending through the Greek and Roman Saloons, the contrast between the Kensington and British Museums is very remarkable. The former may be said to be characterised by sensationalism, the latter by solidity. Gigantic Egypt, mother of mysteries, lies silent as death, yet living before us,—massive, simple, sublime; the human heads starting in their calm repose, abstraction, and dignity, yet ever pleasing, almost smiling, and benevolent. Curiously interposed between Egypt and the standpoint of the Cnidias lion, almost as a veil, stands the solid symbolism of Assyria,—minute and elaborate, yet grand and overpowering; its cere-cloths cast aside, and risen, perfect almost as when hurried, from the sepulchre of ages. And ideal and heautous Greece, joyous yet tempered with her own pale cast of thought, with her faint and distant shadow, Rome,—they, too, speak here, oh, how eloquently beyond words! still with ever that wondrous appearance of unconsciousness of the spectator, and striking absence of any sign of mere self-exhibition, which defies the gods and ennobles the men. But, what! our ancient love, Clytie, is it she? Surely, yea. She, all know, pined away, and was metamorphosed into a flower; but on what poetic or prosaic authority does she change from of old into "an inexpressive of the Augustan period"? Another supposititious subject, "Caligula," arrests instant attention among the novelties; but whoever the airy and elegant figure portrays, there can be no mistake about the nobility of his steed.

The Parthenon marbles are now concentrated in the second Elgin Room, the frieze of the cells being protected with glass. In what was called the First Elgin Room are remains from the Mausoleum at Halicarnassus, erected in the

palmy period of Greek art, and which gave its name to subsequent memorials of the kind. The magnificent colossal horses seem to prance and curve; the lions are very characteristic studies; and not the least interesting statue is one presumed to be of Mausolus himself—a draped figure of great dignity, found broken into sixty-five fragments, at length reunited.

Externally, sheds still disfigure the colonnades, fantalizing with dreams of priceless treasures there and in cellars concealed from public gaze, and recalling the plaintive cry of "Antiques" in Count Platen's mournful verses:—

"Here have ye piled his together, and left us in cruel confusion;
Each one pressing his fellows, and each of us shading his brother;
None in a fitting abode, in the life-giving play of the sunshine.
Here in disorder we lie, like desolate bones in a charnel;
Waking, in all that can feel, deep sense of sorrowful yearning
For the magnificent days when, as all but alive, we were honoured!
Ye, too, have ye no temples, no pleached arcades in your gardens,
Where ye can take us, and plant us all near the un-perishing heavens,
After our own sweet went, to the joy of the pious beholder?"

The colossal pedestals will, it is to be feared, long continue without colossal statues; but cannot the accomplished architect to the Museum persuade the authorities to place a fountain in the centre of the grass-plot on either side of the portico? With two more respectful suggestions,—the labelling of hundreds of objects without any description, and the issue separately, with division of cost, of catalogues of the collections of natural history and antiquities, two diverse subjects conjoined in one pamphlet,—I may conclude this slight annotation on, incomparably, the most valuable collection existing in one edifice of natural, artistic, and literary productions. EDWARD L. TARBUCK.

RAILWAY MATTERS.

The New Liverpool and Manchester Railway.—Messrs. Benton & Woodriss, railway contractors, have entered into an engagement to complete the new railway within two years. The railway, which is undertaken by the Manchester and Sheffield Company, in conjunction with the Midland and Great Northern Companies, will have a spacious station in Ranelagh-street, Liverpool, and will join the Garston line about a quarter of a mile on the Liverpool side of that village, leaving Woolton to the left. It will then run through Farnworth and the heart of Warrington, taking, in its course to Manchester, the edge of Carrington Moss, Flixton, and other places, and will join the Manchester, South Junction, and Altrincham line near Old Trafford. There will be a fork from the line near Carrington to join the line at present constructed, leading through Stockport, and it will form a connexion with the Midland Company's new line running through Derbyshire and the neighbourhood of Woodley, and also with the Manchester, Sheffield, and Lincolnshire line at Godley, thereby forming a through route to London and all the places of importance on the eastern coast. The line from Liverpool to Manchester will be almost straight—32½ miles in length, and the introduction of the latest improvements in the construction of engines and carriages will, it is expected, enable passengers to traverse the distance in forty-five minutes. The line presents but few engineering difficulties, the chief erection being the bridge over the St. Helen's and Warrington Canal. The heaviest portion of the works at the Liverpool end of the line will be commenced very shortly in the neighbourhood of Halewood.

Rough and Ready.—A bridge on the Jeffersonville and Indianapolis railroad, 160 ft. long, was recently burned down, and rebuilt so that the trains passed over in eighteen hours.

A Scream of Triumph.—The completion of the Central Pacific railroad was celebrated characteristically at San Francisco. When the telegraph announced the last rail laid, the whistles of thirty locomotives, gaily decked, and drawn up in a line, screeched out in concert as an expression of joy, and the steam-whistles in the city joined in.

The proposed Bridge Across the Mersey.—At a recent meeting of the committee of works of the Mersey Docks and Harbour Board, Messrs. Low & Thomas, the projectors of the proposed Liverpool and Birkenhead railway, were present by invitation. The principal features of the scheme discussed by the Board were the two piers pro-

posed to be placed in the river, and the height of the bridge above high-water mark. One member of the committee considered that the height of 140 ft. above high-water mark was insufficient; and others were of opinion that objection would be raised to the piers in the river. Messrs. Low & Thomas were referred to the conservators of the river, and if it were found that no objection was raised by them, the committee of works thought that the Mersey Docks and Harbour Boards would not raise any difficulties.

THE SITE FOR THE LAW COURTS.

A FASHIONER of St. Clement Danes being asked for his consent to the Bill for acquiring the Embankment site, writes,—

"I dissent in reference thereto. Firstly—Because, from my knowledge of the site, my conviction is that the cost will go far beyond the amount provided in the Bill. Secondly—Because, owing to the quicksand on the Thames Embankment, it may be found necessary to have the foundations on the site of the streets, which would render the acquisition of the blocks of buildings up the Strand frontage necessary. Thirdly—Even if the Thames Embankment ground could be used for the foundation, from the cost to be paid for the Somerset House—some of the finest buildings in London—would be eclipsed in effect by Mr. Street's proposed façade to the river. Fourthly—Because, from the economical point of view, the Carey-street site would be found better adapted to the Law Courts. And, finally—Because the parish of St. Clement Strand has already been seriously injured by the removal of a large neighbourhood, and a second clearance in the parish of a large locality would cause a serious amount of ruin and inconvenience to the inhabitants, which no amount of compensation could repay."

The Royal Commission have appointed a committee to examine all the questions of measurement and cost.

Mr. E. M. Barry is justly urging that

"The printed correspondence, in answer to Mr. Benjick's motion on the appointment of the architect, is partial and incomplete." He says,—“It omits several letters from Mr. Street and myself, written when there was no difference of opinion between us, that the decision of the judges could not be departed from (as has since been done) without an intolerable breach of faith. It does not give, moreover, some further letters from me, in one of which, several months since, I asked for definite information on an important point without obtaining a reply. I hope Mr. Benjick or some other member will get his return completed, as it is most unfair to me that a portion of my correspondence should be printed with the omission of context and sequel.”

LINCOLN DIOCESAN ARCHITECTURAL ASSOCIATION.

The annual gathering of this association was held on Wednesday and Thursday, June 2nd and 3rd, at Southwell, under the presidency of Dr. Wordsworth, Bishop of Lincoln. Wednesday's proceedings commenced with service in the minister.

Mr. Fowler, architect to the dean and chapter of Durham Cathedral (formerly connected with Southwell Minster), afterwards read a paper descriptive of the architectural features of Southwell Collegiate Church. In the afternoon, after divine service, Mr. Fowler gave an account of the old palace to a company assembled in the grounds.

In the evening a meeting was held in the Assembly-rooms, presided over by the Bishop of Lincoln.

Mr. Bloxam read a paper on the effigy of Archbishop Sandys, and Mr. Dimock on “The Documentary History of Southwell.”

On Thursday the members made an excursion to Rufford Abbey, the seat of Captain Saville; also calling on their way at the various churches between Southwell and Edwinstowe. A large party proceeded on the excursion, which included Halsam, Edingley, Parnsfield, Bilthorpe, Rufford Abbey, and Edwinstowe. About twenty conferences of various descriptions were occupied by the party, and the weather was fine. At Rufford Abbey they had luncheon. After visiting Edwinstowe they returned to Southwell. The annual dinner was held there in the Assembly-room. During the meeting of the Society a paper “On the Documentary History of Southwell,” by the Rev. J. F. Dimock, of Bamborough, was read.

Archdeacon Trollope on Thursday evening read a paper “On the Norman and Early English Styles of Gothic Architecture;” and Mr. Poole another “On Ways and Means.”

The Arundel Society.—The annual general meeting of this society was held on Monday last when the council gave a very favourable report of its condition and progress.

THE CLASSIFICATION OF STREETS.

Numerous propositions having been set forth with regard to dividing the metropolis into districts, one more proposal I venture to think will not muddle those who are now endeavoring to bring forth a great scheme. This additional idea is, divide the metropolis into twenty-four districts, and name each after the letters of our alphabet, A, B, C, and so on. In district A let all the names of the streets commence with A, Arbingler, Ales, Ach, Adara, &c., and down to Z district with the names of the streets commencing with Z, Zura, Zosland, &c. The alterations I give is, let the streets in each district be known by a number; thus, A, 1, A, 20, W, 4, Z, 10, and so on. This letter will be the most simple. The letters and numbers could be easily and inexpensively marked on all the lamps, and when it becomes known that No. 1 street in each district commenced nearest St. Paul's Cathedral, a child would have no difficulty in finding the direction required. Although streets in some parts of America are known by numbers (in letters, not numerals), there are no districts; and instead of writing one hundred and thirty-seven street, here it would be simply 137 A.

Objections may be raised as to doing away with familiar names; but, according to many late instances, familiar names end things have not stood in the way for supposed improvements. S.D.

PORTUGUESE ARCHITECTURE.*

M. SILVA, the architect of the King of Portugal, read an able paper on Portuguese architecture at the Congress of Architects at Paris held in Paris in 1867, which he has now published and illustrated with five photographs. It is written in French. The first photograph contains eight portraits of foreign architects who attended the congress, from Austria, Hungary, Prussia, America, Russia, and Portugal; the others represent buildings illustrative of different periods of Portuguese architecture. After a few preliminary remarks, M. Silva puts the clue to his thoughts about the architecture of his country in our hands. He states his conviction, like others, that the arts—especially architecture—are mirrors which reflect the moral and physical condition of the people who cultivate them; and that they become, in their turn, a powerful element in their civilization; and he then proceeds to show how Portuguese architecture exercised its influence in developing the civilization of the Portuguese, and to consider the mission of the architect to society. Four buildings are sufficient to illustrate his theme. These, he considers, characterise the principal phases of Portuguese architecture as well as of the life of the Portuguese people. They are the monasteries of Alcobaca, Batalha, Belem, and the Royal Palace of Mafra.

The monastery of Alcobaca was the work of Alphonse I., the founder of the Portuguese monarchy, in the middle of the twelfth century. Though it has been altered from time to time, it has maintained the proportions of its primitive construction, its simple portals, its high and thick walls, its three roofs sustained by massive columns, destitute of ornaments; and these, M. Silva believes, exemplify the simple faith of the Portuguese of those days, their gross but pure and simple manners, their efforts for the foundation of the monarchy, and the consolidation of the national independence. The high walls, massive and sombre as the walls of a fortress, tell us that their founders were absorbed with religions and warlike ideas, and that the vitality of the nation was employed exclusively in the battle-field.

The Convent of Batalha, erected by Jean I., after his victory over the King of Castile, had placed him upon the throne of his natural brother, Ferdinand, marks another epoch in the sovereignty of the people, called by the author the most remarkable and glorious in the history of the country. Of all Portuguese monuments this is that which he considers presents the most admirable harmony in all its parts, the most taste, the best distribution of ornament, and the greatest excellence in execution. It also shows the beginning of a great impulse given to the national life, the glories acquired by the king and his son over the rival claimants of the throne in the field of battle, as well as the discovery of new lands and seas. Besides reflecting the development of a nation, architecture contributes to it in placing before the eyes of the mass beauties the contemplation of which has the effect of gradually softening their manners; and this building in an eminent degree fulfilled both missions.

The end of the fifteenth century saw another great change in the rate of Portuguese progress. The discovery of the route to the Indies by

* Dissertation Artistique sur l'Architecture en Portugal, depuis le XI^eème au XVII^eème Siècle, lue dans le Congrès International des Architectes à Paris dans la Séance de 29 Juillet, 1867. Par Chevalier J. N. De Silva, Architecte de S.M. le Roi de Portugal. Lisbon, 1868.

Vasco da Gama, gave a great impulse to the national life. Conquest, commerce, and navigation put the Portuguese in communication with foreign people, and furnished them much new information, which gave rise to new wants, and modified their habits. Riches gave birth to luxury. Austerity changed to softness, simplicity to gallantry. Adventure was the order of the day, and hymns of triumph a popular feature. This phase of Portuguese history Mr. Silva considers elaborately represented in the monastery of Belem, erected by King Emmanuel the Great, in memory of the discovery of the Indies and of Vasco da Gama. In this noble building he sees the greatness and heroic courage which presided at the foundation of the Portuguese dominion in the East, and that made Lisbon the commercial centre for all the provinces of Asia, as well as the splendour and glory of the national arms, and the poetry of the adventurous enterprises. The feeling that presided at its construction is an indication of the grand enthusiasm for the propagation of the faith, and the aggrandisement of the monarchy that animated the Portuguese at that period.

The fourth era in the national history illustrated by a building is that when Jean V. ceased to convene the three estates of the kingdom to his councils, and inaugurated a personal or absolute government. The sumptuous convent and palace of Matra was erected by this monarch. At this time the world was ringing with praises of the works of Bramanti, Peruzzi, Sangallo, Michelangelo, Vignola, and Palladio; consequently, it is not to be wondered at that the new palace was in the Renaissance style. Whilst taking the works of these artists into consideration, M. Silva declares that the architect of this palace did not blindly copy them; though he seized the feeling of the fashion they set, he gave a national tone to his building; told of the manners, hopes, and aspirations of the sovereign and the people; and in raising it created a type of national architecture, not bandsome, but regular, noble, and majestic—a type which serves as the chronicle and portrait of the long reign of Jean V. In the colossal proportions of the edifice, especially, and in the boldness of the superh cupola, he symbolised the elevation of the legislative ideas then being shown in the opening of canals, construction of roads and bridges, the introduction of new industries, the re-organisation of the navy, the foundation of an academy, and other works. Again, in the severity of the façades of the palace, and the strictness of their expression, might be traced the manner in which royal and monastic life were blended; thus the architecture showed the severe etiquette and ostentation of piety of the court of Jean V., and the *bristes* habits and monotonous manners of the people. Twenty thousand men worked at its foundation, therefore, M. Silva believes, was the inauguration of a new epoch of reform and splendour, for it encouraged the arts and created artists, who, by their talents and application to work, contributed to the progress of civilization.

After recounting that monuments constitute the best chronicles of the history of peoples, M. Silva sets before the architect what he concludes to be his double mission—firstly, to make the edifices entrusted to him to erect appropriate to the manners, customs, and tastes of the people among whom he dwells, when he thus becomes their historian; secondly, to make an effort to introduce into his country good taste, to establish harmony and system in the proportions of buildings, so that there may be transmitted insensibly into the national mind the harmony and order which give birth to generous thoughts and grand civilising enterprises; and, above all, to search carefully to ameliorate social conditions. Very suggestive, dignified, and thoughtful are many of M. Silva's remarks. Beauty, he continues, is an ideal very difficult to define, and which, in the vast realms of nature, takes very varied and capricious forms. Ask a rustic what are the attributes of beauty, and he will not know what to answer; but place before him a beautiful object, and you will see his ecstacy and astonishment. When a city is transformed so rapidly as Paris has been, little by little, by the systematic action of her architects, its inhabitants, accustomed to see on all sides the same principles of order, precepts of regularity, and laws of harmony, cannot fail to acquire good taste as a sort of possession transmitted from father to son. The most transcendental view of an architect's mission is obtained when we observe how he is called to assist at most of our social problems. When the re-

organization of punishment for criminal offences was before the Legislature, the architect stepped in with the penitentiary, in which building the criminal was precluded from evil communications, and every facility offered him to commence a new life; when the disasters of the old hospital systems were the burden of the day, the architect, with his new distribution of light and air, and infinity of sanitary contrivances, was the cure for them; and, in the great question of public amusement, the architect is again all in all in the theatre and other *salles de spectacle* public safety generally. And, without the national exhibitions are the most remarkable, would be impracticable. After dwelling in this manner upon the distinguished position of the architect *devant la société*, the influence he exercises in its illustration and upon its well-being, and the duty of Governments to second with all the means in their power the noble and very honourable mission which the progress of humanity has confided to him, M. Silva concludes with words of recognition of the grandeur of the great gathering together of all nations, which was the occasion of the congress, and of the affability of French hospitality and the generosity of French encouragement. It will be remembered that English architects were conspicuous by their absence from the congress. English architecture had not a single representative.

CREWE HALL, CHESHIRE.

CREWE HALL, one of the most interesting relics of English seventeenth century architecture, was destroyed by fire, as most of our readers are probably aware, in 1866. Since that time it has been in course of restoration (with additions), under Mr. Edward M. Barry, A.R.C.A., and is now nearly completed. Some years since, it was effectively restored by Mr. Biore, who, having withdrawn from active professional duties, was not willing to undertake the work a second time, though invited by Lord Crewe to do so. The main body of the house was entirely gutted by the fire (except portions of the dining-room), and has been almost wholly rebuilt according to its original design. The kitchen and offices were but slightly injured. The dining-room, the carved parlour, and the principal staircase, which were among the best specimens of Elizabethan architecture, have been carefully restored according to their original design, and the other parts of the house have been designed by the architect to correspond with them in style. As the accommodation for guests was very limited, new bedrooms and dressing-rooms have been added in a tower and private wing towards the garden, additional servants' offices have been constructed on the ground-floor, and advantage has been taken of the necessary reconstruction of the roof to form in it an attic story containing about twenty rooms for servants or others. The rooms for the men are divided from the women's rooms by a wall of separation. A new circular staircase leads from the ground-floor to the former, and the latter are approached by a distinct staircase.

New terraces have been built around the house, and the design for that given in our view has been taken from an oil painting in the possession of Lord Crewe, which shows Crewe Hall in the olden time, with terraces and a gateway, which have since disappeared. The principal piers of the balustrade are finished with supporters carved by Messrs. Farmer.

The chief alteration of the interior consists of the formation of the hall and principal staircase, with open galleries round it, to give access to the rooms on the mezzanine floor. Corridors on the one-pair floor for a similar purpose are built over the ceiling of the mezzanine corridors, leaving the centre of the court occupied by the skylight which lights the hall. These corridors occupy the four sides over the mezzanine corridors. They are arched with ornamental plaster ceilings of strapwork; at the four corners the corridors finish with four domes, with pendentives lighted through the eyes of the domes with ornamental glass.

An internal view of the hall was exhibited at the Royal Academy in 1868. It is entirely constructed of oak, with a hammer-beam roof, and principals filled in with perforated and carved Elizabethan fretwork. The hall is lighted from the top by squares of stained glass. The glass shows the heraldic devices of the Crewe family,

divided by moulded oak ribs, with carved bosses at the intersections. All the stained glass is by Messrs. Clayton & Bell. From the pendants to the hammer-beams wrought-iron gaseliers, by Messrs. Hardman, will light the hall at night.

The carved parlour has been restored according to its original design, except that the chimney-piece, which was formerly of stone, is now of alabaster and marble. The somewhat grotesque modelling of the figures in the bas-reliefs above the wall-framing has likewise been modified. The room is 14 ft. 6 in. in height, and the wall-framing is 9 ft. high, with plaster-work above, consisting of bas-reliefs in panels and foliated scroll-work.

The staircase communicates with the hall, and the landings are enlarged by being thrown open to it by triple openings on each landing. The openings on the one-pair floor (on which the drawing-rooms and picture-gallery are situated) lead to the corridors above described, and are of stone, forming an arcade of semicircular arches elaborately carved. A view of the hall is obtained from the corridors at each end, through openings level with the hammer-beams of the roof. A hot-water warming apparatus has been placed under the hall, and air-flues lead from it to conduct warm air to all the principal rooms. The latter are panelled with oak framing, and the drawing-rooms have dados and floor-borders of inlaid woods of different colours.

The chimney-pieces are of marble and alabaster, carved and inlaid. That for the picture-gallery is 15 ft. high and 10 ft. wide. It contains over the opening two oval niches, in which are placed marble busts of two ancestors of Lord Crewe, Bishop Crewe and Sir Randolph Crewe, executed by Mr. Weekes, R.A. The drawing-room chimney-piece contains, in a panel, a bas-relief by Mr. Armstead, representing a scene in the "Tempest." The design of these and some other chimney-pieces is very elaborate; and the modelling of them and of the work generally has been carried out by Mr. J. Mahey, of Princes-street, Westminster, who was engaged largely in the modelling for the Houses of Parliament, under the late Mr. Thomas. Mr. Mahey also executed the elaborately-enriched ceilings of the principal rooms.

The library is fitted up with walnut bookcases, over which are bas-reliefs in plaster of various scenes from English poets by Mr. Mahey, and the lower parts of the bookcases support statuettes in oak, about 18 in. high, of Elizabethan celebrities, by Mr. Philip. The chapel, which is consecrated, is on the ground-floor, with Lord Crewe's pew in a gallery at the west end, approached from the hall by the mezzanine corridor. The roof is oak, having arched principals, with plaster panels between them, and is being decorated by Messrs. Clayton & Bell. The other parts of the building are being decorated by Mr. Crace. The sacrum arch at the east end of the chapel is of alabaster and marble, with incised patterns; and the reredos under the window is of similar materials, with medallion heads of prophets and saints, by Mr. Philip. The east window is filled with stained glass. The entrance to the chapel is at the west end, under Lord Crewe's pew. The latter is carried on a screen of oak, with double arcades. The centre opening is closed by wrought-iron gates, by Messrs. Hardman.

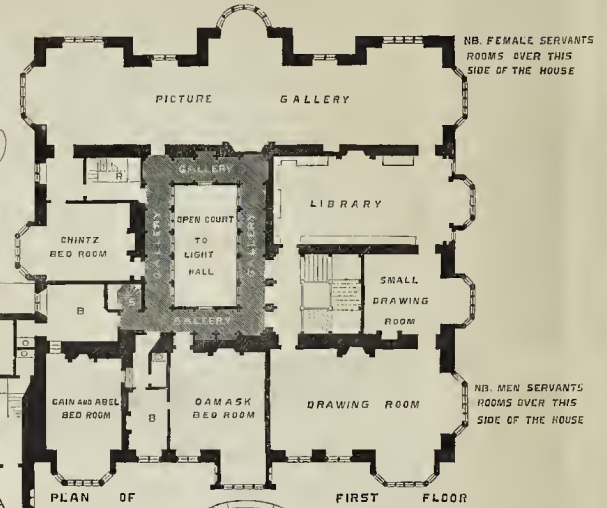
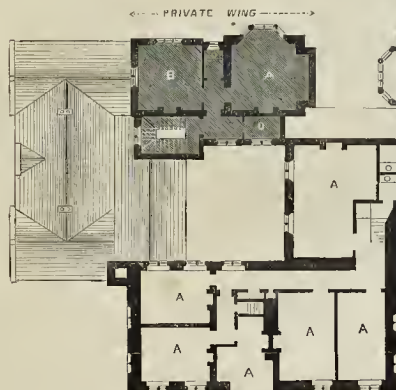
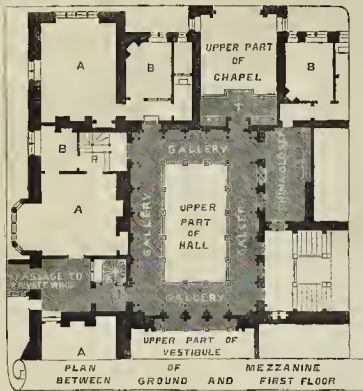
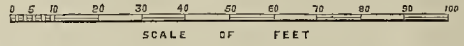
The works have been carried out by Messrs. W. Cubitt & Co., as general contractors, and are expected to be completed during the present year. Lord Crewe has been very anxious, while retaining the characteristic style of his interesting house, to render the present works illustrative of the art of the present time; and Messrs. Weekes, Armstead, Philip, Crace, Clayton, Hardman, and all who have been engaged, have readily co-operated with the architect in carrying out his views.

Mr. Barry tells us that as regards the parts of the building which have been restored according to their original design, he has derived much assistance from the drawings of Crewe Hall contained in Mr. Richardson's valuable work on Old English Mansions.

REFERENCES.

- A. Bedroom.
- B. Dressing-room.
- C. Bookcase's Room.
- D. Bakery.
- E. Sill-room.
- F. Cleaning-room.
- G. Fruit-room.
- H. Meat-larder.
- I. Larder.
- K. Pastry.
- L. Muniment-room.
- M. Strong Closet.
- N. Glass.
- O. Store-closet.
- P. Kitchens.
- Q. Fish-larder.
- R. Women's Stairs.
- S. Men's Stairs.
- T. Private Pew.

GREWE HALL. GESHIRE.



NB THE NEW BUILDINGS AND PORTIONS OF THE OLD BUILDING WHICH ARE NEWLY DESIGNED ARE INDICATED BY SHADING





CREWE HALL, CHESHIRE: AS RESTORED, WITH ADDITIONS, BY MR. E. M. BARRY, A.R.A., ARCHT.

BUILDINGS NEXT THE THAMES.

SIR,—Those who advocate the placing of our public buildings upon the embankments, have, perhaps, in their mind's eye the Seine and the view formed by the magnificent buildings lining its banks. The *tout ensemble* is worthy of imitation, and, as Englishmen and lovers of the beautiful, we wish London to possess as grand, as ennobling a scene. But London and Paris, the Thames and the Seine, are very different affairs, and must be treated differently.

The Thames, with its broad black bosom, seems to me inimical to architectural effect; it dwarfs the largest buildings, and by the similarity of its colour to our soot-stained, woe-hegone edifices, produces such a heavy sameness, as to destroy all poetry—also sublimity. The traffic of coal barges, the puffing of grimy steamers, the tackling of lighters, the stationary and helpless-looking dredgers, all combine, not only to stir up in heavy rolling volumes the mud and sediment of the bottom, but also the spectator's bile; whilst the occasional splash, splash, of the turbid waters upon landing steps, and the ceaseless snaking motion of the waves as they lazily rise and fall, are more suggestive of suicide than aesthetics.

What effect does the river front of the Houses of Parliament produce upon the *voyageur* as he passes it on his way up or down the river? Not one of awe for the size of the building, nor one of admiration for its beauty—rather indifference; but place that front in the position of another well-abused building, the National Gallery, and both awe and admiration would result.

The vast bridges which span the stream, and the heavy overpowering viaducts, all help to dwarf the finest buildings, and to militate against architectural effect. I am not arguing for the neglect of the embankments by the architect. I simply state that the embankment is not the fittest place in London to put a fine building, but one where it will have to contend against many killing effects.

Admitting, therefore, that the embankments, although unfit for the display of our finest buildings, whose size and importance should be enhanced rather than overpowered by contrast, I would plant thickly with trees more thickly than at present attempted, and devote the building sites to large shops, encouraging rather than depressing diversity of architecture; for this reason,—since grandeur is out of the question, I would invite the picturesque to assist me; by so doing the bridges would gain importance and grace—the green trees by day, and the brilliantly-lighted shops by night, would divest the river of some of its moody blackness, and give me the satisfaction of improving existing costly works, instead of the disappointment consequent upon the failure of a vast scheme met at all points by adverse forces.

The manner in which our neighbours would treat the subject would probably be as follows:—

"Here," they would say, "we have a wide river, we consider it too wide for architectural effect: so, for that reason and others, we will lay our foundation, running from London Bridge to Chelsea, and upon this will erect a grand row of houses facing north and south upon each side; we will have a broad roadway with double rows of trees; the river wall shall be massive and handsome, with corresponding steps and landing-places; we will remove all the mud from the channels separated by this long island; we will concrete or otherwise pave the bottom; and will then, without a blush on our cheek, invite both salmon and trout to disport themselves in our now silvery Thames. Do not think we have not dealt with the towns higher up with a strong hand; the strength of the current so augmented by the narrowing will prevent the accumulation of any deposit, and assist us in discovering weaknesses in such of the works crossing the river and lining its banks as shall have been already completed. This latter consideration, he assured, is looked upon by us as very weighty."

Mr. Lowe is quite welcome to this last idea: be work, he will instantly see, will more than pay for itself. He should therefore give it his best consideration and support, when started; otherwise, the best thing he can do is to leave the whole business alone: let the Courts be built upon the Strand site, where the architect will still him they ought to be placed.

In contemplating the manner in which the whole subject has been treated by our legislators, we are apt to look upon our countrymen as only cottagers in art. What a fuss and bother

have been kicked up about the three millions; ration and bankruptcy have been made to follow the expenditure of such an enormous sum—for a palace. Three millions! three millions! three millions! Notes of admiration fail to convey the terrible reality. Repetition, trumpet-tongued, still seems but the piping of a whistle, to those of our wise men who look upon gold as god and art as dress. Why, it is art, and art alone, that makes gold of any value. But these "cute" political economists cannot conceive a proposition so absurd. Where money is so quickly, quietly, and surely got rid of—where capital (political) is not to be made by retrenchment—we think nothing of throwing a million of money into the lap of Mr. Reed, and beseeching him to favour us with one of his monsters as a *quid pro quo*; and this monster after monster, million after million, come and go, and are likely to go on for ever; but when a million or two are required for art purposes, how very valuable money becomes! Verily, England is a great country, but it has much to learn yet as regards the fostering of the arts. Boasting, as we do, of being the wealthiest nation on the face of the globe, it is a pity we cannot boast of a higher civilization. Men with the sneers of some of our leading men at learning, their open flouting or neglect of fine art, the question naturally arises as to the good of doing anything but eating and drinking. The masses are by such teaching led to believe that such must be the fact. Let us hope, however, that the ventilation of this Law Court business, and its connexion with the expenditure of money for art purposes, will teach the nation that less so necessary for its true greatness.

M. U.

COMPETITIONS.

King's Norton Union.—The Guardians of King's Norton Union, Worcestershire, have selected the designs of Mr. E. Holmes, architect, for the new workhouse to be erected at Selly Oak. The estimated cost is about 15,000*l.* The plans have already been approved by the Poor-law Board, and tenders are to be at once advertised for. This is the ninth successive competition this architect has of late been engaged upon, in each of which (as we are informed) he has been more or less signally successful.

THE DRINKING FOUNTAIN IN BERKELEY SQUARE.

DESIGNERS of drinking-fountains may obtain a wrinkle by visiting the Lansdowne Fountain in Berkeley-square. The stream of water has a fall of about 3*ft.* from the lip of the urn into the basin, and nearly the same into the cup when held at the usual height. Result:—A small shower-bath to the thirsty wayfarer, refreshing or otherwise, according to individual opinion; also a wet and muddy condition of pavement generally prevalent around the fountain.

A. S. C. B.

STYLE IN ARCHITECTURE.

SIR,—I observe in your last issue that the distinguished French editor, M. César Daly, complains of the absence of "a really scientific definition of what constitutes a style" in architecture. However this may be, there does not appear any insuperable difficulty in the matter. A style of architecture is simply that characteristic and collective material expression in which all the artists concerned in its production, working among a given people or in a given age, coincide. To be true, it must indicate the people's or age's collective type of character. This is an indispensable requisite; and to be good or great, it must indicate good or great things. But such good or great things are to be considered in reference to the people or age; for into what is abstractly, or absolutely, good or great, the subject does not require us to enter,—at least until we have, in some small degree, consolidated modern diverse theories into one consistent code.

"So our virtues lie in the interpretation of the time."

The above explanations will he found to apply rigorously to the Egyptian, Greek, Roman, Gothic, and other ancient styles; but now we have neither a true nor good, much less great style of architecture, reflecting our collective type of character; recent reproductions of effete styles (a *retrogression*, not *revival*, almost con-

finied to architecture and sculpture), mirroring, not modernism, but undue reverence for antiquity. It is clearly obvious that one man never did and never can invent a new style of architecture; this being consequent on the concurrence of many men, still leaving room for the exclusive peculiarities of individuals, constituting their separate manners or modes of expressing a concrete generality, or generic style. Of course, to develop the style, there must be a certain consentaneousness of sentiment, with harmony of conviction and aim, governing universality of expression of what is in, or common to, every mind; such oneness as there was of old, and is absent now in this unsettled time. But if architects, like our foremost *literati*, really thought for themselves, they would evolve results proportionately maintained by low optimistic retrogression, and more characteristic of the present age than of past periods of history.

E. L. T.

THE CHURCHYARD OF ST. MARGARET'S, WESTMINSTER.

SIR,—Will you allow me to suggest through your columns a small public improvement? The churchyard of St. Margaret's, Westminster, extending from the church for the full length of the Abhey, is now in this condition:—

It is bounded by an old and mean-looking palisade railing. It is traversed by footways that are paved with grave-stones, while its general surface is irregularly studded with grave-stones, the intervening spaces being covered with a coarse gravel. Owing to the constant traffic, the inscriptions on the grave-stones are mostly obliterated. The whole inclosure presents a slovenly and unsatisfactory appearance.

My suggestion is, to renew the palisade railing, say, with a similar railing to that near the statue of Canning; to take up all the grave-stones, and to range them regularly round the border of the churchyard, so as to form an inner margin, finishing this margin with a granite edging; to lay out and pave the requisite footpaths, finishing them with a like-granite edging; and to turf over all the residue.

I think if some such scheme as this were carried out under the eye of Mr. E. M. Barry, who has so much improved the adjacent open spaces, a satisfactory improvement might be effected without much cost.

Might I also suggest to the authorities in charge of the Abhey to have the grass that borders the building mowed occasionally, and not to permit rubbish to be deposited against the buttresses?

Z.

METROPOLITAN BUILDING ACT.

At the meeting of the Metropolitan Board of Works on Friday last, the Building Act Committee submitted a Bill to amend the Building Act, and recommended that it be at once introduced into the House of Commons, and that Mr. Tite, M.P., be requested to take charge of the same, which was approved by the Board. A letter was received from the Home Secretary, stating that the Parliamentary counsel had been requested to make the additions suggested by the Board to the schedule of the Bill for the transfer of the duties connected with dangerous structures to the Board.

CHARING-CROSS THEATRE.

ONE man in his time plays many parts, and so it is with some buildings. The Lowther dancing-rooms, on the north side of King William-street, Strand, were transformed some few years ago into a Roman Catholic Chapel, the original seat of the "Oratorians." When that body migrated to Brompton the chapel became a temple sacred, not to Wodin, but to Woodin, hight the Poly-graphic Hall; and now, *prestis*, pass! and we have in its stead a smart little theatre, with boxes, pit, and gallery, capable of holding some 1,200 persons, with stage, and underground green-room. There are also eight private boxes. Mr. Evers has acted as architect; Mr. Foster, builder; and the decorations have been executed by Mr. Bradwell, who is one of the proprietors. The ornamental work in relief, including the perforated dome, balcony-fronts, and proscenium, were designed and executed by Messrs. White & Co., in their carton pierre and papier maché. The figures in the spandrels of the proscenium, on the ceiling, and in lunettes on each side over the private boxes, are tastefully painted by Mr. Ballard.

16 A PRIME NUMBER.

Sir,—In the preface which Mr. Fergusson has written to his "Architecture of Hindostan," I read with considerable surprise the following passage on the number 16 as a prime number:—

"Its importance will scarcely be felt by those who have not been in India, and who consequently cannot know how important the division of everything into 16 parts is, or some multiple or sub-multiple of that number. Not only is the money of the country so divided, and all the weights and measures, but all property is divided into annas (sixteenths), and in conversation it is the usual expiessive of quantity. For all the ordinary purposes of life, it is certain that this mode of division is much superior to our heterogeneous system, and also to the French decimal division, for I fear it is too true that the greatest of all the mathematical misfortunes that ever happened to mankind was that of our forefathers counting their thumbs as fingers, and then going on to ten instead of stopping at eight, as they should have done. It is too late to remedy this now, but the Hindoos have done what was possible to correct this fatal error, and in doing so have invented a system which pervades their architecture, as it does everything else," &c.

Now, sir, this statement, unaccompanied as it is by any illustrations or explanations, is to me rather startling. While I am prepared to admit that our own Anglo-Saxon methods of computing money and weights and measures are not perfect, yet as a scientific student I have found the now nearly universal decimal system so appreciated, and withal so easy and successful in every department of human work to which it has been applied, that I am led to ask how it is that—admitting, as we do, that our present methods of computation are imperfect—we have so far adopted the decimal system as to make it legally optional, instead of the more perfect one which is enunciated above? E. G.

ARCHITECTURAL EDUCATION IN THE PROVINCES.

Sir,—I have read with some interest the report in your columns on architectural education. With your permission, I would offer one or two suggestions in connexion with the subject.

The committee appear to have left out of consideration, almost altogether, provincial architects and pupils, and I need not remind you that there is really a very considerable number of both.

To pupils in provincial towns, all the extraneous advantages for acquiring instruction in subjects connected with their profession, as announced in the report, are practically useless; and if the clause in that document, to the effect that the "artistic education of the architect, which is so much required, it is hoped will eventually be obtained in the London University," means anything at all, it means positive exclusion to the unfortunate provincial from any chance of acquiring the artistic education which, &c.

Of what possible utility can instruction in free-hand drawing at South Kensington, materials and construction at King's College, or even a lecture at the British Museum on "Athenian Sculpture, with the actual examples of the Parthenon frieze to illustrate the lecturer's remarks," be to a pupil at Newcastle, or Manchester, or Glasgow?

The suggested scheme must be extended and amplified, so as to be workable and useful, not only to that section of the profession who may have the good fortune to reside in London, but to the majority in the provinces also.

It appears to me that to this end the provincial societies or associations ought to be utilized. There should be appointed in every large town, and in connexion with each of these societies, a local board of examiners, properly qualified, to whom the examination papers prepared by the central board or committee in London should be entrusted, and the decisions of these local examiners should be as authoritative in their effect as those of the local marine examiners in seaport towns.

In connexion also with the provincial societies classes might be formed for instruction in elementary design (this is the case, I believe, in Liverpool), in the history of architecture, and in materials and construction.

The Government schools of art, which exist in the majority of large towns, would afford efficient instruction in free-hand drawing and perspective. And the fact of a pupil having passed successfully an examination in these subjects in such schools might be taken into account when he presented himself for examination before the local architectural board.

For instruction in mathematics, mensuration,

languages, &c., the provincial pupil would be driven to a great extent to private sources; for there need be no difficulty on that score, for there is no lack of competent teachers.

I think that the Committee on Architectural Education should add to obligations under which they have already placed the profession by their labours by drawing up a "Course of Study" for the use of beginners, to guide them in carrying on their studies systematically, and append to it a list of suitable and necessary books. And these books should be in duplicate at least in the library of every provincial society for the use of students.

It is to be hoped that all the societies, both in London and the provinces, will heartily unite in endeavouring to carry out this good work. It will do far more to raise the status of the profession, and to exclude incapables, than any amount of grumbling correspondence in professional papers. ROBERT LAMB.

CHURCH-BUILDING NEWS.

Ely.—For many years the western tower of the cathedral has been considered unsafe. Mr. Basevi, architect, who fell from the interior of this tower in 1845, and was killed, was at that time making an examination as to the strengthening of the walls of the tower; and after that gentleman's death his suggestions were in part carried out by the dean, Dr. Peacock. Recently, some internal scaffolding to the south-west turret of the tower has been fixed by order of the present dean, Dr. Goodwin, who has consulted Mr. G. G. Scott as to the firmness of the walls, and a considerable number of oak beams and iron bracing have been recommended to be fixed, to prevent the bulging of the walls, or, in fact, to prevent the falling of any part of the upper portions of the tower.

Doncaster.—The restoration of the parapets and pinnacles of the tower of the parish church, at an estimated cost of 500*l.*, is proposed. Mr. E. B. Denison, Q.C., has expressed his willingness to contribute half the requisite amount. The present appearance of the tower of the church is not creditable.

Peterborough.—The Great Northern Railway Church has been consecrated. It has been built for the locomotive establishment of the Great Northern Railway Company, at New England, about a mile north of the Peterborough Station. Mr. Edward Denison, the late chairman of the company, offered 1,000*l.*, and Mr. E. B. Denison, Q.C., 500*l.*, on condition that an adequate sum were subscribed for a plain church, to hold 500 persons, according to a design given by the latter gentleman. The shareholders subscribed about 1,500*l.*, which, together with some local subscriptions and grants from societies, leaves a deficiency of about 500*l.* still to be supplied. Mr. Teale, of Doncaster, is the architect. The church is 104 ft. long and 48 ft. wide, and has a low central tower, but no transepts, a pyramidal roof covered with the slates of the county, and a semicircular apse.

Yarmouth.—The foundation-stone of the new church of St. James has been laid. The new church is intended to displace the iron mission-room at the south end. The chancel will first be constructed, capable of containing 200 persons, and as funds are obtained the remainder of the edifice will be built, which, when completed, will afford accommodation for about 1,000 persons.

Llandulas.—The church of St. Cymbrid, Llandulas, erected at the expense of Mr. R. B. Heskeith, Gwyrch Castle, has been consecrated. The church, which will accommodate about 300 persons, and cost between 5,000*l.* and 6,000*l.*, is of Gothic architecture, from designs supplied by Mr. G. E. Street, of London; and the work has been carried out by Messrs. J. & J. Hughes, of Llandudno, builders. The edifice contains several stained-glass windows, and is furnished with a small organ, by Messrs. Hall & Sons, of London.

Thornton.—Arrangements have been made at Thornton that the erection of the new church, which has now been agitated for some time, may be proceeded with forthwith. A site has been given by Messrs. John Foster & Son, in an eligible position on the north side of the new road, and directly opposite the old church. The plans are now being prepared by the Messrs. Hasley, architects, Bradford.

Oldham.—The foundation-stone has been laid of a new church at Shaw, near Oldham. The edifice will occupy a site near that of the old

church of Holy Trinity, which is in a dilapidated condition, and is said to possess not one single architectural feature. The new building will cost from 7,000*l.* to 8,000*l.*, and is intended to be in the Early Decorated style.

Slingsby.—A new structure, replacing the ancient church of All Saints, has been opened for divine worship. This was one of the projects of the late Earl of Carlisle, but his death shortly after his retirement from the vice-royalty prevented its execution. The church, having become so dilapidated that its safety was imperilled, Earl Carlisle's brother, the Hon. Admiral Howard, resolved upon its complete restoration. The new church occupies the site of the old church, but is rather larger. The mixed architecture and the ancient monuments have been considered. The perpendicular window of the east end is filled with glass in memory of the late Earl of Carlisle, placed there by the Howard family. The Walker family have placed a two-light window in the south wall of the chancel, to the memory of the late rector, the Rev. W. Walker. The trustees of the Earl of Carlisle have fitted the three-light western window with stained glass, in memory of the illustrious Charles Hardwick, Archdeacon of Ely, a native of Slingsby, who was killed by falling over a precipice near Luchon, in the Pyrenees, on the 15th of August, 1859. These windows were all the work of Messrs. Clayton & Bell, of London. The tower, which is 55 ft. high, is set at the west end of the church. The sculpture in the edifice throughout is the work of Mr. Roddis, of Birmingham. The wood-stainer was Mr. Harker, of York. The new church will seat between 300 and 400 persons. Its dimensions are as follow:—Chancel 31 ft. by 18 ft., with south aisle 19 ft. by 8 ft., and north aisle 19 ft. by 11½ ft., having eastward of it (occupying N.E. angle) a vestry 11½ ft. by 10 ft., beneath which the heating apparatus is arranged, and from which the hot-air flues radiate. The nave is 39 ft. by 19 ft., the north aisle 39 ft. by 10½ ft., and the south aisle 39 ft. by 7 ft. The architect was Mr. Johnson, of Newcastle, and the cost has been about 5,000*l.*, almost the whole of which has been defrayed by the Hon. Admiral Howard. The general contractor was Mr. John Brown, of York; Mr. Bailey, of York, doing the mason's work; and Messrs. Hodgson, of York, the plumbers and glaziers' work.

Turpoley.—The parish church, after restoration and extension, has been reopened for Divine Service. The architect, Mr. J. S. Crowther, of Manchester, has extended the west end of the nave and north aisle, which now form two gables, surmounted by floriated crosses, the front elevation being in a line with the old tower. The west window consists of four lights, divided by mullions, the tracery, like that of the other windows in the western portion, being geometrical. The entrance, by means of a porch at the southern side, necessitated the removal of the lower part of the north and east walls of the tower. These have been replaced with two arches, through which the public enter to the south aisle and nave. Between these there is a pillar, from which a sloping buttress springs, defining the length of the old nave. While getting on the stone from the base of the tower the workmen came upon the lid of what had apparently been a child's stone coffin, on which a cross was rudely cut. The restored portion of the building embraces the nave and aisles up to the choir, for which the old stone was redressed and worked up again. The eastern part, including the chancel and choir, was rebuilt some time ago. The only portions of the old church now remaining are the tower and the chapel in the north aisle. Of the interior of the tower it may be said that the roof is of pitch pine varnished, the seats being of the same material. The latter are all free.

Tridingsbridge.—St. Mark's Church has been consecrated. The edifice is built in the Early Decorated style, the material used being White Cressa bricks and Ancaster stone. The ground plan is a Latin cross, comprising chancel, sacristy, chantry chapel, nave, and south-west clock tower, to be provided with a spire. The site of the church, with the churchyard surrounding, is about half an acre in extent. Several painted windows have been introduced, and portions of others are the gifts of Captain Cating, Captain Aveling, Mr. S. T. Aveling, Mr. E. M. Smith (his own work), the incumbent, and members of his family. Another window has also been promised by Mr. James Aveling. The church is calculated to hold 300 persons.

and its total cost will be 2,500*l.*, including a sum of about 500*l.*, which is required to build the north-west tower. The architect was Mr. J. H. Owen, and the contractor Mr. C. Bennett, of Lynn; the stained windows were executed by Messrs. Heaton, Butler, & Bayne, of London, and Mr. E. M. Smith, of Wisbech.

Frampton-on-Severn.—Plans and specifications for the restoration and enlargement of the parish church have been executed by Mr. Henry Woodyer, of Guildford, architect. A new chancel is to be added, and the nave extended. Several large pillars will be done away with, and also the side galleries. A temporary vestry will be fitted up in the north aisle. The choir will occupy the chancel. The porch will be lowered, and the vestry, which is over the porch, will be removed. Several portions will be rebuilt, and others restored, so as to correspond with the original work. Some of the windows will be new, and others restored. Tenders will soon be had for the work.

Frosterley (near Stanhope-in-Weardale).—A new church here, dedicated to St. Michael, has been consecrated. The building is now nearly completed, the spire only remaining to be finished. The edifice, which is of the Early Decorated style, occupies a site on a slight eminence to the south of the village, and is built of Waskerley Hill stone, with some dressings. The flooring of the chancel is laid with encaustic tiles, and that of the aisles with variegated mosaic tiles. The interior of the walls is bare stone, similar to the exterior, and the edifice is lighted by day from about a dozen windows, and at night by paraffine lamps, there being no gas nearer than Stanhope or Wolsingham. The roof is open, and the spire will be at the extreme west end. The entrance is by a porch, on the west side, near the end. The seats are open, varnished, and free, and will accommodate about 270. The pulpit and reading-desk are of oak, and were made by Messrs. Richardson & Co., of Darlington; and the font, which is of Gathersley stone, is the work of Mr. D. Hurworth, of Darlington. The heating is obtained by Hayden's patent apparatus. The cost of the building is about 2,300*l.*; and, to complete the spire, about 200*l.* more will be required. The contractors for the work were Messrs. Lynes, of Darlington, and Mr. A. Kellott, of Crook. Mr. K. Hutchinson, of Durham, was clerk of the works; and the building is from the designs of Mr. Street.

Maisemore (near Gloucester).—The restoration and enlargement of the old parish church of Maisemore is in progress. The cost will be about 1,500*l.*. The walls are now ready to receive the roof. The new building is plain and simple. No trace of the old building remains save the chancel, the tower, and the porch. A new aisle takes the place of galleries, and open seats will be substituted for pews. The work is being done under the direction of Messrs. Fulljames & Waller, the architects.

Pensford.—The small parish church at Pensford has been reopened for Divine worship, after being closed for rebuilding. The tower is the only part that is now left of the first structure. Some two years ago it was found that the church was falling into a state of extreme dilapidation. It has, however, been rebuilt, at a cost of about 1,000*l.*. New open seats of stained deal have taken the place of pews. The architect was Mr. C. E. Giles, of Furnival's Inn, and the contractors were Messrs. Hayes & Son, of Bodminster.

DISSENTING CHURCH-BUILDING NEWS.

Bradford.—The church which has now for more than a year been in course of erection in Chapel-lane, for the Unitarian body, has been formally opened for religious service. The cost of the edifice has been 5,500*l.* The style of architecture which the architects, Messrs. Andrews, Son, & Pepper, have adopted is the French Gothic of the close of the thirteenth century. The street front, which extends nearly 100 ft. along Chapel-lane, is composed of a gable upwards of 75 ft. high, flanked by two large entrance porches. The gable is the feature of the external architecture. It is pierced with a moulded window, 40 ft. high and 24 ft. wide, with five lights, divided by clusters of shafts, surmounted by a large circle filled in with tracery of smaller circles. Over the window are three miniature porches, recessed, one of which is filled by a globe, while the gable is finished off with a cross-finish. The design includes the erection of a light spire, which may be added when desired. Internally the chapel is 83 ft. long by 55 ft. broad, and consists of a nave, with side aisles and a chancel. With

the view of giving the whole of the congregation an unobstructed view of the minister the aisles have been narrowed until they are merely broad and commodious passages, the congregation being all seated within the nave, on the centre of which runs a wide passage. On each side of the nave are five arches, springing from stone shafts with carved capitals, supporting the main side walls, and these walls, carried up to a considerable height, are strengthened by flying buttresses extending over the side aisles. Each bay has in the aisles two single-light windows, and in the upper part of the nave a large two-light window, having a circle above containing geometrical tracery. The ceiling, which rises upwards of 50 ft. above the level of the floor, is semicircular in form, divided by main and intermediate ribs, and is painted blue. At the south or chancel end of the chapel is an arch opening into an apse, which is paved with encaustic tiles and surrounded by an arcade of decorated arches and tracery, with four lancet windows above. At the sides are chambers for the organ and choir, with private entrance. The pulpit is at the south side of the aisle, and is of Caen stone with carved panels, containing in the centre discs of polished marbles, and a cornice enriched by foliated ornaments. The heating of the building will be effected by Hayden's system of hot air, and the artificial lighting by gas standards and brackets. Accommodation is afforded for 500 to 600 persons. As already stated, Messrs. Andrews, Son, & Pepper, of Bradford, are the architects, and the following the contractors for the respective trades:—Masons, Messrs. Barraclough & Co.; joiner, Wm. Crabtree; plumber, John Seafield; plasterer, Benjamin Dixon; slaters, Hill & Nelson; painter, H. Briggs; gasfitters, Messrs. Dooey & Co., Manchester; and carvers, Messrs. Maw & Ingle, of Leeds.

Cheadle Hulme.—The memorial-stone of the new Congregational Church at Cheadle Hulme, has been laid. The edifice consists of a nave with an apsidal end, semi-hexagonal in plan. The nave is in seven bays, with traceried windows on the sides, the two bays next the centre of the sides having three-light windows. The other windows are of two-lights each, and all have traceried heads under Gothic equilateral arches. The chief entrance is at the north-west angle by a porch beneath a tower, about 11 ft. square at its base. The tower is carried up square, with hipped angles for about 40 ft., when it slightly diminishes, by stone weathering courses, on which the tower assumes an octagonal form, with two-light windows on each face, the angles of the weatherings being surmounted by pinnacles about 12 ft. high from base to apex. The tower is to be roofed with timber, and covered with slates on green and blue bands. From the ground to the apex of the tower will be about 95 ft. At the north-east angle of the building is another porch, with a gabled roof. The roof of the chapel (open timber) is of one span, the principals of which spring from stone corbels about 8 ft. from the floor, and assume the form of a pointed arch. The windows of the apse end are a considerable height from the floor, so as to admit of an organ being placed beneath them. Preparations are being made for a gallery to be added at a future time, if required. Externally, in the south-west elevation, comprising the chief entrance and tower, each bay is marked by a buttress between the windows. The elevation to the north-east comprises the tower at the angle, the secondary porch at the opposite angle, and a broad gable divided into three bays of buttresses. The centre bay is filled with a five-light traceried window; the two others with similar windows, but of two lights only. The two other elevations are somewhat less ornate, though of a similar character. The chapel will be covered with blue slates, and the straight line of roof will be broken by dormers. The school building communicates with the chapel by means of the secondary porch, and comprises a room 40 ft. by 25 ft., and about 17 ft. high to the centre of the wagon-headed ceiling. Adjoining are two class-rooms. The cost of the building will probably be about 3,000*l.*, the site for which has been given by Mr. Storey. The architect is Mr. Henry Littler, Cheadle Hulme and Manchester. Mr. George Atkinson is the contractor, Mr. George Roy supplying the mason's work.

Thornston.—The Congregationalists of Thornston, near Bradford, are about to erect a new chapel in the village, and have sought designs for the proposed building. Messrs. Andrews, Son, & Pepper, of Bradford; Messrs. Pritchett

& Son, of Darlington; and other architects, competed, and the design by the first of these firms has been chosen. The chapel is to be erected in the main street of the village, the style selected being Gothic. The building will consist of a nave, aisles, and chancel, with minister's vestry on one side, and organ-chamber on the other, a screen dividing the chancel from the nave. Internally, the chapel will be 90 ft. long by 41 ft. wide, with a height of 45 ft. in the centre, and it will be fitted up with galleries. Entrance will be gained by three doors in the south front, facing the road, the gallery staircases branching off right and left. Externally, the building will be of stone; and at one side of the front a square tower and spire of the same shape will rise to the height of 110 ft., with convenient arrangement for a clock. The cost will be somewhere about 3,000*l.*

SCHOOL-BUILDING NEWS.

Kessingland.—Plans and specifications have been obtained for the erection of school-rooms. The Bishop of Norwich has laid the foundation stone. The cost of the schools will be about 900*l.* The building is to be in the Gothic style, designed by Mr. I. B. Pearce, of Norwich, and will be of red brick with white dressings. Mr. Samuel Hall, of Norwich, has taken the contract.

Great Horton.—New Congregational Schools have been opened here. They were designed by Messrs. Paull & Robinson, of Manchester, architects, and have been erected at a cost of nearly 6,000*l.*, the site on which they stand being rendered expensive on account of a public-house and other buildings which occupied it. The buildings consist of a large assembly-room, above which is a suite of small class-rooms. The ground-floor, underneath the assembly-room, is occupied by infants' class-rooms and the various offices connected with the buildings. The rooms are ventilated and warmed.

Leek.—The foundation-stone of new Sunday schools, for the Methodist New Connexion in Leek, and attached to the chapel erected a few years ago, was recently laid here. Mr. Sugden, of Leek, is the architect.

Gloucester.—The foundation-stone of St. Luke's Schools has been laid. They will consist of three large rooms placed side by side, and occupying in the aggregate a space larger than the Corn Exchange. The rooms are divided into departments for boys, girls, and infants, with separate entrances, and there will be cloak-rooms and lavatories. The master's house will adjoin the schools. A playground will be formed in the rear of the schools for each class. The elevations are designed wholly in brick and stone: varieties of the latter will be used. The contract has been taken by Mr. Moreland, of this city, for 2,542*l.* The architect is Mr. Maberly, of Gloucester and London, and the works will be erected under his supervision.

Middleham.—The foundation-stone of a school about to be erected in a memorial of the late rector of the parish, the Rev. Mr. Birch, has been laid here. The school will be erected by Mr. John Thorpe, stonemason, and Mr. John Clarkson, joiner, both of Middleham. The design is by Mr. John Topham, of this place. The plans and specifications have been prepared by Mr. Sturdy, of Middleham, architect.

Newmarket.—A national school for All Saints' parish is to be erected. The design has been prepared by Mr. J. F. Clark, of Newmarket, architect, and the plan includes a school-room, 60 ft. by 20 ft., with two class-rooms, each 16 ft. by 14 ft., the latter to be converted into reading-rooms, &c., during the winter months, whilst the former will be available for lectures and other entertainments. There will also be a master's house, and the total cost is estimated at 1,150*l.* The contract for the work included in the specifications has been taken by Messrs. Whitmore & Simpkin, of Newmarket, builders, at 1,119*l.* 16s. In addition to the erection of a national school, it is also proposed to enlarge the parish church, so as to double the present accommodation, which is only sufficient for about one-fourth of the population. The cost of the work now contemplated is estimated at 2,500*l.*

Bracebridge.—A school has been built here. The residence of the mistress is placed at the north extremity of the site. The school-room is placed immediately behind the residence, having playgrounds on the south side. The school-room is 31 ft. by 16 ft. inside, and 11 ft. 6 in. high to the square of the walls, the roof being open to the top of the side pieces, thus giving

the height of 17 ft. from the floor to the flat ceiling. Adjoining the school-room is a classroom, 12 ft. by 10 ft. 6 in., fitted up with infants' gallery. The building has been erected by Mr. Chambers, from designs by Mr. Watkin, of Lincoln, architect.

PROVINCIAL NEWS.

Lodden.—It is proposed to erect a building for public purposes in this place. Mr. Benet, of Norwich, architect, has provided the design, and guarantees that the total expense will not exceed 1,350*l.* A limited company is to be formed to raise the necessary funds. Shares to the amount of 860*l.* have been already taken.

Llanrhidian (Gower).—The foundation-stone of a new vicarage-house has been laid here. The architect is Mr. W. Richards, of Swansea.

Leicester.—The Wellington Hotel, which is about to be erected upon the site of the present "Wellington Castle" by Mr. Wm. Burley, from the design of Mr. R. J. Goodacre, architect, will have a frontage to Rutland-street of about 115 ft., and to Granby-street of 44 ft., and will be built in the modern Italian style, with white brick facing and stone dressings. The angle at the junction of the two streets will be made circular, and in it will be placed the principal entrance. The ground floor will consist of entrance-hall, staircase, bar, commercial and sample rooms, coffee-room, and waiting and private rooms. The first-floor will contain dining-room, 38 ft. long; billiard-room, and six private rooms. On the second and third floors there will be twenty-two bedrooms, bath-room, and store-rooms. The kitchen is to be a one-story building on the ground floor, adjoining the main corridor, and ventilated with Watson's patent syphon ventilator. A portion of the offices are to be constructed on the ground-floor, and the remainder in the basement. The whole area of the building is to be excavated and made available for storage. A lift will be introduced and communicate with the several floors for the transmission of luggage and other heavy articles. It is proposed to provide stabling for fifty or sixty horses.

Basingstoke.—The foundation-stone of the Mechanics' Institute has been laid here. The site of the new building is in New-street, and the ground has been purchased with a fund formed by the proceeds of a Loan Exhibition held some time since. The plans of Messrs. Messenger & Seymour, architects, London, were chosen by the committee, there being sixteen other competitors. The plans adopted were slightly modified, to meet the wishes of the committee, and, when finished, the building will consist of a large reading-room, library, and other offices on the ground floor, with club-room, class-rooms over, and the librarian's residence in the rear. The cost will be 875*l.*, and the contract has been accepted by Mr. W. Pistell, the ex-mayor.

Bournemouth.—The New Dispensary Buildings in Madeira Vale have been opened. They have been erected at a cost of more than 1,000*l.*, and were opened free of debt. They are built of brick, with stone dressings. There are seven rooms on the ground floor,—the accident ward, the consulting room, the waiting-room, the laboratory, the kitchen, the larder, and the scullery, 10 ft. square. Upstairs the rooms are four in number. Mr. Tuck acted gratuitously as the architect.

Poulton.—A paragon-house for the Rev. John Rule, whom the bishop instituted as vicar, is just completed. Mr. Ewan Christian was the architect, and the style is Early English. The stone of the district, with Bath stone quoins and facings, was employed; and the tiles were also of native stone. The joiners' work throughout is stained and varnished, and the paint-brush is banished to the kitchen and servants' rooms. The chimney-pieces are of Bath stone, with borders of Minton's encaustic tiles, and frame and shelf being of pitch pine. The stabling is good, and the loose boxes are of stained deal. The estimated cost of the building was 2,046*l.*, and the work has been executed by Mr. William Hinton, of Cirencester, builder. One of the churchwardens has started a subscription towards the erection of a new church and schools, with the gift of 200*l.*, and all the stone required. As soon as a suitable site has been secured, it is hoped to set to work to build them. The new church is intended to be more centrally situated, the old church of St. Michael being declared to be at an inconvenient distance from the village, and past restoration.

FROM AUSTRALIA.

Melbourne (Victoria).—The trustees of the Melbourne Public Library have issued their prospectus of the proposed Fine Arts Exhibition, and preparations were to be made to open the Exhibition towards the end of March. The display will comprise works of art, art treasures, and specimens of ornamental and decorative art.

—At a meeting of the education committee of the Presbyterian Church of Victoria, held on the 1st of February, it was unanimously resolved:—"That the committee recommend the General Assembly not to sanction the transference of any more Presbyterian schools to the Board of Education, till it is ascertained what course the Legislature will take in the education question."

A sub-committee was also appointed to make arrangements for conferring with other denominations, with the view of conserving the religious element in any system of education that may be introduced by the Legislature.—The Presbyterian congregation of Richmond, Melbourne, who have since their formation in 1860 assembled for public worship in the wooden chapel in Lennox-street, opened on Sunday, February 14th, their new stone church, situated on the hill at the top of Lennox-street, close to the Bridge-road. The building is of blue stone, and is in the Gothic style. The part opened is calculated to contain 600 seats. When the whole building is finished, accommodation will be furnished for nearly 1,000 persons. The total length is to be 93 ft. 6 in., and the width 51 ft. The height of the church in the interior is 56 ft., and the outside walls are just on a level with the top of the spire of the Congregational Church in Collins-street—a circumstance showing the great elevation of the land on which the church is built.

The tower and spire, which it is proposed to erect at a future time, will be 160 ft. high from the ground. In the interior of the church the whole length of the floor rises as a slight inclined plane from the pulpit to the back of the church. The pulpit, pews, and fittings are of polished cedar, designed in keeping with the Gothic style of the church. The roof, which is arched, is of polished wood; and the windows, twelve in number, are filled with designed glass of various light-tinted colours. There are two rooms also erected at the end of the church: one for the minister, and the other for the committee. The amount expended on the portion now opened, reckoning the cost of the land, will be about 2,600*l.* or 2,700*l.*—The foundation-stone of a new Roman Catholic church, dedicated to St. Bridget, was laid on the 14th of February in the reserve in the corner of Nicholson-street and Reilly-street, Fitzroy. The church is to be in the Decorated style, and will consist of a single nave, 28 ft. wide by 60 ft. long, with an octagonal chancel. It is intended to afford accommodation for 450 persons, and will cost about 1,200*l.*—Mr. J. Flannagan, architect, who was some months ago prosecuted on an unfounded charge of perjury, which had subsequently been withdrawn by the officer of the Crown as untenable, was on 1st of February presented with an illuminated address, signed by many of the most influential mercantile and professional gentlemen of Melbourne, condoling with him in his sufferings while under the stigma of an unjust accusation, and expressing the entire belief of those whose signatures were appended to the document in the innocence and straightforwardness of Mr. Flannagan.—An omnibus company has been for some time in existence in Melbourne. They propose when in full working order to have about 50 omnibuses and 600 horses employed. The primitive and inconvenient street cars will thus be shortly replaced, it is hoped, by more commodious vehicles.

—A piece of gold weighing 10 dwts. was lately picked up in the roadway opposite Murphy's Hotel, Castlemaine. It was separated from a piece of quartz, which a cart-wheel had crushed in passing over. A few days afterwards a nugget was picked up in the roadway opposite the Criterion Hotel. It is well known that the Chewton-road, which is spread in some parts with quartz tailings, is sufficiently auriferous to induce the Chinese to sweep it at night, and it is said they are well repaid for the trouble. "Streets paved with gold! Such was the statement," says the *Castlemaine Daily News*, "that appeared in some of the English papers a few years ago in reference to Victoria; and far-fetched as the remark was, it may be seen that it was not altogether untrue."

It has long been known that the Western Australian eucalyptus, known as mahogany, or

Jarrah wood, possesses the valuable property of resisting the attacks of the white ant, which has destroyed all sleepers of native woods that have been laid down on the Indian lines of railway. Its purchase and ship to Calcutta has often suggested itself to Victorian speculators as a probably good operation. Late letters from India mention that a large contract has been taken in Calcutta for the supply of this wood, and that the contractor is on his way to Melbourne to make the necessary arrangements. A similar contract was made not long ago by Mr. Compton who is now understood to be in Perth fulfilling it, his great difficulty being the finding of ships. In connexion with the same subject, a singular circumstance has been mentioned. A large and formal-looking letter reached the Melbourne post-office by a recent mail, addressed to "The largest and most important timber merchant in Melbourne,—in the discretion of the postman;" and this was tendered to Mr. John Sharp, of Collins-street West. At first Mr. Sharp declined to receive it; but at length he opened the missive, when it proved to be an order from some one in Calcutta to send sample tenders of the various Australian woods. The order, it seems, is to be fulfilled, and it is possible that an important trade may arise out of this curiously opened correspondence.

FROM SCOTLAND.

Milnathort.—The new United Presbyterian Church has been opened for public worship. The building has a large class-room and vestry attached, and has accommodation for 700 sitters. It has a spire, 125 ft. in height, built of stone, the whole being completed under Mr. William Ingram, architect, Glasgow, at an expense of about 3,000*l.* The internal arrangements include a Gothic pulpit platform, the church being principally lighted at night by a star or sunlight of thirty burners, suspended from the centre, with ornamental scroll brackets under the galleries. It is heated by one of Clark's patent heaters. The windows are all filled with cathedral stained glass, having coloured borders, with centre stained rosettes.

Burns's Cottage.—Some alterations, according to the *Scotsman*, have recently been made in Burns's Cottage, Doonside, by the Corporation of Shoemakers of Ayr, who are in the possession of the interesting "biggin." The establishment of the place as an inn has proved a great convenience to the public; one of the two apartments has been fitted up for the exhibition and sale of Manchine woodwork and other objects of interest. The kitchen is still preserved in its original state. In the course of the alterations it was necessary to remove one of the old beams of the cottage, and from the little sound wood there remained in this the corporation have succeeded in getting a few ornamental articles made for distribution as mementos of the place. The alterations have been chiefly carried out under the superintendence of Convener Cowan.

Dumfries.—A meeting of the building committee in connexion with the new infirmary buildings has been held for the purpose of further considering the plan of Mr. Starford, architect, which had been selected for recommendation to the governors on condition that it was shown that it could be constructed for the stipulated sum of 10,000*l.* Mr. Starford's plan had originally exceeded that amount, and it was now produced in an amended form, an estimate based upon it amounting to 8,650*l.* 9s. 8d. Should the proceedings of the committee be confirmed, the building will be commenced forthwith.

Jedburgh.—The proposed restoration of the Abbey Church of Jedburgh, which has been before the public for a considerable time, seems now to be in a fair way of being carried into effect. At a meeting of the heritors of the parish, held on the 24th of February last, it was agreed, by a majority, to adopt the fifth recommendation of Mr. Bell, architect, Glasgow, for the restoration of the church, which plan restored the great west window and the St. Catherine's wheel in the west gable, the south aisle, and the clearstory, and would cost 4,200*l.* At the same meeting a committee was appointed to see the plan carried out. Against these resolutions several of the heritors protested, amongst whom was the Marquis of Lothian. Interdicts have now been served on all the acting members of committee, and the case is thus being brought before the law courts.

Kilmarnock.—A stained-glass window, prepared by the Messrs. W. & J. J. Kier, of Glasgow, has been erected in the High Church here, as a

memorial of the last earl of Kilmarnock. It is a three-light window, with figures illustrating the three injunctions of the Sermon on the Mount, "Ask, and it shall be given you," &c. At the base of the centre compartment is emblazoned the escutcheon of the Boyd family, and at right and left are the arms and names of some early benefactors of the church.

Books Received.

Transactions of the Architectural Institute of Scotland. Session 1867-68. Illustrations of Scottish Buildings.

The part last issued by the Architectural Institute of Scotland contains illustrations of the Font and Market Cross at Inverkeithing; the Monastic Church of Queensferry, and the Abbey Church of Dryburgh, drawn and lithographed (with evident knowledge of his subject) by Mr. E. C. Clarke. The remains of the church at Dryburgh, twelfth and thirteenth century in date, are amongst the most interesting ruins in Scotland. The domestic buildings at Dryburgh are in a more complete state than the church, and of these it is intended to give illustrations in the next issue of the Transactions.

The church of the Carmelite Monastery of Queensferry (founded about 1330) is at present thus profitably appropriated—the east end is used as a burial-place, the tower as a pigeon-house, and the nave as a receptacle for rabbits!

The writing to the various illustrations is, for 99 persons out of a 100, unreadable,—a sheer absurdity. If a little son, writing home to tell "dear papa" of the holidays, be forced to rule lines to keep his words straight, he always takes care to rub the lines out before despatching his epistle. Why should the public be worse treated than the parent?

Architectural Illustrations and Description of Kettering Church, Northamptonshire. By Mr. R. W. BILLINGS. Revised by the Author. May, 1869. Atchley & Co., Great Russell-street, W.C.

This work is so well known that it is unnecessary to do more than announce that a new edition, revised by the author, has been published. The manner in which these illustrations are given should be a lesson to the sketchers and scratchers of the present day. Kettering Church, as we suppose all our readers know, is a fine example of the Perpendicular period (mainly).

Cyclopaedic Science Simplified. By J. H. PEPPER. London: Warne & Co.

Though still an elementary work, this handsome volume is of a more advanced order than are the author's previous works. It contains a large mass of facts, with numerous illustrations, and is excellently well adapted to excite popular interest, from the author's great experience as a popular lecturer at the Royal Polytechnic Institution and elsewhere, which has specially prepared him for the production of just such a work. The author has also made good use of the valuable papers of such men of science as Faraday, Wheatstone, Brewster, Tyndall, Crookes, and others. The work treats fully of light, heat, electricity, magnetism, pneumatics, acoustics, and chemistry. It gives explanatory accounts of the curious experiments and exhibitions which so many thousands have witnessed at the Polytechnic.

VARIORUM.

"GOOD SOCIETY: a complete Manual of Manners," published by Routledge, is a valuable little volume. Ridicule has been attached to such books, but this is a mistake. A book on etiquette may, of course, be ridiculous, but it is not ridiculous simply because it is a book on etiquette. "Good Society," however, goes beyond etiquette; it contains much useful information, and is good in tone and feeling. There are very few persons, be their position what it may, who might not gain from its perusal. In the next edition the assertion on the title-page that it is "by the Right Hon. the Countess of" should be left out. The book is quite good enough to do without such nonsense as that.—The current number of *Fraser's Magazine* has a long and fairly-argued paper, headed "The Working Man and his Friends."—The title of *The Young Gentleman's Magazine* (Routledge)

explains its purpose, and this purpose is being fairly carried out.—"Cooling Cups and Dainty Drinks." By W. Terrington. Well! artists and antiquaries and builders want "cooling cups" as well as other people (so long as they are not heating cups no harm will be done), and there is no reason therefore why we should not mention that the little book thus headed, published by Messrs. Routledge, contains a number of useful recipes.—Mr. Tegg, amongst his reproductions, has issued a modernised edition of the "Surprising Adventures of Philip Quarll,"—always welcome to young folks.

Miscellaneous.

Poisoning by White Lead.—An inquiry has been held at the German Hospital, by Mr. Richards, into the circumstances attending the poisoning of a workman. Fortunately, only one of eight men so poisoned had died. Mr. Manthas Kurts said that the deceased was a walking-stick maker. He was employed by witness to varnish walking-sticks. On the 29th ult. deceased left his work, as he was too ill to continue it. Witness used white lead in his business for fastening on the tops of fancy sticks and also to whiten them. Dr. Julius Wibell said that the deceased was admitted into the hospital on the 29th of May, suffering from the effects of lead poisoning. He was in convulsions. Witness had told Mr. Kurts that it was dangerous to use white lead in his business, for it was a poison. The men were poisoned through not washing their hands at meal-times. The poison was not inhaled; it came from the hands while eating. The stomach was contracted, and a *post-mortem* examination proved that the deceased had died from the effects of lead poisoning. The other men have, under medical treatment, recovered. A juror said that white zinc would answer all the purposes for which white lead was used in the business, and that it would be harmless. The doctor said that if the men kept their hands washed, and the place was well ventilated, the effects would not be so injurious. The coroner said that it would be well to write to the officer of health to see that proper precautions were taken, and the jury returned a verdict "That the deceased expired from the mortal effects of lead poisoning."

Netherlands International Exhibition.—A meeting of the London committee has been held at the Mansion House, the Lord Mayor in the chair. The sub-committee reported that the portion of the building allotted to the United Kingdom would be well filled by nearly 200 exhibitors, and would include the most important British industries, all classes of these being more or less fully represented, and especially those of household necessaries, clothing, and food. Messrs. Gilbert Saunders, P. Lo Neve Foster, Hodgson Pratt, Edmund Johnson, and P. L. Simmonds were nominated British jurors, having expressed their willingness to serve if approved by his Majesty the King of the Netherlands. The secretary was instructed to proceed, as soon as the preliminary details of allotment have been completed, to Amsterdam, to arrange the British section for the reception of the exhibits. Baron Mackay, president of the central committee at the Hague, stated that very complete arrangements had been made by a special reception committee for boarding and lodging 200 of our working classes during the exhibition, on the most economical scale; it would be necessary, however, to have the precise dates previously agreed upon.

Gibraltar Drainage and Water Supply. The sanitary state of Gibraltar is causing great anxiety. The new drainage system is nearly completed, but there is no provision of water to flush the sewers, and the emanations from the sinks and traps are very offensive. All the barracks are overcrowded, and this aggravates the evil. The rainfall, too, is below the average. Could not sea-water be lifted into a reservoir for the flushing of the sewers?

Technical Education.—Sir Roderick Murchison has kindly placed the theatre of the School of Mines, in Jermyn-street, at the disposal of the Workmen's Technical Education Committee, 150, Strand, to hold their first annual meeting on Thursday next, the 24th instant, at eight o'clock p.m. Lord Elcho, M.P., has consented to preside. Efforts to provide technical education for British workmen are well worthy the support of all classes.

Monumental.—Mr. Layard, in answer to Mr. N. Grenville, in the Commons, said the statue of Sir Robert Peel, lately removed from Palace-yard, is now in a Government store. As regards the question of its re-erection, he was now in communication with the committee under whose auspices it was made. There are two other statues warehoused in the Government stores, namely, those of Brunel and Stephenson. He had put these statues very carefully away till some arrangement can be made as to a site. It is proposed that they should be placed on the Thames Embankment, which would be an appropriate site for engineers. The original design was, that the statues of Peel and Palmerston should stand back to back on each side of the railing. The House has already decided against the statue being placed within the railing. A promise has been made that the Palmerston statue should stand on the outside; but, before this is carried out, it appeared to him advisable that Mr. Woolner should place on the site a model, both of the pedestal and the statue, so that members of Parliament may be enabled to judge whether the site is a proper one. The model is now up.—Mr. W. Thood, the sculptor, has just finished a statue of Lord Derby. It is a commission for St. George's Hall, Liverpool, where it will be formally inaugurated about the end of the present month or early in July. It is of heroic size, and represents the earl in his full-dress robes as a peer of Parliament, and with the insignia of the Garter: the figure stands in a somewhat haughty and almost defiant attitude. The material is a white marble, approaching closely to the appearance of alabaster. It is to be placed in a sculptured niche in the hall.

Prison Labour.—At the last meeting of the Howard Association (for the promotion of the most effectual methods of penal treatment and crime-prevention), Sir John Bowring in the chair, interesting statements in relation to the progress of the objects of the association were made by the chairman and committee, and the secretary, Mr. Tallack. Amongst other resolutions the following was unanimously agreed to:—"This meeting believes that very satisfactory results would follow the adoption (first as an experiment, and then as a rule) of a system of *Labour Sentences*, for certain classes of offenders, involving their confinement or restraint until they have, by the result of their labour, made total or partial *restitution* for their offences, or have at least defrayed the cost of their detention, either wholly or in good degree, according to their ability."

Artists and Tintagel Church.—As every one knows, Tintagel and the ruins of King Arthur's Castle have been much frequented by painters and *littérateurs*, and the artistic tastes of the vicar of the parish have led to much kindly intercourse between him and the visitors to the place. An effort on his part to restore his ancient church has called forth contributions from several artists, who have specially charged themselves with the care of the north,—or, as it will be henceforth named, the Painters'—Transept. Among the contributors are Mr. Poole, R.A., Mr. Samuel Palmer, and Mr. E. Duncan, of the Old Society; Mr. Thomas Danby, Mr. C. P. Knight, Mr. Naish, Mr. F. Dillon, &c. The works contributed arc now on sale at Messrs. Colnaghi's.

Artists' Benevolent Fund.—This fund, which was established in 1810, consists of two separate branches, the "Artists' Annuity Fund," and the "Artists' Benevolent Fund." The first is supported by the contributions of its members for their own relief in sickness or old age. The second has for its object the relief of the widows and orphans of the members of the artists' annuity fund, and is supported by the friends of the fine arts and artists, and the annual contributions of the members of the annuity fund. During the past year 48 widows and 4 orphans received annuities amounting in the whole to 975*l.* The dinner in aid of the fund is fixed to take place on Thursday, the 24th. Dr. William H. Russell will preside. Will not some of our readers assist to ensure a good gathering?

A New Town-hall for Liverpool.—A tempting offer has been made to the corporation for the purchase of the Town-hall; and the land adjoining the Public Offices has been surveyed, with a view to ascertain whether or not a new Town-hall could be erected thereon suitable to the high position Liverpool holds in the commercial world.

Gloucester Cathedral.—The work of restoration is being carried forward in this cathedral. Five months have elapsed since the restoration of the choir was begun, and much of it has now been executed. The thick layers of whitewash have been removed from one-half of the vaulting, from part of the triforium, and from a large portion of the side walls. Some faint traces of decoration have been found, but nothing of any value; and the anticipation that colour and gilding existed in the vaulting has been disappointed, no trace of decoration of any kind having been discovered. The stone tracery of the two eastern-most windows on the north side has been taken out and renewed, and the reglazing has been begun; the three remaining windows have to be restored. The exterior work in the south transept has been completed. The chapels dedicated to St. Andrew and St. Paul have been restored, the former at the expense of Mr. T. Marling and Mr. Gambier Parry, county magistrates; the latter by the Earl of Ellenborough. Mr. Marling has also promised a window for the south transept, at a cost of not less than 600*l*. The south porch is at present under restoration, the expense, estimated at 500*l*., being defrayed by Mr. W. P. Price, the senior member for the city. Some progress has been made in the restoration of the chapel of St. Philip, which is to form a memorial of the late Sir C. W. Codrington, M.P. The entire work of restoration will cost 40,000*l*.

Ancient Civilisation and History.—The fifth lecture of the series was recently given, at St. John's House, Winchester, by Mr. Reginald Stuart Poole, of the British Museum. On this occasion he traced the stages of Greek history from the Nomad, when the country was subject to the incursions of adventurers, the chief of whom were the Pelagian, Eolian, Achaian, and Ionian. The colonies of the latter were also found on the opposite shores of Asia Minor, and they were the commercial people of that early day. He pointed out that the cultivation of art was not necessarily favourable to a high morality; it depended upon the end for which any art was cultivated, whether its influence should ennoble or otherwise. Music, the least debasable of all arts, might be prostituted to vile purposes, though the art itself could not be rendered essentially bad. Greek sculpture was the finest ever produced; nothing has since been given to us, except perhaps by Raffaele, which could be considered its equal. The deductions the lecturer drew from his subject were—that philosophy is not religion; that it will never supply that which man wants; it takes the spoil, but it does not gain the battle over human nature; it affects to have discovered truths, whereas religion had done it before. And whether it be the Greek or any other nation, if it does not assign to woman as high a place as man, make her equal though diverse in her power, that nation will either fall or have to modify its own system. And no matter how high may be intellectual attainments in music, oratory, or architecture, they are all valuable rather as effects than as the causes of real good.

Laying Chief Stone of Water Tower for Tewkesbury.—Within the last two years Tewkesbury has been sewered, and now the Cheltenham Water Company has begun the necessary works for providing the inhabitants with water from the Severn. The company have purchased land at the foot of the Mythe Bridge, and the works have been designed by Mr. W. M'Landborough, C.E., formerly city surveyor at Gloucester. The water will be pumped into a subsiding tank, from which it will pass through three filtering-beds into a covered pure-water tank; and thence it will be pumped into the service reservoir. This reservoir is to be erected on the top of the Mythe-hill. The tower will be 30 ft. high; and, as the hill is 90 ft. above the level of the river, the water will flow to the top of the highest house in Tewkesbury. The base of the water-tower will be of red and black bricks, with moulded brick dressings; the tank, of cast-iron, will hold 85,000 gallons; and engine-power is provided to raise, in 8 hours, a sufficient daily supply for the town, allowing 20 gallons per inhabitant. The estimated cost of the works is about 8,000*l*. or 9,000*l*., and it is expected that they will be completed by Christmas. Messrs. J. M. Butt & Co., of the Kingsholm Foundry, are contractors for the ironwork. The foundation-stone of the water-tower was laid, with suitable ceremony, by the wife of the Mayor of Tewkesbury.

Proposed New Freemasons' Hall, at Wimborne.—The Lodge of "S. Cathberga" of Free and Accepted Masons have purchased the freehold of a large building here with the intention of converting it into a lodge-room. They have formed themselves into a company, and a committee has been appointed to carry out the arrangement and building. Mr. Walter Fleteber has been employed to prepare the design, &c. Liberal contributions have been promised.

The Post-office and the Telegraphs.—The United Kingdom Electric Telegraph Company, Limited, state that the Post-office have completed their arrangements, under the Telegraphs Act, with the whole of the telegraph companies for the purchase of their undertakings, and have nearly settled their arrangements with the railways. The amount of purchase-money required is now, therefore, so nearly ascertained that a reliable estimate may be arrived at of the probable financial result to the country. The money will be raised at from 3*1*/₂ to 3*3*/₄ per cent., and the revenue derived from the telegraphic business shows a return of between 5 and 6 per cent. upon the total sum required, and therefore a large net gain to the national revenue. The basis of twenty years' purchase of the net receipts of the companies, as fixed by Parliament under the Act, includes the plant as well as the goodwill of the business. The Act of 1844 prescribed 25 years' purchase of the net profits and of the prospective profits of the railways; so that the present arrangement is far more favourable to the country than existing precedents would have appeared to warrant. As an index to the sort of sums dealt with we may state that the directors of the British and Irish Magnetic Telegraph have just agreed to accept the sum of 1,243,526*l*. as a settlement in full.

The Channel Tunnel.—The chairman of the Channel Tunnel Committee, Lord Richard Grosvenor, M.P., and Mr. Thomas Brassey, jun., M.P., accompanied by the engineers, Messrs. J. Hawkshaw, J. Brunlees, and W. Low, having had an audience with the Emperor Napoleon, have obtained the report made by a special commission appointed by his Majesty to examine into the practicability of executing the proposed submarine tunnel between England and France. The report is of considerable length; all the members agree upon the practicability of the undertaking, as proposed by the English engineers, and the simplicity of ventilating during construction, by means of the double driftway. There are some differences of opinion as to whether the amount of probable traffic would be remunerative at first. They think it will take time to develop the traffic in opposition to established routes, but that other matters than traffic solely ought to be considered, "such as the advantage of strengthening the bonds which unite us to an industrious, conservative, and wise people, whose alliance with France constitutes a valuable pledge for the peace of the world." The French council of engineers of roads and bridges, and council of mining engineers, were unanimously of opinion that the driving of a submarine tunnel across the straits, in the manner proposed by the English engineers, presented no insurmountable difficulties. Copies of the report and other documents have been sent to the President of the Board of Trade.

A Gift to Westbury.—A newly-erected building, comprising lecture-room, reading-room, library, a residence for the porter and his wife, a ladies' cloak-room, and other offices, has been provided for the benefit of the increasing population of Westbury-on-Trym, by Mr. H. St. Vincent Ames, of Cote House, Westbury. The block is built of magnesian limestone from Clifton, with freestone dressings, and a porch of same material. The hall is capable of accommodating nearly 400 persons, and is lighted by means of large side windows and a window in the west end. It has an open timbered roof, stained and varnished, and the height from floor to ridge of roof is about 40 ft. The cost is over 2,000*l*. for the building, and to this must be added the cost of the land.

Rather Too Fast.—A three-story brick house, 18 ft. by 40 ft., and in the construction of which 42,350 bricks were used, was built in Lanoaster, Pennsylvania, last month, in nineteen hours and a half, and persons were living in it within three days from the time it was commenced.

"A Bishop among Architects."—Little anecdotes of this kind (quoted in your last) are always worth putting right. The *wot* in question is, I believe, one which attaches not to an architect, but to an acuary well known in the city of London. The bishop had long placed familiar confidence in Mr. A. in connexion with his official property, but could not help, on one occasion, harsarding in good humour the remark that his fee of a hundred guineas for a certain report was as much as many a hard-working cnrate received for a year's work. The witty reply was in effect as quoted,—"Your lordship will kindly remember that I am not a curate, but a bishop, in my profession"; and [so the affair was laughed off. I have heard this version of the story told in the presence of the gentleman I refer to, by way of a compliment to himself, which seems to be good proof of correctness. As for architects, it is well known that bishop and curate are paid by the self-same percentage.

R. K.

Congress of the Social Science Association.—An invitation from authorities to hold the next Congress of the Social Science Association in Bristol has been received, amongst others, and the executive committee have agreed to recommend the council to accept it.

TENDERS.

For the rebuilding of Montpellier Baths, Cheltenham, Mr. Edward Holmes, architect. Quantities applied by Mr. T. Mansell:—

Hilton	23,995 10 0
Bentley	3,573 13 2
Marchant	3,559 16 8
Broom & Sons	3,538 0 0
Channon	3,539 0 0
Dixon	3,549 16 0
Trow & Sons	3,191 17 4
King & Godwin, exclusive of old materials (accepted)	3,075 0 0

For the engineer's work, Montpellier Baths, Cheltenham:—

Dense	21,543 0 0
Ingram & Bailey	1,932 10 0
Purdell	1,810 0 0
Adanson & Co.	1,300 0 0
Milton & Co.	1,250 0 0
Felding & Platt	1,238 0 0
Mulroy and Green	1,205 0 0
Lethers & Randall	1,203 0 0
Fraser & Sons	1,200 0 0
Whitton	1,000 0 0
Carter & Co.	995 0 0
Parke	890 10 0
Asbury & Sons	878 7 3
Savory & Son (accepted)	963 0 0
Cornell, jun.	665 0 0

For finishing 19 houses on the Trafalgar-road Estate, Old Kent-road. Mr. William Smith, architect:—

Hearle	21,098 0 0
Harvey	539 1 0
Cook & Green	883 0 0
Hughesden	818 0 0
Blackmore & Morley	790 0 0
Baker & Constable	770 0 0

For new Wesleyan chapel, schools, &c., Watford, Herts. Mr. Thomas Pearson, architect. Quantities supplied:—

Taylor	21,764 14 0
Wentworth	1,650 0 0
Staines & Son	1,598 0 0
Humphrey	1,535 10 0
Nightingale	1,533 0 0
Waterman, Brothers	1,493 0 0
Raper	1,489 0 0
Foale	1,479 0 0
Snowdon	1,463 0 0
Cooper Callum	1,436 0 0

For various works to Paper Mills, Ilford, for Mr. W. Simpson. Messrs. Parr & Strong, architects:—

Watts	21,110 0 0
King & Son	1,066 0 0
Robinson	1,077 0 0

For the erection of two chapels, a lodge, outbuildings, bonny walls, fences, gates, &c., for the new cemetery at Copt Hill, for the parish of St. Mary, Dover. Mr. Klein, architect. Quantities supplied:—

Trowdale, Wilson, & Co.	23,421 13 9
M'Kenzie	3,193 2 93
Mathews	2,840 0 0
Adcock	2,729 12 0
Ayers & Son	2,703 0 0
Richardson (accepted)	2,563 0 0

For new hot and cold baths at St. Winifred's Well, Holywell. Messrs. Robert Sorvener & Son, architects. Quantities supplied:—

No. 1	No. 2	
Pickard & Perry	21,150 14 5	21,135 10 9
Hughes	1,090 0 0	1,060 0 0
Edwards	1,031 0 0	1,000 0 0
Evans & Son	1,000 0 0	1,063 0 0
Chester	800 0 0	890 0 0
Anderson & Co. (accepted)	720 15 0	926 5 0

For building boundary-walls round the new ground at the Strand Cemetery. Mr. William Clissold, architect:—

Workman	2,400 0 0
Ball (accepted)	349 0 0

For alterations and repairs to Haslewood House, Winchmore Hill, Mr. W. H. ...

LONDON RAILWAYS AND STATIONS. STANFORD'S SPECIAL MAP OF THE RAILWAYS AND STATIONS IN LONDON AND ITS ENVIRONS, ON THE SCALE OF ONE INCH TO A MILE.

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TO CORRESPONDENTS. W. C. C. W. A. S. & Co. ... Mr. Henshaw states that the amount of his tender was £2,623, not £3,623.

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MESSRS. IZARD & BEETS are instructed by the Trustees, under Deed of Assignment, to SELL, by AUCTION, on the PREMISES, the Swan-street Saw-mill, together with the premises, on MONDAY next, JUNE 22nd, at TWELVE o'clock.

TO ARCHITECTS. A good collection, TO BE DISPOSED OF, within a few years has been established in Bolton, Lancashire. His retirement is solely owing to ill health.—Address, in the first instance, by letter only, "Sigma, care of WHITE & HODGSON, 11, Clements-lane, London, E.C.—Principals will send reply.

Advertisement for Improved Machinery, continued, mentioning Steam Power and various clock-making services.

BALHAM HILL and CLAPHAM PARK.—Freshfield Building Land. MR. H. C. MARTIN will SELL, at the MARY, Tottenham-yard, on MONDAY, the 29th day of JUNE, next, at TWELVE o'clock precisely, PLOTS of FRESHFIELD BUILDING LAND for shops, private houses, and business premises.

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ADVERTISEMENTS.

TWICKENHAM, Middlesex.—Forty-nine PLOTS of valuable Freshfield Building Land, near the Railway Station.

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MR. J. T. NEWMAN will SELL by AUCTION, at the MARY, Tottenham-yard, on WEDNESDAY, JUNE 24th, at THREE o'clock, PLOTS of valuable FRESHFIELD BUILDING LAND, variously situated, at Brixton, Harold Wood, Upper Clapton, Victoria Dock, and Silchester, also 21 Leeward House at Silchester, built for 35 years at grand rents amounting to £50, and let to weekly tenants at a gross and net of £1,000 per annum.

BOOKKEEPER WANTED.—One who can make plain drawings, especially work connected with a French work would be preferred. To a suitable person the situation would be a permanent one—Apply, stating salary and former engagements, 772, Office of "The Builder."

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CURTAIN ROAD, corner of Spinnaker-row.—By order of Mr. Wm. Headly, the contractor for the erection of twenty large houses there.

GENERAL FOREMAN.—WANTED, by a BUILDER and DECORATOR at the West End of London, a GENERAL FOREMAN, of the character of the Building Branch of the Business. A man of trade, and one who has been similarly employed before, preferred. Wages 6s. per week, including board and lodging, and particulars of former engagements, No. 625, Office of "The Builder."

MESSRS. C. STUART BARKER & SON are favoured with instructions from the Trustees, under Deed of Assignment, to SELL, by AUCTION, on the PREMISES, the Swan-street Saw-mill, together with the premises, on MONDAY next, JUNE 22nd, at TWELVE o'clock.

PERFECTION IN BOOKKEEPING.—BUILDERS and others desiring really good systems, may have a SET of MODELS for BUILDERS BOOKS, by DOUBLE ENTRY, in which was awarded the prize offered in "The Builder," No. 1180, and which has been adopted by many large firms. Also a Revised Arrangement by Single Entry, suitable for small builders.—Address, R. A. C. St. George's-street, Regent's Park, London.

PLUMSTED DISTRICT BOARD of WORKS.—ELECTION of SURVEYOR to the PARISH of PLUMSTED.—The duties of the Surveyor will be to carry out the provisions of the Acts of Parliament by which the Board is constituted, and the by-laws made thereunder, full particulars of which may be obtained at the Board's Office, at Old Charlton. The salary will be £50, per annum, with certain extras. The engagement will only terminate by three months' notice on either side. Applications, addressed to the Clerk of the Plumstead Board of Works, enclosed "Surveyor," must be delivered at the Office of the Board, at Old Charlton, before FOUR o'clock on the evening of TUESDAY, JUNE 15th, 1869.—By order of the Board, JAS. MURRAY DALE, Clerk, 772, Office of "The Builder," 15th, 1869.

MESSRS. C. STUART BARKER & SON are favoured with instructions from the Trustees, under Deed of Assignment, to SELL, by AUCTION, on the PREMISES, the Swan-street Saw-mill, together with the premises, on MONDAY next, JUNE 22nd, at TWELVE o'clock.

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REQUIRED, the Services of a competent TIMBER VALUER and SURVEYOR, to go abroad for a few days.—Address, with references and nature of the engagement (one who has been in the former trade preferred), to W. J. T. 127, Great Colindale-street, Haverley-square.

MESSRS. C. STUART BARKER & SON are favoured with instructions from the Trustees, under Deed of Assignment, to SELL, by AUCTION, on the PREMISES, the Swan-street Saw-mill, together with the premises, on MONDAY next, JUNE 22nd, at TWELVE o'clock.

WANTED, at ONCE! Every Architect, Mason, Builder, Undertaker, Painter, Brick, and Slateman in the Kingdom, to send 12 post-paid stamps, or small bills, by return of post, to FULL BOND, in town or country; the Materials removed with all possible dispatch. Terms cash.—Address, W. BLOUNT, 45 to 48, Southampton-street, Cambridge-street, E.C.

TO SANITARY ENGINEERS, SURVEYORS, &c.—THE MARCH LOCAL BOARD of HEALTH, after meeting to be held on MONDAY, the 21st day of JULY next, will proceed to appoint a Person to the Office of RESIDENT SURVEYOR, INSPECTOR OF NUISANCES, SUPERINTENDENT of HIGHWAYS, and COLLECTOR of the RATES, for their District, the Town portion of which comprises an area of about 600 acres and the Highways are about 14 miles in extent. Candidates will find the duties of the office fully set forth in the "Public Health Act, 1848" (the "Minutes of Instruction" issued by the General Board of Health in the year 1853, and the "General Highway Act," but it is indispensable that they should be familiar with the practice of engineering in connection with works of town drainage, of levelling, the making and management of roads, streets, and pavements, and competent to produce all the working drawings, and prepare specifications and estimates necessary for any additional works of drainage required for the district (the principal works having been already executed) and also be able to superintend the work, test materials, and see to the fulfilment of the conditions of contracts by cost account for work. The Collection of the Rates extends over the whole district, comprising an area of 12,000 acres of land. The person elected will be required to enter upon his duties on the 1st day of August, and to give sufficient security for the faithful execution of his office, and he will be required to devote the whole of his time to that object. Applicants for the office are requested to forward their testimonials in writing on or before MONDAY the 21st day of JUNE next accompanied by a letter in their own handwriting, stating their practical experience in the office and business, and also a recommendation of character, and the names of their referees; whereupon a selection will be made, and such candidates only as shall receive an invitation from the Board will be expected to attend on the day of election, but the Board do not pledge themselves to appoint any of the candidates. The salary will be £100 per annum.—By order of the Board, THOR. T. ELLIOTT, Clerk, March, 15th, June 8th, 1869.

MESSRS. RUSHWORTH, ABBOTT, & CO. will SELL by AUCTION, in JULY next (unless an acceptance be made by the contract), the above to the City of London, in the Building Gardens, building the New Royal Academy, requiring the property eligible for any improvement connected with the gardens, a club-house, or exhibition rooms, and equally desirable for any building.

TO ARCHITECTS, SURVEYORS, BUILDERS, and OTHERS.—HOUSES, WAREHOUSES, and BUILDINGS of every description, in large or small lots, will be OFFERED TO FULL BOND, in town or country; the Materials removed with all possible dispatch. Terms cash.—Address, W. BLOUNT, 45 to 48, Southampton-street, Cambridge-street, E.C.

REQUIRED, by the Advertiser, a SITUATION in an Architect's Office, or as CLERK of WORKS. It is a good draughtsman, can take out quantities, and measure up work, and has had practical experience in the office and business, and is a native of the town or country.—Address, W. J. T. 127, Great Colindale-street, Haverley-square.

MESSRS. RUSHWORTH, ABBOTT, & CO. will SELL by AUCTION, in JULY next (unless an acceptance be made by the contract), the above to the City of London, in the Building Gardens, building the New Royal Academy, requiring the property eligible for any improvement connected with the gardens, a club-house, or exhibition rooms, and equally desirable for any building.

TO ARCHITECTS, SURVEYORS, BUILDERS, and OTHERS.—HOUSES, WAREHOUSES, and BUILDINGS of every description, in large or small lots, will be OFFERED TO FULL BOND, in town or country; the Materials removed with all possible dispatch. Terms cash.—Address, W. BLOUNT, 45 to 48, Southampton-street, Cambridge-street, E.C.

WANTED, a practical and steady Man, for completing a large job, a RE-ENGAGEMENT as GENERAL FOREMAN, in charge of a job. Will be a native of town and making working drawings. Carpenter and Joiner. Salary £2. Good references.—Address, ABRAHAM, Royal Engineer Office, Newley House, near Southampton.

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WANTED, an ENGAGEMENT, in a Builder's Office, by the Advertiser, who has just completed his studies. Can draw, take out quantities, and do the usual routine of a builder's office. Salary not so much an object as the improvement. Good references.—Address, R. L. W. Post-office, Highgate, Somerset.

COUNTRY TRAVELLER WANTED, to call upon ARCHITECTS and BUILDERS. Must have some knowledge of mechanical drawing.—Apply, by letter in the first instance, to RUSSELL & CO., 5, Queen-street, E.C.

WANTED, a SITUATION in a builder's office, by one who is well up in general office work, estimating, measuring, &c.—Address, LUCAS, 318, Kingsland-road, N.E. W.

WANTED, in an Architect and Surveyor's Office, a competent DRAUGHTSMAN well up in construction and details, and able to take charge of an office. One having had some experience in working up applications preferred. To a suitable assistant the situation would be permanent.—Apply, by letter, stating references and salary required, to No. 674, Office of "The Builder."

TO Moulding Machinists, WANTED, a steady Man, to undertake the WORKING of Mouldings (piecework), to MAKE CUTTERS, and provide all labour required. Must be joined by trade. None need apply who cannot give good references as to ability and sobriety.—Address, 691, Office of "The Builder."

WANTED, an experienced Person, to TAKE CHARGE of and WORK a GENERAL JOINER. He must thoroughly understand machinery, and be in every way efficient. A person having a knowledge of joinery preferred.—Apply, stating references, salary required, &c. to Z. Y. X. Post-office, Gloucester.

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TO BUILDERS, WANTED, a RE-ENGAGEMENT, as GENERAL FOREMAN, or to Take Charge of a Job, Town or country. Carpenter by trade. Thoroughly competent. Good references.—Address, F. R. 15, Dealing-terrace South, Brighton, S.W.

WANTED, an ENGAGEMENT, by a first-class ARCHITECTURAL DRAUGHTSMAN, well up in design, detail, and constructive work, who is also a good hand at the voban.—Address, L. M. N. 9, Portland Villa, Richmond-road, Walsby-green, S.W.

TO BUILDERS' FOREMEN, &c., WANTED, by a THOROUGHLY YOUNG MAN, a SITUATION as an IMPROVER in the CARPENTRY and JOINERY, or Strainers Work. Has had five year's good experience. Wages according to ability, &c.—Address, Y. Z. Post-office, Broad-street, Reading, Berks.

WANTED, by an experienced CLERK of WORKS, a RE-ENGAGEMENT as above, or as MANAGING FOREMAN. Well up in the various branches. Can take a plan, working out detail drawings, measure up, &c. Can take out quantities.—Address, M. N. 8, Epsom-place, South-end, Epsom.

TO MANUFACTURERS and DECORATORS, WANTED, by the Advertiser, a SITUATION as DESIGNER, or Junior Designer.—Address, E. P. 13, The Terrace, Kensington.

WANTED, by an experienced Man, a RE-ENGAGEMENT as CLERK of WORKS, or General Manager in the building trade. Good references.—Address, S. W. Z. Post-office, Devonshire-street, Marylebone, W.

TO MASTER PLUMBERS or BUILDERS, WANTED, by a steady Man, aged 27, a SITUATION as PLUMBER, PAINTER, and GLAZIER. A good general hand. Three years in last shop.—Address, M. B. Post office, Waybridge Station, Surrey.

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TO BUILDERS, WANTED, a RE-ENGAGEMENT, by a thoroughly practical out-door FOREMAN, just finishing a Government job. First-class references.—Address, 63, Office of "The Builder."

TO BUILDERS, CONTRACTORS, AND OTHERS, WANTED, a SITUATION as NIGHT or DAY WATCHMAN, Stone, or Gate Keeper. Good references.—Address, W. R. Knowles's Library, 1, Colridge-place, Westbourne-square, W.

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TO ARCHITECTS and SURVEYORS, W. F. is open to an ENGAGEMENT as JUNIOR or GENERAL ASSISTANT. Eight years' experience.—Address, Z. Cal. ex Wyke, Crowhurst-road, Epsom, S.W.

TO PLUMBERS and BUILDERS, WANTED, by a first class PLUMBER, a SITUATION, or Job. No objection to fill up time painting or glazing. Terms and salary as above.—Address, J. W. 21, Elm-road, Wyddham-road, Camberwell.

TO BUILDERS, PLUMBERS, and OTHERS, WANTED, by a respectable Young Man, a SITUATION as THREE BRANCH HAND. Good references.—Address, PLUMBER, 5, James-place, North-street, Peckham.

TO PLUMBERS, BUILDERS, and OTHERS, WANTED, by a Young Man, a PERMANENT as PLUMBER, Painter, Glazier, Writer, Grainer, and Paper-hanger.—Address, H. S. 74, York-place, Oxford-road, Baysbury, Harington.

WANTED, a SITUATION as FOREMAN of PLASTERERS, or to take Piecework, if required. Good references.—Address, Y. Z. 27, Clarendon-road, Notting-hill, W.

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WANTED, by an experienced Measuring and Quantity Clerk (A practical one), an ENGAGEMENT in a Builder's or Quantity Surveyor's Office.—Address, SEPT. 20, Thistle-grove, Bromley, S.W.

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TO CONTRACTORS, WANTED, by a Young Man, a RE-ENGAGEMENT as CLERK or TIMEKEEPER. Can draw. Good references.—Address, M. S. Derby-street, Parliament-street, S.W.

WANTED, by a Youth, a RE-ENGAGEMENT Can trace and copy plans, &c. squares dimensions, abstract lines and materials, and put into bill, measure up timber, &c. Writes a good book. Is thoroughly used to the routine of a builder. Highest references. Country not objected to.—Address, 677, Office of "The Builder."

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TO BUILDERS, &c., WANTED, a RE-ENGAGEMENT, as SHOP FOREMAN of JOINERS, or as the Charge of a Job. Has a practical knowledge of all trades in the building line. Good references. Age 43.—Address, G. V. Junior's New Agency, 131, N. Ribston-street, Brighton.

WANTED, by a thoroughly competent ARCHITECTURAL DRAUGHTSMAN, an ENGAGEMENT well up in construction, and can detail. First-class testimonials.—Address, W. BROWN, 22, Midland-row, West-End of Piccadilly, N.E.

TO BUILDERS, PLUMBERS, &c., WANTED, a SITUATION, by an experienced PLUMBER. Could fill up time at printing, glazing, &c.—Address, PLUMBER, 29, Albert-street, Brighton.

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TO ARCHITECTS, BUILDERS, and CONTRACTORS, WANTED, by a thoroughly-experienced, successful Man, a RE-ENGAGEMENT as CLERK of WORKS, GENERAL FOREMAN, or MEASURING CLERK. It will sojourn in arranging accounts with architects and surveyors. First-class references.—Address, E. T. care of Messrs. Buck & Wootton, 125, West-End-street, London, W.C.

WANTED, by a thorough Plumber, experienced in the use of old work, a JOB or SITUATION in or near Town; or will fill up time at other branches for a permanent. Age 38 years.—Address, "Plumber," 4, Harford-place, Drury-lane, W.C.

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WANTED, to take (labour only) the CARPENTRY and JOINERY WORK, in any amount, by a thoroughly practical Man, just finishing a large country job. First class references. Town or country.—Address, M. A. Bye Cottage, Hital-road, Bedford.

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TO BUILDERS and ARCHITECTS, WANTED, a RE-ENGAGEMENT, as GENERAL FOREMAN or CLERK of WORKS, by a thoroughly experienced Man. Has carried out extensive works in town and country. Carpenter and Joiner. Age 40. References. First-class.—Address, F. R. U. 12, Dartmouth-street, Chesham-road.

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TO BUILDERS, PLUMBERS, &c., WANTED, by a first-class Plumber, a SITUATION, or Job, piecework or otherwise; or as Three-branch Hand, or Sash-turner, &c. A. Z. 3, Curatona-place, Victoria-road, Peckham, S.E.

WANTED, a RE-ENGAGEMENT as CLERK of WORKS or Builder's out-door FOREMAN, by a thoroughly practical Man, joiner by trade. Middle age.—Address, A. S. Post-office, Granton-road, 12, Tottenham, N.W.

TO BUILDERS with STEAM MACHINERY, WANTED, a SITUATION as SHOP or MILL FOREMAN. Has a practical knowledge of joinery machinery; quick at detail and setting out work. Would be glad to accept an advantage in a firm well established. No objection to working foreman as above.—Address, JOINER, 4, The Mall, Kensington, W.

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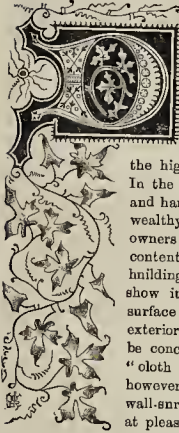
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The Builder.

VOL. XXVII.—No. 1377.

The Use of Plaster in Decoration.



DEMANDS of modern luxury, in a northern climate especially, will probably always run counter, in a greater or less degree, to those of the highest architectural art. In the earlier days of simple and hardy existence, the most wealthy and self-indulgent owners of habitations were content to let the genuine building material of the walls show itself on the interior surface as openly as on the exterior, save where it might be concealed by hangings of "cloth of Arras," forming, however, no part of the wall-surface, and removable at pleasure with little cost or trouble. Then came, by slow

degrees, the days of wainscoting, rich, elaborate, and expensive in its best developments, and telling unmistakably of a time of settled aristocratic family succession, when a mansion was slowly and carefully built and decorated to serve, not merely for the short-lived enjoyment of its founder, but as an heirloom to his successors. And finally we merged into the plaster epoch, not merely covering the walls, for utilitarian purposes, but inventing cunning imitations in plaster of the stone-work of our ancestors, and discovering how Greek coffered ceilings and Gothic vaulted roofs could be thereby reproduced and multiplied, upon a fit cradling of lath and framework, to the great delectation of the beholders.

Whereupon a reaction; as there always is and will be a reaction, sooner or later, against whatever is mean and false, in art as in other matters. The prophet Pugin, seeing how architecture generally had been thus "dandied with untempered mortar," not only took up his song against it with an alarming energy, but (to use the language of Tate and Brady) "also practised what he knew;" building himself a house after his own heart, with bare stone walls, rather than enjoy the pleasures of plaster for a season. And though few of us have followed this heroic example, yet it must be admitted that the encrusting of a building with so base a material, —really a species of mud,—certainly deprives it of anything like a monumental or perennial expression, and goes far to vulgarise any design. We are tacitly conceding this in the efforts we are making in many quarters to dispense with plaster in our churches, and substitute the honest brick wall in the interior; though there are not wanting philosophical minds who boldly rail at this, and aver that we have as much right to expect comfort and luxury in our chnrb as in our drawing-room. Be this as it may, it seems probable that in our ordinary dwelling-houses we must for the present accept internal plastering as a necessary evil, until some better, more durable, and more architectural material is discovered wherewith to line our rooms without entailing an extravagant outlay. And the existence of plaster in our rooms being thus accepted and recognized, it is

natural enough that we should also wish that the material should be made to "pay its footing," so to speak, in the shape of decoration; and that as we have admitted it as useful we should also admit it as ornamental; the only proviso being that the ornament should be of a kind suitable to the nature, capabilities, and defects of the material.

The commonest and simplest method of employing plaster in a decorative manner is, of course, the agglomeration of a certain bulk of the material, greater or less (generally greater), at the angle formed by the meeting of the wall and ceiling, the collected mass being then "run" into the form of mouldings of any required section. Within certain limits, this is a legitimate and sensible way enough of employing plaster; it breaks the abrupt angle which would otherwise be formed in that position, and forms a frame to any decoration which may be attempted on the surface of the ceiling. But plaster has been much misused in this form; which is not to be wondered at, seeing that there is an idea current among those who "by this craft have their wealth," that the plaster cornice round the room represents the bracket which carries the floor above; at least, this was the theory of it which was gravely propounded to us not long ago by an excellent master of his trade. On this supposition, it is easy to understand how there has arisen the habit of "bracketing down" with concealed wooden brackets, in order to obtain a cornice heavier and deeper than could possibly be accomplished in plaster without such assistance, and which, if it were in reality what to the eye it is made to appear, a solid mass of plaster, would of course fall down at once. This is a process as absurd and disagreeable as it is wasteful of material. The only theory on which this source of ornament can be defended is simply the one we have hinted at—the desire to do away with the harsh effect of the plain rectangle at the junction of wall and ceiling; and this can only be done so as not to be offensive to the architectural eye, when the mass of plaster composing the cornice is so shallow as to be manifestly self-supporting, and to show itself in its true character. Besides this, it is a manifest error, except in the case of a disproportionately high room, to diminish the apparent height of the apartment, and consequently its dignified appearance, by bringing the material of the ceiling low down on to the wall, and thus losing 10 in. or 12 in. in height of wall. The plaster moulding, if it is desired to make it at all elaborate, should spread out, not upon the wall, but upon the ceiling, the (generally) bare expanse of which is thus reduced in extent; and the mouldings and general section should be kept so flat as to render it evident that the material can easily be retained in position by its own cohesive power. The section given in fig. 1 of our illustration represents the kind of form which such a cornice might take.* Here it will be seen that the mouldings are simple, not so small and crowded as to confuse the eye (which is often the case), and divided into groups by flat soffits, which serve to spread out the cornice over the ceiling without adding to its bulk. The small hollows introduced are a capital source of effect, giving a strong black line of shadow against the white material; and though the plasterer is sure to complain of the difficulty of miring them, he can do it, if he chooses, well enough. Such a cornice as this will be secure without any bracketing; and the large hollow in the angle, which is necessary in order to reduce the weight of material sufficiently, is also utilized, in order to form a dark shadow behind a perforated ornament, such as is shown at A.

This question of ornament, or, as it is more commonly called, "enrichment," in plaster cornices, is however a much more serious affair than

that of mere mouldings, and on this head the sina both of past and present generations have been grievous. In nearly all dwelling-houses erected by builders, and unhappily in not a few which have been under the supervision of architects, the visitor's impression, if he look up on entering a sitting-room, is that the products of the kitchen-garden are having a race round the ceiling. In proportion to the estimated rental of the house, there are to be seen one, two, or three rows of ragged, straggling plaster leafage inserted in the cornice—awkward attempts to imitate, in mis-shapen coarse casting, the delicate lines and surface markings of natural foliage, or the effect of wood or stone-carving, varied by an occasional gap where some badly-attached lump has fallen out; while in the centre of the ceiling is seen a strange excrescence, looking like a gigantic cauliflower squeezed flat, and fixed up there as a warning to its kind. Those of our readers who may have paid any attention to our observations in a former number as to the relation between design and material (see p. 3, ante), will the better enter into our view as to the style and degree of ornamental design permissible with good effect in plaster. Two things, as it appears to us, have to be borne in mind with regard to this, as to all vehicles of ornamental design—first, that the elaboration of the design, and the amount of thought bestowed upon it, should not be out of proportion to the durability of the material and the difficulty of working it; for to see a very highly elaborate and carefully-prepared design confided to a mean and perishable material, always conveys a sense of disproportion and of wasted labour. Secondly, that the manner in which the material is to be worked, and its texture and quality, must be taken into consideration in designing for it. Now plaster is a soft and by no means very durable material, forming, in its ornamental developments, no integral part of the building in which it is introduced; and all ornament which is executed in it is obtained by casting in a mould. These considerations will determine that in the first place such ornament should be of a comparatively simple character, since it is not worth while to expend the same amount of thought on the design as if it were to be executed in stone or wood, and consequently survive for many generations; that it should be highly conventionalized, since any attempt to imitate the delicacy of natural foliage in the manner which has sometimes been successfully accomplished in wood-carving, becomes simply offensive with the coarse lines and blunt angles which always characterize cast work; and that the effect should be obtained mainly by contrast of light and shadow, of flat surfaces with deep and decided sinking; for anything like surface manipulation, whilst it must necessarily, as we have observed, be very coarse in execution, becomes also offensive in so white a material, as the means of visibly harbouring dust and soot, which soon "relieve" the design in a manner scarcely calculated by its originator. On the other hand, this very quality of whiteness renders all shadow peculiarly valuable and marked, when employed as a contrast to a flat surface of plaster. For this reason such pierced designs as those shown at A, and figures 1 and 2 in our illustrations, are well suited for plaster ornament; with the deep hollow behind them, which, as we before observed, has a practical use in diminishing the weight of the cornice, the interlaced patterns in white plaster have quite a sparkling effect, whilst there is nothing on the surface which can hold dust. The moulds for these are best made by simply cutting them with a knife in a flat cake of plaster, without the intervention of clay at all; and by bevelling the sides of the pattern from back to front, the visible lines of the ornament can be rendered very thin and delicate to the spectator, while leaving sufficient material at the back to insure the required strength. The same

* See p. 500.

system can be mingled with surface decoration of a simple character, as in Fig. 7, where it is not necessary to have a perforation right through, as the employment of a deep sinking around the trefoil leaf will produce the desired effect. Our figures, up to No. 9, show some other examples of the style of ornament which appears to us suitable for cornice decorations in plaster. It will be seen that all these are simple and very conventional in character, depending on very few lines for their effect, and that the patterns are produced almost entirely by direct sinking, or by the contrast of surfaces in two different places. It will be observed also that all of them are designs of small extent, consisting merely of two small alternating members indefinitely repeated; these in general look better in execution than a more extended design, which often has a straggling appearance; and thus also one of the advantages of cast work is brought out, viz., the possibility of numerous repetitions of a small design without entailing a disproportionate degree of labour, or exercising the craftsman in a dreary mechanical carving of the same features *ad infinitum*. The effect of such repetition, however, when once executed, is exceedingly valuable, and was, as we all know, practised by the Greeks even in so hard a material as marble, in the execution of their "egg-and-tongue" moulding; one of the most beautiful and suggestive forms of ornament ever invented, and which may serve as a basis for endless modifications. In the present illustrations, we may observe, figures B, C, 3, 6, 7, 8, and 9, are only modifications of the same principle, the alternation of a shorter and rounder form with a thinner and more elongated one. But to leave the cornice and come to the consideration of the inevitable "cauliflower" which forms the centre piece; it seems quite consistent with propriety that a ceiling which is ornamented round the margin should have a central ornament also in the same style; but the centre "flowers" commonly kept in stock by plasterers and fixed up to order in the middle of the ceiling are the most absurd and offensive things, and violate every principle of architectural taste. They are for the most part great unwieldy lumps of so-called ornament, sometimes not without a certain elegance of conception, which makes the design look pleasing on paper or in a photograph, but in a florid style of surface-work and under-cutting which could only be accomplished with any effect in elaborate wood-carving. Even this is an exception, however, for in most cases the designs put up are simply, or rather elaborately, odious. Moreover, if those who eat dinners under the shade of these specimens of plaster vegetation were aware of their actual weight and the slight means by which they are often attached to the ceiling, they would be regarded in the same light as the sword of Damocles. Now the style of the centre ornament should have distinct references to the style and ornamentation of the angle cornice, and many of the remarks which we have made with regard to the latter apply equally to the former. Instead of looking like some huge elaborate specimen of vegetation stuck up above us, the centre ornament should be conventionalized and "architecturalized" into harmony with the cornice. We like best to see it take the form of a geometrical pattern in moulded lines, which might be "run" upon the ceiling just as the cornice lines are run, and then finished by the addition of some simple ornament in the interspaces. Or if the large number of mitres is an objection to running the lines, at least the whole thing should be kept flat and shallow, in the same style as our model cornice, and not be of such a shape and weight as to suggest the wonder how it ever could be kept in its place. Figures 10 and 11 are suggestive of the style of thing which might be inoffensively used; not imitative of any natural form, but simply an arrangement of ornament, for the most part flat or nearly so, in geometrical forms; the one with the orthodox circular outline, the other in the lozenge form, which might be tried as a variation, often, with good effect.

These two orthodox modes of placing plaster decoration, however, in ordinary houses, leave the principal expanse of the ceiling a plain white surface, as uninteresting and bald as can possibly be. Of course this is sometimes utilized for painting, which is, generally, however, if it is to be at all well done, an expensive process, and cannot be expected to become universal. But why, with an impressive material like plaster covering the ceiling, can no ornament be attained by diversity of surface anywhere, save at the

sides and in the centre? It is surely possible to devise means for impressing on the finishing coat of plaster, while still wet, such a small diaper ornament as might relieve the dreary monotony of surface, and serve to connect the centre ornament with the angle-cornices. This attempt is at least worth making, and a much better effect would be produced if some of the extravagances of cast ornament now lavished on the centres and sides of the ceilings of our drawing-rooms were retrenched, and the ornament more equally distributed over the ceiling, which might thus also afford a ground for a simple decorative treatment of colour, by laying in the ground of the diaper-work in a flat tint, so as to bring out the principal lines of the patterns, or by a judicious touch of gilding appropriately placed. We give a suggestive sketch of a portion of a ceiling with the centre part treated in this manner; but even a simpler pattern than the one we have shown might be perfectly effective, and would be, at any rate, a vast improvement on the ordinary expanse of flat plaster which seems to be commonly accepted as a sufficient finish to our drawing-rooms above, in whatever richness of design and materials, in the shape of carpets and rugs, we may tread under our feet.

If we have confined our remarks and suggestions to what must be considered simple and every-day uses of plaster in decoration, and have not given any illustration of its use in more elaborate forms, it is because we feel that the least encouragement there is to the use of so unsatisfactory a material in large and important buildings, and in highly ornamental and elaborate decoration, the better will it be for art generally, and for architecture in particular. In ordinary dwelling-houses, where it is impossible to go to much expense in decorating, the (at present) necessary introduction of plaster as an interior lining, furnishes, as we observed, opportunity and means for a certain amount of decoration not altogether to be despised, if judiciously carried out, when we consider the cheapness and ease with which it can be produced. But with regard to all buildings of a high class, and even of large houses where expense is less an object, the rules with regard to the employment of plaster ought to coexist, like the Decalogue, chiefly of prohibitions, "thou shalt not" predominating over "thou shalt." Even with regard to the angle-cornice of a room, which seems so universally accepted as a proper situation for the decorative employment of plaster, we should prefer to see, where expense will admit of it, the employment of a moulded beam, whether decorated with colour or not, which would then really form that bracket for the flooring above which our plastering friends fondly suppose is represented by their agglomeration of run mouldings. And as to some other employments of plaster which are not infrequent, we hold that they should be altogether abolished. Tainted capitals, for instance, are most unfit subjects for execution in plaster, seeing that the very aspect of the material at once suggests weakness, where we know that, if a column is doing any real work at all, strength is specially required. Under the like category come all the devices so common, even with architects by no means to be despised in their profession, of bracketed plaster arches, bracketed drop mouldings and pendants, and all those devices which represent plaster as doing what it never can do, or endeavour to cheat you into the belief that it is another material. Plaster in a certain degree increases the comfort (though certainly not the cleanliness) of our houses, and is susceptible of being made ornamental up to a certain point with good effect, if treated as what it is, viz., a thin coating artificially laid on to the wall, and capable of being moulded or impressed in simple patterns. So treated, it may be called an architectural material, though of the lowest grade. Endeavour to go beyond this point with it, and it at once becomes a sham, repulsive to the architectural mind, and ranking no higher than so much confectionary pie-crust.

The Yorkshire Tumuli: Incised Stones.

The Rev. Canon Greenwell, of Durham, has resumed his researches among the British grave mounds, on the estates of Major Stapleton, Wess Moor, near Helmsley. Though unproductive in the usual accompaniments of grave mounds burials, two of the barrows yielded incised stones bearing the "cup" markings, analogous to those of the sculptured rocks and cist covers which we before described.

FRENCH UTENSILS IN THE MIDDLE AGES.

AFTER an interval of ten years since the publication of his first volume on French furniture from the Carolingian period to that of the Renaissance, M. Viollet-le-Duc has now issued the first part of the second volume. He accounts for this long delay by saying the extreme favour with which the first was received frightened him a little. He felt that he must make his work worthy of its reception: in two expressive words, "*succès obligés*." This instalment of the second volume relates to utensils, and will be followed by a part on goldsmiths' work. As now proposed, vestments and trinkets will be treated of in a third volume, and arms and tools in a fourth.

Foremost amongst the utensils described and illustrated are *aiguillères*, vessels for holding water, used both in ecclesiastical ceremonies and civil life. There are seven ancient examples figured, beginning with a specimen from a ninth-century MSS., which shows that a classical form was then still in use, and proceeding through successive centuries with the eccentricities they ran into. One *aiguillère* is in the form of a bust, with the spout inserted over the forehead; another is a strong-limbed horse, with a tap projecting from its broad chest.

The French equivalent for our word plate, *assiette*, was not used till the end of the fifteenth century: before then the term was still retain was employed—*plats*. And it was not till the twelfth century that a plate was apportioned to each guest at a banquet: previously one porringer served for two persons. In still earlier times people helped themselves out of the general dishes with their hands, in the Eastern fashion, and either threw the *débris* of their repast upon the floor or left it on the table. In the simple days of grilled meats, before mankind came to a knowledge of ragouts and crimes, a slice of bread laid before each person was sufficient accommodation. Upon this primitive plate the portion of each guest was laid, which he either cut with a knife or divided with his fingers into morsels. With every change of dish, or course, fresh slices of bread were provided. The custom still in use of serving small game upon slices of toasted bread is a lingering tradition of this ancient usage. M. Le Duc also tells us that the most ancient French plates were similar to those of the present day, only smaller; shallower, too, if intended for solids, and deeper if meant for *les mets liquides*. Earthenware plates were rare. The poor ate off wood; the middle class, off pewter; and the nobility, off silver. An illustration shows a fifteenth-century contrivance to send a dish hot to table. Instead of burning the attendants' hands with the hot pewter or silver, the circular dish was placed on the top of a cylindrical open copper ring, furnished with handles and feet, and thus transported easily to table while very hot. This contrivance, called a *doublure*, is perforated with an ornamental pattern.

Under the head of *Bassins*, we are told that basins for the accommodation of washing hands after a repast were either double or accompanied by one of the *aiguillères* we have mentioned. Egyptian paintings and sculptures show the use of basins with their proper vases for this purpose, as do those of ancient Greece. Vignettes of Greek MSS. of the early centuries of Christianity prove the continuity of the custom. A vignette in a psalter of the ninth century, in the Imperial Library, shows one of these basins, furnished with a long, straight, hollow handle, finished with a lion's head, through which the contents could be emptied. This is figured, as is the celebrated copper basin, decorated with enamels, found at Soisson, now in the same library. Sometimes basins for this purpose were made of silver and gold. In a woodcut M. Le Duc shows us, laid out in a sumptuous apartment, a Medieval repast, at which is seated a lady of rank, by the side of whom a page is kneeling and pouring scented water from one basin, furnished with an orifice for the purpose, over her hands into a larger basin he is holding with his left hand below them. Another illustration shows us a Medieval toilet-basin, with a girl washing in it. It is wide, round, and shallow, and placed on the floor; consequently the person using it had to kneel down beside it.

The exigencies of an alphabetical arrangement bring us, shortly after this, to a utensil of a less domestic character,—the barrow, *brunette*. Here M. Le Duc corrects an error that has prevailed

in France with regard to the invention of this little vehicle by Dupin, in 1669. He says he has found mention of them in thirteenth, fourteenth, and fifteenth century MSS., and gives an illustration from a vignette of a MS. of the thirteenth century, of a man propelling a wheelbarrow, the form of which differs but very slightly from that now in use.

Of the gold candlesticks mentioned with so much precision in the old catalogues of household gods, we are told not one example is left in France, and only a few silver ones; but of bronze chandeliers, with one or several branches, there is still an incredible variety. Of the dozen illustrations the most curious shows us a dragon, with a supplemental head where his tail ought to be, on which is seated a stunted personage, holding a large outspreading flower, in the cup of which is the spike for the candle to be fixed upon.

This candlestick is of the same dwarfish uncouth character as the twelfth-century sculptures in Apulian churches. The most beautiful example given is the gilded bronze upright candlestick which once belonged to Mans Cathedral, and before that was part of the treasure of Gloucester Cathedral, and is now again in England. It is of twelfth-century work, and covered from the three lobes at the top to the three feet at its base with a mass of human and animal figures fantastically linked and entwined, of which only the four evangelists can be identified. On the rim is written what has been supposed to be an explanation of the design:—

"Loci: ouis: virtutis: opus: doctrina: refulgens:
Prelucet: int: vicio: non: tenebretur: homo."

There is a second legend within the bowl at the top:—

"Hoc eumannensis res ecclesie Potentius: Thomas
Ditavit eum solannum."

And round the stem, over its encrustation of figures, is wreathed a scroll, on which is written:

"Abbatia: Petri: Gregis: et: Devotio: mitis:
me: Dedit: ecclesie: acti: petri: Gloucester."

In the Middle Ages every house had its *dragoir*, either upon a credence-table or on the *dressoir*, which, full of confections, sweetmeats, and spices, was offered to every visitor on his arrival, and also after a repast. They were of various forms, but generally stood on trays on which they could conveniently be handed about. M. Le Duc illustrates a handsome specimen of a bowl form, raised on a stem with an octagonal base ornamented with little griffins at each angle, which has a dome-shaped cover. It stands upon a platoon, or narrow oblong tray, with two handles to it, leaving ample room for the spoons to be laid on one side of it and the cover upon the other. This last was laid on the tray on its crown, within which were the *serviettes* for wiping the fingers of those who helped themselves to the dainties of the *dragoir*. In the house of the Dukes of Burgundy, where luxury was carried to its greatest height, those objects were of extreme richness. M. Le Duc quotes an ancient writing relating to these princes, where mention is made of seven *dragoirs* set with precious stones as part of the utensils in use at their feasts.

Close to these elegancies we are shown a curious utensil, which is also a piece of furniture, belonging to the toilet of the ladies of the Middle Ages, called a *damoiselle à atourer*. It consists of a circular stand about the height of a table, out of which rises, to the height of a woman, a twisted stem furnished with arms. One arm holds a mirror, the other a dish of pins; on the top of the stem is what we should probably call a "dummy," but which the Medieval gallants designated a *damoiselle*, on which the lady's head-dress was placed till it was required for deposit of combs, brushes, and cosmetics, during the progress of the toilet. M. Le Duc says, the adornment of ladies' heads during the period from the twelfth to the fifteenth centuries was very complicated, and to that of the fifteenth, especially, the *coiffures* of noble ladies required an infinite care, and a long time to arrange them properly and becomingly; and it was only likely that the *gardes-robis* would contain utensils and furniture specially adapted for them. He gives an illustration of a lady in the hands of the tire-woman seated, on a large ottoman, before one of these *damoiselles*.

Turning over a few more pages, we come to an arresting piece of iron-work, arresting because of its gracefulness. It is of a wheel form, the rays from the centre passing out of

the rim and finishing in flours-de-lis, and the spaces between each spoke being filled in with what we might almost call tracery. Details show that this handsome disc turns upon an axis fixed in a tripod furnished with a long handle, and we find it is nothing more than a griddle, made beautiful by the mind and hand of the smith who fashioned it. The use of the axis was to turn the grill round and round should an undue heat below threaten to burn the meat dressing upon it. The original is in the *Musée de Cluny*.

In the vast goblet called a *hanap* we find another word which was once common to both countries, but which one only has retained. Only in the title of an officer of state do we now use the term as *hanaper*. The author of this dictionary of relics of old French times takes up this subject from Saxon times, when politeness required that two persons should drink out of one hanap, the first to drink saying, according to French rendering in an ancient MS. called *li Romans de Brut*, *Wes hal*, and he who received the goblet to empty it saying *Drinkel*. But the hanap is often of a capacity to hold more than sufficient for two persons. Though generally of a goblet form, we hear of its approaching a punch-bowl character in the instance of that which belonged to Saint Louis, described as a *coupe* or *petit bacin*. Sometimes they were furnished with covers, and more occasionally with lock and keys. A fifteenth-century hanap figured consists of two spheroids of different sizes; the larger, furnished with a short stem and footed base, being the bowl; and the upper, or smaller one, the cover. This is surmounted by a crown, which, when it is turned upside down, becomes a second hanap. This cleverly-concocted goblet was, doubtless, carried on a platoon to those to whom it was offered, and the taster sipped from the cover.

French Medieval lamps, again, as well as lanterns, are of many clever shapes. The earliest lamps were identical in form with those of the Greeks and Romans, and in material with those of Pompeii, of *terre cuite*. Then Oriental intercourse produced the cup form, suspended by chains or dropped into tripods. But as these gave but a feeble light, thirteenth-century invention set the wick free again in a bronze vessel, supported by a chain from above. In the fifteenth century the lamp consisted of either a round or square bowl, having a stem rising from one part of the rim and bending over it, the bend being furnished with a hook or loop, for facility in hanging. The stems were handsomely wrought into ornamental patterns, and round one of the bowls shown runs an inscription: *Servo e me Cosumo altvi*, accompanied with a device of a pair of hands joined, a heart, and a dog.

In the matter of mirrors we must not flatter ourselves we have progressed as far as outlines go. A Carolingian mirror did not swing, certainly, but it stood upright on a stem rising out of a fitting base, very gracefully. It was made of polished metal, not glass, framed sometimes in goldsmith's work, made more precious with enamel, gems, and pearls. In the thirteenth century an attempt was made to utilize glass for this purpose, but the process of quicksilvering being then unknown, the result was not sufficiently satisfactory to banish the steel mirror before the commencement of the sixteenth century. Ancient mirrors were not, however, to be compared with those of "the modern" for size. A large mirror was the size of a plate; and one of less pretensions might have been secreted by a hole in her pocket. M. Le Duc figures a circular mirror, the frame surrounded with small balls, and the stem rising out of a disc.

There is a beautiful example of a *nef*, which, from the heraldry upon it, must have belonged to a Duke of Orleans. At the hanquet the *nef* was placed before the *seigneur*. It was of goldsmith's or silversmith's work, in the form of a ship, furnished with crew, masts, sails, and rigging complete. It contained, under lock and key, the spoons, forks, napkins, cups, salts, and spoons required for a repast; just as our modern caddy is supposed to hold the tea and sugar in safe custody. The name *cadenas* was sometimes applied to them. The occasion of their use was the fear of poison. In those days of undeveloped medical science, doubtless many deaths attributed to poison may have occurred from natural causes not understood or discovered. On the other hand, it is to be feared that many persons were hurried out of the world by poisons administered in their food. A Duchess of Orleans,

quoted by M. Le Duc, states that half the people of the court of Louis XIV. died from poison. The *nef* of the Duke of Orleans before us is of silver, with enamel. On the side-planks of the ship, as well as on the stern, are large shields, which form the doors to the cupboards within. Six lions crouching beneath sustain it in position on a *plateau* called an *entablement de maçonnerie*. On deck, and on an upper deck, are many armed men, whose shields are ranged to form parapets round them. Five large hammers are flying. Old inventories mention a prodigious number of these *nefs*, in silver and gold, decorated with enamel and precious stones. Charles V. owned four of gold and twenty-one of silver gilt. Sometimes the rigging and sails were of silk. Contemporary with them was the *baril*, an ornamental barrel made to stand upon the table or upon the *dressoir*, to hold wines, scented waters, and condiments. These were sometimes of silver, likewise; sometimes of ivory and wood. One figured is supported on the shoulders of two youths at a sufficient height to admit of the goblet being placed below the tap, and these stand on a trefoil tray, so that the wine should not be spilled upon the credence, *dressoir*, or table. In the sixteenth-century wine-ragons began to be put upon the table; before then persons of rank handed their goblets to the attendant pages to be filled.

In the salt-cellar we find a similar display of ornamentation at this early period. These, when large, were provided with wheels, so as to be easily passed down the table. When smaller, and there were numerous guests, they were placed at intervals as with us. Some like the *nefs* were in the form of ships. They were generally furnished with lids. Examples of the pre-Renaissance work are very rare. The author, however, gives a thirteenth century low flat-topped pewter salt-box, of a hexagon form. On each of the six sides of these is a little panel, with a figure on it; and on the lid is a representation of the Annunciation, on a diapered hack-ground, with an inscription:—"*Beatus me facit Ave gratia Plena, Dominus Tecum.*" On the under side of the lid, which, when thrown open, would be in full view, is a representation of the Crucifixion, with a legend:—"*Cum sis in pensis primo de paupere pensa: cum pascis cum pascis amice Deum.*" Less severe than this, and of infinitely more costly material, is a second example, belonging to the fourteenth century, in silver, gilded. An agate vessel holds the salt, and is mounted in the manner of a chariot, on a framework furnished with four wheels. A miniature chateau on the top forms a rest for the golden lid when opened, and a snake's head serves as a clasp with which to make it secure when closed.

A Merovingian pail even was a picturesque object, not narrowed at the base, but of equal diameter throughout, with flat iron hoops, with an ornament on them, and a flat ornamental handle. These wooden pails have been frequently found in graves in the north of France and on the borders of the Rhine. A vessel of precisely similar character was used throughout the Middle Ages as almoners' pots, in which broken food was given to the poor. They were occasionally made of copper, lined with tin. Some inventories mention almoners' pots, or pails, of silver; and that of Charles V. enumerates a *pot à aumône* of gold.

Under the heading *seringue* we see the most primitive of fire-engines, the syringe. In 1663 a fire was extinguished in Troyes Cathedral with a syringe. In 1700 the same edifice possessed several of these engines. It was customary, formerly, to make a reservoir of rain-water under the roofs of great buildings, to which was supplemented a syringe. Sometimes a little water was sufficient to avert a great calamity, and the syringe was useful in directing it upon the portion of the structure on fire. Troyes Cathedral still possesses one of these relics, dating from the sixteenth century. It is figured. Between the last two rings binding its long cylinder, are the arms of the chapter, and the initials S. P., for St. Peter, the patron.

Of all the trenchers that were once in use in France there is no example in any museum. They were made of crystal, silver, silver gilt, and gold, and all have alike vanished. Upon them the carver cut up the viands, and also arranged the slices of bread destined to receive the morsels selected by the guests. They are mentioned frequently in inventories, and the vignettes of MSS. show them over and over again, but there is no specimen known for M. Le Duc to figure.

The gold and silver vessels of the French kings and of the Dukes of Burgundy, it will be seen from our occasional reference to their inventories, were almost incredibly numerous. M. Le Duc epitomises the inventory of Charles V., and in this abbreviated form its richness is startling: 36 doz. silver plates, 33 doz ditto silver gilt, and 72 of pure gold, besides innumerable pots, hanaps, *drageoirs bassins*, *aiguïères*, *nefs*, salt-collars, one in the form of a *nef*, 6 doz. silver-gilt candlesticks, 14 gold ditto, &c. And then the inventory of gold vessels set with precious stones and pearls exceeds even this in magnificence of array. Some of these possessions were relics, such as the *coupe* of St. Louis, with its ewer, the *coupe* of King Dagobert, the *coupe* of Charlemagne set with sapphires, &c.

An account of glass vessels, *verrierie*, brings this portion of the work to a close. There is a graphic description of drinking-glasses from the days when they could not be set down unless they were empty, till the more moderate times when they were provided with stems. One of the five illustrations is shaped like a cone and ornamented with spiral stripes. This is assigned to the Merovingian period. We have but dipped into M. Le Duc's work sufficiently to give our readers a taste of its contents. It is like an ancient French *drageoir*—full of good things skilfully prepared.

SUCCESS OF MODEL DWELLINGS.

THE report presented by the directors at the annual meeting of the "Metropolitan Association for Improving the Dwellings of the Industrial Classes," possesses an interest which is far from being confined to the shareholders in that undertaking. There are two points in the report to which we would call the attention of all those interested in one of the most important social and sanitary questions of the day: first, the financial aspect of the undertaking, and the result produced in proportion to the capital employed; and, second, the sanitary condition of the inhabitants of these model dwellings, as shown by the death-rate which prevailed in those occupied during the past year.

The Metropolitan Association appears to have embarked a capital of rather more than 100,000*l.* in its endeavours to improve the dwellings of the industrial classes, and, notwithstanding the large amount of capital which was during the year unproductive pending the completion of the buildings upon which it was expended, the result, financially, of the year's transactions was a net profit of 4,236*l.* 1*s.* This sum was sufficient to declare a dividend of 4*l.* per cent., and to carry forward nearly 180*l.* to the guarantee fund, which was thus raised to 4,000*l.* It appears pretty evident that when the buildings are all fully occupied there will be no difficulty in earning a secure 5*l.* per cent. upon the capital employed, after making ample provision for deterioration of property. This should be considered quite satisfactory: here is an employment for capital, with undeniable security, and earning a certain 5*l.* per cent., with the important recommendation that a most invaluable social reform is being helped on its way. Moreover, the payment of the 5*l.* per cent. prevents the inhabitants of these dwellings from feeling that they are the recipients of charity, at the same time that the capitalist can have the satisfaction of being charitable in one of the most needed and most useful channels, and literally at no cost to himself.

The report further tells us that during the past year the property of the Metropolitan Association has housed an average population of 3,531 persons, and this with an outlay of only 100,000*l.*, a great part of which has been spent upon property untenanted during a great portion of the year. Probably the investment of this sum of money will, during the current year, house 4,000 persons, which is really an important section of the class for whose benefit the association was founded. In this population of 3,531 persons 62 deaths occurred during the year, 38 of which were of children under ten years of age. These deaths showed an annual death-rate rather under 18 per 1,000, while the death-rate of the whole metropolis during the same period exceeded 24 per 1,000. This sanitary result is eminently encouraging, and when the social and moral effect upon the inhabitants resulting from the radical improvement of their dwellings is further taken into consideration, it appears astonishing that this

and kindred companies should have to complain of their efforts being crippled through the want of additional capital. This surely will not long be the case when it is more generally known that 100,000*l.*, judiciously employed, will provide improved dwellings, with all their attendant blessings, for a population of about 4,000 persons; yet such is the truth, if the figures in the report alluded to are to be relied upon.

There is yet another class of our London and other large town populations, which appears at present to have been somewhat overlooked by the various societies and companies for improving the dwellings of the poor. We mean the very lowest class of labourers and others, who can only afford to pay 1*s.*, or at most 1*s.* 6*d.*, a week for their lodging. This class is, no doubt, a difficult one to cater for, but it is one of not inconsiderable number, and it is the class standing most in need of sanitary, social, and moral elevation. We earnestly hope, therefore, that some efforts will be made to afford to a lower stratum of society some of the benefits which are now being enjoyed, and fully appreciated, by the inhabitants of the numerous tenements erected by one or another of the associations established for this benevolent purpose.

THE ARTISTIC TREATMENT OF PIERS, PILLARS, AND COLUMNS.*

BEFORE the Doric order was lannoching itself into eccentricities, and was still in that perfection of beauty we see in the Parthenon, another more richly decorated, and in some respects more complete, style, was, while gradually throwing off the marks of its wooden origin, assuming an important position in Greek art. The Ionic order, although through all time it preserved in a strongly marked manner the signs of its eastern origin, gave more scope for the variety in its enrichment, and lent itself more freely to the changefulness and ornamentation which, at a later period, the Greek artists came to desire.

In one most essential matter it differed from the Doric, and could claim the superiority of completeness over it in having a base; and this no small insignificant member, as if an early attempt to soften off the sharp junction between the shaft and ground line, but as homely moulded and well developed as if directly copied from its Assyrian prototype. Through all the changes the form of the column afterwards underwent, this feature, once fairly introduced, was never lost; and, although in later phases of art it may not be so richly moulded, it is always regarded as an essential part of the column. In the capital, no less than in the base, is the Asiatic origin of the order manifested. The voluted encorchements which, in the Assyrian example, formed so marked a characteristic of the style are retained, but with that alteration which was natural to those by whom it was again employed. As with the bnd capital, the upper and useless part was cut away, but, in imposing thereon a square thin abacus that did not fit itself to the projections of the capital, the Greeks were scarcely as fortunate as in their adaptation of Egyptian forms. We can, of course, only speak here of the finished specimens of the order as now found; but doubtless there must have been many tentative examples, traces of which have now altogether disappeared, which would heter have linked on the graceful pillars of the Erechtheion with the grand columns of Persepolis and Susa.

The capital of this order depended less on colour than on form for its beauty, differing perhaps therein from the Doric. But, to a limited extent, we know that coloured materials were employed to heighten the effect, and the graceful curves of the volute were emphasised by the insertion of glass or marble in the eye. The columns of the Assyrian porticoes were usually arranged in antis; hence the difficulty of dealing with a capital, the sides of which differed from the front, only first presented itself to the Greeks. Instead of boldly adopting some such expedient as might have been suggested by the ante of the Doric order, they attempted to manipulate the volute in a manner so meaningless and with a result so contrary to good taste, that all the refinement and delicacy of their finish could never atone for, and which, more perhaps than anything else, led to the abandonment of the order or its absorption in another style. In the portico of the British Museum

example enough is seen of the bad effect of turning out the angle volute of the corner capital, and the attempt to make the front and side to correspond. In the Temple of Apollo at Bassæ, where the internal order employed is Ionic, its treatment is very peculiar. The shafts are set against square pilasters, of which they form a part, and the three faces of the capital show each a pair of volutes which mire at the angles, having thus become more ornamental accessories, with little or none of that appearance of encorchement which was the *motif* of the earliest examples.

In the treatment of the shaft the original model was exactly followed. The flutings, as at Persepolis, were evidently applied to a circular shaft, not evolved from a square pier, and were separated by distinct fillets following the curve of the column. The necking, which before had not been used in Doric, was now frequently employed, as in the Erechtheion, to inclose a band of raised ornament, as eastern in its character as the rest of the work. The use of the necking is not here, however, very great; but we shall see, when it becomes allied to the bell-shaped capitals of the Corinthian order, how useful an accessory it is.

We have not yet referred to the entasis which is given to these orders, and which in force is peculiar to each. The Doric, like its model, is most marked, but in Greek hands became much more refined, as suited their less massive piers, and with a curved outline so delicate that it requires the most exact measurements to detect its form. The entasis of the Ionic shaft, while perfectly apparent, is less marked, as is necessary for its greater height in proportion to its diameter and the number of flutings given to the shaft.

Before leaving this part of the subject, it would be as well to instance, as additional proof (if additional proof be required) of the strong influence of Assyrian upon Greek art, the bull-headed capitals of the island of Delos. Were it not that they were not only used in a temple of Apollo, of undoubted Greek work, but in some cases forming parts of some Doric piers, they might be taken for eastern work.

At Delphi was found a fragment of uncertain date, which shows a remarkable difference from what we have already seen, and supplies us, perhaps, with the first hint at a coming change. It is a graceful bell-shaped capital of palm-leaves, turning over boldly, springing directly from the shaft without a necking, and surmounted by a square unrounded abacus. It looks precisely as if one of the palm-leaved capitals of Egypt, refused a little in its outline, had had placed upon it a Doric abacus, and used without further adaptation. What may be the chronological position of this fragment it is now impossible to say; but one of the earliest examples we know of, in the Corinthian order, betrays, though not to so marked a degree, its Egyptian origin. In the Tower of the Winds at Athens is a series of columns, with square abaci and bell-shaped capitals set about closely with leaves of the acanthus and water-lily, while the shafts are fluted and hairless. In the Choriagion monument of Lysicrates, a slight advancement is perceptible in the adaptation of the Ionic volute to the capital, modified and lessened so as not to be incongruous, as a means of relieving the crude junction between the circular bell and the square abacus. But in this case the abacus has itself also undergone a change. The sides have been hollowed out on plan, and the sharp angles which resulted therefrom, and which have so had an effect in the late example of Hadrian's Temple, are cut off. But this new arrangement, although it might give an appearance of lightness and more refined delicacy of form to the abacus, paved the way for a total disregard for the uses of the capital, and its declension once more to be as useless a member, practically, of architecture as ever were the beautiful models of Egyptian art from which the Corinthian order was initiated.

But, before we pass to the further notice of this order, which only reached the completion of the first stage of its history in the hands of the Romans, and its highest perfection and advancement in the Middle Ages, there are one or two points to be noticed concerning the general arrangement of columns employed by the Greeks. The first is the rule never to use more than one order in the erection of a building, except only in such positions as will prevent their being seen and compared with each other at the same time; and this rule applied to the works of the Egyptians and Greeks was in perfectly good taste, as the repetition of such

* By Mr. J. Tavenor Perry. See p. 493, *ante*.

forms as were used by the former were never monotonous, from the great variety given to them by the coloured decoration; and with the latter, the form being so simple in itself, that it could not be more objectionable than the repetition of similar parts in other edifices. But when this rule came to be applied to late buildings enriched with sculpture and all the decorations the Romans lavished on their capitals, the result was not only monotonous, but altogether disastrous to invention, and there is little wonder that it ended in a complete degradation of the refined lovely forms taken from the Greeks, and the general disgust one often feels for an order which contains in itself so many essential elements of beauty.

A startling exception to this rule is found in the Temple of Apollo at Baesæ, already mentioned, where, among capitals of the Ionic order, is introduced one of a Corinthian character. Particular historical reasons are adduced to account for this, though, except to students of that style of art to which too often a careful study of the Five Orders leads, the result would be sufficient excess.

Another point is the intercommunities. Though regulated by the rules of proportion, these rules were not among the Greeks of that class unbending nature found in the pages of Vitruvius; and I think it must be evident, from a study of the examples of the best periods, that their rules were not so much those of arithmetical precision, as of a careful and cultivated eye.

Before the Romans, by the adaptation and alterations of the Corinthian order, and by the multiplication of examples throughout their empire, made it rather a feature of their own than of the Greek styles, they had brought to some perfection a form of column indigenous to their own country. This was the Tuscan, which, insinuating or allying itself with the Greek models, became better known and commonly used as the Roman Doric. It commenced among a people of an origin closely allied to the Pelagis; and numerous examples remain, particularly in the pilasters of the tomb at Cervetri, showing the similarity between the modes of ornamentation employed by the kindred races. This, as showing to a great extent the influence of wooden construction on their works, will account for the addition to the Doric order of a base, a feature afterwards employed almost without exception in the buildings of Italy.

But the style the Roman artist peculiarly liked when his art reached its zenith was the Corinthian, which became the favourite order for buildings of the more ornate class throughout the empire; and the remains of its graceful capitals and highly enriched friezes are scattered over the whole region of Roman influence, from Tadmor in the Wilderness to the pillars of Heracles. Wherever it was found it exerted an overpowering influence on the works of after times; and though for a while its Doric rival seemed to monopolise the attention of our earlier artists, it was the bell-shaped capital that the Middle Ages made the one and only form known throughout the best periods of his art.

The Romans, in their treatment of the capital, followed at first, without much alteration, their Greek models, with one essential difference. As the Greeks first used the order complete, they only employed it for smaller monumental works, so that the peculiar form which it appeared when the Romans came to employ it for their largest edifices; and the full absurdity of the form only became apparent when—the hearing surface of the abacus being reduced to the minimum, and the projecting and useless angles reinforced by the addition of the large volutes of the Ionic—that beautiful solecism was perpetrated, the Composite order.

We have not time here to dwell at any length on the varieties of these orders to be found throughout the world. In their Roman dress they are so well known by modern reproductions, and so continually before us in architectural schools, that any reference to example is unnecessary. The Eastern influence, which gave to the later phases of the art so much richness of ornamentation, frittered away in meaningless forms the finer ideas of earlier times. The buildings of Baalbec and Palmyra, covered with all the wildest excess of carving, or the strange distorted columns of the ruins of Tivoli, alike show the degradation to which the art was brought; and it is fortunate for architecture that ere all true principles were utterly lost, that sweeping desolation came which scattered far and wide her memorials, to

inspire future generations to emulate her successes, while they avoided those errors which had led to her decline.

When, in the year 500, Theodoric visited Rome in his office of king of Italy, he found the city in a much more perfect state than might be expected from the frequent sieges and troubles it had passed through. Awed by the splendour of its buildings, and interested in a preservation of its glories, he ordered a careful conservation of its monuments, and devoted large sums of money to this purpose. Although it has been too common among the Gothic invaders to seem barbarians unable to appreciate the refinements of art and the beauties of architecture, this name of Theodoric is associated with one of the earliest examples, showing a taste for cultivating the neglected arts. The tomb of Theodoric is an example of no new style, with little but its rude mouldings to distinguish it from the works of much earlier ages, yet showing signs of that returning power and vigour, infused by the new races, which afterwards covered Italy—and not only Italy, but civilised Europe—with buildings rivaling the monuments of Rome for their grandeur, and of Greece for their beauty. The grant of money Theodoric made for the preservation of Roman works was well applied, and architecture, instead of being thrown back on altogether first principles, had preserved to it some of the finest edifices of former times, enabling the later builders, though halting, and doubtful of their first efforts, to carry on this same style until it reached its completeness in Mediaeval times.

The basilicas erected in Rome during the two or three centuries which elapsed after the decay of the Imperial power, were almost entirely formed out of fragments of other buildings existing in the city, so that few, if any, exhibit the smallest improvement on previous works, and it would seem as if the very abundance of material ready prepared to hand rendered all artistic effort useless.

But while art in the West is sleeping, we must turn to the East and see how there it is active and carrying on its work. The provinces of Asia, we have already noticed, were marked by that excessive richness and luxuriance of imagination which ever characterized the arts of the East. The gorgeous styles of Assyria and Persia—never wholly lost in their particular seats, and carried on unimpaired by other styles across the Indus to still greater perfection, refined by Greek influence and reinvigorated by Roman enterprise—developed into new forms under the Sassanian dynasties. Among the ruins of Tephnan, Ctosphon, Diabekr, and other cities of Persia, we find many relics of a form of art, resulting from the partial fusion of these various styles, and giving already signs of some of those new forms, which were afterwards to exert so marked an influence on all Eastern art. The peculiar convex form of capital, which became a feature in Byzantine works, is here most commonly found enriched with graceful and consistent forms of decoration unlike anything of previous times with which we are acquainted. In the small capitals from Warka, now in the British Museum, we find some examples of that form so peculiarly Assyrian, which the Greeks brought to perfection in their Ionic; but these forms are rare, and the convex form must be regarded as the representative one of the style. Whence this form was derived, so unlike any of the examples which had been common in Assyria in former periods of her prosperity, though not unlike the later phases of the style as found in India, we cannot say, unless it owe its origin to that rude imitation of Roman Doric by provincial masons, to which we shall presently have to trace the commencement of our own more short-lived, but scarcely less beautiful Romanesque forms. The decoration frequently employed consisted of scale ornaments in slight relief applied to the capital, richly carved neckings, and an arched or running pattern on the abaci. The richness, as well as the refinement of this work, was carried to a very high degree of excellence, but it could never relieve the coarse and ungraceful outline of the capital and the equareness of its parts. The shafts appear to have been generally unduted and round, while the haecs seem to have had little to distinguish them from the more usual Roman examples. Indeed, there is little in the style to merit more than a passing notice, except for the one particular of the capitals, and the influence they exercised on the style to which we now turn.

When Constantine founded his city on the Golden Horn, he found that the arts had well nigh died out, and he had to lament that while

he might have the ability to make his new city rival Rome or Alexandria for size and wealth, it was only by pilfering from every province in his empire that he could succeed at all in rivalling them in the beauties of sculpture or architecture. The number of churches, palaces, and other public buildings he erected, as well as the wondrous statues and carvings of Greeks and Asia he brought together, proved an incentive to the study of the forgotten art; while the absence of large ancient buildings in the new city, with the ever-present influence of the Eastern nations around, caused his works to be freer from the servile imitation which might have marked them in the West. Beside this, the Greek city of Byzantium was incorporated in the new capital of the East, and Greek, not Roman, artists were employed in the erection of the edifices, so that we can scarcely wonder that signs of life and beauty once more appear in art.

The city was, however, hastily and unsuitably built, so that ere long it gave place to more lasting buildings, worthier, not only of the capital of the East, but the centre of art and luxury. The western empire, and nearly all the provinces of the mighty dominion were falling continually under alarms and invasions, while in the city of Constantine life passed much more quietly, sunned by the splendour of a court rivaling all the state and luxury of Asiatic despotism. The many changes of government which it survived invariably left the power resident in the city, and that power one, with very rare exceptions, patronizing art or display.

Among the earliest buildings we have remaining is the church of S. Johannes, built in 463, affording us a good idea of the state of art so long posterior to the building of the city. In the atrium we have a column of similar proportions to the Corinthian, but with an unduted shaft, and a capital of the form like that I have already instanced from Asia. The carving is of that sharply-cut, well-defined character, so indicative of the style and unarranged in such the same way as the ordinary Corinthian cap. The termination of the shaft is more distinctly marked, and projects considerably before the hollow of the abacus, which is unadorned, but enriched with a band of sunk ornament. The entablature is complete in all its parts, with carved frieze, modillions, and a richness of carving luxuriating over the whole, but destroying none of its classicality. Contrast all this with a capital from the interior, and here we see the change that has taken place in the form of the capital where the requirements are different. The example is taken from the arcade of the gallery. In pure Roman examples we should have had a capital surmounted with its complete scrap of entablature; but here the entablature has quite vanished, or has been reduced to such form and smallness as to confound it with the abacus. The decoration is still Roman, but the spirit is that of a new and more perfect style.

In the great representative church of the next century we find the change still more complete and marked. At Sta. Sofia's the capitals have almost entirely lost the earlier form, and the entablature has disappeared or become fused in a more useful abacus. The capitals take the outlines of the Sassanian examples; the abacus, like them, is unadorned, square, and enriched with sunk ornament, and although the little projecting volutes and other signs of classicality remain to show their origin, the result evinces that complete emancipation from old forms and adaptation to new requirements which had commenced with the introduction of the arch as an ornamental feature as well as a constructive necessity.

But whilst these changes in detail were making themselves apparent in the column, a new feature was developing itself and taking a position in architecture of which little had been known before. The arch had already altered the proportions and height of the column, separated from it the entablature to which it had for so long been bound, and now the introduction of the dome brought with it a feature of greater massiveness and very different proportions to the pillar, but fulfilling much the same requirements. With the arch itself, little more than the height of the column in relation to its diameter had been altered, for the same arrangement which had held good through former times of small intercolumniations was as possible, and indeed as necessary, as before. But when once the architects attempted to raise on the intercession of the nave a solid dome, the necessity was apparent for placing at the chief points of support massive piers, capable of bearing the concen-

trated weight of the roof. The Roman arcades had already prepared the way for this, in the grouping together of pilasters, as in the Colosseum; and in the basilica of Maxentius we have a perfect example in form of the pier. But here it is only one in appearance, being a column with its piece of entablature complete, stuck against a wall, which really carries all the weight of the vault, so that the proportions of the order have not had to be sacrificed to the necessities of the case. In the earlier instances of Byzantine treatment of the pier we find it little more than a mere strip of masonry left between the openings, to carry the superstructure, thus going back, as it were, to the very first principles of building. But with the domical forms of construction, the weight to be carried above was far too great to be trusted on the single slender shafts of the usual orders; so that having no precedent to guide them, they introduced the great masses of masonry necessary for the purpose, with but slight attempts, as a rule, to disguise their bulk. This is the case in the churches of SS. Sergius and Bacchus, Sta. Sofia, the Dome of the Rock, where, however panelled with marble or enriched with moldings, the awkwardness and rudeness of the mass is very apparent. As the feature, however, became more used, or the architects gained more experience, we find the pier broken up into smaller parts, and built with a regularity more akin to our own late and more perfect examples in Medieval times. In the Armenian churches of Dighour, Pitzonnda, &c., the piers have simple square pilaster faces on each side, which are carried through without break to form the arches under the dome. At Ani, a little later, the piers are still further divided, and distinct caps given to them at the springing of the arches. The angle shafts often introduced in the piers were carried up the whole height, and not only suggested different proportions for the single shafts, but gradually led the way for introducing the complete compound pier sometimes found in late Byzantine work. A good example of this is figured in Salzenburg, from the church of Pantokrator, which might almost pass for a Western example.

But as this new feature was thus being slowly worked out for the new requirements of the East, the want of skill, and poorness of materials, was also bringing about the same change in the West. The first ideas of the workmen—if not the result of absolute necessity—may have been given to them by the buildings erected at Ravenna and elsewhere, under direct Byzantine influence; but whatever their origin, the result was, that the pier came to take as important, or even a more important, place in Western than in Eastern art. But there was this essential difference between the two styles in their treatment of it, in the latter it rarely, if ever, was to be confounded with the pillar, except, perhaps, only in the very late Armenian works, and never once appeared to have forgotten its origin as a mere slip of wall; but with the Western it soon became mixed up with columns in every possible way, and to a great extent lost its original form in the clustered shafts, which are *par excellence* the mark of Medieval work. And this is not all; the habit of using the massive pier intermingled indiscriminately with the column, caused them to act and react on one another in a manner scarcely noticeable in the East.

It is not, however, to Italy that we must look for the chief results of the introduction of this new feature. There we have, as it were, the materials which our builders used; for although the Italians worked to a certain extent in the Pointed style, there was never that fusion capable of producing the results to be found in the architecture of France and England, or the countries influenced by them. Hence it is from them we must draw our examples, and in them we shall find quite enough to show the gradual change.*

Alleged Subterranean Passage under Richborough Castle.—A correspondent draws attention to the discovery under Richborough Castle of a subterranean passage, which he says has been cleared for a considerable distance. It is some 6 ft. high and 3 ft. broad, and some hundreds of yards in extent. There are also, he says, passages leading in other directions, but these have not yet been cleared of the earth. The walls and roof of the excavated portion are said to be lined with rough stones and flints. We shall be glad to hear something more of this if correct.

* To be continued.

THE TRADES MOVEMENT.

Bath.—The master and operative carpenters and joiners of this city have, in order to prevent strikes, established a Board of Arbitration and Conciliation, which consists of six members from each section. Mr. Edward J. B. Mercer has been chosen by the employers as their secretary, and the operatives have selected Mr. Thomas P. Chapman. The Recorder has consented to become umpire.

Leeds.—There was recently a meeting of the Joiners' Board of Arbitration, with Mr. Jowitt as umpire, to arrange a dispute that had arisen as to the rate of wages fixed by Mr. Rupert Kettle a year ago. At that time, amongst the rules agreed upon was one providing that men of fair average skill should be paid at the rate of 6½d. per hour. On the part of the masters it was stated their understanding was, that the increase was ½d. all round, and this they had paid. Further, they stated that trade being bad, men offered themselves at a lower rate than 6½d., and were employed by the non-associated masters, and the associated masters, being in a minority, if they paid the full rate, would not be able to compete with them. The men, however, pointed out that the wording of the rule was clear,—that 6½d. should be paid to fair workmen. The umpire stated that if the men were determined to abide by the letter of the law it must be carried out, and after a long discussion it was mutually agreed that a man might be engaged without stipulation as to the wage; and that, after two or three days, he should be paid according to his worth.

Worcester.—The painters' strike, it is said, may now be considered at an end.

CONCRETE IN BUILDINGS: SHEFFIELD.

MR. THOMAS PRIDEAUX, a gentleman who has patented and worked a smoke-consuming apparatus, and who has also patented in England and France a new kind of concrete walling for break-waters and sea-walls, has just completed a block of dwelling-houses in Havelock and Brunswick streets, Sheffield. It is called Havelock-square, and consists of nineteen houses, each containing ten rooms, water-closet, bath-room, wine and coal cellars. The houses form three sides of the square, and the fourth side is occupied by stabling for the use of the tenants, and a house for the residence of the stable-keeper. The buildings are of pressed brick, built in the Anglo-French style, with white string-courses. The appearance is improved by heightening the pitch of the roof, in doing which three bedrooms are formed in the place of two attics, which are generally to be found in buildings of this class; while above them is a large garret fitted up as a laundry. One of the features in connexion with the building of the houses is, that the plastering of the walls and ceilings has been accomplished without the use of hair in the mixing of the plaster. Instead of hair, Mr. Prideaux has employed the common hench-shavings, which, after being chopped into certain lengths by a chaff-cutting machine, are ground thoroughly with the plaster. The result obtained is said to prove that shavings are of a more tenacious character than hair, for, notwithstanding that the walls and ceilings have been plastered several months, not a single crack or flaw can be detected in any of the houses. Another feature is, instead of using stone, a peculiar concrete is employed in the making of fireplace hearths, footpaths, door-stones, &c. This concrete is prepared from the very waste of the Sheffield steel-refining furnaces, viz.,—the refuse crucibles which, having done service in the making of steel, and having been changed by metallic action, and the heat of furnaces from fire clay into a substance harder than stone though more brittle, are broken into pieces and cast into the mortar-mill, with proportionate parts of gas lime and water. These are well ground together, and while in a semi-liquid state, the compound is run into the place in which it is required, and after being worked or trodden for a time, is allowed partially to set. It is then "dressed," and when thoroughly dry, looks as well as stone. The patentee has tried several experiments with this compound, only employing the ordinary building lime, but he finds that the use of the gas lime produces a concrete far harder than that by the building lime. In the process of mixing nearly the whole of the small of the gas lime is evaporated, and by the time the compound is "set" not a trace of it can be detected. The fire-grates in the houses are peculiar in their construction. In appearance

they do not much differ from those generally in use, but on examination it is seen that at the back is an air-chamber fed by apertures in the back of the grate. The outlets of the air-chamber are at the back of the fireplace, through parallel openings. When heated, the air passes through these openings into the fire, and the result is that nearly the whole of the smoke made by the fire is consumed. No cinders are left in the grate, but simply a gray ash. By the construction of the flues of the chimneys smoky fireplaces are prevented. Mr. Prideaux has found extensive use for his concrete preparation in the erection of boundary walls in the yard and the stable-keeper's house, which latter is entirely built of it. For the building of the walls, &c., the concrete used is much coarser than that used within. It is run into its place in plank moulds to the thickness of about 9 in., then a layer of rubble or any kind of stone or pot rubbish is laid on the top of this, then another layer of concrete, then another of rubble, and so on until the required height is attained. The walls are then allowed to dry, and are afterwards dressed over with the finer concrete and jointed. These works show that the rubbish of Sheffield is of value in building, and that two things, hitherto considered almost useless, furnace-pots and gas lime, when properly combined, form one of the strongest of concretes. It is with this concrete that it is proposed to cover the whole of the yards of the houses, the footpaths at the front, and other places where formerly tar asphalt was used.

FREE LIBRARIES AND MUSEUMS.

The committee of the Society of Arts, appointed by the council to consider and report upon the best means to be employed for the promotion of free libraries and museums, to which we recently referred, met again, on Monday last, at the society's house in the Adelphi, for the further promotion of their object. Lord Henry G. Lennox, M.P., presided, and there were present in addition General Eardley Wilmot, Captain Donnelly, R.E., Captain Festing, R.E., Messrs. Wilbraham Egerton, M.P., Edward Denison, M.P., George Godwin, S. Redgrave, Seymour Teulon, Hyde Clarke, J. F. Iselin, and James Hole.

The following resolutions, of which notice had been given, were adopted, after a full and free conversational discussion:—

"That free libraries and museums, maintained under the Free Libraries and Museums Act, should be regarded as parts of a system of national education, and assisted by funds voted by Parliament, in addition to local rates. That various old public libraries, as that of Archbishop Tension, having been dispersed, it is expedient that legal provision should be made for the security, as public property, of all libraries and museums which are appropriated to the public use."

In the discussion on the first resolution entire unanimity was expressed upon the point that a comparatively small sum voted by Parliament in encouraging the formation of free libraries and museums was calculated to yield an ample educational return. Aid was absolutely necessary, in many instances, in the first step; the provision of a building and a moderate principal sum granted for this purpose, would greatly stimulate local effort in the formation of libraries and museums, and afterwards in their augmentation and proper maintenance.

In relation to the second resolution, Mr. Hyde Clarke stated that he had urged Mr. Ewart to introduce a clause into his Bill for the protection, as public property in perpetuity, of books, pictures, and such other objects as had been once devoted to public use. Mr. Ewart entirely concurred in the recommendation, but was unwilling to encumber his Bill with clauses or provisions not absolutely necessary, or that were likely to hinder its adoption. In the United States public libraries are under the protection of the State Legislature; and, on the Continent, of the authorities of provinces, departments, communes, or municipalities: the consequence of which is that these collections accumulate and are preserved; whereas in this country, from the failure of institutions, and the absence of any protective provision, valuable collections of books, devoted to public use, are frequently dispersed.

Lord Henry Lennox, the chairman, referred to his intention of asking a question in the House of Commons, with a view to obtaining Government sanction and assistance in the distribution to local museums and libraries of duplicate and redundant works of science and art, books, and other objects, now in the possession of national

museums and galleries in the metropolis, but perfectly useless. At South Kensington there were three pictures, exactly like each other in all respects, painted by the same artist; and there were many valuable drawings and works of art, by Turner and others, stowed away, out of sight, at the National Gallery, that ought to be, and should be, put to a far more worthy use.

There cannot be a doubt that a comparatively small public grant in aid of free libraries and museums, and the distribution of duplicate unexhibited works of art, and of unused hooks, would serve two important purposes (1), in directly stimulating important educational agencies, and (2) in abating the feeling of jealousy with which votes in aid of the great national museums and galleries of the metropolis are regarded in the provinces.

COTTAGE PROPERTY IN LIVERPOOL.

A JURY was recently empanelled in the Sheriff's Court to assess the amount to be paid to Mr. James Nohlet for fourteen cottages situated in Norfolk-street and Watkinson-street, which are about to be taken and pulled down by the corporation in making a new road from Parliament-street to Park-lane. The property consisted of three houses in Norfolk-street, three in Watkinson-street, and eight in a court running between the two. The latter, it appeared, were occupied by eleven tenants, and in reality formed eleven tenements. The property was shown to the jury by Mr. Wylie, architect and surveyor, on the part of the claimant; and by Mr. Walter Scott, for the corporation. Mr. Gully, in stating the case for the claimant, said the property was leased by the corporation for seventy-five years from 1851. It was situated close to the docks, and in the very centre of that part of the town in which the working population required lodgings and houses. The gross rental of the premises was 235l. 6s. when fully occupied. Generally fifteen years' purchase was allowed in cases of this kind to arrive at the real value of the property; and, taking it in that way, and adding the usual 10 per cent. for compulsory sale, they arrived at a value varying from 3,070l. to about 3,270l. Mr. Lewis Hornblower, architect and surveyor, said he thought 15 per cent. for leakage on the property in Norfolk-street, 20 per cent. for that in Watkinson-street, and 25 per cent. for that in the court, were very liberal deductions to make. That would make the total net rental 186l. 3s. 2½d. Fifteen years' purchase would bring the sum up to 2,792l. 8s., to which he added 279l. 4s. for compulsory sale, which made the amount the claimant was entitled to, in his opinion, 3,071l. 12s. Mr. Wylie, architect and surveyor, considered claimant entitled to 3,264l. 10s. Mr. Wm. Henry Wordley, architect and surveyor, was of opinion that 3,150l. would be a fair sum to award the claimant. The jury awarded the claimant 2,500l. (The claim sent in to the corporation was for 3,500l.)

COMPETITION WORKS FROM THE SCHOOLS OF ART.

The prize works of the Schools of Art of the United Kingdom submitted in national competition are now open to the public in the galleries overlooking the Horticultural Gardens, for want of space in the South Kensington Museum. All kinds of art work peculiar to students enter into this competition—drawing and modelling from the antique; painting of still life from nature, in oil or water-colour; and architectural, surface, and plastic design. The prizes consist in all of ten gold medals, twenty silver, and fifty bronze ones, besides "additional prizes" in the shape of works of art and hooks. There are also drawings and models in reply to premiums offered by the Plasterers' Company: the former for ornamental work over a doorway are unsatisfactory; the latter, ornamental brackets, include several creditable works, such as those by John Brooks and James Rowley.

The gold medal has been given to E. Healey (Bradford School) for a design for a town-hall, meritorious in many respects. John Trego (Conventry) gets the silver medal, for an outline design for a metal chancel screen. For the most part, however, the architectural works are poor. B. Perks (Kidderminster) has the gold medal, for designs for the decoration of a room, and deserves it; designs by Andrew Brophy (South Kensington) for dining-room decorations, in colours and gold, are also very creditable. H. Archer (Shef-

field) is well entitled to the gold medal awarded him for a large metal dragon; and the same may he said in the case of A. S. Palmer (South Kensington), who sends a painting of a dead pigeon and accessories, and of Mary Anne Mansell (South Kensington), for some very graceful designs for the decoration of cups and saucers. Alice Donkin (Oxford), and Frances Seymour (Dahlin), who have both sent studies of heads, ought to be heard of again.

In the gallery of approach are some very meritorious large medallion heads in terra cotta, by George Tinworth (Lamheth), to whom the bronze medal has been awarded.

The collection shows a considerable advance as compared with those of previous years, and includes a number of designs for manufactures, which might be advantageously carried into execution. Manufacturers, indeed, ought to feel it to be their duty and their interest to take up young men and women who distinguish themselves in these competitions, and so to aid the efforts now making to advance the arts of design in this country.

PROPOSED COURTS OF LAW.

MR. GLADSTONE on Tuesday last moved for the appointment of a select committee to inquire into the site and charge of the new Courts of Law. Taking into consideration the advanced period of the session and the great pressure of public business on Parliament, he thought it would be impossible to devote the time absolutely necessary to a fair consideration of the rival plans. Under these circumstances, the Government being desirous to give complete satisfaction in the matter, wished to associate the House of Commons with themselves in arriving at a decision. He would therefore move for a select committee to inquire into the site and charge of the new Law Courts. Mr. Walter wished the first minister to state if he intended that the particular plans for the proposed buildings should be submitted to the committee. Mr. Gladstone said that the designs would not come under the consideration of the committee, but the plans would. The motion was then agreed to.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

ARCHITECTURAL EDUCATION.

At the closing meeting of this Institute for the session 1868-69, Mr. W. Tite, M.P., president, in the chair, Mr. Seddon, hon. sec., announced that the report of the General Committee on Architectural Education had been considered by the Council, who had passed the following resolutions based on certain propositions contained in the report:—

1. That a text-book or pamphlet should be prepared setting out where and when (in addition to office instruction) courses of lectures specially pertaining to the profession can be attended, and giving a limited number of books in which the best information is to be had.

2. That a certificate be granted to all who pass the voluntary architectural examination established by the Institute.

3. That a preliminary examination be held at the Institute in elementary subjects, open to all students who have been at least one year in an architect's office, provided that it be not made compulsory on those who come up for the voluntary architectural examination.

4. That the Institute should assist the Architectural Association to carry out the drawing-school which it was proposed by that society to establish this session.

The Honorary Secretary also announced that Professor T. H. Lewis and Mr. A. Waterhouse had been requested to prepare the text-book referred to in Resolution No. 1, which, when approved by the council, would be submitted to members at a general meeting next session; that a form of certificate had been prepared, and would in future be given to those candidates who pass the voluntary architectural examination; that the preliminary examination mentioned in Resolution No. 3 would be (with the approval of the general body) henceforth established in connexion with the annual voluntary architectural examination; and that the council were prepared to assist the Architectural Association drawing-class in accordance with Resolution No. 4. It was further stated that in regard to the other suggestions made in the report of the general committee, the council desired to retain under the control of the Institute the architectural examinations above mentioned, but that they could not at present entertain the proposition that passing the examination should be made a condition of future membership.

The following papers were then read:—

"A Description of the Tomb of Vitellia (an ancient Roman architect) in the Villa Volkonsky at Rome, and of some Remains in Palestine," by Prof. Donaldson.

"On Abyssinian Church Architecture," by Mr. W. Simpson.

Before the meeting adjourned the President announced that in consequence of the engagements of many guests who had been invited on the 26th inst., the Council had reluctantly found it necessary to postpone the dinner, which was to have been given in the Crystal Palace on that day.

The Conversazione will be held in the rooms of the Institute, on Thursday, the 1st of July.

BUILDERS' ACTION FOR LIBEL.

MATHER AND REED V. HACKWORTH.

THIS was an action for libel in the Court of Queen's Bench, Westminster, before the Lord Chief Justice and a special jury.

Mr. Serjeant Parry and Mr. Pearce were counsel for the plaintiffs; Mr. Serjeant Ballantine and Mr. A. L. Smith were counsel for the defendant.

The plaintiffs were builders and contractors, carrying on business in Charles-street, Westminster, and the defendant was also a builder and contractor, in St. John's-wood. In June, 1867, the Board of Works advertised for tenders to build a fire-brigade station in Adelaide-road, St. John's-wood. The plaintiffs and defendant sent in tenders. The plaintiffs' tender was for 1,650l., and the defendant's for 2,000l., and consequently the former was accepted. Owing to a dispute with reference to the title to the land, the works were suspended until February, 1868. They were then commenced, and again finally stopped on the 31st of March. On the 21st of March a letter, signed "Fair Play," was published in the *Builder*, and elsewhere, headed, "Low Estimates and How Carried Out." The letter referred to the tenders for the erection of the fire-brigade station in the Adelaide-road, St. John's-wood, and charged the plaintiffs with having used "a little dirty pit ballast, with a great deal of unscreened burnt clay (or hallast, if you will)" instead of "clean-washed Thames ballast," required by the specification. The letter also contained this sentence,—

"I would, in conclusion, ask what inducement can there be for respectable builders to enter into competition jobs, with so little chance of success, against the 'cheap jacks' of the present day?"

The defendant, Mr. Hackworth, admitted the authorship of the letter.

The plaintiff, Mr. Mather, stated in evidence that the materials were changed with the consent of the Metropolitan Board of Works' surveyor; but in cross-examination, it was shown that he had sworn in November last, in reply to certain interrogatories, that "the concrete used was composed of fresh-burnt blue lias ground lime and clean-washed Thames ballast, in the proportion of one of lime to six of ballast." In explanation, plaintiff said the words "Thames ballast" had been used in the reply in mistake.

Mr. Serjeant Parry then elected to be non-suited. The plaintiffs were nonsuited accordingly.

MANUFACTURE OF TERRA COTTA.

SIR,—Terra cotta as a decoration for buildings has latterly become a subject of much discussion among architects, not though as to its applicability, as I believe most architects are agreed that ornamented clay is more in character with a building which is built of brick than stone dressings, from the fact that it is the same material in an artistic form, whereas stone is a foreign material in an artistic form. In one of your former impressions of the *Builder* (early in 1868) you gave an interesting account of a meeting of architects on this subject, at which the mode of manufacturing terra cotta was treated upon at some length, and a diversity of opinions was expressed, the principal objections to the use of terra cotta being the contraction and the liability to twist in the burning. I may say that I have been connected with the manufacture of terra cotta and fire-clay in their various forms in England and Scotland for some years, and my experience convinces me that plain and ornamental blocks of large dimensions can be made with the greatest accuracy without any twisting whatever, and can be produced as sharp and distinct in outline as stone. I will go further and state that terra cotta can be produced in a rich variety of colours at a cost which will favourably compare with stone. The first important point in the manufacture of terra cotta is to mix a body slightly vitreous, and ascertain

carefully the amount of contraction per inch in the burning, and allow accordingly in the clay state. The next point is to make the articles hollow, and allow them to dry when finished gradually without any heat, excepting a dry atmosphere, such as can be obtained in any building which is covered in. The only matter to be considered is the time required in drying, which is really of no importance if the work be commenced early. As regards the burning, which is an important consideration, a circular muffled kiln should be adopted, with a good number of fires in proportion to the size of the kiln (the circumference of the inner case of the kiln should never exceed 12 ft., by 11 ft. high, so that the heat can get a good "grip" of the whole interior). When the kiln is lighted it should be allowed to go on what is called "slow fire" for at least three days and three nights; that is to say, the months should be gradually filled up with coals until that time, after which the heat should be worked up to the pitch required. As regards the manufacture of terra cotta in colours, I have found the following plan to work well. Mix the various colours with a portion of the clay which forms the body of the material into a slip or liquid, and lay them on the moulds used with a camel-hair pencil, then fill up the mould with the clay (also made into a liquid), and allow the mould to absorb it until about half an inch thick, after which pour out the remainder. When the coating on the mould has become slightly hardened, take some clay (the same material as used in casting), and fill up to the thickness required. When sufficiently hard, strip the mould, and there will be produced an article, with a coloured surface, and of equal contraction with the main body. When it becomes what is termed "hard green," wash the surface over with a transparent glaze, and when burnt you have a glazed coloured surface, which is quite indestructible. The foregoing plan I have found to act well, and believe it might be adopted generally with great advantage in the decoration of buildings, as it would resist any atmosphere, would never require painting, and would wash perfectly clean with every shower of rain, thereby effecting a great saving, and what is of far greater importance, would be the legitimate decoration of a brick building.

ALPHA.

THE GRAND PUMP-ROOM HOTEL, BATH.

This new establishment has been formally opened. It occupies the site of the White Hart Hotel. The exterior corresponds with the Stall-street elevation of the Grand Pump-room and its colonnades. The baths are not yet completed. The public coffee-room is the largest apartment, occupying the whole of the northern wing, which is 54 ft. long and 21 ft. wide, exclusive of a recess 20 ft. long and 14 ft. wide. The grand staircase is of stone, with cast-iron balusters and mahogany rail. There is also a lift to the upper floors, which will admit of bath-chairs ascending and descending. The passages and chamber floors are covered with kamptulicon, and beneath the carpets with which the rooms are also covered. The works have been executed under the direction of Messrs. Wilson & Wilcox, architects; by Messrs. Bladwell, mason; Rideout, carpenter; Llewellyn & James (of Bristol), plumbers; Packer, slater, plasterer, painter, glazier, and paperhanger; and Phillips & Wilcox, smiths, gasfitters, and bellhangers. The hotel has been erected at the cost of a company. The town council have had permission from the Treasury to borrow 10,000*l.* to build the baths.

SURVEYORS.

Cockermouth.—The authorities here have dismissed their surveyor, Mr. Middlemiss, because, as it seems, he had given in his resignation, which would have expired in a month, and because he did not continue to present himself before "the Board," but had employed a "foreman" out of his enormous salary of 80*l.* per annum (for "carrying out the whole of the sanitary improvements in Cockermouth"), to act for him while he was in London. This, and such as this, was treating the Board "with the greatest contempt," so that they voted his "dismissal" by a majority of six to five,—a donkey-thing, which pleases them, and can do no harm, we should think, to their late surveyor.

Penzance.—The borough surveyor, Mr. John Matthews, has resigned his office on account of ill health. The reading of his letter of resigna-

tion in the town council, was followed by a spontaneous, warm, and general testimony to the worth of their surveyor, to his indefatigable labours, his ability and tact, and his strict integrity. Nearly every member present joined in this testimony, and many expressed their deep regret that illness should threaten to sever a connexion of twenty-five years. Finally, it was left to the secretaries of the committees to consider what plan may be adopted to secure the advice of Mr. Matthews as a consulting engineer, to mark the council's sense of his invaluable services, and to appoint his successor.

St. Alban's.—The Local Highway Board have passed a resolution, increasing the salary of their surveyor, Mr. Wells, from 180*l.* to 225*l.* a year, and allowing him a gratuity of 20*l.* "for the efficiency of his past services."

COPYRIGHT OF ARCHITECTS' WORKS.

The President and Council of the Royal Institute of British Architects have addressed a petition to the Lords Spiritual and Temporal of the United Kingdom in Parliament assembled. It sheweth,—

"That architects are liable to considerable injury in the piracy of their designs and inventions, and that other parties can and do copy and appropriate to themselves such original ideas without any benefit or remuneration to the authors.

That it is therefore desirable to afford protection to architects for the copyright of their works by including works of architectural art under the definition of works of fine art in the Fine Arts Copyright Consolidation and Amendment Bill.

That such copyright should extend to their executed works or designs.

That the copyright of an architect in any work executed, or in a work proposed to be executed, should not pass to the employer, except under special agreement, but remain with the architect; and that the design in the drawings and specifications prepared for the purpose should still remain so far the property of the architect.

That copyright of architects' productions should extend to the same period as to authors of other works of fine art.

Your petitioners therefore most humbly pray your Lordships that, in the Bill introduced in your Lordships' House for consolidating and amending the law of copyright in works of fine art, provision to the above effect be made for the protection of architects in a manner similar to that for authors and inventors."

CLERKS OF WORKS.

Sir,—Your "Young Clerk of Works" in the *Builder* appears to think that he has some claim to be called a clerk of works through being what, according to his statement, I should call an apprentice to a clerk of works, which puts me in mind of the Irishman asking a learned judge to take his boy as an apprentice, and make him a judge "like your Honour's own self." And with your permission I will try to explain to him why I consider a man from the ranks ought to make the best clerk of works. I learned my trade with my father's men in the country, and having a desire to learn something more, I came to London and obtained employment with one of the best firms, where, after working for two years upon one job, I was sent out in charge of a small job as the working foreman, and at that time we used to work until we had satisfied ourselves that we had done a fair day's work. And here I would remind our young friend that until a man has worked himself, he has no right to be placed over others, as he cannot know when a man has done his duty at the various jobs to which he may be put. From this job I was sent to others, until I was placed upon the list as a recognised foreman. Now, with a good recommendation, I obtained an appointment as a walking foreman. This made me acquainted with the various merchants in the trade, and their prices, with an insight into the docks, and with the opportunity of knowing and inspecting the various descriptions of timber, which, though not being known by architects, had never been mentioned in a specification. Our works being extensive, and being carried out under five different architects; at one time I had the benefit of their experience through being in almost constant contact with them. At that time our works extended to a circle of about 12 miles round London, so that I had the chance of seeing how to manage the soapy sliding clay of

Norwood, and the solid bottom at Kensington. Since that I have carried out works in the Fens of Lincolnshire, also upon the Romney Marshes, and at many other places; and if our young friend had been with me through all this, he would have found out that there was something more than being able to make a working drawing required to make a clerk of works. I have picked up many of my workings from the sand in the road, sketched with an umbrella by more than one architect under whom I have served.

I will just hint to our young friend that he never can become a clerk of works at one place, but must travel a little.

AN OLD CLERK OF WORKS.

ALMSHOUSES AT SALISBURY COMPETITION.

Sir,—Last week a notice of a competition for some almshouses at Salisbury appeared in your paper, with a premium of 10*l.* offered for the best design. I have no doubt that many young architects eagerly embraced an opportunity of earning for themselves a small work like this. On inquiry, however, I found out that it is not intended that the successful competitor shall carry out the work, for the successful drawings are to be handed over to the surveyor.

This is at best a gross insult to the profession, and a systematic piece of jollification which it is the duty of architects to set themselves against. But, sir, the intentions of the committee were not made public till the following week; this has, of course, caused a great deal of valuable time and money to be wasted by men who can little spare either, and many who would never, simply on the chance of winning a paltry 10*l.*, have begun to prepare a set of drawings to supply the incompetency of a local surveyor. I trust you will give publicity to this in your valuable paper.

H. S.

DRAINAGE AND IRRIGATION: BROMLEY.

ON the 17th inst., a deputation from the Local Board of Bromley, in Kent, had an interview with the Secretary of State for the Home Department, with reference to the drainage and sewerage works in contemplation at that place.

The immediate object of the deputation was to obtain a further inquiry into the merits of the scheme proposed by the Board, under the advice of Mr. Arthur Jacob, C.E., who prepared the necessary plans and estimates. The inquiry was requested with a view of obtaining the sanction of a loan of 54,000*l.*, to assist in purchasing the land required for the purpose of irrigation and carrying out the necessary works.

The deputation comprised Mr. W. D. Starling, Dr. Farr, Mr. Holt, Mr. Hughes, Mr. West, Mr. Muddif, Mr. Chambers, Mr. Ryle (of Parliament-street), Mr. Latier, clerk to the Board, and Mr. Jacob, engineer for the proposed works.

The Right Honourable gentleman, in his reply, alluded to the fact that the proposed project had been most favourably reported upon by Mr. Morgan, Government inspector, who conducted a former inquiry on the subject. While admitting the soundness, validity, and engineering merits of the project, Mr. Bruce regretted that at present he was unable to give a decisive answer to the request of the deputation. He would, however, take it into consideration, and afterwards a further investigation of the whole question, with special reference to allegations put forward by the adjoining landowners in the matter of residential damage.

MASONS' MARKS FROM INDIA.

I HAVE read with great interest the extremely interesting lecture of Mr. G. Godwin, published in your No. 1,364,* on Masons' Marks in Various Countries, and as I have collected those of the North-West Provinces of India for some seven or eight years, and as these are not touched upon in the article in question, I think some illustrations of them might interest your readers.

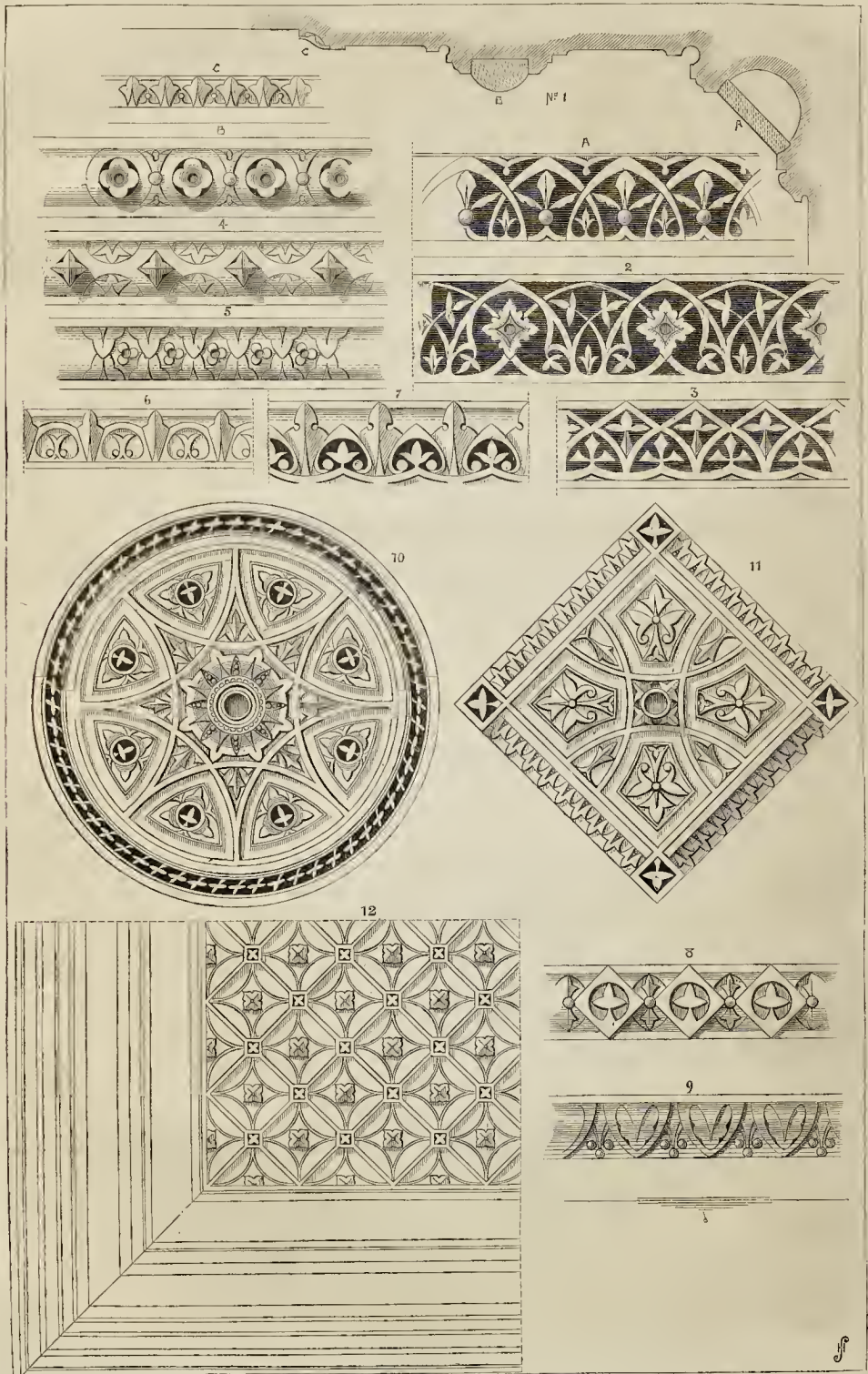
From their nature I am of opinion, with Mr. Godwin, that many of them are ancestral. Some are undoubtedly the arbitrary signa adopted by a craftsman to mark his work, e.g., a hatchet or nail.

In parts of large and ancient buildings I have often found as many as perhaps forty or fifty stones near to one another, marked in a similar manner. The same man probably dressed all these stones on five sides, leaving the rough side innermost, on which he set his mark.

This mark would then be useful in computing the amount of work performed, which was often paid for by contract; and this is indeed the practice at the present day at the quarries near Allahabad, where the stone was obtained to build the abutments of the great Jam na railway-bridge.

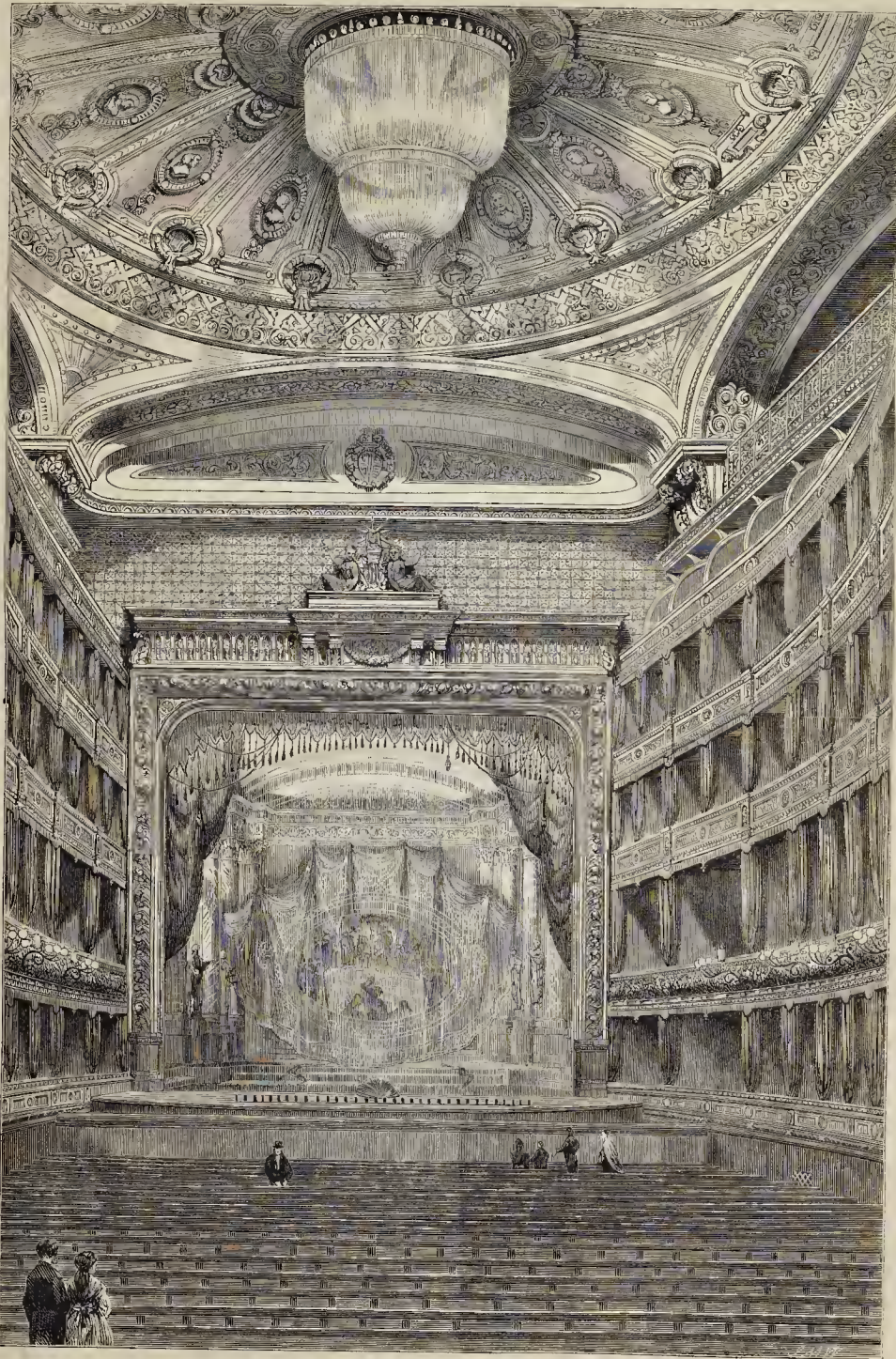
Some men, it will be seen, used mere fanciful devices, as a bird, a scorpion, or a bow-and-arrow. Others, again, employed a letter, perhaps the first of their name.

* See pp. 237, 245, ante.



SUGGESTIONS FOR THE USE OF PLASTER IN DECORATION.

[See ante.



HER MAJESTY'S THEATRE, HAYMARKET.—MESSRS. C. LEE, SONS, & PAIN, ARCHITECTS.

HER MAJESTY'S THEATRE, HAYMARKET.

We have on several occasions referred to the rebuilding of the burnt-down Opera-house, in the Haymarket, and in our last volume gave comparative plans of the old and the new house.* We now add a view of the Interior looking towards the stage, and will give a section in an early issue. From the illustrations, and our previous notices, all the dimensions are obtainable. It will be seen that there are now four tiers of boxes in front of the stage, and four tiers and an additional half-tier at either side. The space between the upper half-rows of boxes is thus gained for amphitheatre stalls, and a wide lofty amphitheatre behind them. Above these, again, is a back gallery, with the usual narrow side gallery running above the boxes. The boxes are larger than of old. They have about 6 ft. frontage, with heights according to the line of 7 ft. and 9 ft., with depths varying from 7 ft. to 12 ft. The Queen's box, seen in the view, has a private entrance and a public State entrance, both of stone stairs between walls. Behind the royal box are waiting-rooms. All the tiers of boxes are so built that there is no need of columns for the support of any part, and the partitions between them are so arranged that during the winter season they can be removed in the course of a day or so, and almost the whole of the curve formed into the unbroken balcony of a dress-cirque. Thus it will be seen, like Covent Garden, for winter performances. From the outer walls a series of wrought-iron brackets have been built out, radiating towards the centre. These midway from the wall are supported by a series of cast-iron columns, which extend from the basement to the roof. The broad passages between these iron columns and the walls are filled up on the inner theatre side with walls, and arched roofs overhead. Then there is a distinct fireproof passage round every tier of boxes from top to bottom. The weight of the boxes themselves is carried on that part of the cantilevers which projects beyond the columns.

A triumphed achievement in gilt carving, representing Apollo supported by Tragedy and Comedy, the work of M. Prolat, occupies the centre at the top of the proscenium. The ceiling, which is circular, is tinted in blue and gilt, and in each of its radial compartments is an oval panel, painted in imitation of a cameo, and containing the portrait of some famous composer. The names are,—Beethoven, Handel, Mozart, Rossini, Meyerbeer, Verdi, Bellini, Donizetti, Weber, Anber, and Cherubini. The prevailing line of the decoration is a pale salmon, picked out in cornices and panels with a variety of tints, and with enrichments of gold. The panels on the grand tier are divided by modelled trophies representing musical instruments, and other symbols have been executed in relief on the various tiers. The chandelier is 12 ft. in diameter and 18 ft. high.

Twelve feet below the stage is a mezzanine floor, and the total depth below the stage extends to nearly 30 ft., where the drums are placed for hoisting the scenery. It is not intended to have the usual sliding scenes on the stage. They are nearly all, if not entirely, to be what are technically called "cloths"—that is, scenes not painted on framework, but on loose canvas, with heavy rollers at the ends to keep them firm and stiff in their places when lowered. The advantage of this plan is, that it avoids the noise, and bustle, and labour of scene-shifting, the scene being merely raised up or lowered beneath the stage like an ordinary curtain. The side scenes, too, are not intended to be run in the ordinary wooden grooves, which constantly occasion embarrassment and delay. These scenes will simply be taken down 12 ft. below the stage into the mezzanine floor, and then run in grooves without requiring support from above. The house is built in a horse-shoe curve, 70 ft. deep from the curtain, by 56 ft. wide in the middle.

Mr. Drummond had charge of the stage arrangements. One of the principal improvements claimed is the increased facility with which almost any extent of the stage floor can be let down or raised as occasion may require. A space of as much as 46 ft. by 19 ft. can thus be raised or let down at once to the height or depth of 8 ft. The painting-room and carpenter's shop have been removed from their former position above the auditorium to one side of the part behind the scenes—to a space formerly occupied by the old Bijon Theatre—where the scenes are no longer painted in a horizontal but in a perpendicular position.

The footlights, as in some other recent theatres, instead of burning up, burn down into iron lines, under an artificial pressure of air, which also does duty in carrying off the smoke.

On a level with the grand tier of boxes is a chief saloon, answering to the foyer in a foreign opera-house. The size of this is 58 ft. by 20 ft. Each tier of boxes, as well as the amphitheatre stalls, has a ladies' saloon.

Mr. William Telbin, sen., has painted a very beautiful act-drop—an architectural composition of columns and white satin drapery, in the centre of which is an adaptation of Raffaele's "Mount Parnassus," in the *Stanza* of the Vatican. The figures in this work have been painted by Mr. John Absolon, and the effect is very good. For the purpose of ventilation there are two of Gruney's stoves, an air-chamber of 25 ft. area, and an opening in the ceiling of 12 ft. diameter. The roof of the theatre over the auditorium is carried by four wrought-iron girders, 90 ft. in span; whilst the roof over the stage is supported by five wrought-iron girders, 56 ft. span. The number of persons Her Majesty's Theatre will accommodate is said to be about 1,800 for opera, and 2,500 for dramatic representations.

The architects are Messrs. Lee, Sons, & Pain. Messrs. Strode & Co. had charge of the gas-fittings. The whole of the work has been carried out under the superintendence of Messrs. Trollope, the contractors. The contract between the Messrs. Trollope and the Earl of Dudley was signed on the 28th of May, last year, and the house was completed in ten months, at a cost of about 50,000l.

How the theatre will be utilized remains to be seen. The lessee under the Crown, to whom the freehold belongs, is the Earl of Dudley, who has an unexpired term of, we believe, twenty-four years. Mr. Mapleson is the lessee in possession under the earl, with a very short term unexpired.

AIR-TIGHT COMPARTMENTS IN SHIPS.

As most first-class ships are already divided off into several compartments, each capable of being shut off water-tight from the rest of the vessel, there would not be any very great difficulty in rendering such compartments air-tight, by closing down the hatchways upon india-rubber padding, &c., which would ensure any part of the cargostored in such compartment from being destroyed by fire; and for two reasons:—

1st. If from any compartment in which goods were closely packed, a certain amount of air were extracted—say, reducing the atmospheric pressure some 2 lb.—without for a time (suppose a few minutes) letting in any more, a portion of heat and air would be withdrawn from the most internal part of any bale, and, in fact, from every nook or part of such compartment, no matter how closely packed. Then let in the fresh cool air, which would find its way thoroughly through the cargo. By from time to time continuing some such means, any amount of closely-packed goods could be ventilated, and hence kept cool and free from spontaneous combustion in either warehouses or holds of vessels.

2nd. If goods be on fire in a compartment capable of being made air-tight, air being extracted to the value of 2 lb. pressure from such compartment, and then only nitrogen or carbonic acid gas being let in to fill up the partial vacuum; continuing the operation, in a very short time a fire, which otherwise would be most unmanageable, would be readily influenced and extinguished by such atmosphere becoming entirely unfit for combustion.

Carbonic acid gas and nitrogen can be readily obtained anywhere by burning charcoal, or wood, &c., in any vessel or chamber, inverted, with its open or lower end immersed in water.

This operation has the advantage of not destroying property—at least, food and a few things excepted. Therefore, would it not be well for our assumed fire-proof warehouses and ships to be air-tight, or practically speaking so?

A SURVEYOR AND ENGINEER.

The Morley Water Works.—These works have been opened with some ceremonial. The fire apparatus was attached to the hydrants in various parts of the town, and the water was thrown over the buildings to the great delight of the inhabitants. In the evening Mr. Joseph Armitage Haigh, the chairman of the Local Board, was entertained to dinner at the Dartmouth's Arms.

THE WINDSOR ALBERT INSTITUTE.

Sir,—In your impression of the 5th inst. there appeared a letter signed "Bacon & Bell, Architects," which purports to be fair and legitimate comments on a letter of mine with respect to the proposed "Windsor Albert Institute." I have, hitherto, not had time to notice it; indeed, I hesitated whether I should do so at all, simply because there is not the slightest ground for the construction your correspondents have been pleased to put on the proposal made by me, and the motives which induced me to make it. As to the competition, which they seem anxious to remind your reader's took place three years ago, I think it would be as well, perhaps, if they were to let that little matter rest in peace. I have no desire to trouble you with a long letter in answer to their distorted statement, as the facts they have very ingeniously suppressed. Why did they not inform you that a public meeting had been held some time back of the members and those interested for the express purpose of considering the question of abandoning the scheme altogether, and after a warm discussion, the meeting was adjourned, and so stands until the early part of next month? Why did they not further state that it is pretty generally understood and believed by those who wish it well, that the said Institute will not come to anything under existing circumstances; and, moreover, that some of those who have given their subscriptions, talk of writing to have them returned, so that they may apply the money to some other charitable purpose?

Such are the facts, and it was under these circumstances I was induced to come forward and state what I was disposed to do, and that through the public press, so that it might stand clear of all parties, and not in the spirit or with the object which Messrs. Bacon & Bell invidiously impart to me. I simply wished, as the scheme was likely to fall through, to come to the rescue; but if it can be carried out, no one will be better pleased than myself. However, should the reverse be the case, perhaps those gentlemen will come forward and do what is proposed, and reap the benefits which they insinuate I wished to deprive them of; and of one thing they may rest assured, I shall not rush into print and impute to them other than the proper motives.

I may further be allowed, in conclusion, to say, that it would be rather an unreasonable thing to be expected of me to propose such aid to carry out the designs of more successful competitors.

W. SIB.
The unsuccessful Competitor referred to.

CHRIST CHURCH BELLS, OXFORD.

In my article on the Bells of Christ Church, &c. (vide *Builder*, 5th inst.), with a view mainly to explain certain allusions in Dean Aldrich's *Round*, I mentioned the different services held in the cathedral.

The information on this point was kindly supplied by a "well-known member of the cathedral establishment" in two letters dated respectively no longer ago than September 10th, and October 20th, 1868.

The same highly-esteemed clergyman has, however, just favoured me with two other letters, in which he says,— "With the exception of the words *in admo*, instead of *behind*, which was manifestly a slip of the pen, the account of our cathedral services which I sent you in 1868 was at that time correct, but certain changes have been gradually made since."

I therefore feel bound to state in the columns of the *Builder* that the following are the present arrangements:—

- Collegiate prayers at 8 a.m.
- Cathedral service at 10 a.m. and at 5 p.m.
- The cathedral clock is kept five minutes behind ordinary clocks.
- The evening collegiate service, which, in Dean Aldrich's day, and for many years after, took place at 9, and subsequently at 6-4, has been abolished.
- I give the name of the clergyman alluded to, but not for publication.

THOMAS WALSBY.

THE KIDDERMINSTER INFIRMARY COMPETITION.

In your issue of the 12th inst. Mr. Bland replies to my letter in your pages of the 22nd inst. and in that reply admits that upon two counts of the indictment he ought to have been out of court.

1st. He did not deliver his drawings in time.
2nd. He did largely exceed the stipulated outlay.
Upon a third count he also admits that which, in my opinion, professional etiquette ought to have condemned, viz., that he staked himself of his right as a subscriber to visit the room in which the designs were exhibited. I should have waited until the committee had decided the fate of the competition.

Upon the fourth count Mr. Bland may be correct. I am told that the designs of Mr. Bland and those of another competitor, having been selected by the committee, were submitted to a professional referee; the facts elicited by this correspondence should have formed part of his instructions, otherwise his adjudication must have been made in the absence of the most important evidence.

And, in conclusion, I leave it, sir, to you and your referee to judge whether the expressions used in my letter be applicable or not to the circumstances of the case,—whether, in short, they be such as a "man in his proper senses," to use Mr. Bland's phrase, would employ "upon such slender grounds." In my opinion, they are those which one "proper sense," that of honour and good faith, should justify.

•• The correspondences may end here.

REACTED.

DISINFECTANTS.

Sir,—In your impression for June 12 appears a letter signed "Sanitos" upon a question of disinfecting, and referring to a previous letter in a medical journal,—which letter I have not myself seen,—advocating the use of green copperas for the purposes of disinfection, particularly of drains, which are liable to contaminate domestic water supplies.

Proto-sulphate of iron possesses no advantage as a deodoriser—a disinfectant I do not take it to be. Its action for this purpose would be, in

presence of sewage, to combine with the hydro-sulphate of ammonia, and the sulphuric acid would combine with the ammonia or carbonate of ammonia, and thus non-volatile salts would be formed and the offensive odour cease.

The presence of iron in well-water would be objectionable for ordinary uses, and the only safe course to pursue, in the case of contamination by sewage, is to close the well and seek a purer source.

W. X.

CHURCH-BUILDING NEWS.

Newcastle-on-Tyne.—The foundation-stone of a new church at Eastington Lane, for the recently formed ecclesiastical district of Helton Lyons, has been laid. Mr. Swan, of Newcastle, is the architect, and the contractor is Mr. Harrison, of Houghton.

Brafield Combust (near Bury St. Edmunds).—The church here has been re-opened after restoration. The roof was taken off, and it was then found that the chancel wall was in so dilapidated a condition, and had been so badly repaired by some former churchwardens, that it would have to be almost entirely rebuilt. This has been done in tile and flint, in imitation of the old style, and a three-light window with tracered head has been inserted, which will be filled with stained glass in memory of Arthur Young, the agriculturist. Between the nave and chancel there was scarcely anything to indicate where the one concluded or the other began, but in the aisle was a raised step, which was evidently where, in olden time, the altar stood. This has been continued across the church, and indicates the division between the two. The north wall of the church has also been repaired, and supported by buttresses, and a new two-light window inserted, filled with stained glass. The west wall of the nave has also been repaired, and a three-light window put in, all the windows in the nave and chancel being new. One of the three bells has been recast, by Moore, of London, as it was cracked. On the north wall of the church three oil paintings were found, one representing the encounter of St. George and the Dragon, the second the legend of St. Christopher fording the stream, while the third is supposed to have been a representation of heaven. To the aisle but little has been done. The west wall has, however, been repaired, a new window filled with stained glass put in, and the other wall raised. In the south wall also are two stained glass windows. In the east wall of the aisle is a large three-light window. The architect was Mr. Penrose, of London, and the work has been carried out by Mr. Cadgo, of Hartest, builder. The cost will be about 800*l.* or 900*l.*

Bracebridge (Lincolnshire).—A new chapel at the Lincolnshire County Asylum has been opened. In consequence of additions to the asylum, the original chapel became too small, and the committee of visitors were accordingly authorised to erect a detached chapel, capable of accommodating a congregation of 450, and to convert the old building into a recreation-hall, the cost altogether not to exceed 2,000*l.* The new chapel is 70 ft. 9 in. by 45 ft. There are separate entrances for the sexes, through porches 7 ft. 6 in. by 7 ft., between which are two retiring-rooms for epileptics, 10 ft. by 7 ft. 4 in. The roof is high pitched, all the timbers being exposed to view, and plastered between the rafters. The windows are glazed with cathedral glass, in lead lights. The woodwork exposed to view is stained and varnished. The stone for the walls and for lime was obtained upon the estate. The west gable is surmounted by a small bellcote. The original chapel has been altered so as to fit it for a recreation-hall. It is 45 ft. by 37 ft., with a raised stage 14 ft. by 6 ft., and a gallery 36 ft. by 7 ft. Both the new chapel and the recreation-hall are warmed by Gurney's stoves. The plans were prepared by the surveyor to the visitors (Mr. Young), according to instructions from Dr. Palmer, and the total cost has not exceeded the means placed at the disposal of the committee. The contract has been carried out by Messrs. Otter & Binne, of Lincoln, under the superintendence of Mr. Wm. Young, as clerk of works.

Cambridge.—The foundation-stone of St. Barnabas' Church, Mill-road, has been laid. The master and fellows of Gonville and Caius College have given the site for the church, and nearly 1,000*l.* have been already promised. When completed the church will consist of a nave and two aisles, 80 ft. by 22 ft., and is computed to accommodate 600 persons. It will be erected in the Early Decorated style of archi-

ture of a simple character, with a bell turret at the north-west angle, and a porch on the side fronting the road. It is to be built of brick and Bath stone, with a slated roof. At present, however, it is proposed to build only the chancel end (40 ft. by 22 ft., inside measurement), to accommodate about 200 persons. The seats are to be entirely free. The architect is Mr. Talbot Bury, of London; and the builders are Messrs. Quinsee & Attack, of Cambridge.

Maldstone.—St. Philip's Church, which has recently undergone extensive alterations, has been reopened by the Archbishop of Canterbury. The alterations and additions were designed to accommodate 220 additional persons, but as the work proceeded it was found that the boarding of the roof of the existing building was fast decaying, and other structural dilapidations were discovered, which rendered the outlay larger than was at first contemplated. The work done includes the pulling down of the north wall of the nave, and the erection of a north aisle (52 ft. by 16 ft.) and arcade. The old chancel arch and eastern gable of the nave have been pulled down and a new chancel arch and gable built. The whole of the internal ceiling and fittings have been re-arranged. The organ has been removed from the west end of the nave to the east end of the north aisle, and seats for the choristers are arranged in close proximity. The roof of the nave has been strengthened with iron, and the tiling has been stripped off and the roof re-tiled. Externally, the details of the side and end windows are of a more elaborate character than those of the old building, with stone-coped buttresses, carved stone crosses on the gables, base courses, &c. But to complete the work it is necessary to build the tower and spire 120 ft. high, and the apsidal chancel 30 ft. long, which forms part of the original design. The building is heated inside with hot water. The alterations have been carried out from the designs of Mr. E. W. Stephens, architect, Maldstone. The general contract work was executed by Mr. Vaughan, builder; Mr. Hylec doing the plumber's and decorator's work. The carving was by Messrs. Farmer & Brindley, of London; the metal work by Messrs. Hart & Son, of London; and the heating apparatus was supplied by Messrs. Perkins & Co., of London. An illumination on the organ has been worked out by a student at the local school of art, Mr. Frederick Elphick. A new chancel, with organ chamber, is estimated to cost 600*l.*, a west window 120*l.*, and a tower and spire 1,000*l.* Towards the latter, Messrs. Randall & Co. have promised 100*l.* The outlay up to the present time has been about 2,000*l.*

Lutterworth.—The parish church, known as Wycliffe's Church, at Lutterworth, has been reopened for divine worship, after having been closed upwards of three years for restoration. A contract was entered into for the nave and chancel. On the wall over the chancel arch a painting was found. The subject of it is the Judgment Day. This painting must have been done previously to Wycliffe's time. Another painting was discovered on the wall over the north door. This consists of two male figures wearing crowns, with the figure of a female between them. The foundations throughout have been taken out, and concrete, with brick and cement, substituted. The roof of the nave has been restored, and also the roof of the north and south aisles. There has been a new chapel or chancel aisle added to the east of the north aisle, with an arcade next the chancel, and an arch adjoining the north aisle. There is also a new vestry leading from the new aisle at the east, with a door at the north side. The north wall of the north aisle was found considerably out of the perpendicular. This has been placed upright without taking it down. The chancel has been restored, with a new oak roof, carved. The whole of the roofs are covered with lead, and the stonework throughout, except the tower, has been restored, and the old walls repointed. The new work is built to correspond with the old. The north and south arcades were in a dangerous state, the foundations having given way, and the stone crushed in such a manner that it was determined to take them all out, put in new foundations, and rebuild the columns. The old galleries had been cut into them, and the cap bases, &c., mutilated, all of which have been rebuilt. The old windows have been retained wherever practicable, new ones being put into the south. While carrying on the work, an early lancet window was found on the south side of the chancel, which has been restored and glazed. The church has had a new parapet added, with coping. The church

has been recoted throughout with oak seats, carved and moulded. The east window of the south aisle is a memorial window to the late Mr. Thos. Evans, of Lutterworth, being of stained glass, and the subject the Good Samaritan. The lancet window before mentioned is also of coloured glass, and has been restored. The subject is St. John the Evangelist. Another stained glass window at the east side of the south aisle is given by the executor of the late Mr. Charles Watte, formerly of Lutterworth, subject, the Three Marys. Mr. G. G. Scott is the architect; and Mr. Morgan clerk of the works. The contractors for the whole are Messrs. Law & Son, of Lutterworth; and their foreman is Mr. James King. The plumbing and glazing were done by Mr. H. Bawwell; the pointing, &c., by Mr. Doe; the ironwork by Mr. Henly; the decorations to roof and nave, &c., by Mr. C. J. Lea, of Lutterworth; the gas-fittings by Mr. Skidmore, of Coventry; and the whole of the carving by Mr. Riddock, of London; the painting over the chancel arch, and the one over the north door, being restored by Messrs. Burdison & Grylls, of London, who also applied the stained glass windows. The estimated expense of the restoration was 7,700*l.* The tower and porch are not yet done, from want of funds.

Lincoln-cum-Colchester (near Ellesmere).—The foundation-stone of the memorial church of St. John the Evangelist has been laid here by Lady Marian Alfred. The church has been designed by Mr. Street, architect, and the plans are to be carried out by Messrs. Powell & Son, of Preece, the contractors. It will cost upwards of 2,000*l.*, and is the gift of Lady Marian Alfred, in memory of John late Earl Brownlow. It is to be built of Cefn freestone, in the Early Gothic style, and to seat 236 people. The walls are at present nearly 4 ft. high. Its form is to be a simple parallelogram, consisting of nave, chancel, and chancel aisle, with an open-timbered roof, and carved ribs. The bell-turret is to be between the nave and chancel, rising at the division in the roof between the chancel and nave, and it is to have two bells. In the body of the church there are to be five two-light windows, with tracered heads, and a three-light lancet-headed window comprised under one arch in the west gable. The chancel will terminate in a gable window of five lights, in tracery. The chancel-roof will be boarded internally, and divided into panels by moulds and ribs.

Melford.—The old church of Melford has been reopened with special services, after undergoing a restoration. The restorations include the removal of the old high pews, and replacing them with open benches in proper order and position, in oak; repairing, with Messrs. Minton & Co.'s red, black, and buff tiles, the tower, the chancel, and the passages in nave and aisles, those in the choir being laid with encaustic tiles; new tower arch and turret; restoration of arcades and clearatories on either side of nave and choir; restoring of oak tracery screen enclosing the choir and chancel, new seats in chancel aisle, and new moulded, tracery, and carved stalls in choir, all of oak; heating apparatus (warm air), by Porritt; lighting the church with gas. The present restoration is only a portion of the design prepared by the present architect, Mr. Henry Woodyer, of Grafham, near Guildford, which design contemplates the restoration of the east end, and consequent removal of the present carved and painted Grecian altar-piece, and the substitution of a Gothic retable, &c., and also the reformation of the tower, which was built in the commencement of the eighteenth century, the former one, with its spire, having been destroyed by lightning. The principal work was executed under the superintendence of the architect. The new benches are not his design, but are in a modified form a copy of those designed by Mr. Gilbert Scott for St. James' Church, Bury St. Edmunds. The stonework was executed by Messrs. Keogh, of Sudbury; half the benches by Mr. Fordham, of Melford, and the remainder by Mr. Leeks, of Melford, who undertook the carving, which was principally cut by Mr. Sprungin, Mr. Theobald, of Melford, did the bricklayers' work, &c. The total cost of the work, exclusive of the money spent on the chancel and private chapels, but including the organ (by Walker, which cost 500*l.*) amounts to 2,572*l.*

Gillingham.—The ancient church of Gillingham has been re-opened for divine service after the restoration which it has undergone, under

the direction of Mr. Arthur W. Blomfield, architect; the work having been executed by Mr. Alfred Stump, of Brompton. Without and within all is changed, except the greater part of the main fabric, which only required to be restored. The pews are gone. The seats are now all of the modern style, low and open. Part of the church has been rebuilt. The old architecture within and without has been so treated as to show to advantage. The church had been greatly maltreated in past ages. On the exterior all the repair and improvements originally recommended have now been included in the undertaking. Nearly the whole of the side walls of the chancel have been rebuilt; the roof is new, and at the east end there is a window displaying the old "Kentish oisping," one of the many contributions from Woodlands. Inside the church the columns and aisles are thrown up, and the roof seems raised to a greater height overhead. The arches and pillars had to be stripped of paint many coats thick. The nave roof was fortunately in the main in good condition, but required new raftering and ribs. The roofs of the chancel and both aisles are entirely new. A light gallery has been erected at the west end of the church for the organ and choir; this is the only gallery. The window above the reredos, the gift of Mr. John Lock, is large, carved, with Kentish oispe, and filled with stained glass. In the centre is the Saviour ascending. On the lower part are large figures of the four Evangelists. Above are kneeling angels with censers; and above these the symbols of the Evangelists; and the various openings are filled with illuminated glass. Besides this window, which was executed by Messrs. Heaton & Butler, there are three painted windows in Mr. Lock's chapel, and a memorial window to the Rev. Dr. Page, presented by Mrs. Page, executed by Messrs. Clayton & Bell; another to his first wife, Mary, presented by her daughters Mrs. Hay & Mrs. Jones, executed by Messrs. Heaton & Butler; a third to the memory of Mr. Stunt, presented by his sons, and the work of Mr. Hardman; and a fourth to the memory of the Marsh family, by Messrs. Lavers & Barrand. This window bears two fine figures—our Saviour with a lamb, and our Saviour knocking at the door.

DISSENTING CHURCH-BUILDING NEWS.

New Swindon.—For some time past the large building formerly known as the "Barracks," at New Swindon, has been undergoing a transformation into a chapel, to meet the requirements of the Wesleyan body. It is now completed, and opened. The building is of considerable extent, and besides the chapel proper, contains three class-rooms and two vestries. The school-rooms had long been felt a great desideratum. The builder's estimate was 2,363*l.*; and the site with building, 1,600*l.*

Thursall.—The new Wesleyan chapel at Alsager, erected from the plans of Mr. G. B. Ford, architect, Burslem, the foundation-stone of which was laid in June last year by Mr. A. Shaw, has now been opened. The building is in the Gothic style. Red pressed bricks, relieved by bands of black and white bricks, with stone dressings, have been used in the construction. There is a gallery over the entrance porch and vestibule. The orchestra, in which is placed a new organ, is at the back of the pulpit, underneath which is the minister's vestry, and at the rear a class-room. The roof of the chapel is celled half way up in a vaulted form, and is constructed with the view of preventing any reverberation of sound. The space between the ceiling and the roof will act as a ventilating chamber, into which the vitiated air will pass from the chapel by a simple mode of revolving shutters, and underneath these shutters are panels with ornamental wood. The internal woodwork is of red deal and pitch pine, stained and varnished. The windows are glazed with cathedral tinted glass, in leaded quarry lights, with a margin of coloured glass round each light. A warming apparatus has been fixed by Mr. William Boulton, of Burslem. The floor of the chapel is calculated to seat upwards of 400 persons. The total cost of the building, including the land and organ, is expected to be about 2,500*l.* The contract has been carried out by Mr. John Stringer, of Sandbach.

Bradford.—The chief stone of the works connected with the enlargement of Muff Field Wesleyan Reformers' Chapel in Old Bowling-lane, Bradford, has been laid. It is proposed to extend the present edifice on the southern side, making its dimensions 61 ft. by 39 ft.; it will

also be raised to a sufficient height to admit of the erection of galleries. The building stands on a site which inclines to the south, and two dwellings will be made on that side. The style of architecture approximates to the Corinthian. Mr. M. Brayshaw, of Bradford, is the architect, and the following are the contractors:—Mason, Mr. James Smith, Bradford; joiner, Mr. C. Wadsworth, Odsal; slater, Mr. James Smithies, Great Horton; plasterer, Mr. Jeremiah Bottomley, Bradford; plumber, Mr. John Radford, of the same place.

Nkley.—The new Congregational Church here has been opened for divine service. The buildings comprise a church, schools, and church-keeper's house, which are all designed in the Early Decorated style, and erected on a site, with frontages to Riddings-road and Green-lane, two of the principal new streets. The church is arranged with the gable in Riddings-road, looking towards the station, and has in the centre a doorway with recessed shafts, having moulded base and carved capitals, and surmounted by a crocketed gable. Over the doorway is a five-light window, with decorated tracery head, which rises into the gable, surmounted by a stone floriated cross. At the corner of the two roads stands a tower, which is to be surmounted by a spire, to finish 130 ft. from the ground. At the opposite corner to the tower is placed an octagonal turret, covered with a slated spire. The side of the church to Green-lane is designed in six bays, the first being occupied by the tower, the next four by windows containing tracery, and surmounted by gables which break the outline of the roof. Next the end of the nave comes the chancel of one bay, having an aisle containing the vestry and low clearstory pierced by trefoil windows. Beyond the chancel is the gable end of the school, which runs at right angles to the church. This gable has a wheel window above. Space is reserved for a minister's house near the church, and the whole site is to be surrounded by an open wrought iron railing on a low parapet wall. Internally the church is divided into nave and aisles approached by vestibules, and terminated by a moulded arch in the centre opening into the chancel or platform by an arcade, with the organ chamber on one side, and the doors into the vestries at the other side. The aisles are divided from the nave by light iron pillars, which are capitals decorated with foliage wrought in copper, and from these capitals spring moulded arches supporting the roof, which is wagon-headed in form. On corbels, half way up the pillars, rest narrow galleries, which run round three sides of the nave. All the seats in the church are open stalls. They are all made of grained pitch pine. The ceilings are coloured a sky-blue, powdered with white stars, and bordered round the timbers of the roof and ceilings with running ornaments in vermilion and blue. The walls are tinted stone-colour, with double lines indicating stonework, but conventionalised, and with a flower in the middle of each stone. Round all walls, urns, and cornices there is a running ornament in reddish-brown colour, and round the chancel arch is written in large ornamental letters this inspired admonition to all congregations,—“He that hath an ear to hear, let him hear what the Spirit saith unto the churches.” The pillars of the arcade are decorated with a diaper pattern, in chocolate and orange; the caps are picked out in green, blue, and crimson and gold, and the hauses are relieved in similar colours. Surrounding them the arches have ornaments running round the face and soffits, and the spandrels are decorated in a similar manner. All the windows are filled with painted glass, having coloured borders. On the floors of the vestibules and passages are laid mosaic tiles. The gas corones, brackets, balusters, and other metal-work, are all in keeping with the rest of the work. Accommodation is provided for about 650 adults in the church, and 200 scholars in the school. The whole of the works have been designed and superintended by Mr. J. P. Pritchett, of Darlington, architect, assisted by Mr. R. Law as clerk of the works, and the contracts have been executed by the following tradesmen:—Masons' work, Messrs. Y. & M. Freeman, Odsal; slating and plastering, Mr. John Tattersall, Bradford; joiners' work, Messrs. Ives & Son, Shipley; plumber's and glazier's work, Mr. L. Bannister, Leeds; painting and decoration, Mr. H. Mitchell, Huddersfield; constructive ironwork, Messrs. Walker & Son, Newcastle-on-Tyne; art metal work, Mr. Duvoy, Manchester; warming (which is achieved by means of heated air), Messrs. Haden & Son, Manchester.

Stockton-on-Tees.—A new Baptist chapel, situate in Wellington-street, top of St. John's-road, has been opened for divine worship. The plot of ground which the premises occupy measures 69 ft. by 68 ft. The structure is of Classical architecture, and built principally of brick, with stone facings. The chapel, in the interior, measures 60 ft. by 40 ft.; and the schoolroom, which is beneath the chapel, and approached from the back of the building, measures 40 ft. by 30 ft., and is 11½ ft. high. The pews are arranged with two aisles, with accommodation for 350 persons. There is no gallery at present, but the building is so constructed that one can be added. The church have decided to call the building the Long Memorial Chapel, in commemoration of the long services of their pastor. The architect was Mr. George Fletcher; and the contractor, Mr. John Craggs. The entire cost of the building will be about 1,650*l.*

SCHOOL-BUILDING NEWS.

Marlow.—New school-rooms have recently been completed and opened here. The new buildings, which have been erected at a cost of about 1,700*l.*, consist of a school-room, 50 ft. by 20 ft., and a class-room, providing accommodation for 120 infants, together with two residences for a master and two mistresses. The architect was Mr. L. Stride, of London.

Gloucester.—The foundation-stone of St. Luks's new National Schools has been laid. The new building will consist of three large rooms placed side by side. The rooms are divided into departments for boys, girls, and infants, with separate entrances, and there will be cloak rooms and lavatories. The master's house will adjoin the schools. A large playground will be formed in the rear of the schools for each class. The elevations are designed wholly in brick and stone; varieties of the latter will be used to vary the mass. The contract has been taken by Mr. Moreland, of this city, for 2,642*l.*, and it is expected that the works will be completed soon after Christmas. The architect is Mr. Maharity, of Gloucester and London, and the works will be erected under his supervision.

Sheffield.—The memorial stones of a Wesleyan Day and Sunday School have been laid at Sheffield Moor. A plan has been decided on which includes a ladies' room, to be erected on a line with the front elevation of the chapel; a chapel-keeper's house; a series of large school-rooms to accommodate 500 children, with lavatories and other conveniences; several class-rooms, and covered playgrounds; ministers' and stewards' vestries; and rooms with boilers and tea-making apparatus. The present rooms, when the new premises are completed, will be used as infant and ragged schools. The entire outlay is estimated at about 2,500*l.*, and 2,000*l.* have already been obtained. Mr. J. D. Webster is the architect. The mason work is being done by Mr. Thompson, the joinery by Mr. Robertson, the slating by Messrs. Harrison & Chadwick; the plastering by Mr. Taylor, and the plumbing and glazing by Mr. Columbine.

Wilmslow.—The new schools at Wilmslow have been opened. The design for these schools was passed by the committee of the Privy Council, and a grant was made by Government towards the building fund. The schools combine all that is needed for a national day-school, with facilities for parish or local meetings, lectures, &c. The boys' school-room is 42 ft. long by 20 ft. wide, and is separated from the girls' school-room, which is 34 ft. long by 20 ft. wide, by folding doors, thus making, when so required, one large "T"-shaped room, capable of holding 300 persons. Both of these rooms have class-rooms adjoining. The infant school is 35 ft. long by 30 ft. wide, and is entered by the same porch as the girls' school, on the north side of the building. The boys' porch is on the south side. At the east end of the building is the master's house. The schools are situated on a piece of glohe land, sloping towards the south, and near to the church. With this old Perpendicular building lately restored, the new schools have been designed to harmonise. They are built of grey brick, relieved by slight touches of red, in arches, bands, string-courses, &c. The framework of the windows is of stone; the roofs are of slate, in two colours, arranged in patterns. The tracery of the windows has ornamental glazing, which has been done by Messrs. Edmundson & Co. The gasfittings, put in by Messrs. Thomson & Co., of Birmingham, are simple in design, and consist of pendants and brackets. There is

accommodation, according to Government regulations, for 120 boys, 100 girls, and 130 infants—350 in all. The architects are Messrs. Medland & Henry Taylor, of Manchester.

Coddington.—A new school-room for this little parish is now completed, and opened. It is built close to the church on a site looking across Herefordshire to the Welsh hills. The building is of red sandstone, the same as the church, with Bath-stone facings. The school-room is 25 ft. 6 in. by 16 ft. There is a house attached. The site was given by Major Heywood, of Hops End. The contractors were the same as rebuilt the church three years ago,—Messrs. Collins & Cullis, of Tewkesbury. The contract was for 560*l.*, but the well, pump, fencing, books, and maps with which the school is well furnished, make the total cost come up to 600*l.*

FROM SCOTLAND.

Edinburgh.—The local Review says,—

"While city improvements are in progress in the heart of the Old Town, at a cost which dispropor­tionably increases the local taxation, private enterprise has projected an improvement which will make Castle-terrace one of the finest streets in the city. We do not now refer to the very handsome range of dwelling-house tenements Mr. Gowans has raised and is still raising at this part of the city, but to the equally novel and attractive feature he is about to make of the park opposite his new houses. The stone dyke by which it is enclosed is to be removed, and a trottoir formed, 30 ft. wide, in the centre of which there will be a row of trees, hedges and elms alternately. The park itself will be surrounded with an ornamental iron railing, will be planted at intervals with shrubs, and laid out in walks. There will be an entrance to the garden opposite Cambridge-street, and another opposite the parallel new street further east called Cornwall-street. These walks will converge at a point on the lower part of the garden, where it is proposed to construct a light iron bridge connecting with West Princes-street-gardens, forming a more direct and pleasant route for the Princes-street people who have to pass in the Morningside direction."

Speaking of the houses on Castle-terrace from Mr. Gowans's designs, the same writer says,—

"Whether or not his theory is accepted of the application of geometric proportion to architectural design, the result is that we have a specimen of street architecture most harmonious in its composition and details, as well as striking from its novelty." There are sanitary improvements in the construction of these houses, he remarks, which might be introduced with advantage into the new houses which are rising on all sides of the city at present. The common stairs leading to the flats are exceptionally well lighted. At the end of the lobby in each flat there is a window which, besides serving the subsidiary purpose of providing a borrowed light for the part of a house which is often the gloomiest, opens into a wide ventilating-shaft, running up to the roof. The water-pipes, both those in connexion with the water company's main and those carrying soiled water to the sewers, are kept just within the back wall of the building, to prevent injury or accident from frost or other causes. To prevent contamination of the water in the cistern, the overflow-pipe communicates—not with the water-closet pipe, but with the bath. Pipes and shafts are also provided by which the foul air from the soil-pipes and sewers escapes on the top of the roof, instead of finding its way into the dwelling-houses.

FROM AUSTRALIA.

Adelaide (South Australia).—The chief stone of the Prince Alfred Sailors' Home has been laid by the Prince himself, on his second visit to Australia. The site has a frontage to St. Vincent-street of 150 ft., and a depth of 240 ft. It is near the Port Adelaide Railway Terminus, and is valued at about 600*l.* The subscriptions have reached a sum of 2,285*l.* Mr. R. G. Thomas, the Colonial Government architect, obtained permission of the Government to prepare plans for the proposed Home, which he has done, and his design has been approved by the committee. The plans include a large basement, which is not to be finished at present. On the ground floor there is an entrance-hall from St. Vincent-street, and a sailors' waiting-room leading to a shipping-office on one side, and an office belonging to the establishment on the other. There are also, for the use of the sailors, a large kitchen and scullery, a dining-room 40 ft. by 20 ft., a smoking-room 20 ft. by 20 ft., a library and reading-room 20 ft. by 20 ft., bath-rooms, a large verandah with balcony above, which will command a view of the shipping and the port. The upper floor accommodation is laid out almost entirely as dormitories for the sailors. There are forty

cabins and small bedrooms, and also lavatories and bath-rooms. There are also apartments on this floor for the manager. The upper floor will not be fitted up at present, and all the internal arrangements will be plain. The frontage to St. Vincent-street will be 100 ft., and the building will be arranged in three stories, besides the basement. The ground story will be 13 ft. high, and the other stories 10 ft. each, the total height of the building being 50 ft. The Home will be constructed of Dry Creek stone, with brick and freestone dressings. The design is plain Gothic in style. The total cost of the building will be about 8,000*l.*, but it is only proposed to build a part of it at present. Total accommodation will be afforded when the building is completed for 100 seamen.

Ballarat.—The peal of eight bells to commemorate the visit of the Duke of Edinburgh to Ballarat are in the key of E flat, the tenor weighing 23 cwt. The bells have just been cast by Messrs. Mears & Stainbank, of Whitechapel, agreeably with an order received from the "Alfred Memorial Bells Fund Committee," to be placed in the new tower at Ballarat, "to perpetuate the joy of its inhabitants at the failure of the murderers attempt on the life of H.R.H. the Duke of Edinburgh while on his memorable visit to these shores." Mr. Walsley sends us the inscription on the tenor bell, which is as follows:—

"IN MEMORIAM DEI OPTIMI MAXIMI GLORIAM.
QUI PRINCIPUM HONORABILISSIMUM ALFREDUM
KINGSBURGAE DUCEM
REGINAE ROSAE VICTORIAE FILIUM
SCIAM MANU GRAVITER VULNERATUM
EX MORTE TRIPUIT
CIVES BALLARATENSES
GRATISSIME TANTAM REM MEMORIA PROSECUTI
HAS CAMPANAS FUNDI JUSSERUNT.
ANNO SALUTIS ROSAE
MDCCLXXIII."

Most of the principal inhabitants of Ballarat have subscribed to the fund for defraying the expense.

Books Received.

A Dictionary, Practical, Theoretical, and Historical, of Commerce and Commercial Navigation. By the late J. R. McCulloch. With a biographical notice. New edition by HUGH G. REID. Longmans. 1869.

As every one knows, there is no work of this kind equal to McCulloch's standard Cyclopaedia of commercial lore. Mr. Reid was McCulloch's secretary from 1843 onwards, and eventually became his son-in-law. He has revised and corrected the whole work, and in doing so he has made use of materials which Mr. McCulloch, before he died, in 1864, had accumulated for a new edition. Mr. Reid has brought the work generally up to a recent date, as every such work requires; and has added new entries which the progress of science and commerce necessitated, such as on petroleum, acids and alkalis, telegraphs, transit, passports, &c. Nevertheless, the work was originally so based on great principles, that any necessity of completely remodelling it can scarcely arise. Much of the very small type has disappeared, although the book is still comprised within one pair of boards, the goodly bulk, however, extending to nearly 1,600 pages. The matter is now printed in double columns for facility of reference. On the whole, therefore, the Dictionary is edited in a very competent and efficient manner; and it only requires the insertion of separate and special articles on the commerce of our own chief towns,—not even London, Liverpool, or Glasgow, having any separate notice, although every great foreign port and city has,—in order to render it in all respects complete. No doubt it may be objected by the editor that the commerce of all our chief ports and cities is dealt with throughout the whole work, and that to have special articles on London, Liverpool, &c., would necessitate a repetition of all the information already embodied in the Dictionary; but surely a great work on the commerce of the world, such as this is, cannot be regarded as being complete, so long as it contains no separate articles on the commerce of the chief commercial centres of the greatest commercial country in the world. In whatever way it may be done, therefore, it is to be hoped that in the next edition this defect will be in some way remedied.

The present edition contains a biographical notice of McCulloch by the present editor, but no portrait, which is also to be regretted, especially as there are both portraits and busts of

him from which a good likeness might have been engraved. From the biographical sketch it appears that John Ramsay McCulloch was born in Whitburn, Wigtonshire, in Scotland, in 1789, and that he was, therefore, 76 years of age when he died in 1864, and was interred in Brompton Cemetery. His father was a small landed proprietor in the stewartry of Kirkcubright. McCulloch was bred as a lawyer, his education having chiefly been carried out at Edinburgh; but he disliked the law, and soon left it. He became a contributor to such periodicals as the *Edinburgh Review*, and was at one time editor of the *Scotsman* newspaper. Though a great politician and writer on political economy, he early devoted himself to the subject for which he afterwards became so celebrated. After spending nearly twenty years in collecting materials, he produced the first of the many editions of the "Commercial Dictionary," in 1832. The work has been republished in America, translated into several languages, and is referred to for the adjustment of mercantile disputes in all quarters of the globe. Since its first publication it has greatly increased in bulk, and is, in truth, a gigantic work; for if printed like ordinary books, it would make at least thirty volumes octavo. The author was naturally proud of its popularity and reputation; and an anecdote was told lately, at a public meeting, by a friend of his, Lord Neaves, a Scotch judge, which is worth repeating. His Lordship said, speaking of Mr. McCulloch, "He asked me once, 'Do you ever quote my "Commercial Dictionary"?' in court?" I said, with some emphasis, "Never; we never quote it, and we never mention it." Sometimes, I said, 'a set of papers come upon us at night upon a mercantile question that we know nothing about, and we go up to our shelves and take down the "Commercial Dictionary," and find all we want there, and next morning we come out, to the astonishment of our clients, with better information upon the subject than they have themselves; but we never mention McCulloch's "Dictionary." And that pleased the old man, who had been rather chilled by my first observation, better than it was easily possible to please him."

In 1838 Mr. McCulloch was appointed, by Lord Melbourne, to the Comptrollership of the Stationery Office, a situation which he held till his death. In 1846 Sir Robert Peel testified his respect for Mr. McCulloch's services in preparing the way for those memorable commercial reforms which signalled his administration by conferring on him a well-merited pension of 200*l.* a year.

VARIORUM.

"Annual Report of the Committee of the Manchester and Salford Sanitary Association. Poulson, Printers, Manchester." This committee, in presenting the report, state their regret that the health of Manchester and Salford has been very unsatisfactory during the year 1868. They are of opinion that the great mortality of the city and borough is caused by the bad state of ash-pits and sewers, by the very faulty construction and arrangement of the houses of the working classes, by the dirty and intemperate habits of too many of the people, and in part by the want of accommodation for infectious diseases. The sanitary lectures delivered under the auspices of the Association continue to attract large and attentive audiences, it being not at all uncommon for working-men to travel three or four miles to hear them. The subjects treated of in these lectures and the names of the gentlemen who delivered them are appended to the report. They treat, of course, of sanitary subjects, such as the disposal of refuse, water-closets, death-rate, &c. The income of the Association for the year is 2,111 12s. 2d., being less by 25*l.* 2s. 8d. than that for 1867. During 1868 the expenditure has again exceeded the income. The Association, say the committee, cannot continue its operations without a considerable increase in the annual subscriptions.—"Report on the Sanitary Condition of the Parish of St. George, Hanover-square. By C. J. B. Aldis, M.D., Medical Officer of Health." One of the chief features of this report relates to the Workshop Regulation Act. Dr. Aldis received fifty-eight complaints during the last year as to establishments in St. George's parish. These complaints were, as might be expected, mostly anonymous, but nearly all were true. In one case he says:—

"I found at a house in Lupus-street, six young women sitting in a scullery in the basement, where the chimney looked so much that a fire could not be lighted in it, and the room being dark, they always worked by light. It contained a sink having a trap unsealed by water, with a water-closet adjoining. The cubic capacity insufficient for six persons, but nine usually worked there, rendering the room almost unbearable. On remonstrating with the proprietor, he acceded to my request, that he should provide a cheerful room upstairs, and lessen the hours of work. He provided the room; but as continued to employ the young women beyond the legal hours,—on one occasion, before the Alhambra hall, until 30 at night, and on another after 4 p.m. on Saturdays,—was compelled to take proceedings.

Steps already taken have greatly diminished the excessive hours of work in the parish for the present, and the reporter remarks that, no doubt, a result will conduce to the health and social welfare of the milliners. With regard to the moral aspect of the question, several of the employers have said that he will "drive the young women into Regent-street." On further inquiry, however, it did not appear that more than two or three employers paid any attention to the moral improvement of the girls; but probably they referred to the diminution of wages consequent on the shortening of day's work. In reference to the subject of the destruction of houses and erection of model dwellings, the reporter says:—

"In consequence of the destruction of King-street, 15 miles, Princes-row West,—a wretched locality—and of Queen-street, and of Ebury-street, about 127 miles, comprising 508 persons, have been displaced, the site immediately behind 'The Compasses' public house at the top of Ebury-street, will be partly occupied by five blocks of improved dwellings. The plan provides for ten good shops, and 120 first and second-class distinct premises for mechanics and others. The building has been delayed by some formal proceedings necessary for opening up an old street and forming a new one 40 ft. wide and 100 ft. deep.

New model dwellings are erected in Grosvenor-mews, Bond-street, and will shortly be completed. They are planned to contain 10 single-room and 10 double-room flats."

Report upon the Sewerage Works of some Towns in England. By R. R. Rowe, C.E., late Town Surveyor of Cambridge. Webb, Printer, Cambridge. This report was an extra-official one, presented to the Cambridge Improvement Commissioners. It treats briefly of what has been done, in regard to sewerage, at Stroud, Cheltenham, Weston-super-Mare, Leamington, Warwick, Banbury, Norwich, Bury, Bedford, and Croxford. The result is favourable to the utilization of sewage by irrigation, and against attempts otherwise to deodorise sewage. The reporter recommends the formation of a sewage farm at Cambridge, as suggested by Mr. Bazalgette.

Report of the Nottingham Highway Committee to the Town Council. Dnnn, Printer, Nottingham. It appears from this report that the average annual expenditure on public works at Nottingham has of late years been £7,291; but this average has been exceeded during the past year. The sewerage works have been more than usually extensive; 2 miles 432 yards having been executed during the year. The works referred to in the report have been carried out under the direction of Mr. M. O. Tabor, C.E.—"The Spiral Pump applied as a Force Pump, Suction Pump, and Mercury Pump. By Wilfrid Airy, J.E.S., London; Willis, Sotheman, & Co., Charing-cross." For bringing forward the subject of a machine so antiquated as the spiral pump (or Archimedes' screw), the apology of the author is that in England, at least, the machine has never had a practical trial, and that when tried on the Continent it has always given satisfaction. The author treats of the theory of the machine, and gives formulae for calculation, &c.

Miscellaneous.

Public Audit.—A letter to the president of the Board of Trade, by Mr. E. E. Scott, public accountant, urges the necessity of appointing, by the Board of Trade, a body of certified and sworn auditors, from amongst whom every company should be bound by Act of Parliament to select an auditor, only removable upon petition and complaint to the Board of Trade. Auditors would thus be independent of directors on the one hand, and not likely, on the other, voluntarily to expose the affairs of the companies, though familiar with their working, and a safeguard and watchman for the general interest of the shareholders.

The Architectural Museum.—The evening of Wednesday, July 21, has been fixed for the opening of the new museum by a gathering of subscribers and friends.

Value of Building Ground in Carlisle.—A number of lots of building ground in Aglionby, Brunswick, Alfred, and other streets in Carlisle, the property of the corporation, were recently offered for sale, in the Town-hall, by auction. A number of fields on the Longtown-road, consisting of 12½ acres, and known as the Kingmoor Estate, were also announced to be sold at a minimum price of 950l., but at the conclusion of the sale of building-ground the auctioneer declared the sale to be postponed. There was a fair attendance of bidders. Sites in Cavendish-place and Alfred-street, lowest upset price 8s. per square yard; in North and South Portland-square, 10s. 6d. to 12s.; Brunswick-street and Aglionby-street, 7s.; Aglionby-street and Brunswick-street (corner lot), 5s. There was also offered some building-ground bounded by James-street, Rome-street, St. Stephen-street, and Lamplugh-street, called Mill-field, the minimum price of which was 5s. The bidding was very slow, and the only lots sold were the following:—Two sites in Portland-square to Mr. Jas. Graham, builder, at 10s. 6d. per square yard; a site in Aglionby-street South to Mr. Johnston, plasterer, at 7s. per square yard; seven sites in Mill-field to Mr. Metoife, builder, at 5s. per square yard.

Value of House Property in Sheffield.—An arbitration arising out of the requirements of the Corporation for the making of the new thoroughfare from the Haymarket into Norfolk-street is in progress. The claimant is a pawnbroker in Market-street, whose freehold house and shop, situated at the corner of Market-street and Baker's-hill, have to be removed, in order to make way for the intended improvements. The quantity of land proposed to be taken was 9½ square yards. A claim was made of 2,500l. for the building, and 5,000l. as compensation for loss and damage, besides payments of all costs. The claim had since been reduced to about 5,300l. There were two arbitrators—Mr. E. C. Cowley, Manchester, for the Corporation, and Mr. Thomas Haynes, surveyor, London, for the claimant; but at the outset it was agreed that the amount in dispute should be decided by Mr. George Pownall, of London, who had been appointed umpire. The claimant, it was shown, had hired a pawnbroker on the premises for twenty-three years. The value of the freehold was put at 50l. a year, with a twenty years' purchase, making a total of 1,600l. On behalf of the Corporation Mr. Holmes, the borough surveyor, put the rental of the house at 60l. a year, as it was in bad repair. Mr. T. J. Flockton, architect and surveyor, also considered 60l. a year would be a fair rent for it, taking it at twenty years' purchase. Mr. H. Jones, surveyor, London, also gave evidence; and Mr. Pownall said he would take time to consider his award.

Proposal for a Free Library for Derby. At a meeting of the committee of the Town and County Library and Museum, amongst other resolutions was passed the following:—"That a sub-committee be and is hereby appointed to confer with the committee of the Mechanics' Institution as to the amalgamation of this institution with the Mechanics' Institution, for the purpose of establishing the whole into a free library and museum, or otherwise." The Town and County Library and Museum has a library of from 9,000 to 10,000 volumes, many of them of value as books of reference. They have also a museum. The Mechanics' Institution has a library of about 6,000 to 7,000 volumes. They have also property in paintings, scientific apparatus, &c. They have also freehold property adapted for an extensive museum and library in the centre of the town. The lecture-hall of the Mechanics' Institution would be appropriated to the museum. The committee of the Mechanics' Institution has resolved that the suggestions be received and considered.

Sawbridge-worth.—Hyde Hall, a fine mansion, situated at Sawbridge-worth, Herts, has lately undergone renovation at the expense of its present occupant, Mr. H. L. Bischoffshelm, the hanker. Mr. A. Verlat, of Brussels, is the artist who was selected for the wall painting. The hall-room, with its monumental mantel-piece (of Brussels manufacture), and its lofty dome, has been painted *en grisaille*; and Mr. Vanden Bosch, Mr. Verlat's assistant, has ornamented the walls of the billiard-room with bunches of grapes and birds.

Carlisle.—It is proposed to erect a large public hall in this city. A committee has been appointed to arrange as to the project.

New Corporate Buildings for Birmingham.—A report of the Estate and Buildings Committee of the town-council on this subject was read at a recent meeting of the council. The committee gave extracts from the report and schedules of Mr. Waterhouse, to show the accommodation set out by him which would exist in the proposed buildings. 1st. The Corporate Buildings, comprising rooms and offices for the mayor and other officers of the corporation. 2nd. Assize Courts; one for the transaction of criminal business, with rooms and offices for the judges, the jury, witnesses, &c.; and another for the hearing of civil cases, with rooms for the judges, barristers, &c. 3rd. Judges' lodgings, containing all the necessary rooms and offices required for the judges' accommodation. "The cost of these erections, as nearly as can be estimated, would be, in Mr. Waterhouse's opinion, as follows, viz.—Corporate buildings, 37,000l.; Assize Courts, 76,000l.; Judges' Lodgings, 12,500l.; total, 125,500l. This expenditure would allow of the buildings being faced with stone, and erected in the most substantial and handsome manner. Built, however, in a more economical manner, at some sacrifice of appearance, both externally and internally, the cost need not, in his opinion, exceed the following; viz.—Corporate buildings, 31,000l.; Assize Courts, 63,000l.; Judges' lodgings, 10,500l.; total, 104,500l." The report having been received, the committee were authorised to advertise for plans for the new corporate buildings, and submit the same to the council for approval.

Monumental.—A public meeting has been held in the theatre of the Royal Institution for the purpose of considering the propriety of raising a public memorial of the late Professor Faraday. The Prince of Wales occupied the chair, and was supported by the president, members of the council, and fellows of the different learned and scientific societies, and deputations were also present from France, Italy, and Holland. It was resolved, "That it is desirable to raise a memorial to the late Professor Faraday," and that a public subscription be opened for the purpose. The proceedings concluded with a vote of thanks to his Royal Highness.—It is proposed to erect a tablet to the memory of the author of the "Christian Year" in the "Poet's Corner" of Westminster Abbey. The tablet has been designed by Mr. G. G. Scott, R.A., and will include a medallion likeness of Keble, to be executed by Mr. Woolner, sculptor.

St. Nicholas's Steeple, Newcastle-upon-Tyne.—Mr. George Robert Stephenson has written a letter to the Committee of Management of the St. Nicholas's Steeple Fund, in which he says:—"Although the firm I represent subscribed liberally towards the repairs in progress, and also paid the voluntary rate, I am willing, on my own account, and independently of my firm, to offer 500l. if any five gentlemen will come forward and guarantee 500l. each to carry out and complete the works required."

- Society of Arts' Prizes.—The Council Prize (for Female Candidates)—The Council Prize (for Female Candidates) of ten guineas has been adjudged to Elizabeth Backhouse, aged 21, of the Birkbeck Literary and Scientific Institution (no occupation stated), who has obtained the following first-class certificates:—
- 1868. English History—First-class Certificate, with Second Prize, and the Prize for Female Candidates.
 - " Geography—First-class Certificate, with the Prize for Female Candidates.
 - 1869. Domestic Economy—First-class Certificate, with the Prize for Female Candidates.
 - " English Literature—First-class Certificate.

A Building for the Indian Museum.—We understand that plans are being prepared for a building worthy to contain the collection of articles at present in the India Office, illustrative of the products, manufactures, and arts of India. It will stand on the vacant spot of ground south of the present India Office.

"Crews Hall."—We have to add to our notice of the restoration of this building, that Mr. John Leslie is the Clerk of Works. Mr. Leslie filled the same post at the building of Halifax town-hall.

Sheffield Architectural and Archaeological Society.—The third excursion of the members of this society for the present season took place on Wednesday last week. The places visited were Oughtibridge, Moor Hall, Broomhead Hall (where the excursionists were entertained by Mr. J. W. R. Wilson), Yewden Valley, Bradfield, &c.

Westminster Boulevard.—This scheme may now be said to have been launched before the public. The promoter, Mr. F. Lewis Margarin, adopted the successful expedient of issuing invitations to some 200 gentlemen interested in the undertaking to be present at the London Tavern, and hear the deeds read in public, and witness the appendature of the signatures thereto. A very large number of gentlemen assembled. The scheme is embodied in a Bill now before Parliament, to empower the company to acquire the land and houses (pulling down the latter) necessary for the purpose of constructing a boulevard extending in a straight line from the clock-tower at the Houses of Parliament for nearly a mile in the direction of Eaton-square. The scheme provides for the erection of model lodging-houses for the accommodation of the poor who will be displaced by the pulling down of their present wretched habitations. "No less than seven of the most eminent architects" have assisted in the preparation of the estimates, plans, designs, &c. The expenditure already incurred, as "preliminary or promotion expenses," amounts in round numbers to about 10,000*l*.

Extension of the Brighton Museum.—Mr. Twining, of Twickenham, having presented a collection of articles from the Twickenham Economic Museum to the Brighton Sanitary Association, together with a donation of twenty guineas, three unused rooms at the Pavilion, adjoining the Town Museum, were placed at the disposal of the Association, who, having formed an interesting collection "with a view to impart in a manner at once scientific and entertaining that knowledge of common things which is so necessary for securing health and comfort," have publicly opened their Museum and presented it to the Corporation. Henceforward it will form a part of the Brighton Museum, under the title of the Economic Department. The object of the founders of the department is to improve the manner in which people live,—to teach them how they can have more wholesome and non-nourishing food,—how they can live more economically,—and how they can enjoy greater comfort and better health. The Brighton Museum ought to be thrown open free to the public more frequently than once a month, as at present. Half the specimens in the general museum, moreover, according to our authority, the local *Herald*, are passed by almost unheeded and unnoticed, because they have no labels to inform the visitor of their character and history.

Southwark Park.—In the south-eastern district of the metropolis, a piece of land of about sixty-three acres, has been converted from market gardens into a new park by the Metropolitan Board of Works, and was opened, according to the newspapers, on Saturday last. It is situated near the Spa-road Railway Station, between Paradise-row, Rotherhithe, the Deptford Lower-road, and Rotherhithe New-road, about one mile from London Bridge, and within easy walking distance from the crowded parts of the parishes of Southwark, Horselydown, and Bermondsey. The land chiefly belonged to Field-Marshal Sir William Gumm, G.C.B. The expenditure for the land and other costs has been as follows:—For freehold and leasehold interests, 68,398*l*. 1*l*. 2*s*.; professional and other charges and wages, 5,330*l*. 18*s*. 5*d*.; incidentals, 722*l*. 19*s*. 2*d*.; contracts for works, for entrance lodges, gates, enclosure palings, formation of roads, &c., drainage of roads, and planting, 20,710*l*. 2*s*. 6*d*.; total to 25th of March, 1869, 95,162*l*. 11*s*. 5*d*. The cost of the freehold land was about 91*l*. per acre for sixty acres. There are sixteen acres reserved for building purposes to meet the expenditure of the metropolis in respect of the purchase.

Discovery in Bunbury Church.—A wall-painting has just been discovered on one side of the east window of Bunbury Church, corresponding to another which was found on the other side. It is the figure of an angel, with both wings represented. There was a legend on a scroll in old English characters, not however legible. The pictorial representation first discovered is that of a man with a child in his arms, and pointing to a cross of the ordinary shape, which, says the vicar, was also traversed by a St. Andrew's cross, and a wreath, perhaps of thorns, encircled them both. There was also the hammer and a pair of pincers, and a large nail in the lower part of the cross. This may have been meant to represent the child Jesus seeing, as in a vision, the future scene of his suffering.

The Fire near Drury-lane Theatre.—A panic was excited in the Strand and its neighbourhood on Saturday night last by the appearance of huge volumes of smoke and a report that Drury-lane Theatre was on fire. The "house" was not on fire, though the walls were scorched. The building in which the fire commenced and ended was that of the Messrs. Howard, builders, next door to the Albion Tavern, Russell-street, and immediately opposite one of the pit entrances to the theatre. This occurrence enforces two assertions we have often made,—namely, that theatres should be insulated, and that the yards of builders and timber merchants in towns should be under supervision.

Discoveries in Cheltenham Church.—The restoration of the chancel of this church, which has been effected at the expense of the Duke of Devonshire, has revealed some scroll paintings. On removing the plaster from the south wall, a painting from the beatitudes was discovered. The subject uncovered—"Blessed are the pure in heart, for they shall see God"—was written in Old English characters on a zigzag scroll or ribbon, the face of which had been white, the back gold, ornamented with red stars. The whole is twined round a stem, from which spring branches bearing leaves and red-berries, artistically drawn in a bold hand. Traces of a similar scroll are observable on the other side of the window, and it appears very likely that the whole of the walls were so decorated.

Floating Meadows.—In the Atlantic Ocean, a little to the west of the Azores, there exists, as is well known, a space seven times larger than all Germany, according to Humboldt, completely covered with a dense mass of marine vegetation. Monsieur Jules Lavinière has proposed to the Société d'Agriculture to make these floating meadows, as they are called, subservient to the purposes of agriculture. His suggestion is that the ships occupied during the summer in cod-fishing should in other seasons be employed in conveying this abundant manure to the Azores, where an entrepôt could be established, the weeds pressed and dried, and the mineral salts they contain extracted. Analysis has shown that these weeds possess the same fertilizing properties as those already employed as manure on the British and French coasts. Perhaps our own agriculturists may find it worth while to inquire whether an inexhaustible stock of cheap manure has not, like guano, been here overlooked for centuries.

New Children's Hospital, Southwark Bridge-road.—The Evelina Hospital, a new hospital for sick children, erected in the Southwark Bridge-road by Baron Ferdinand de Rothschild in memory of his wife, has been opened. It is capable of accommodating 100 beds, and will shortly be opened for thirty patients.

Bradford Town-hall Competition.—In reply to the invitation of the Bradford Corporation to architects to send in competitive designs for this proposed building, about 300 applications for particulars have already been received from architects in various parts of the three kingdoms.

New Post-office for Birmingham.—The miscellaneous estimates in the House of Commons contain an item of 21,850*l*. for the purchase of a site for a new Post-office in Birmingham.

The President of the Institute of Architects.—It is reported that Mr. Tite, M.P., will shortly receive the honour of knighthood.

TENDERS.

For St. Philip, Heigham, Norwich. Mr. Edward Power, architect. Quantities not supplied.—	
Balls (accepted).....	43,770 0 0
For additions and alterations to the Parish Church Bridge, near Preston. Messrs. Brade & Smiles, architects:—	
Gillett.....	22,985 10 0
Bickerstaffe.....	1,399 0 0
Blackwell & Marsden.....	1,570 0 0
Roberts.....	1,490 0 0
Pickup (accepted).....	1,332 0 0
For the erection of three cottages and gardener's residence at Clewer, Berks, for Sir Daniel Gooch, bart., M.P. Mr. William Sim, architect:—	
Kelly.....	21,119 0 0
Fish.....	1,950 0 0
* For the erection of a house and shop in Broad-street, Reading, for Mr. Payton:—	
Clacy.....	£924 0 0

For alterations and additions to Oldfield House, Clapham. Mr. H. Saxon Snell, architect:—	
Waterson.....	£993 10 0
Shelley & Horne.....	627 0 0
Collis.....	623 0 0
Wright.....	616 1 0
Baxter.....	590 0 0
Wills.....	587 0 0
Sawyer.....	587 0 0
Vickers.....	585 0 0
Fletcher & Coughly.....	584 0 0
Beaman.....	559 0 0
Till.....	557 0 0
King & Son.....	555 0 0
Dover.....	519 0 0
Crake.....	517 0 0
Hutchinson.....	510 0 0
Ball.....	535 0 0
Perceval.....	533 0 0
Butts.....	628 0 0
Brown.....	525 0 0
Clarke.....	521 10 0
Soden.....	495 0 0
Forsdick.....	490 0 0
Hone.....	488 0 0
Shires.....	576 10 0
Crabbe & Vaghan (accepted).....	475 0 0
Watson.....	410 0 0

For schools at Ratcliff, for the Worshipful Company of Coopers. Mr. George Barnes Williams, architect:—	
Myers & Sons.....	£3,270 0 0
Thompson.....	3,255 0 0
Rider & Son.....	3,212 0 0
Colman.....	3,109 0 0
Ernor.....	3,069 0 0
Brass.....	3,072 0 0
Ashby & Horner.....	3,040 0 0
Hidley.....	2,990 0 0
Ashby & Son.....	2,986 0 0
Browne & Robinson.....	2,874 0 0

For the erection of a villa, cottages, and stables, at Berchamstead, Berks, for Mr. W. Cooper. Messrs. Painter & Plombe, architects. Quantities supplied. Proprietor fluting bricks, chimney-pieces, grates, gas and water pipes, plate-glass, and a portion of the iron work:—	
Cook.....	£1,123 14 2
Preedy & Son.....	1,109 0 0
Fairhall & Weeks.....	1,098 0 0
Snell.....	1,058 0 0
Humphrey.....	975 0 0
Honour.....	959 12 6
Harris (accepted).....	925 0 0

For a range of greenhouses, for Mr. C. H. Crompton Roberts, Sunningdale, Upper Avenue-road, St. John's Wood. Mr. F. Saw, architect:—	
Warren.....	£1,375 0 0
Patrick & Son.....	817 0 0
Hackworth.....	825 0 0
Sanders.....	749 0 0

For a cement concrete villa at Addlestone, for Mr. W. Bravington. Mr. T. Wonnacott, architect:—	
Simpson.....	£1,569 0 0
Exister.....	1,450 0 0
Sharpington & Cole.....	1,395 0 0
Rudkin.....	1,393 0 0
Knight & Sons.....	1,382 0 0
Nightingale.....	1,323 0 0
Drake & Co.....	1,295 0 0
Harris.....	1,238 10 0
Hobbs.....	1,156 0 0
Rans (accepted).....	1,098 5 0
Taylor.....	1,082 18 0

For villa residence, in cement concrete, at Wargrave, Berks. Mr. T. Wonnacott, architect:—	
Drake Brothers & Reid (accepted).....	£1,118 0 0

For pair of villa residences at Addlestone, Surrey, for Mr. B. Bartholomew. Mr. T. Wonnacott, architect:—	
Foister.....	£918 0 0
Harris.....	897 0 0
Hill.....	793 0 0
Raper.....	709 0 0
Brown.....	699 0 0
Hobbs (accepted).....	650 0 0

For warehouse at Coventry, for Messrs. Robbins & Powers. Quantities supplied. Messrs. Scrivener & Son, architects:—	
Mariot.....	£4,182 0 0
Barlow.....	3,680 0 0
Trow & Sons (accepted).....	3,450 0 0

For certain decorative and other works at Stone Hall, Oxford, for Mr. G. Barker. Messrs. Tolley & Dale, architects:—	
Cowan & Mannooch.....	£707 10 0
Clarke & Mannooch.....	645 10 0
Colls & Sons.....	645 0 0
Tooth.....	580 0 0
Heeps.....	535 0 0
Ward.....	337 0 0

For additions and alterations at the Holloway Working Men's Institution. Messrs. Turner & Son, architects. Quantities by Mr. Shrubsole:—	
Wills & Co.....	£930 0 0
Sprayson.....	919 0 0
Fletcher & Coughly (accepted).....	900 0 0

For alterations and additions to house and premises, Houndsditch, for Mr. L. Friedlander. Mr. H. H. Collins, architect:—	
Mitchell.....	£1,137 0 0
Shaw.....	952 0 0
Richardson.....	828 0 0
Saie (accepted).....	795 0 0

For the erection of house and premises, Broad-street Reading, for Mr. Avonck. Messrs. Wm. & J. T. Brown, architects. Quantities supplied:—	
Whiting.....	£1,312 0 0
Clacy.....	1,243 0 0
East.....	1,240 0 0

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A PLUMBER and GAS-FITTER wants a JOB as ASSISTANT in THREE-BENCH HAND. References.—Address, A. 2, 9, Park-place-church, Lower Park-road, Peckham, S.E.

A YOUNG MAN requires an ENGAGEMENT with either an Architect or Builder. Has been with last employer for architect eight years according to the usual office routine. Satisfactory references can be given.—Address, D. Post-office, Osterham, Surrey.

A FIRST-CLASS STAIRCASE HAND is in WANT of EMPLOYMENT (piecework).—Address, 825, Office of "The Builder."

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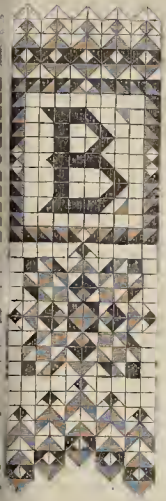
TO PLUMBERS AND BUILDERS. A GOOD practical PLUMBER is in WANT of constant EMPLOYMENT as Three-bench Hand, Clerk of Works, and plain zinc work. Good references if required. In or out of town preferred. Wages, 6d. per hour.—Address, MILLS, 33, Marylebone-lane, W.

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The Builder.

VOL. XXVII.—No. 1378.

Odds and Ends.



BEFORE settling the date for an entertainment, it would seem easy for a public body to learn what other hodies were doing in that direction, and so to avoid clashing. Whether easy or otherwise, this is not done. On Thursday night in last week the Royal Academy and the Royal Horticultural Society opened their doors to guests, the dinner for the Artists' Benevolent Fund then also taking place, and, as a matter of course, with reduced numbers; and on Thursday night in this week the Society of Arts and the Royal Institute of British Ar-

chitects both held a *conversatione*, the former in the South Kensington Museum—a mighty crowd—and the latter at the House in Conduit-street. We note the occurrence in hope of preventing similar conflicts in another year. The Academy *soirée*, held earlier in the season than usual, with London full and new galleries to attract, was the most brilliant they have ever had. Music lent its aid, and the dresses of the ladies took the colour out of the pictures. This was also done by the gas, which seemed, so far as the paintings were concerned, to be a little in excess. Mr. Smirke's galleries, however, came out admirably, and the varied decoration was more observable, or at any rate more observed, than had hitherto been the case. The public will soon pay for the new building. We have heard, on tolerably good authority, that the "takings" at the door during the first month exceeded those of last year by 800*l.* a week; and that if the attendance continue to be as it has been, the total receipts for the season will probably be little less than 20,000*l.* We hear, too, that there will be no evening exhibition at a "reduced" charge, as heretofore; and hope, if this be true, that the Academy will compensate the less fortunate part of the public by reducing the entrance-fee, say for the last week. If they were to open the Exhibition *free* for a short time, it would increase their popularity.

Prince Teck at the Horticultural Society would have pleased the members better if, following the example of the Duke of Buccleuch on a similar occasion, he had personally received each visitor: the character of a "reception" is quite changed when visitors are not received. At the Artists' dinner Dr. W. H. Russell discharged well the duties of chairman, and nearly 800*l.*, including a recent bequest, were the result. A wonderful career has been that of William Howard Russell, the "pen of the war," and very much his countrymen owe him. The Crimea, India, America, Russia, Egypt, have been scenes of his labour, and, as a writer under difficulties, he may claim amongst his characteristics wonderful truthfulness as well as brilliancy. In drinking "Prosperity to the Artists'

Benevolent Fund," he said that in asking their continued support to the institution he was not soliciting aid for a struggling fund in its infancy, but for a veteran of green old age, with, he hoped, the prospect of a long and active existence. It was solely in that conviction that he addressed them. The fund was not in the process of organisation,—a word which he confessed he had a horror of,—he was simply anxious to promote a system of recruiting, and thus ensure a continuance of that support which so useful an institution required and demanded. The fund was in a flourishing condition, but that condition might fall into a state of decay unless the same active powers now in operation were employed to maintain it. If his humble words could reach the world outside the room, and if he could successfully appeal to the sympathies of those whose walls were hung with the works of artists, he was quite sure he should be enabled to do something towards increasing the benefits of the fund. All the institution wanted was fuel to put into the boiler to enable it to go on as it had done.

This fuel must not be withheld. The fund specially helps those who help themselves. Every young artist should obtain an interest in the Annuity Fund. Only one R.A. was present on the occasion of which we are speaking, namely, Mr. O'Neill; partly because of the *conversatione* already referred to, and partly perhaps because of their attendance not long ago at the dinner for the Artists' General Benevolent Institution, an excellent society, but one that does not render the Artists' Fund unnecessary; in fact, as Mr. C. J. Dimond, the honorary secretary of the latter, said, if the Annuity Fund were rightly taken advantage of there would be little necessity for the General Benevolent Fund. The dinner was not well reported. It is an odd fact, by the way, that newspaper reporters of dinners, by whom half the speakers may not be mentioned, state, nine times out of ten, that Mr. This or Mr. That "was the toast-master;" though the doings of the majority of these officials, who request the company to "drink the herry with all the honors," are scarcely hearable.

Amongst other recent meetings we would mention that of the Society for Improving the Condition of the Working Classes, which was held on Friday in last week, the Hon. W. Cowper presiding, and the Rev. J. B. Owen, the Rev. A. W. Thorold, and several others, speaking earnestly in its favour. Mr. C. Payne, the active secretary, in the course of his report gave an epitome of the balance-sheet, thus:—Received from all sources in the year, 5,659*l.* 15*s.* 4*d.*; to which add balance in hand, 516*l.* 12*s.* 2*d.*; total, 6,176*l.* 7*s.* 6*d.* The current expenses of all the lodging-houses, including repairs, amount to 3,504*l.* 2*s.* 11*d.*; the interest on loans, &c., 898*l.* 5*s.* 9*d.*; printing publications, and lithography, 107*l.* 1*s.* 1*d.*; salaries, agency, rent of offices, advertisements, and all incidentals, 852*l.* 2*s.* 4*d.*; leaving to the credit of the society, 814*l.* 13*s.* 4*d.*; total, 6,176*l.* 7*s.* 6*d.* The real property, &c., belonging to the society (at cost), including balance at banker's, for the year ending December 31st, 1868, is 44,973*l.* 5*s.* 9*d.*; general liabilities, 20,987*l.* 3*s.* 3*d.*; leaving assets, 23,986*l.* 2*s.* 6*d.*

Some little regret was expressed by one speaker, and we think with justice, that, considering the large amount expended, the net profits of the year were so small. Mr. Owen had said in his speech, with respect to the rate of mortality in the houses of the society, it might be remarked that for the last ten years there had been a steady decrease in the average per 1,000. In 1859 the average was 20 per 1,000. In the year following it fell to 19 per 1,000. For the next five years it kept steadily to 16 per 1,000. In 1866, in consequence of an epidemic, it went back to 19 per 1,000. In 1867

it fell to 15 per 1,000, and from the causes stated in the report, clearly of a temporary and exceptional character, it had risen last year to 22 per 1,000. As the pioneers in this work they had to make and clear the way, and thus had to encounter greater difficulties than those who followed in the same course. The Limited Liability Act, which had been passed since the society commenced, had greatly facilitated the promotion of other companies for building improved dwellings for the working classes. They were delighted to see the spread and the success of these hodies, because they looked upon themselves as the parent society, and upon the others as their legitimate progeny. There was, however, and would continue, this difference between them, namely, that this society was in the main based on philanthropic principles, and a pecuniary dividend was a secondary consideration; while the others very properly based their operations on the commercial principle, and looked for a fair return upon the capital invested.

Fully admitting the position of the Society as a pioneer, we should be glad to see it returning a better percentage on the money spent, so that other bodies might find it their interest to invest in a similar direction. The chairman, in his closing address, said the society might undoubtedly have shown a larger balance in their favour, but that must have been done by charging higher rents, and this was not their object. It was, however, gratifying to know that in some cases a good, steady dividend of 4 per cent. had been realised by some of the companies; and if by the use of concrete walls or the Portland cement walls lately introduced the cost of cottages could be reduced from 130*l.* to 80*l.* and lower, they might hope not only to multiply these dwellings, but to reach a lower stratum of society. They might all be thankful that so far they had been engaged in a good work, and had achieved some success. The utility of the society was not confined to the buildings it had erected or modified and improved. It was in constant communication with persons on the Continent, and even in America, who sought advice, assistance, and plans, and in this special direction it was of very great service, and he thought they might look back with satisfaction on the past, and with hope to the future.

This is perfectly true, and ought to be taken fully into account when scanning the financial results. We may make another opportunity, however, to discuss this matter more fully.

At the dinner, a few weeks ago, of the Artists' General Benevolent Society, to which we alluded just now, the conductor of this journal ventured to call somewhat urgently for a reinstatement of the British Institution, or, at any rate, for the re-establishment of the annual exhibition of the works of the old masters, formerly held under its auspices, and thought that its capital—some 14,000*l.* or 15,000*l.*—ought not to be lost to art. The remarks found ready acceptance, and have since brought us a number of letters asking what should be done in order to secure the exhibition in question. It may be as well, therefore, that we should say, the Burlington Fine Arts Club, at present a small though influential association, are again moving with a view to bring this about. It appears that this club was founded to bring together on a friendly footing collectors, amateurs, and persons variously interested in matters of art, and to provide a centre for the exhibition and comparison, among its members, of objects of interest in their possession. Secondly, to utilise these exhibitions by making them, from time to time, subservient to the illustration of particular arts, or the art of a particular master or period, and to render them, under certain restrictions, accessible to a portion of the public. Thirdly, and especially, to identify the action of the club with the action, about to cease, of the British Institution, with a view to the revival and maintenance of periodical exhibi-

bitions in London of works of art by the great masters. With these objects the club opened in temporary premises, 177, Piccadilly, on the 1st of January, 1867, and has held there each special exhibition as a limited space and light permitted; free access to these exhibitions being given to artists, men of letters, and other persons known to take a legitimate interest in art. It was soon found, however, that better accommodation was needed, and a sub-committee recommended the following as a course proper to be adopted, viz. :—

"To bring before the special general meeting, announced for the third Tuesday in May next, the desirability of extending the club to 500 members, either as a regular Dining Club (plus a certain art action), at 5s. per annum subscription; or as an Art Club (minus dining accommodation), at 5s. per annual subscription, as the meeting should, after discussion, determine. One of the objects of these propositions having been carried, the sub-committee consider that invitations should forthwith be addressed to persons likely to prove eligible members of the club, setting forth the details of the scheme, and undertaking that if, in reply to such invitations, the committee should receive before Michaelmas next assurances that a sufficient number of additional members would join the club as from the 1st day of January, 1870, then the committee would engage suitable premises into which they would remove from their present house, so that the new premises might be occupied, and the business of the extended club commence, as from the 1st day of January, 1870, from which date subscriptions of new members should run."

Touching the British Institution, and a continuance of the Exhibitions of Works by the Old Masters, a conference was held, whereas it was understood to be agreed that the directors of the British Institution would advance their capital of 14,500l. or 15,000l., free of interest, on a substantial security that the money would be laid out by the club in prosecuting the objects for which the British Institution had been incorporated; and endeavours were at once made to obtain a site available for the double purpose of an extended club and a gallery. It would appear, however, that no site suitable to the double purpose in view has as yet presented itself.

The club, we are told, has recently determined to adopt the recommendation to extend the number of members to 500, on the basis of its present constitution as an Art Club; and that for the purpose of providing adequate accommodation for the club so extended, and for affording increased facilities for carrying out the special art objects of the club, the committee are to hire on lease or otherwise such premises as they may deem eligible. Further, they are to communicate the proceedings to the council of the Royal Academy of Arts, and to the directors of the British Institution, and to suggest a conference of the three bodies, with a view to the settlement of the question, viz. :—“Is it desirable that Annual Exhibitions of Works of Art by Old Masters should be held in London; and if so, does it appear that by the action, collective or separate, of the three bodies above-named, this desideratum may be attained?”

What will come out of this we have yet to see. The difficulty in the way of obtaining a proper site is considerable. The Art-Union of London has a large sum of money in hand applicable to the provision of a gallery for the exhibition of works of art, and the Council of that body has made several endeavours to obtain land for it, but hitherto without success. If a union of these two funds could be usefully brought about, the difficulties might perhaps be lessened. This idea, which has occurred to us on the instant, has sufficient promise in it to prevent us from overlaying it with any further gossip. We commend it to the consideration of those who are concerned.

THE ARCHITECTURAL PUPIL.

WHATEVER may be thought of the value or importance of such meetings as those of what is called the “Architectural Alliance,” where a small number of delegates, by no means representing all the provincial or leading architectural societies, meet with closed doors to debate on the advancement of the profession, the recent printed reports of the last meeting furnish us at least with some new data as to the position of the architectural pupil, in the provinces especially, which are not without interest or significance. That much-neglected young man is at last to receive some tardy attention, his present position to be inquired into, and his future welfare and instruction are to be at least discussed, if not immediately or adequately provided for. We put a distinction between the question as referring to London and to the provinces, seeing that the facilities, for self-education at least, in London are so out of all proportion superior to those attainable in any

provincial town, that the direction in which improvement seems to be called for is quite different in the two cases. Taking the Report of the London Architectural Association, furnished in reply to a request from Mr. Rickman (hon. secretary to the Architectural Alliance), we find the main complaint of those who draw up the Report is that the students do not take advantage of the numerous opportunities for instruction open to them, including all the lectures at King's and University Colleges, the Royal Academy, and the Royal Institute of Architects, the Schools of Art and Libraries at South Kensington, the Architectural Museum, the British Museum, &c., and, we may add on our own part, the advantage of living where buildings on a large scale are constantly being carried out, and can be inspected and studied in progress. The neglect of these golden means of improvement is not, however, charged by the report entirely, or even mainly, on the idleness or indifference of the pupils themselves, but on the fact that they are kept too close to their office-work, and are not allowed time enough by their principals to attend lectures, and to practice sketching and prosecute private study; the steps taken for the improvement of the pupil by his principal amounting in general, it is said, only to the ordinary routine of office-work, accompanied by “suggestions” as to the desirability of attending the evening lectures of the association, &c.,—a cheap way, certainly, of doing your duty to your pupil. Then the Association is also of opinion that a serious hinderance in the way of useful and exhaustive study lies in the fact that the great facilities for acquiring information in London have not been embodied by any one “in a definite or accepted system.” Still the facilities are there, *in posse*; and, given a desire for knowledge on the part of the student, and a reasonable liberality as to allowance of the requisite time on the part of the principal, it really seems impossible that any man of good ability should not be able to amass a quantity of valuable information in the course of a few years, although it might not be attained in the most systematic manner, or at least the pupil might have to systematise it for himself.

Turning from the report of the London Association to those furnished on the same occasion, and in answer to the same schedule of questions, by the Architectural Societies of Birmingham, Liverpool, Manchester, and Glasgow, the difference as to the available means of education existing in these large provincial towns, as compared with London, is remarkable. Scarcely any where do there seem to be regular lessons or courses of instruction in strictly architectural subjects, unless we include under that head the fortnightly papers, regularly read during the session of the Liverpool Architectural Society, some of which have appeared from time to time in our column; but these are often rather theoretical than practical, and of more value to advanced members of the profession than to students. It appears that in connexion with the Liverpool Institute, where *inter alia* are taught mechanical statics and dynamic, and drawing from casts, &c., there were also formerly special architectural and building classes, which have been discontinued “from want of attendance.” In Manchester, again, there is a school of art and a Mechanics' Institute, “in both of which architectural drawing is taught; the latter is attended principally by artisans in the building trades, and nearly every architectural pupil has attended at one period or another the former; but as *neat draughtsmanship appears to be the sole object*, the constructional and practical branches of the profession are consequently neglected.” In Glasgow there is a school of design, but we learn nothing about its practical value, or the extent to which the pupils avail themselves of it. But one thing that especially strikes us in looking at these documents is their beautiful and touching candour. In place of making the most of the possible good intentions of the architects of each town as to instructing their pupils, all these reports are unanimous in representing that the duty of the architect to his pupil is systematically ignored. The Birmingham report says, “Articled pupils are left pretty much to themselves with regard to obtaining knowledge beyond the usual office work,” and adds with great *naïveté*, “Our society does not take any steps towards the improvement of art-students.” The Liverpool report states, that “in the majority of offices very little systematic instruction is given to pupils,—in some cases none;” and also that very little opportu-

nity is given to the students of visiting buildings in progress, and making practical acquaintance with the details of their profession; a very important point in architectural education. In Manchester “the steps usually taken during the term of articles for the advancement of the pupil are so very insignificant, that we may safely state them, with a very few honourable exceptions, as none whatever.” The Liverpool and Manchester Societies, however, unlike the Birmingham, have endeavoured to atone for the neglect of their pupils by individual architects, and the absence of means of self-instruction in their respective towns, by instituting classes in connexion with each society for instruction in matters connected with the profession. Thus, the Manchester Society has a class for design and construction on Monday evenings, a modelling-class on Wednesday evenings, and a figure and free-hand drawing class on Friday evenings; and on Saturday afternoons there is a class for water-colour drawing. The Liverpool Society, besides offering prizes for designs and sketches both in summer and winter, has a figure-drawing class meeting two nights in the week. The reports of both societies, however, complain of the want of attendance at the evening classes, though the Liverpool Society's report states that the students' prizes are actively competed for, and with results creditable to the competitors. As to the Glasgow Society, Mr. H. K. Bromhead, in his report on their behalf, disposes of all preliminary systematic education at one fell swoop. They do not trouble themselves with the pupil's education; but they have an Institute incorporated by Act of Parliament, entrance into which is supposed to be the grand object of the pupil's struggles; and as this entrance is not obtained but by passing an examination as to proficiency, it is supposed that here is efficient inducement for the pupil to educate himself as well as he can. So far as we understand the report, at least, the architects do not attempt to educate the pupil; only he cannot come into the Institute unless he is educated. But, then, the Glasgow architects do not take premiums, which Mr. Bromhead seems to think is their “weakest point;” on the contrary, the pupil is paid small sums during the latter years of his apprenticeship; and, on the whole, it is certainly better that architects should openly declare their intention of doing nothing for their pupils, and act accordingly, than that they should pocket a few cool hundred and pursue the same *laissez-faire* system after all, without acknowledging it. As to the means to be adopted for the future amelioration of architectural education, none of the provincial societies offer any express opinion, except the Liverpool one. The committee who drew up the report are of opinion that much must depend on “the recognition by individual architects of their responsibility towards their pupils;” but we must be allowed to observe that the fact that much does depend upon this, is just one of the evils of the present system; our architectural education ought to be independent of the caprice or conscientiousness of particular individuals. The Liverpool committee, however, further express their conviction that :—

“The strongest inducement to the improvement of architectural education would be the establishment of a compulsory examination for those who wish to enter the profession of architecture; such examinations being held in the provinces at conveniently situated central towns, if possible, but nevertheless in connexion with a governing body in London, such as the Royal Institute of British Architects; or in connexion with the English universities, if these latter should be brought to recognise the importance of art education, and provide for it in an adequate manner.”

“Much virtue in an *iff*” but this last “if” is one which we shall have to wait some time for. The committee also suggest the formation of a lending library, on an extensive scale, of architectural works; a project which has been mooted before, but never seems to have met with efficient support to induce any one to take it up, and become the *Mudie* of the architectural world.

The report of the general committee selected from the Royal Institute of Architects, the Royal Academy, the Architectural Museum, the Architectural Association, and the Architectural Exhibition Society, to examine into the defects and possible remedies of architectural education, goes (as might be expected) much more fully into the subject than any of the previously-mentioned documents. Their salient propositions are, first, “That a certificate be granted to all who pass the voluntary architectural examination;” that at some future period “the membership of the Institute be made dependent on the passing of the voluntary architectural ex-

amination in the class of proficiency; and "that a preliminary examination be held in elementary subjects, open to all students who have been at least one year in an architect's office." The object of the last is to encourage the student early to the habit of systematic study of the elementary knowledge connected with his profession, that he may more readily understand what he is working at, and lose less time. This would certainly be a good step, and would help to convince the pupil from the first that he was entering a profession requiring systematic study to master it: a conviction which we imagine is wanting to a good many of the young gentlemen who are at present knocking about in architects' offices. Then, taking into consideration the great facilities afforded in London for self-education, and the absence of anything like a systematic use of them, the committee suggest the preparation of a text-book or pamphlet, containing a complete curriculum of study for the architectural student, and especially pointing out when and where lectures specially pertaining to the profession can be heard, and giving a limited number of books in which the best information can be had in a condensed form. This the Institute have determined on providing.

That such a book, carefully drawn up, will be of the greatest use to students who have not the good fortune to be placed with a master willing or able regularly to educate them, there can be no doubt whatever. The committee urge the complaint, which is also made in the reports of one or two of the provincial societies, that the students make very little use of the opportunities now within their reach. There must be some reason for this. One cannot suppose that architectural pupils alone, of all students, are idle and good for nothing. The fact is, that there is no sufficient definite inducement to study hard, no assurance that without hard study the profession cannot be taken up and exercised. Young men intending to enter the professions of law and medicine know from the first there is a stiff examination awaiting them at the end of their period of study, which they must pass, or lose the whole time they have spent in study; but the architectural student sees that men constantly get good commissions through the interest of their friends, without possessing any remarkable natural talent, or spending any of the midnight oil in hard study, and he naturally hopes that he will be able to do even as these; and, in such case, it is difficult to entice him, as the good lady in the rhyme enticed her geese to "come and be killed" in a voluntary examination. He cannot be led—

"To scorn delights and live laborious days"

in the hope of passing, when he knows that Jones, who has wasted his time in sporting with Amaryllis in the shade, and snags his fingers at the examination, may, after all, get into just as good, or better, practice; for we all know that interest often goes a great way further than talent. The committee think, that one reason why the great number of lectures and other means of improvement attainable in London are not more used, is that principals do not allow the pupil time for them in the daytime (a complaint echoed by the Architectural Association), and they urge that subjects which are necessarily constituent parts of architectural education ought to be learned during office hours, in place of the pupil being compelled to spend his evening over them. Nothing more true; but then what is the advantage of the considerations to a pupil in the provinces, who is not within reach of all these lectures, and museums, and exhibitions? It may, of course, be said that he should come to London for his education; but are the London architects to be expected to find room in their offices for all the young men from the country who wish to study for the architectural profession? The more we go into the subject the more evident it becomes that the whole system requires altering. These kind of half-measures which provide first for placing a lad in an architect's office, and then for getting him out again at intervals to learn what he cannot learn, or is not likely to be assisted in learning while there, supply no really systematic course of education. It is a very uneconomical method of using the time during the period of study, to mingle up together office routine, and attendance upon lectures, and drawing-schools, in an irregular in-and-out way; it is not in such a manner that either the practical or the theoretical portion of the profession is likely to be thoroughly learned. What we want is the establishment of architectural schools or acad-

emies on the same system which has been long adopted on the Continent, where the principles of architectural design and construction, and the necessary supplementary branches of drawing, can be definitely and systematically taught by persons adequate to the task, where the student may apply himself to the acquirement, on a theoretical basis, of all the main branches of knowledge necessary to his professional success, without finding the regular and consecutive course of study disturbed and broken up by the details of office work. The knowledge of these latter can be acquired afterwards, and will be acquired in a much shorter time when the student comes to them with a previous knowledge of the general bearings and scope of his profession, than when (as at present) he is turned loose into an office to grope his way into the details of the work by degrees, and trust to finding out the general value of them afterwards.

We cannot just now go into the question, how such academies may be instituted, who is to institute them, and how they are to be supported; probably an appeal to Government would be necessary, and in that case we might hope that it would be the more easy to obtain governmental recognition also of the examination which should follow. Without saying that no one should be allowed to practise as an architect unless he has passed a prescribed examination, two things we wish to see done, without which no thorough reform can be accomplished; we wish to see the term "properly educated architect" legally defined by some qualifying adjective (say "certificated architect") which may distinguish the hearer of it from the jury-builder who writes up "architect" over his door; and we wish to see "the architectural pupil" altogether eliminated, and the architectural student taking his place.

COLOUR AND SOUND.

In examining the history of the physical sciences we cannot fail to be struck with the gradual tendency of their various laws towards unity.

The phenomena of each branch mutually illustrate each other, and the more they are studied and compared the more it becomes manifest that all are obedient to the same essential laws and governing principles, differing only in degree, and in the results the same operating forces produce.

In obedience to this principle, already we have striking analogies between light, heat, electricity, and sound, and we believe that the time will come when all the more common phenomena of nature will be found influenced by a few general laws common to each. Unfortunately for scientific education, phrases originally merely poetic becoming common, are apt to be so assimilated, as it were, that we fancy we understand their sense, without giving much attention to the absolute meaning of the words composing them. The harmony of colour will be spoken of, and apparently understood, by many to whom the true scientific explanation of the expression is entirely new.

That there is a similarity between the impressions produced by a painting and those produced by a musical composition, is a fact so long undoubted that an analogy between sound and colour has for some time occupied the attention of both painters and musicians; but with the exception of the remarkable results obtained with the prism and the monochord by Newton, no advance seems to have been made to the scientific application of musical harmony to the art of painting. It has remained for Dr. Macdonald* to bring forward a clear and probable theory. Just, then, as a note depends upon the number of vibrations of the string or other instrument causing it, so the colour of the light ray depends upon the number of its undulations. It has been found that the undulations of the colours of the iris increase in number and diminish in size as they ascend from the base red to the violet, just as happens in the musical scale in passing from the graver to the more acute sounds.

Can we not work out the precise relationships existing between the two scales, painting may be elevated to the status of a science, based, like music, upon mathematical principles.

Surely we may the more assume this step toward analogy to be correct from a knowledge

of the physical effect of beat—expansion; and we find that the heating power diminishes in the respective light-rays as they advance up the scale.* Pointing out first the similarity between the seven notes in the musical scale, and the seven prismatic colours, Dr. Macdonald says that "the primitive colours, red, yellow, and blue, occurring respectively upon the first, third, and fifth intervals in truthful analogy, independent of coincidence or fortuity of any kind, may be said to compose the perfect chord of colour answerable to that in music, which all musicians admit to be the very groundwork and basis of harmony."

Again, we may fairly argue that pitch in sounds is equivalent to tint or hue in colours, determining their relations to each other. In confining his attention to the natural key in music, that commencing with the note C, Dr. Macdonald assumes red to be its analogue in the colorific scale, and for this assumption there are several favourable arguments.

As was before remarked, red is the least fraughtful of the primitive, and its vibrations are longer and slower than those of any in its own series. This, too, is the case with the key-note with reference to the other intervals of its scale.

It would be difficult, in the small available space here, to give even the rudiments of harmony: we must be content with remarking that sounds in music are those whose respective undulations render it possible for them to act together, without interfering with or neutralizing each other,—without, in short, infringing the law of "interference."

Speaking technically, and quoting from the above-mentioned author,—

"From the study of their properties and offices the different intervals of the musical scale have received appropriate names; thus C is denominated the tonic; D, the super-tonic; E, the mediant; F, the sub-dominant; G, the dominant; A, the sub-mediast; and B, the sub-tonic. The word "tonic" is always applied to the first or key note; the dominant to the fifth, from its predominance in harmony; and the mediant to the third, from the position it holds between the tonic and the dominant."

It will occur to every musician, either practical or scientific, that every note in the gamut may be supported by a fundamental bass note, with its third and fifth forming the common chord. There are but three chords required on the bass clef, the first founded on the tonic, C (red), E (yellow), and G (blue); the second on the sub-dominant, F (green), A (indigo), and C (red); and the third on the dominant, G (blue), B (violet), and D (orange). The painter is advised to choose first his key, and then to translate some good harmonic phrases into colours most heighting the nature of his subject; and to the determination of a key a clear perception of the fifth interval, the dominant colour, is essential.

"In giving an account of the complementary colours, it is usual to adduce the series resulting from the binary mixture of the primitives, forming a sort of colorific hexachord, like the old musical one in which the seventh interval, equivalent to violet, was wanting.

Had Guido, the monk, taken the prismatic scale for his guide, instead of its effect making a mechanical mixture of the three major constituents of the diatonic scale, he would have transmitted a still greater name to posterity."

Alternate colours produce common chords, red, yellow, and blue answering to C, E, and G, and orange, green, and purple to D, F, and A.

If we take one primitive, say red, the other two, yellow and blue, must exist, either separately or in its complementary, green; or, taking a compound colour, purple, composed of red and blue, its complementary will be found either in the opposite colour, yellow, or in the alternate compounds, green and orange, taken together.

We may here notice the analogy in effects of "interference," both in colour and in sound: yellow is said to be "indifferent" to green, red to orange, and violet to blue. Musically speaking, these intervals, being seconds, are positive discords; and, speaking of colour scientifically, we may notice that a green opposed to a strong yellow appears blue, a purple to a blue red, and an orange to a red appears yellow; the fact being that the undulations somewhat interfere with each other, and similar ones interfering with and nullifying each other, the solitary colour stands out with undue force. With reference to complementary sounds,—

"If a string sounding C be divided into four parts, 1-4th and 3-4ths will also produce C; but the complement of 1-4th are 3-4ths, yielding F, which is equivalent to green, the complementary colour to red. Divide the strings into five parts, 1-5th, 2-5ths, and 4-5ths will produce E, yellow; but the complement of 2-5ths are 3-5ths, yielding A, the equivalent of indigo or purple, which is the colour required."

* "Sound and Colour: their Relations, Analogies, and Harmonies." By T. D. Macdonald, M.D., F.R.S.

* See *Builder*, May 8th, "On Scientific Origin of Artistic Notions."

From these facts, the inference that complementary colours are, as it were, chromatic harmonies, is undeniable; and from these, too, we may account for the complementary impressions which arise on the retina when some particular colour long impinging upon it has been removed: it would appear that its surface, when long excited by the influence of a particular colour, is more susceptible of the vibrations of its complementary in white light.

Dr. Macdonald does not fail to show the scientific analogy between the structures of the human eye and ear, and the harmony between the sensations perceived by those organs. We must refer the reader to his little work for these interesting details. There has been a time when it was sufficient for the thinking man to give the world his thoughts, but with the present practical and somewhat hasty age, the cry is ever, *Cui bono?* Of what use can you make your discoveries? And to this inquiry the mind of genius at most times responds, feeling that to compass the greater good it must sacrifice somewhat to the less intellectual though more practical of its fellows.

Thus the ingenious gentleman we have quoted points out how many of the great masters were practical musicians as well as painters, and profited accordingly. "What is termed 'Gusto' in colouring is intuitive to the painter of genius, as musical taste is a natural gift to the born musician, who may compose and harmonise pleasingly, though ignorant of its rules."

We may remark Salvator Rosa, Carl Antonio, Guido Reni, Julio Romano, one of Raffaele's most excellent disciples, as instances of painters being at the same time musicians; and Dominichino, whose talent lay principally in the correctness of his style, and his power of expressing the emotions of the mind, was a thorough scholar in the theory of music.

But though natural taste has achieved great things in the graphic art, a scientific rule may be most advantageous to those not so highly favoured, and surprising results otherwise undreamt of may be developed. In a general sense, the lower the refrangibility of a colour the nearer it will appear to the eye; the more refrangible the greater will be the apparent distance. Thus, red being the least refrangible, will generally predominate in the foreground; yellow, green, and such intermediate colours in the middle distance; and blue, being the most so, with every variety of greys, will form the background of mountains, vapours, horizon, and sky.

A most striking effect has been accomplished by Paul Veronese, with much musical perception, in his picture of "The Marriage of Cana in Galilee":—

"The Redeemer, who is here the principal figure, is carried somewhat back in the picture, and the painter, who could not properly distinguish him by mere lights and shadows, clothed him in red; the least refrangible, and therefore the most approximating colour of the scale, so as effectually to conduct the eye to that figure."

Now, the first essential is the choice of a key. A definite key-note—say red—must first be fixed upon, and then the proper and dependent colours must be localised according to the painter's own taste and judgment. This note must necessarily hold the most central and prominent position in the picture, and the arrangement of the chords of the dominant (blue) and the sub-dominant (green) must be determined by it.

"The Taking Down from the Cross," by Rubens, is a peculiarly celebrated example of this arrangement. John is here the key-note, and the red drapery is in wonderful harmony with the colours in the immediate vicinity. "To the left we find the other components of the perfect chord, and to the right the common chord of the sub-dominant, the first interval of which is given in the green drapery of the female figure kneeling."

The three Marys are clothed in drapery answering to the third and fifth intervals; Joseph of Arimathea, a prominent character in the story, has colours corresponding to the tonic mediant and dominant. Two assistants are judiciously introduced, wearing also drapery in direct harmony, and in suitable places passing colours of limited extent are added, to promote the general effectiveness of the composition, as passing notes add grace and set off the agreements of a musical theme.

Donthless among the old masters very many pictures might be adduced as examples of pleasurable sensations being produced by arrangements which may be scientifically analysed and found in harmony with the foregoing rules; and doubtless, too, on the walls of the present Academy of Arts many works will stand the test

of severe musical criticism, and not be found wanting. For the encouragement of those who may fail to pass this searching examination, we may point out the picture of "Bacchus and Ariadne," justly reckoned a masterpiece of Titian. Dr. Macdonald says that it,—

"When translated into music, affords full harmonies, but there is an undue force in the dominant, as compared with the other intervals of the perfect chord. An excess of this kind is of course quite as possible in music as in painting. Were the notes one and three sounded together, and a fifth of inordinate strength then introduced, the latter would naturally counterbalance the other notes, and obtrude itself painfully on the ear."

"Musical rule would prescribe a reduction of the power of the fifth to equalise the harmony, and the same principles should be recognised in painting, viz., to preserve equality in breadth and strength of the components of all colorific chords."

"Trusting to the truth of musical analogy, we are in no fear of incurring the charge of presumption in thus noticing a slight defect in a noble picture so often, and so justly quoted by critics as a standard of art in colouring." He notices that the companion to this picture—however, Jupiter and Europa, in the Bourgeois collection, also by Titian, and painted in exactly the same key, has the common chord in perfection, the dominant being kept within due limits, and the harmony complete. Dr. Macdonald winds up his interesting pamphlet by deploring the tendency of modern paintings to lose their colour after the lapse of a few years. This he ascribes to an erroneous principle in the mode of colouring, involving too many processes, and to the chemical action arising from the mixture and intermixture of various tints.

Pictures painted by the old masters on the transparent principle 150 or 200 years ago seem but to be gaining in appearance, and improving in mellowness and beauty, while the portraits in the Dulwich Gallery are already faded.—Mrs. Tickle, Mrs. Sheridan, and the Moody family, presenting a sad and unhealthy aspect.

Pure linseed oil, both in a boiled and in a raw state, seems to have been the only vehicle for colour employed by the old masters, and we have no evidence to show that varnish of any kind was used with their paints.

Oil, as it were, insulates the molecules of the pigments, and preserves them from extraneous agencies, and even from chemical changes, with the atoms of other pigments commingled with them in tinting.

"It stands to reason that every absorbing surface, as in the bibulous grounding material of some kinds of prepared canvas, added to the want of binding and the evanescent nature of the vehicle itself, will sooner or later deprive the pigments of their protective matrix, exposing them to the action of new affinities, to the niter destruction of the pictorial effects they were intended to sustain. Soap and water would very soon undermine such colouring, whereas they may be fearlessly employed, if necessary, in the superficial cleansing of pictures painted with linseed oil."

Do not the foregoing remarks explain much that, in our sensations, has been incomprehensible? We have felt the effect surely when the sun has suddenly burst upon the landscape on a dull April day. Is it not the same when an accomplished organist suddenly introduces the "principal stop" into his "fugue," and on the swell organ chases it from the dull tones of the diapasons to the brighter and more striking ones of the "hantboy" and the "trumpet"? And in the endeavour to assimilate the foregoing rules, and to hear with the inner ear the melody both of pictorial art and of nature, are we not struck with the extraordinary musical crescendo and diminuendo effect of our English summer, when the swell organ of the sunlight affects the feelings with tenderness by its soft and fascinating impulses?

The light cheerful strain of spring upon the upper notes of the scale, and with but half-developed harmonies, the yellows and the greens, and the delicate lightly moving shadows, an air played, as it were, solely in the treble clef, gradually swelling upward, and slowly strengthening as the deeper notes of the summer tone the yellow into orange, and tint the green with a darker hue; while the high lights are brought forward, with great force, as the brilliant effect of the solar light, "the principal" mingles with and freshens up the whole.

Then, too, begins to appear more strongly the tonic, the key-note of the picture, and from sky and forest, the red light gleams in the middle distance, bringing it closer and into more familiar relations with our sympathies. Browns of every hue form an under-current of melody in the foreground, while infinite degrees of grey, and the cool upper tints of the scale, form a back-

ground of nonmountains, mists, clouds, and skies. Then the lessening energy and the diminished effects as the autumn dulness casts its shadows over, and, as softening melody appears to die away into distance, the foreground occupies the now prominent position, while the horizon vanishes, and the middle distance fades into the background. Then, as the fugue slowly descends the scale to the quiet resting-place of a deep bass note, some transient flash of old summer weather once again lights up the picture, the orange and the red reflecting back their colours over field and forest from a glorious sunset, the blue distance deepening to a violet, and every variety of rich and full chords boldly and brilliantly struck, while the "tenor" of the fallen leaves and the deep bass of the darkening shadows fill the soul with harmony, the true music of nature.

"And now the golden coves where autumn lingers
The never wearied hours have left behind;
Winter o'er all the hills with frosty fingers
Hath spread its pall of mist upon the pines."

And as the brighter high lights die away in the evening, and the darker masses of shadow creeping slowly up, throw the scenes far into the distance, the glorious pictorial anthem is left,—left to the last few notes on the mediant, to the repeated bass, and to the deep dark silence of winter.

S. S.

THE DECAY OF STONE.

I HAVE perused with interest in the *Builder* of the 12th ult. the abstract of a paper "On the Building Stones used in the Metropolis," and read before the Civil and Mechanical Engineers' Society by Mr. Arthur C. Pain.*

There are, however, one or two points upon the causes of decay in stone in which I must differ from the writer. The error into which he has fallen is, unfortunately, a very common one; but why it should be so, or why so remain, I can see no sufficient reason.

It is reported in this paper that the decay of stone was caused by bad selection! and proof is assumed that certain buildings erected in proximity to quarries from which the stone was obtained, are in good preservation; and that buildings erected in London of similar stone were more or less in a state of decay.

Unhappily, no specific reference is made to the kind of stone, nor the buildings in which it is used, whereby they may be identified. I do not pay much heed to the statement of local masons misunderstanding the stone better than their city brothers; indeed, most of the London masons are from the great stone-producing districts, and really the operators have virtually little option than to obey instructions.

No doubt, a proper selection in material, and the stone being fixed on a natural bed, have much to do with prevention of decay; but these are points well known.

Now, it is a fact, which has been already shown in this journal, that a stone eminently suitable for country districts may be altogether unsuited for the buildings in a town; a case in point being the Houses of Parliament.

The difference arises from atmospheric causes—chiefly gaseous contamination; and as the magnitude of a town and the importance of its manufactures increase, so it may be that a stone will be more and more unsuitable. The classes of building material to which I refer especially are those known as magnesian limestones—commonly and erroneously termed "Dolomites;" and also, though in a less degree, to all stone containing magnesia.

I may state that as the quantity of carbonate of this earth, as a constituent of any stone, becomes less,—the objection decreases.

The objection to material of this sort in certain localities arises from its component parts being more or less rapidly decomposable from the presence of acids of sulphur always existing in the atmosphere, particularly in populous districts, its source being primarily the oxidation of sulphur, during combustion of coal, a portion of which acid combines with ammonia, and no doubt, some remains as free acid.

From the affinity which exists between this earth,—magnesia,—and sulphuric acid, they readily combine; and, as the resulting sulphate of magnesia is very soluble in water, it is easily conceived that any building material into which magnesia enters must quickly undergo what is termed decay; and, let me observe, that as the porosity of a stone and its power to absorb

* See p. 461, ante.

moisture increases, so does its liability to destruction, independently of disintegration by frost. Calcareous and sand stones frequently deteriorate in small patches, in holes or veins; that is, in stones which are sound when first prepared.

I have sometimes examined these defective and also the sounder portions, and generally found the first to contain a few per cents. of carbonate of magnesia, whilst the latter have been free or nearly so. I do not know if this has been before remarked by other observers. However, it should not be lost sight of,—it is important. Of course, when the coherency of a part is destroyed by removal of some of its particles the thing easily crumbles, and such is the case with these lime-stones.

It is somewhat singular that in the same number of the *Builder*, under the head of "Church-Building News," will be found an error somewhat like that of Mr. Pain's, but more significant. The words are few, and I will repeat them; they are worth the attention of observant students.

In describing the building of a Presbyterian Church at Leicester, your correspondent says: "The building generally will be faced with rock-faced Bulwall stone, which has been preferred to the granite rubble of the locality, as being in itself equally durable, and forming sounder masonry." (!) Let me observe, *en passant*, that the granite of this locality, although granitoid, is not granitic, but syenitic; a true granite I have not seen produced by the Leicestershire quarries. This is of no importance; yet I mention it because many of your readers are unaware of their not being granites. But to the point: My curiosity was somewhat incited to know what stone was equally durable with granite, and forming sounder masonry! I procured a few specimens, and confess a glance raised my suspicion of its goodness. Not a had-looking stone when seen in the work from a distance; but examination shows it as a very porous mineral,—somewhat as if air had been blown through a mass of crystals. The substance was evidently a lime, and may belong to any formation, geologically, above the "New Red." It is something pulverulent, especially when dry. Its crushing power must be low.

The result of analysis indicates that the stone as a building material is unsuited to urban atmospheres, for it contains upwards of 22 per cent. of carbonate of magnesia, which in Leicester, with its number of manufactories and great consumption of coal, must and will become converted into "Epsom salts," and the natural porosity of the stone will considerably tend to assist in its destruction, apart from the action of frost.

ANALYSIS OF BULWELL LIMESTONE.

Soluble in Acids.

Water	1.91
Alumina and protoxide of iron, with trace of manganese	19.98
Carbonate of lime	53.28
Carbonate of magnesia	22.56
Alkali	00.35

Insoluble in Acids.

Silica, alumina, peroxide of iron, and traces of lime, magnesia, and manganese	109.90
	100.00

The water absorbed is 9.27 per cent., or 1 part in 10.99.

In determining the aqueous absorption, a specimen was thoroughly dried in hot air for eleven hours, and subsequently immersed in water for seven hours,—not a very stringent test. The absorbing power of Portland and Bath stones, I believe, are respectively 1 in 16 and 1 in 13.

In conclusion, let me add my caution against the use of this stone in positions of atmospheric gaseous contaminations, &c., inseparable from a large manufacturing town, for I consider it inferior and inapposite.

Let me add one word, that it would be interesting to know upon what probable grounds the material in question was described and considered by your correspondent as "has been preferred to the granite rubble of the locality, being in itself equally durable, and forming sounder masonry." W. R.

Dumfries Infirmary.—With reference to a paragraph in a previous Number (p. 492, *ante*), Mr. Starforth says the original estimate for his design did not exceed 10,000*l.*, but on the contrary was 9,250*l.*, and the working plans now produced are not in an amended form, as they are strictly in accordance with the original designs. The highest tender was 10,875*l.* 19*s.* 7*d.* and the lowest 8,650*l.* 9*s.* 8*d.*

HOPE FOR THE MINERS.*

AGAIN from out the pit's black mouth arise
Appalling shrieks for help; heartrending cries
Of stifling miners, who, beyond the gloom,
Lie scorched and shrivelled in a fiery tomb!
Down the black shaft a hundred heroes go
With generous eager haste, though well they know
'Tis death to venture in the "fire-damp" wave
That laves their dying mates; so recklessly brave
They rush, in hopes to bring back one dear life,
To agonising mother, child, or wife,
Too of their noble self-forgetting zeal,
Bears them within the gulf, whose flames reveal
Its hellish work, and with their lives they pay
Peril for haste that will not brook delay;
And thus the fearful death-roll is prolonged,
And the pit's mouth with dead and dying thronged.

Is there no hope? Can nowhere help be found
To stop this wholesale slaughter underground?
What has experience done in all these years? . . .
Take for reply those harrowing shrieks, those tears
That thickly rain from widows' orphans' eyes,
As, one by one, from out the pit arise
The scorched and mangled forms they scarcely dare
To look upon, lest those they love he there!

But hark! a calm majestic voice I hear,
That checks the sob and stays the willing tear;
'Tis Science speaks: "Mortal, I give to thee
My fairest child, bright Electricity;
Let but her holy light for ever shine
Through the dim pathways of the fatal mine,
And free from danger, free from gasping dread,
Securely thou may'st walk whilst by her led." . . .
Can this be true? Is there, indeed, a charm
To guard the "venturous miner's life from harm?"
Up, then, ye pit-owners! Up, every one!
Ere yet another day its course has run,
Make,—at least, make,—a trial of the gift!
If it succeed or not, your efforts lift
From off your consciences a heavy load,
Which else had burden'd you along the road
To Heaven,—perchance proved an avenging rod
To drive you thence; and, looking up to God,
But watching, working still, we'll humbly pray
A blessing on the New Hope of to-day.

R. F. H.

THE TRADES MOVEMENT.

Liverpool.—A letter to the local *Journal*, from the Secretary to the Liverpool Master Builders' Association, dated South Crescent-chambers, 6, Lord-street, June 24, says:—

"I beg to enclose you a copy of the wages offered by the Master Builders' Association to competent masons, as an answer to the mistatements made at the trades meeting, held last night at the Oddfellows' Hall, in reference to reducing the wages of the masons in winter by the hour system."

The offer to masons is as follows:—
"There are 250 free-labour masons now at work in Liverpool, and there is constant work for 200 more. The masters invite all masons who wish to think and act for themselves to assist them in their endeavours to free the town of Liverpool from trade union tyranny and dictation (which have had the effect of injuring to a great extent both the trade and the best interests of the workmen), by accepting the employment offered. The wages offered are 7*d.* per hour, or 3*s.* 2*d.* per week in summer, and 7*d.* per hour, or not less than 30*s.* per week during the shortest days in winter, with constant employment. Masons, haster to accept these advantages, and you will find the masters to be your firm friends and supporters. Do not be misled by the emissaries from Liverpool, who make false statements to mislead you, that they may be enabled to live in luxury at the expense of their dupes. Apply to William Wood, secretary of the Liverpool Builders' Association, South Crescent-chambers, No. 6, Lord-street, Liverpool; or to any of the employers in Liverpool, who will enter into special engagements as to the payment of fares to Liverpool."

The offer is dated 21st June.
Manchester.—Strenuous efforts have been made by the master builders, during the last two or three weeks, to procure non-union workmen, and a number of men have been brought to the town; and a fortnight since there were already at work upwards of 300 masons and 150 bricklayers. During the following week, however, the brickmakers took up the quarrel, and refused to make or supply bricks to be set by non-union bricklayers. This is likely, we understand, to lead to the introduction of machinery into Manchester for the purpose of making bricks; and, seeing that there are about 70,000,000 made annually in this city and the immediate neighbourhood, it is rather surprising that it has not been done before. Man-

chester is one of the very few large towns in England where bricks continue to be made exclusively by hand. Two or three companies and individuals have established brickmaking machinery, but the operative bricklayers have refused to set them, and the hand-brickmakers have refused to supply bricks to any master who attempted to use for any purpose bricks made by machinery. The consequence has been that all such efforts have had to be abandoned, and have resulted in loss, if not ruin; but in none of the previous efforts had the master-builders taken a part. They, it appears, went on in the old way, unwilling to encounter a strike as long as it could be avoided; but now, we are told, the matter is to be taken up by the trade. The masters have resolved, it seems, to establish, if possible, free trade in bricks as well as in labour.

The operative carpenters and joiners of Northwich and neighbourhood having given the masters notice of alterations involving a reduction of 2½ hours per week during the summer months and an advance of 1*d.* per hour throughout the year, an equal number of masters and workmen met to consider the subject. On the part of the masters it was contended that the trade of the locality, much less the general trade of the country, did not warrant any change having a tendency to increase the present price of labour. In proof of this the monthly state of the operatives' unions of this trade was quoted. In one report (that of the Amalgamated Society) there appeared only six towns, representing 140 members, where trade was good, against 105 towns where it was either slack, dull, or had, and nearly a similar number said to be only moderate, steady, or improving. Another association (the General) represented matters to be even worse. It was also contended that anything tending to make work in winter unnecessarily dearer than in summer was most suicidal to the interests of the greater portion of the workmen, and that the time worked and the wages at present paid in this locality compared favourably with many towns, in and out of the county, of much greater commercial importance than this. On the other hand, the operatives maintained this was otherwise in several neighbouring towns, such as Warrington, Altrincham, Runcorn, and Chester, where the wages were greater and the time worked less. The result of the meeting was an amicable readjustment of the present rules, chiefly as to phraseology and the number of weeks to constitute the winter months, the working hours and wages to remain as at present. The new rules were signed by Messrs. Bockett, Drinkwater, and Bostock, on behalf of the employers, and by three of the operatives.

It is understood that the dispute between the operative masons and master builders of Bristol has terminated, the masters finding themselves, owing to a want of union in their body, unable to continue the contest.

The masons' strike at Halifax has terminated. The men have returned to their work at the old terms.

The house-painters of Glasgow have resolved to close the strike, their belief being that if now adjourned, the advance of wages asked might be obtained without trouble at the beginning of next year. The men have been out since the 1st of May.

A large meeting of the joiners of Glasgow and the neighbourhood has been held in the Trades' Hall with regard to the nine hours movement. It was reported that eighteen employers were willing to concede the nine hours. Others had either not been waited on or had refused. It was finally resolved to defer the movement till the 1st of March, 1870.

A numerously attended public meeting, convened by the Mayor, in response to a requisition of the inhabitants, has been held at the Town-hall, Oldham,—

"To allow the working-classes an opportunity of expressing their opinions for or against the Bill now before Parliament, to amend the law relating to trade combinations and trade-unions."

The chair was occupied by the Mayor, who said he quite agreed with the spirit of the requisition, which set forth a belief that—

"Should the Bill become law, it would be the means of bringing about a better understanding between employers and employed, and consequently prevent to some extent those great evils, lock-outs and strikes."

He proceeded to remark that the amount of money that had been sacrificed by strikes in Oldham was something incalculable, and any measure that could obviate the necessity of such a mode of dealing with questions affecting

* Suggested by the proposition in the *Builder* by Mr. R. Taylor, an ingenious working-man, to employ sparks of electricity in coal-mines, to detect and consume dangerous gases as soon as evolved, which proposal was afterwards taken up in Paris, and made the subject of a paper.

hour would be a step in the right direction. A resolution in favour of the Bill was carried unanimously, and it was afterwards agreed that a petition in its support should be signed by the Mayor on behalf of the meeting for presentation to the House of Commons by Mr. Hihbert, with a request that Mr. Platt, the other borough member, together with the representatives of this division of the county, would give it their support.

SMITHFIELD MARTYRS' MEMORIAL CHURCH.

On Tuesday last, being St. Peter's-day, the foundation-stone of the Smithfield Martyrs' Memorial Church, which is to be dedicated to St. Peter, was laid by the Earl of Shaftesbury. The site is in St. John-street-road.

It was originally intended to erect the Martyrs' Memorial Church in Smithfield, near to the scene of martyrdom, but this was impracticable. A tablet will, however, be placed there, recording the facts of history with regard to the martyrdom, and will, at the same time, direct to the memorial church, which will not be far from the spot. The edifice will in every respect be a "memorial," both outside and in, to the Smithfield martyrs. It is proposed to affix in some part of the building Chillingworth's motto, "The Bible, and the Bible alone, is the religion of Protestants." Beside this there are to be tablets to every martyr who suffered during the Marian persecution. As regards plan, the church will consist of a central nave, with north and south aisles, transepts, and a well-developed chancel, also with aisles, with a high tower occupying the north-west angle of the nave and north aisle. This tower will form a prominent object, reaching to a height of 120 ft. The lower story is to be an open porch, forming the chief entrance to the building. The western front of the nave will have a four-light window in the upper part, and two smaller two-light windows in the lower, the latter forming the lights of the baptistery. In the transepts there are to be rose windows above, and under the tower level a range of three lancets. Between the rose windows and the last-mentioned there will be, as respects the transepts, sculptured decoration in the shape of bas-reliefs, representing scenes from the Smithfield martyrdoms. The like bas-reliefs will also decorate the panelled spaces beneath the west windows of the nave and the west and north faces of the tower. The buttresses will terminate in canopied niches, containing statues, and the turret top and pinnacles of the tower will contain similar figures. The style of architecture is thirteenth century Gothic. The church is to seat 1,000 persons. The architect is Mr. E. L. Blackbourne. The contractors are Messrs. Dove, Brothers.

THE MISCELLANEOUS ESTIMATES.

On the vote of 17,000*l.*, to complete the sum of 25,000*l.* for the acquisition of land for the purpose of the New Palace at Westminster, and further embankment of the river Thames, Mr. Layard said that the original estimate amounted to 150,000*l.* It had been represented to him that if a fire occurred in those houses near the palace that building would be seriously endangered. The vote was agreed to.

A sum of 34,026*l.* was proposed to complete the amount required for the buildings of the Houses of Parliament. Mr. L. King inquired if divine service was to be regularly performed in the crypt. Mr. Layard said it would be for the House to decide. Mr. Kinnaird said anything more monstrous than the expenditure upon the crypt could not be conceived, and for no purpose whatever. Mr. Bentinck said some absurd statues were lately placed in the Queen's robing-room and other parts of the palace. One of these represented Henry VIII., the fattest man of his age, as a very slight personage; another made William III. a tall man, though it was well known that he was short and small. Mr. Morley suggested that rooms should be provided where members could have intercourse with their constituents. Mr. Miller called attention to the largeness of the amount required for the construction of the subway to the railway station, 4,410*l.* Mr. Layard said he was quite aware of the want of accommodation in the interior of the building. The subway was constructed under a contract. Mr. White proposed to reduce the vote by 2,500*l.* for the purpose of preventing the proposed decoration of walls, to which, he said,

the First Commissioner of Works had ominously referred, and which might involve hereafter some extravagant expenditure. Lord J. Manners thought there ought to be some further explanation. He understood that the First Commissioner of Works confined his remark to the central hall. Was the House to commence the redecoration of the Houses of Parliament? He wished to know whether Mr. Barry was of opinion that the elevation of the roof of the central hall would be in conformity with the style of the building. Mr. Layard said that what he proposed to do was recommended by the report of the architect himself. The central hall was so dark during a great portion of the day that gas had to be used. He did not intend to go further in the way of decoration than he had mentioned. The amendment was negatived. Mr. L. King moved that the vote be reduced by 500*l.*, the sum required for the crypt of St. Stephen. Mr. Kinnaird disapproved of the ornamentations in the crypt, and hoped the amendment would be pressed. Mr. Onslow stated that the ornamentations of the crypt were much admired. Majority against the amendment, seventy-nine. The vote was then agreed to.

BRISTOL EXCHANGE.

Str.—At a meeting of the Bristol town council, on Tuesday last, it was decided, by a miserable majority of two votes, to utterly destroy Wood's fine old Classic Exchange, by putting over the open quadrangle a semi-elliptical roof of glass and iron, which was correctly described by Alderman Robinson as "the chump-end of a railway station," and by another gentleman as "a dish-cover." Having seen the model, I can state that a more unsuitable design for the purpose could scarcely be imagined; and I am quite sure that every professional man, and almost every citizen, who may see what is intended to be stuck up over the finest architectural work of the kind in the West of England, will be indignant that such an act of "Vandalism" is really intended to be perpetrated.

Pray, sir, lend your powerful aid to prevent this shameful act. W.

THE ROYAL COMMISSION ON WATER SUPPLY.

On the 24th of December, 1866, a Royal Commission was appointed to inquire fully into the water supply of the metropolis and other large towns. This Commission, consisting of the Duke of Richmond, Sir John Thwaites, Col. Harness, Alderman Sir Benjamin Phillips, Mr. Thomas E. Harrison, and Mr. Joseph Prestwich, was re-appointed early in April, 1867. The report of the Commissioners, bearing date the 9th of June, 1869, has just been presented to Parliament. The origin of the Commission, it will be remembered, was due in a great measure to the public interest which was excited, during the autumn of 1866, in all matters connected with the water supply, more especially of the metropolis, through the uncontroverted evidence of its direct influence upon the mortality from cholera, during the epidemic which then prevailed. The report in question, no doubt, contains a valuable contribution to what was already known upon the subject; but considering the vital importance of the inquiry, and the circumstances under which it was instituted, the delay in its publication appears somewhat unreasonable.

The principal points to which the attention of the Commission was directed were,—first, the present and growing insufficiency of the water supply in the metropolis and other large towns, and the consideration of different suggested sources for supplementing or substituting that supply; and, secondly, the pollution to which the rivers and open streams from which the water now supplied to the metropolis and other large towns is drawn, is continually exposed.

The inquiry naturally took two distinct channels, one relating to the present water supply of London and other large towns, and the other to the merits of the several rival schemes for supplying the metropolis from completely different sources from the one now used, namely, the Thames and its tributaries.

We can only now touch upon one or two of the conclusions and recommendations to which the Royal Commissioners have committed themselves, after this extended inquiry. They pronounce Mr. Bateman's scheme to be "in an engineering point of view, feasible and prac-

ticable," but recommend "great caution in judging of the sufficiency of a gravitation scheme of such magnitude." The quality of the water would be, they say, "satisfactory as regards purity," but in point of softness and colour they consider that it might prove "less suitable for the supply of the metropolis than the harder water at present used." The cost of this scheme would, according to the evidence produced, be at least 11,000,000*l.*; and, if it be taken for granted that this estimate would not be exceeded, we are told that the cost to the metropolis of obtaining water by this scheme would be much greater than under the present system. The scheme would probably be opposed strongly in Parliament by the interests connected with the River Severn, and great local anxiety would be felt as to the formation of immense artificial reservoirs at the head of the Severn Valley. The same general remarks and objections are said to apply, in the main, to Messrs. Hemans and Hassard's scheme for supplying the metropolis from the Lake district; indeed, the Commissioners, in leaving this branch of the subject, express grave doubts "whether it is desirable that the metropolis should be dependent on one source of supply so far removed, and which might be liable to accidental interruption."

Having thus pronounced against the various projects for deriving the water-supply of London from a distance, it is easy to imagine that their deliberations have led them, not hastily, to conclude that the Thames basin affords the most natural and desirable source for the supply of the metropolis. The Commissioners are of opinion,—"That the river Thames, supplemented if necessary, by works for storing the flood waters, together with the river Lee, and the water obtainable from the chalk to the south and south-east of London, as well probably as from the Lower Greensand, will furnish a supply sufficient for any probable increase to the metropolitan population." These considerations have been arrived at by the evidence of the abundance, permanence, and regularity of the supply from this source, the supply streams of which are self-maintaining, and the collecting area of necessity much larger than any that could be made available on the gravitation system. As to the quality of the water supplied by the water companies, they pronounce that the weight of evidence is in favour of its generally good and wholesome character; that for drinking purposes it is quite unobjectionable, and in no way prejudicial to health, more especially as hard waters were in evidence declared to be more free from certain dangers inherent in soft waters, on account of their great solvent powers. The hardness, moreover, of the Thames water was said to be moderate in degree, and therefore not radically objectionable for cooking or washing purposes, while the proportion of the whole metropolitan supply need for manufacturing purposes was stated to be too small to render it necessary to go to a great distance for soft water. The Commissioners declare that perfect filtration is of the first importance to the good quality of the water supplied, and state that "this process is at present in many cases very imperfectly performed, and that more efficient means of enforcing the provisions of the law in this respect are required." They state, in conclusion, that "when efficient measures are adopted for excluding the sewage and other pollutions from the Thames, and the Lee, and their tributaries, and for ensuring perfect filtration, water taken from the present sources will be perfectly wholesome, and of suitable quality for the supply of the metropolis."

As to the quantity of water likely to be hereafter required for the supply of the metropolis, the Commissioners are of opinion that, even entertaining the possibility of an eventual increase of the population of London to between four and five millions, a supply equal to 200,000,000 gallons per day is the highest demand that need be reasonably provided for the metropolitan supply. It appears that the existing companies are prepared with only moderate additions to their present engineering means to supply a quantity little short of this amount.

The system of constant service is recommended for adoption to the furthest possible extent in the supply of the metropolis, and the Commissioners say that it "ought to be promptly introduced." Seeing that this cannot be effectually carried out "as long as the supply remains in the hands of private companies, to whom it would be inexpedient to confide the great powers

necessary for the purpose," the Commissioners are of opinion that "the future control of the water supply should be entrusted to a responsible public body, with powers conferred on them for the purchase and extension of the existing works, and for levying the rates," which would be necessary for the support of the system.

We hope on some future occasion to return to the discussion of one or two of the conclusions arrived at by the Royal Commissioners, which are in the main acceptable; but in concluding this brief notice of their report, we cannot refrain from expressing a regret that they have not declared an opinion as to the possibility of "excluding sewage and other pollutions from the Thames and the Lee, and their tributaries." It is on the very possibility of this supposition being carried into effect that the value of their conclusions and recommendations appears to us most essentially to depend.

THE ARTISTIC TREATMENT OF PIERS, PILLARS, AND COLUMNS.*

THROUGHOUT Gaul, the Roman colonies were very rich in buildings of public importance, with that amount of grandeur and decoration inseparable from such; but by far the greater part of them had vanished completely after the barbarian invasions to which the province fell a victim. Here and there, however, works remained to influence the new possessors of the soil when they at last turned their energies in this direction. But at best these Roman examples were rude, except, perhaps, in the extreme south, and taught little more than how to build well. In their details they displayed that ignorance of their models which betrayed their provincial origin, and it is well that thereby so much was left to the quick imagination of the new builders.

In their first attempts at building, the columns from the older edifices and ruins not being of sufficient strength to sustain the enormous weights which the hardness of the work and the thickness of the wall necessitated, they first need them rather as ornamental accessories in the angles of the piers, and from this came the habit of using the angle shaft, so long a feature of early work. One of the best examples of this method is seen in the Baptistery of St. Jean at Poitiers, where all the principal projecting angles of the interior have a complete shaft, capital, and base, the shafts having the usual entasis imitated from the ancient models, which fill below the necking forming part of the shaft. But as soon as this mode of decorating the angles of the square pier became common, a less expensive and difficult arrangement had to be adopted, and we find the angle shaft built up with the rest of the work in regular courses. This rendered the setting out of the regular diminution too difficult for the ordinary workman, and it was omitted altogether in such a position. Another mode of using the column was by placing it against the face of the pier, to carry one or more orders of arches, somewhat after the fashion of the piers and pilasters under the arcades of Roman work. A fine typical example of this treatment is found in the cloisters of Le Puy Cathedral, and it is seen in this how the proportions of the shaft and capital have undergone modification by the new manner of building. The habit of forming much more solid piers to carry arcades has tended to make the old canons of proportion neglected. In this case the shafts are only about six diameters high, the capitals massive, and the bases very pronounced. These alterations in the size of the capital have been the result of a fusion of some of the members of the entablature with the abacus, and the result has been a capital apparently much more capable of doing its work than the model from which it was taken.

If we analyse the parts we shall see how this has come to pass. In imitating the Roman cornice, or in constructing the broken fragments of a building of that style, we find that it was customary to omit the frieze altogether, putting the cornice itself directly on the abacus of the column. A good example of this is seen in the apse of the church of Alet, where all the parts are perfect, except the frieze, which is omitted. Throughout France and Germany numerous examples occur of this; and, as the cornice gradually became smaller, and more akin to a string marking the line of the arch-springing, the fusion became complete. But the

abacus, though thus overpowered by the additions above it, was never lost, through all the best and purest examples of Gothic work in all countries, and may be easily separated, even where the two are formed out of one stone; and it will be generally found that the face of the abacus is in the same plane as the wall above. But this alteration of the Roman mode involved another important change. The great piers of built masonry were strengthened by themselves, or strengthened by the addition, as at Le Puy, of shafts, were crowned only by this string, and not by a capital; and thus we see the origin of so peculiar and, at that time, so unprecedented a treatment of capitals, as the circular ones in the cathedral of Carcassonne. And this distinction between the piers and pillars is kept up through all the best periods of art, where the true capital is given only to the pillar, single or grouped.

Of the several orders employed by the Romans, only two came to be very distinctly imitated by the Romanesque builders; and although for a time each appeared likely to be the model on which all later examples would be founded, the more finished and lighter one gradually extinguished its rival. These two forms were the same, which, with different details, had for long been used side by side in each of the preceding styles, and which had in each played the same parts. They are best distinguished as the convex and the concave. With the Egyptians the early ind-shaped capital gave place to the full-blown flower; with the Greeks the Doric yielded to the Corinthian; and the rude, coarse Tuscan, under the Romans was soon displaced by the more finished and elegant Composite capital. And when the earlier builders in our own country and France commenced to work out for themselves that new style which was to contain the excellences of all the others, their first tentative efforts were directed to the enrichment of this form of capital, rather than to that other, which afterwards so well adapted itself to the more light and elegant details of the succeeding phases of the style. There is no doubt that when the revival in art first began there were numerous examples of Composite and Corinthian capitals found in the land for imitation; but they required more skill in the execution than the ruder forms of Roman Doric, especially as the details of that order were not nearly so finished as in Italian examples. In the Porta Nigra at Trèves, at Vienna, and other places, are specimens of the rough way in which it was worked, and which, although executed in the times of the Roman occupation, show most distinctly signs of the complete cushion capital.

Although, in many cases, it would seem that this form was roughly prepared in the stone and carved at later times, when the skill of the workman had increased, it was more common in the richest examples to trust solely to colour as a relief to the bald and ungainly shape. Examples of this still remain at Roshaim, Jamieges, Moscow, and other places, while cushion capitals carved afterwards are frequently met with in our own country and abroad. After the custom of using these capitals was established and Romanesque architecture had arrived at a considerable degree of perfection, the ornament with which they were covered was always of a flat nature, generally running up horizontally round the cap and not springing up from the necking, thus to a great extent betraying its origin in painted decoration. There is no doubt that this peculiar and heavy form of capital was admirably fitted for the part it played among the bold and massive details of Early Gothic, but that it was for this purpose specially invented, or evolved from the intersection of the cube and the hemisphere, is, I think, much less probable than the theory I have given. But that there may have been another cause is possible. It is not unlikely that many buildings had their capitals boasted out for the carving which there was not skill to execute, and these, left in the rough or eventually painted, might give the suggestion required. Eastern influence may have done more, especially in the south of France, where, not only the capitals, but so many other features, bear strong evidences of its presence. But, whatever the origin, whether an imitation of the coarse Roman models or a reflection of Sassanian art, or still more improbable, the natural outcome of the necessities of the work, it is certain that for long the convex form of capital was common throughout Christendom, and it was only when it came to be fairly compared with the other model that it gradually gave way to its superior elegance.

There is an curious example at Notre Dame du Port, Clermont, where one of these rude Doric caps is placed side by side in the same pier, with a quite as rude copy of the Composite; and although both are as coarse as well can be, the superiority of the latter to the former is most marked. But in some of the more refined examples the carving goes very far to redeem the shape, and not a few in South France are as richly and elegantly carved as the best of Byzantine work, the influence of which is very apparent in such cases as Le Puy, Issoire, Brionde, &c. There is a point that Mr. Ruskin notices particularly about these early capitals, namely, that the line of carving in the convex ones is always sunk back from the face, while in the hell-shaped it is invariably applied to the curve; so that in all the best examples you will find that the carving of a capital will be bounded between two lines, concave and convex, and anything thrown out beyond becomes very emphatic, as the crocket angles of later French work, but liable, if overdone, to be coarse and unsnaphy.

In the imitation of Composite capitals there were few difficulties to get over beyond the mechanical one of the stone carving, and for awhile they contented themselves with copying anything they could get, until they had so far mastered the style as to have the confidence to make slight alterations in the arrangement of the foliage, and introduce fresh varieties. One of the earliest alterations was the simply dividing up the whole into leaves, placed as in their classic models, but omitting altogether the deep indentations and serrated outlines, giving a breadth of effect very telling when in close comparison, as is frequently the case, with capitals copied more exactly from the antique.

It is a noticeable feature in some of the great capitals of the simple cylindrical shafts, that where arranged round the apsidal end of a choir, their abaci were not unfrequently curved to follow the line of the processional path. This is very marked in the choir of S. Remi at Reims, and is seen in the bases of the piers of S. Bartholomew the Great, London.

The earlier forms of capital long survived another feature of classic origin, with which at first they were closely allied. The entasis early succumbed to the mechanical difficulties in the way of its construction, or the indifference of the builders, to a feature of such refinement. It was no easy matter for them to set out on the heads of stone the gradual decrease of the diameter, and thus the entasis came to be at first confined to the smaller monolithic shafts which could be easily turned in the lathe. Of these, good examples occur at S. Michel Le Puy and Gelnhausen and other parts of Germany. And when the habit of using the large circular piers without any bulge, became confirmed, the regard for the entasis died out, although the mechanical skill of the builders had much increased.

The decoration of the piers and columns was by no means confined to the capitals and bases in early work, and it is not unlikely that the habit of richly decorating their shafts tended to enhance the difficulty of using a diminishing column. Plenty of Roman examples remained to give the first idea for such work, and the simple channelled piers of La Charité sur Loire and Aunay, as well as the richly-ornamented shafts of Le Puy, show how readily they took to the idea. In England, a common and not ungraceful mode of decoration for the great Norman piers was by incised chevrons or interlaced work, the examples of which are so well known from Durham and Waltham Abbey. One or two examples remain of an opposite treatment, but the peculiar specimen from S. Lawrence, Pitlington, of a boldly projecting roll winding around the shaft is a warning that such decoration applied to a pier of any size would be most unfortunate.

The gradual disuse of these forms of applied decoration resulted from two causes,—the breaking up of the great piers into smaller grouped shafts, and the introduction of marble. The latter was a material too hard and altogether unfit for such a style of treatment, and was, therefore, left to its unassisted natural beauties, possibly heightened by polish. But this is, I hope, doubtful, in spite of the remains of fragments found at Salisbury and elsewhere worked to a considerable degree of polish. There can be, I think, but one opinion that the substitution of the mere mechanical work of polishing for the more artistic modes of decoration previously employed was a step in the wrong direction. And this for no abstract principle involved, but simply because this introduction of a material so unlike the rest of the work, in a position of such

* By Mr. J. Tavenor Perry. See pp. 450 and 500, ante.

importance, tended to break up the mass to the extent of weakening the appearance of support, and detract from the very assurance of strength it was intended to inspire. The effect of a series of highly-polished dark marble shafts let in the angles of piers and windows is at first rather that of deep vacancies than supports, and much less happy than where the simple gray tint of unpolished marble harmonises with the rest of the building, as in Westminster Abbey. The love of breadth, or the absence of materials, preserved the great chanoines of France from suffering by these violent contrasts; but to this day our love for strong marbles is only equalled by our excessive admiration for plate glass and French polish.

A few cases remain where painted decoration has been happily employed on the columns. One of the best of these is in the north transept of the church of Our Lady of Charity, Faversham, where an octagonal Early English shaft has a series of figure-subjects ranged round it in bands, much in the same way as found in Egyptian temples and Russian churches.

The breaking up of the great piers into grouped shafts was brought about chiefly by the alterations and advancement made in the roofing great spaces, and thus still further concentrating the weight and thrust upon particular points, requiring their reinforcement by increase of bulk or compactness. The very common mode of covering the naves of the churches by wooden roof, carried on stone arches crossing at intervals, and dividing them into bays, caused the alternate piers to be much thicker, and necessitated the vaulting shaft carried up the whole height of the church, and resting on or grouped below with the piers of the nave arcade. This introduction of the vaulting-shaft in the nave led the way for that admirable arrangement of colonnettes which became so usual throughout all pure Gothic times, and which allotted to each rib of the vaulting or arch of the arcade its particular means of support, and grouped them around some main pier that carried a large proportion of the superincumbent weight.

The new arrangement caused many further modifications in the details. The capitals of these smaller shafts were, to a great extent, made independent of the capital of the larger pier. The super-abacus as a rule mitred round all alike, but the capital itself was generally made deeper in the large pier than to the small surrounding columns. Examples of this are to be found in many of the French cathedrals, as well as at Chichester, Salisbury, &c., in our own country. But at Chichester the mouldings of the super-abaci, as well as of the bases, are of different sections, and intersect in a manner less happy than peculiar. This difference in the heights of the capitals was not at first, perhaps, altogether the result of intentional regard for proportion, although in the result so fortunate. The upper bed of the stone which was of the depth of the smaller capitals, was generally of one stone, to form, with the super-abacus above, at once a tie to all the parts of the pier, and a means of evenly distributing the pressure over the whole. The horizontal joint which this necessitated across the carving of the great capital frequently suggested a charming treatment. A curious example of how important the Medievals regarded the distribution of the pressure over their grouped shafts, and the necessity for a medium capable of the task is seen at Salisbury, where is introduced an abacus made of bronze. This is in the centre of the west front, and it may have been thought that the great weight to be carried rendered an abacus so deeply undercut as are those of the Early English period liable to flake off in a material of less coherence.

The treatment of the abacus differed very materially in England and France. In the latter the much more common use of vaulting had the effect on the abacus of defining much more exactly its shape, which followed accurately the general outline of the mouldings or shafts placed upon it, and the arrangement of the foliage below was so regarded as to enhance the effect of strength given to the point on which there was the appearance of the greatest pressure. Add to this the depth given to it, and the simple bold mouldings formed on its edge, and we see that it is little wonder that it so favourably contrasts with the weak and lincey effect of our own Early English examples. With us, however, the form of the abacus, as a rule, followed that of the shaft beneath, whether in single or grouped examples, until the circular form of capital

became so established that piers, which are either square or octagonal in their arrangement, not unfrequently had above them circular abaci. Those of St. Hilda, Hartlepool, are good examples of this peculiarity, where the forms are very varied, being sometimes grouped shafts, and sometimes compound piers, but in all cases the abacus is simply a circular stone, fitting neither the square bold plan of the mouldings above nor the piers below. Compare to these the very similar piers from S. Etienne, Beauvais, and you will see how much the English example loses by its want of appropriateness in this respect. At the east end of Chichester are some similarly treated piers, where a circular abacus is placed in the same manner, over three shafts, standing wide apart, and only united at the cap and base. Numerous exceptions to this occur, as at Canterbury, Stamford, All Saints, Staughton Parva, &c., which it is impossible in a paper like this to particularize, although the examples are very interesting. In England a great alteration in the character of the foliage was the natural result of this change of the form of the abacus, as the antique mode would not readily adapt itself to the much altered circumstances. Here, too, we never had the numerous models of ancient sculpture for imitation, and our masons did not so early arrive at that perfection of carving which characterized the work of French artists. There were, thus, fewer trammels to hold us to that form which so peculiarly points to a classic origin; and this perhaps is scarcely a matter for regret, for although later in the field, and much more rarely called upon to produce works so grandly monumental, our sculptors attained a very high degree of excellence, and showed, in their treatment of the capital at least, more variety and imagination than their neighbours. The graceful and strange animal forms frequently introduced gave life and vigour to the whole, and made such works as those in the chapel of the Nine Altars, Durham, comparable with the best efforts of any age or country. On the other hand, the boldness of the crockets with which the French emphasised their angles and heavily weighted points, often became, from mere frequency of iteration, wanting in that piquancy which at first appears so striking, while the constant change and delicate beauty of the early English foliage are never monotonous or tiring.

Another new and important feature here first introduced to us is the band. While the whole mass of the pier was built in regular courses of masonry extending through the whole breadth, no other bond was required; but directly the smaller shafts, formed of different materials and of different density, were introduced, some tie capable of holding together the various parts became necessary. The plan already suggested by the treatment of the abaci gave sufficient suggestion, and like them the bands were usually nothing more than plates of stone, moulded on the edge, going throughout the pier or respond, holding the whole together or to the wall. In our own country we have one or two metal examples. At Salisbury they are simply hoops of bronze, with long hooked ties connected therewith, which were built up in the courses of the central shaft. The copper bands at Westminster are even better known. The stone bands across the wall shafts of Noyon and Laon cathedrals form remarkable features in these buildings, and are useful otherwise than for the construction, by marking more particularly the graceful proportions existing between the central and side shafts. At Noyon the bands are 7 in. deep, and occur every 4 ft. or 5 ft. At Chichester, where some of the wall shafts project a considerable distance from the wall, a long tie of Purbeck marble, well bonded into the wall and elaborately wrought with foliage at the sides, is worked into a moulded band on the face. The necessity of the bands is shown in some cases where they have been omitted. In that rather peculiar and beautiful Early English church at Hythe are several examples of Purbeck shafts, 4 in. or 5 in. thick, which have been bent from their own incapacity to bear the weight above without lateral support. This, too, may be seen in the porches of St. Alban's Abbey, where are several specimens of the peculiar way in which Purbeck shafts will sometimes yield and laminate if not put up headways. Where hands are used they are generally evenly spaced, as any irregularity is likely to give an appearance of distortion to the pier; but in some cases, where near the eye, and where the unequal spacing is too marked to appear anything but intentional, the effect is

good, as at S. Julian Brionde, where a hand is used at about a third the height of the shaft. The bands were not used only for the purpose of holding several shafts together, but were often placed in the centre of a single shaft, when that was built in two or more large stones, as at St. Peter's, Northampton, where there is a richly-ornamented deep hand introduced. As the style advanced and the separate shafts became gradually so united with the main piers as to allow of the whole being built up together in ordinary masonry, the absolute need for bands disappeared, and we find the great clustered shafts of Bourges and Le Mans rising their whole height without any break whatever; and it is a question, had they been cut up with bands as were the smaller piers at Noyon, if they would ever have had the grand and monumental effect they now present.

There is no feature connected with our subject of more variety and delicateness of execution than the base, and yet there is none in which the original model was so well preserved in all countries and through all ages. The Attic base from which the earlier Romanesque bases were copied, became in the hands of the Gothic builders more refined in its outline, with more deeply-cut hollows to throw out in strong relief the delicate fillets which bounded them, and which were set at such angles as would reflect the greatest light. The lower roll in the great bases became very pronounced, and, at times, the hollow was enriched with carved ornament. In Continental work the base was generally raised higher than in our own, and exhibits a much more carefully thought-out section than ours, although we have more members in a base of the same size. The bringing the base nearer the eye required that more attention should be devoted to its refinement and fitness than would be the case with other mouldings, and we find in them all the delicacy and finish of the finest Greek work mixed with that boldness of shadow and sharpness of outline so characteristic of Northern Gothic. Although our base differed from the French in none of its general arrangements, there was one matter of detail modified by slight differences of treatment. The hollow between the rolls being nearer the eye in the French example, the upper half of the shade in the hollow would be sufficiently seen to give the relief required, but with us the frequent absence of defined shadows, and the lower position of the base caused the hollow to be cut down to such a depth and in such a manner as to hold the water and moss.

The manner of raising the bases on high plinths, so common on the Continent, is very superior to the classic models suggesting the idea. The heavy mouldings which, in the antique examples, crown the plinth are here omitted, and the base mouldings form a graceful and gradual junction between the plinth—the true constructive base—and the shaft. The plinth, following the abacus, was generally angular in shape, and the expedients resorted to for hiding the exposed corners resulted in the introduction of the Claw. This is to be found in all Early Gothic work of most clever and appropriate designs, and it seems a pity that a feature so elegant should, by the rounding of the bases, and omitting the plinths, have gradually fallen into disuse in England. The plinths were frequently reduced to their smallest size possible with good construction, especially as the style progressed, and the lower roll of the base allowed to project considerably beyond the plinth. And this effect was often further enhanced by chamfering so much of the upper edge of the plinth as was left exposed, and stopping the chamfer square under the base, as in the choir of St. Hilda, Hartlepool, and commonly throughout France; while in S. Cyr, Nevers, they have gone to the extent of placing a small corbel under the projecting moulding, thus appearing to carry the weight.

Plinths came much more into use in the later styles of our own country, but rather on account of the introduction of benches into our churches than from any felt constructive necessity.

It will be unnecessary to pursue further our subject in the later periods of the Gothic and Revival, as I sought only, when commencing this paper, to trace the various features from their birth to their perfection; and, although instructive, it would be scarcely interesting to follow it, step by step, to its end and degradation. In the country, where, perhaps, the column was brought to its most perfect form and proportions, it was reduced to its most meaningless deformity. Side by side in Senlis Cathedral you may see columns rivaling the purest Doric for grandeur, and the

most delicate Corinthian for refinement, with those meaningless abortions so common in Flamboyant work, wanting in all the essentials of a column, and looking like nothing so much as petrified harley-sugar.

In briefly concluding this paper, I would just indicate one or two of the most important points to be learned from the subject. The complete column, as used in the best periods of art, was the natural outcome of the wants of the builders, and no detail or feature was suffered to be present merely for its æsthetic value. No ornament applied was in any way allowed to interfere with its constructive value, and weaken its apparent strength. But it too often happens now that a capital is only introduced as a means of showing off lacily copied carving, or to be, as defined by our chief Architectural Dictionary, merely an ornamental finish to the top of a column. The construction of the pier must depend entirely on the materials in reach, but it should always convey an idea of strength and ability to sustain the super-imposed load, and should therefore be one of the last members to receive decoration. But just now, unfortunately, there is a fashion of employing richly-veined shafts to support negligently capitals of twice their height, mere lumps of meretricious ornament introduced at the expense of solidity, or to cover a want of taste and proportion. Granite columns bearing cement entablatures and polished marble shafts corielled out to carry exaggerated dripstones, are features not uncommon in City forms of Victorian architecture; while, if a model at the South Kensington Museum is correct, it may yet be our fate to see grouped shafts "after the Gothic manner," with a regular entasis, looking like a stack of hop-poles trusting to one another for support, and as incapable of sustaining any weight. But a slight acquaintance with the best examples of the past would prevent the occurrence of such anomalies, and I have therefore presumed in so long a paper to give such an historical account of the whole matter as might clearly show the leading principles which guided architects in their treatment of this feature through all the best periods of our art.

WIRE TRAMWAYS.

ALTHOUGH the railway system is now in its fourth decade, we are still in the habit of drawing comparisons between its speed and comfort and the days when the performance of a coach journey between London and York was thought no common feat. Yet this very mode of transit was a sharer, to a large extent, in those obstacles which always present themselves to all new inventions—obstacles which, while distasteful to originators of new schemes, are not without conspicuous advantages, inasmuch as they serve to test, in a tolerably conclusive manner, the real merit of each new invention presented to the public.

No inventions are more likely to contribute to the welfare of mankind than those tending to promote and increase the facilities for inter-communication between different places, which adds to man's power to render himself *en rapport* with his fellow man or which enables him to transmit the produce of his land, whether vegetable or mineral, at a moderate expense to the point where a want for such produce exists. It is well known that one chief obstacle to the advancement of many, if not of all, our colonies, is the difficulty of transmitting the produce raised or manufactured by the settlers to a market at such a moderate expense as will admit of a profitable business being transacted alike by the buyer and the vendor. In numerous instances mines otherwise valuable at present remain useless to their owners, although in many cases but a moderate distance from a railway station, simply from the excessive expense of any arrangement hitherto available for transporting their produce, in consequence of the obstacles which present themselves to the construction of any roadway.

The present railway system has, however paradoxical the statement may seem, in one sense fought against itself. It is during the days of its infancy it has been decidedly an expensive system. The laws of physics were studied by early engineers to the neglect of those of commerce, the result being that while in certain districts we have unprecedented facilities for travelling or transmitting our goods, yet we find our railways are not profitable, nor is the system so generally applicable to all exigencies as to render it anything like generally available

for all purposes of transit. In a word, a railway, to realise even a moderate profit, can only be made where there is a large general traffic, and considerable natural facilities for its construction. Such a system as this is useless to transmit the produce of some quarry or mine of value, but which is surrounded by a rugged country abounding with ravines and precipices.

There is a mode of transit which has been practised in India and Australia by means of a rope stretched from point to point, but which as yet has been only what may be called a local arrangement used principally for bridging rivers or ravines. A scheme has lately been brought before the public which proposes an extension of this arrangement, and to apply it to the transmission of goods over long distances through countries where the ordinary railroad, from the reasons already stated, is inapplicable. The system known as the wire tramway is an attempt to convey goods over natural obstacles at so moderate an expense as to render it possible to profitably work collieries, mines, quarries, &c., situated in wild or mountainous places. The scheme is still comparatively in its infancy, and is capable of much development, but the essence of the plan is perfect, and a wire tramway—as it is called by the inventor—is already in actual practical operation, a line of three miles being successfully worked in Leicestershire at this moment. It runs from some granite quarries—the property of Messrs. Ellis & Everard—at Markfield to Bardonia, a station on a branch of the Midland Railway. The line is conveying stone from the quarries to a powerful crushing-machine at Bardonia, to be broken for road-metal. The line has been constructed to carry 100 tons a day, but has never as yet been worked to its full powers. It is actuated by a double-cylinder portable engine of sixteen-horse power, but which, like the tramway, is not nearly fully worked.

The nature of the scheme is simple, and has been already briefly described in these columns. It may not be needless, however, to recur to it. To suspend a weight from a rope supported by a post at either end would seem simple enough; to move the rope with such load would likewise appear easy to accomplish; but to cause the load to pass the post is another matter, but yet one that a little reflection will show can be managed without difficulty. The rope passes twice over the ground in one of the modes of arrangement, being, in fact, an endless belt passing at one end of the line round a Fowler's clip-drum, and at the other round a large pulley, or wheel, with a deep groove in the rim. The rope between the termini is supported on posts of any reasonable height, resting at these points on small wheels grooved in the rims, to prevent the rope slipping from them. On motion being communicated to the clip-drum, the rope moves also at the same speed as the periphery of the drum, of course. Any weight hung on the rope will move with it, and supposing the weight to be able to clear the posts it will move from end to end of the line, and were it not for the drums at the ends would move continuously; indeed, by proper arrangement and formation of the hooks, they would pass round these, and then the load would move continuously if required. The posts which support the rope are placed midway between the up and the down line of rope, and have at their upper extremities cross bars, at whose ends the grooved wheels are placed at such distance from the upright as to bring them in a line with the rope; these wheels act as friction rollers, and rotate as the rope moves.

The rolling stock, if we may call it so, consists of a number of boxes, each of which is provided with two iron hooks lined, where they rest on the rope, with wood; the shape of these hooks is the method whereby the boxes pass the posts. At the place where they hang on the rope they are simply hooks; a little below the rope, however, they spring back with a curve, similar to that of the bar which suspends the flat pan or plate used for weighing butter, &c., by cheese-mongers. This curve leads the hook or hanger clear of the wheel supporting the rope, and when quite below, it bends in horizontally, and supports the box which thus hangs below the wheel, its centre of gravity coinciding with the centre of the rope. When the rope moves the box moves, and the depth of the groove in the supporting wheel being but little in excess of the diameter of the rope, and the wood liners of the hooks being suitably curved, they pass gently up on the edge of the wheel and down the other side to the rope again, without perceptible jerk of any kind. From the foregoing it will be obvious that

so long as the supports and rope are of sufficient strength to sustain the load and the hauling power adequate, any given load may be transported from place to place without difficulty. The boxes will hang true, irrespective of the shape of the hangers connecting them with the rope, so long as the centre of gravity is kept in a proper line.

The question of curves may be dealt with in a variety of ways. The plan at present adopted at the Markfield and Bardonia line is a series of wheels set with their axes at an angle both with the horizon and also with each other, so that they would, if produced, meet in one common point, whose distance from the wheels would be proportionate to the rapidity of the curve. The number of wheels varies with the amount of alteration of the direction of the rope that is found necessary. The arrangement at the unloading end of the Bardonia line is simply a light angle iron, curved round the same centre as that of the clip drum, save that it is farther away from the latter, in the opposite direction to the line of rope. This angle runs parallel with rope for 2 ft. or 3 ft., and at the incoming side, curves gently up higher for a short distance, and then inclines all round to its other extremity, which is a little below the rope level. The hangers of the boxes are each fitted with a little grooved trunnion, and as each box comes to the angle iron, these trunnions pass on to it, and the impetus of the box causes it to run the trunnions up the angle iron, thereby lifting the hooks from the rope, and it then has the falling incline, down which it runs to an attendant, who unsets the box over a railway truck standing beneath, and when empty allows it to pursue its course along the angle iron till it rolls gently on to the rope, to pursue its way back to the quarry at Markfield, where a somewhat similar arrangement is provided, the boxes being there shunted by hand to be loaded. These arrangements are all capable of sundry modifications.

The general dimensions of the details of the Bardonia line are as follow:—The posts are from 10 ft. to 12 ft. high; the carrying wheels are 15 in. diameter on the bottom of the groove; the posts are about 150 ft. apart, with one exception, where it was found necessary to place them 600 ft. apart; the two supports here are about 40 ft. in height. The clip-drum is 4 ft. 6 in. diameter; the distance between the up and the down line being also 4 ft. 6 in. The rope is a wire one, 1 1/2 in. in circumference. The speed of the boxes is about four miles an hour, though this may be considerably exceeded. The boxes carry about 1 cwt. of stone, when loaded.

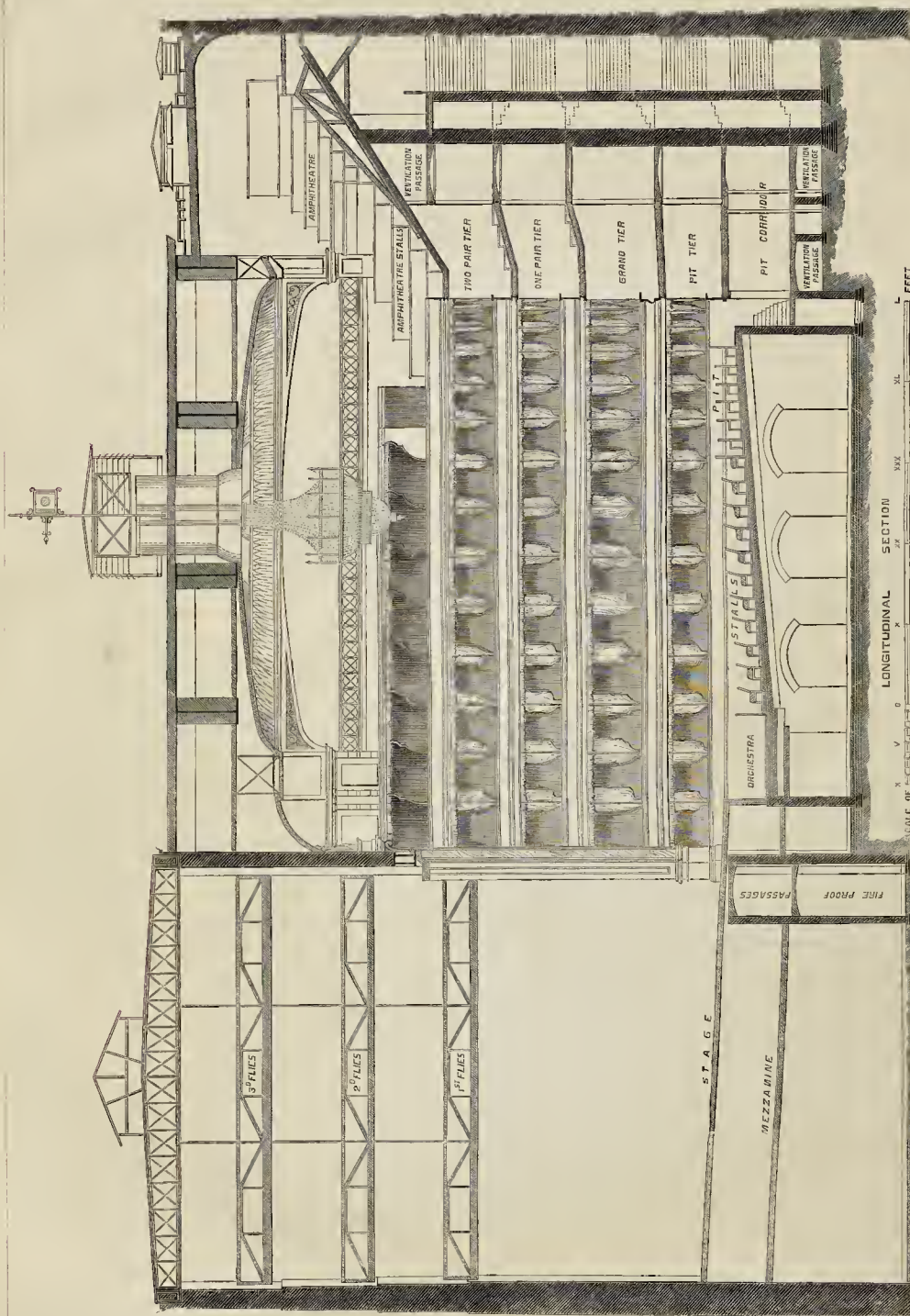
There is much reason to anticipate that the principle of moving loads, especially minerals, along a rope, will prove of much value to contractors or others engaged in erecting large buildings, from the facility with which a line can be constructed between quarries, brickfields, &c., and the scene of operations. Large structures, taking two or more years to complete, could have their lines put up at moderate cost, and on the completion of the work the line could be removed elsewhere. The contractor could have either his own post and rope, or hire so many thousand yards or so many miles of line, for such time as he required.

The employment of the system promises, too, the development of mines hitherto either unprofitable or altogether unworked for want of cheap transport. In a word, it promises to supply that which ordinary railways do not furnish, a line portable, cheap, and which may be any length from 100 yards to 100 miles. Some doubts have been expressed as to whether it could ever be worked on the system of a main line and branches, whereby more than one colliery or mine could be worked at the same time. There is no difficulty whatever in arranging such a system, the only requisite being suitable shunting arrangements and to have the main line a little stronger than the branches. Colliery proprietors and others possessing mineral property appear to entertain a sense of the probable value of the scheme from the inquiries they have hitherto been making into the matter.

HER MAJESTY'S THEATRE, LONDON.

In addition to the previous illustrations of the new theatre in the Haymarket, we give in our present number a Longitudinal Section of the building.*

* See pp. 508, 509, ante; and vol. xxvi., pp. 611, 612.



SCALE OF FEET
 SECTION
 LONGITUDINAL
 HER MAJESTY'S THEATRE, HAYMARKET.



MECHANICS' INSTITUTE AND SCHOOL OF SCIENCE AND ART, KEIGHLEY, YORKSHIRE.
MESSRS. LOCKWOOD & MAWSON, ARCHITECTS.

KEIGHLEY MECHANICS' INSTITUTE AND SCHOOL OF SCIENCE AND ART.

The erection of a large building for the joint accommodation of the Mechanics' Institute and School of Science and Art has just been commenced at Keighley, a rising town in Yorkshire. The Mechanics' Institute here was one of the first established in England, and a new building has been long wanted. This want will now be supplied.

On the ground or principal floor the Institute will have its more important rooms; consisting of reading-room, conversation-room, library, room for patents, and a large lecture-hall to accommodate 700 persons.

The first floor of the building will be devoted to the School of Science and Art, which will have a handsome suite of rooms adapted to its purpose. The painting-room will be lighted from the north; and the exhibition-room, for the drawings of the students, will be 48 ft. by 22 ft., with lantern light. Elementary drawing-room, modelling and casting rooms, master's rooms, and separate retiring-rooms and lavatories are arranged upon this floor.

The basement floor is occupied by class-rooms and curator's rooms; and from the nature of the site this story is clear of the ground on all sides. The entrances are so arranged that the mechanics' institute, the lecture-hall, and the school of art may each be in operation at the same time without interference with each other. All the rooms are lofty and well ventilated, and will be warmed by open fireplaces and by hot water.

Externally, the building will be Gothic in style, built entirely of stone, with ashlar quoins and dressings. It is placed at the angle formed by the Skipton-road and Cvsendish-street, and will be a conspicuous addition to the public buildings of the town. The funds for its erection have been raised by subscription, and the principal contributor is the Duke of Devonshire. The cost will be about 12,000*l.* The architects are Messrs. Lockwood & Mawson, of Bradford and London, who are also erecting large new baths and washhouses for the town in the immediate neighbourhood.

In addition to the accommodation afforded for the higher branches of science and art teaching there will also be rooms provided for the more primary and elementary education of working-men who have not had the advantage of attending school in youth. A too numerous class of such men still exists, and their delicacy of feeling is such that they cannot be persuaded in any numbers to attend the primary night classes usually monopolised by, and devoted to, the teaching of boys; and this accommodation is especially provided with separate rooms and entrances, &c., as an inducement to such persons.

There will be similar accommodation for female teaching, and it is expected that in both these branches advantage will be largely taken of it.

From this short description it will be seen that the Institution is designed as an industrial college for the Keighley district. The plan of operations under the consideration of the directors seems commendable. It is suggested that a school be established, upon the Bristol model, in the rooms allotted to the school of science, and that, in combination with the evening classes and the school of art, a complete system of instruction in science and art be organised. It needs not be pointed out how readily this scheme will be available for the whole of the district. At Bingley, Saltaire, Skipton, Wilsden, and Cottingley ordinary evening science classes are either in operation or will be established prior to the ensuing autumn session. From these classes the most anxious students can be passed on to the more advanced instruction that can be given at the Keighley institute, while the distance from the trade school is not great enough to prevent the daily attendance of lads whose parents desire for them a higher education than can be obtained in the day-schools of the respective townships. It is proposed to be done at Keighley by doing a every centre of industry, and English mechanics will have no right to complain of want of opportunities.

Waterproof Paper.—A patent has been obtained in America for the manufacture of a waterproof paper. It will be no uncommon thing, by and by, to carry a quart of milk home in a paper bag!

IRON BUILDINGS IN NEW YORK.*

In the city of New York there are a greater number of entire cast-iron building fronts in process of erection than ever before at any one period of time. Iron, indeed, has meritoriously secured for itself an almost universal adoption in this country for the first-story fronts of stores, on account of its durability, strength combined with lightness, and ready renovation; but its use for complete fronts, for a number of years immediately past, has, in comparison with marble and freestone, been small. When, some twenty years ago, iron fronts were introduced as a novelty, their low price secured a large adoption; but, incorporated with these early attempts were defects which in due time secured a general dislike to them. The introducing manufacturers and architects in iron, acting on the self-evident proposition that a multiplicity of ornament and decoration could be executed in iron at an expense not to be named in comparison with that of stone, literally covered their fronts with useless flagree work. Every column must be fluted or of some intricate pattern, every moulding enriched. Wherever a square foot of plain surface revealed itself, that was deemed a legitimate place for elaboration. The carvings high up in the air, on the fifth story, were the same as those low down on the first,—no bolder,—and in every case too flat and fine. Instead of seeking for beautiful outlines and proportions, and appropriately embellishing special features, to contrast with other portions of the edifice, purposely left plain and unpretending, with ironworkers' ornamentation was made the governing idea; and an elaboration, such as architects previously might have dreamed of, but did not dare represent in their plans, produced, with twistings and contortions of outline and crowding in of small columns and pilasters and dimming with so-called ornament, and planting on miles of reiterated and unmeaning rope mouldings,—all this was presented as embodying the beautiful, and as a thing which would greatly elevate the public taste. But the pretensions and vulgarity of these over-ornamented fronts, in due time, brought them into well-merited contempt, and sealed their condemnation by every person who had any knowledge at all of what is truthful and comely in architecture.

The fault of these fronts was not in the material employed, but in the false treatment. Mistakes occurred in the use of cast-iron from its unskillful disposal; and the material was judged more by the mistakes made by the unskillful, than by its capabilities for proper application.

For building purposes, cast-iron possesses unequalled advantages of strength, durability, economy, and adaptability to ornament and decoration. In resisting any kind of strain, it is vastly superior to granite, marble, freestone, or brick. Practically, cast-iron is crushing-proof, for a column must be ten miles in height before it will crush itself by its own weight. Unlike wrought-iron and steel, it is not subject to rapid oxidation and decay by exposure to the atmosphere, and whatever tendency it may have in that direction, can easily be prevented by a proper coating of paint. No other material is so valuable after it has served its original purposes, as it may be recast into new forms, and adapted to new uses.

In business quarters, where blocks of stores are built up solid, where each building measures about 100 ft. deep by 25 ft. wide, rear almost butting to rear, with window openings only at the front and back, light becomes one of the most important requirements. An airy edifice of iron may be safely substituted for the umbrous structures of other substances, and ample strength secured, without the exclusion of daylight. Iron, in this respect, presents peculiar fitness. It wants proper treatment, and asks not to be set up as a false jewel, coloured and sanded in imitation of stone, or made flashy with over-ornamentation. This material—emphatically an American building material—has peculiarities of its own, and will preserve its own individuality. If the ancient examples of cornices and capitals, and mouldings generally, which have stood the test of criticism and been judged correct, are deemed best for stone, then they are best for iron also, and an attempt to inaugurate new styles of architecture should bring a frown as quick when in iron as in stone. Whatever moulding is good in stone, or projection, or general outline, is also good in iron. And iron, with its greater daylight openings, and airiness of structure, will proudly speak for itself.

* By Wm. J. Fryer, Jr., Constructor in Iron.

But correct outlines must be faithfully followed; and can be in the hands of a skilful manufacturer. If error be committed by the unskillful, it no more condemns the material than will the thousands of ludicrous mistakes in wood and stone condemn those materials. The ancients worked in stone, and artistically produced outlines that perhaps never can be rivalled. Iron is the modern building material, dug from the bowels of the earth, smelted and purified by an advanced science, and ready to supplant stone, just as history relates stone supplanted mud in the construction of dwellings for men. Each tells of a growth in knowledge applying a better material.

In this country, where stone and brick are scarce and expensive, and where prejudices are less settled than in older countries, cast-iron building fronts have crept into public favour and confidence more rapidly than elsewhere. Much has been said against iron from misconception. It is exceedingly difficult in the minds of most writers who use sweeping denunciations and citations against iron, to separate wrought iron and cast iron in their respective endurance against weather. Wrought-iron rapidly oxidizes when exposed to the atmosphere, and goes to decay. Cast-iron, on the contrary, slowly oxidizes in damp situations; rust does not scale from it, and the oxidation, when formed, is of a much less dangerous kind than on wrought-iron. A coating of paint will counteract whatever tendency cast-iron has to rust when exposed.

A great deal has been written about the colour to paint iron work. Iron being a material which requires a coating of lead and oil, it is meet and proper to give it any colour that good taste may suggest. The colour will often be regulated by the character and hue of adjoining buildings or other surroundings. Because marble is white or sandstone brown, the painting of iron work in these colours must not be prohibited. What is to be condemned is the graining of iron in imitation of marble, and sanding in imitation of stone. Wherever practicable, iron work should be painted inside as well as out. Particular care in this respect should be given to window lintels and sills, so that if rain-water gets in behind and trickles down the face of the building, there will be no streaks of rust to tell of carelessness, or of the entire omission of an inside coating. All iron work put together in pieces, as cornices, trusses, &c., should have their joints well painted before being bolted or riveted together. In applying ornaments to iron, such as leaves of capitals, &c., not only should the ornaments themselves be first thoroughly painted, but the screws which fasten them to the main work should be dipped in white lead or paint. After drilling a hole in iron the nuts around the hole should always be filed away. A lack of care in these little matters often causes the greatest annoyance. For the first coating of iron nothing is superior to oxide of iron mixed with oil, or what is known as metallic paint.

Long after a stone front has gone to decay and disappeared, the iron will be retained in its original fulness and sharpness in every line. Keep it painted; and, after a thousand years of exposure to wind and weather, an iron front will be as perfect as on the day of erection. To paint iron costs much less than to paint wood or other materials, on account of its non-absorbent surface. The interest on the difference in first cost between a stone and an iron front will easily pay for painting. More than that: allow the difference in cost to accumulate with legal interest, less the expense of two coats of paint every three years, and, by the time the stone is ruined, the iron will not only have cleared itself, and stand on the balance-sheet at a profit, but be in prime condition for continued service.

On any much-travelled street, a marble front soon becomes rusty and discoloured with dust and rain. An iron front, kept properly painted, appears periodically in a new dress, and is always clean and bright. Other things being equal, place two merchants respectively in a stone front and an iron front, store, side by side, and he in the clean, bright, attractive front will do the most business, and can afford to pay the largest rent. Just above Grace Church, on Broadway, there are two stores erecting, adjoining each other, and precisely alike in every detail, one front of iron and one of marble. These take a place in the history of building fronts.

A plain surface in iron, however, shows quite different from that of stone. The preserving coat of lead and oil gives to iron a glare and extreme smoothness of surface that is annoying and hurtful to the sight in reflecting the sun's

rays. Painting, too, reveals the unevenness and imperfections of the casting in a magnified degree, particularly when the sun's rays strike it at certain angles. On stone surfaces, after being made level and true with the chisel, there is still a grain and a slight but regular roughness of surface which prevents a glaring reflection. By a simple but very effectual process—that of casting the plain surfaces of iron with a fine cord running vertically—the shafts of columns, and arches, and lintels, &c., are given that charm of chiaroscuro which, by its delicate play of light and shadows, makes it soft and pleasant to the eye. This fine crimping destroys the effect of the usual and ordinarily unavoidable unevenness in the surface of castings, and in effect makes iron altogether more nearly to resemble stone.

When iron fronts were first introduced it was strenuously asserted by some, that expansion and contraction would dislocate the joints, and render a building unsafe. An examination of any of the numerous cast-iron structures, which, for a number of years, have been exposed to every change of atmospheric temperature without, and to the heat of steam-boilers, &c., within, will show everything unchanged. This proves that the temperature of our climate, throughout its utmost range, from the greatest cold to the greatest heat, exerts upon it no appreciable effect. Events have also proved, in the cases of the burning of store-houses, filled with combustible goods, that cast-iron fronts are absolutely fireproof, and will neither warp, nor crack, nor fall down. Only let it be remembered that, in addition to a high and intense heat, the use of a blast is required to reduce iron to a molten state, and the ability of iron fronts to withstand fire will be readily understood. They are also perfectly safe during thunder-storms. The metal, presenting so great a mass to the over-charged clouds, becomes a huge conductor in itself, and silently conveys all the electricity to the earth. In them, the intensity current is instantly diffused throughout the entire mass, and changed into a current of quantity, thus obviating all danger from disruptive discharges.

A front of iron can be previously prepared and fitted in the manufactory, and thence safely transported to the place of erection and put together with wonderful rapidity, and at all seasons of the year. It takes up less space than a stone front with brick backing, and so enlarges the interior of a building. When it becomes desirable to tear down the building itself, to make way for other improvements, the iron front may be taken to pieces, without injury to any of its parts, and be re-erected elsewhere, with the same perfection as at first. Instead of destruction, there would be removal only. In iron, as in other materials, must ever be observed those undeviating laws of proportion, and rules deduced from a refined analysis of what is suitable in the highest degree to the end proposed. There is not a structure erected anywhere, but adds its quantum to the good or bad impressions to be directly stamped upon the public mind. Thus every one who builds is unwittingly enhancing, or deteriorating, the taste of the masses; and the aggregate result of this is a thing not to be over-estimated. It behoves the general use and careful treatment of a material which allows greater architectural effect, in proportion to the outlay of money, than any other. In our new and growing country, the dollars saved on one building are required for the erection of another, or for use in railroad, or mining, or manufacturing enterprises. It is primarily a duty for every builder to do the most with his money and the most for art.

On the manufacturer depends the artistic appearance of an iron building as well as its durability. The material is capable of receiving the sharpest kind of lines. But to secure under-cuttings, and that certain crispness necessary to the proper effect, particularly of carved work, requires the experienced foundry-man in this class of castings. An architectural and a practical education are both essential to guide and direct a creditable execution. Between the iron fronts of to-day and those erected ten years ago, there is a perceptible improvement. The artistic working up of the material is better understood, and enlarged ideas of proportion and boldness are displayed. In capitals, for example: those first made were strictly in accordance with authorities given in architectural publications. These authorities gave stated heights of columns for their diameters. A 12-in. diameter column should be about ten

diameters high (10 ft.). Practically, 12-in. columns for building purposes were required about 15 ft. high. The capitals, however, were made without reference to the stretch in length of the column. By and by it was seen that these capitals were squatly in appearance, like a tall man wearing a low hat. The capitals were then lengthened, and in addition a greater projection given. This treatment was followed on bases, and cornices, &c., until now boldness in every part is carefully sought after.

The price of stone, in consequence of a continuous advance in labour, is doing wonders for iron. In New York there are under contract several entire blocks of dwelling-houses with iron ashlar fronts in place of stone. This iron ashlar is a mere shell in rascated courses, bolted together and anchored to the brick wall, which latter is of the same thickness as in the case of brick backing to stone. The window openings have sills and lintels of a character similar to stone. This kind of treatment in iron costs less than one-half of the same in stone, and is cheaper than Philadelphia pressed brick, with moulded stone trimmings, for fronts of houses. For this innovation the eight-hour men in part have to answer, but even they cannot stay the progress of iron.

A system of building has been lately brought out which looks to the entire exclusion of brick-work. It consists of a series of hollow cast-iron box columns, placed about 18 ft. apart on a line with the depth of the building. On top of the columns rest wrought-iron cross girders, for sustaining the floor beams. Column over column, with girders, extend to the height of the structure. Between the columns are horizontal and vertical bars, on which are bolted cast-iron plates, of such a character as to receive and retain the plaster, which is spread directly upon them. These iron walls occupy far less space than brick, are economical in construction, incombustible, and able to resist an earthquake shock.

The use of iron in buildings has increased enormously within the past few years, and that it will increase in a greater ratio in the coming years, there can be no doubt. New ideas will push the work on in the march of improvement from its present stand-point. The uses and requirements and values of buildings are changing every day, and iron, in its architectural application, is to fulfil future requirements, such as in the past it has but limitedly supplied.

THE SOCIAL POSITION OF THE ARCHITECT. EDUCATION.

SIR.—There is much truth in the observations of your correspondent "Experientia" (p. 450, *ante*), but the remedy in a great measure rests with employers, who should satisfy themselves, before they commence a building, that the party whom they propose to employ is not only a well-educated man, but that he has also studied his profession thoroughly as a member of the Royal Institute of British Architects, and provisionally to commencing practice has passed a creditable examination before some of the members of that society, or others. For this purpose a certain routine, without being too intricate or difficult a course, should be laid down; commencing, perhaps, with a plain course of useful and classical learning, and then proceeding with a thorough course of good reading in the Institute or other professional library, of which there is less lack at the present day than was the case half a century since, when no other book was placed in the student's hands but Sir W. Chambers—and this never explained—and *no work on Gothic architecture for the student.*

Some years since, there was a most excellent synopsis published in the *Builder* of that day, pointing out and naming a very valuable course of books to study on every branch relating to the education of the architect. This might be revised, without rendering the course too intricate or laborious to the young student, who becomes shy in placing himself in contact with a professional man for examination. The course of study pursued in France and other countries in the education of youth for a profession is far different, and it is surprising in this country that the hint has not been taken, either by the Royal Academy or even other learned institutions. If a young man is intended to travel, before doing so it becomes essential that he should know how to observe, and avail himself of his travels, having a slight knowledge of French and Italian, combined with Latin. He

should also have a thorough knowledge of perspective, sketching, light and shade, with a facility of drawing the figure. It must be borne in mind that we are living in a different era to what we were some fifty years since. We have seen (thanks to the late enlightened Prince) what a boon was gained by the first International Exhibition, and we have since seen the progress and emulation it has excited in this country, in regard to manufactures and science; then why not to architecture? Let us have no bigoted feeling in regard to styles, but let each be well understood and well defined, and let us trust and hope that the day is not far distant that this country may have occasion to be proud of the talent of art, either in architecture, sculpture, or painting, in the form of a building or that of a royal palace. We have youth to encourage this, and a Prince who has travelled, and had every opportunity of witnessing how much better art is studied abroad than in this country. W.

TECHNICAL EDUCATION.

SIR.—At the conference held in the theatre of the School of Mines, in Jermyn-street, on the 24th of June, much regret was felt at the little interest evinced by the employers and artisans of London in the above important movement. Professor Huxley and Dr. Lyon Playfair told the working-men assembled that they must do something themselves if they wanted others to help them; and they further said that if industrial education did not advance, England must, as a necessary consequence, lose her high place among nations, and sink in the scale of civilization.

Papers were solicited to be read at the conference, but as that course was not followed, the conference was carried out orally, and, as is usual in such cases, much irrelevant matter was introduced. Although general education has made some advance, industrial and scientific education is no higher than it was before the Exhibition in 1851; and it is evident to all but those interested that the working men of this country must have facilities both in and out of the workshop for acquiring a thorough knowledge of the scientific principles whereon their special branches of industry depend. If their special employers are not yet aware of the fact that in scientific knowledge the masters and men of foreign countries are far in advance of us, and are fully alive to the necessity which exists for the higher development of industrial education. While the Government and great employers of labour in this country have been slumbering, they have been working, and are now reaping their reward by being able to compete successfully in the market of the world with the manufacturers of England. It is to be lamented that employers as a class take but little interest in what is going on around them. The technical conference held at the Society of Arts more than twelve months ago was not attended by a single employer; and up to the present not one employer has, I believe, taken the least notice of the efforts and objects of the technical education committee. The advantages which would result to all parties from establishing libraries of trade literature in connexion with their establishments is unappreciated, and apprentices and young workmen have less advantages now (in so far as learning their trade) than was to be had forty or fifty years ago. They are now left to pick up what they can, without supervision from employer or manager. Schools, lectures, and museums there are none; and the young, after their day's work, think of nothing but the last new star at the local music-hall, or what is out at the gait or minor theatre. Since the Great Exhibition of 1851, many warnings have been given to employers in this country, and yet not one technical library has been formed, or one school established, and to-day the general body of workmen are not one whit more advanced in systematic and scientific knowledge than they were before foreign competition became so close. What is wanted to remedy the present defective condition of things, and to stimulate the young workmen to higher efforts, is, in my opinion, closer supervision by the heads of establishments, and the formation of a system of rewards for the apprentices who attain the highest proficiency in their respective trades. Some plan ought to be provided whereby every apprentice or article workman should be informed as to the nature of the obligations he was going to undertake, with the benefits which

will eventually accrue to them, as workmen, from an attentive study of their trade, and in aiming to excel in all they undertake. If that honourable ambition could be formed in early life, it would be the means of preserving them from many snares, and in time would cleanse the workshops from that low moral state into which they have fallen; and, instead of taking a pride in obscene and immoral language, an emulation for the noble would be fostered, and the inertness which now prevails would be eradicated, and all engaged in the good work would reap a rich reward. It is well known that but few English workmen are scientifically taught; and if they have to deviate ever so little from the usual path they are lost. It is not at all unusual to find men engaged in watchmaking, engine-fitting, and machinery, who never read a work on mechanics and mechanism and who could not give an explanation of the simple mechanical powers—the lever, crank, and pulley; carpenters who can barely describe a circle, and to whom angles are a mystery entirely beyond their comprehension, and who are entirely lost if any one speaks to them of geometry; painters who cannot mix colours; opticians who know nothing of optics; mathematical instrument-makers who never studied mathematics. Illustrations of the above description might be adduced in connexion with every trade, and the evil of it is that they would in no case be exceptional. I have said that employers are apathetic as to what is doing in other countries, and the same may be said of the men. Their leaders are always harping on trade rights and the perfection of trade-unions. Advance of wages is of more interest to them than advance of knowledge, and they seem to suppose that the first can be maintained irrespective of all other considerations. If a look-out be not kept, the industry of the country will fall into the ditch.

Another point I wish to bring to the notice of the readers of the *Builder* and technical committee is the time of working of many trades in London, and which is one of the causes that retard the intellectual progress of those trades. In nearly all the London trades, except the builder's, it is the practice to begin work at 8 or 9 o'clock in the morning, and work up to the same hour in the evening; thus giving those engaged no time for improvement of any description. When it happens that I have been working in factories and shops where that mode of working is countenanced, I have invariably found the men dissatisfied with it. Many of the better sort have said that their time was passed in working, eating, and sleeping, as they often lay in bed till they had scarcely time to eat their breakfast; and that when they got home at night, washed, and had supper, it was time to go to bed. They have said they could alter the system of working if the men wished it, but lying in bed late had become a habit, and they had not the will and energy to emancipate themselves from it. It is evident to many that the custom is pernicious in every respect, and has an evil influence on the young, who have no time left for attending night-schools or any other instruction. I believe it will as a rule be found that the morals of such workshops are low, and as one bad habit begets another, the workman or boy who has no time for the culture of his mind, is in too many instances reckless and oblivious to improvement in trades or morals. The results of labour under such conditions are that anything is of more interest to them than the business they are working at; and I believe any one might be for an age in such places without hearing one high or lofty sentiment. Horse-racing, betting, gambling, is much of their theme; and one often feels that where there are many men and boys employed the place is something like a little hell, without one redeeming feature. One of the labours of the permanent technical education committee will be to rid the country of that evil custom, and give to those an opportunity of improving their minds. I know that the labour is almost Herculean, but it must be done; and let us hope that the "Society of Arts Free Library committee" will soon so agitate the country that there will be at least one free library in every town; and then there will be some hope that the young men, when released from labour, will become habituated to intellectual pursuits. The stigma that the English workmen are not readers or thinkers will be got rid of, and future generations will honour those who laboured to raise the workmen of this country to a high intellectual standard.

JACK PLANE.

LEICESTER TOWN-HALL.

SIR,—In your issue of the 5th ult. you were kind enough to insert a letter from me as to our beggarly town-hall and police accommodation, since which time there have been sundry sub-committee meetings of an equal number on each side of the disputing parties. A compromise was agreed to, which was considered equally honourable to both sides.

The advocates of the Friar-lane site gave way to their opponents by submitting to a diagonal street, and also the sale of about six or seven hundred yards of the ground, allowing them the privilege of erecting, at a future time, a large public hall on their favourite site; the police-station, court, and municipal offices to be erected upon the Friar-lane site. The mayor and ex-mayor, who are both of them worthily esteemed (although advocates for the Cattle-market site), very courteously agreed to the compromise, and to the erection of the buildings without further delay.

At the quarterly meeting, although matters had been so far settled, Mr. E. S. Ellis, one of the advocates of the Cattle-market site, and leader of the minority, strenuously opposed such compromise, and urged further delay. In consequence of this the matter again stands over, and probably will do so for some time to come, unless it be seen to through the Home Secretary, which would soon be done were he cognizant of the whole facts.

The urgent necessity for the building above named may be easily imagined, when I positively affirm that the materials of the old hall are not worth 10l.

We, unfortunately, have those amongst us who are always determined to lead, but never willing to follow.

CLEMENT PRETTY.

** We have taken some pains to inquire into the position of this question, and are satisfied that it would be greatly for the advantage of Leicester to have at once a fitting and handsome town-hall. Both parties should put their heads together for the common good, call in sound and impartial advice, and make up their minds to follow it. The present structure is quite discreditible, and we believe every one in Leicester who has thought about it feels that it is so. Money wisely used on such improvements increases the value of property in the town where it is spent, and raises the character of its inhabitants.

THEATRICAL.

The Haymarket.—The first part of Mr. Tom Taylor's new drama, "Mary Warner," reminds the playgoer of "Not Guilty," produced at the Queen's Theatre not long ago. This, however, is soon passed, and a fresh combination is made, which gives the principal character, played by Miss Bateman, some excellent situations, of which she makes good use, touching effectively the hearts of the audience. The part of the husband, *George Warner*, an inventive, practical engineer, suits the rough, heavy style of Mr. Howe. Mr. Kendal leaves his gentlemanly ways, and portrays effectively a tipsy, unprincipled vagabond, who is too well treated by the author; and Miss Caroline Hill and a little child give good aid. Without any great endeavours to render the scenery a striking feature, it is sufficiently interesting and realistic to convey fully the time and place. The machines in motion in the engineer's yard on the Lambeth side of the Thames; Plumtree-court, with its gaslights and lamp-lighter; and the interior of *George Warner's* house, in South Kensington, when he has risen in the world, are well contrived and executed. This piece is increasing in attractiveness, and the house is full every evening. The run, however, can be but short, as Mr. Buckstone's benefit is announced for the 10th, when he will doubtless, as usual, make one of his amusing addresses.

The Charing-cross Theatre.—The house now finished looks pleasant and bright; but parts of the interior must be altered. In the upper boxes, substituted for a gallery, only those sitting in the first and part of the second row can see the stage properly. The seats must be raised. It is a most singular thing that constructors of theatres do not in all cases make themselves certain on points of this sort before the house is opened to the public.

The new Opera-house in Vienna has proved a failure, we are told, in an acoustical point of view, and will require important alterations

inside. They should wait a little. Time seems to do something in this respect. We heard an eminent singer state recently that the Royal Italian Opera-house, Covent Garden, has improved so greatly as regards the transmission of sound, that it is now the most delightful place to sing in that an artist could desire.

WASTED ART-TREASURES.

ON Monday last a meeting of the Free Libraries and Museums Committee of the Society of Arts was held at the Society's house in the Adelphi, Mr. H. Cole, C.B., presiding. A number of Members of Parliament were present. The business related exclusively to the subject of the distribution and circulation, to the utmost extent, with reasonable expectation of public advantage, of the works of art, scientific objects, specimens of manufacture, and other objects, matters, and things, fitted to promote technical, scientific, and general culture, that are wasting in oblivion, utterly unproductive and valueless, in the store-rooms and lumber-rooms of some of our great metropolitan collections. There was entire unanimity in the decision arrived at, that strenuous efforts should be made, without delay, to remedy the evil indicated.

The result of the meeting was the adoption of the following resolution:—

"That Mr. Gladstone, the Premier, be requested to request a deputation from the Free Libraries and Museums Committee of the Society of Arts, appointed to promote the systematic circulation to local museums, libraries, and institutions of the United Kingdom, of the superfluous or unutilized specimens of works of art, science, and literature in the national museums and galleries in the metropolis."

In this important matter there can happily be no party feeling, and it may be expected that a very powerful deputation will wait upon Mr. Gladstone, and press upon him the reasonable object they are organised to promote.

ARCHITECTS AND QUANTITIES.

SIR,—Knowing your strict impartiality, I am sure you will not deny me space for the few remarks I have to make on this subject. A contract being advertised, being a builder, I instinctively at this dull time made my way to the architect's office, whose name is attached to the advertisement, and obtained the bill of quantities for the work, and sat down for the purpose of pricing out and making up my offer for the work contained therein. Instead of that I address myself to you, Mr. Editor, being annoyed at the very outset by the three paragraphs that precede each section of the work; and as the same obnoxious lines often appear whenever an architect takes out the quantities for work he has in hand, I feel determined to commit this common cause of complaint to your judgment. The first paragraph on the bill is—

1st. The contractor whose tender is accepted will be at liberty to compare the following bill of quantities with the drawings and specifications before he signs the contract, and any errors therein pointed out will be corrected.

2nd. After accepting the bill of quantities as correct, no notice can be taken of any errors that may subsequently be discovered.

3rd. The contractor is to pay the architect 2½ per cent. on the amount of complete tender for the bill of quantities, &c.

Now, Mr. Editor, I do not complain of the first and second paragraphs, if the third is left out; and I have not much to say about the third if the first and second are left out, but as a whole they are most unjust to contractors.

Sir, I think you will easily see how these conditions work against the contractor.

"The contractor is to pay the architect 2½ per cent. on the amount of complete tender for the bill of quantities; but he has to compare the bill with the drawings and specifications to ascertain if they are correct," thus redoing the work for which the architect receives 2½ per cent. commission, and the contractor (for the same work) not a penny.

Now, Mr. Editor, I would ask those architects that adopt this system, why the contractor has to be at the expense of checking their quantities when they are well paid for ascertaining the correct amount of work to be done; and further, when any deficiency appears after signing the contract, the contractor has to forego all claim and any deficiency, simply because he has not found it sooner? In conclusion, I ask, are contractors fairly dealt with? Do they get justice and equity from the architect? I say, no. I think it only fair that a competent surveyor should be employed who guarantees the bill to be correct, as the person who takes out the quantities ought to be the only person responsible for any mistake arising therefrom.

Or if the contractor is to have any responsibility in the matter, the architect should divide with him the commission, as the contractor has as much labour to perform in checking the bill as the architect originally has in making it out.

A RATEPAYER.

CASES UNDER THE METROPOLITAN BUILDING ACT.

ALTERATION OF WOODEN BUILDINGS.

Mr. R. SMITH, of Newington-holly, corner of Francis-street, appeared before Mr. Woodrych, Lambeth, to a summons which had been adjourned from Friday, the 19th June, in which it was complained by Mr. Long, the district surveyor, that he had erected or so altered a wooden shed in the rear of his premises as to be in contravention of the Building Act, by not having it constructed of incombustible materials.

Mr. Arnold, from the firm of Messrs. H. & F. Chesters, solicitors, of Newington, appeared for the defendant, and contended that the building existed long before the Building Act, having been erected upwards of thirty years; and also that, according to the 150th section, proceedings should have been taken within a month of the discovery of the alteration.

Mr. J. Carpenter and Mr. Z. Cohen, who had lived in and known the premises for upwards of thirty-five years, deposed that the shed had all the time remained in the same condition with the exception of a few necessary repairs.

It was, however, contended that a greater part of the shed as at present stood was new, and evidence was called to prove that the timber used in the alterations was enough to make more than one-half of the building "new."

An adjournment was agreed to for the purpose of enabling Mr. Woodrych to view the premises, which having been done, he said that certainly one-half was new, and that brought the case within the Act. He therefore decided that the alterations must be so made as to comply with the Building Act.

ALBERT INSTITUTE, WINDSOR.

Sir,—If any of your readers take sufficient interest in this matter, to turn to our letter in your impression of the 5th ult., they will see that Mr. Sim's letter in your last number confirms the justice of our complaint.

To his counter-charges that we suppress the fact of a meeting having been called to consider the position of the scheme, and that certain subscribers had "talked of writing," to have their subscriptions cancelled, as there was so little promise of the work going on, we reply that the alleged facts had not come to our knowledge; and that if they had, they are entirely beside the question. We can, therefore, lay no claim to the "ingenuity" with which he credits us.

What he means by advising us to let the fact of our success in this competition "rest in peace," we do not know; nothing is, however, further from our intention.

Mr. Sim's statement that the meeting he advert to stands adjourned till next month, certainly does not improve his case; for it was scarcely decent that he should in the interim come forward with his plan for taking the commission out of our hands.

We should not have trespassed on your kindness in this matter, but that at the present moment much consideration is being given to measures for raising the status, and securing the dignity of the profession; and it is, at least, desirable that those who have in hand the cure of a disease should be made acquainted with its various manifestations.

BACON & BROS.

METROPOLITAN BOARD OF WORKS.

At the last weekly meeting of this Board, the first subject considered was a claim of £4,500, against the Board.

The Works and General Purposes Committee brought up a report which recommended that the claim of Mr. Crook (£4,500), in respect of loss which he alleges he has sustained under his contract for the engines at the Abbey Mills Pumping Station, by reason of the delay in starting them, be settled at the sum of £3,000. Eventually the subject was agreed to be referred back to the committee for further investigation.

Southwark Park.—The thanks of the Board were given to the vestries who had provided the entertainment on the occasion of opening the Southwark Park, and a memorial from the inhabitants praying the Board not to let any part of the park for building purposes was referred to the Works and Improvements Committee.

Finsbury Park.—It was announced that Finsbury Park would be opened to the public early in the month of August.

SANITARY PROGRESS IN KIDDERMINSTER.

At a meeting of the town council to consider communications recently received from the Home Secretary with regard to a memorial of the guardians; to consider a resolution as to opening up, widening, and properly paving the streets of the town; and the appointment of a surveyor under the Local Government Act; the council resolved, on the first subject, by 11 votes to 2,—

"That, as the town has only just adopted the Local Government Act, and has not yet had a fair opportunity of properly carrying out and working the same, no steps be taken until sufficient time has elapsed to test whether or not such Local Government Act will provide all necessary requirements."

It was also resolved:—

"That the Council use the powers given to them as a Local Board to widen, improve, and open up streets where they found this necessary."

Mr. Corbet, in supporting this resolution, said, as an illustration of his argument, that there were many who, when a new market, at an expense of 2,000*l.*, was projected, said it would be a ruinous loss, whereas, they had now a handsome, well-arranged market, a credit to the town; and what had just happened? They had let it for 45*l.*, or 220*l.* more than the old one, and were thus getting 10*l.* per cent. for

their outlay. He referred to other towns where similar improvements had been effected, and concluded by saying the times required spirited although judicious legislation. The mayor then said, in reference to the appointment of a surveyor, that it was considered that the municipal offices—as the nuisance inspector, collector of rates, superintendent of the street repairs, and other offices—might be added in one person, to whom they could then afford to give a salary of about 180*l.*, but it was urged that he should give his whole time to the duties of his office; and at length the council resolved to advertise for a suitable person in the four papers having the greatest circulation in the district; viz., the *Daily Gazette*, *Daily Post*, *Brierley Hill Advertiser*, and *Kidderminster Times*; and also in the *Builder*.

ARRANGEMENTS FOR STREET TRAFFIC.

Sir,—Seeing a notice in your paper as to bridges across the streets for foot-passengers has determined me to ask your permission to propose a scheme which seems to me worthy of consideration. It is simply this,—in very crowded thoroughfares to construct a footway over the present path. May I now ask, through your paper, what the streets being connected by bridges. A large part of the present path could thus be thrown into the roadway, giving more room for vehicles, while foot-passengers would be completely freed from all danger. The inconvenience caused by the alteration to the householders would be compensated for by the additional value given to the house, since the first floor would be converted into a ground floor, and the second floor would be raised while the present ground floor would be valuable for warehouses. Not being an engineer, I do not enter into the question of how it is to be done; but if it were necessary to carry iron girders across the streets to support the paths, it might in time lead to the formation of an intermediate roadway, which being used only for light traffic, would leave the lower one (then, as it were, subterranean) for the heavy wagons, which now render locomotion so difficult.

S. ARTHUR SAWELL.

THE VELOCIPEDE.

Sir,—In a recent number of the *Builder* you quote paragraphs showing that years ago you suggested the use of self-propelling carriages to convey persons to their business, &c. May I now ask, through your paper, what we are to do with them when we get there? Everybody asks me this. Can we not have velocipede stables, where they could be kept during the day at a moderate charge? They do not occupy much room.

AN ARCHITECT'S CLEEK AND VELOCIPEDE.

* * Not occupying much room, they might often be permitted to be taken into offices or other business premises; onto the back courts, &c., of coffee-houses, and other places, where dinner or tea is had. But, no doubt, special places will be opened, as in carriage depôts, stables, &c., at 1*d.* each, or so.

UNDERGROUND TEMPERATURE.

The temperature inside the earth has often been a matter of speculation. Mr. G. J. Symons, the well-known authority on rain and rainfall, has been investigating the subject. He has carried on his experiments at Hampstead. A well was sunk there many years ago into the chalk to the depth of between 500 ft. and 600 ft. for the water supply, and the demand exceeding the supply, an Artesian bore was made through the centre of the well to the depth of a quarter of a mile, in expectation of finding water in abundance in the lower green sand. The Waterworks Company, 1853, reached the depth of 1,302 ft., sunk nearly 8,000*l.* in two years, found no lower greensand, unfortunately, no water, and became ruined. The property passed eventually into the hands of the new River Company, who accorded to Mr. Symons the permission he sought to conduct a series of thermometric experiments on the abandoned site. Mr. Symons erected a hut over the well, and fitted up a little observing-house. At the British Association meeting at Dundee a committee was appointed to investigate the temperature of the earth at great depths. Mr. Symons is a member of that committee, also Sir W. Thomson, who moved for its appointment. Upon the solution hang certain matters of contention between Sir William and Professor Huxley as to how far underground temperature may be made to test the age of the world. Mr. Symons's experiments are not yet concluded. The results so far he regards as decisive. He has made gradual observations down to a depth of 1,100 ft., and has ascertained that the temperature there is 20 degrees higher than above ground; that is to say, the thermometer showed 70 degrees, whereas the mean temperature of London is 50 degrees. If this rate of increase continues, as there seems no reason to doubt would be the case, boiling point (212 degrees) would be reached about a mile and a half down. At present, however, Mr. Symons is at a standstill; he has literally stuck in the mud. About 200 ft. of blue-black deposit

has accumulated at the bottom of the tube, and into this the thermometers cannot penetrate. Of course the learned society under whose auspices the work is being prosecuted will forbid such an ignominious termination of a valuable investigation, the like of which has never before been attempted.

INTERNAL DECORATION.

Your recent article on the "Use of Plaster in Decoration" is well worthy the study of every lover of art, as applied to the internal decoration of houses. It shows in a concise form the utter inability of the material as regards its durability, and as a means of support, and also as to its "tenacity" for adhering to all the dust which may arise to its surface. The question now presents itself, what is the legitimate material to use in the external decoration of a building? I have briefly explained in former letters that glazed surfaces of clay are the most durable and legitimate for the external decoration of a building. Now, if this system can be adopted where it is exposed to all kinds of weather, and to every variation of atmosphere (especially damp), to which the climate of Great Britain is subject, why, I would ask, could it not be employed internally? As regards the bracketing and enporring of angles, instead of having a "sham," which is supposed to support the corner of a room, you have a material which will have the strength of wood or stone, and which is more durable than either. If earthenware and china can be manufactured, and sold at such a cheap rate (and a manufacturer can afford to sell a white and gold china tea-service of twenty-eight pieces, for 8*s.* 6*d.* to a wholesale dealer), why could not a cornice, a bracket, or a centre flower be made and sold at an equally moderate price? You cannot purchase an ornamented cornice flower in plaster under 7*s.* 6*d.* or 10*s.*, and I am quite sure if twenty-eight pieces of china can be sold glazed and gilt, for 8*s.* 6*d.*, a centre flower of the same material could be produced for the same sum, with a good profit to the producer. I venture to assert that internal decorations could be sold at a considerably less sum than what I have quoted, as they could be made of a terra-cotta body, and washed over with a white glazed surface, which would be much cheaper than making the whole body of china or earthenware. This system would undoubtedly be a great advance on the present mode of internal decoration, and could be adopted by the "enrichment" decorators in plaster themselves, so that they could not complain of having their "trade" taken out of their hands, as they would be merely substituting another more durable and legitimate material for the one they are now using.

ALPHA.

WHAT ABOUT THE OLD PAVING STONES?

Sir,—What becomes of the granite paving-blocks continually removed from our roadways by the contractors for the re-paving of them? Are they allowed for in the fresh contract?

I ask these questions, because, after watching the operation on many occasions, it has struck me, that by relaying the blocks bottom upwards, the same purpose would be answered, without the expense of new granite, as the wear and tear cannot have taken off above $\frac{1}{4}$ in. of stone, and for such a trifle it seems gross extravagance to purchase new blocks.

The old blocks, by a little labour bestowed upon them, must yield the contractors a very handsome return when chipped and relaid in other thoroughfares, under other contracts. Perhaps I may be mistaken, and these blocks may be broken into small pieces for macadamizing purposes. At all events, as an over-burdened rate-payer, I should like to get some reliable information on the subject.

BACON & BROS.

NUMBER OF BELLS IN OLD TIMES.

Sir,—I think I can answer Mr. Parry's question, in your issue of the 15th of May, ult., about the number of bells before the Reformation.

In small parishes, three was the usual number; each service of the day was to be marked by the tone of a different bell: so three bells would suit,—*Manc.*, *Meridie*, *Vespera*. For the first Vespers, the Ave Maria bell was rung, the angelical salutation being then said. (See Rappin, *Hist.*, vol. v., p. 403.)

At Osney Abbey they had six bells (afterwards transferred to Christ Church, Oxon), called *Douce*, *Clement*, *Austin*, *Hautester*, *Gabriel*, and *John*. In an old MS. relating to the religious offices performed in that abbey, it is said, *Officium Agnus Dei, collentur Douce, Clement, et Austin; et post missam, per non magnam spatium, pulsantur. Et notandum, quod semper*

post magnam missam, pulsetur Hæntectæ; ad completorium Gabriel vel John." (See "Hearne's Curious Discoveries," p. 305.)

On festival days, according to the ancient rituals, all the bells were to be rung, "et hauc planationem classicum vocant." (See "Bona, de Rebus Liturgicis," p. 173.)

"Enallor" means "to toll," "undo" "knell," and when more than one bell is so sounded, they make a *chime*. "Pulso" means "to ring."

H. T. ELLACOMBE, M.A.

CHURCH-BUILDING NEWS.

Holloway.—The foundation-stone of a new church, dedicated to St. Peter, has been laid in Kingsdown-road. The site was purchased out of the Bishop of London's Fund, which contributed 6,000l. The total amount besides, received before the laying of the stone, was 2,500l. Three sides of the edifice will face the Kingsdown, Shadwell, and Montpelier Roads respectively, and the principal entrance will be from the last of these roads. The structure will be in the Gothic style, and of simple character. The walls will be of brick, faced with yellow stocks, with Bath stone dressings. The nave, at the east end of which there will be a three-sided apse, will be 100 ft. long, 24 ft. wide, and 55 ft. high from the floor to the boarding of the roof. On either side will be aisles, each 80 ft. long, 13 ft. wide, and 20 ft. high. These will be separated from the nave by five pointed arches, supported on coupled columns of polished red granite. The church will be lighted by sixteen two-light clearstory windows, extending round the north, east, and south sides of the building, while at the west end there will be a large rose window over 6½ lancets. In addition to those of the clearstory there will be ten windows in the aisles, placed at such an elevation that the galleries which it is ultimately proposed to erect will not intercept the light from them. The number of sittings provided on the ground floor will be nearly 700. The galleries, which will not be erected at present, are designed to hold about 300 persons, so that the church will contain 1,000 sittings when completed. The contract for the erection of the edifice has been taken by Mr. Thompson, of Camberwell-green, for 4,880l. Messrs. Henry Jarvis & Son, of Southwark, are the architects.

Bury (Lancashire).—The Bury new cemetery has been formally opened. The site is a little over a mile from the centre of the town, and a little off the main road to Manchester. The grounds contain 33a. 1r. 27p. statute measure: 20 acres of which are intended to be devoted to the burial of the dead, and will contain 22,054 graves. The remaining 13a. 1r. 27p. are set aside for walks for the use of the inhabitants of the town. The drains are from 10 ft. to 14 ft. deep, and are constructed of dry rubble. They vary from 2 ft. 6 in. to 1 ft. 6 in. diameter; the total length of the main drains being 2,221 lineal yards. The whole site of the cemetery and walk is surrounded by a boundary wall of parapets hatched with rubble, having an average height of 4 ft. 6 in. This includes a stone and weathered coping 1 ft. 3 in., with 4-ft. piers at intervals. Between these piers and extending all round the grounds, is an ornamental railing of wrought-iron vertical bars, fitted in with cast-iron tracery from a special design. There are three entrances, viz.—one at the north-east corner, one at the south-east, and the principal at the south side. The carriage or main gateway is 12 ft. high, with piers at either side 4 ft. 9 in. square at the base, and 19 ft. 6 in. high, with buttresses and crocketed canopies. The Established Church is cruciform on plan, with a octagonal apse. Its extreme length is 52 ft., and the width across the transepts 34 ft. 6 in. There is a south porch facing the tower entrance, and between these is a vestibule screened off from the main body of the chapel with a glazed screen. The roof is open-timbered. The interior is fitted up with open seats having ornamental iron bench-ends. The floors are laid with ornamental tiles of a geometrical pattern. The tower and spire are 76 ft. high. The roof is covered with blue and green slates in patterns. The style is Decorated. The chancel of the Dissenters' Chapel consists of a porch, vestibule, small tower, nave, and vestry—the vestry occupying the place of the chancel. The vestry and vestibule are screened off from the nave, and glazed as in the former structure. The fittings are of red deal, with moulded caps to bench-ends, stop-chamfered. The south-west

angle-tower and spire are 54 ft. high, and in many points look hoiler than in the case of the church building. The tower, besides being a ventilating tower, adds to the general character of the structure. The roof is open-timbered, of steep pitch, stained and varnished. It is covered with purple and blue slates, with ornamental ridging. The plan of the Roman Catholic Chapel forms a nave, chancel, porch, and vestry. The roof is open-timbered. The chancel-arch is partly supported by carved caps and columns. The fittings are of red deal, stained and varnished. The floor is to be laid with ornamental tiles. The west end (exterior) is crowned by a bell-gable with canopy, underneath which is a colossal figure of a bishop, 6 ft. 6 in., supported on a carved cap, column, and pendant. The gable is pierced with two two-light traceried windows. The extreme length of the chapel is 44 ft., the width of the nave 37 ft. 9 in., and the width of the chancel 12 ft. The roof is covered with blue and green slates, arranged in alternate bands, and cut to pattern. The ridge is blue Staffordshire tile-cresting. The registrar's house is situated to the right of the main entrance. The gardener's lodge is one story high. At the hack and near to this is a propagating house, 60 ft. by 15 ft., for the use of the grounds. The grounds and walks have been artistically arranged. The total length of roads and walks is 4,745 yards, or nearly three miles. The total number of trees and shrubs planted in the grounds is 41,662. The designs were by Mr. James Farrar, borough surveyor for Bury, and by Mr. Henry Styan, architect, Manchester. Mr. Thomas Vicar acted as clerk of the works. The carving was by Mr. Joseph Bonehill, Manchester, while the greatest portion of the stone-work was executed by the employes of the Burial Board. The joiner-work was by Mr. F. Dawson, contractor, Elton; the ironwork by Mr. Joseph Downham; the plumbers' work by Mr. T. Cornall; the painting and plastering by Messrs. Jacob Lomax & Sons, all of Bury; the slating by Mr. Kirkeley, of Manchester; the tiles being supplied by Messrs. Minton, of Stoke.

PROVINCIAL NEWS.

Great Wollaston.—The foundation stone of a new vicarage has been laid here. The ground for site, garden, and paddock is the gift of Mr. R. Gardner, of Sansaw; the estimated cost of land and building, 1,150l. A new church is to be built in a central part of the parish, money for the site and burying-ground having been left by a former incumbent. Messrs. Bowdler & Darlington, of Shrewsbury, are the contractors for the vicarage.

Osley.—The memorial stone of a new mechanics' hall has been laid here. The new building will be in the modern Italian style, and will include on the ground-floor a small lecture-room, which may be divided into two class-rooms, retiring or cloak rooms, reading-room, library, two class-rooms, lavatory, &c. On the basement will be a kitchen, scullery, chemical class-room, heating apparatus, coal and lumber closets, &c. The first-floor will comprise a large concert-room, with gallery, platform, orchestra, and organ. Over the class-rooms and under the orchestra will be a general and ladies' retiring-rooms, and a librarian's residence will be attached to the institution. The concert-room will accommodate about 900 persons, allowing to each a space of 2 ft. 6 in. by 1 ft. 6 in. The orchestra will contain sittings for about 120 singers, exclusive of platform room, and ample entrance and exit accommodation will be provided.

Burslem.—Mr. Edward Challinor, of Tunstall, has decided upon the erection of a new manufactory on the site of the old Oven House Works at Burslem, which are being pulled down. The new works will be of the most modern construction, and will include a mill for the grinding of materials and colour. The contract for the building has been undertaken by Mr. John Stringer, of Sandhaeb, and that for the engineer's work by Mr. William Boulton, of Burslem. The whole has been designed by Mr. George B. Ford, of Burslem, architect, and will be carried out under his superintendance.

Templesoverby (Carlisle).—The foundation stone of Ostenstands bridge has been laid. Ostenstands is a point on the River Eden, about a mile and a half south of the village of Templesoverby, and about a mile from that station on the Eden Valley Railway. The works have already made considerable progress. The plan of Mr. Bintley, of Kendal, was accepted; and

the contract for the work was let to Mr. Hepworth, of Kendal. The width of the river where the bridge will cross is about 150 ft. The bridge will be built of stone, and will consist of four arches; three of these will be 30 ft. span, and the fourth, a dry arch, will span 54 ft. The bridge is vested in trustees.

Blackburn.—New parsonage-houses are being erected as residences for the vicar of the parish of St. John, Blackburn, and also for the vicar of St. Mark's, at Witton. The former is to cost about 1,800l., and the latter about 1,100l., exclusive of laying out and ornamenting grounds, &c. The land in both cases has been a gift from Mr. Joseph Fielden, of Witton Park. Mr. Joseph Brierley, of Blackburn, is the architect.

STAINED GLASS.

Hanley Castle.—At a parish meeting held at Easter last, the following resolution was unanimously adopted:—"That some substantial memorial be erected by the parishioners of Hanley Castle, to the memory of the late Mrs. Lechmere, and for this purpose a subscription be entered into, and a committee appointed to carry out this object." In accordance with this resolution, the committee appointed at the meeting have decided upon filling the west window in Hanley Castle, with stained glass of the richest and best quality, the subject of the design to be "The Ascension," the cost to be defrayed by subscriptions raised in the parish. The amount required, about 190l., was collected in a few days; the sum was limited to that amount, and the subscription to the parish.

Trinity Church, Tewkesbury.—Mrs. Laing, of the Mythe, Tewkesbury, has just had an obituary window placed in this church, to the memory of a youthful son who died many years ago. It depicts the incident of Christ blessing little children, and forms an ornament to the chancel, which has lately been improved. It is the work of Messrs. Heaton & Co., of London. In addition to this, Mrs. Laing is also causing the other windows of the church, seven in number, which were of the usual common glass, to be refilled with thick tinted glass with colored borders.

Uffington Church.—A memorial window has just been placed in the parish church of Uffington. The window, executed by Mr. Gibbs, of London, consists of three lancet lights, and the subject is, in the centre the Crucifixion, and on either side a type of the Crucifixion: Moses lifting up the serpent in the wilderness on one side, and Abraham offering up his son Isaac on the other.

St. Michael and All Angels', Neepsend (Sheffield).—The east window of this church has just been filled with stained and painted glass. The style is of the Late Decorated period of architecture, of five principal openings, with geometrical tracery. In the centre light of the tracery is the figure of St. Michael, with the subdued dragon at his feet. The surrounding openings are filled in with ornamental lights of a mosaic design of deep colours. In the five lower openings is represented the scene of the crucifixion of our Saviour, and its attendant incidents, which extend over the entire breadth of the window. The figures are about 3 ft. in height. Each opening is surmounted with canopies of rich tabernacle work, with an arcade base across the window. Further colour is given to the design by a trefoil foliage border, enclosing each of the five lower openings. The window is the gift of the Rev. Thomas Wilkins. It was executed by Messrs. Baillie & Mayer, of London.

St. Bartholomew's, Dublin.—The three eastern windows of the chancel of this church have just been fitted with stained glass by Mr. O'Connor, of London. The subjects are "The Sermon on the Mount," "The Crucifixion," and "The Resurrection." The windows are a thank-offering from friends of the incumbent, for the providential escape from serious accident which the clergy and choir had when a pinnacle was blown down in the gale of December 27th, and fell into the chancel during Divine Service.

New Parish Church, Bolton.—A window in honour of Mr. Peter Ormrod, for his generosity in rebuilding the parish church, at a cost of over 30,000l., is to be put up in the new church. A design has been obtained from Messrs. Hartman & Co., of Birmingham, for a stained east window. The window is a seven-light one, 35 ft. high and 25 ft. wide. The artist shows a double series of groups of figures, the large ones on blue ground, and the smaller on a ruby. The subjects chosen

for the figures are from the life of St. Peter, owing to the church being dedicated to St. Peter, and also to the fact that the benefactor, Mr. Ormrod, bears that name. The cost is estimated at 800*l.*, to which there will be extras. The design has been commended, but the design of another artist who had been consulted not having been sent in, the decision on the matter has been deferred. A committee has been appointed to carry out the object.

Denton Church, near Manchester.—An easterly decorated window, consisting of three lights and tracery, has been filled with stained glass in this church. The three lights are occupied by life-size figures of our Saviour in the centre opening, and in the side lights Moses and Elias. These are surmounted by canopies and borders. The tracery is filled with sacred devices and monograms. Messrs. Edmundson & Son, of Manchester, were the artists.

Shipley Church, Yorkshire.—A painted window, consisting of three lights and tracery, has been placed in the nave of this church. The three lights are occupied by the Crucifixion, the Transfiguration, the Resurrection, and the Acts of Mercy, viz., feeding the hungry and clothing the naked, and the Good Samaritan. The upper portion of the window is filled with grisaille work, and the tracery contains angels and sacred emblems of a suitable character of design. These windows are from the establishment of Messrs. Edmundson & Son.

Books Received.

What is Matter? By an Inner Templar; author of "More Light: a Dream in Science." London: Wynman & Sons, Great Queen-street, Lincoln's Inn-fields, 1869.

Trotter somewhat eccentric and startling in certain of its enunciations, this is a thoughtful and suggestive treatise. First of all, a brief and rapid *resumé* of ancient and modern opinions on the subject in hand, down to Faraday, is well given, in remarkably few words. The author's own theory is eclectic, but in pretty close accordance with Faraday's, so far as Faraday has treated of centres of force as the more immediate basis or subject of physical phenomena. The author thus introduces his own response to the question, "What is Matter?"

"The universe is filled with centres of force; each centre the centre of a sphere; each sphere a compound of two spheres, having the same centre, one a sphere of attraction, the other a sphere of repulsion."

It is by the separation of these two spheres of attraction and repulsion, and therefore by the calling forth and exercise of their powers by each, that we have the different modifications of matter.

And again,—

"The Divine Mind caused a certain immense, but yet finite, portion of space to be marked off from his immediate presence as a centre—a great sphere—of space. This by some manifestation of His power and presence, was filled with centres of force, the seeds, as it were, of that which was to be known as matter, round each of which two forces, attraction and repulsion, were in abeyance."

This "abeyance," from balancement of attractive and repulsive force, appears to be the author's explanation of the ether stipulated for by various physical philosophers as a medium filling space, and which the Inner Templar accepts, in his own way, as the original or "prime matter." Professor Huxley's idea of "inert matter" in general is said to be that it consists of a balancement of attractive and repulsive forces. The words "attractive" and "attraction" imply an incomprehensible act, however, which is hypothetical, and which, Professor de Morgan jocularly predicts, will, by future theorists, be called "the pulley-haulay system."

In order to avoid all hypothesis on this subject, we have ourselves long used the words "concentrative" and "concentration" which are simply declarative of the universal fact or phenomenon, without involving either the "pulley-haulay system" or any other. And as the antithesis of concentrative, of course, we have preferred to use the word "radiative" rather than "repulsive." Using our own terms, then, we would suggest both to Professor Huxley and to the Inner Templar whether they ought not to modify their definitions of what matter is, by the consideration that, in ethereal or other "radiant matter," instead of the radiative and concentrative forces being in a state of balancement, the radiative is plus, the concentrative minus; while in more tangible and resistive forms of what is called gross matter, the concentrative is plus, the radiative minus. Thus, too,

the way out of matter into spirit may simply be the way out of concentrative into radiative states,—a possibility which involves the radiative infinity whence the grosser forms of matter proper may be said to have descended into concentrative unity. If concentrated matter can be infinitely radiated (as it may well be in the infinite, whence it emanated), what can matter radiated to a certain extent be but spirit? This we may more readily allow, since we find even sceptics ceasing to regard matter as that lifeless, dead, inert, and brute mass which it once was conceived to be. As a congeries of living and associated forces, concentrative and radiative, emanating together from central points of space, the "inert substratum," or, in truth, substratum merely, heretofore called "matter," on which all material forms, bodies, or superstructures, were supposed to be based, is knucked from beneath our feet, and all that remain are living forces, concentrative and radiative, emanating from central points, through which, as it were, we have a direct glimpse of the Unitive and Infinite meta-physical Power on which all physical creation is based, whence it all emanates, and by which it is all and ever sustained.

The Creator is a Sphere whose centre, said Coleridge, is everywhere and whose circumference is nowhere. Here we have a beautiful and true definition of that Unitive and Infinite Principle, who creates all centres of force, by whom all things subsist, and "in whom we live, move, and have our being." Though beyond all, He is in and through all, and perpetually sustains all. And as for the "infinitely divisible" matter, with which materialists used to dabble, it is easy to see that it is a bottomless pit where there is finally nothing to stand upon; and though, as they would insist, our forces must inhere in a subject, it is clear that they have in matter no such subject, no such basis; and therefore we must seek elsewhere for it; nor need we waste much time in the search; for concentrative force clearly emanates from and is based upon Unitive Power or Principle, and radiative force from and upon Infinite; so that the Unitive and Infinite Principle which transcends all physics—all creation, is the Substance or Basis of all, as well as the Creator and Disposer of all.

The accordance of the idea of Faraday, Huxley, or the Inner Templar,—that every body in existence is based upon forces emanating from (nitive) points or centres,—with the nature of the mind of man, which has been shown, in the *Builder* (of July 11th, 1863), to be an estimator of forces and their relations, and itself based on forces, affords an additional reason for looking with favour upon such an idea; but we cannot here enter further on this subject, and must therefore briefly wind up our notice of the Inner Templar's response to the question, "What is Matter?"

Basing it on his idea of matter, the author gives a version of the nebular theory, and also proposes a new theory of light, which we have not time at present to look into, but which seems to contain some rather curious and startling propositions, one of these involving the exact measurement of an atom or primitive sphere of force in various substances, such as air, water, and glass. On these and other points the author considers that he has "given the key which will unlock many mysteries in the world of philosophy and science;" and whatever the reader of his book may think on this point, he will find a good deal in it to ponder on, with nothing to weary the attention in the shape of prosey or prolix disquisition.

Miscellaneous.

The Tower Subway.—This work has now passed the nearest approach to the bed of the river, the top of the tunnel being 23 ft. below the bed, and the engineer, Mr. Peter W. Barlow, jun., reports that at the present rate of progress the tunnel will reach high-water mark on the Snrrey side in ten weeks. The ground, it is said, is so dry that the New River Company's water laid on the works has to be taken from the shafts for the cement used in the tunnel. Air is supplied to the men by a steam-engine at the shafts. Communication between the men at the face of the works and the top of the shafts is effected by an electric telegraph.

* In connexion with the whole subject we may here refer to an article in the *Builder* of 1854, p. 580, titled, "What is Electricity?" and to a "Psychological Key," by J. E. Dove, in the *Builder* of July 11th, 1863.

Slate Quarrying in Wales.—Seventy-five years ago slate quarrying in Wales was confined to out-of-the-way corners, where a few slates and slabs were got by the owners of the ground for their own use. As far back as the last decade of the last century, however, the Penryn quarry began to be looked on as a profitable investment for capital, and the true value of slates as articles of commerce began to be felt. The want of roads or other efficient means of transport to the sea, greatly retarded the development of the new industry. All the slates and slabs were at first, perforce, carried six miles to port on the backs of ponies. Subsequently, a road was made, and carts and wagons were used; and at last came the tramway. Later on, the great Llanberis quarry was opened; and, later still, the quarries of Nantlle, Festiniog, and Corris. The fact that money was to be made by quarrying and selling slates soon attracted attention; and within the last half-century not fewer than 100 quarries have been opened in different parts of Wales, either by private enterprise or by public companies, but of these not half the number is now in operation, while the number of those worked to a profit is probably under twenty. Within an arc of six miles radius, described from Port Madoc as a centre, more than 250,000*l.* have been spent without the prospect of a return. Why this has been the case it is almost beyond our province to inquire. The incompetence of directors and managers has been one principal cause of the financial ruin of more than one company. The great error committed seems to have consisted in opening quarries in districts where the slate formation is naturally bad in a commercial sense. There are only three veins of absolutely pure, laminated, and lasting slate rock as yet known to exist in North Wales.—*The Engineer.*

Technical Education.—A conference on technical education has taken place in the theatre of the School of Mines, Jermyn-street, under the presidency of Lord Elcho. Several representative working men and others interested in the question were present. The chairman, in his opening address, said it was absolutely necessary that we should have something in the way of technical education, if our manufacturers and artisans were to hold their own in the face of foreign competition. Papers dealing with the question were read by Mr. Bookmaster and others, and several resolutions were subsequently introduced. The movers proposed, in effect, that the Workmen's Technical Education Committee should be a permanent organisation, under the name of "The Workmen's Technical School Union;" that the necessity for providing technical education for their workmen and apprentices should be urged upon the great employers of labour; that the trade societies be recommended to establish schools, night-classes, museums, and libraries for the apprentices in their respective industries; and that all corporate bodies, like the guilds of the City of London, be asked to apply a portion of their funds to a similar purpose; that the Government be urged to establish a certain number of superior schools of arts and trades, similar to those in France, for the education of foremen and other high-class workmen; that application be made for the establishment of chairs for instruction in the evening, precisely similar to that given in the daytime at the School of Mines, and that provision be made in the primary schools for instruction in the elements of science and art.

Palestine Exploration Fund.—The annual meeting of this Fund has been held in Willis's Rooms, the Archbishop of York in the chair. Among those present were Mr. Tito, M.P., Professor Owen, Mr. Magregor of the Rob Roy, and various other well-known persons. Mr. Grove, the hon. sec., read the report of the executive committee, and Mr. Morrison read the treasurer's report, from which it appears that the number of annual subscribers was doubled during the past year, which we are glad to think denotes increasing interest in the very important explorations at Jerusalem. We hope the list will again be doubled during the present year. A resolution was agreed to approving of the operations and desiring their continuance.

The French Duty on English Plate Glass.—A deputation of English plate-glass manufacturers has had an interview with Mr. Bright at the office of the Board of Trade, to present a memorial praying for a remission of the duty now imposed on English plate-glass by the French Government.

Enclosure of Commons.—The quantity of land which has been enclosed in England and Wales, or is in process of being enclosed, since the passing of the Enclosure Act of 1845, amounts to 614,804 acres; out of this quantity 1,742 acres were reserved for the purposes of exercise and recreation, and 2,223 acres reserved as allotments for the labouring poor. Wandsworth Common possessed over 800 acres of pasturage, which was used for common rights; but by the Enclosures Act nearly the whole of this has been taken for the erection of public institutions, the county prison, and railway cuttings, and the rights are reduced to within 100 acres. Now we are told that twenty acres more of the common are about to be taken by a parochial board for the erection of paper buildings.

Improved Cabs.—The Council of the Society of Arts have offered the following medals for improved hackney carriages specially suited to the metropolis:—The Society's Gold Medal for the best and most convenient open hackney carriage for two persons; the Society's Silver Medal for the second-best ditto; the Society's Gold Medal for the best and most convenient closed hackney carriage for two persons; the Society's Silver Medal for the second-best ditto; the Society's Gold Medal for the best and most convenient closed hackney carriage for four persons; the Society's Silver Medal for the second-best ditto. Lightness of construction, combined with adequate strength and durability, will be especially considered in making the awards.

Well-sinking in Algeria.—A curious circumstance is announced from Algeria. A well lately sunk at Ain Sala to the depth of forty-four metres, threw up not only a large body of water, but, to the surprise of the engineers, an innumerable quantity of small fish. These are described as being on an average half an inch long, and resembling whitebait both in appearance and taste. From the fact of the sand extracted from these wells being identical with that which forms the bed of the Nile, it is concluded that an underground communication must exist between them and that river.

Leicestershire Architectural and Archaeological Society.—The annual summer gathering of this society was held at Melton Mowbray, with an excursion to Botesford and several other places on the way. A day's diggings at Melton, upon ground where Anglo-Saxon relics have been found, preceded the excursions. A public meeting took place in the Corn Exchange, the vicar of Melton in the chair, when Mr. James Thompson read a paper on the objects of Architectural and Archaeological Societies, and the Rev. Assheton Pownall one on Early English Money. Mr. North also read a paper on the Ancient Schools of Melton. On the following day the excursion took place, when a party of about thirty proceeded in vehicles to visit the principal churches and objects of interest in a district extending to the extreme north-east of the county. Mr. M. H. Bloxam and Mr. T. North were amongst them.

The Workmen's International Exhibition, 1870.—A public meeting promotive of this exhibition has been held at the Pimlico Rooms, Winchester-street, Pimlico, when a deputation from the council explained the details and arrangements. The exhibition will be held in the Agricultural Hall, Islington. It is to serve, *inter alia*, as a school of technical education. All articles exhibited will be signed with the name of the workmen by whom they were made. Where division of labour prevails, workmen are invited to exhibit specimens of that particular part of the work in which they are severally engaged, such as in a piano or a watch, and to combine for the production of the completed article. Medals and certificates of merit will be given, and also, in special cases, money prizes. Articles may be sold, but not removed, during the exhibition.

Annual Poor-Rate Return.—The return for the year ending at Lady-day, 1868, shows that the gross estimated rental of the property in England and Wales assessed to the Poor-rate in the year was returned as 118,334,081*l.*, the rateable annual value 100,612,734*l.* The amount levied as poor-rates was 11,054,513*l.*, being 1*s.* 10*d.* in the pound on the gross estimated rental, 2*s.* 2*d.* on the net annual value. These ratios are larger than in the preceding year by 1*s.* 5*d.* and 1*d.* respectively. The total amount of local taxation was 16,660,459*l.*

Gas-Burners.—Too little attention has heretofore been paid to the subject of gas-burners, many of which are wasteful, while some others are far more economical. The referees appointed under the City of London Gas Act, 1868, in their report to the Board of Trade of the 3rd May, 1869, point attention to this subject, and state that they have found Leoni's standard Adamas, Albert Crutch, and Economiser, to be far more economical than others they have tested. The referees think it a matter of urgent importance that such facts as those they state should be brought to the knowledge of the public.

The Proposed Building at Southwark Park.—An out-door meeting has been held in Southwark, to protest against the proposition to build on a part of the ground purchased with the view of making a park for Southwark. The Metropolitan Board purchased 63 acres, their purpose being to aid the ratepayers in defraying the cost by devoting 16 acres to building purposes, without which purpose, doubtless, no park would have been purchased at all; and the only fear, we should think, may be that the movement against the proposed arrangement may prevent the Board from purchasing open ground for parks in other parts of the metropolis. The meeting referred to resolved to send a deputation to the Board on the subject.

Farewell Breakfast to Artisan Emigrants.—At the Cannon-street Hotel, an interesting breakfast party has been held, to bid God-speed after the old Christian fashion to a party of fourteen British operatives, who, with wives and children, were about to leave this country for the United States of America, to be employed there on the new buildings of the Cornell University, at Ithaca, to which Mr. Goldwin Smith has been attached. These fourteen skilled workmen have been picked and chosen from the Associated Trades, through the agency, we believe, of Mr. George Howell, and under the auspices of the Hon. Anthon Herberst and Mr. Hodgson Pratt, by whom the invitations to this friendly little gathering were sent. Lord Houghton presided. After Lord Houghton, Mr. Applegarth, Dr. Watts (of Manchester), the Hon. G. Brodrick, Mr. George Howell, Mr. Hodgson Pratt, Lord Edward Fitzmaurice, Mr. Morier, and Mr. Cramer, were the speakers, as also was Mr. Sneath, a carpenter, one of the emigrants.

Electro Telegraphic Progress.—The French Atlantic cable which is being laid showed a slight defect in the electrical condition on Friday night. The gutta-percha resistance fell, and there was every indication of a fault which it was impossible to localise. On Saturday morning, however, the communication was again perfect, and telegrams between the ship and the shore were freely passed. The fault reported was considered to be evidently very minute, and in no way affecting the practical working of the cable. Since then a telegram has announced the cutting and hoisting of the cable, but whether in shoal water, or previous to reaching it, was not said; nor was any reason given.—It is stated that the sum agreed upon by the Electric Telegraph Company, as the price of their property, is 2,938,000*l.* The plant is valued at 1,000,000*l.*, and the net profits of 180,000*l.* will realise above 6 per cent. upon the sum the Government will pay.—In the House of Commons, in reply to questions, the Postmaster-General stated that the negotiations with the telegraph companies for the acquisition of the telegraphs were now completed, but those with the railway companies were not yet quite finished; these last, however, were in such a state as to enable the Government to ascertain very nearly the sum required for the acquisition of the whole of the telegraphs of the country, and a Bill would shortly be introduced for the purpose of raising the necessary funds. A clause would be introduced giving to the Government a monopoly of the transmission of telegraphic messages, in the same way that they have a monopoly of the transmission of letters.

British Museum.—A large and beautifully-carved vase (or, as the museum authorities prefer to label it, a "krater") found in the villa of Hadrian, Paestrina, has just been erected in the middle of the area of the entrance-hall. It is a very rich piece of ancient work, the bowl being supported on hold claw trusses with lions' heads. Round the upper part satyrs are carved, represented in the act of making wine. The whole erection stands about 10 ft. from the floor.

A Tribute to Mr. Applegarth.—A demonstration in honour of Mr. Robert Applegarth, secretary of the Amalgamated Society of Carpenters and Joiners, has been held at Chorlton-on-Medlock. Mr. Applegarth was presented with a book-case and 200 volumes of works, selected by Mr. Hughes, M.P., and other gentlemen, and towards which contributions were received from Mr. Rupert Kettle, Mr. Mandella, M.P., Mr. Vernon Lushington, Mr. Crompton, the late Mr. Ernest Jones, Professor Beesly, of the London University, Professor Jevons, of Owen's College, Mr. J. M. Ludlow, Mr. Lloyd Jones, and others. The testimonial was got up not merely as a reward for duty, but as a stamp of approval of Mr. Applegarth's public conduct.

Well-opening at Edlston and Wyaston.—The inhabitants of Edlston and Wyaston have for generations suffered from the want of fresh water, particularly in the drought of 1868, but that necessity has been at length supplied by the liberality of Mrs. Alderson, of Wyaston Grove. A well has been sunk and a pump put down for the free use of the parishioners, over which has been erected a stone building. The presentation of the well took place on Wednesday, the 16th ult., when the inhabitants in gratitude made a public demonstration, and with the proceeds of a subscription from workmen's wives, presented Mrs. Alderson with a glass jug and two goliets.

The Royal Horticultural Society.—The president and fellows of this society have presented an interesting entertainment to a numerous and distinguished company. In addition to a *soirée*, several incidents occurred which are not generally included in the programme of this class of social gatherings. Prince Teck was present, and a long line of gasjets lighted up the bright combinations of colour effected by the movements of the company through the hall, and the statuary was thrown into bold relief by the sombre background of exotics. The members of the St. Cecilia Choral Society performed a selection of glees and part songs, all, except one, the compositions of English masters. Whippert's hand agreeably alternated with the singing, and the visitors continued to move through the conservatory and the avenues of promenade in its vicinity until nearly midnight.

Society of Arts.—The 115th annual meeting of the members of the Society for the Encouragement of Arts was held on Wednesday, at the offices of the society, Lord Henry Lennox in the chair. Mr. Le Nève Foster, the secretary, read a lengthy report detailing the operations of the society during the past year, which had been of the most varied description. The Albert Medal for rewarding distinguished merit in promoting art, manufactures, or commerce, had in this year been awarded to Baron Liebig. The Swiney Prize had been given to Dr. Guy. Prizes for art-workmanship to the amount of 95*l.* had been given. Three courses of Cantor lectures had been delivered by Mr. W. Perkins, Mr. S. Hart, and Mr. J. Henderson.

Addition to the Earlwood Asylum for Idiots.—The Prince of Wales has laid the foundation-stone of an addition to this asylum. The additions proposed comprise an extension of the dining-hall to nearly double its present length, with enlarged space for playing and recreation, new kitchen, scullery, bakehouse, wardrobes, workrooms, lavatories, baths, &c. The estimated cost of these is 12,000*l.*, but it is also intended to erect a detached infirmary whenever the Board shall find that they have sufficient funds in hand to justify the necessary outlay.

The New Fish Market, Swansea.—This much required accommodation, erected by the corporation at an expense of something like 500*l.*, has been opened. It is erected over the butchers' stalls on the south side of the market, near the Orange-street entrance. Means have been adopted to secure ventilation, and marble troughs have been erected for the display of fish; whilst there is an abundant supply of water.

Gas-pipes of Wood.—A firm in Oshkosh, Wisconsin (U. S.), has contracted to make 1,000,000 ft. of wooden tubes to lay down in that city for gas-pipes. They are to be made of timber 6 in. square, bored in the same way as pump-barrels. For the hackwoods of America wooden gas-pipes may be all very well; but where metals abound such pipes are not to be commended. The Chinese cane gas-pipes, even, would be better than these.

Value of a House in Cheapside.—The freehold premises in Cheapside occupied by Mr. John Bennett, the watch and clock maker, have been put up at auction. The auctioneer stated that the property covered an area of 1,750 square feet, which, if in possession, he should value at 15l. per square foot; but Mr. Bennett held a lease of the premises for about 11 years at 500l. per annum, for which he paid a large premium in addition to making considerable alterations; and if the premises were now in hand he should estimate them to be worth at least 1,000l. a year. The biddings commenced at 10,000l., and after competition the property was bought in, we believe, at 14,000l.

The New Law Courts.—A report has been issued by the committee appointed by the Courts of Justice Commission "to examine all the plans submitted to the Commission, with a view to ascertain the dimensions and measurements." The total area of office accommodation in the Parliament scheme is 256,821 superficial feet; the area provided in Mr. Street's Howard-street scheme is 180,423 ft.; that in Mr. Street's reduced scheme for Carey-street site, as just published by the Office of Works, 278,395 ft.; and under the scheme approved by the Commission reduced to the Carey-street site, 284,188 ft. This information is supplemented by the report from the surveyor of Her Majesty's Works and Public Buildings to the First Commissioner on the sites proposed for the courts and offices of law. It concludes in favour of the Embankment site.

Convallescent Hospital for Children.—The Mansion at Highgate known as Cromwell House, and believed to have been built by Cromwell for his daughter, and her husband, General Ireton, has been converted into a convalescent hospital for children by the managers of the children's hospital in Great Ormond-street. The rooms for dormitories and day-rooms are spacious and lofty, and there are an extensive playground and garden, with a large kitchen-garden. There are also bath-rooms, lavatories, and other modern appliances. When fully occupied, the house will receive about 100 patients. At the outset 50 children will be received. The works of alteration and adaptation have been carried out at an outlay of about 3,000l., by Messrs. Wagstaff & Son, under the direction of Mr. Arntz. The baths and hot-water apparatus, with all the fittings in the kitchen department, are the work of Messrs. Benham & Son. Other parts of the work have been carried out by Messrs. Jennings.

The South Kensington Museum.—In reply to Lord Eloho in the Commons, the Vice-President of the Committee of Council on Education said the reason why the brick and terra cotta buildings of the South Kensington Museum in Exhibition-road were not progressing for the last three months, was simply that it was thought necessary to reduce the building vote, which was 8,500l. for this year, and there were other works the completion of which was more urgently called for.

Working Men's Club and Institute Union.—On the 28th ult., a conference of persons interested in working men's clubs and institutes was held in the theatre of the Society of Arts, at eleven o'clock a.m. After the conference, the representatives of clubs in the country dined with members of the London institutions at the Artisans' Club in Newman-street. After the dinner a paper was read on "Art applied to Industry," by Mr. C. Lamport. On the following day (Tuesday), the 29th ult., the annual meeting of the union took place at Exeter Hall.

Public Parks (Ireland) Bill.—Viscount Lifford, in the House of Lords, said the object of this bill, which came up from the House of Commons, was to assimilate the law of Ireland with respect to the creation of public parks to that of England. The bill gave power to the commissioners of towns with a population of 10,000 or over, to levy rates for the purpose of forming local parks. The bill was read a second time.

Payment of Board of Health Surveyors. During a recent discussion concerning advertising for a new surveyor to the Local Board of Cockermonth, one of the members of the Board, Dr. Dodgson, said justly that it was a strange thing that they should give the engineman 2 1/2 a year and a free cottage to live in, while they were offering to a man who would have to look after the engineman the sum of 50l. per year.

The Value of Land in Brighton.—The surplus land which had been acquired by the corporation for improving the lower part of North-road, was recently submitted to public competition. Amongst the portions sold we may note Lot 6, at the corner of Jubilee-street, having a frontage of 18 ft. 6 in. to North-road, and of 35 ft. 8 in. to Jubilee-street, by Mr. A. Buckwell, for 295l.; Lot 7, to the west of this, having a frontage to North-road of 17 ft. 4 in., by Mr. W. Wilson, for 200l.; Lot 10, at the upper corner of Regent-street, to which it has a frontage of 45 ft. 4 in., and a frontage to North-road of 17 ft. 6 in., by Mr. Corney, for 310l.; Lot 11, to the west of this, a frontage to North-road, 16 ft., by Mr. W. Wilson, for 220l.; Lot 12, again to the west, a frontage of 20 ft., by Mr. H. Verrall, for 250l.; Lot 13, again to the west, a frontage of 16 ft., by Mr. H. Dash, for 260l.; and Lot 14, at the corner of Gardener-street, to which it has a frontage of 39 ft. 4 in., and to North-road of 16 ft. 6 in., by Mr. Oliver Weston, for 610l.

The Projected Channel Tunnel.—A deputation, consisting of Lord Richard Grosvenor, Admiral Elliot, Mr. Hawkshaw, C.E., and others, has had an interview with the Right Hon. J. Bright, at the office of the Board of Trade, on the subject of the proposed Channel tunnel from England to France.

Public Works in Greece.—An announcement of much interest was made in the King of Greece's speech at the opening of the new Chamber of Deputies. Amongst various other public works which will be speedily commenced, a canal is to be cut through the Isthmus of Corinth. This undertaking is at last to be realized, with the help, we believe, of M. de Lesseps. The famous Peloponnesus will then become an island.

Rats and Mice.—A recent writer says that cotton saturated with chloroform, and then stuffed in the holes of rats and mice, will prevent their re-appearance in a house. Tar is said to be a capital thing to pour into their holes, and might be largely used in conjunction with broken bottles and cement for filling up the places they have undermined and infest. In the bottles and cement alone not much faith is to be put.

Heat by Compression.—Every one knows that, if a certain volume of air be compressed, the temperature is raised in certain proportions. Acting on this fact, Mr. Bessemer has devised a plan for increasing immensely the heat of furnaces by condensing the gases.

Congress of the British Archaeological Association.—The congress of this association will this year be held in St. Alban's, commencing August 2nd, and ending on the 7th. Lord Lytton is the president, and the arrangements are making satisfactory progress.

Kent Archaeological Society.—It has been resolved that the general meeting of this society shall take place at West Malling on Thursday and Friday, the 5th and 6th of August.

Chelmsford.—The Chelmsford Highway Board, at their last meeting, passed a resolution increasing the clerk's salary 20l. A short time since they increased the salary of their district surveyor, Mr. Frank Whitmore, from 200l. to 250l. a year.

Royal Archaeological Institute.—The Royal Archaeological Institute of Great Britain and Ireland will visit Bury St. Edmunds on the 29th inst.

New Process for Preserving Wood.—A new process for preserving wood by means of borax is announced. The wood, it is said, can be made impermeable to water by dissolving some shellac in the solution of borax.

Schools of Art Works.—We are glad to hear that the large metal flagon, designed, modelled, and chased by Mr. H. Archer, and for which the gold medal was awarded, has been bought by an eminent firm in Sheffield.

TENDERS.

For erecting warehouse, Speck's-fields, Mile-and New Town, for Mr. A. Bishop. Mr. J. Tamer, architect:—	
Marr.....	2,256 0 0
Asby & Sons.....	1,392 0 0
Eaton & Chapman.....	1,949 0 0
Turner & Sons.....	1,859 0 0
Asby & Horner (accepted).....	1,850 0 0

For completing fire brigade station, Renfrew-road, Lower Kennington-lane, for the Metropolitan Board of Works:—	
Clark & Green.....	£871 0 0
Ebb.....	844 0 0
Till.....	835 0 0
Crookell.....	795 0 0
Waterson.....	765 0 0
Blackmore & Morley.....	755 0 0
Shurmer.....	684 0 0
Ball.....	637 0 0
Winship.....	615 0 0

For St. Anne's Church, Brompton. Mr. A. Porter, architect. Quantities supplied:—	
Coleman.....	£3,275 0 0
Dove, Brothers.....	3,255 0 0
Hart.....	3,250 0 0
Merritt & Ashby.....	3,241 0 0
Myers & Son.....	3,159 0 0
Kelly, Brothers.....	3,027 0 0
Nixon.....	2,996 0 0
Weeb & Sons.....	2,974 0 0
Browne & Robinson.....	2,850 0 0

For rebuilding house, Westminster, for Mr. Parks. Mr. H. W. Badd, architect:—	
Hoare & Postlethwaite.....	£267 0 0
King & Son.....	565 0 0
Richards.....	525 0 0
Foster.....	610 0 0

For the erection of twelve cottages, at New Swindon, for Mr. William Road. Mr. T. S. Lansdown, architect:—	
Harrison & Son.....	£2,432 0 0
Bridges.....	2,291 0 0
Nightingale (too late).....	2,268 0 0
Kimberly.....	2,134 0 0
Newcomb.....	2,069 0 0
Lovett.....	1,969 0 0
Dover.....	1,900 0 0
Haynes.....	1,830 0 0
Forsshaw (accepted).....	1,828 0 0
Briggs.....	1,794 14 0
Barrett (withdrawn).....	1,770 10 0
Wilshire (withdrawn).....	1,767 7 11

For school and class room and teacher's residence, Bredgar, Kent. Mr. G. Buck, architect. Quantities supplied:—	
Gannon.....	£983 15 0
Sollitt.....	879 0 0
Harris.....	379 0 0
Ansell.....	965 0 0
Tidy.....	855 0 0
Clements.....	835 0 0
Seywell.....	828 0 0
Wallis & Clements.....	883 0 0
Seager & Marley.....	859 0 0
Epps (accepted).....	747 10 0

For rebuilding and dwelling-house, at Woolton Bassett, for Mr. S. Hart. Mr. T. S. Lansdown, architect:—	
Kimberly.....	£2,450 0 0
Newcombe.....	2,256 0 0
Wheatley.....	1,827 0 0
Dover.....	2,115 0 0
Jones.....	2,100 0 0
Drew.....	2,014 0 0
Barrett.....	1,919 2 4
Dyer (accepted).....	1,920 0 0

For reseating, refronting, &c. Congregational Chapel, in Fish-street, Hull. Mr. S. Musgrave, architect:—	
Bricklayer's and Plasterer's Work.	
Musgrave.....	£400 0 0
Carpenter's and Joiner's Work.	
Sissons.....	£680 0 0
Mason's Work.	
Sweeting.....	£35 0 0
Plumber's Work.	
Richardson.....	£21 0 0
Gasfitter's Work.	
Stones.....	£36 0 0
Slater's Work.	
Wilde & Co.....	£9 16 0
Painter's Work.	
Chapman.....	£30 0 0

For erecting Sandown townhall, Isle of Wight. Mr. T. Dowell, architect:—	
Cooker.....	£1,800 0 0
Nesman.....	1,469 0 0
Parson & Co.....	1,424 0 0
Lowe.....	1,418 0 0
Young.....	1,359 0 0
Hayden.....	1,327 10 0
Urey.....	1,327 0 0
Flue.....	1,287 0 0
Jellicoe.....	1,256 0 0
Thomas (accepted).....	1,278 0 0

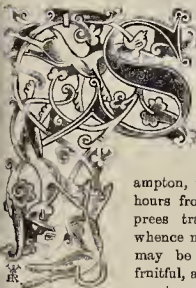
For alterations and enlargement of the Horse and Doners, Broad-street-hill, Cannon-street, for Mr. T. Brinn. Drawings prepared by Mr. F. Arthur:—	
Builder's Work.	
Messrs. Michell.....	£396 0 0
Plumber's Work.	
Messrs. Clements.....	—
Painter's and Decorator's Work.	
McCarty.....	—

For rebuilding house and premises, No. 13, Elizabeth-street, Fimlico. Mr. J. M. Dance:—	
Wilson.....	£561 0 0
Leggett.....	523 10 0
Whitick (accepted).....	526 0 0

The Builder.

VOL. XXVII.—No. 1379.

A Note from Northampton.



WOULD any of our readers, having exhausted nearer quarries of antiquarian and artistic interest, be seeking a fresh working, they will find it in Northampton, which is about two hours from London by express train, and a centre whence numerous excursions may be made, instructive, fruitful, and delightful. The county, as every one probably knows, is full of historical

associations, dating from the time when the Romans constructed a chain of forts along the banks of the river Nen to the Warwickshire Avon, and further, up to the year 1675, when a large part of Northampton was burnt down. Hamtune, in Saxon times, or North Hamptone, as it was called soon after the Normans came, witnessed many important events. The Danes burnt it. Great councils were held here by Henry I., Stephen, Henry II., and others. Here the barons swore allegiance to John, in the year 1199; and afterwards, when they had made the king sign Magna Charta, Northampton Castle, amongst other castles, was given up to them as security for the fulfilment of the engagement. The last Parliament assembled in Northampton ordered the poll-tax which led to Wat Tyler's rebellion. One of the great battles between the Roses was fought in the fields close to the town, when the king, Henry VI., was taken prisoner. Burleigh reminds us of Queen Elizabeth, Fotheringay of Mary Queen of Scots, Tresham's triangular Lodge at Rushton, of the Gunpowder Plot; and Naseby, of the irretrievable defeat of Charles I. by Fairfax and Cromwell. Earthworks are not wanting, and architectural remains from the time of the Anglo-Saxons to that of the Tudors are plentiful. The works left by the former in England, indeed, cannot be fully studied without taking into consideration those to be found in the neighbourhood of Northampton. The churches of Brixworth, Barton, Barnack, and Brigstock,—all beginning with B, by the way,—are most important items in the group of works which remain to us, unquestionably dating from before the Norman conquest, and concerning which we will speak again hereafter. Northampton itself has one of the only four Round Churches in England, resulting from the Crusades, St. Sepulchre's; also a very beautiful specimen of Anglo-Norman work, St. Peter's Church, and the best remaining Eleanor cross. Eleanor, the half-sister of the king of Castile, and who, it will be remembered, accompanied her husband—when Prince Edward—to the Holy Land, and saved his life by sucking the wound made by a poisoned weapon, died at Harby, or Hardely, in Nottinghamshire, on the 28th of November, 1290. Crosses were erected, as every one knows, at the places where the body rested on its way to London, and some Expende Rolle, which have been preserved, mention one at Lincoln, at Northampton, Stoney Stratford, Woburn, Dunstable, and St. Alban's, all mainly the work of John de Bello, or of Battle. There were others at Harby, Geddington, Waltham, Cheap-side, and Charing.

Of the fifteen believed to have been originally erected, only three,—those at Northampton, Geddington, and Waltham,—remain. The statues of Eleanor for the Northampton Cross, as well as for others, were by William de Hibernia, or Ireland, but seem to have been copied from the statue executed by Master William Torrell, goldsmith, for the tomb in Westminster Abbey. The four statues still remaining in the Northampton Cross (all of the Queen) are graceful and dignified.

The Northampton Cross, about a mile from the town, placed on a flight of steps that give it admirable firmness of aspect, is beautifully situated on rising ground at the side of the road: backed with trees, and with a charming view of the town in the distance on one side, it forms a picture that remains on the memory. The structure is in a fair state of repair, with the exception of the terminal, or fourth stage, but having been restored on various occasions, once at a period when less care was paid to the retention of old forms than is now the case, doubt is felt as to the correctness of some of the portions. We are disposed to think, however, that no considerable departure from the original was made.

It is noticeable that under each statue, on four of the eight faces of the first stage, is sculptured a small projecting deck with an open book on it, for the most part defaced, but still obvious.

It is sometimes said that these large crosses form a class of structures wholly peculiar to England; but this is not correct. The Schöne Brunnen in the market-place of Nuremberg is a remarkably fine work of the same kind, larger and more elaborate than those dedicated to the *Chère Reine*,—the beloved of all England, as Walsingham calls her. If we remember rightly, however, this particular example is of somewhat later date.

The Round Church, St. Sepulchre's, was built by Simon de Liz, the second Earl of Northampton, when he returned from the first Crusade, and is very rude and ugly. Round lofty columns form the annular aisle within, and are connected by pointed arches, which may or may not be original. At present the building is in a miserable condition, without interest of any sort except its age and origin. The later church, added to the Round in the thirteenth century, as at the Temple Church, London, has been lately restored, and, we believe, added to. Stones of two colours, call them white and brown, were originally used here somewhat indiscriminately. In the restoration and rebuilding, the colours have been varied with more regularity, and the result is a specimen of what has been wickedly termed the Holy Zebra style, at present somewhat wanting in repose. Time, however, the great harmonizer, will gradually lessen its garishness. The new work includes a considerable amount of carving, some of it very well executed.

The angular buttresses of the later tower here project so considerably at the bottom, and decrease so regularly, as to continue the lines of the spire down to the ground with agreeable effect.

St. Peter's is a remarkably interesting specimen of the Norman style; the variety in the capitals of the columns inside, and the beauty of some of them, are very striking. Britton, in his well-known 5th volume,* a most valuable hook, gives a sheet of these capitals, besides internal and external views of the church. Miss Baker, the sister of the historian of the county, spent a long time in removing from these carvings successive coats of whitewash, which had disfigured and preserved them. The tower, the greater part of which is Norman, is especially noticeable for its angular buttresses, each formed of a cluster of three columns, so to speak, decreasing in

size, story by story, and for a highly enriched Norman discharging arch on the west front of it. The effect of these buttresses, now that the earth is removed from the bases, and they are seen in their whole height, is very fine. The variety and beauty of the interlacings and floral patterns that adorn the face of the curious arch, alluded to, are also charming. These two features make the tower unique, so far as we know. To the other churches in the town we can but briefly allude. All Saints', the principal, which stands at the intersection of main streets, is a strange hybrid, completed in the reign of Queen Anne, but is not without interesting associations. St. Giles's Church is an ancient building, of various periods, and includes a handsome Norman doorway in the west face of the tower.*

It is worth noting that the calculations of the probable duration of life at certain ages known as the Northampton table, and on which, though it is now thought of little value, the present system of Life Assurance was almost founded, were made by Dr. Price from the account of burials in this town during a period of forty-five years,—1735 to 1780.

Of the new town-hall here our readers have heard before now. It is founded in general arrangement on the same type as the Manchester Assize Courts are, with central tower, under which is formed the main approach, and includes a considerable amount of descriptive sculpture in relief, and a range of figures under canopies along the whole front below the parapet. These canopies, awkwardly stuck on, are not quite satisfactory: nevertheless, the building, as a whole, is creditable to all concerned, and a great ornament to the town. A museum of local antiquities and other objects of interest will be found in one of its apartments, and is said to be worth a visit: we did not see it. Several of the inhabitants have a taste for collecting.

At "The George," for example, an inn of very ancient repute, though the present building is not old, the owner, Mr. Higgins, has gathered a number of pleasant pictures and many interesting odds and ends in the shape of china and old prints. This hotel is a comfortable, good place, and may be recommended. The sitting-rooms look up the principal street, and from them, on a Saturday, when a weekly market is held, a scene of great animation and hustle is visible, especially in the evening, when every stall has its light. During the whole day people stream through the street, and the amount of business done is very considerable.

We will make a couple of little excursions,—one that shall include Brixworth Church and Althorp House, the seat of Earl Spencer, with its fine library and paintings; the other to take in Earl's Barton Church, which will give us something to say on Anglo-Saxon work generally, and Castle Ashby, the house of the Marquis of Northampton. The name of this domain recalls to us forcibly the late marquis, Spencer Joshua Alwyne, whose memory is dear to the older fellows of the Royal Society. His *conversations* held annually, as president of that society, at his house in Piccadilly, not many doors from Apeley House, were the most agreeable evenings of the kind that can be remembered. Genial, hustling, thoughtful, the president brought people together, made them known to each other, and gave to these gatherings memories that remain. It was at these meetings that the late Prince Consort first made acquaintance with English men of science. We can remember distinctly the first at which the Prince appeared, when, passing round a table whereon were a number of

* It was the last anniversary of her Majesty the Queen's accession, and which fell on a Sunday, when we visited St. Alban's church, and on this occasion the Rev. Mr. Wright, the curate as we were told, preached a sermon full of loyalty and good teaching, so eloquent, and withal so simple and unstrained, that we shall expect to hear of him soon in a wider sphere.

* "Architectural Antiquities."

things, minerals, models, and such like, he made a pertinent remark on every one of them, ending with an observation on a machine for cutting out circular timbers for ship-building, which forced the inventor to say, "Well, sir, I must admit that what your Royal Highness objects to is its weak point."

At the same time that Lord Northampton was holding these meetings, the late Lord Londesborough, not then arrived at that title, was giving similar *conversations*, as president of the British Archaeological Association, in the adjoining house, as he afterwards did in Carlton Gardens, and Earl de Grey, as president of the Institute of Architects, was doing the same in St. James's-square. To all these gatherings men of any prominence in their several walks, or likely to become so, and, in the case of the latter two, ladies also, could find their way. The *conversations* now given by the various societies, mostly in their own rooms, agreeable and useful as they are, do not supply the place of those of which we are speaking. This, however, is a digression.

Starting for Althorp, we pass on the road, just outside the town, Becket's Well. It was to a council held in Northampton that King Henry II. summoned the imperious archbishop to hear charges made against him of perjury and contumacy. On the 18th of October, 1164, Becket appeared in great state in the hall of the castle, so offending Henry by his appearance and bearing as to lead the king to retire into an inner apartment. When the Earl of Leicester began to read to the Archbishop the sentence of the Court, commencing with the usual form, "*Oyez ci le jugement rendu contre vous*," Becket interrupted him, denied their jurisdiction, and reformed his quarrel to the Pope. At night, he secretly left the town, and tradition says he knelt to pray at the well that in consequence now bears his name. This trial of Becket has been pointed to as the earliest State trial of which we have any account. When our bellman cries "O yes! O yes!" he thinks he is talking English, not that he is carrying on the old Norman form of bidding people listen to a legal decree,—"*Oyez ci le jugement rendu*."

Although we have started, it is too late now to go on to Althorp. To use the often quoted lines of the poet Cowper, who lived at Olney, not far off,—

—"The setting sun concludes the day,
And all the fair enchantment fades away;
The George receives us to the peaceful bed,
'Till morn new beauties o'er the landscape spread."

When the sun rises we will rise too and finish our Note from Northampton.

THE PROPOSED TRADE-UNION LEGISLATION.

AMID all the complicated struggles that vex the social system of modern Europe may be traced the action of two distinct and antagonistic principles. The influence which they exert is not novel, for their existence is coeval with human nature; or, at all events, with human society. But amid the rapid, although bloodless, revolution which is the offspring of the nineteenth century many of the ancient watchwords of party have been laid aside. Much that was once assumed to be unquestionably true is now not only exploded, but forgotten. That religious horror of innovation which, two thousand years ago, was considered to be a distinct effect and sign of the fear of God, has retired to its remotest strongholds, if it has not altogether ceased to be an element of moral activity. The evil of change, as change, is no longer held by any person to be an undeniable truth. In the face of the immense strides made by science, and especially by the practical science of the chemist and of the mechanic, the most timid conservative confines his aspirations to the desire, that change shall be well considered, well aimed, and well ordered. To remain *in statu quo* is no longer the expectation of any person who thinks at all.

For the mind that seeks to look beyond the immediate requirements of the hour, and to dispel that haze of conventionalism in which the language and the ideas of party spirit involve the great questions of the day, it is instructive to be brought face to face with the great principles to which we refer, displayed in their naked simplicity. On all questions of organisation, from above or from below, of hierarchical order, or of democratic delegation, of the rights of capital, the rights of labour, and the rights of man, the widest differences of opinion may, and

no doubt do, honestly obtain. But the oneness of the absolute and irrecolvable hostility that underlies every other form or pretext of conflict is the division which subsists between those who endeavour, with more or less wisdom, to draw and bind together all classes and elements of society for the common good, and those who endeavour to set interest against interest, class against class, or man against man, for the sake of individual advantage. The former seek to build, the latter to pull down. The former are willing, in so far as it is in their power, faithfully to serve the State. The latter postpone any thought for national or for general advantage, to the supply of their own need, or the gratification of their own vanity.

If we bear this unquestionable distinction clearly in mind, we may find that much of the mist and vague doubt that beset some of the great social questions of the day will disappear. More especially may we hope that this will be the case when we approach one of the most vital of them all—the subject of the organisation of labour.

The organisation of labour has two aspects. We cannot divide it, as might at first be expected, into the natural and the artificial, for such a division is, in fact, nothing more than another mode of describing the presence or the absence of organisation. But any attempt at organisation has to deal with the two primary elements of demand and of supply, of the employers and the producers of labour, of the customer and the manufacturer, the mouth and the hand.

Now the radical, essential evil of the form which the trade-union organisation has assumed within the last half-century lies in the fact that the men who have given movement to the masses have not regarded this primary division of the subject. They have overlooked the essential relation between demand and supply, and they have not overlooked, but endeavoured to destroy, the intimate interdependence that exists between the two productive agencies themselves. They have committed the fatal error of placing labour in opposition to the natural element of labour, which we call capital. They have taught the workman to regard his interest as permanently distinct from that of his employer, instead of being so intimately connected with it as to be, in the long run, identical. They have sought to place the man who works to-day, in opposition to the man who, having worked yesterday, has something which his successor wants, and which, by a common effort, each may help the other to acquire or to increase. They have drawn a line between employer and employed, instead of between producer and consumer; and they have drawn a barbed line at this false limit, than that which ought to be interposed at the proper point of division.

To speak at the present day of the trade organisation of workmen as a crime, an evil, or a matter to be compulsorily put down, is as unphilosophical as it is unpractical. In even the worst abuses of the union organisation may be detected the instinctive effort of the proprietor of labour to do for himself that which ought to have been done for him. He may, and too often does, mistake the way. Not only so, but he may often be found seeking for what he wants in the very opposite direction from that of the path which he ought to take. But the blame of this ignorance is not exclusively his own. Neither is it by negative teaching that the case is to be met, or that the powerful, though blind, craving for organisation is to be either satisfied or suppressed.

Labour at the present day is in the very crisis of emancipation from a long and painful servitude. The moralist is beginning to regard the toil of man, whether it be with the brain or with the muscles, as a blessing, and not as a curse. Men of thought are awakening to the fact that the great requisite of progress is the adequate distribution of labour. The wealth, that is to say, the well-being of society, demands that every member of every class shall take his or her appropriate share in the great total of human duty, and shall win the reward attendant on the faithful discharge of the same. Luxurious idleness for one, grinding and sordid toil for another, is a state of things evil for all alike. All men who can be said to think at all are agreed on this point. The tendency which is so fearfully prevalent at the present day to make the rich man richer, and the poor man poorer, is felt by all persons who have any pretension to have a voice in the matter, to be one of the chief, if not the chief, menace that clouds the future. Thus, in every grade and rank of society we see indica-

tions of a tendency towards that happy state of things in which England may find each man ready and willing to do his duty.

The idea that the theoretic perfection of society implies the complete distribution of labour, intellectual and physical, among its members, so that idleness and oppression shall be equally dreaded and avoided, may be regarded as the key to the great problem of the social bond. As this thought becomes concrete in action, so will the occupants of any degree of the social scale be more harmoniously bound to those both above and below them. And it is a principle which, while never yet distinctly put forward as the cry of a party or the symbol of a school, has got a far more energetic life, and a far wider influence, than we may at first be inclined to imagine.

The success that attends the exertions of any individual labourer, or of any class of labourers, in the great social hive, will be found to depend on the degree in which those exertions tend towards the realisation of this great object—the provident and efficient distribution of labour. As in every successful industry the distribution of the parts tends to the perfection of the whole, so is it in the great master industry of social life. And it is for this reason that all purely selfish attempts at organisation are mischievous. They are short-sighted in their aim; and, therefore, false in their results. They endeavour to give a factitious independence to a part, the welfare of which is impossible without the welfare of the whole.

No instance of the fatal results attendant on a neglect of this principle of social solidarity is more striking than that which is found in the case where labour is arrayed against capital. The true object of every special industry is the attainment of the industrial results by means of the *minimum* exertion of labour. For it is not labour, alone and by itself, that is a blessing, but productive labour. Thus, the punishment of the treadmill is said to be most grievous to those doomed to undergo it, from the sense of the absolute waste of time and of power, and the sheer inutilty of the toil. Let the prison labour fill reservoirs, or grind corn, or produce any tangible, useful, known result, and the toil of the prisoner will be lightened of its bitterest moral element. Then, the more productive each item of labour is made, the more room is left for further application. Waste of toil is thus as great a social evil as waste of time, or waste of the products of toil.

In this diminution of unnecessary labour the great part is played by what is unfortunately called capital. The relation between the capitalist and the craftsman is of the same nature as that which exists between the workman and his tools. The capitalist, normally considered, is a great tool-maker, seller, or warehouseman. He has provided, at the cost of past labour, the shelter of workshops and of manufactories, the steam-engines that drive, the pumps that clear the workings, the cupolas and steam-bleats that smelt the ore, the shafts that reach the mineral, the winding-gear that brings it to the surface. All this is the contribution of capital to its partnership with labour, and evil it is for all those who attempt to divide what God hath thus joined.

So far, then, as the general organisation of the trade-unions of this country tends to draw a line between the capitalist and the labourer, to set increase of wages against rate of profit, and to make the workman regard his interest as permanently apart from, or even opposed to, that of the master, the influence of these associations can only be regarded as hostile to the best interests of society.

But in so far as they tend to impress on the mind of the workman that he is a member of an order of society as indispensable to the common welfare as any other order, and one, moreover, that is clothed with its own most ancient dignity, that of productive energy and perseverance, the trade organisations may be regarded as the product of the instinctive efforts of those who live by labour to rise to the height of their duty and of their task. And even when we regard those features which all wise men must lament and all good men must blame, let us remember how far those above, too, have been negligent or unwise. Have the educated so bestirred themselves to help the workman, that they have the right to condemn his uneducated but honest effort to help to raise or to instruct himself?

It is a very hopeful sign for the future of our manufacturing industry to see, as we have done on a recent occasion, the chair of a public meet-

ing held by, or in behalf of trade-unions, taken by a master manufacturer. The sentiments expressed by Mr. Morley on the occasion to which we refer, merit the serious and grateful attention of every operative. It will be a public benefit to convince the great mass of working men that their employers, so far from being their enemies, are their best and truest friends. And nothing is more likely to tend to this desirable result than the proof which is afforded by meetings of this description, that the master manufacturers by no means desire the degradation of the operative class. They do not wish their work-people to remain a mere disorganised mob. What they do desire is, that the organisation should be based on natural principles, and directed to a practical end. In a word, it is to co-operative, not to mutually defiant, organisation, that employer as well as employed must look, if they wish to retain, or rather to regain, our command of the markets of the world, or even to keep the wolf from the door.

The more intelligent, the more able, the more comfortable the workman, the better for the employer. That which the latter has to dread is, not education, but imperfect and erroneous education; not elevation in the social scale, but inflation with a false notion of self-importance; not combination, but conspiracy. The educated operative is the best aid to the educated master. It is the half-educated man, whether employing or employed, who is the source of disturbance. The man who has enough intelligence to understand how the exertions of all conduce to the welfare of each, has attained to that position in the moral world that we desire to see generally occupied. The man who has learned just enough to see the evils of the present state of society, without justly appreciating the causes, is apt to look to violence as the remedy. And thus has that element of brute force been appealed to, which disturbs and complicates the social relations, which embitters class against class, and which tends to chase industry from its great centres, and comfort and content from our shores.

In looking at those steps which tend to draw together master and workman as partners and fellow-labourers, we wish to call attention to some of those institutions already existing among us, the full development of which is seriously to be desired. Perhaps the first of these beneficent fruits of incipient organisation is the sick fund. In this, as far as our own experience extends, the management has generally been retained, and that with some degree of jealousy, in the hands of the operatives. The one great point to regard is the safe-keeping, and the just application, of the subscriptions. The danger of waste, or of misapplication, is wont to increase with increasing prosperity. As the bulk of the money is collected in the form of a weekly deduction from wages, nothing can be more proper than that the distribution should be effected by the hands that earn, and that collect, the supply. But it is no less a duty incumbent on the employers of labour to contribute to this fund. Directly or indirectly, they *must* do so to some extent; and it is in all respects most desirable that the contribution of the employer should take a distinct monetary form. Nor is it so much for his interest, as for that of the ultimate objects of the fund, that a voice as to the care and proper application of the fund should be given to the capitalist in virtue of his appearance as a subscriber.

Next to the sick fund in the estimation of the sick—prime in importance in the view of the foregoing—is the industrial school. In this the initiation and guidance belong to the masters or employers, no less naturally than do those of the sick fund to the subscribers. But none the less is the concurrence of the operations of the utmost importance. The hope and promise of the future, the greater or less delay which must interpose before the proper dignity of labour is assumed, lie within the province of the school-master. No association of workmen, whether among themselves or in relation to their employers, has within itself the salt of durable success, if the schools for the young are neglected. As we sow, in this respect, shall we surely reap. The importance of the conveyance of this conviction to the minds of the operative classes, is of the first order.

Following the school is the Mechanics' Institute. All forms of adult education, improvement, and intelligent amusement, come under this head. Libraries, lectures, lessons in music, cottage flower-shows,—all those modes of employing the brief leisure of the workman, which afford a relief from the constant pressure of toil

on the one hand, and from the fatal allurements of the public-house on the other, come under this head. Amusement, within due limits, is the right of the workman. Within or without such limits, he is sure to crave for it, and pretty sure to have it. The care of his friends, whether they wear broad-cloth or fustian, should be to supply that quality of amusement which is suitable both to his taste and to his welfare. And, so far as this can be done by intellectual amusement,—by that which, while play to the well-taught mind, will fill the un instructed with wonder, as in the case of some of the marvels of demonstrative chemistry,—the gain is immense. No source of mischief is more active than *ennui*; and this intolerable scourge is by no means confined to the gentle or to the tenderly nurtured. There is the *ennui* of ignorant idleness; and no social evil is at times more to be dreaded. The cure for this disease is to be found in that class of occupations which may be grouped together under the general name of the Mechanics' Institute and Club.

An industrial community,—whether associated together under a single employer, as in the case of villages that cluster around some important manufactory, or whether formed of a congeries of such distinct groups, as in the case of our larger manufacturing towns,—in which masters and work-folk are bound together in a common interest by means of the sick fund, the school, and the mechanics' institute, is the best example of a true trade-union. But we have yet, in some cases, advanced a step or two further in the emancipation of labour, and at each such step we attain further advantages for each and for all.

The step to which we now refer is that which is due to co-operation. Viewed in its simplest form, co-operation is the necessary complement to the division of labour. Looked at as a question of policies proper, it is a means of enlisting human nature on the side of industry instead of on the side of idleness. It is a method by which the selfish instincts are made to tend to the welfare of society. We are far from wishing to suggest that every effort to apply the principle is economically wise, or that amateur associations can with nicotinate advantage replace the properly-trained tradesman, unless under exceptional circumstances.

But there are simple and effective methods by which the operative classes can be economically interested in that saving which they have the means of readily effecting. The stimulus to the means of avoiding waste, and to the exertion, at every point, of the utmost care and the most untiring skill, that is afforded by the existence of a pecuniary interest, however slight, in the results of the manufacture, it is not easy to exaggerate. In some instances the work-people have had their wages augmented by a percentage dependent on the profit of the work. They are thus associated in a direct partnership with the capitalist. Wages, and interest on capital, together with a proper allowance for depreciation of plant and machinery, being first paid, and all expenses, direct or contingent, allowed for, the resulting net profit is divided, in an ascertained ratio, between the head and the hands. The satisfactory result of this intimate alliance between the master and the man is said to be as striking as might be anticipated to be the case.

Another method in which the influence of the spirit of association tends to bind class to class is to be found displayed in the operation of building societies. The advantage of a wise development of this system is even greater than that of directly interesting the workman in the product of his toil. For, by the prudent capitalisation of his savings, by means of monthly or weekly subscriptions to the building fund, the workman becomes more closely linked, not only to his fellow-countrymen, but to his native land. He becomes, to an adequate extent, a landholder. The great question of the division, or even the opposition, between the landed and the industrial interests, thus receives a solution that is advantageous to us all; for, while a minutely-divided peasant proprietary is hostile to the due cultivation of land, and thus to the productive power of the country, an industrious manufacturing proprietary, whose savings, whether in the form of commercial returns or of domestic comfort, become tangibly augmented from year to year, form an invaluable element of the national wealth.

We trust that the attention which is directed to the Bill lately before the House of Commons will not be limited to the discussion of its clauses; but that all those who are interested in the welfare

of the operative classes will turn their thoughts to those tangible results of a real trade-union, which are within the reach of provident industry, and which are so important to the national welfare.

NORMAN HYDRAULIC ENGINEERING AT CANTERBURY.*

The Kent Archaeological Society has added to the "Archæologia Cantiana" a careful and picturesque paper, written by Professor Willis, "On the Architectural History of the Conventual Buildings of the great Monastery of Christ Church, Canterbury," the outline of which was read by him to the Archaeological Institute in 1847, and subsequently to the Society of Antiquaries. The subject is one capable of much elaboration, and this has been bestowed upon it in the years that have elapsed since it was first undertaken; and several plans, and a large number of sketches taken by the Professor's skilful pencil, conduce highly to the interest of the mode of treatment. We would draw attention, however, chiefly to two Norman drawings showing the system of waterworks and drainage, reproduced in all their terse, spirited quaintness. One of them has not been published before; the other, mistaken for an architectural plan of the monastic buildings, was engraved in the "Vestals Monuments," but not with the minute fidelity of the present specimen, for the contractions of the inscriptions were expanded, and the aspects of the names, which in the original follow the elevations of the buildings, were made uniform, so that they could be read without turning the plan about; and this engraving has been reduced for other works without collation with the original: hence these liberties have been perpetuated. Professor Willis has, however, now traced line for line, reserving all explanations of contractions for his letter-press description. The original drawings are preserved in the library of Trinity College, Cambridge, fastened, by stitching and paste in the one instance, and by paste only in the other, into a large folio illuminated MS. volume, containing the Psalter in Latin, Norman French, and Saxon, with other sacred writings, generally known as "Eadwin's Psalter." Two hundred and seventy-three pages of this folio are continuous, when there occurs a gap, as though some leaves had been torn out; and it is in this vacancy that the larger of the two Norman drawings is stitched through its middle crease into the binding bands of the book. Following the drawing is a portrait of Eadwin, and then two more leaves of the original volume, on which is written the latter part of the Nicene Creed, the missing portion, clearly, having been on one of the leaves torn out; and then, pasted to the vellum guard that is the return of the final page, is the smaller second drawing.

Professor Willis takes them both to be the work of the engineer Wibert, or of his assistants; and considers that, though incidentally they figure the convent buildings, they were made for the purpose of illustrating and explaining, for the information of those in charge of it, and of those who might come after them, the system of waterworks and drains they laid down. The larger drawing, he thinks, bears evidence on the face of it of having been made by a mechanist anxious to explain his contrivances, for which purpose he has delineated the monastic buildings and named them, so as to show the exact course of the pipes from one to the other, and the positions of the cisterns and standpipes in reference to them; and the smaller drawing has the appearance of being a disentanglement of the hydraulic system from the architectural plan, or a condensation, by the same hand, of the same information, so compressed, with a view only of making the hydraulic arrangements clear, that no other buildings than those actually supplied with water are indicated, and these only just sufficiently for identification, and with no inscriptions. Before noticing the Professor's explanation of the system thus illustrated, we should mention that these bird's-eye views of the Norman draughtsman are the earliest Mediæval example of this kind of perspective known. Instead of placing his buildings on the plan as though seen from one point of view up in the air, as we now do, he made a different

* The Architectural History of the Conventual Buildings of the Monastery of Christ Church in Canterbury, considered in relation to the Monastic Life and Rules, and drawn up from personal Surveys and original Documentary Research, by the Rev. Robert Willis, M.A., F.R.S. London: Printed for the Kent Archaeological Society, by Taylor & Co., Little Queen-street. 1869.

point of view for each building, so as to keep his elevations on the lines belonging to them on his plan. Thus angles and projections are not of much account in his eyes, and he places all gable-ends upon the same *hass linas* as the elevations.

When the drawings are spread out before us they show a number of stiff tiny buildings, most of which are roofed with scaly tiles, and all of which are irregularly strung together, though scattered over the sheets, by the thick line that represents the water-pipes from one to another. Here and there, too, there are circles which represent the various tanks. In the larger drawing, which is upon two sheets like the original, and where, as we have said, there are more buildings depicted than on the smaller, we can see the semicircular-headed arcades of the cloisters, and the rosette-formed basins of the lavatories in them; and that some of the largest roofs are ribbed as though covered with lead; and we can see the gutters intended to carry away the rain waters encompassing some of the courts and traversing others. Now and then the gables are surmounted with crosses, but more frequently with balls, and when there is neither of these, fantastic animals or birds either crouch or are perched upon them. The herbarium is quaintly distinguished by rows of plants as much like crooked pins as anything else; and the fish-pond by an enclosed and scalloped space, in the centre of which two fishes' heads are projecting in opposite directions from a circle. On some of the doors and posts there are indications of handsome iron-work. Everywhere the windows are long, deep black, single lights. Sometimes over the roof tops, sometimes on the façades and on the ground are written in Latin, very neatly, with many contractions, the following explanations, which we quote from the Professor's table of translations:—

Cistern in the Ladies' Cemetery.

Here the water flows into the fish-pond from the cistern in the outer or Ladies' Cemetery.

Here the water passes into the aisle of the infirmary hall.

And here comes out of that aisle and enters the fish-pond.

Here it quits the fish-pond, and passes to the Prior's cistern.

Cemetery-gate near the chapel.

Tub from which the water flows under the necessarium of the infirmary.

Kitchen of the infirmary.

Vestibule or treasury.

Door of the crypt.

Passage which leads from the great cloister to the infirmary.

Stand-pipe into which, when the waters of the source fail, water raised from the well may be poured, and it will be distributed to all the offices.

Well.

Small cistern, before the door of the leontory; the rain-water delivered into the gutters which are fixed round the cloister garth is turned into this cistern, and conducted in a drain-pipe under the passage which leads to the infirmary hall.

This pipe, when it comes opposite to the crypt door, is turned to the right, and continues its course outside the passage.

Door of the leontory.

Iron door.

Window where the porters were seated out.

Window through which the platters are tossed out for washing.

Chamber in which fish is washed.

Gate between the guest hall and kitchen.

Postern near the north wall.

Well.

Small cistern, before the door of the leontory; the rain-water delivered into the gutters which are fixed round the cloister garth is turned into this cistern, and conducted in a drain-pipe under the passage which leads to the infirmary hall.

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Door of the leontory.

Iron door.

Window where the porters were seated out.

Window through which the platters are tossed out for washing.

Chamber in which fish is washed.

Gate between the guest hall and kitchen.

Postern near the north wall.

Before this system of distribution was adopted the water was raised from wells, which were not then covered over, but retained as additional sources of supply should this one go wrong. A column with a large capital, which served as a funnel, was placed near the well of the infirmary cloister upon a pipe which communicated with all the offices, and supplied them by stand-pipes; and, as we have read among the inscriptions, when the ordinary supply was deficient water could be obtained from the well, and poured down the column, whence it would run from any of the cocks of the stand-pipes communicating with it. And a second well in the outer cemetery was also retained side by side with a new cistern, which is depicted as furnished with a lever handle raised on a forked pole, and having a chain and bucket at one end and a balancing stone at the other. The new cistern by its side was not provided with a tap, but with a pedestal, on which the town's-people could stand and dip their pails into it, probably to prevent careless persons from leaving the tap running and the water wasting. A waste-pipe conveyed all superfluous water to the great fish-pond.

There were three layers, or lavatories, to be supplied. On entering the monastery the pipe made straight through the prior's gateway and under the infirmary kitchen to the first of these, in the infirmary cloister, which was used by the monks for their ablutions when they first issued from their dormitories in the morning. A second pipe proceeded westwards to the next layer, in front of the refectory, used for ablutions before meals; and here the small tank which received the water was elevated on a pillar, apparently to give it a sufficient head to enable it to pass to the other receptacles, the first of which was the third layer, in front of the infirmary. These layers appear to have been all furnished with taps, from which water could be carried away in pails; but they were, nevertheless, pyramidal roofed structures of a highly ornamental character. That near the refectory had a large low circular octafold basin, from the centre of which arose a pillar or stem carrying a smaller basin, the margin of which was formed of semicircles placed alternately with angular projections, which last served as lips from which the water poured down into the lower basin. Each fall of this lower basin appears to have been provided with one of the contrivances we have mentioned as being likely to mean a stop-cock or tap, so that each monk could wash at a separate spot without deluging the whole of the water. The Professor acutely notices that the draughtsman omitted to show what became of the waste water that flowed from the upper to the lower basin, and again from the taps when in use, and concludes there must have been a circular tank on the pavement to receive it.

The provision for carrying off the rain-water from the south side of the church and the roofs of the great cloister consisted of an open gutter round the outer border of the cloister garth, and a channel which crossed the garth from west to east. These channels conveyed the waters to a small cistern underground near a passage from the principal cloisters to those of the infirmary, and thence they were carried underground till they flowed into a channel proceeding from the prior's water-tub, and were conveyed across the Green-court into the town ditch. This plan was still in use in the fifteenth century, as may be seen in the list of the works executed in Prior Chillenden's time, which sets forth that he repaired and amended the gutter in question; and again in that which relates the works of Prior Goldston, 1495-1517, who constructed rain channels on the south and east sides of the church, and joined them to that which had been amended by Chillenden, as aforesaid. That they were not altogether sufficient we may conclude from the statement made by Prior Goldston, that before the construction of his subterranean aqueduct outside the church the rain-waters "were wont to inundate the whole crypt of the Virgin and the adjacent chapels, and greatly hinder the access of the pilgrims to the glorious Virgin."

The Norman engineers made an arrangement for flushing or purging the pipes. At the angle of every pipe where it turned vertically to feed a tank, they placed a short horizontal branch leading to the nearest drain gutter, and furnished with a stop-cock. These branches are marked on the drawing *Purgatorium*, and can have been intended for no other purpose than to purge the pipes from sediment; and they cleansed the fosse of the great *necessarium* by conducting their great sewer through it.

This Norman scheme of distribution of water and drainage was useless after the Reformation. The buildings in which were the principal layers and stand-pipes were taken down, and water was required in new positions, especially in the prebendal houses. Hence a new conduit-house was built in the centre of the Green-court, and from a large cistern on its upper floor the new requirements were met. This new house is shown on an unpublished plan, entitled "A Description of y^e Vanils, Pipes, Sestones, and Cutters belonging to the Church, as is herein shewed. Drane out and finished by James Wilkes, Waterman to y^e Deane and Chapter of Christ's Church, Canterbury, October the 27th, anno 1668."

The quaint Norman drawings bring to mind the care and skill the engineers displayed in their works; the corn-fields, vineyards, and orchards amidst which they worked; and the constant going and coming of guests and pilgrims that made up so much of life in those old days. The new conduit-house that displaced their lavatories, and which a local antiquary has handed down, was "square and like a country pigeon-house," had no long reign, and was itself displaced at the beginning of the last century.

The archæology of engineering has made a gain in the hands of Professor Willis.

COVERING IN THE BRISTOL EXCHANGE.

The determination of the town council of Bristol, by a very narrow majority, to cover the quadrangle of the Exchange with a roof of iron and glass, according to a design furnished by Mr. Turner, of Dublin, has caused some excitement in that city, and led to numerous objections. We printed a letter on the subject in our last, and the Bristol papers have since published various other communications and editorial comments. It is very satisfactory to find so much interest manifested on such a subject. It was the privilege of the conductor of this journal, some years ago, by a report made professionally, to enforce the claims to admiration possessed by the Exchange, one of the best designs of Wood, of Bath; to prevent a proposed renewal of paint and whitewash on the stonework of it, and to lead to its being brought back to its original condition. We feel on that and other grounds more than ordinarily anxious to prevent any act that would tend to injure this building as an architectural monument, and we join urgently with those who are requesting the town-council to obtain the best possible advice before taking such a step as that contemplated. We do not say, by any means, that the quadrangle should not be covered in: there may be good reasons for taking such a step; but this may be done well or done badly, and the council will incur serious responsibility if they do not adopt the necessary precautions to insure the former. We have not seen the design, but the accounts of it that have reached us are far from satisfactory. We should be sorry to damage any individual, especially a manufacturer so creditably known as Mr. Turner; but the profession of this gentleman seems to us to have been a little misunderstood by those members of the council who put forward the fact that Mr. Turner erected the great Palm-house at Kew and the Botanic Winter Garden in the Regent's Park as a reason for accepting his design for covering in their Exchange. Both these works were designed by architects,—Mr. Smirke in one case, Mr. Decimus Burton in the other. We repeat that we have no wish to condemn the scheme; but we do urge most strenuously, in the interests of architecture and of the city of Bristol, that the town council should obtain the best possible artistic advice before they proceed to carry it out.

Opening of New Sunday and Day Schools at Farsley.—New Sunday and day schools have been erected at Farsley, near Leeds, by the friends of the United Methodist Free Church. The building is entirely of stone. The architects are Messrs. C. S. & A. J. Nelson, of Leeds. It is of two stories, the lower story being adapted as an infant school and a day school, being divided with a mid-partition, while the upper story, which is a fine room about 75 ft. in length and 36 ft. in width, will be exclusively used as a Sunday school. For this purpose four separate class-rooms for senior scholars will be available. It is estimated that the total cost when finished and furnished will be about 2,500*l.*

THE SOLWAY FRITH CROSSED BY A RAILWAY.

The public openings of new railways remarkable for important engineering works have become comparatively rare occurrences. The successful construction of a highway across a tidal estuary would be, at any time in the history of railway enterprises, specially worthy of note. This engineering feat has now been completely accomplished in connexion with the Solway Junction Railway, under the direction of Mr. James Brunles, the engineer who, about ten years since, conducted to a successful issue the works of the Ulverston and Lancaster line, which crosses the tidal estuaries of the rivers Kent and Lever, and the treacherous sands at the head of Morcombe bay. The works in the Solway Frith are in some respects of a similar character to those near Ulverston; the chief point of difference is probably in the "stair" which had to be pierced and the consequently altered mode of dealing with it. In Morcombe bay nothing but sand was met with in borings of 70 ft., and the cast-iron piles in the works there have disc bottoms. In the Solway a variable depth of sand overlies rough boulder gravel, and the piles of the viaduct there have chilled cast points.

The Solway Junction Railway, of about 22 miles in length, commences, at its southern end, at the Brayton Station on the Maryport and Carlisle line, and proceeds in a northerly direction to Kirtlebridge, about 17 miles north of Carlisle, where it joins the Caledonian line. It crosses the Solway Frith from Bowness point, just below Port Carlisle, to the Port of Annan, on the north, or Scotch side. The line is about 8 miles below the head of the Frith, or the point near Greta reached by the tide.

The distance between shores is about 2 miles wide at high water, and the hydraulic engineering works include two banks and an open iron viaduct. The south bank is 440 yards long, the Scotch bank, 154 yards long; they are each about 25 ft. high at the outer or waterway ends. The banks have cores of clay to their bases, and the slopes, 2 to 1, are puddled with clay about 1 ft. deep, upon which pitching stones are laid of from 15 in. to 18 in. deep.

The open viaduct, through which the tidal waters pass, is 1,960 yards long, divided into 30 ft. spans. The supporting piles are 12 in. diameter, 3/4 in. thick, and are cast in 9 ft. lengths, connected at each of the turned flange joints by eight 1 in. bolts. The rails are 34 ft. above the bed of the Solway. The mean rise of the tide is 20 ft. The girders are of wrought-iron, and 2 ft. 6 in. deep, with a 1/2 in. camber upon the length of each; they have expansion joints over the piers. The platform is formed of Mallet's buckle plates, riveted to the girders longitudinally, and to plates transversely. The longitudinal are stayed by ties and transoms 10 ft. apart. Every 16th range of the cast-iron columns is doubled. The piles were driven by Lisson & White's steam pile-driver; 12 to 15 blows per minute could be got from a 25 cwt. monkey, with a 5 ft. drop. The driving was tidal work, and usually required two tides for each pile. They are driven to 17 ft. and 18 ft.

No scaffolding was used for the work, which was for the greater part executed from barges specially constructed for the purpose. The upper portion of the work was finished outwards from the shores, and the successive girders swung into position by steam cranes. The weight of the cast-iron used is about 2,900 tons, and of wrought-iron 1,807 tons. The cost of the viaduct and sea embankment has been 100,000.

The only other remarkable work was the crossing of Bowness Moas, on the Camberland side, which has, in some places, a depth of 50 ft. of unstable sponge. By draining the portion of the Moss over which the line is carried was so much consolidated as to sink about 5 ft. A good road was obtained by long sleepers laid upon faggots, of which about 100,000 were used.

The chief traffic likely to be conducted upon the new line will be the conveyance of its mercantile iron ore from the Cumberland and Furness districts to the Scotch ironworks. Above 200,000 tons of mercantile ore are sent annually from these districts to Scotland, including above 30,000 tons carried by sea; a portion of which, at least, may be expected to be carried over the new line, to the avoidance and relief of the crowded station at Carlisle. The route by Solway Junction and Caledonian to Coatbridge—the centre of the Scottish iron trade—is much shorter than any other, as it is

also to numerous ironworks nearly north of Dumfries. An agreement has just been confirmed by Parliament under which the Caledonian Company will work the new line at 45 per cent. of the gross earnings, diminishing to 42 1/2 per cent. in three years, and to 40 per cent. in other three. The Solway Company to maintain the permanent way of their line. The North British and the Glasgow and South-Western Companies sought running powers over the Solway line from the committee of the House of Lords, but these powers were not granted. The Caledonian Company subscribed 60,000, to the Solway Company, but the other two companies are not contributors.

Colonel Yolland, from the Board of Trade, has been over the line, which will be opened immediately for traffic.

The works were laid out by Mr. James Brunles, C.E., engineer-in-chief, and executed, under the inspection of Mr. Alex. McKerron, resident engineer, to the entire satisfaction of the board of directors, by Messrs. Waring, Brothers, & Eckersley, contractors.

PARK-LANE IMPROVEMENT.

FOR several past sessions of Parliament, continuously, the Metropolitan Board of Works has promoted a bill for the urgently needful improvement of widening Park-lane at the Piccadilly end. The unconquerable opponent of the measure has always been his Royal Highness the Duke of Cambridge, the acquisition of whose mansion was thought indispensable to the improvement. Last session a special committee was appointed, and reported specially upon the subject to the House of Commons. His Royal Highness being determined not to part with his house if he had power to retain it, led the committee, if he may be supposed, to make the recommendation that the widening should be in Hamilton-place instead of at the narrow end of Park-lane, and that Hamilton-place should become a continuation of the main portion of Park-lane. This recommendation has been adopted, and the long-desired improvement will now be carried into effect, without touching the residence of the Duke of Cambridge. The most important properties scheduled in the Book of Reference as necessary for the improvement are, the mansion of Sir Edward Kerrison, at the junction of Hamilton-place with Piccadilly; the mansion in Hamilton-place of the Hon. Butler Johnstone, and portions of pleasure-gardens belonging to the Lord Chief Justice, Sir Alexander Cockburn, Earl Vane, and others. The remainder of the property scheduled consists of coach-houses, yards, and stables. The improvement will consist of the widening of Hamilton-place to its junction with Park-lane,—a distance of 400 ft.,—to the full width of the latter thoroughfare.

SEWER GAS AND VENTILATION.

At a recent meeting of the Social Science Association, Dr. Alfred Carpenter read a paper on the "Influence of Sewer Gas on the Public Health; and the Theory of Ventilation as required in Sewers."

After demonstrating the evil power of sewer gas and its results, he said this is neither the time nor place in which to detail cases which have come under my own observation; but I may be allowed to adduce the fact that, previously to the introduction of the plan now adopted in my own town, occasional outbreaks of fever used to puzzle us, notwithstanding the insertion of ventilating pipes, and the occasional use of the rain-water pipes for the same purpose.

On inquiry, and continual research, I found that these cases always occurred after dry weather, and shortly after a succeeding heavy rainfall;—that the cases occurred near to the dead ends of long lines of pipe sewers, that an extension of those sewers removed the fever higher up, and relieved the houses formerly affected;—that the fatal cases most often occurred in houses at the very end of a sewer, and farthest from the outfall;—that the inmates of those houses had been probably breathing the sewer gas for a long period in a less concentrated form, before its final outfall, and before the system became sufficiently charged to enable the change to arise in the blood, the total of which is called "typhoid fever." If the total is not reached, the disturbance may take on one of the disorders I have

already mentioned, or even merely produce a want of power. Chemists tell us what small amounts of material help to entirely change the form of bodies and alter their constituent particles; who shall say how much the ordinary chemical actions which take place in the nutrition or purification of the body may be interfered with by such gases? It seems certain that one effect is the decrease of red blood-corpuscles, but how brought about one is only able to conjecture.

When a smell is perceived at a particular spot, or in a particular house, orders are generally given to stop the place of issue, by trapping the offending opening, with the beneficial result of removing the smell, and staying the progress of disease in that particular house or place; but no means are taken to prevent its influence being felt elsewhere. The mischief is simply transferred in a selfish kind of way, and the public suffer for it. I have had much experience of this kind of thing in our district, and soon saw that trapping was not a proper remedy, unless it was accompanied by the provision of another exit. This has been clearly made out upon lines of ordinary sewers, but it has been even more manifest in detached sewers; that is, sewers not connected with any general system. The effects of trapping were very marked last year at the Warehousemen and Clerks' Schools, on Russell Hill. These schools accommodate some 160 children; they were opened nearly three years ago, and at first the children enjoyed unusually good health, but in the autumn of 1867 typhoid fever made its appearance. It appears that a smell, slight at first, but afterwards very intense, had been perceived in the laundry. The place of exit was trapped, and the smell prevented at that place; but as no other place of exit was provided for the sewer gas until it reached the interior of the building, it was conveyed from the cesspool by the pipe sewers into the lower part of the building, and then into the classrooms. Now, in cold, damp weather they do not so freely ventilate such buildings as much as might be. The rooms being warmed by hot-water pipes, have no open chimneys to produce draughts. The hot summer was followed by heavy rains, fires had not been commenced, and the rooms were not chilled by having the windows opened. The children would get up in the morning and go down to work in their classrooms before breakfast, and inhale the sewer gas when they were least able to resist its influence, and when it was most concentrated, viz., on cold, damp mornings, after heavy and warm rains had stirred up the deposits in the sewers and cesspools. The result of this action was that nearly 40 per cent. of the children suffered from mild typhoid fever.

The same result happened this spring at the Female Orphan Asylum at Beddington. No provision was made for the ventilation of the sewers in connexion with the building, but an accidental opening—accidental at least as far as ventilation was concerned—existed in the plug which acted as an overflow-pipe in the latrines. The latrines were in close communication with the classrooms, into which the children used to go in the early mornings. The classrooms were not provided with any efficient and certain means of ventilation like the Russell Hill Schools; they are warmed by hot-water pipes instead of open fireplaces. Foul air once in the room could not easily get out, and in a short time about 30 per cent. of the children suffered from the effects of sewer gas.

Similar results have happened in other schools, both public and private, within my own observation, but I need not multiply instances. I may, however, give one more illustration, that afforded by the book kept by our local Board for the registration of stoppages in sewers. Our engineer, Mr. Latham, says that before the introduction of the plan now adopted by our local Board, stoppage in the sewer was always coincident, in point of time, with illness in the houses affected by the stoppage. I have at times been able to draw attention to a defective sewer, simply from observing on that line of sewer rather more than the ordinary amount of illness of a slight kind, and it has always been found that that sewer had a defective ventilation, and by remedying that defect the illness on that line of sewer decreased.

The frequent recurrence of these cases led me to consult all the publications upon the subject that I could find, being convinced that a remedy existed. I found especial assistance from the reports of Dr. Letheby and Mr. Hayward, which were published by the City Commission of

Sewers in 1858. But while they acknowledged the sufficiency of cause, they did not point out an effective or practical remedy; meanwhile openings were multiplied, as strongly recommended by Mr. Rawlinson, and eventually the Croydon Local Board determined, three years ago, to adopt the principle of opening the extremity of every sewer, and of every branch or house drain in connexion with the sewer, and make every house ventilate the house drain, whilst the Local Board had openings made into the sewers at 100 yards' interval, so as to allow of a constant and continuous current of air. By this means the effects of sewer gas have been entirely obviated, and the consequences removed in those portions of our district to which the law is made to apply in a most marked and decisive manner.

The early sanitarians reasoned in favour of small sewers, partly on the idea that they would keep perfectly clean, and that no decomposition could take place, and therefore that no gas products would be formed. Theory and practice do not, however, go together; sewers are never constructed in ordinary towns as the early sanitarians intended that they should be; they do not, as a rule, flush clean; they are often badly laid, and as a consequence deposit takes place in them, and decomposition, with the liberation of sewer gas, results. Now this sewer gas makes its way more easily out of the large sewers of London, with the many open gratings existing therein, so as to some extent to obviate the chance of pressure upon the traps, which exists much more forcibly in the pipe sewers of less extensive drainage areas. It will form at times very abundantly in the house drains, and these being, like gas receivers, open at the bottom only, the sewer products will make their way through the traps into the houses; and if the traps become, as is often the case, untrapped, especially in dry weather, there is a ready means for the entrance of the gas into the house, independently of the means afforded by the water in the trap itself, which is a ready conductor of the miasms—absorbing the agent on one side and giving it off on the other.

Theoretically, ventilation of sewers ought not to be necessary, for, theoretically, no deposit ought to exist in a sewer; but practically this is found at times an impossibility, and an efficient system of ventilation must be provided.

The experience obtained in extended drainage areas, as well as that from more isolated districts, has shown that trapping is only stopping the danger at one point and forcing it in another direction, quite as dangerous to those exposed to its influences. It follows, therefore, that the only satisfactory solution of the difficulty is the prevention of its intrusion into houses at all, and the prevention of its collection in sewers in that concentrated form which leads to mischief. Its formation cannot be prevented,—not at least until sewers are so constructed, as to their fall and their workmanship, that no deposit is likely to take place in them at all, and that no settlement shall change their level, whilst the character and the quantity of sewage continue the same. It is seen, therefore, that miasms will form; how, then, are their influences to be avoided?

The nature of this miasm has been well pointed out by various chemists and medical authorities; all concur in the belief that dilution destroys it; that if sufficiently diluted with air it becomes innocuous, and its sting is taken away; when it first escapes from a sewer it carries with it some condition which is injurious to life, tending to prevent some necessary change in the blood, or other vital tissues, either by its own power or by means of a property to which it simply bears the relation of carrier. If it be mixed with sufficient air, especially if that air be ozonised, the miasm becomes oxidised and comparatively harmless, or if not so oxidised its presence is not injurious to life. Just as a minute quantity of urea in the blood is not injurious, yet if the purifying influence of the circulation through the kidney be interfered with, or obstructed, a rapid change for the worse results. So again with carbonic acid; if the ventilation of lung structure is interfered with serious damage is suffered; even the ordinary ventilation through the pores of the skin must not be stopped, or some change takes place in the body which is not consistent with perfect health.

It is seen that the circulation of air, or of air-carrying fluids, is incessant in both plants and animals; that this incessant action is the result in a great measure of chemical and physical changes in the moving fluids; that the safety of

animal as well as of vegetable life depends upon this incessant movement; that if this movement can be produced and continued in sewers, no sewer gas could exist in a form sufficiently concentrated to be hurtful to human life.

Professor Graham and others have pointed out that nature has given to gases a law by which they have a tendency to diffuse themselves inversely as the square roots of their densities. This law certainly comes into play as soon as ever the gases are disengaged, at once tending to produce motion in the air. This motion will be assisted by the continuous changes of temperature following upon the quantity of hot water going into the sewer; it will also be encouraged by the presence of a flowing stream, varying in depth, and keeping up a varying circulation, causing an incessant motion of the air; as sewage rushes down, air must rush up to occupy the vacant places. Our problem, therefore, is how to render this circulation positively continuous, and to prevent its sinking into that dead calm which arises when the forces oppose one another, and which then allows the air to become saturated with sewer miasm. This has been effected most perfectly in our district, by compelling every new house to have ventilation for itself. The soil-pipe is continued upwards in a straight line above the level of the pan between the trap and the sewer, and it is made to terminate by an open extremity above the eaves of the house, away from a window, and not close to or level with a chimney. Every connexion with the sewer requiring the presence of a trap has that trap guarded from the consequences of pressure by a ventilator similar to the soil-pipe, the latter being placed as close to the trap as possible. It is found necessary to make these shafts ascend straight up, and not curve or turn at right angles, or their efficiency is interfered with. The result of making these innumerable openings at the higher points of the sewer has been to promote a rapid circulation through the sewer, by which all sewer gas is removed as quickly as formed by dilution and deoxidisation, and no concentration can take place. If any of the traps which may be considered absolutely necessary in the house should get out of order, then the introduced gas would be comparatively harmless because so diluted; but every communication with the sewer other than that of the W.C. is indirect only.

These innumerable openings act like the pores on the skin, or like the stomates upon the leaves of plants: they are themselves causes of motion, for the air in the sewer of a large town will always have a temperature and density different from that outside; it will always be warmer in cold weather, whilst in hot weather it will be much more loaded with moisture. Differences of temperature, density, and moisture, will always be sufficient to determine a circulation, provided entrances exist for fresh air, as well as exits for that which has passed through the sewer.

The ordinary manholes and gullies in the streets will provide these openings, and more often lead to a down-draught than to any upward current of foul air. I have often found this to be the case in the ventilating places which have been opened near the lower ends of our Croydon sewers; air enters instead of finding an exit. The principle to be observed is stagnation, whether of acid, of liquid, or gas,—deposit must not be allowed, fluid must always run off; let there be also innumerable openings near the tops of the houses, and it may be safely assumed that no stagnation will exist in the sewers themselves, for these openings will be the promoters of incessant movement. Let every water-closet have its movement promoter, its safety-valve, in the pipe I have mentioned; let every trap, which it is absolutely necessary to use for the protection of the inmates of a house in a similar manner protected; let every pipe, not actually conveying sewage, have an indirect communication with the sewer only. Let all openings in the streets be untrapped and everything done which will promote sewer circulation, and disease in every way will become, as it has been in Croydon, more tractable, and the effects of drain-poison almost unknown.

It may be argued that these recommendations apply only to pipe-sewers, and will not do for the large culverts now being constructed in London. This I deny; they can be ventilated as well as the Southwark subway, or the metropolitan railway tunnels. If they contain deposit they are badly constructed, and such had work ought to be remedied. It is becoming more and more certain, however, that more mischief arises in

the house drains, where stagnation can take place, than in the main sewers in which the main current is over flowing; it never stagnates sufficiently long to allow of decomposition taking place, except under the most exceptional circumstances, which would be fully guarded against by the precaution of having proper charcoal ventilators in the manholes of the streets, at those places at which an up-current might be established—as at the top of a sewer having a rapid fall towards one on dead level. These ventilators have been often lately perfected by our engineer, Mr. Latham, by means of which the chimney is protected from rain, and the air compelled to pass through a double sieve. Various other ways may be adopted for promoting rapid circulation in the large sewers better known to engineers than to myself, but the correct theory of sewer ventilation is undoubtedly motion. Motion is success, stagnation is destruction or defeat. I have not supported by figures the proposition I have submitted, because it has been found impossible to isolate the districts so as to place them under the same conditions, but I may simply state that the mortality for the parish of Croydon for the quarter ending March 30th, 1869, the quarter which generally has the highest rate of mortality, was 19.53; the deaths from fever in the same quarter were nil among nearly 60,000 people. The mortality for London in the same quarter was 25.0; that for all England, 24.84.

The idea of reading this paper arose from hearing at the Society of Arts a paper upon house-drains, which seemed only to urge traps as a remedy for smells. I say ventilate; do not trap.

In the course of discussion, the chairman, Mr. Edwin Chadwick, C.B., said:—

The theory of the paper states that theory and practice do not always go together, and that sewers are never so constructed in ordinary towns as the early sanitarians intended they should be. But it is not the mechanical theory, as he assumes, which is in default, but the administrative theory; the theory shanted for of local self-government, which has shant out instruction from an authority which is the best means of information, competent from undivided attention, and really responsible, for its advice and initiation; the theory gave sole initiation to an authority, unformed and extremely liable to be misinformed, misguided, and really irresponsible, for non-observance, for misfeasance, or for malfeasance. Hence the gross imperfection and waste in these works which have been maintained and extended. Hence such works as house-drains without properly adjusted supplies of water; large expenditures in sewers, made uselessly, even when on proper scales, which they rarely are—because they are made without the proper connexion with house-drains, and house-drains constructed, but connected with sewers of deposit, and forming the necks of the retort with the bulbs, contained in my report of 1862. Hence such works as, after all the sanitary work and all the expense, the people are no better off than before, and that sanitary works are only another means of nuisance,—as under such works as are frequently met with, exemplified on a large scale in the metropolis, where house-drains and blocks of houses, possibly well drained, are joined on to immense sewers of deposit—extended cesspools. In the metropolis there are yet some thousand miles of sewers of deposit, retaining matter until a periodical cleansing, usually at a cost at which, by proper work, self-cleansing sewers might be made,—meanwhile giving off the noxious products of decomposition into the streets and houses. Why, even at this town of Croydon, it turned out that the first imperfectly constructed tubular drains and tubular sewers were connected with old sewers and drains of deposit—it not being then perceived that when so connected, they may be made the means of conveying the noxious products of decomposition into houses. The most important part of the paper read to-night is the reference to the fact that, classes of fever cases in the houses are almost invariably found to be connected with defective drains, or with the "dead ends" of sewers. Now it may be confidently asserted that these defective drains and "dead ends" mean only bad work, productive of decomposing deposit, and that the right course, instead of washing off the products of decomposition, is to prevent them by taking up the bad works, and laying down better. Instead of that, so common, so general are the drains and the sewers of deposit, that there is no common comprehension of any other, and the question arises, how to keep them down, how to deodorise them, how to neutralise them, how to trap them, how to keep them from how to wash them off by shafts, or send them amidst the crowd amongst other people; the last thing to be considered for lime to come being not yet conceived—namely, how not to produce them. I despair of the defect required. In the general prevalence of bad work, and of deposits and the products of decomposition, we have no perception of the wide distinction between the putrid sewage which produces it, and kills fish, and of the fresh sewage, which, when it is allowed to escape into rivers,—a waste that ought not to be,—feeds them.

We have sewer gas treated as a necessity. Now, for

people of more advanced perceptions and information, I will mention another test of bad work; that is, the "nose test," as I call it. You may test the work of the architect and the work of the sewer-engineer in the street, by the nose. The sewer, administered by the nose. The drain small in the house, the sewer small in the streets, are infallible proofs that ought to be known and acted upon by the sewer-administrators, by the street and mal-administration. You may infallibly test a local administration—by the nose. All smells of decomposing animal or vegetable matter may be taken as meaning decomposition, and, if intense, immediate disease, as described in our earlier instructions. Where works are properly constructed, there is, I repeat, no deposit, no decomposition, and no smell of decomposition. Traps are only needed against accidental obstructions, which usually arise from defective inlets or from positive nuisance.

Mr. Hensle said that no doubt good ventilation and a quick current along sewers would do much, but still decomposition could not be altogether prevented. Much of what passed from houses, especially the products of cookery, was already in a state of decomposition. Moreover, the offensive products of trades, steam, and hot water passed freely into the sewers to the great disturbance of the contents. He went on to say that, in a state of decomposition, the most important improvement was also required—namely, the severing the communication between the interior of the house and the sewers. Nothing short of this would do, and it was on the subject, that he had several suggestions which could keep out the offence. The chimney draught, the heated air within houses, inevitably drew the foul current into the houses under houses at all. No water-closets should be entered into a house; however close it might be it should be necessary to go into the open air first. All stop-pugs to pass into the open and drop in a hole. Barrels to be placed in the street, and outside, having no continuous communication with the interior. Small speculative builders and others were in the habit of running up anything, however defective, as long as it was not interfered with by the sanitary surveyors and local authorities seemed to be unable in any way to meet the case, although in the construction of the minor matters, there was plenty of interference in the case. The wholesome views of the Commission were scarcely touched. The most important part, as regarded health, the laying down of sound efficient drains, was scarcely touched. He was sorry that the architects and builders, as a whole, were far more anxious to make a slightly and well-paying affair, than to give any real consideration to health and convenience, and yet these considerations of an importance impossible to be over-rated, are not in any respect incompatible with true taste.

Mr. Cook, as a member of the Metropolitan Board of Works, and one who had moved for a committee of the Board on the subject, said that there were several difficulties in the way of carrying out a perfect system of ventilation. The great embankment sewer, which had a fall of only one inch in a mile from Fulham down to Abbey Wood, admitted only of a very tardy flow of the sewage. In the still of night, there is a large discharge of offensive smell from the traps. This had been obviated to some extent by a new plan, consisting of a small opening applying directly to the gully-holes. But in purifying the air as it escaped, it had the effect of stopping the ventilation so that it could not work in the sewers. At the East End of London this plan, also tried, and the shafts at the Woolwich Arsenal a shaft with a strong draught had been erected, but this too was unsuccessful, inasmuch as the air, which could not extend but a comparatively short distance up the sewer, was not able to get to the top of the shaft, and a system complete. There was no doubt that the offensive gases in sewers should be got rid of, and he hoped that some day would suggest some cheap chemical which might be introduced, and which would have the effect of deodorising the liquid sewage. He concluded by inquiring whether dilution was destruction.

Mr. Arthur Jacob, Chief Engineer of the Board, who has waterworks under their administration, as a rule, trap-inspectors are appointed to prevent the waste of water. This precaution was observed because waste of water is a matter of great importance to him, that the relative position of district and local boards with their constituents, the ratayers, forbid the adoption of the health of the people. But he less regard to be had for the health of the people than for their pecuniary interests; and if not, why were not trap-inspectors as well as trap-inspectors? Ordinary traps were exceedingly dangerous, and much in his opinion might be done by systematic inspection of them.

Mr. Aldis was sorry to hear objections made to the trapping of gullies, for what else could be done when noxious gases escaped from them in every direction? At ventilators of sewers also gave rise to many complaints, and he believed that abats connected with the sewers, and carried up as high as the chimney-tops, would obviate much of the evil. He knew places in the east end of London where they had been erected, and produced the best results by preventing sickness in families. More experiments should be made upon the effects of sewer gases. It was true that the late Dr. Barker, of Bedford, had supposed a deficiency in this respect, but still further experiments were required. Mr. Aldis believed that more evil was attracted to the houses by the gas accompanying the zymotic disease. An air-pipe, extending from the soil-pipe to the roofs of the houses, was frequently found in the older houses of St. George's, in the Strand square. He had tried the charcoal ventilator, which, besides obstructing the outlet of gas to some extent from the sewer, was filled up by boys with stones, and rendered perfectly useless.

Mr. Liddle remarked that it was a mere waste of time to discuss the question of the pernicious influence of sewer gas upon the public health. The fact of its pernicious influence was admitted, but the important question for consideration was how the sewer gases could be prevented from making their way into the houses and streets. Dr. Carpenter had been spoken of as a remedy for the evil, but in his (Mr. Liddle's) opinion the best, and in the end the cheapest, way was to reconstruct a large portion of the sewerage of the metropolis. The sewerage of St. George's, in the Strand square, was several outlets in the river, and hence, most of them had not sufficient inclination; so that instead of their being conduits of filth, they were deposits of filth, which became continually increased in amount, and the offensive smell so much complained of. It was the duty, in Mr. Liddle's opinion, of the Metropolitan Board, when commencing the sewerage for draining the metropolis, to so reconstruct the whole of the existing sewers to suit the new outfall at Barking and at Crossness, as that they should cease

to be mere deposits of filth. At present the sewers of London were under the jurisdiction of the several local Boards, all acting independently of each other, and the Metropolitan Board. This was a bad arrangement, for in his opinion the whole sewerage of the metropolis should be placed under one jurisdiction, who should appoint proper officers to see that the sewers were always in perfect working order, who should inspect all the house-drains communicating with the sewers, and who should have power to compel the owners of houses to have the house-drains so constructed that the emanations from them should not be able to find their way into the houses. In a short, the whole of the sanitary arrangements of a house should be submitted to a competent authority before the house was suffered to be built.

Other gentlemen having spoken, the Chairman said:—I cannot conclude this evening's proceedings without observing upon what you have heard from the member of the Metropolitan Board of Works who has taken part in the discussion. You have heard him describe the very poor fall that the engineering skill selected by that Board appears to have considered available for an important main line sewer, as well as the consequence of the sluggish flow obtainable with that fall, deposit, and, of course, noxious decomposition. Now, I can assure you, and it ought to be made known, that steam power, which raises water to heights for distribution at a working expense of a shilling only for every 70,000 gallons lifted 100 ft., can also at the same rate practically give fall to any extent needed by lifting it from depths. It might even lift the subsoil drainage water, as well as the surface water, from uncovered spaces, that is, as I conceive, improperly carried into the sewers. What might have been done may be proved to what has been done elsewhere—that is, that every court, alley, and street, of 1,500 miles of street in the metropolis might have been provided, to its immense relief, with complete self-cleaning sewers, outfalls and all, for less than the four millions of money that, under the direction of that Board, have been expended on the great intercepting sewers it has directed, and such quality as one of its members has described to you. It is really most deplorable that such works can have been done, and that so imperfect is the knowledge current on the subject that they should pass unchallenged as being ill-done.

THE PROPOSED LAW COURTS.

The Committee met for the first time on Monday last, Lord Stanley in the chair. Almost all the members attended. The first witness was Mr. E. W. Field, secretary of the Courts of Justice Commission, who was examined respecting the certificate given by the Commission as to the total cost of the scheme not exceeding 1,500,000L. Mr. Layard then put questions to show the insufficiency of the public accesses to the Strand or Carey-street site. The witness denied this, and said that the chief question was the convenience of access for lawyers, and that for this purpose the present accesses to the Carey-street site were sufficient. In answer to Mr. Tite, he said that in the reduced plan of the Commission, the Probate Department (though not the Probate Court) had been omitted. The map of the Incorporated Law Society was said by Mr. Field to be inaccurate only in minor details, but perfectly correct in principle. The Commission thought it was possible to erect all the most important courts and offices on the Carey-street site. There would be more light and air by the side of the river, but the Howard-street site was otherwise so objectionable as to outweigh all such advantages. He deprecated strongly different buildings for the Courts of Law and Equity as a hindrance to the fusion of the two branches of the law. In his opinion, the Commission had nothing to do with any site but Carey-street, and he would as soon think of building the Courts at Kensington as in Howard-street. Great delay and inconvenience occurred daily from the present scattered state of the legal buildings. It was of vital importance that the chambers of counsel and offices of solicitors should adjoin the new courts. The present dispersion caused not only slow work, but bad work, and was very injurious to suitors.

The letters unaccountably omitted in the return of correspondence with the two architects recommended by the Judges of Design, already printed, have now been published, by order of the House of Lords. They are very material to a right understanding of Mr. E. M. Barry's position, and show the justice of Mr. Barry's complaint of the omission.

We reprint a portion of the letter from Mr. Street to the Earl of Derby, dated Jan. 20th, 1868, a letter quite honourable to that gentleman.

"I gather, from the minutes of the Courts of Justice Commission, that on the 30th of July, 1867, after six months' deliberation, the Judges of Design made an award which recommended the employment of Mr. E. M. Barry and myself as joint architects to the building. Four months later they repeated their decision, which was then sent to the Commission, who agreed, on December 13th, 1867, that we might be asked to undertake the work, suggesting only that the opinion of the Attorney-General should be taken as to whether the decision of the judges should be recognized."

It is now more than a year since the plans for this great work were sent in, and nearly a year since the award was made; and though I cannot doubt the eventual acceptance of their award, I feel that I ought not any

longer to delay saying to your lordship that the present uncertainty is not only a great hardship to me, personally, but also at the same time in some degree a hindrance to the proper execution of the work, if it is finally entrusted to me. For, first, very many persons, assuming that I am to be one of the architects, refuse, naturally enough, to put smaller works into my hands, supposing that my time is already almost exclusively occupied on this great work; and, secondly, I am myself at present unwilling to refuse much work, which, if this question were settled in my favour, I should undoubtedly refuse, in order to be able to devote sufficient time to the most important architectural work of the day. For, though the architects were not at all bound by the conditions of competition to refuse any fresh work, it is certain that in any case they would at once be obliged, and ought, to refuse a good deal.

In common with the other nine competitors, I entered upon this competition, as I thought, with a most distinct understanding that the award of the Judges of Design was to be final. This opinion was founded on the Treasury minute of December 23rd, 1865, "that the notice or invitations to compete be issued by the Committee of Judges, and that their award should be final." This minute was communicated to me by the Commission."

"I do not suppose that the award of the judges being made in favour of two architects can be less an award than it would have been if it had been made in favour of one only. It is true that the instructions did not expressly indicate the possibility of such an award, but at the same time they nowhere prohibited it, either really or by inference; and indeed the minutes of the Commission, at page 73, speak of negotiations having 'passed between the architects and the Treasury as to the terms on which the successful competitors should be engaged.'"

And, as regards the advantage or the contrary, of the employment of two architects on such a work, it may not be improper to observe that, impressed probably by the enormous extent of the work to be done, the Commission originally proposed to obtain, first of all, floor plans from one architect, and afterwards to obtain architectural elevations by competition from another; that the same course of employing two architects of that which has lately been proposed by the *Times*; and that among the competitors for this work two at any rate were in partnership with other architects, and in the event of the selection of either of them, there would in fact have been the same employment of two men.

The opinion which I hold as to the finality of the award is shared by other of the competitors."

ATKINSON MORLEY'S CONVALESCENT HOSPITAL, WIMBLEDON.

The hospital, founded by the late Mr. Atkinson Morley, for the reception of patients from St. George's Hospital, will be opened for the reception of patients on Wednesday next, July 14th, the anniversary of Mr. Morley's death. The governors of St. George's Hospital, to whom the funds have been entrusted by the founder, do not feel that they would be justified in spending any money upon "a ceremony" usual upon such occasions; but any governors or subscribers to St. George's Hospital, or other persons, will be admitted after four o'clock on that day, to the grounds of the hospital at Wimbledon, on presenting their cards. The Institution includes two day-rooms, one for men, one for women, 49 ft. 8 in. long, 14 ft. 10 in. wide; 12 ft. high. Four dormitories, two for men, two for women, for twenty beds each, 79 ft. 10 in. long, 24 ft. 10 in. wide; 15 ft. high. One ward for five beds, 49 ft. 10 in. long, 15 ft. wide, and 15 ft. high. One ward for twelve children, same size. Ten wards for single beds for serious cases, 15 ft. 10 in. long, 12 ft. wide, and 15 ft. high—each. There are warm baths, lavatories, and W.C. on each floor; chapel, superintendent's apartments, besides laundry, coach-house, and stables.

TECHNICAL EDUCATION.

The council of the Union of Lancashire and Cheshire Institutes, in conjunction with the Society of Arts, have resolved to urge upon the attention of Parliament the subject of the extension and improvement of technical education. A petition has been forwarded by the council for presentation by their president, Mr. Bazley, M.P.; showing that science classes exist in connexion with ninety-two institutes of the union; that the petitioners also promote annual exhibitions in connexion with the Society of Arts; that great difficulty arises from the insufficiency of primary instruction received by the students; that much greater facilities for securing scientific knowledge and discipline exist on the Continent than are provided for that purpose in Great Britain; and that the industry of this country must seriously suffer if this defect be not remedied. The petitioners believe that the only proper course of procedure to effect the desired object is to establish a national system of primary instruction; to re-organise and improve the character and methods of secondary schools; and to constitute science colleges, fitted to receive the best pupils from the secondary schools and science classes. The petitioners, therefore, urge upon Parliament to adopt such measures as may be best adapted to meet the case.

BRICKMAKING IN WESTERN INDIA.*

ENGLISH brickmaking has been unsuccessful in Bombay, and the want of success is always attributed, it seems, to a wrong cause. The author of the pamphlet under notice, states that he has "succeeded not only in making good bricks from Bombay clays, but also in finding out the causes of previous failure, and in clearly defining by what means brickmaking in Western India becomes a certainty instead of a hazard." Want of suitable clay was blamed, but Mr. Walsh has found plenty of good clay. The ignorance of the native brickmakers has been often expatiated upon, but he learnt that first-rate bricks had been made in Western India; and if the modern native bricks were comparatively rubbishy, still they were good enough for the purposes to which they were put. Want of the ancient fuel (wood), appears to account for modern deterioration; and the import of coal from England is very costly. Mr. Walsh finds that the fuel used by the native brickmakers is the most available. He says, on this subject, —

"The sweepings of the streets in Indian towns, &c., consist, in great part, of a heterogeneous mass of valuable matter, &c., which, on account of there being eight months in the year of fine weather, instead of being converted into manure, exists as dry combustible matter, which receives the name of *cutchra*. The amount of *cutchra* which is constantly accumulating in a large town is considerable. The accumulations in Bombay alone are enormous, and a large staff is constantly employed to keep it cleared away."

"The native brickmakers use *cutchra*, &c., as the fuel for burning their bricks, but their method of using it does not admit of the bricks being burnt to an English standard. It occurred to me that if *cutchra* could be burnt in a kiln instead of in a clamp, the proper burning of the bricks would be effected. Some experiments which I made entirely confirmed my anticipations. The Government of India granted me a patent for this use of *cutchra*, &c. I also designed a kiln which I considered suitable for the purpose. The form of kiln was also secured to me by patent."

The author concludes his pamphlet, by stating some of the conditions which must be observed in order to be enabled to produce really good bricks from Indian clays. These are, "1st, in the preparation of clay to be careful not to disturb the balance of constituents which is observable in true brick earth; 2nd, not to interfere in any way with the attraction of cohesion within the bricks; 3rd, to so arrange the bricks in kiln, and so apply the fuel, as to prevent the bricks from becoming scorificous; 4th, to so construct the kiln that the proper economy of fuel will be effected."

THE TRADE-UNION BILL.

A NUMEROUSLY attended deputation from the trades' societies of the metropolis, appointed at the recent meeting of the trades at Exeter Hall, waited upon Mr. Bruce, the Home Secretary, for the purpose of urging upon the Government the propriety of giving their support to the Trade-Union Bill before Parliament. Nearly the whole of the leading trades were represented. The deputation was accompanied by Messrs. T. Hughes, M.P., A. J. Mundella, M.P., and several other members of Parliament. Mr. Hughes introduced the deputation, and explained the objects of the Bill. Several members of the deputation then spoke at some length. Mr. Bruce, in replying, said that the pressure of business on the Government had been the only reason why the question had not been taken up by it this session. He had examined the reports of the commissions and the Bill in question, and there were some points in it with which he agreed. He thought the Bill dealt with a most important question, which could only be dealt with by the Government in its official capacity; and he should advise the deputation not to press the Bill this session, but to wait, and allow the Government to deal with the whole question in the next session, when there would be more time for consideration. The deputation said their constituents would not feel satisfied without the second reading of the Bill was pressed to a division, that they might see which members falsified or fulfilled their pledges at the hustings. The discussion lasted about two hours. The deputation afterwards held a meeting, when a resolution was unanimously adopted, "That the promoters of the Bill are hereby respectfully requested to press the second reading of the Trade-Union Bill, on Wednesday next, to a division, no matter from what quarter any opposition may proceed." The second reading

* Chemical and Geological Observations relating to Brickmaking in Western India. By M. Walsh, London: Spott.

of the Trade-Union Bill was moved, on Wednesday, by Mr. Thomas Hughes. He denied that trade-unions, when strikes could be avoided, were favourable to them; or that these operations had the effect of driving trade out of the country. He declined to enter at length into the clauses, as the Bill is not to be pressed further in the present session. These societies, he submitted, deserved well of the country, in consequence of the money expended by them for benevolent purposes. The motion for second reading was seconded by Mr. Mundella. Mr. Brassey considered that the result of trade combinations had been more favourable to the employer than to the labouring classes, far greater advantages having been conferred on those classes by the natural operation of the laws of supply and demand. He supported the second reading, and thought there should be concurrent legislation in reference to threats. The Bill was read a second time, and the House shortly afterwards adjourned.

THE WORKING MEN'S CLUBS AND INSTITUTES UNION.

At the seventh annual meeting of this union, held at Exeter Hall, the Hon. George Brodrick in the chair, the report that was read stated that the aggregate number of working men's clubs had risen from 312 to 355 during the past year, 23 of which were established with the aid of this society. Fifty-six institutions had affiliated themselves with the union, and thus raised the number to double the former amount. The Marquis of Westminster had offered a site and a donation of 1,000*l.* towards the erection of a Workmen's club in Piccadilly. Five new clubs had been established in London during the past year, and three had been closed. The council had not neglected to do their best to help all these institutions to fulfil the important functions for which they were established. The London Artisan Club was spoken of as a model institution, and had been highly successful. The failures were such as might be traced to remediable causes.

Endeavours are being made to provide the members of workmen's clubs and institutes throughout England with the means of access to the best works of our principal writers, and especially to afford them the means of perusing new works of interest and importance. A circulating library has, therefore, been established at the main office, for the purpose of supplying to institutions in union with this society thirty volumes every quarter, for an annual subscription of 5*s.* As there are upwards of 350 workmen's clubs and institutes with a constituency of about 60,000 members, it will be seen that this library affords the means of putting into the hands of a very intelligent and numerous body of men, books which it is really of national importance that such men should become acquainted with, but which, without this agency, they would probably have no opportunity of seeing. The council appeal to all persons interested in this condition of the working classes, to promote this important work by contributions to the library, either in money or books. We echo their appeal.

THE NEW MARKET-HOUSE, HEMEL HEMPSTEAD.

THE opening of a new church for this town has been followed by the completion of a new market-house. The town buildings now comprise a town-hall and magistrates' room erected in 1851, the Corn Exchange, constructed in 1857, and the new Market-house erected in 1868-9, under the auspices of a committee formed of the principal inhabitants of the town.

The new building adjoins the Town-hall, being built on the site of the old market-house. It contains market-place, 50 ft. long, and 25 ft. wide, protected from the weather, the back and side being enclosed with glazed openings, and the front archways fitted with iron revolving shutters. There are large lofts over, with a hydraulic lift for raising the grain. The building has a turret 70 ft. high, in which the market and fire bell is placed. This turret is the principal feature in the front, and through its base there is a passage to the churchyard, and the ancient Norman church. The other entrance to the churchyard is by a principal archway under the magistrates' room. There is a porch in the centre of the front of the market-house, extending over the pathway, and supported by two polished granite shafts with carved capitals.

The floor of this market-house is formed of iron huckle plates, and supported by wrought-iron girders. A large cellarage has been constructed under the market-house. At the south end a small portion of the premises is occupied by the London and County Bank. The buildings, as now complete, extend 180 ft. along the High-street. The structure is designed in the style prevalent in the reign of James I. The materials used are brick and stone throughout. The principal and return fronts are built of red brick.

The whole of the buildings have been designed by Mr. George Low, architect, London, and erected under his superintendence. The contract for erecting the market-house was carried out by Mr. Thomas Cook, of Berkhampstead, builder. The amount of the contract was 2,140*l.*; but the total cost is in excess of this sum.

ART-UNION OF LONDON PRIZES.

We give a second list of works selected by prize-holders:—

From the Royal Academy.—Winter Shooting, R. Ansell, A.R.A., 35*l.*; Boatside, E.M. Ward, R.A.—The Castle and Town of Samur, G. C. Stanfield, 100*l.*; By the Waters of Babylon, W. E. Frost, 63*l.*; Early Training, P. Jaclman, 50*l.*; Evening, Causal, E. Hayes, 53*l.*; We too, We too, must Fall, F. The Solo, G. Pope, 45*l.*; The Torrent Brook, Dolgely, P. Deakin, 40*l.*; Faggot Stacking, A. Fraser, 40*l.*; In the Wood, near Miner's Bridge, R. S. Rowley, 55*l.*; Bright Weather after a Gale, H. Moore, 50*l.*; The Puddle, E. Eagles, 23*l.* 10*s.*; Puck, W. E. Frost, A.R.A., 21*l.*; The First Lesson in Straw-plaiting, G. W. Brownlow, 25*l.*; Near the Market-house, Ross, W. Callow, 20*l.*; The Berkshire Coast, H. Jutsum, 20*l.*

From the Society of British Artists.—A Mountain Stream, W. S. Ross, 25*l.*; Graining, H. King, 25*l.*; Going Home, W. Bromley, 25*l.*; Reminding the old cabinet, T. J. Watson, 40*l.*; Ducklings, J. A. Vinter, 20*l.*; Morning, J. Peel, 25*l.*; View in Glen Neagh, J. C. Ward, 25*l.*; Evening Shadows, E. M. Wimperis, 25*l.*; Dort on the Meuse, J. J. Wilson, 20*l.*; Where the Painted Leaves are strewn along the Winding Ways, W. Luker, 42*l.*; Algerine Pirates, J. Danby, 50*l.*; It won't come straight, T. Heaphy, 30*l.*; Waiting for Somebody, J. T. Peel, 25*l.*; No Throughfare, P. Mizenab, 25*l.*; Evening, C. Le Copard, 40*l.*; The Faith Mawr, T. Pyno, 30*l.*; The Kivrol, C. Smith, 30*l.*; Mountain Road in Dolgely, J. C. Ward, 35*l.*; Mountain Stream, R. Harwood, 35*l.*; Scene near Elstead, Jno. Tennant, 40*l.*; An English Farmyard, J. S. Herring, 40*l.*

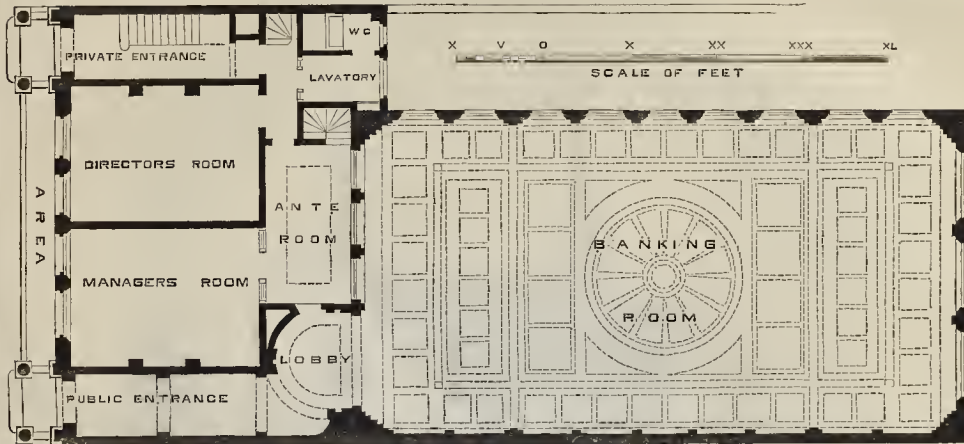
From the Institute of Painters in Water Colours.—On the Beach, Eastbourne, E. Roberts, 52*l.* 10*s.*; Coniston Water, Cumberland, J. E. Hay, 25*l.*

From the Society of Painters in Water Colours.—Interior of Portly Hall, Joseph Nash, 25*l.*; The Hobe Goll Berchtersgaden, Colledge Smith, 20*l.*; Parable of Our Lord, P. Priolo, 70*l.*; The Willing Captive, W. M. Egley, 21*l.*

THE NEW MOVABLE BRIDGE AT SKELTON.

IN the course of last month a new bridge, which has been constructed over the Ouse, between the Skelton and the Hook side of the river, was to be opened for use. The bridge in question crosses the river at a point where the stream is fully 800 ft. in width, and is so constructed as to admit of two lines of rails, which will shortly be put in use by the North-Eastern Railway Company, who have constructed what is known as the Hull and Doncaster Railway, and which joins the Hull and Selby line with the South Yorkshire branch near to Doncaster, and opens up a new route from Hull to London. The difficulties attending the bridging of the river for so great a distance was rendered all the more difficult by the engineer having to provide an opening through which vessels could pass. This was got over by a swivel bridge being fitted in the centre, which is 250 ft. in length, and which turns upon a centre pier of 50 ft. in diameter. The bridge itself is made up of seven spans, which are composed of solid webbed fish-lashed girders, which rest on cast-iron pillars of great strength. There are three piles in each pier, which have been sunk through various estuarine and fluvial deposits to a distance of about 60 ft., and then screwed into Kimmeridge clay. The opening in the bridge is placed over the deepest part of the stream, and has been so constructed as to give 100 ft. of headway for vessels. The bridge is moved by hydraulic power, by engines invented by Sir W. G. Armstrong & Co., who are the contractors for the movable part of the bridge, which can be opened and closed in the short space of half a minute. The signals are constructed on the "lock system," and are regulated by the movements of the bridge. It is intended to light the bridge with gas. Mr. Pitt, plumber, of Goolo, has obtained the contract for lighting the bridge, which, viewed from a distance, has a good appearance. The contractors for the fixed parts of the structure are Messrs. Butler & Pitt, of Stanningley, near Leeds.

BIRMINGHAM TOWN AND DISTRICT BANK.



Plan.

RICHARD CASTLES, ARCHITECT.

ANOTHER little bit of neglected biography of another overlooked architect will not, I think, be out of place in the pages of the *Builder*. Unremembered now, yet celebrated in his day, our subject was one of those professional architects whose birth and training belonged to one country, while the practice of his art was confined exclusively to another. Few even of the citizens of Civita Eblana, who are justly proud of their public buildings, are aware that it was to the subject of this short sketch that they owe the design of Leinster House (now the Royal Dublin Society), and also the design of the Dublin Lying-in Hospital, beside which stands the historic Rotunda.

Richard Castles was a native of Germany, being born in Cassel, and he was brought over to Ireland by Sir Gustavus Hume, of Hume Castle, in the county Fermangh, in the last century. I have not been able to discover any record of designs for works by him in this country during our architect's residence in Ireland, but it is quite possible and probable that, owing to his extensive practice, extending over many years, he designed some works in England.

Castles was a clever but very eccentric architect, and many curious stories are related of his professional career in Ireland. The following enumeration of the principal of his public and private works will show that he had no small share of patronage in Ireland during his career:—The Lying-in Hospital, Leinster House, the Printing-house in Trinity College, the Cupola of the College Chapel, which was pulled down towards the close of the last century. The design for the finishing of the Parliament House was also his. Of baronial or palatial mansions in the capital and country, he designed Powerscourt House, county Wicklow; Hazelwood, in the county Sligo; a mansion at Summerhill, county Meath; Cartown, county Kildare, for the Duke of Leinster; Ballyhays, a residence vaulted over with stone for Colonel Newburgh, county Cavan; a house for the Marquis of Waterford, in Marlborough, afterwards occupied by the Board of Education; two houses in Kildare-place for Lord Masserene, and for Sir Skeffington Smyth; two or three large residences in Sackville-street, Dublin; one for Lord Bective in Smithfield, Dublin; one for the Lady Dowager of Kildare in Kildare-street; one for the Protestant Bishop of Clogher; and several others of minor note.

From the above list it may be seen that Castles had a good practice. He also erected the first stone lock in Ireland—that of the Newry Canal, county Antrim. Like some other clever professional men, he had one great failing; he was addicted to intemperance, and in consequence was improvident. A great portion of Castles's time was spent in the tavern overnight, and one

of his principal companions was no less a personage than the celebrated and justly-esteemed Dr. Bartholomew Mosse, the founder of that very humane institution, the first in the kingdom, the Dublin Lying-in Hospital. Mosse bequeathed his fortune for the purpose.

Richard Castles was extremely odd and whimsical in his manner and habits; he had a decided aversion against shaving himself, and was over-cautious and most particular about those whom he employed on his works. The art of stucco plastering was carried to a high perfection in Dublin in the last century, as many of the residences of the nobility still testify. A Mr. Simpson enjoyed a great reputation in that line, and was employed by Castles, who liked his performance so well that he ever afterwards kept him on his works, and when not requiring him recommended him to others. Castles was a good draughtsman, and was most clear in his directions to workmen. Whenever he came to view his buildings and wished to give any special direction he would summon all the workmen together, and they were obliged to follow over the works in a long train, while he pointed out to each what he required to be altered or done. He was very changeful, and he frequently had many of his buildings half pulled down when he did not like the appearance presented.

Castles married an Irish lady, a native of Lisburn, in the county of Antrim, but he had no issue by her, and her death preceded his by some years. He continued a widower ever afterwards.

While engaged at the Duke of Leinster's, at Cartown, county Kildare, Castles's death took place. Retiring after dinner one day to write some directions for the carpenter, he was suddenly seized with a fit, and was found dead in his chair. Long addicted to drink and late hours, he was subject to attacks of the gout, which weakened his constitution. Richard Castles was between fifty and sixty at the period of his death.

For the information of the craft and his countrymen, we are able to state that the ashes of this clever and eccentric architect rest in the Church of Maynooth, Kildare. Independently of his failings, our subject was a man of strict integrity in all his professional and personal engagements. His extensive practice gave him opportunities of amassing wealth, but he neglected to avail himself of them, and the result was that he was often distressed for means. Yet he was highly esteemed as a professional man. His company was much sought, he being a most agreeable companion. The Irish capital is indebted to Richard Castles more than it is aware, for he was the pioneer of the fine architecture in public buildings in that city which culminated afterwards so grandly under the sway of Thomas Cooley and James Gandon.

C. C. H.

LONDON ORPHAN ASYLUM.

THEIR Royal Highnesses the Prince and Princess of Wales have signified their intention of laying the foundation-stone of the proposed new asylum at Watford, on Monday, the 12th inst.

The annual report of this valuable institution for the past year has been published. In their appeal to the public, the managers notice the fact of their having contracted for the erection of the new building at Watford, from Mr. H. Dawson's design, for 450 orphans, for 63,088*l.*

The Grocers' Company have, in a spirit worthy of their ancient liberality, voluntarily bestowed the sum of 3,000*l.* for building a house for the reception of fifty orphans, to be designated "The Gift of the Grocers' Company." Eight such houses are designed for the accommodation of 400 boys; and the Board are not without hope that some other public body or individual may generously emulate the noble example of the "Worshipful Company of Grocers." The contract price for erecting the structure, of which we give illustrations, is rather under 3,000*l.*

Another gift has afforded the managers great satisfaction, and we do not wonder. Four years ago the Head Mistress, much esteemed, married the late Mr. George Peckett, who had done good service to the institution. Having lately lost her husband, Mrs. Peckett has announced her intention of building the chapel (of which we give a view), at her own cost (about 5,000*l.*), to serve at once as a memorial of him, and of her own regard for an institution with which she was long connected,—an occurrence as honorable to the managers as it is to the lady.

Donations to the building fund, and for annual subscriptions, are pressing called for. Some statistical tables appended to the report show how considerable a difference on the whole expenditure is sometimes made by a small increase of cost on each individual for provisions, &c. Thus in 1863, the cost per head of each orphan was 10*l.* 1*s.* 1*d.*, and the cost for the entire establishment was hence 4,343*l.* 19*s.* 7*d.*; while in 1868 the cost of each child was 12*l.* 1*s.* 5*d.*, and the total cost was hence increased to 5,230*l.* 1*s.* 3*d.* The average number of children in 1863 was 432, and in 1868 it was 431.

The objects of this institution are most admirable, and we fully endorse words lately uttered by the Rev. J. W. Gleadow, while pleading the cause of the asylum:—

"This Institution is distinguished from a great many of the other establishments of benevolence, which, like gems in a monarch's diadem, adorn and dignify our land. Whilst others direct their attention to mitigate the different evils that result from poverty, disease, old age, and accident, thus furnishing a refuge for the broken remnant of human life, this, on the other hand, contemplates its objects in the first years of their existence. It takes them from the position of danger in which, by no act of their own—by no vice or folly of their own—they have been placed. It rescues them from the associations and from influences which might make utter shipwreck of their hopes and their happiness. It saves them from such a fate, and with all the anxiety of a parent, guards their early years and trains them to religion, to virtue, and to usefulness."

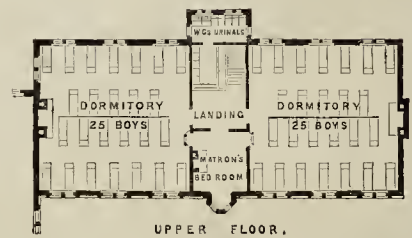
LONDON ORPHAN ASYLUM, WATFORD.



View of Chapel.

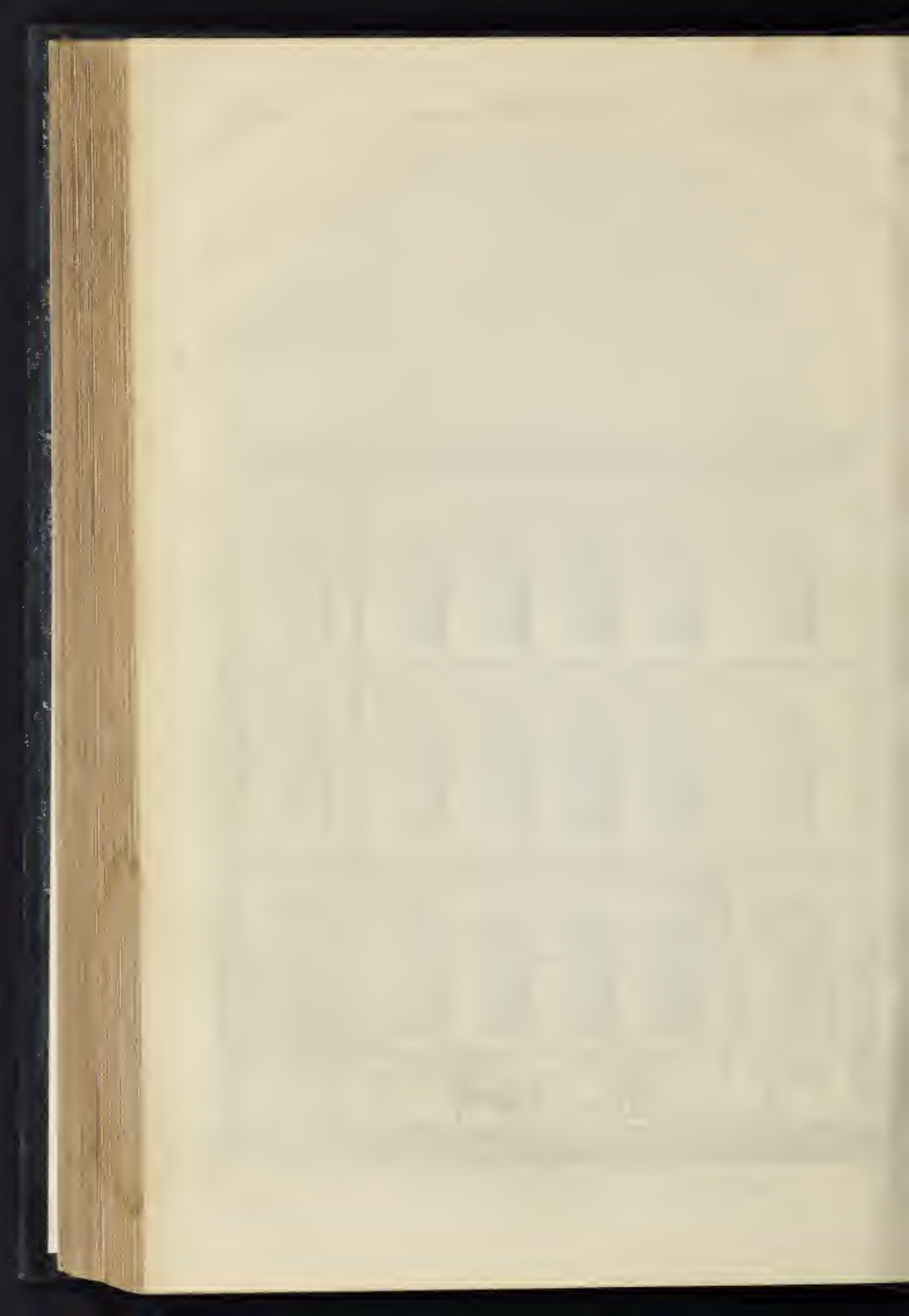


Boys' House.





BIRMINGHAM TOWN AND DISTRICT BANK.—MR. YEOWILLE THOMASON, ARCHITECT.



surveyor, it was to be out of the first instalment, which was, of course, the employer's money, and the item was very properly to be provided for by the builder at the foot of the estimate. The tenders ranged from 9,000*l.* to 7,500*l.*, or thereabouts; or, after allowing for 500*l.* worth of old materials, showed 5,000*l.* to be the lowest value to be put on the work. At the foot of all the builders' estimates the item of "Surveyor's fees, 15 per cent." was added, being included in the amount of the tender. The lowest tender was that of the old-established and respectable firm of Daniel Crowe & Sons. A deed of contract was prepared by Mr. Moore's solicitor, submitted to Messrs. Crowe's solicitors, and approved, and everything appeared in fair train for proceeding with the work, when it was found that Mr. Crowe, sen., was in too infirm a state of health to execute the contract, and some delay took place. Eventually Messrs. Crowe, jun., offered to carry on the work, giving the names of three first-rate merchants of the city of Dublin as securities. This, however, defendant did not choose to accept, and soon after, without informing either the architect, the surveyor, or the builders, changed his mind, and advertised the site for sale. None of the work had been carried out, and as the surveyor had no builder to pay him in the ordinary way, and as provided for by the "conditions of tender," he looked to the defendant to pay him, as having first employed him through his architect, and as being the only party who received any benefit. It would also be proved that defendant fully understood and approved of the plaintiff's being employed on the usual terms.

After evidence had been led for the plaintiff, Mr. Macdonough stated the case for the defendant. In course of which the Chief Justice said—Really, Mr. Macdonough, do you have any defence to this? We had a case—Taylor v. Hill—so like this before that it seems needless to waste further time on it. The only doubt then was, whether the employer or the builder was the party liable, as some work had been done; but here there can be no doubt on that subject. The custom of the trade was then proved by half a dozen witnesses. You would be better employed in another court.

Several jurors also said it was really only wasting time to continue the trial. Mr. Macdonough here conferred with defendant, and announced that his client pressed him to go on, as he had never seen the plaintiff or authorised his employment, and conceived he had a good defence to the action. Defendant addressed the Court to the same effect.

The Chief Justice said that, of course, he would try the case on, if the parties were determined on it. At the close of the evidence for the defendant, the Chief Justice briefly charged the jury. The evidence, he said, was, to some extent, contradictory; the defendant asserting that under no circumstances he was to pay the plaintiff, and that he instructed the architect to that effect. The latter, on the contrary, asserted that the surveyor was employed under the usual arrangement, as set forth in the documents, without any such special stipulation as that stated by defendant. If they believed the former, they should find for the defendant; if they believed the latter they should find for the plaintiff, as undoubtedly the work had been abandoned; and on the authority of the case cited, as well as the usage proved, the employer became liable under these circumstances.

While the jury retired, Dr. Boyd submitted to his lordship that even supposing Mr. Fogarty had been instructed, as stated by defendant, that was no answer to the plaintiff, unless it could be proved that he was aware of and had acquiesced in the alleged arrangement. (The Chief Justice took a note of the exception.)

The jury, after a brief deliberation, returned a verdict for the plaintiff for 12*l.*, 1*s.*, and costs.

THE REFORM OF HOTEL CHARGES.

THE erection of limited company hotels, and the employment of capital in them, has been generally a failure in England, as I know to my cost, having been so unlucky as to take shares in several of them. Does not this want of success arise from their scale of charges as compared to the prices at the German watering-places, the proprietors of which, with a short season of about four months, almost all make fortunes, besides benefiting by their custom the towns in which they reside? It seems impossible in our country to get the old idea "of sticking it into a few customers at the old approved rates" out of the heads of our innkeepers, whether of the old sort, or the new modern limited style.

I noticed a paragraph in one of the daily papers last month suggesting a speculation in chambers or buildings suitable for the middle classes, in the style of the Grosvenor Buildings, with sets of rooms to be rented, say, at from 50*l.* to 100*l.* per annum, with a restaurant attached, from which the residents could be supplied at a fixed tariff, and thus avoid to a certain extent the expense and trouble of servants. The idea is a good one, and worth the attention of some of your enterprising readers.

On reference to the dividends of several hotel companies, I have not been able to account for the poor returns obtained, and cannot see why an undertaking of this kind, in a thickly-populated, rich, and active country, should not yield large profits if conducted upon such principles as to secure constant employment and use of the accommodation offered to the public.

As my profession has led me to travel for many years past on the Continent, and much in England, and having been compelled by my own health and that of my family to wander about the world and reside in hotels, lodgings, and furnished houses, my attention has been frequently drawn to the matter of hotel accommo-

dation in England, and its inferiority to that on the Continent, notwithstanding that most articles of consumption are cheaper with us; and my experience has led me to ascribe this entirely to the high charges persisted in by our countrymen in face of the poor results obtained by them. To succeed, they must tap the pockets of the millions, be content with a small profit from each, and leave the old system of the yellow and blue rooms, with their dozen occupants, and their port and sherry at 8*s.* a bottle, claret at 10*s.*, to the upper ten thousand, the *parvenus* rich and others of that sort, and send the old Boniface traditions of the road to the limbo of forgotten things.

In this view I beg to submit an estimate of the returns for an establishment built to accommodate 100 guests, in the style of the German hotels, and let at an average of 2*s.* per day, and kept full by a low tariff:—

	Per Day.	Per Year.
Rent—To pay for house, furniture, &c., 100 at 2 <i>s.</i>	£10 0 0	... 23,650 0 0
Profit on food, &c.:—		
On breakfast and tea; cost, 6 <i>d.</i> , each person, charged 1 <i>s.</i>	2 10 0	... 912 10 0
On dinner; cost 9 <i>d.</i> , charged 1 <i>s.</i> 6 <i>d.</i> , 10 <i>s.</i>	3 15 0	... 1,368 15 0
On wines, say 6 <i>d.</i> , each person	2 10 0	... 912 10 0
Servants, charged at 3 <i>d.</i> , each per day	—	456 5 0

The cost here is calculated from the actual retail prices of plain breakfasts, consisting of tea, coffee, or cocoa, bread, fresh butter, and eggs or fish; dinners of plain joints of beef, mutton, or veal, with vegetables, bread and cheese, and farinaceous puddings, supplied to a family of four persons, where meat is 1*d.* per pound dearer than in London, and bread, butter, and groceries also rather higher in price, except tea, which I have taken at 2*s.* 6*d.* per pound.

Possibly some of your readers would be surprised at this estimate,—and so was I when it came out on paper. Now, here is the lowest charge at which I have ever been able to get myself and family applied in England, at hotels professing the most reasonable charges:—

4 persons—Breakfast, plain, at 6 <i>d.</i>	20 6 0
Tea ditto 1 <i>s.</i>	0 4 0
Dinner ditto 1 <i>s.</i> 6 <i>d.</i>	0 7 0
Servants, at 6 <i>d.</i> (but generally 1 <i>s.</i>)	0 2 0
	£0 19 0

against actual cost, 5*s.* Is it any wonder, therefore, that people in my class of life, with incomes from 250*l.* to 600*l.* per annum, carefully avoid hotels and take lodgings in England, and spend the holidays in Germany or elsewhere on the Continent?

The charge of 1*s.* 6*d.* per day for each person generally made at railway hotels in England is most unreasonable, and of itself prevents many persons from frequenting them. It is the knowledge of these charges in England that has put the Germans up to imitating them to the English in a moderate ratio. It may be objected to this statement, that these figures assume that all the 100 rooms are let. So they will be at my scale of charges. Many families and other persons would reside altogether in such establishments, as they do in America. The restaurant would supply people outside of the house in the neighbourhood, and there would be other profits on wines, hire of carriages, &c., provided always that the proprietors will content themselves with moderate profits in a large turn-over. Remember that the trade is all ready-money; and surely 100 per cent. ought to satisfy an innkeeper. I know few other trades but chemists who would not be well pleased with half that rate.

As I find my pocket will not stand, this summer, the English charges, I am off to Germany next week, for a couple of months, and shall be glad if this statement will enable you to throw out any hints in your valuable paper to remedy this state of things, and enable me next year to spend my money in old England.

A RETIRED BUILDER.

Concrete Houses.—Travellers by railway and others visiting Cleckheaton, will have noticed two houses which are in course of erection there by Mr. James Cockroft, upon the concrete principle. These houses are now fast approaching towards completion. They are semi-detached, with bay windows to the front, and comprise on the ground floor four rooms each, with five bed rooms, bath-room, and closet above. The wood-work throughout will be of pitch pine varnished.

SUBURBAN VILLAGE AND GENERAL DWELLING COMPANY.

THE annual general meeting of this company has been held. The report of the directors was read, in which they revert to the difficulties they had to contend with, but are enabled to speak with satisfaction as to the present position and future prospects of the company. The estate at Longborough Park had been obtained on terms that admitted of no doubt, they thought, that, when covered, a substantial return for capital invested would be secured. The retiring directors and auditors were re-elected. The chairman said that the directors had hitherto given their services gratuitously, and should ask for no fees until the company was in a more prosperous condition.

THE ROYAL ARCHITECTURAL MUSEUM.

WE mention with great satisfaction an intimation from Sir Thos. Biddulph that her Majesty the Queen graciously consents to become the patron of the Royal Architectural Museum, and gives 50*l.* We have already mentioned that the new building, near Dean's-yard, Westminster, will be opened on the evening of July 21st. The council are understood to wish the meeting to have something of the character of the well-remembered gatherings in the old "cock-lofts" of Canon-row, whereat artists-workmen formed part of the audience, and short addresses were delivered by friends of the Institution.

THE PROPOSED MOSAICS FOR THE HOUSES OF PARLIAMENT.

WE hear that an attempt is to be made to rescind the vote enabling Mr. Lyard to fill some of the spandrels in the Central Hall with mosaics. We trust, however, it will not prove successful. That our artists have not at present produced any thoroughly satisfactory works in mosaics is no sufficient reason for stopping endeavours in that direction, but the reverse. Excellence is not to be attained by a jump: it must be perseveringly striven for.

MARTYRS' MEMORIAL.

SIR,—On reading in the *Builder* your notice of the Smithfield Martyrs' Memorial Church, it struck me as especially necessary to repeat your advice elsewhere given, that the mottoes and inscriptions should be written in the current characters of the present day, whether on stone or glass. I hope no Mediaeval notions will prevent this being done. I do not trouble you with reasons; I think they will readily occur to your readers. REFORMER.

SANITARY STATISTICS IN PARIS.

PARIS now publishes weekly returns of mortality, and furnishes to our Registrar-General the number of deaths each week, with certain information relating to the causes of death, in time for simultaneous publication in the official weekly return of births and deaths in London and thirteen other large towns of the United Kingdom. This marked sign of progress toward a complete system of International Sanitary Statistics is important beyond the mere value of the facts thus rendered available. So long as Paris neglected to publish this weekly information, which in time of epidemics is of great international interest, other large continental cities felt justified in showing the same apathy; the example now set by Paris will probably ere long be followed elsewhere. Berlin has for some time, and Vienna for a still longer period, enabled the Registrar-General to publish weekly statistics of those cities; but the value of the return received for the first time this week from Paris is greatly enhanced by its referring to the same week as the return for London, which has not hitherto been the case with either Berlin or Vienna.

According to the return received from Paris, the present population of that city is estimated at 1,883,842. In this population 840 deaths were registered during the week ending Saturday, 3rd July, which showed an annual death-rate in the week of 23 per 1,000 persons estimated to be living. In London, during the same week, the death-rate did not exceed 20 per 1,000; but in Berlin, in the seven days ending Thursday, 1st July, the death-rate was so high as 34 per 1,000.

A comparison of the relative mortality from a few diseases during last week will be interesting, although its value will be far enhanced when the comparison can be extended over a series of weeks. The numbers for Paris have for this purpose been raised in proportion to the difference of population, and are not the actual numbers registered. Small-pox would have caused 27 deaths in Paris last week (were Paris as large as London) against 4 in London. Scarlatina, on the contrary, caused only 5 deaths in Paris, against 75 in London; measles 15 against 22; and diarrhoea, 15 against 20. The fatal cases of diphtheria were as 10 in Paris to 4 in London. Inflammatory diseases of the respiratory organs, bronchitis, and pneumonia, caused 169 deaths in the week in Paris in proportion to 146 in London. The deaths resulting in childbirth were as 13 in Paris to 8 in London.

The return from Paris does not yet contain information relating to the temperature or rainfall, or to the number of births registered; but what we have is a most valuable instalment, and it will doubtless be rendered more complete ere long.

NEW STREET PAVING.

A PART of Threadneedle-street has been paved with a new material, so far as England is concerned; viz., compressed rock asphalt. This kind of paving has been used in the continent, and in Paris and other cities, and is extensively used in Paris and is being gradually repaved with it. The advantages of this material laid in the manner adopted in Paris, of which the part of Threadneedle-street is a specimen, include the absence of noise, mud, and dirt, and its durability (some of the streets in Paris having been laid fifteen or sixteen years without renewal).

The work has been executed by French workmen, under the superintendence of Messrs. Callender & Amos, who hold the right for Great Britain from the proprietors of the mines from which this rock asphalt is obtained.

LADDERS.

SIR,—I have the honour to suggest that ladders for use especially in the metropolis and large towns, could most conveniently be made of iron, folding by jointed lengths; and that these iron arms be attached to the ladders at each joint, on both sides of the ladder, for the purpose of being hooked into rivets or staples, to be placed in the walls of buildings that ladders are erected against. Such ladders would be easy to move about, and be safest when erected, and could be put up almost at any place, where otherwise ladders cannot, by reason of the difficulty of getting them set up. Modern erections could at suitable distances in their walls have iron rods run through them, with the staple end of the iron rod projecting slightly on the outside wall, and be securely fastened on the inside by a crossed pin or bar. If you name the matter, it may be carried out advantageously by some of your readers perhaps, and safety to life and limbs be obtained at very little cost or trouble.

H. H.

GLAZING.

SIR,—Can any of your correspondents give me the benefit of experience as to the use of hair felt in the place of putty, partially or otherwise, for the purpose of having glass of large size on iron skylight-bars?

CLERK OF WORKS.

DECORATION OF SURFACES.

SIR,—In reading over the article, "The Use of Plaster in Decoration" in the *Builder*, June 26th, I find the following:—"It is surely possible to devise means for impressing on the finishing coat of plaster, while still wet, such a small diaper ornament as might relieve the dreary monotony of surface."

I have been thinking of the same thing for some time. This is what I propose. Have a polished metal roller about 9 in. diameter, and from 12 in. to 18 in. long, and 1/4 in. thick; die-sink the pattern on the polished surface, and roll it on the wall or ceiling while the plaster is still wet. A brush may be fixed on the frame to keep the surface moistened with oil. I have an idea for a rotary paint-brush to paint large surfaces cheaply.

The axle is a tin cylinder to hold the colour, with brushes fixed on the outside. The brushes are supplied with colour from the cylinder or root of the brushes through perforations in the cylinder. A friction wheel at each end will give motion to the brush when rolled on the wall or ceiling.

For the decoration of walls and ceilings, I propose to have a rotary stencil plate, that is, a perforated cylinder of paper or metal, with a brush inside revolving in a contrary direction.

The motion to the brush can be given by friction rollers and straps. Could not the same thing be used for plans? I think it would be cleaner and more expeditious. Instead of liquid colour, have a stiff brush and a solid cake or pad.

THOS. LEWIS JOWETT.

CHURCH-BUILDING NEWS.

Blayton.—The improvements which have for a considerable time past been carried out in St. Cuthbert's Church, are now approaching completion. The tower, which, at the building of the church, was left in an unfinished state, now begins to form a feature of the edifice as seen from a distance. Two stained-glass memorials have been inserted in the easternmost windows of the north and south aisles. The north aisle window consists of two figures, the one taken from Joh xix. 25, 26, depicting the patriarch uttering the passage:—"For I know that my Redeemer liveth, and that He shall stand at the latter day upon the earth; and though after my skin worms destroy this body, yet in my flesh shall I see God." The other figure, from 2 Timothy iv. 6-8 represents St. Paul as he expresses the words:—"For I am now ready to be offered, and the time of my departure is at hand. I have kept the faith: henceforth there is laid up for me a crown of righteousness, which the Lord, the righteous judge, shall give me at that day; and not to me only, but unto all them also that love His appearing." This window has been placed as a memorial of the late Mr. Charles Armstrong, of Newcastle. The other window, situated in the south aisle, has been erected at the sole expense of his partners, in memory of the late Mr. Henry Poole, of the firm of Poole, Austin, & Co., Blaydon Bottle Works, and consists of a coloured design, of a geometrical and grisaille character, with medallion emblems, sacred and Masonic. The great east window, which was filled with painted glass some time ago, at the cost of the present incumbent, as a memorial to his deceased relatives, has recently had the old over-glazing taken out for the purpose of better adjusting the iron bars that crossed the faces of some of the figures, and marred their effect. It has now been overglazed with patent rough plate, so arranged as to leave the figure subjects clear. These windows, as well as other three stained ornamental windows in this church, are all from the works of Mr. Henry M. Barnett, of Newcastle. There is, it is understood, a project on foot for the purpose of procuring a new organ, to be placed at the western end of the nave, immediately under the tower.

Whittington.—The chief stone of the chantry and north aisle of Elford Church has been laid. The design is by Mr. Street, and the work is in the hands of Mr. Clarkson, Tamworth. The whole expense will be defrayed by the Hon. Mrs. Howard, the patroness of the living.

Douling.—The ancient church of Douling, near Shepton Mallet, is about to be restored. It was built about 600 years ago, on the site of a former church, begun in 960, at the instigation of St. Dunstan, who visited Douling in that year, and persuaded the people to replace the old wooden church by one of stone, to be dedicated to St. Aldhelm, Bishop of Sherborne, Abbot of Malmesbury, and first Bishop of Salisbury, who died where Douling Church now stands. The total cost of the work will be about 4,000l., and it will occupy about two years.

Brindle, near Preston.—The old chancel and the Cavendish Chapel of Brindle Church are being rebuilt, and the nave also will be considerably remodelled and improved, and new bench seating provided throughout the church. The ancient church was altered, and to a great extent rebuilt, about forty years ago, in the then prevailing style of Gothic. The work is being carried out by local contributions, assisted by subscriptions from the Duke of Devonshire, patron of the living, Lord Chesham, and others. Messrs. Brade & Smales, of Kendal, are the architects; and Mr. Robert Pickup, of Chorley, is the contractor for the work.

Hartley Wintney.—The foundation-stone of a new church has been laid here. The design is Decorated, and the plan comprises nave and two side aisles, transepts, chancel, baptistery, organ-chamber, vestry, &c. The materials are Bath stone and brick. The architect (Mr. Lansdowns), was selected by open competition, and the contractor is Mr. Hibbard.

Farndon (Cheshire).—The church of St. Chad, Farndon, has been re-opened. The gallery has

been taken down at the west end, thus affording once again the use of an entrance under the tower, and exposing the west window to view.

The pier arches have been cleaned of colouring, and the character of the stonework disclosed; and the font, placed at the west end, near the tower, is likewise restored. In the roof, little of the old timber remained. This has been cleaned, and moulded ribs added of pitch pine, coloured to match, and so panels have been formed, the spaces of which are plastered. In the chancel, screens and new oak seats have been added to correspond with the work done when the chancel was partially restored some years ago; while the seats throughout the body and aisles, which are all free and open, are of pitch pine, stained and varnished. The aisle floors have been laid with tiles, red, white, and buff, supplied by Messrs. Boote, of Barslem. The windows have been re-glazed throughout. With the exception of the windows in the chancel and the tower, a semi-transparent glass has been used, with blue and ruby-coloured borders. The others are tinted, and the whole of this work was attended to by Messrs. Lavers, Barrand, & Westlake. The heating will be by means of hot air from a Porritt stove, under a grating at the entrance from the north porch. In the south aisle a mural monument has been erected to the memory of Dr. W. H. Clarke, a judge in the Recorder's Court at Rangoon, who was born at Farndon, and died at sea. The inscription is on white marble under a crocketed canopy of Caen stone, supported by dark green marble shafts. The chapel of the Barnston family has been entirely rebuilt or re-aced. The old roof and ceiling were removed, and the underside of the new roof is panelled, with moulded ribs and cornice, which are slightly decorated in colour. A new window of four lights has been put in. This chapel has cost about 200l., the architect being Mr. Douglas, of Chester; and the builder, Mr. Harrison. Externally, the repairs of the church have been confined to the roof, and repointing the walls, where the mortar had fallen away. The total cost of the work is nearly 800l., but this does not include the cost of the chapel, which is borne entirely by Major Barnston. The work of restoration has been carried out by Mr. Edwin Huxley, of Holt, the foreman for Mr. J. Harrison, of Chester, upon the plans of the architects, Messrs. Kelly & Edwards, of Chester.

Hemel Hempstead.—St. Paul's Church here has been consecrated. The new edifice has been erected in the Early English style of thirteenth century. The church consists of a nave with north and south aisles, a chancel, and a transept on the north side; a vestry on the north side of the chancel, and an organ-chamber on the south side. There is a bell-turret about 60 ft. in height, which is placed on the north-west angle of the nave, with a vane at the top. The nave is divided from the aisles on each side by arcades of five bays, with shafts alternately octagonal and cylindrical, with moulded bases and caps, and pointed arches. The windows in the clearstory are circular, of four, five, and six foil, and the aisles have pointed windows arranged in triplets. The large east and west windows, and the windows of the transept and clearstory, are filled with geometrical tracery, and the east window (four-light with tracery head) is filled with stained glass by Messrs. Lavers, Barrand, & Westlake. There are three entrances to the church, viz., the north porch, which forms the principal entrance, and faces Queen-street; a large western door; and a door within the porch at the end of the north aisle. The nave and aisles have open roofs of stained deal, plastered between the rafters, and with pierced quatrefoil panels. The chancel is divided from the body of the church by a chancel arch springing from moulded corbels, and the roof of the chancel is close boarded and divided by moulded ribs into panels. The chancel is paved with glazed tiles, and the space within the Communion-rails with Minton's tiles in patterns, the passages in the nave being laid with blue and red Staffordshire tiles. The sittings in the church consist of open benches of stained deal, and there are stalls in the chancel with prayer-desks and a lectern. The pulpit, font, and reredos have been executed from the architects' designs, the two latter by Mr. Earp, of London. The walls of the church are constructed of flints, dug on the site, with quoins and dressings of Box Ground Bath stone for the outside; the pillars, arches, and dressings of the inside being of Combe Down Bath stone, with the general surfaces plastered. The interior dimensions of the church are 105 ft. 9 in. in length, by 54 ft. 4 in. in width. The height of

the nave is 24 ft. to the plat, and 17 ft. 6 in. from plate to ridge. The church affords accommodation for about 570 persons, and 300 sittings will be free. The architects were Messrs. Drury & Lovejoy, of London; the contractor, Messrs. Gibson, Brothers, of Southall. The Clerk of the Works was Mr. Richard Slanagher. The amount of the original contract was 2,800*l.*, but we are informed that the entire cost of the building will much exceed that sum.

Birkenhead.—St. James's Church has been consecrated by the Bishop of Chester. The church is situated in an area at the northern part of the town, where no less than eight streets converge. The building is in the Early English style. It was designed by Mr. Charles Evans Lang, and Messrs. J. & W. Walker, of Birkenhead, were the builders. The church consists of a nave and aisles, a clearstory, a chancel, 40 ft. in length, and north and south transepts, in the latter of which are galleries. The aisles are divided from the nave by a range of columns, and from these spring the arches which carry the clearstory and roof. At the junction of the nave and chancel is an arch which springs from reeded columns and rises some 40 ft. in height. The chancel is lighted at the east end by a triplet window, and by three coupled lancets at each of the sides. An uninterrupted view of the church is afforded from east to west, owing to the nave and aisles being unbroken and unintruded upon, except by the pews and organ, the latter being placed in the western bay of the north aisle. The western window is of considerable magnitude, and consists of three lofty lancets, which, together with the intervening arches and a triangular window above, occupy the entire west end of the nave. The church is slated to accommodate 800 adults, and is 140 ft. long by 50 ft. wide. The transepts from north to south are 86 ft. long. The tower and spire are placed at the west end of the north aisle, and rise 130 ft. high. On the south side is a porch, and at the east end are two entrances with convenient vestries. The roof has no tie-beams, but externally there are flying buttresses. Extensive schools have been built in connexion with this church. These afford accommodation for about 500 children, and there are also houses for the teachers adjoining.

Dinnington.—This small village, situate twelve miles east of Sheffield, and six miles north-west of Worksop, has been recently improved by the erection of a church, built at the sole expense of Mr. J. C. Athorpe, the lord of the manor. The new church is a small edifice dedicated to St. Nicholas. It is in the Early English style, and built by Mr. Cawthorne, of Retford. It consists of nave, chancel, and north and south transepts. The benches are open. On each side of the chancel is a stained-glass window. In the south transept is a painted memorial window, representing the resurrection of Christ. In the tracery over the window are the four evangelists, hieroglyphically represented—St. Matthew by a lust, St. Mark by the head of a lion, St. Luke by that of a bull, St. John by the head of an eagle. The west window is filled with stained glass. There are four cartoons, representing—"Christ blessing little Children," "Baptism of St. John," "Joseph and Mary, with the Infant Child Jesus in Bethlehem," and "Christ among the Doctors in the Temple." The whole of the painted windows are from Munich; a wheel window is placed over them.

Hertford.—At a recent meeting of the building committee of St. Andrew's Church, the architect and clerk of the works were in attendance, and Mr. Johnson produced the names of five companies, who had sent him prospectuses for warming the church. It was resolved unanimously that the committee, on the suggestion of the architect, recommend Gurney's stoves to the consideration of the parishioners, provided the whole work of warming the church, brick-work included, be done at a cost not exceeding 100*l.* Mr. Cousine was appointed clerk of the works from the 3rd of May last, at 2*l.* 2s. per week, payable at the end of every four weeks. A rate to increase the funds was also recommended.

Jarrow.—The question of a new cemetery for Jarrow has been under consideration. The burial board have been authorised to purchase the piece of land called the — Close, situated at Shipdon, in the occupation of Miss Carr, from Col. Townley, for the purpose of forming it into a cemetery, according to Mr. Thompson's plan; the whole cost not to exceed 2,600*l.*

Abingdon.—The Church of St. Helen's is about to be restored. The old pews are to be swept away, open seats put in their place,

and other alterations made as a commencement; and afterwards, as funds come in, the whole structure will be restored. The architect is Mr. Woodyer, of Guildford.

Books Received.

"RAILWAY Travelling in the Nineteenth Century, with Plan of Proposed Improvement, by George Lansdown. London: printed by Pettitt & Co., Frith-street, Soho." The plan which we have urged for many years as a *sine qua non* for efficiency and safety in passenger and guard communication,—namely, a means of free transit along the train for guard or passenger,—is insisted on by the author of this pamphlet, who has patented a communication between carriages by adjustable platforms. He shows clearly that the objection of cost in altering carriages, loss of seats, &c., is all a bugbear, and that there would be gain rather than loss on the change, by comparison with the fitting up of electric or other signalling. But even that is a very secondary consideration by comparison with the public safety, which can in no other way be insured by the trim of trains in transit. The system is already in operation both in America and on the Continent, and nothing but the stolidity of our countrymen prevents its adoption here. The plans of Mr. Lansdown would accomplish the desired alteration in perhaps an unobjectionable way as possible.—"Railways and the Public. By Raphael Brandon, F.R.S.B.A. Second edition. Bell & Daldy." We are glad to see that Mr. Brandon's project seems to be meeting with favour, as we agree with its principle, whatever be the merits of the precise fares fixed upon. In his preface Mr. Brandon says that, according to the returns for 1857, if his system had been in operation, the annual income would have exceeded the actual receipts by 48,000,000*l.* sterling; and that this suggests the possibility of still further reducing the fares, from 1*l.* first-class, 6*l.* second, and 3*l.* third, as he proposed in the first edition of his pamphlet to 6*l.* first-class, 2*l.* second, and 1*l.* third-class, "all the way"; even were it from the Land's End to John o' Groat's House. Perhaps Mr. Brandon only means to add strength to his first proposal, however; and certainly the public would be satisfied with that, whatever the shareholders—if any—might be. Meantime, a "National Railway Association," with a good long list of members, has been established for the purpose of carrying out Mr. Brandon's scheme, with Mr. Brandon himself as hon. sec. A prospectus and list of members accompany the second edition of his pamphlet.—"The Paying and Non-paying Weights pulled by the Locomotive Engine in 1857, considered in connexion with existing Charges for Passengers and Goods. By B. Haughton, of the London and North-Western Railway. McCordale & Co., printers, Gardington-street, London." This is a very different sort of pamphlet from Mr. Brandon's. The author is on the engineering staff of the North Western, and his paper on this subject was read before the Civil and Mechanical Engineers' Society, of which he is president. Mr. Haughton states that the Board of Trade and other returns on which his calculations are based

"disclose the strange facts that the average British passenger weighs 2 tons with train accessories; and that the ton of goods, &c., weighs 3*l.* tons; and by no known processes can these enormous multiplications of original net weights be reduced, consistent with affording that amount of personal security, and comfort, and accommodation now enjoyed. Let them in their future deliberations on this subject [he says] relinquish the idea which has so long clung to them, and which has been so ingeniously and persistently placed before them, that a railway passenger is a feather weight—a letter or a newspaper as it were—and that he may be treated accordingly; let them try to realize the facts as stated, as to the actual total of paying and non-paying weights pulled, and the enormous energy developed in order to produce the effect expressed in the figures as before given, viz.,—25,312,656,458, horse-miles tons.

These, combined with the figures representing the wear and tear of material, and the labour expended in the maintenance of the system, will perhaps convince them of what an exhausting, devouring, and insatiable monster it is that they have called upon to minister to their lately-born wants, and will go far to reconcile them to the existing tariffs of fares and rates."

—"Notes on Joint-Stock Companies." By Robt. A. Ward, Solicitor. London: Eiflingham Wilson, and Simpkin, Marshall, & Co. Mr. Ward is the author of a work on "Investments," which we favourably noticed in 1852. The pamphlet under notice is one that cannot but be useful to

all intending to have anything to do with Joint Stock Companies. Take the following as an specimen:—

"Before taking shares in a company the following questions should be put to the secretary or promoters:— 1. Who are the promoters of the company? 2. How many shares have been *bona fide* subscribed for, and by whom? State in your reply the number applied for by each person. 3. Are paid-up shares to be given to any director or other person?—if so, state particulars and reasons. 4. Is any guarantee given to any subscriber against loss or liability? 5. Are any paid-up shares, and if so, how many, to be allotted to the promoters of the company; and are they to receive any, and if any, what other advantages? 6. Is any remuneration, and if so, what, fixed for the services of the directors, manager, and officers of the company? 7. Are the whole amount of the shares to be allotted if applied for? 8. Are the allotments to be made in the order in which the applications are received, or at the caprice of the directors? 9. How are the directors, manager, and other officers removable? 10. Is it proposed to place any restriction upon the transfer of shares? 11. What is the qualification of a director?"

A case of winding up is quoted, which shows that where a company is on the verge of bankruptcy, a shareholder may, nevertheless, shift a great part of his responsibility. The case was one in which a person held 250 shares in a company, for which he had paid 1,750*l.*: these he sold to a clerk of his for 1*l.*, and so escaped liability, as the court decided, on the ground that it was an absolute and *bona fide* transfer, out and out, without any trust or reservation. On the subject of investments, the author *inter alia* says,—

"Land companies are as yet in their infancy. My impression is, that purchasing land with judgment, and reselling it in lots with a registered title, is a very desirable mode of investment for a company or an individual, and it contains the element of speculation in a small degree only, as the land cannot be lost."

—"The Quarterly Journal of Science." July, 1869. Longmans & Co. This number contains an interesting paper on "The Prohibitive Antiquities of and around Lough Gur," in Ireland, by Professor Harkness, F.R.S.; illustrated by a sketch map and wood engravings. There is also one by Dr. E. Lankester, F.R.S., on the "Teaching of Natural Science in Schools;" another by F. Hall, F.R.S., on "A Ternary Geological Classification;" and various others, besides the usual Chronicles of Science and Notices of Scientific Works.—"A Letter on Clubs and Institutes for Trade Societies. Published for the Working-men's Club and Institute Union, 150, Strand." In this little circular trade societies are very properly recommended to establish clubs, where the members may meet for the transaction of business, instead of resorting to public-houses. Some communications approving of the suggestion, from the Rev. H. Solly, Mr. Lloyd Jones, Mr. Applegarth, Mr. G. Potter, and others, are appended.—"Report on the Pollution of Rivers and Streams in Lancashire. By Councillor Joseph Brierley, C.E. *Blackburn Times* office." This report was presented to the Royal Commissioners on Rivers Pollution, on their official visit to Blackburn; and has been reprinted from the local *Times*. The author has been for many years surveyor to the Burnley Improvement Commissioner, and engineer to the Blackburn Corporation. In this report he offers various suggestions for the consideration of the Commissioners, as remedial measures; such as that each river basin be placed under the conservancy of a proper officer; and that there be a central or controlling board, with officers under the control of the central board only; that a survey be made of all rivers and streams, and their pollution with solid matters be at once prohibited under penalties; and, as to other offensive matters, such as sewage, trade waste, &c., that two years be allowed for otherwise disposing of it; and so on.

Miscellaneous.

Blasting Rocks under the Sea.—The granite rocks which have so long impeded the navigation of the arm of the sea between New York and Long Island, are now being blasted. Apparatus is erected for working a drill under water by steam. The drill bar at its cutting end is 1*l.* in diameter, and has nineteen diamonds embedded in its face. When in motion it makes from 300 to 500 rotations a minute, and in that time, such is the cutting effect of the diamonds, the hole is sunk 1*l.* in. A number of holes, consequently, can be drilled in a day. A diver then descends and charges them with nitro-glycerine, which is exploded in the usual way.

The Society of Engineers.—On Friday, in last week, the members and associates of the Society of Engineers made their second excursion of the present season, when they visited the Chatham Dockyard Extension Works, by permission of the Lords Commissioners of the Admiralty. A steamer was chartered for the occasion, in which the members and their friends, to the number of about 100, made a pleasant run down the Thames and up the Medway, luncheon being served on the way. The band of the Grenadier Guards was on board, and added to the pleasure of the day by performing an excellent selection of music. Amongst the members present were Messrs. F. W. Bryant (president of the society), W. Adams (vice-president), Alfred Williams (honorary secretary), Perry F. Nursey (auditor), G. W. Harris (secretary), Baldwin Latham, G. Waller, A. E. Stephenson, &c. The docks, which are very extensive, are fast rising upon a large tract of marsh, formerly known as St. Mary's Island, which covers an area of about 320 acres, and lies to the north-east of the present yard. The works, when completed, will consist of four graving docks, each of which will be 510 ft. long, 80 ft. wide at the coping, and 41 ft. 6 in. from floor to coping level. They will have 28 ft. 6 in. depth of water at the highest level of the neap tides. There are also three large basins, the combined area of which will be 74 acres, and the depth of water in each 30 ft. at high-water neap tides. The works are progressing satisfactorily, and the contractor, Mr. A. Gabrieli, expects to complete them by Christmas, 1870, the time allotted in the contract.

The New Assize Courts at Durham.—These courts have been re-opened. The whole of the architectural features in the vestibule, corridor, hall, and courts have been carried out to correspond with the original design of the exterior of the building. The fittings of the interior of the courts are in Dantzic oak and American ash, with red and yellow pine linings, the woodwork of the old courts having been used as the framing or heart to the new, the whole being stained and varnished. We postpone a description of the buildings, as we shall probably illustrate them. The cost of all the works will be about 5,000l. Mr. C. Turnbull has been the clerk of the works, and has carried out the masonwork, which was principally alterations, with daily workmen, and the following tradesmen have been contractors for their different departments of the work:—Joiner and carpenter, G. Gradon, Durham; slater, R. Rule & Son, Durham; plasterer and for cement and tile flooring, W. B. Wilkinson, Newcastle-on-Tyne; painter and glazier, W. Hodgson, Durham; plumber and gasfitter, James Laidler, Durham; for heating and ventilation, Haden & Sons, Trowbridge and Manchester; furnishing, W. Robson, Durham. The whole has been executed under the superintendence of Mr. William Crosier, the county surveyor and architect.

Sanitary Report on Islington, 1868.—The report on the sanitary condition of the parish of St. Mary, Islington, for 1868, by Dr. Ballard, the medical officer of health, has been printed. In respect to the Workshops' Regulation Act, Dr. Ballard states that although he thinks it highly desirable that the Act should be put into action, the difficulties met with have entirely prevented any enforcement of its provisions. Unwholesome crowding, uncleanness, and want of ventilation, however, have been interdicted, and a good many amendments in these respects made. Under the Artisans' and Labourers' Dwellings Act three series of premises have been reported to the vestry; namely, Parocella-court, in the High-street; certain houses and shanties in Broad-street, Holloway; and certain houses in Albert-square. The last have already been closed. In the other cases the premises have been reported as being dangerous to health.

An Imperial Inventor.—Some years ago the Emperor of the French was astonished at the great space occupied by flour when packed in sacks in the usual manner, and imagined that it might be compressed into a much smaller bulk, and be thus rendered of easier transport. He at once authorised some experiments to be made on the subject, which resulted in the flour being submitted to powerful hydraulic pressure, and served to the various regiments in the cases, not only occupying a very small bulk, but protecting the flour from the damp of the atmosphere, and so preventing it from becoming mouldy.

Coroner's Report for Central Middlesex.—The sixth annual report of Dr. E. Lankester, F.R.S., is printed in the weekly sessional proceedings of the Social Science Association for 1st July. It contains much important information and suggestion on such subjects as infantile deaths and infanticide, deaths from accident, suicide, sudden deaths, &c. In six cases of death from small-pox on which inquests were held, none of the deceased had been vaccinated. Dr. Lankester calls attention to "the existence of a sect of fanatics, who, regardless of the overwhelming evidence in favour of the beneficent effects of vaccination, and in defiance of the laws of the country, recommend that children should not be vaccinated. These persons [he adds] recommend that parents should not have the births of their children registered, so that the inspectors of vaccination may not be thus enabled to discover the residences of unvaccinated children." We believe that in such cases an opinion is entertained that though vaccination diminishes deaths from small-pox it produces other diseases, but we have not yet seen anything like clear evidence that this is other than a mere fancy. Sudden death from disease of the heart, Dr. Lankester says, although it is almost a natural cause of death amongst old people, also frequently occurs amongst persons under sixty years of age, mostly from the effects of alcoholic drinks, preventing the due oxidation of the tissues.

The Prince Consort's Windsor Association.—The annual meeting of this Association has been held in Windsor Home Park. Princess Christian of Schleswig-Holstein and Princess Louise presided, and presented the prizes to the successful candidates. In a large marquee separating a smaller division, where the royal dais was erected, from that used more particularly by the general public, was a collection of exotics and fruit. Other tents in the larger half of the enclosure contained an exhibition of vegetables and fruit, and a display of cottage handicraft. There were models of locomotives, a church, lathe, electric telegraph, &c., and specimens of needlework. About 250 exhibitors dined in a large marquee. The vicar of Windsor presided. After the dinner Lieutenant-General Seymour read the report of the Committee, and the exhibitors were addressed by the vicar of Egham. The prizeholders, about 200 in number, were afterwards marshalled up to the royal dais one by one by the Committee; and as their names were called over by General Seymour, the prizes were delivered by the princesses. The prizes varied in amount from 3s. downwards, while the successful candidates in six of the classes also received framed and glazed certificates, surmounted by a medallion of the Prince Consort. The certificates were signed by her Majesty.

A Lost Opportunity.—When the Viceroy of Egypt inspected the fire brigade in the gardens of Buckingham Palace, we learn that, in order to illustrate the utility of fire-escapes, certain firemen went through the form of rescue from the roof of the palace. They assumed, we are told, a helpless state, and were carried down on the backs of their comrades, some being lowered by means of ropes. We almost wish, says the *Pall Mall Gazette*, that at the same time his Highness could have been favoured with other scenes illustrative of our habits which could not have failed to interest him, and would have been useful as warnings, if not as examples. For instance, a few hack cabs might have been driven to the palace gardens, a select number of police constables assuming a helpless condition while the vehicles were allowed to loiter leisurely through the grounds. The entrance to the palace might have been upheaved by one of our gas companies, then carefully relaid and repaved; upheaved again by a waterworks company, again carefully relaid, and then dug up once more by an underground railway company,—everybody present assuming "the helpless condition." The Viceroy would then have left the palace with a fair idea of the "working of our systems."

The late Mr. Robert Grace, Architect. We regret having to record the death of Mr. Robert Grace, architect (late of Derby), at his residence, Newton-road, Burton-upon-Trent. Mr. Grace held the office of town commissioner for several years, and during that time discharged the duties devolving upon him to the great satisfaction of all the ratepayers. His loss will be felt by a large circle of friends.

St. Alban's Congress of the British Archaeological Association.—The proceedings of the Congress will include—*Monday, Aug. 2.* Opening Meeting at the Town-hall.—Address of the President.—*Déjeuner* at the Town-hall.—Examination of the Alby Church and Monastery.—*Dinner* at the Town-hall. *Tuesday,* Excursion to Redburne, Kewsthorpe, and Marleyate Cella, and Dunstable.—Lunch at Dunstable.—Inspection of the Kielday Way. *Wednesday,* Visit to Verulam, and the special excavations.—Luncheon.—Examination of the churches and town, and Sopwell Nunnery. *Thursday,* Excursion to Hatfield.—Examination of Hatfield House.—Visit to Kuchworth.—Reception by the President, Lord Lytton, and *Déjeuner.* *Friday,* Excursion to Hemel Hempstead and Berkhamstead.—Lunch at Berkhamstead.—Examination of the Church and Castle, and of Penley Manor House. *And Saturday,* Excursion to Abbot's Langley, King's Langley, and Cheries.—Lunch at Cheries. A number of good papers have been promised.

Holborn Board of Works has come into collision with the corporate authorities of the City. At the meeting on Monday evening last the Clerk reported that, acting under the direction of the Board, and by the advice of counsel, he had taken proceedings against Messrs. Boit, the contractors for the City Corporation. The proceedings have reference to certain works executed at the intersection of Cow Cross-street and St. John-street. An indictment has been presented at the Middlesex Sessions, and a true bill has been found, but the case has been removed by the City under a writ of *certiorari* to the Court of Queen's Bench, where it will not be heard until next November. It is a pity there should have arisen this necessity for litigation between two bodies so closely interested in each other's welfare.

The Wright Testimonial.—A painting, in commemoration of the labours of Thomas Wright, the prison philanthropist, has been presented to the Corporation of London in the Guildhall. There was a numerous assemblage of ladies and gentlemen in the body of the hall. This is one of three pictures to be presented,—one to London, one to Manchester, and one to Salford. The picture entitled "The Condemned Cell," and of which we have before spoken, painted by Mr. Charles Mercier, contains a life-size portrait of the philanthropic workman in the act of ministering to a convict supposed to be under sentence of death. The deputation from the committee was accompanied by Mr. Wright. Lord Shaftesbury presented the picture to the corporation.

New Mode of Cheapening Pig Iron.—Mr. Richard Brown, of the Shotts Iron Company, Glasgow, has provisionally protected an expedient for cheapening the production of pig-iron, which has been well received by the Scottish ironmasters. Ironstone, after being calcined, according to the usual custom, is allowed to cool down, and in many instances is permitted to lie in heaps till the grass grows over the mound, while all the time the char is absorbing moisture from the atmosphere of from 10 to 20 per cent. What Mr. Brown proposes is to remove the ore in as hot a condition as possible, and, at all events, before it reaches the temperature of the atmosphere. If removed in an incandescent state to the blast-furnace, it enters on its further stages as a protoxide instead of as a peroxide of iron, is much lighter in weight, and a consequent saving is effected in the lordship, and also in its transmission by railway. Less fuel will also be required to convert ore so removed into pig-iron. There are other improvements, and the saving from all sources is estimated at from 3s. to 5s. a ton.

The Competition for the new Market at Bradford.—A considerable number of designs are lodged at the Town Clerk's office, but they will be kept strictly private until the award has been made by the committee of the council delegated with that duty. The ground proposed to be covered is the site bounded by Godwin-street, Darley-street, Kirkgate, and Kirkgate Chapel, and the competition is confined to local architects.

Inverted Siphon.—An iron pipe, 11 in. in diameter and 8,800 ft. (a mile and two-thirds) long, has been laid in Tuolumne county, California. It runs down a mountain, under a creek, and up the ascent on the opposite side, under a perpendicular pressure at the lowest point of 684 ft.

Wholesale Destruction of Bricks.—During Sunday night in last week, a large amount of mischief was done at the brickfield of Mr. George Bradbury, Bury New-road, Manchester. Some 21,000 bricks had been stacked in walls 3 ft. or 4 ft. high, and about 80 yards long, as a final preparation for the kiln. On Monday morning the whole of these walls of bricks were found to have been thrown down, and the damage is attributed to the fact that Mr. Bradbury and his men are at variance. The great point of contention is the resolution of masters to pay by the hour. Mr. Bradbury resisted a peremptory notice he received three weeks before to cease supplying bricks to the hour men. He expresses his determination to persevere, and his yard is now every night in charge of the police. The majority of the masters, it appears, have been induced to side with the men, and the result is that some sixty or seventy firms refuse to supply bricks to those master bricklayers who enforce the hour system. On the other hand, some ten or a dozen refuse to cut off the supply, and Mr. Bradbury is one of them. Their yards have been stopped for about three weeks, the men, it is alleged, refusing to make up the bricks unless the masters promise not to supply the bricklayers who have joined the hour system. The conspiracy, therefore, as in so many other instances, is that of workmen against workmen, rather than against employers, who, in this case, are scarcely entitled to be called masters.

Public Museums and Libraries.—In the Commons, Lord H. Lennox asked the First Lord of the Treasury whether he would authorize the necessary steps being taken to effect the systematic circulation to local museums, libraries, and institutions of the United Kingdom of the superfluous and unexhibited specimens of art, science, and literature now deposited in the national museums and galleries in the metropolis. In reply, Mr. Gladstone said her Majesty's Government were very favourable to the object contemplated in the question. Some things had been done in this direction, especially at the South Kensington Museum, the powers of whose directory were not adequate to enable them to effect everything desirable. Within the past month the Treasury had had a letter from the trustees of the National Gallery to the effect that they had made collections of drawings intended to be deposited on loan at centres remote from London. Government would consider the whole subject in the interest of the public.

The Iron-gate Improvement, Derby.—The foundation-stone of the projected buildings has been laid by Mr. Councillor John Smith, who purchased the hock at the top of Amen-alley, which he has demolished, and upon the site of which he intends to erect shops, from designs furnished by Mr. B. Wilson, architect. Mr. Smith being a member of the Provincial Grand Lodge of Derbyshire Freemasons, the officers of the Arhetorum Lodge and other friends were present on the occasion, and assisted in laying the stone according to Masonic order. At the commencement of the proceedings, the architect, in presenting a silver trowel to Mr. Smith, thanked him for the opportunity it had given him of showing what the Iron-gate Improvement would have been if his original plan and designs had been carried out. On the conclusion of the ceremony Mr. Smith invited the company present to a dinner at the Lanh Inn.

London Association of Foremen Engineers.—The thirty-fourth half-yearly meeting was held on Saturday at the City Terminus Hotel. It was well attended, and the auditors' report and balance-sheet were presented and unanimously accepted. From these documents it appears that the institution now numbers 210 members, that the general fund amounts to 481l. 6s. the superannuation fund to 1,014l., and the widows' and orphans' fund to 15l. 10s.

Monumental.—The statue of Mr. Joseph Mayer, by Signor Giovanni Fontana, has at length been placed in St. George's Hall, Liverpool. It was by Mr. Mayer's advice that Signor Fontana, a pupil of Thorwaldsen, was selected to execute the work. The figure, we hear, is executed with vigour and feeling.—The statue of the Marquis of Westminster has been inaugurated. The defect in the inscription, to which we lately referred, has been altered from "2d Marquis of Westminster" to "Second Marquis of Westminster." The inauguration was not of a public character.

Michael Faraday.—In reply to Mr. Lyon Playfair, in the Commons, the Chancellor of the Exchequer said he deduced from facts the general rule that the practice of the country has not been to give parliamentary grants for the purpose of erecting statues to private citizens, however illustrious. There have lived Shakspeare, Milton, Newton, Locke, none of whom have had public statues erected to them. "Therefore," he said, "I think that we may well be content to pass over Faraday in such company, and I say this without any disrespect to Faraday."—We may here remark that Faraday is to be honoured in Paris. Three new streets about to be opened beyond the Arc de Triomphe at the end of the Champs Elysées, are to be named after Lebon, Torricelli, and Faraday.

Llandaf Cathedral.—The last great portions of the work of restoration before the reopening have been the rebuilding of the south-western tower,—now surmounted by a spire that makes the cathedral visible to all the country round,—and the giving again to the northern tower its crown of battlements. The cost of these works has been more than 8,000l. There are many minor details (of no little cost, however, in the aggregate) which still remain to be accomplished, such as the completion of the *flèche*, the extension of the choir, the carving of seats and corbels, and parapet, the arceding over the great west window, the provision of additional seats and a peal of bells, &c.; but all these will probably be undertaken separately, and finished year by year as resources can be found.

The Metropolitan District Railway.—At a meeting of the Metropolitan Board of Works, the engineer (Mr. Bazalgette) reported that about eighty men were employed on the Metropolitan District Railway works on the Thames Embankment, and said that unless the works were carried on more vigorously it would be some years before they were completed. Mr. Freeman withdrew a motion he had made that a mandamus be applied for, and the question was postponed until this week.

The Isle of Dogs.—There are at the present time, according to an official statement, nearly 700 houses unoccupied in the Isle of Dogs. In most instances the doors and shutters have been carried away, and every square of glass is broken. Many of the tenements are falling rapidly into decay. The total number receiving out-door relief in Poplar is 5,018, last year 6,976.

Wimbleton Sewerage.—The Local Board have had a system of drainage laid out by their surveyor, Mr. Bird, to convey the sewage from New Wimbleton, in the valley of the Wandale, and from the village of Wimbleton, to the lowest part of the common, where they propose to irrigate the land by the sewage. Mr. Grantham was called in to report upon the proposed scheme.

Luton Waterworks.—Mr. T. F. Middlemiss, who in April last resigned the surveyorship of Cockermonth, was on the 18th of June appointed engineer, manager, and secretary to this company, vice Mr. Wm. Wood, gas works, Cambridge. The works are now being constructed, and expected to be completed in a few months.

Sewage Utilisation.—The Hon. Henry Petre writes that his farm (Lodge Farm, Barking) has for the last two years been cultivated with London sewage alone as a manure. There are now upwards of 100 acres bearing corn, root, and other crops, produced solely by sewage, and Mr. Petre has no hesitation in saying that sewage can be profitably and economically used in the cultivation of all the ordinary farm crops of this country.

The Company of Armourers and Brasiers.—The office of surveyor to this company becoming vacant, an election to fill it took place on Thursday, the 1st inst. There were three candidates, Mr. Graham, Mr. Taylor, and Mr. Iebh; Mr. Graham was elected.

Destruction by Relic-hunters.—The *Dumfries Courier* calls attention to the partial destruction, by some relic-hunters, of the tombstone erected by Sir W. Scott over the grave of Helen Walker, the prototype of the imaginary Jennie Deans.

Royal Academy.—At a general assembly of the Royal Academy, on the 30th ult., Mr. E. M. Barry, associate, was elected a Royal Academician.

Lynn Dock.—The Prince and Princess of Wales opened the Lynn new dock on Wednesday. Their royal highnesses were presented with an address at the Town-hall.

TENDERS.

For repairs, painting, &c., Iaverness-terrace, Hyde Park. Mr. N. S. Joseph, architect:—
Verral £373 0 0
King & Sons 282 0 0
Heeps 278 0 0

For new show-room and other works to premises, 128, Leadenhall-street. Mr. F. J. Lepard, architect:—
Gammon & Sons £1,719 0 0
Browne & Robinson 1,688 0 0
Coleman 1,660 0 0
Abraham 1,680 0 0
Newman & Mann 1,555 0 0
King & Sons 1,400 0 0
Woodward 1,450 0 0

For St. Ann's Church, Bermondsey. Mr. A. Porter, architect:—
Coleman £3,275 0 0
Dove, Brothers 3,255 10 0
Hart & Son 3,250 0 0
Merrett & Ashby 3,200 0 0
Myers 3,150 0 0
Kelly, Brothers 3,047 0 0
Nixon & Son 2,968 0 0
Webb & Son 2,974 0 0
Browne & Robinson 2,890 0 0

For Congregational chapel and school, Crewe. Mr. W. F. Poulton, architect:—
Longson £2,352 0 0
Cobb 2,060 0 0
Bowker 1,860 0 0
Bamber 1,887 0 0
Pollitt 1,860 0 0
Gohard 1,768 0 0
Parrell 1,750 0 0
Atkinson 1,668 16 0
Cottrell (accepted) 1,644 0 0

For villa residence at Caterham, for Mr. A. Nicholson. Messrs. T. & W. Stone, architects:—
Roberts £1,933 0 0
Turner & Son 1,897 0 0
Merrett & Ashby 1,777 0 0
Ward 1,751 0 0
Bill, Keddell, & Waldram 1,725 0 0

For alterations to the Gospel Oak Tavern, Gospel Oak-fields, for Mr. T. H. Carman. Mr. F. Tyreman, architect:—
R. & T. Wilson (accepted) £385 0 0

For Saltaire Institute and School of Art, near Bradford, Yorkshire. Messrs. Lockwood & Mawson, architects:—
Hillegarth & Son £22,241 0 0
Ives & Son 2,375 0 0
Ives 19,660 0 0
Whitley 19,300 0 0
Gibson & Mansel 18,399 0 0
Barry (accepted) 18,364 0 0

For the erection of St. Saviour's Church, Battersea Park. Mr. E. C. Robins, architect:—
Forrest £5,180 0 0
Kirk 4,930 0 0
Brass 5,200 0 0
Fritchard 4,150 0 0
Newman & Mann 4,078 0 0
Dove, Brothers 4,075 0 0
Scrivener & White 4,035 0 0
Lathey, Brothers 3,856 0 0
Myers & Sons 3,729 0 0

For building the Queen Victoria, Blue Anchor-road, Bermondsey. Mr. F. Harger, architect:—
Smith £1,301 19 4
Shirley & Home 1,150 0 0
Shurran 1,144 0 0
Maeers 1,140 0 0
Davies 1,109 0 0
Whitaker 1,055 0 0
Luxford & Co. 1,030 0 0
Saunders 1,022 0 0
Schollfeld 1,009 0 0
Stone 876 0 0
For labour only.
Lancaster 549 0 0
Smith 522 4 0

For alterations and additions to the Industrial Schools, Brentwood, for the Guardians of the parish of St. Leonard, Shore-ditch. Mr. Wm. Lee, architect. Quantities supplied by Messrs. Linsdell & Gillard:—
Turner £21,000 0 0
Deacon 19,300 0 0
Henshaw 19,319 0 0
Kirk 18,889 0 0
Fish 18,341 0 0
Whitaker 17,908 0 0
Wood 17,883 0 0
Newman 17,565 0 0
Perry 17,489 0 0
Hill, Keddell, & Waldram 17,390 0 0
Nightingale 17,063 0 0
Winship 16,990 0 0
Blackmore 16,910 0 0
* Accepted.

For sewers, gullies, and junctions on the Leabonon Estate, Wandsworth, for Mr. J. Nickinson. Mr. D. Haylock, surveyor:—
Parsons £242 0 0
Hobson 218 0 0
Cooper 210 0 0
Blackmore 179 10 0
Chappel (accepted) 161 10 0

The Builder.

VOL. XXVII.—No. 1380.



A Note
from Northampton.

LIDTHORPE, or, as it is now called, Althorp, mentioned in the first part of our note,* is about five miles from Northampton. The House has little to recommend it from an architectural point of view, but contains a library of world-wide fame, and some 400 pictures, including fine specimens of the work of Titian, Vandycck, Janssens, Holbein, Sir Antonio More, Pourbus, Snyder, Kneller, Lely, Sir Joshua Reynolds, and Gainsborough. The number of the books here is estimated by

Mr. Baker to be 33,000, and there is a further portion of the library in the town residence, Spencer House, St. James's. It is a treat at Althorp to look even at the backs of them. What real use is permitted of them we cannot say. It would be interesting, and not valueless, to learn what amount of actual benefit has been conferred on society, say during the last fifty years, by this wonderful collection of the results of man's learning and labour? The excuse made by "Charles Surface" for having sold the family library,—“For my part, I was always of a communicative disposition, so I thought it a shame to keep so much knowledge to myself.”—was really sounder than he thought it was. Of course we should be sorry to see such collections as this at Althorp dispersed, but glad enough to find them turned to greater account.

We have no intention to give a list of the pictures, or even to point out the best of them. The main thing to say is, that they well repay a journey. William, first Duke of Bedford, and George Digby, second Earl of Bristol, in one frame, is a very fine specimen of Vandycck's skill. His better known picture here of Dædalus and Icarus is to our mind less satisfactory. A powerful full-length, by Pourbus the younger, of one of the Dukes de Guise; Sarah, Duchess of Marlborough, by Kneller; Rubens, by Vandycck, a capital sketch by Rubens, representing David presenting a thank-offering to Jehovah on the return of the Ark of the Covenant; a portrait of Sir Antonio More, by himself; Sir Kenelm Digby, by Janssens; and a number of elegant female portraits by Sir Joshua Reynolds, are sure to be noticed by those who pass through the rooms. The younger Corrado, by Titian, is another striking work.

There is a mystery, a pathos, in the colouring of Titian which is more often felt than understood. A very recent writer, whose book has scarcely left the binder's,† traces Titian's appreciation of the grandeur of Nature and the poetry of labour, his knowledge of those moments in Nature when her splendour is soul-shudding, to his early home amongst the Dolomite mountains

of Cadore:—"Even the revels of a Bacchanal were rebuked by the tones of earth and sky; and it was as in the pensive twilight of some great day that princes, senators, and soldiers, were rendered to posterity."

How well Titian was known to appreciate nature is shown in one of Aretino's letters to him, wherein he describes himself as attracted by the splendours of a sunset while looking out of window at a boat-race. "There appeared in certain places a green azure, in others an azure green, composed according to the caprice of the Master of masters—Nature; so that," says he, "I called out two or three times 'O Titian, where art thou?'" Do we not find in such scenes the true source of Venetian art, so glowing and yet so subdued? A great master was *il Gran Tizian*. The circumstances of his death were sadly in contrast with his life. The centre of a delightful circle, including rank, beauty, and genius; the entertainer of a king, and pointed to by Michelangelo as the man alone worthy to be called a painter, he died at 99, in the midst of plague-stricken Venice, 1576, abandoned and alone,—his plate and pictures carried off before his eyes by ruffians. A law had been passed that during the visitation no person should be buried in the churches; but an exception was made in favour of Titian, and the church of the Frari has, in consequence, become a place to be visited by all lovers and students of art. We are rambling, however, from Althorp. A view of the Green Park in 1760, by Hogarth, should be looked at. It shows Spencer House, and the piece of water next Piccadilly, since got rid of. There was a report the other day, by the way, that Hogarth's house at Chiswick was to be pulled down. Fortunately this was erroneous; there is no such intention, we believe, just now. Something should be done to ensure its preservation.

Judging from the richness of the dress, the admirable picture of an old lady, now called "Rembrandt's Mother," by Rembrandt, more probably represents one of his wealthy sisters; and others have thought so before us. Amongst the earlier works is an admirably-painted triptych, or rather an altar-piece with doors; the centre part of which, popularly but erroneously called "St. Jerome studying Theology," shows the saint with an open book, and pointing to a skull, with the motto on a portion of the apartment, *Respice finem*. We have seen a duplicate of the picture elsewhere. Waagen, in his usual dogmatic style, attributes it to Bartholomew de Bruyn. A piece of encaustic painting found near Beneventum, and cut out in the presence of Georgiana Countess Dowager Spencer, by permission of Ferdinand, fourth King of Naples, in the year 1793, should not be passed over. There is a small picture attributed to Claude, which is much darker than the great majority of his works. It possesses considerable beauty. After all is said by adverse critics, Claude must still retain the character of a great landscape painter. "I remember," says Sir George Beaumont, in a letter now accidentally before us, "receiving a reprimand from Wilson, the painter, for finding fault with Claude, though I qualified my observation by saying what I really thought at the time, that Wilson was a much better painter himself. 'I'll tell you what,' said Wilson, 'all I know of the matter I learnt from Claude and Cuy, the only people who ever could paint fine weather and Italian skies; and if you will study Claude well, and get acquainted with him, you will be of the same opinion. There is one picture of his (and I think he named the Doria Claude, with the Temple), which makes my heart ache. I shall never paint such a picture as that were I to live a thousand years.'" A very piquant portrait of the author of the "Fæerie Queen" (what the author called "a continued allegory, or dark conceit") reminds the visitor of the probable connexion of the poet

with the noble family of the Spencers; and if he inquire he will find little reason to doubt it. In dedications of some of his poems to three of the daughters of Sir John Spencer the relationship is referred to, and in another poem, in which various ladies are engiosed, he says:—

"No lesse praiseworthy are the sisters three,
The honor of the noble familie;
Of which I meaneast boast myself to be,
And most that unto them I am so nie."

Why in modern times his name has been spelt with *s* instead of *c* is not obvious. On the poet's monument in Westminster Abbey (for though he died "from lack of bread," he has a stone there) his name is written like that of the owner of Althorp,—SPENCER. His epitaph (we have just now looked at it to be certain) reads thus:—"Hæare lyes (expecting the second coming of our Saviour Christ Iesus) the body of Edmond Spencer the prince of poets in his tyme whose divine spirit needs noe other witness then the works which he left behinde him."

When leaving the House and its rich contents, a piece of modern sculpture in the hall, a floating Sailor about to sink, attracts attention. If we mistake not, it is by one of our countrymen, now practising an adopted art in Florence, Captain Fuller. The expression of the face is remarkably good.

Brixworth, anciently Briolesworde and Brikelswerth, is about three miles farther on, from Northampton. Its characteristic feature, semicircular arches in the present outer walls of the nave formed by two concentric rings of so-called Roman bricks, with a flat course over each ring, will be remembered by all who have looked at illustrations of early architecture in England. They may also remember that it has a square tower at the west end, and a large staircase-turret built against the tower, with a rounded end westward. All these three features would seem to be of different dates, and all anterior to the Conquest. Good antiquaries have considered the nave to be actually Roman work, and may be right. Other good antiquaries deny this, viewing it as early Saxon work, the material being obtained from Roman buildings in the neighbourhood, and they may be right. Those who know the basilicas of Italy, those who believe that the pharos and church on Dover heights are of Roman work, will see no reason to deny at once the Roman parentage of the church at Brixworth, especially if seen now; for some of these arches have been rebuilt during the recent restoration, and look more Roman than ever, the bricks having been made to radiate truthfully, while in the original no attention had been paid to this, and the radii were all manner of ways. This is one of the misfortunes that attend restoration, however conscientiously conducted. We make no great complaint against those who conducted the work here; ancient parts are left exposed, and there seems to have been an anxious desire to do right. Modern exigencies must be met; but the question arises whether in the case of buildings of such age and national interest with respect to art-history as Brixworth, they should not be left alone, except to the extent of maintaining them, and other structures provided to fulfil their purpose.

The plan of Brixworth Church is Basilican. The nave is of two squares, and is 60 ft. long by 30 ft. wide. The chancel is one square, 30 ft. both ways. On each side of the nave, north and south, beyond the arches in question, was, not a continuous aisle, but a series of small apartments, or *cubicula*, five on each side, as excavations have shown, besides one on each side of the tower. In an upper story of the tower a three-light balustrade window, with the arches formed of bricks, altogether of the type we call Saxon, has been formed in the wall next the nave, displacing part of an arch of bricks similar to those at the sides. The turret, again, built against the tower, is also pre-Norman; so that

* See p. 537, ante.

† Cadore, by Josiah Gilbert.

the extreme age of the nave is undoubted. Even if the nave were not built in the time of the Roman domination, it is work in the Roman manner carried on by the Britons or the Saxons. We have more, however, to say on this point, especially as illustrated by the tower of Earl's Barton Church, than we can get into the tail of an article, and so must break off again for a time.

THE GREAT COAL SUPPLY QUESTION.

It appears that we are to have a reprieve. Not in our days, nor even in the days of our sons, or our sons' sons, is the evil of exhausted coal fields to come upon our country. A famine, to which the cotton famine would be as nothing—a dearth of our chief source of light, of heat, and of motive power, so far as those prime elements of civilization are now artificially produced—is declared, by the best authorities, to be far from imminent. Our annual consumption of 100,000,000 of tons of coal may continue, and may augment, for more years than we need care to reckon. The wolf which was declared to be at our door is now stated to be a very distant, if not an altogether mythical, beast of prey.

Our readers may remember the glance which we afforded them, now nearly two years ago, at the coal fields of the future. The very important question of the extent of our own sources of supply, and the probable duration of their enormous and increasing yield, has, since that time, been investigated with a minute care not unworthy of the occasion. We are not yet in possession of the report of the Commission. In fact, a sort of appeal has been made to our forbearance on this score; and it is urged that the Commissioners ought not, by any public expression of impatience, to be hurried into a premature and incomplete publication of the result of their labour.

We are happy to think that the matter is not so urgent as to call for the rejection of this plea. No practical evil is likely to result from the delay of a few weeks, more or less, in the completion of the inquiry. On the other hand, it is of extreme importance that the work of the Commission should be exhaustive of the subject; and that the report should present us, not with the vagaries of individual opinion, but with the undeniable result of all that is, or that can be, known on the subject at present. So practical an object would be such a welcome novelty among the reports of the Royal Commissions that have had to deal with any great engineering questions, that we should be loth to do anything to cause miscarriage, or to impede the happy and timely delivery. To have the great question of coal supply removed from the province of opinion to that of scientific certitude, will be an achievement worthy of the best efforts of the miners, geologists, and statisticians, of our day.

The inquiry is divided into five several branches, respectively carried on by as many distinct sub-committees. The first of these relates to the limit which is placed on the productive value of our present coal-fields, by the mere condition of depth from the surface. In this respect the result of the present investigation can only be regarded as negative, or at least as provisional. The actual limit may be stated with more or less precision. The future limit can never be less remote. It may, on the contrary, be greatly extended. All improvements in our mechanical and chemical knowledge have a tendency to roll that limit further back, and to endow us with the power of penetrating yet deeper into the bowels of the earth. We may expect to learn from the report of, and from the evidence taken by, the Commission, how far increasing heat is a function of increasing depth below the level of the sea; and how far such an increase may be regarded as dependent on a general geognostic law, or how far it may be influenced by local conditions. We may also expect precise information as to the best and most reliable method of ventilation; and as to the effect of good ventilation in checking or eliminating the noxious heat of deep subterranean workings. But as to the result of methods of ventilation yet untried,—of the artificial production of a low temperature, or rather of a chemical means of absorbing heat;—or as to improvements in the mechanical mode of extracting the rich mineral wealth of the coal-fields with the minimum amount of human labour,—the Report will have but little to tell us. Under this head, therefore, we may confidently hold that the facts will be better than the anticipations, and the future more satisfactory than the present.

It will be highly desirable that, in considering this important part of the theory of our coal supply, the investigation should not be limited to the question of temperature. Human safety is no less an economic element, as regards the cost of coal, than human comfort. When we are inquiring how far a deep seam may be accessible, the high temperature which obtains in its galleries being the great obstacle to its free working, let us not forget that liability to explosion increases, both with pressure and with temperature. The Commission cannot, with justice to this object, fail to glance at the causes, and the methods of prevention, of those terrible calamities with which, since the appointment of this national inquest, our mining districts have been more than ordinarily afflicted. In speaking of the ventilation that will reduce temperature, the investigators ought to define and to recommend the system that will prevent explosions. The two objects, if not identical, are, at all events, very nearly allied, and, to some extent, are to be pursued by similar means.

The waste of consumption, the second point of inquiry, is in itself a wide and comprehensive subject. It is one that has often dwelt upon in the pages of the *Builder*. Considered in its full extent, it is a matter of architecture and of social habit, rather than an incident of mining. It is a question in relation to which our friends, the political economists, are equally at fault. Neither the terror of the coal merchant's bill, nor the more constant aggravation of smoky chimneys and smoke-laden skies, has induced us, as a nation, to take any serious steps towards the economical, clearly, and perfect combustion of fuel for domestic purposes. A few bricks interposed behind the kitchen range, as a feeble barrier against the combusive fury of the cook (that great ally of the coal dealer), and a more general flattening of the grates of our sitting-rooms, constitute the main improvements which the past half-century has witnessed in our household coal burning. And the waste in the coal districts themselves, the consumption of slack at the mouth of the pit (nearly or quite obviated as it is by the application of all forms of coal-dust to the fabrication of artificial fuel), is but trifling in comparison to the thriftless and gigantic waste of our careless open fires.

The waste in production, which must chiefly depend on the more or less thorough exhaustion of every seam, by the removal of pillars and similar measures, is a point on which we may fairly expect that the report of the Commissioners will be full and conclusive. It is eminently a coal-owners' or coal-miners' question, and all concerned in the production of coal will look with interest to this portion of the evidence taken by the Commission, and probably to the expression of the opinion of the Commissioners on the subject.

The geological part of the question, or the statement of what we may call the *geological expectation* of the discovery of further supplies of coal beneath more recent strata, is understood to be that part of the subject on which the labours of the Commission are most forward. It is, indeed, almost enough that the honoured name of Sir Roderick Murchison is associated with this part of the investigation, to insure that this should be the case. The result of this part of the inquiry is, we are told, most encouraging. No doubt very much and very valuable information will be here forthcoming. Not so much that we can expect anything absolutely new, at all events to the geologist, as that we may expect to have all that is known to science, in its present phase, clearly and distinctly placed beneath the eye in a synoptic form. In this alone, even if no other result is to be anticipated, we may fully expect to find a justification for the appointment, and for the cost, of the Commission.

It is, however, evident that the practical value of this part of the labours of the Commissioners must depend, to a very considerable extent, on the results attained by the first sub-committee. Interesting as it may be to know under what surface soils, and at what estimated depths rich stores of the precious mineral may be fairly predicated to exist, the economic value of those stores will be dependent on the success of our system of deepworking. Nor will the necessity, and the very serious cost, of *verifying*, by actual sinking, any prediction ventured on from merely geological premises and induction, fail to interpose a wholesome check on the activity of the imagination, or on the energy of the scientific faith, of those who seek to burrow beneath

districts now innocent of coal, for the hurried and long unsuspected coal measures that may, or that *ought to*, lie beneath them.

The labours of the Commission would not be complete without a glance at the poetry of the subject. For we can hardly speak of the endeavours of Mr. Robert Hunt, of the Mining Record Office, to determine the coal consumption of the future, otherwise than as an exercise of the powers of imagination, in a field which that celestial faculty has, for the moment, all to itself. All that statistics has to say on this subject can be said in a few lines. The quantity of coal which we have, or which the four sub-committees agree that we ought to have, in an economically accessible condition, will come out in an approximate statement of millions of tons. At our present rate of consumption, this will last for so many years—tens, hundreds, or thousands, as the figures may show. Thus, if we take the rate of increase of consumption (whether we go back rather more than half a century to the commencement of the era of peaceful industry that succeeded the collapse of the Gallic empire, or whether we run back to the earlier epoch, of which we now celebrate the centenary, of the hinding of the genius of steam to the chariot of human civilization), we shall find a certain annual rate of increase in production and in consumption of mineral fuel to have obtained. Applying either one or the other of these two ratios of augmentation to the future, we shall again arrive at a numeric result—an *Annus Domini* considerably nearer to 1869 than that provisionally indicated. Any more elaborate attempt at prediction we think likely to be little more than waste of time. The rougher method is likely to be really the truer. As to certain branches or items of consumption, much is known, and, no doubt, by patient investigation, a pretty fair guess may be made as to the future. But other elements are altogether in embryo. New, and entirely unexpected, demands on the light-producing, heat-producing, motion-producing force of coal, are certain to spring up. On the other hand, the discovery of new sources of supply of light, heat, and motive power may be none the less confidently anticipated. Let us set the unknown against the unknown, and save the time that would be consumed to no purpose in the minute dissection of certain details of a great subject, the entire comprehension of which is far beyond our grasp.

In this, as in almost every engineering, mechanical, or chemical question, the ultimate arbiter is the ledger. People speak of discovering, or of inventing, other sources of light and heat than those of which we now familiarly make use. Mechanical men know that there is no difficulty in so doing. Electricity has been mentioned. We know something, as yet but a very little, of what we may expect from electricity. But the knot of the question lies in the pen-table. So long as, by the combustion of a pound of coal, we can produce a greater dynamic effect than by any method which does not cost more than the price of a pound of coal—coal will be king, or, at least, coal will be employed. When, either by the increased cost of winning coal, or by the decreased cost of the application of any other source, or reservoir, of power, this pre-eminence falls to be enjoyed by the black diamond, it is to such other sources that we shall turn. Nor are we altogether without expectation that the employment of such cheaper force may diminish, or, at all events, very seriously modify the character of, the demand for the employment of coal long before we approach any indication of the proximate exhaustion of our coal fields.

Our readers will receive this remark with the more interest from the fact that an intimation which we formerly threw out as to the great source of supply of a large proportion of the mechanical power of the future, has become invested with the character of experiment in America. The papers inform us that a patent has been taken out for economizing the tidal force. How far this appropriation of one of the most stupendous elements of mechanical agency to the inflation of an individual purse may be possible, we cannot, of course, tell. Conventions of detail may, of course, be protected by patent; but the idea of a tide-mill is as old as that of any form of water-mill. To propel the floats of a paddle-wheel by a rush of water, whether by a stream always gravitating in one direction, or by a reciprocating current, the inward and outward flow of which are due to the same universal force, is the same thing in principle; nor is there room for any very striking

novely in the application of the force of a current. But there are two considerations which make the question one of unusual interest to ourselves. The first is that of the great tidal rise that occurs around the greater portion of our coasts. We may reckon this at from 15 ft. to 20 ft. on an average. In some places—as in the Yarmouth Roads—the general change in tidal level is not more than 4 ft. or 5 ft. At Choptow, on the other hand, the extreme rise of the highest springs is stated to amount to no less than 70 ft., and on the occasion of the floating of the tube for the railway bridge it considerably exceeded 50 ft. Thus the power of elevation and depression which is exerted on our coasts, twice within twenty-four hours, and of which little or no mechanical use is at present made, is so enormous as to be practically limitless. A mechanical equivalent far exceeding the whole effect produced by our annual consumption of coal is now entirely neglected. We cannot suppose that this will always be the case, and that the tremendous power of the tide will be allowed to expend itself for ever on the disintegration of our cliffs, or in the scouring out (or, indeed, in the silting up) of our harbours. The other consideration is, that no country in the world is so favourably situated for the economical use of the tidal power. When we compare the extent of coast-line in the United Kingdom with the acreage of the island, we must be struck with the ready accessibility of the greater part of the country. In other cases, such as in Greece, Italy, and the Archipelago, where the ratio of coast-line to area is equal, or superior, to that which obtains with ourselves, the tidal power is feeble. But in England, Scotland, and, though less remarkably, in Ireland, the broad fringe of coast, swept by a three-fathom tide, hears a very high proportion to the gross surface of the island, and is accessible in a very unusual degree. Nor must we consider that the force of current is the only mode in which the great lifting power of the tide can be exerted. Tidal basins, with influx and eflux mechanically utilised, may be constructed with signal advantage on many portions of our coast, especially in the Principality and in the western parts of the island. But the hydraulic power is limited by the area we may enclose; that is to say, by the size of the tidal basins. As to the hydrostatic power, the only limit would seem to be that of the number of machines that may be invented or constructed. The lift of the body of water that surrounds our coasts,—say to the height of six fathoms every twenty-four hours,—amounts to a mechanical force more easy to state in figures than to realise in the mind; and any application, either of the hydraulic or of the hydrostatic energy, which may be possible in the great Western hemisphere, will always, from our geographical position, be so much more available to the inhabitants of this country, that we may afford to contemplate with considerable sang froid the mechanical outcome of the future.

Our coal-mines, indeed, we have now learned to regard a stored-up result of the action of what we may call *celestial chemistry*. The force exerted by the heat of the sun, and utilised, and, as it were, condensed by the vegetative process, lies there ready for our use. It is but going a step further to contemplate the utilization of the forces of *celestial mechanics*. Such, in its simple fact, is the tidal energy. Historically speaking, the chemical application has been first made by mankind. We burnt coal in ignorance of what combustion was. No thought of chemical science inspired the earliest experimenter, who, applying light to the black substance on which he stumbled, said,—“Aha, I am warm; I have seen the fire.” The economic value of heat is a matter at the knowledge of which we have arrived empirically. If we had never needed to cook, or to warm ourselves, we should never have invented the steam-engine. But, having gone thus far on a path which we took in entire ignorance of whither it would lead us, we are in a position to look round at the wide and noble prospect that opens before us. And, regarding the question analytically, it is evident that it is simpler to produce a mechanical result by a mechanical, than by a “chemical,” process. Had man been obliged to “evolve” his mechanical power “from his inner consciousness,” instead of having arrived at his present condition by a happy sequence of accident and of consequent experiment, he would certainly have sought the aid of the tidal force before he had thought of harnessing the submerged powers of the coal measures. That which, as a matter of history, is the last application of the

powers of nature, would, if philosophically anticipated, have been the first. Whether, therefore, our own time may witness the economical application of the tidal process or not, we cannot doubt that, if the abode of mankind is to be prolonged on this planet to a future at all commensurate with the past, we shall draw from this inexhaustible source much of our artificial supply of heat and of motion.

GEOLOGY AND BUILDING STONES.

AMIDST the many and radical changes which all professions and trades have undergone within the last twenty years, none is so important as the necessity that now exists of acquiring the knowledge of collateral sciences, many of which ranked in former days under the head of “Ologies,” to be taken up or not at the fancy of the student. They are no fancy studies now, however, but such as every man engaged in practical work must sooner or later make himself acquainted with, if he hopes to get on. Be he farmer, builder, ironmaster, brewer, or what not, there are subjects to be mastered of which his forefathers dreamt not, and of these chemistry and geology are probably the most useful; the latter, indeed, is not essential to so many trades as the former; but it is not the less useful, and especially in the provinces of architecture and building. All the same, it is a science utterly neglected by both architect and builder; and although at first it may be difficult to see the connexion between fossils and houses, there are branches of geology which are of the utmost importance to the building trade—such as lithological, which treats of the composition and character of the rocks and stones; stratigraphical, useful in all questions concerning situation, foundation, drainage, &c. And in the same way that a farmer ought to be intimately acquainted with the geologic constituents of the soil, the builder ought to have a thorough knowledge of building stones. Every holder will naturally be acquainted with the stones of his own neighbourhood or county; but taking the subject in its widest sense, there is considerable ignorance as to the geological position, durability, and capabilities of the various building stones in England, especially as difficulties are often interposed by the confusion of names, by which the same rocks are identified in different parts of the country. Even in coalfields, where one would have thought that each seam was known throughout its whole course, an interval of five or ten miles is often sufficient to give it an entirely different name, and cause the impression to be initiated that it is a new and different vein.

We propose to offer a few remarks from a geological point of view on some of the strata from which we draw our supplies, in the hope that they may not be uninteresting or devoid of some practical utility to the readers of the *Builder*. But, at the same time, we say the subject is of such importance that it would be worth while to appoint a commission, consisting of practical geologists, builders, and engineers, which should systematically report on the qualities of every known stone-bed in England. Take, for instance, the freestones of the oolite, and it will be allowed, that while recognising the economic value of the really good ones, an immense amount of rubbish called Bath or Portland stone, is sent out, which is quite incapable of resisting the action of the weather, and chips away at the first frost. It would be well if every gentleman who determines on building a house, or every committee which has to superintend the erection of a public monument, would, before putting themselves into the hands of the builder, go to the trouble and expense (which would be often saved over and over again) of having an analysis or report of the stone to be used. By so doing, the builder would often save his credit, and the employer his money.

There are but few districts in Great Britain in which the buildings do not attest, more or less, the geological character of the neighbourhood; and as an educated farmer ought to be able to prognosticate the formation by the adaptability to certain crops, so an architect ought to give a good guess at the same from a passing glance at the outside of a cottage, the building differences being frequently as sharply defined as those of geology.

In Gloucestershire, for instance, there is no mistaking the substantial look and the comfortable yellow glow of the farmhouses and churches on the top of the Cotswold oolite hills, and all

the way thence into Oxfordshire and Wilts; but at the bottom of the same line of hills, where the lias plains of the Severn Valley appear, we find a totally different kind of country building, in which timber and plaster have played the most important parts. This shows, that the formation of lias, marls, and clays is one which is not rich in quarries; for, as a general rule, the old builders used the materials that were nearest at hand, and I have no doubt that this was partly the reason why so many of the old houses of England were built of timber and plaster. They will, in most cases, be found in districts which were well wooded, and on formations which were not prolific in building quarries, such as the lias marls of Worcester and Gloucester, or the new red sandstone marls of Cheshire and Shropshire. Carriage was an important item in those days, and country gentlemen were content to build their houses and cottages from off their own estates. They did not send fabulous distances for a particular kind of stone, like the Earl of Belmore, who built his splendid mansion near Euniskillen, of Portland stone, while he had much more beautiful, and quite as durable marble on his own grounds; or like Sir Francis Willoughby, who in 1550 built Wollaston Hall, near Nottingham, of stone from Ancaster, in Lincolnshire. He said that he got the stone cheap, because he freighted the horses back again with coal from his estate; but old Camden, who was of a disbelieving nature, declared that he did it “out of ostentation to show his riches.”

Although the oolite formation is to be found running in a regular band throughout nine-tenths of the length of England, there are only a few localities in which the stone has got a world-wide celebrity, such as Portland, Bath, Cheltenham, &c. These places have become centres of production, partly on account of the superior quality, partly from their situation as regards carriage, and partly from fashion; but there can be no doubt that there are vast stores of equally good stone to be extracted at other spots.

The oolite zone, which is on an average 80 miles in breadth, extends with great regularity from Portland to Scarborough, but comprises a considerable number of divisions, in which the rocks vary extremely in their composition and value. Geologists divide the series generally into Upper, Middle, and Lower, the Upper being subdivided into Purbeck beds, Portland stone, and Kimmeridge clay; the Middle into Coral Rag and Oxford clay; the Lower into Cornbrash, forest marble, great oolite, fuller’s earth, and inferior oolite. For practical purposes, these subdivisions are sufficient, although both geologists and quarrymen (but especially the former), have a fondness for minutiae which is puzzling to beginners. The geologist subdivides according to a particular band of fossils, by which he can identify the rock and carry out his horizon into another part of the country; but the quarryman is not so scientific in his subdivisions, which are merely founded on differences which notoriously affect the character of the rock, or the manner of working. But as a general rule, although a quarryman’s diagnosis as to character may be worth having, a geologist’s is the only one to be depended upon as to identity of beds.

The Purbeck beds are best seen in Dorsetshire, between Weymouth and Swanage, and in the neighbourhood of Wareham, almost the only localities, indeed, where they are sufficiently developed to be worked, although they are seen in a slight degree in other counties, such as Oxfordshire and Bucks. Geologically speaking, all three divisions of the Purbeck are exceedingly interesting, because they are mostly of fresh-water origin, instead of marine. One of the beds of the middle division is known as the “Cinder Bed” and is almost wholly made up of shells of a peculiar kind of fossil oyster (*Ostrea distorta*), and near the base of the Lower Purbeck is a bed called by the quarrymen the “dirt bed,” or “black dirt,” which was once an old vegetable soil, and contains trunks of fossil trees.

The Upper Purbeck beds from Swanage have furnished the stone called Purbeck marble for the shafts and columns in the Temple Church, in Westminster Abbey, for the tomb of William Rufus in Winchester Cathedral, Salisbury Cathedral, and many others. It is said that the Purbeck stone used in the older churches was not of very good quality, and weathered badly. The Purbeck beds from Wareham supplied the stone for the lighthouse at Margate and the prison at Winchester. There is a marble known as Sussex marble, which is of the Wealden age—

a fresh-water formation just prior to the Purbeck beds. This is often mistaken for Purbeck stone; but the difference may be detected by the size of the fossil shells, which are larger in the Sussex stone.

TELEICONOGRAPHY.

TELEICONOGRAPHY is a long new word, which we owe to the ingenuity of our French neighbours. It means, as those of our readers who are familiar with Greek will see at a glance, the drawing of distant objects. The French have a right to coin the word, inasmuch as it indicates a new and admirable method, discovered by a French artist, by which a faithful delineation of objects so distant as to require the use of the telescope to distinguish their details, may be readily and correctly effected.

M. Revoil, an architect well known in France, from having had charge of the restoration of the Roman remains at Montpellier, Toulon, and Nîmes, has recently been engaged in a special study of the early architecture of the southern provinces of the ancient kingdom. In the course of his attempts to arrive at exactitude of definition, by the aid at one time of the camera lucida, and at another of the telescope, he has been induced to make experiments as to the combination of the principles of the two instruments. The result of this effort M. Revoil has called the *Teleiconographie*.

The principle of this instrument is that of allowing the image transmitted by the object-glass of a telescope to pass through a prism connected with the eye-piece. The rays of light that would in the ordinary use of the telescope be transmitted direct to the eye, are refracted by this prism, and thrown down upon a table placed below the eye-piece. The distance between the prism and the table determines the size of the image projected on the latter, and it is easy for the observer to trace, on a paper placed on this sketching-table, the actual outlines indicated by the refracted light.

The idea once grasped, it is easy to work out the details. The telescope is fixed on a stand with screws and clamps, allowing of both horizontal and vertical motion, as it may often be necessary to give traverse to the instrument, in order to make a connected drawing of a larger area than can be included in the object-glass at one view. In fact, an entire panorama can be traced, if the relative positions of the axis of the telescope and the surface of the sketching-table are undisturbed.

We see no reason to doubt that M. Revoil's eyepiece might be adapted to the ordinary theodolite, so that any person who possesses one of these instruments may, at a small expense, obtain a good sketching apparatus.

The advantage possessed by the Teleiconograph over the camera lucida is manifest. The size of the image may be determined at will by the person who uses the former, without any diminution of accuracy. We have before us a lithograph of the summit of one of the towers of Notre Dame de Paris. The "croquis" was taken, by means of the instrument of M. Revoil, at the distance of about 300 metres. It is 12 in. long. A sketch taken by the aid of a camera lucida is drawn alongside, and is only 1 in. in length, or one-twelfth part of the linear measure of the bold outline of the Teleiconogram (as we suppose the new likeness will be called). Two mountain peaks, in Provence, sketched by aid of the same apparatus, show how admirably it can be applied to the sketching of country. For the purposes of military surveying, its services promise to be of the utmost value.

The Teleiconograph insures certitude in drawing, but it does not draw. It is an aid to the artist, not a self-acting substitute for his eye and hand. The sharp, bold touch of a master of the art of drawing will be as distinct from the feeble peddling of an inferior workman, when the refracting prism is used, as when free-hand sketching is resorted to. The division of attention between the object and the copy, which is often so painful, will be entirely avoided by the use of this instrument. In the hands of a true artist the result will be every way admirable,—exact as a photograph, without the distortion of all those parts of the field which are distant from the centre, and at the same time marked by all the peculiarity of touch proper to the master. The camera lucida, from its greater portability, will still hold its own, but we shall hope to see M. Revoil's instrument brought into familiar use in this country, to meet circumstances for which it is peculiarly adapted.

THE EVIDENCE AS TO THE PROPOSED LAW COURTS.

AT the committee meeting on the 9th inst. Mr. Field said that Messrs. Abraham, Waterhouse, and H. A. Hunt were the witnesses on whose evidence the Commission signed the certificate that the whole scheme (including the purchase of the site) could be carried out for a million and a half. The lowest estimate for opening Turnstile was 91,000. As regards light and air on the Embankment site, he had omitted to refer to the river fogs as a great and special objection to it.

Mr. Burnet, architectural clerk of the Commission, had made the map for the Incorporated Law Society. Admitted certain inaccuracies in the details of the map, which was taken from an old Parliamentary paper showing a plan of Sir Charles Barry's for a design then recommended by him in 1845. Prepared for the Commission a reduced scheme for erecting the building on the site already purchased. The bridges of connexion with the Temple over the Strand were omitted in this scheme. The plan of the Incorporated Law Society was only incorrect in details not affecting its principle. Thought Carey-street ought not to be much less than 50 ft. wide. Had shown a street 60 ft. wide at the west side of the building. Could not speak as to the probable selling value of the Carey-street site. Some of Mr. Street's criticisms on his plans were not quite accurate. The inaccuracies complained of in the Law Society's map were unduly favourable rather than otherwise to the Howard-street site, as many new offices had arisen on the north side of Carey-street, which did not appear in the map of 1845. He prepared the reduced scheme not in any way to interfere with Mr. Street, but as a suggestion to show how much of his scheme could be carried out on the land already purchased. His descriptions of the various plans were drawn up without communication with Mr. Street. The Probate offices, Royal Commission-rooms, and a few others are omitted from the reduced scheme, as also the Probate, Admiralty, and Bankruptcy Courts. The same omissions occur in the Howard-street scheme.

Mr. Street said his first great plan provided everything originally asked for by the Royal Commission, and, with the streets round it, would cover upwards of 7½ acres. The courts were in a central block, with an internal street round it for light and air, bridges of communication around the internal street giving access to the offices beyond on the outside edge of the site. Had proposed certain additional accesses to the site from the north and west, an opening to New-square by the purchase of the houses at the north side of Carey-street; and an opening to Chancery-lane in the centre of the east front of the new building. The Commission adopted almost the whole of these suggestions, with some further additions of their own. Additional accesses to the Carey-street site appeared to him to be indispensable. At the Howard-street site he proposed to take the north as well as the south side of the street, so as to secure the erection of suitable buildings opposite the new buildings. The site gives an acreage of nearly five acres, available for building purposes. This included internal courts for light and air. Thought it an extremely good site. The accesses are good, and facilities for providing light and air, and securing quiet, are very great. Would excel the Carey-street site in those respects. The accesses to the Howard-street site are singularly good,—by the Strand, the Embankment, the railway, the river, and the bridges. The access from the north side needed most explanation. Would utilise the terrace of Somerset House as a carriage approach from Wellington-street. Had arranged with Mr. Fowler a modification of the proposed railway station. Though it was no doubt a difficulty, this would greatly reduce it, and it was no longer a serious objection to the scheme. A tunnel and arcade over it from Howard-street to the north side of the Strand could be constructed. The widening of the upper end of Essex-street would be almost necessary. The site offered great advantages in an architectural sense. A broken front would be a great advantage, and almost called for by the Embankment line being covered. A contrast with the unbroken front of Somerset House is also desirable. Could not admire the river front of Somerset House. His design projected 50 ft. beyond this front, but would hardly hide any portion of it in consequence of the considerable curve of the Embankment. There was

no reason for iron rules of uniformity of frontage. Breaks were often advantageous, and good architecture always assists itself. Looking down on the building from the Strand would not be a serious objection, as many buildings looked very well under similar circumstances. The view from Waterloo Bridge would be extremely good. Anticipated no great difficulties with the foundations, which should be about 25 ft. below the level of the roadway, with a bed of concrete 25 ft. thick. The Embankment offered great advantages for building as to access of materials, &c. This advantage might be stated as an economy of 5 per cent. on the total cost of the building. The rails of the railway are to be 17 ft. below the roadway. It might possibly be necessary to go deeper than 25 ft. for foundations in some parts. Three courts and several offices are omitted in the Howard-street scheme. The general arrangement of the plan was entirely different from that proposed for Carey-street,—not quite so good in some respects, but better in others. The rough estimate of the building is 900,000, inclusive of foundations. The scheme prepared for a smaller scheme on the ground already purchased in Carey-street had the same disadvantages of plan as the Howard-street plan, the shape of the land being very unfavourable and irregular on the western side. Is very inferior for light, air, and quiet. Additional accesses would also be indispensable, and very little could be saved in this respect by the reduced plan. The cost of the reduced plan in Carey-street would be about the same as in Howard-street. On the whole, he preferred the latter. Mr. Burnet, in adapting Mr. Street's plan to the reduced site, had spoilt it.

On Tuesday last, the examination of Mr. Street was continued, and various questions were put to him respecting the aesthetic disadvantages of the Howard-street site; Mr. Beresford Hope asking if St. Paul's would be improved by bringing it down to its present eminence, and placing it on low ground near the river.

Mr. H. A. Hunt was then examined. He was strongly in favour of the Embankment site, as the best for light, air, accesses, and surroundings. He considered that the further expenditure of a million of money would not make Carey-street a good site; and rather than do so, he would prefer to spend such a sum in buying the property between Howard-street and the Strand, and have it an open Court-yard in front of the new Courts, like that in front of the Charing Cross Station. This, however, was not in any way necessary, as he maintained the Government plan provided everything really requisite.

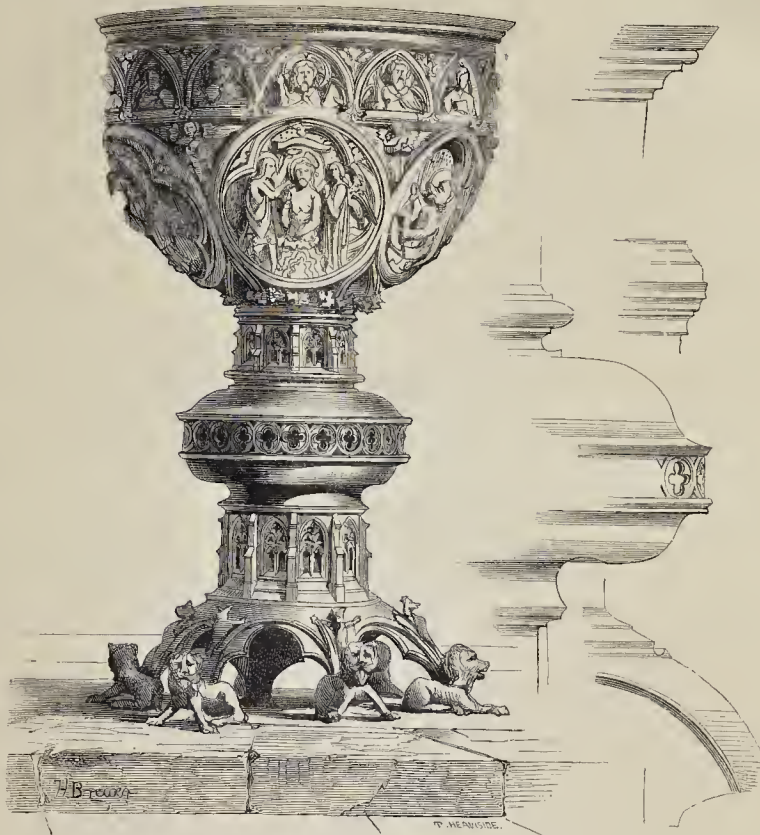
REPORT OF AMALGAMATED ENGINEERS.

THE eighteenth annual report of the Amalgamated Society of Engineers, Machinists, &c. for last year, has been printed for circulation amongst the members. It consists, as usual, chiefly of statistical and arithmetical details relating to the numerous local branches of the association. In his few preliminary remarks, the General Secretary, Mr. Allan, says:—

"In issuing this the eighteenth annual report of our society, ending December, 1868, I deeply regret that I am not in a position to announce a more prosperous state of affairs, so far as our funds are concerned. As in the previous year, it is my painful duty to report a large diminution in our accumulated fund, amounting to 26,564. 0s. 5d. This is attributable to a lengthened depression in trade such as we have never before experienced; and, in this respect, we have only shared the same fate as other similar societies, the depression having extended to all branches of industry, not only in the United Kingdom, but to the whole of the continent of Europe, as well as America. This state of things has, no doubt, in a great measure (if not entirely) arisen from over-speculation and ruinous competition, which for years has existed, and which still continues to exist. However, it is to be hoped that the experience gained in the past will be the means of remedying and preventing such disastrous results in the future."

This adverse state of affairs, however, is only relative; for the society has not only been able to meet all its heavy liabilities, but possesses a balance of no less than 98,699l., or nearly 100,000l. to meet future obligations. During the year, 109,803l. were expended. Of this sum, by far the largest amount was in donations, or for out of work benefit, namely, 64,979l.; the amount so expended in 1867 having been 58,243l. The sick-benefit expenditure was 16,992l.; accidents, 1,000l.; funerals, 5,043l.

Valuation of Property (Metropolis) Bill.—The House in committee on this Bill, have agreed to the clauses with some minor amendments.



FONT OF ST. MARY'S CHURCH, MÜNSTER.

FONT OF ST. MARY'S CHURCH, MÜNSTER.

The font of which we give an illustration is a fine specimen of Mediaeval church furniture. The material of which it is composed is bronze. Immediately below the rim are representations of our Lord and the Apostles (eleven only). Lower down are five great circles, which cover the bowl of the font, and these contain the Evangelistic symbols, and the baptism of our Lord by St. John. At the foot are six lions, and standing on their backs are six bats. The workmanship of the whole is very sharp. It appears to have been first cast, and then cleaned up with some sharp tool. The probable date is about 1350.

The following are the dimensions:—height, 3 ft. 10 in.; height of bowl, 1 ft. 6 in.; width of bowl, 2 ft. 4 in.; width of knob, 1 ft. 5 in.

DESIGNS FOR THE CORN EXCHANGE, ROCHESTER.

The corporation of the city of Rochester having decided that the erection of a New Corn Exchange would be desirable, and, judging by the appearance of the very small and dingy apartment which now bears that name, not before it was necessary, requested several architects to furnish designs, and six have responded to the invitation.

The site for the proposed Exchange is very confined, being surrounded by existing buildings except on the eastern side, where it abuts on a narrow street known as Pump-lane; the southern side is bounded by the present Corn Exchange

and other buildings, nearly excluding any chance of light from thence; and on the north and west the light would be partially built out, so that top lights, or very elevated windows, only could be of service.

The corporation in their list of requirements, which are very multifarious, desire,—“A large room to be used as a corn exchange, assembly-room, or concert-room, as occasions may require; the room is to be so arranged as that the present Corn Exchange may be used at the same time if necessary.” The lower portion of the building is also required to contain a kitchen for the purposes of corporation dinners, a library, &c., and an entrance is to be provided from Pump-lane, as well as through the present Corn Exchange. The cost of the whole is not to exceed 5,000l.

The drawings have been exhibited in the present Corn Exchange, and were very well hung. “Che sarà sarà” explains his design by six drawings to scale, a showy perspective view of a room full of elegantly dressed ladies and gentlemen, amid a tremendous array of columns, and a descriptive specification, which, if it lacks grammar, is certainly not wanting in confidence. The plan of the hall is a rectangle, 47 ft. by 85 ft. in the clear, covering nearly the whole area at command. The longer sides are divided into bays by coupled Corinthian columns, detached from the wall, standing on rather lofty pedestals, and carrying an entablature breaking forwards over each group of pillars. The whole design is very elaborate and very flashy. The ceiling is formed of two coves, one above the other, the lower grained for lunettes, and the centre is covered by three flatish glazed domes, which would appear to be very bad acoustically; although

the specification informs us that the ceiling is curved to “an acoustic cove,” and all deep coffers and skylights are avoided. How the specification and drawings are to be reconciled to one another it is hard to say.

A vast amount of space is lost by the columns, which project 4 ft. into the room, and evidently to no purpose structurally, for, on referring to the plan of the ground floor, it will be found that the wall below the level of the hall is only about 2 ft. thick, and the columns stand forward above, with nothing to carry them. They are intended to be of “Marezzo marble, with plaster caps and bases gilt.” So much for genuine materials and true principles. There is no accommodation for an orchestra, or separate staircase for performers. For dining purposes, arrangements are made for a lift and serving-room, and a little cranny is shown behind the marble columns for a refreshment-bar; but there are no apparent means of supplying it, except through the hall itself.

The principal approach through the present Exchange is pretty good. The stairs from Pump-lane are scarcely 3 ft. wide, rendering it out of the question to use this approach to the hall alone. On the ground-floor a considerable space is reserved in all the plans at the western end of the site for the yard of a public-house, over which the hall is carried in various ways in the different designs, some of which do not seem very secure. The library is badly lighted from the north; the kitchen is absurdly small, and not well supplied with larders or other appliances.

“Perseveranda” exhibits four sheets of drawings, and a perspective of a less pretentious

nature than the first we have noticed. In this case the hall is a rectangle, 42 ft. in width by 92 ft. in length, the sides being divided into six bays, as is the case in most of the designs, by single engaged Corinthian columns, projecting into the hall about 2 ft., and standing on plain block pedestals, but with very little support from below. The entablature, which is cut through by the windows, carries a deep cove, into which the semicircular heads of the windows are groined. The ceiling is commonplace, but the effect of the lighting from windows very high up would be decidedly agreeable. The hall occupies the whole area at disposal more completely than is the case with any other of the designs, but the necessary accommodation for concerts or public dinners, in fact for any purpose other than that of a mere corn exchange, is entirely ignored; and on the lower floor the kitchen is without gully or larder, and the library, which is well lighted from Pump-lane, has no accommodation for a librarian. The approaches are very good, and two separate doors are obtained from the present Exchange, besides a good passage and staircase from Pump-lane.

There are two competitors who exhibit under the motto of "Ceres," the one showing a Gothic and the other a florid Renaissance design. The Gothic design is explained by eight sheets of general drawings and two perspectives, and shows the various requirements of the corporation more completely considered than is the case with other of the competitors, there being three plans of the great hall, showing its adaptability to the purposes of a corn exchange, a concert-room, or a dining-hall. The hall is a rectangle, 73 ft. by 45 ft., free from any sham columns or other projections. The general effect much resembles one of the large dining-halls at the universities.

The hall is divided into six bays, the lower portion of the walls lined with woodwork, and the upper part to a height of about 16 ft. from the floor divided into panels, one to each bay; and shown in the perspective as painted with subjects, intended, no doubt, to illustrate local events. Above these are lofty pointed windows groining into the lower portion of the roof, which is of a flatish hammer-beam construction, boarded on the under side of the ribs, and with square skylights along the ridge, which have not a good effect, and the perspective is so darkly coloured that the upper portion of the roof appears to be in a fog, and the whole effect is much more sombre than might be thought. The Pump-lane approach is good, and has convenient rooms beside it. The orchestra is of a rather unpleasant form, but has a separate staircase and retiring-room for performers close at hand. The principal staircase is so ingenious in plan that it is not easily comprehensible; some portions seem to suggest mounting four or five steps merely to come down again.

"Ceres, No. 2" displays four sheets of neatly-drawn plans and elevations, and seems, with the exception of his namesake, to have entered more fully into the necessities of the case than any other of the competitors. The hall, which is shown in a very attractive perspective, is different in plan from any of the others. It may best be described as a rectangle, 50 ft. by 76 ft., with the corners rounded off, and deep recesses at the ends, containing respectively the orchestra and a very theatrical-looking gallery. The total length of the hall is 94 ft. The walls are decorated with Corinthian pilasters, with round-headed windows between, and the curved corners are formed by similar windows, which have a painful effect. Above is a deep cove, glazed, and a richly ornamented flat ceiling.

The general form of the room would be probably good for musical purposes, but the glazed cove is a dangerous experiment. There are two staircases, and a capital entrance from Pump-lane, and the principal staircase is pretty designed in a square hall domed. The library is badly lighted, and kitchen dark. Taking the designs as a whole, they are nearly all of a most commonplace character, and the stipulated 5,000l. will apparently be exceeded by most of the competitors.

The National Portrait Gallery has become so large that it is necessary to find a new habitation for it until the National Gallery has been made big enough to receive it. In the meantime it is intended to transfer it to the gallery at Kensington, where the Portrait Exhibitions of the last three years were held. The transfer will be completed by the end of the year.

ARCHITECTS IN GOVERNMENT EMPLOYMENT.

On the vote of 18,222l. to complete the sum of 34,222l. for the salaries and expenses of the officers of the Commissioners of her Majesty's Works and Public Buildings being moved in Committee of Supply,—

Mr. Layard (in answer to Mr. S. Booth) explained that certain changes had taken place in the officials of the office, resulting in the appointment of Mr. Fergusson as secretary of works and buildings, the gross amount of salaries to be paid by the department to remain the same. It was found impossible to retain in that position the services of another gentleman who was an architect, who admitted that he could not give an opinion upon the estimates, plans, or elevations of another architect. He thought the committee would be of opinion that a salary of 750l. was not too much for such a functionary, and at the same time a reduction of 200l. was made in the salary of the assistant secretary. Other salaries had also been reduced.

Mr. Hunt suggested that the vote should be withdrawn for the present, and hoped the Government would not decline to do so, in order that the House might see the correspondence.

Mr. Ayrton said that there were two questions, that of the permanent arrangement, and that of the temporary. The former architect and surveyor was in this delicate position, that he was the consulting architect of the department, and yet had the power of undertaking buildings for the Government, on which he was paid by a percentage, as in his private practice. It was thought better, therefore, to have an officer under the title already mentioned, to give advice on all the operations of the department. A special arrangement was made for Mr. Penne- thorne completing the works he had in hand. He trusted the committee would not think it necessary to have the vote postponed.

Sir W. Galloway did not believe that a more able or more disinterested person existed than Mr. Penne- thorne, who was also an old servant of the Government. He wished to know if that gentleman was to leave the service without any retiring pension or allowance.

Mr. McLaren wished to ask whether it was not the fact that all estimates and plans for buildings in Scotland were made out by one gentleman, at a salary of 925l.

Mr. Layard said there was no intention to lay the slightest blame on Mr. Penne- thorne, and the only object had been to release him from a disagreeable position. Mr. Fergusson was not a practical architect, and could give an independent opinion on all matters connected with architecture. He could state that during the three or four months Mr. Fergusson had been in office his services had saved many thousands of pounds to the public. With regard to the Scottish business, the salary of 925l. did not include travelling expenses. As soon as Mr. Penne- thorne had finished the works in hand he would receive his pension, and he was perfectly satisfied with the arrangements made.

The vote as originally prepared was agreed to.

THE REBUILDING OF CARLISLE GAOL.

THE alteration of the county gaol at Carlisle, to meet the requirements of the Prisons Act, is now rapidly approaching completion. The alterations have rendered necessary the entire remodelling of the interior of the gaol. With the exception of two wards which have been converted into bath-houses; of the governor's old house, which has been used for warders' rooms, offices, and chapel; and of the store-rooms, cells, and kitchen on each side of the entrance-gate, the whole of the old buildings, according to our authority, the local journal, have been pulled down, and the materials of which they were composed have been made use of in building the new prison. The male and female wards are now in one large block four stories high, with the governor's old house contiguous to the division wall between the two, so that communication may be had from it to both wards. There are 112 cells for male prisoners, and 56 for females. The total average number of prisoners is about 100. The alterations have been rendered necessary by the determination of Parliament to adopt the separate system, so that the casual criminal may not become contaminated by communication with habitual thieves. Every prisoner has a separate cell

allotted to him; each cell being 13 ft. in length by 7 ft. in breadth, and 9 ft. in height, with an arched roof of masonry, a flagged floor, and a strong wrought-iron door. The furniture is very simple, but one thing seems exceedingly objectionable. Each cell contains what is called a *mullum in parvo*, comprising an earth-closet, convertible into a food-table, as well as cupboard and washstand.

An old building has been converted into a convenient laundry, where the female prisoners wash the prison clothes, and mangle and iron them.

A new tread-wheel is being erected by Messrs. Blaylock & Pratchitt, and by its machinery water will be supplied to the gaol from a well which has been sunk 280 ft. for that purpose, the solid rock having been bored 256 ft. of that depth. The "mill" will be enclosed in a glazed shed, and within it will be placed the mat-looms, so that all the hard labour may be going on at one time under the surveillance of the same officers.

In utilizing the governor's old house an opportunity has been afforded of enlarging the chapel. The whole of one floor of the old house has now been devoted to the chapel and vestry. The chapel is divided into two by a wooden partition, so that the males and females may be completely separated.

The cost of the alterations will be between 15,000l. and 16,000l. Mr. T. Milburn is the builder; and Mr. Gory, the county surveyor, is the architect.

PIER, HARBOUR WORKS, AND NEW HOUSE OF ASSEMBLY, ISLE OF MAN.

THE first column of the new iron pier running out from the foot of Broadway, Douglas, was driven on the 17th of March last, and the last column on the 29th of June. The pier has now been carried out about 1,000 ft. from the shore, including the platform at the outer end, which is 90 ft. in length and 40 ft. in width. The railings alongside the pier are being put up, and the houses are in course of construction. It is expected that the pier, which will add to the attractiveness of Douglas as a watering-place, will be ready for opening by the end of the present month.

At the sittings of the Legislature of the Isle the plans for the extensive harbour works at Douglas have been brought under consideration. It was resolved that a sum of 10,000l. should be granted for a further extension of the new low-water landing-place there. The members then proceeded to consider the general question of harbour works, and, after a long debate, a resolution was arrived at rescinding a former resolution of the Legislature by which it had been decided that the sum of 122,000l. should be expended upon a large work of concrete extending straight across the bay, and in its stead it was resolved that a built work running out in a north-easterly direction from Douglas Head should be substituted. The last work is estimated to cost 52,000l. for the first 550 ft., and when it is extended to that distance, the members will be asked to decide how much further and in what direction the work is to be extended, and what the cost is to be. The governor, in answer to inquiry, said that the engineer-in-chief, Mr. Goode, would receive 600l. a year during the construction of the work for his services, and for the use of his London office. Mr. Powell, who would be in immediate charge of the Douglas works, as well as the works at Ramsey and Peel, would receive 1,000l. a year salary, and 200l. a year travelling expenses.

Extensive plans of harbour works at Ramsey were then brought under the consideration of the court. There are two plans of harbour works proposed for Ramsey; a built work by Mr. Coode, estimated to cost 50,000l.; and an iron work by Mr. Dixon, the contractor for the new pier at Douglas, to cost 35,000l. A committee of the court was appointed to inquire into a report on the merits of the two plans.

The plans for the new House of Assembly at Douglas were then taken into consideration. Eight architects had been invited to send in plans and estimates of this building, which is to include law courts and public offices; but only five responded to the invitation. A prize of 150l. was offered for the best plan, and 75l. for the second best. There were only four plans sent in, two of the architects, Mr. Henry Christian and Mr. Frederick Fothergill, of London, having combined. Their design was for an ornamental building in the style of the thirteenth century, and was estimated to cost 13,000l. Mr. G. W. Hamilton, of Liverpool,

whose design was awarded the second prize, estimated the building planned by him to cost 14,000*l.* The architect in his report, said that "he had endeavoured in the design to produce a building characteristic of its intended purpose, and had avoided costly arched openings and ornamentation." The first prize was awarded to the design sent in by Mr. Burnett, of Glasgow, which was in the Tudor style, and was estimated to cost 17,000*l.* Mr. P. Ellison, of Liverpool, proposed two plans, one in the English castellated or baronial style, to cost 13,663*l.*, and the other an adaptation of the Continental Gothic, and estimated to cost 16,100*l.* The members of the court adopted the recommendation of the committee, and agreed to purchase a site for the building in an advantageous position, at a cost of 2,000*l.*, and after several hours' debate, adjourned the final consideration of the plans.

NEW MODE OF LAYING AND JOINTING PIPES.

A PATENT joint has been invented by Mr. William Williams, an active member of the Water Committee of the Town Council of Liverpool. It consists simply in the direct contact or union of a cylindrical socketed with a spherical butt-ended pipe, without the intervention or use of lead or packing of any kind. The socket end of each cast-iron pipe is made of thickness uniform with the pipe itself, and strengthened by an external hoop of wrought iron. It is then correctly bored so as to form a true section of a cylinder. Upon the butt-end of the pipe is cast a projecting boss or ring, the surface of which is turned truly so as to form the zone of a sphere, of external diameter equal and duly proportioned to the internal diameter of the cylinder. The union of the two metal surfaces is thus designed to be perfectly maintained throughout a circular ring or line of contact which within the cylinder is fixed, but varies on the spherical zone according to the angle of direction at which the pipes are united, while the tightness of the joint is unimpaired by change of position. It is therefore a movable joint, so that, within certain limits, the line of direction of the pipes may be changed, and in case of disturbance or subsidence of the ground in which they are laid, the line of pipes is self-adjusting, and the distortion is unaccompanied by fracture or leakage. It is proposed to use these pipes within the Hilton House Tunnel of the Rivington Pipe Line, where settlement is apprehended from the working of the seams of coal beneath, and a saving of 30,000*l.* is expected to result. The invention has been tested in presence of the mayor and corporation, and various architects, engineers, and others interested.

THE EXTENSION OF WORCESTER PRISON.

THE amalgamation of the city and county prisons rendered necessary an extension of the accommodation previously furnished by the county gaol. For the purposes of this extension it was decided to purchase certain property upon the west side of the old prison, and to erect on the site thus obtained an additional wing, at the cost of the city, sufficient to meet all requirements. Plans were accordingly prepared by Mr. H. Rowe, the city architect, and tenders advertised for, the one sent in by Messrs. Wood & Son, of this city, being ultimately accepted. The work was begun in September last.

The new wing is just ready for the roof. It comprises, upon the basement, capacious stores for the goods manufactured in the prison, with every facility for loading the same. There are also baths and washing-places, where the prisoners on their arrival after receiving sentence, are required to perform the most thorough ablutions before taking up their residence in the scrupulously clean and healthful apartments assigned to them. Here, too, is the apparatus for the heating and ventilation of the prison, which is upon Haden's principle. The whole is arched over with brickwork, and above, in two stories or tiers, are the cells of the prisoners, forty-eight in number. They will be well lighted, warmed, and ventilated, each cell having a separate flue communicating with the central ventilating shaft. The pure air is admitted at the top of the cell, and the impure forced through an outlet in the lower part of the cell wall. This, says our authority, the local *Herald*, is

found in practice to work much better than the reverse principle commonly adopted, as the dust from the prisoners' work is thus carried downwards, and prevented mingling with the air which he is compelled to breathe. The entire atmosphere of the cell is changed once in every seven minutes. Very few rooms of private houses, says the *Herald*, would bear comparison with these cells in the matter of pure atmosphere. Each cell, moreover, has its separate and ample water supply.

The new block or wing of the prison measures about 70 ft. by 44 ft., the external walls of which are of great thickness and very strongly built, whilst along every other course of bricks are two rows of strong iron bonding, which will prove particularly troublesome to any adventurous captive who may endeavour to pick his way through the walls. Surrounding this new wing is a spacious exercise-yard for the prisoners, enclosed by a lofty boundary wall 21 ft. high. This wall on the inner side is perfectly perpendicular, without buttresses or breaks of any kind. The heavy coping-stones have been placed upon two courses of loose bricks, and though regarded as being safe and firm enough if undisturbed, will immediately yield to the force of a man's weight, as every prisoner will doubtless be duly informed. On the outside the wall is built in steps, being thickest at the base, which, however, does not seem to manifest the same sort of consideration for confederates which the perpendicular interior and the coping-stones show for prisoners.

The new gateway has been constructed in this portion of the prison. It is a double one, so that after the ponderous outer doors have been passed by the prison-van there are still massive iron gates which bar further progress. The van will thus pass into the intervening space, and the doors on the one side will be securely closed before the gates on the opposite side are opened.

BUILDING AT THE CAMP.

A VERY rapid piece of building was done at the Wimbledon Camp for Messrs. Spiers & Pond, in the shape of a *Restaurant*, which covers an acre and a quarter of ground, and contains some 9,000 superficial feet of framed and glazed work on the facade, 400 squares of flooring, besides roofing, and all the internal fittings; a bar 200 ft. long, offices, stores, cellars, kitchen, cooking-apparatus, and all internal fittings. The building, which was designed by Mr. Penrice, is put together in lengths of 5 ft., fastened with bolts and nuts, making the whole portable, and variable as to size. This building, together with the temporary erections in troop-stables, forage and commissariat stores, entrance buildings, post and police offices, canteens, and about four miles of fencing, was put up in three weeks and two days by Messrs. W. Bracher & Sons.

The trussed gutters are a little too slight, and should be strengthened next time. The supporting posts are made hollow, and serve as down-pipes in connexion with an elaborate system of drain-pipes. The kitchen was fitted up by Mr. Dray, and all the bread used was baked in three ovens put up by Mr. Batley, of Bermondsey, at the small total cost of 75*l.* The cost of the building, without the fittings, was something over 2,500*l.* The necessity for complete arrangements is shown by the fact, that more than once from 25,000 to 30,000 persons were served in a day.

THE NEW PUBLIC OFFICES.

ON the motion for going into Committee of Supply, Mr. Goldney called attention to the sum granted for the purchase of the site for the new Public Offices, and to the proposed expenditure for the new Home and Colonial Offices, and asked the First Commissioner of Works if he had any objection to lay on the table of the House a plan of the land already purchased, and of the land intended to be acquired, with an explanatory statement, showing what portion of the land was intended to be built upon, the amount of money already laid out, and when and for what purpose it was expended. He also desired to know if a plan and estimate for the new Home Office had been prepared; and if so, the amount of the estimate, and where plans could be seen.

Mr. Leyard replied that the only objection was that the information had been already laid before the House. One portion of the plan had already received the assent of the House, and

had to a great extent been proceeded with, and a Bill was before one of the Committees upstairs relating to the acquisition of additional land, and the completion of the remainder of the buildings. As soon as that Bill was considered by the Committee, and decided upon, full opportunity would be given to the House to discuss its details. The cause of the delay in the carrying out of the scheme of buildings was, that when he came into office he found it advisable to have Mr. Scott's plans reconsidered. That had since been done, and the result had been some additional buildings, which he believed would be found of much use.

In reply to Mr. Kinnaird and Mr. Candlish, Mr. Ayrton stated that the sum expended up to the present time was 706,223*l.*, and that the total estimated cost was 1,181,000*l.* Of this sum the India Office would refund 87,000*l.*, so that the actual expenditure would be 1,094,000*l.* This latter sum, however, was subject to a further reduction of 50,000*l.* on account of exchange of property, but that was a matter still under consideration.

BRADFORD MARKETS COMPETITION.

SIR,—Amongst the numerous improvements now being effected, or proposed to be effected, in the Borough of Bradford, perhaps none is so desirable, none so urgently required, as a covered market. The indescribable place at present used for market purposes is situated near the Manor Hall, and has until within a few years been the property of the ladies of the manor. By a recent Act of Parliament, however, the Corporation have obtained possession of the property as lessees for 999 years. Since the passing of this Act, various propositions have been made with a view to the improvement of the markets accommodation of the town, but without any practical result at present.

In March last, advertisements were issued inviting the architects of Bradford to furnish designs in competition for a new covered market to be erected on the present site. The immediate object of the restriction (which, however, it is rumoured, has been violated) is not easy to perceive; but probably the committee felt that the peculiar circumstances of the site rendered necessary something more than an ordinary survey; but, if this did not constitute the motive, probably it was the *amour propre* of the townsmen, and a prophetic pity for strangers who might possibly be induced to enter the lists, that prompted them. The instructions issued to competitors contained the usual conditions, and appended thereto were three plans showing certain lines "determined upon by the council." In addition to the market itself, the competition was to include designs for exterior buildings, as shops, &c., with which it was proposed to surround *three* sides of the site.

The drawings were delivered on Thursday, the 1st July inst., and on Friday, the 9th, eight days afterwards, the Markets Committee met, and in two brief hours made their choice.

The amount proposed to be expended on the market alone is 20,000*l.*; the surrounding buildings are estimated by one of the competitors to cost 12,000*l.* The "job," therefore, is an important one, and eleven competitors have expended their time in endeavouring to meet the views of the committee. Twelve sets of drawings have been sent in, varying in number from four to thirteen; it may, therefore, safely be presumed that the committee had really an arduous task to perform in the time which they devoted to it, especially as each competitor furnishes a report with his drawings. Reading the reports alone would probably consume the whole of that time, leaving the members no opportunity to compare the merits of the various plans, or to decide upon the correctness of the descriptions given by their authors, or to ascertain whether they had conformed to the instructions or wisely altered them; or, indeed, to investigate any of the numerous questions of utility and appearance which a conscientious consideration of the subject demanded.

As Bradford offers to architects another opportunity of competing for her public buildings, it is desirable that architects should be informed how "they manage these things in Bradford;" and if those to whom the interests and welfare of the town are committed are bent upon sacrificing their public duties to their private proclivities, it will be well for architects to know how to avoid any attempt to confer the benefits of their art and learning upon them.

It will be easy to enquire what kind of decision this is which has been arrived at. Caught by the usual attractions of gorgoons, but not over-strict perspective, and high colour, both the conditions of the competition and the requirements of the public, in some cases, have been overlooked. The first selected design, *Experientia docet*, said to be by Messrs. Lockwood & Mawson, is shown in a beautifully-executed set of drawings. The perspectives, which are highly coloured, are brilliant in effect, and really beautiful as works of art. In considering the plan, however, there seems to be some loss of space in the otherwise picturesque octagonal pavilions which are placed near the two principal entrances. Some of the competitors have, we think wisely, for economical reasons, adopted galleries; these are not shown in the drawings under notice, but it is stated that they might be added; whence an effect is obtained which could not be realised consistently with an advantageous investment of the public money. The character of the interior is not in the least degree that of a market, but partakes rather of the nature of an arcade for fashionable shops; a lounge for dandies, rather than the market-place of a working man. The interior, apart from this paltry consideration of utility, is very pleasing; the enclosing walls being admirably arranged, and the light obtained from the north. The limitation of price, however, has not restrained the designer.

The design placed second in order of merit, "Northern Light" (imputed to Messrs. Andrews, Son, & Pepper), is less ingenious in plan, and relies on the arrangement of the light for its intrinsic merits. The roofs seem admirably designed for the retention of snow; and it is questionable whether the arrangements proposed, which give a glazed surface towards the north, and open upwards towards the south, would be at all effective in excluding heat. The preceding competitor is at least more successful in his arrangements in this respect. The entrances are bold, pretentious, sensational; but the remaining portions of the design are effective and well-proportioned.

The third premium is awarded to a set of drawings signed "Municipal," reported to be the work of Mr. Hargreaves. The plan is highly elaborate, the classification of the trades having been worked out. Objection might be taken to many of these arrangements; but it seems to me that all fish should be excluded from a general market; and the position of the conveniences is most deplorable. The roof is complicated and expensive, without attaining much effect. The style of the exterior findings shows some ability; but the author loses good proportions whilst seeking after novelty of form.

The whole exhibition forms an interesting collection of drawings; but some of the competitors will feel that they have placed themselves in the position of a captive slave in the triumphal procession of a Roman general, devoting themselves to the public amusement without prospect of adequate reward. But since the decision above alluded to is merely the recommendation of a committee to the town council, and will not take effect until ratified by the latter, there is yet time to hope that other means may be adopted to arrive at a right decision on merits whereof drawing is not the greatest. Some of the other competitors seem to have carefully restrained their architectural fancies within the limits of the purse committed to them; and it seems unjust both to the ratepayers of the borough and to the twelve firms who compete, that the decision should be left to a body of a dozen gentlemen, with no special qualifications for the undertaking. Had these been a dozen architects, they would have known more than would have allowed them to decide in so short a time; and it is not reasonable to expect that, being what they are (doubtless highly respectable and worthy) tradesmen, namely, they could perform such an astounding feat as to fully apprehend and pronounce justifiable judgment on so many drawings with such despatch. It is highly desirable, in order that the best man may be placed first, that professional advice should be called in.

INTEGER.

From Ireland.—The Roman Catholic Church of Ballybophil, county Dublin, has been recently altered and remodelled internally, and a new tower, with helix and spire surmounting the same, added at south-east angle. Mr. J. J. Lyons is the architect; Mr. Wm. Conolly, the builder.

INAUGURATION OF KING'S LYNN DOCK.

We have mentioned that the new dock at Lynn was inaugurated by the Prince and Princess of Wales. The water area of the dock basin is 6½ acres. The form is that of an irregular quadrangle, the southern side being 780 ft. in length, and the northern side 590 ft. The width from north to south between the edges of the quays is about 440 ft. At the water surface the width is 420 ft., and the average depth of the dock is 31 ft. The dock is not surrounded with perpendicular quay walls, but has banks with an inclination of 1½ horizontal to 1 perpendicular, the slopes being faced or paved with solid blocks of concrete. Small craft can get up pretty close to the quays, and to accommodate vessels of considerable draught seven timber jetties have been constructed—four on the south side and three on the north side. Each jetty is 16 ft. wide and 32 ft. long, and the floors are furnished with rails leading to the lines round the dock, which are brought into easy communication with the Great Eastern system. The concrete blocks used in facing the dock basin are 4 ft. square and 15 in. thick, and they are composed of Portland cement sand, and shingle. Of these blocks 5,000 were used; they are placed on a layer of concrete and jointed with cement. The foot of the sloping wall or pavement thus formed rests on a foundation of church stone, bedded with concrete, carried down from 2 ft. to 4 ft. below the bottom of the dock. The lock-gates were put together on the spot, the ironwork being supplied by Messrs. Tod & Son, of Edinburgh. The contractor is Mr. Brance, C.E. The dock belongs to the King's Lynn Dock Company, who were incorporated with an authorised capital of 88,000l.

SURVEYORSHIPS.

STR.—You would confer a very great favour upon many of your subscribers by giving the results of elections for surveyorships, with the name of the successful candidate; as in too many cases the election is only a farce, candidates being selected and requested to attend (at great expense) from long distances, while all the time some favoured individual is picked out for election.

J. B.

* * * We do so on all occasions when the names reach us.

SUBTERRANEAN ROME.*

ALTHOUGH most educated people have a tolerably well-defined impression of the nature and appearance of the subterranean primitive Christian cemeteries of Rome, there are yet many facts concerning them of which they must necessarily be in ignorance, because as time goes on fresh discoveries are made which furnish new information. Most people, for instance, will be surprised to hear that the extent of galleries now found, would, if drawn out in a straight line, stretch from the northernmost part of Italy to its southernmost shores. In many particulars, too, the newest information requires us to throw away opinions that were supposed to be founded on facts. Thus it is now ascertained, and demonstrated too, that the subterranean galleries and chambers are not adaptations of old sandpits or *arenaria*, but were originally made by the early Christians for the purpose to which they put them. It need be looked upon as certain that the *pozzolana* so largely used in building operations in Rome was found here, and that the workings, when abandoned because exhausted, were thus utilised. Ordinary English visitors to the dim, narrow labyrinthine passages, and the crypts opening out of them, looked into their "Murray," as that publisher's handbook is familiarly called, and read, "The origin of these subterranean cemeteries was evidently for the purpose of extracting that peculiar species of volcanic ashes called *pozzolana*, so extensively used by the ancient and modern inhabitants in their constructions. Nearly all the catacombs can be traced to no other cause. Originally *arenaria*, the classical designation of these sandpits, they were arranged

by the primitive Christians for their new destinations of dwellings, places of worship, and retirement;" and having read, they believed. More earnest students consulted bulkier volumes, but found the same opinion expressed. Looked at from an artistic point of view, too, the paintings with which they are decorated were formerly described as poor, meagre, and feeble. To entertain these opinions to-day, however, is to have fallen out of the ranks in the grand march of progress, to be behind the time, and of the old school. Murray's chapter on the catacombs was newly written for 1868, renouncing these views, and substituting for them the newly-observed fact that the catacombs were excavated out of the *trufa granularis*, which material was useless for any other purpose, showing that it must have been selected by the early Christians as suitable for graves, and not adapted by them because it was already hollowed out ready to their hand. Again, the language of the old criticism of the worth and date of the art-work no longer applies. Specimens that were inaccessible and scarcely to be made out have in these latter days been opened up; many others have been found, and a certain degradation from simplicity and excellence to be noted in those examples that are clearly the first steps of Mediæval effort, points out that many works of much richness, freedom, and variety must be of earlier date than those of this stiff and meagre type. And when this poorer style of art is known to belong to the end of the third century, it follows that the earlier specimens must have been painted in days that were close upon those we term Apostolic.

Who is it that makes these discoveries, and comes to these conclusions? As is well known, a Commission of Sacred Archaeology has been directing excavations for some years, and among the members of this Commission were the late Padre Marchi, who published an important work upon the monuments of the primitive Christians, and in other ways gave great impulse to the interest felt about them; and the Commendatore de Rossi, who has given nearly thirty years of his life to a minute examination and classification of the same relics of early Christian art. For the last few years all eyes in Rome have been directed to the appearance of a renowned work by this last-mentioned authority, which was expected not only to recount the proceedings of the society, or the results of them, but to give to the world a narrative of surpassing interest, which his discoveries would enable him to relate. Padre Marchi's work was published in 1841. The twenty-eight years that have elapsed since that date have proved more fruitful than the two centuries that preceded it; and De Rossi's industry has been rewarded with the discovery of six or seven historical monuments of great interest, to the position of which, owing to his intimate acquaintance with all the old records, and, specially, two ancient itineraries, he was able to point beforehand with sufficient precision to lead to a successful search. The Commendatore's work, profusely illustrated, and entitled "Roma Sotterranea," has now appeared, and has been received, in Italian archaeological circles, with much cordiality as well as profound respect. And now Messrs. Longmans & Co. have placed it in the power of the English reader to make himself conversant with the nature of the recent discoveries on sites so indissolubly connected with the fortunes of those who first embraced the new faith the apostles preached, by publishing an admirable condensation of it, with his consent, in the English tongue. They have committed this task of compilation to Dr. Northcote and the Rev. W. R. Brownlow, who have executed it with much fidelity, appreciation, and some, if not quite sufficient, circumspection.

To study these ancient catacombs, where not "cooked," is to take up the history of Christianity from the time and place where the New Testament breaks off the wondrous thread. Immediately we approach them we are transported back to those old times when the bodies of St. Peter and St. Paul were not newly buried; and when many who had listened to their stirring words entranced, were still living. De Rossi speaks positively on this head:—"Precisely in those cemeteries to which history or tradition assigns apostolic origin, I see, in the light of the most searching archaeological criticism, the oracle of Christian art and Christian inscriptions; there I find memorials of persons who appear to belong to the times of the Flavii and of Trajan; and finally, I discover precise dates of those times." There is one inscription known bearing date the third year of Vespasian,

* Roma Sotterranea; or, Some Account of the Roman Catacombs, especially of the Cemetery of San Callisto, Compiled from the Works of Commendatore de Rossi, with the consent of the Author, by Rev. J. Spencer Northcote, D.D., President of St. Mary's College, Oscott; and Rev. W. R. Brownlow, M.A., Trinity College, Cambridge, London: Longmans, Green, Reader, & Dyer, 1869.

i.e. A.D. 72, but no record has been kept of the sites on which it was found. In the catacomb of St. Lucina, however, scratched on the mortar of one of the *loculi*, was found by Boldetti a record of the time of the Consulate of *Sura et Senecio*, which marks the year A.D. 107; and another on marble in the same place recording *Piso et Bolano*, Consuls, A.D. 110; as well as a third inscription which De Rossi considers marks the burial of a Christian within forty years of the time that the body of St. Paul was deposited in the same place. This interesting record runs thus:—

“DORMITIONI
T. PLA. ETVY
CHIO. QVI. VI
XII. ANN. XVIII
MES. XI. D. III
HYNO. LOCVM
MORAVIT. M.
ORRIVS. HELI
YS. AMLOVS
KARISSIMVS
KAIRES. BALE.”

“As a resting-place for Titus Flavius Eutyrius, who lived nineteen years, eleven months, three days, his dearest friend, Marcus Orbes, gave this spot. Etwel, beloved.”

The cemetery of Saint Priscilla, on the Via Salaria Nova, always said to have been dug on the property of the family of Pndens, converted by the Apostles, also presents evidences that confirm the statement of this antiquity. The catacomb of St. Agnes is supposed to be no other than the cemetery of Ostrinians, described by Paurinus, the Augustinian friar, as the oldest of all, “because it was in use when St. Peter preached the faith of the Romans;” and, again, the sepulchre at Tor Marancia is now identified as that cemetery which was formerly called by the name of St. Domitilla, or by that of her chamberlains, Saints Nereus and Achilles, for two inscriptions found there clearly state that the ground formerly belonged to this member of the imperial family. After glancing in succession at the principal catacombs supposed to be of apostolic antiquity, the authors of this summary of De Rossi’s work, thus draw up the facts of the position:—

“The local traditions of ancient Christian Rome have come down to us, partly embodied in the acts of the martyrs; partly in the stories that were told to foreigners visiting the city in the seventh and eighth centuries, and by them committed to writing in itineraries; partly in the ‘Books of Indulgences,’ and in the ‘Book of the Wonders of Rome,’ compiled both for the use of strangers and of citizens; partly also, but more sparingly, in the scattered notices of a few Medieval writers. From a diligent comparison of all these various authorities, it is gathered that some five or six of the subterranean cemeteries of Rome were believed to have had their origin in apostolic times; and in every one of these instances, so far as we have an opportunity of examining them, something peculiar has been either noted by our predecessors, or seen by ourselves, which gives countenance to the tradition. When these peculiarities are brought together, they are found to be in perfect harmony, not only with one another, but also with what we should naturally expect from a careful consideration of the period to which they are supposed to belong. The peculiarities are such as these:—Paintings in the most classical style, and scarcely inferior in execution to the best specimens of contemporary Egyptian art; a system of ornamentation, in fine stucco, such as has not yet been found in any Christian subterranean work later than the second century; crypts of considerable dimension, not hewn out of the living rock, but carefully, and even elegantly, built with pilasters and cornices of bricks or terra-cotta; no narrow galleries, with shell-like graves thickly placed in the recesses, or spacious *ambulatoria* with painted walls, and recesses provided only for the reception of sarcophagi; whole families of inscriptions, with classical names, and without any distinctly Christian forms of speech; and, lastly, actual dates of the first or second century. It is impossible that such a marvellous uniformity of phenomena, collected with most patient accuracy from distant and distant cemeteries on all sides of the city, and from authors writing at so many different periods, should be the result of accident or of pre-conceived opinion.”

Two of the itineraries mentioned as having conveyed useful information to the archaeologist were discovered only about a hundred years ago in the library of Salzburg, and were therefore unknown to Bosio and other writers on the Christian remains after their discovery in A.D. 1578. One of these important guides was written between the years 625 and 638, and the other within a few years of the same date. The first starts from the centre of Rome, passing out through the Flaminian Gate, and passes to the principal roads from one to the other by paths, some of which can be still pointed out; the other follows a similar plan, but is second to it in interest, because the writer does not seem to have actually made the survey himself, but rather to have compressed the descriptions he gives from some larger work; but both of them are useful in containing mention of topographical details concerning the cemeteries before the great work of emptying them of their choicest contents was commenced. A third document that has been useful in pointing out the locality of particular tombs is a list of relics collected

by Abbot John from the various shrines in the catacombs, in the days of St. Gregory the Great, for Theolinda, Queen of the Lombards, which list is written on papyrus, and preserved with some of the relics in the cathedral of Monza. But the chief clue to the success of De Rossi’s labours was the fact which enabled him, instead of rejecting these authorities as worthless, to accept their help. He saw that where St. Damasus and other early popes had been at the trouble to build spacious staircases down to particular spots in the catacombs, would be found the tombs of martyrs that were once visited by pilgrims, for whose accommodation these means of access had been made. Whereas, Padre Marchi avoided such places as bore evidence of having been tampered with in later times, and was always on the look-out for chambers and galleries in their primitive condition as when first hewn out of the rock, De Rossi judged that where the crypts had been changed into sanctuaries, *luminaria* opened out for light, and air-galleries widened, and any other structural arrangements made for the accommodation of numbers, then he stood upon a side of the utmost value. Pope Damasus, too, must not be overlooked for the large share he has borne in handing down a true history of the contents of the catacombs in his custom of renewing old inscriptions, and placing others to mark important sites. His assistance, rendered 1,500 years ago, has been invaluable. The beginning of the fifth century, when Rome was sacked by the Goths, ended the history of the catacombs as cemeteries; and for the next 400 years they were used only as shrines and places of pilgrimage, except in rare instances, when they have been chosen as places of refuge, as when Boniface I. concealed himself for a time in the cemetery of St. Felicitas. The popes during these centuries kept the tombs of the martyrs heightened and repaired, as we may see from entries in the *Liber Pontificalis*. Even after Totila had desolated Rome these were restored, and the services renewed, John III. ordering that oblations, ornate, and candles should be sent from the Lateran Palace for the ceremonies every Sunday. But after the siege by the Lombards, under Astolphus, when some of the graves were broken open and the bodies carried off, Paul I. resolved to remove “the bodies of the martyrs, and confessors, and virgins of Christ” into Rome, and place them in a church he built to receive them, dedicated to SS. Stephen and Sylvester, on the site of the house in which he was born and bred, and which he had then inherited. On this occasion more than a hundred saints were removed, and their names duly chronicled in a list still extant. The succeeding popes endeavoured, however, to rehabilitate the ancient cemeteries with their ancient glories, but without much popular support; for, in consequence of the crypts of the martyrs being destroyed and abandoned, Paschal I. translated 2,300 bodies in July, 817; and this new feature in the history of early Christian relics remained in great favour for some time, the succeeding popes not only translating more, but re-translating those already deposited in Rome. Thus rifled, ruined, and abandoned, the cemeteries that were not near monasteries were one by one forgotten. In those that were so fortunately situated lamps were kept burning as late as the eleventh and twelfth centuries. A pilgrim of the eleventh century noticed the cemetery of St. Valentine, on the Via Flaminia, and another writer mentioned it again in the twelfth century. In the fourteenth century, a statistical account of Roman churches mentions only three that were attached to cemeteries; and by the fifteenth there was only one cemetery that was left open and frequented by pilgrims, which was that beneath the Church of St. Sebastian, called in old documents, *Cemeterium ad Catacumbas*. This title, applying only to the part of the Campagna in which the church was built, just as the circus built in the same neighbourhood by Maxentius, was called the *Circus ad Catacumbas*, has since been indiscriminately given to all subterranean cemeteries over the globe. Except as belonging to that of St. Sebastian, the term is not mentioned in old times, the names in use being *hypogaeum*, *cometerium*, *martyrium*, or *confessio*.

A set of terms, new, yet very old, has to be mastered by those who would understand anything of these ancient burial-places. The little chambers opening out of the narrow passages are known as *cubicula*. An ordinary grave,—that is, a flat oblong compartment large enough to receive a body, hollowed in the sides of the

passages, generally in tiers one above another,—is called a *locus* or *loculus*. When a grave was made large enough to contain two, three, or four persons, it was called *bisomum*, *trinomum*, or *quadrisomum*, accordingly. There are to be seen in many of the *cubicula* graves of a more ornamental type. These consist of a semicircular arch recessed in the wall, below the straight base line of which is sunk the space for the body; they are called *arcosolia*, *solum* being the term in use among the pagans for their funeral urns. Sometimes the recess is found square-headed instead of semicircular: when De Rossi, for the sake of distinction, calls it *sepulcro a mensa*. Burial was called *depositio*, and those who dug the graves, *fossores*, in old writings. We quote the authors’ description of the uses, beyond burial, made of the tombs in the subterranean cemeteries:—

“Those of the *arcosolia*, which were also the tombs of martyrs, were used on the anniversaries of their deaths (*anniversarii*, or birthdays) as altars whereon the holy mysteries were celebrated; hence, whilst some of the *cubicula* were only family vaults, others were chapels, or places of public assembly. It is probable that the holy mysteries were celebrated also in the private vaults, on the anniversaries of the deaths of their occupants; and each one was sufficiently large in itself for use on these private occasions; but in order that as many as possible might assist at the public celebrations, two, three, or even four of the *cubicula* were often made close together, all receiving light and ventilation through one shaft or air-lole (*luminare*), pierced through the superincumbent soil up to the open air. In this way as many as a hundred persons might be collected in some parts of the catacomb to assist at the same act of public worship; whilst a still larger number might have been dispersed in the *cubicula* of neighbouring galleries, and received there the bread of life, brought to them by the assistant priests and deacons. Indications of this arrangement are not only to be found in ancient ecclesiastical writings; they may still be seen in the very walls of the catacombs themselves, episcopal chairs, chairs for the presiding deacon or deaconess, and benches for the faithful, having formed part of the original design when the chambers were hewn out of the living rock, and still remaining where they were first made.”

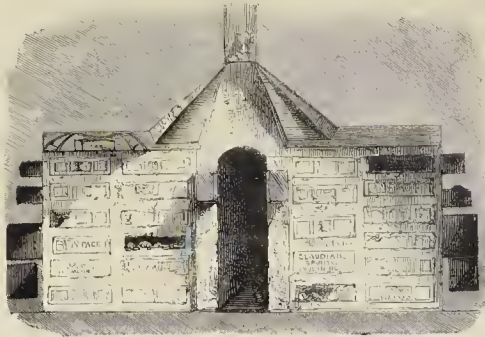
We are enabled to reproduce from the book three views in the catacombs, and the plan of a portion which serves to show the way in which the galleries ramify.

Prominence is given in the work before us to the cemetery of St. Callistus. This, it will be remembered, is that which De Rossi discovered on the Via Appia, after having seen only a fragment of a marble slab, bearing part of the letter R and the syllables NELLUS MARTYR, in the cellar of a vineyard, in 1849. He induced Pope Pius IX. to purchase this and the adjoining vineyard, and in the course of subsequent excavations found the other portion of this slab, with the missing piece of the letter R and the letters CO upon it, which showed him that the conjecture he formed that the tomb of Cornelius, pope and martyr in the middle of the third century, was before him was correct. This tomb he knew from the old writings was close to the cemetery of St. Callistus, in which there was a chapel more famous than most others, as the bodies of the popes in the third and fourth centuries were deposited in it, to which adjoining another chapel in which St. Cecilia was laid. The author of the earliest itinerary we have mentioned, specially mentioned this cemetery as containing “an innumerable multitude of martyrs; first, Sixtus, pope and martyr; Dionysius, pope and martyr; Julian, pope and martyr; Flavianus, martyr; St. Cecilia, virgin and martyr. Eighty martyrs rest here below.” Further excavations were made, in the course of which 121 fragments of one of the Latin inscriptions Pope Damasus put up were found. When put together, and a few missing letters or syllables supplied by the context, this inscription read as follows:—

“Here, if you would know, lie together a whole crowd of holy ones.
These honoured sepulchres enclose the bodies of the saints;
Their noble souls the palace of heaven has taken to itself.
Here lie the companions of Xystus, who bear away the trophies from the enemy;
Here, a number of elders, who guard the altars of Christ;
Here is buried the priest, who long lived in peace;
Here, the holy confessors whom Greece sent us;
Here lie youths and boys, old men, and their chaste offspring.
Who chose, as the better part, to keep their virgin chastity.
Here I, Damasus, confess I wished to lay my bones,
But I feared to disturb the holy ashes of the saints.”

This decided De Rossi that he was in the Papal vault mentioned, ruined indeed, with its approaches blocked up, probably to preserve it from depredators, but still containing fragments among its *debris* of monuments of great interest. In one corner of this crypt, to which access was at first obtained, it appears, down the *luminare*, though one of the ancient staircases has now been restored, is a narrow doorway, cut irregularly in the rock, which opens into a large chamber about 20 ft. square, furnished with a wide lumi-

THE CATACOMBS, ROME.



Section of Chamber in Catacomb of St. Marcellino and St. Pietro, showing lower End of the Shaft of the Luminare, with Dove painted on it.



Interior of a Cubiculum in St. Agnes, with Chairs and Bench hewn out of the Rock.



Gallery, with Tombs.



Plan of Part of Catacomb of St. Agnes.

nare, which enables it to be well seen now. When first found it was filled with earth, which had to be removed, as in other instances, to the surface through this *luminare* or shaft from above. As this work proceeded, and the *luminare*, also full of earth, was emptied, the figure of a woman in the attitude of prayer was deciphered on the wall, below this a Latin cross between two sheep; and below this again, though still in the *luminare*, the figures of three saints. On the wall of the chamber, close to the entrance-way from the burial-place of the popes, was found a painting of a woman, "richly attired, and ornamented with bracelets and necklaces such as might be looked for in a high-born and wealthy Roman bride, and might well be intended to represent St. Cecilia." But this painting, which appeared of seventh-century date, was found to be executed on the surface of ruined mosaic-work; and a niche close by, decorated with a Byzantine head of our Lord, was also noticed to have been previously encased with marble, indicating there had been a renewal of ornamentation, marking a site of high religious interest. This fact, taken in connexion with the circumstance that close to these paintings was a recess large enough to

hold a sarcophagus, and which left but an inch of rock between it and the back of a similar recess in the Papal crypt, and compared with the statements in the documents we have mentioned, led De Rossi to the conclusion that it was in this chamber that the beautiful Christian bride of the martyr Valerius was laid, after three strokes of the executioner had left her to bleed slowly to death on the pavement of her own palace. The legend is related at length in the volume before us. We must pass on to notice two new matters relating to this cemetery, or these cemeteries; for, we should explain, in this neighbourhood there were several Christian burial-places, each complete in itself, and following the outlines of the space of ground above, given for the purpose, but which in course of time have been connected with one another by long passages, so as to make one vast subterranean area. One of these points is a new method of mapping subterranean galleries, invented by Michele De Rossi, the brother of the archaeologist. The writers speak of "a most ingenious instrument" he has devised, by means of which maps of Roma Sotterranea will be as complete as those of any modern city. We shall return to this volume on another occasion.

CANOPIED STATUE OF HER MAJESTY THE QUEEN, FOR BOMBAY.

Our engraving represents a monument which has been executed in this country, and is about to be sent out to India. It is a present from the King of Baroda to the Victoria Gardens, Bombay, where it will be set up, and is the design of Mr. Noble, of Bruton-street. The figure was executed by him, and the architectural part by Mr. Earp, of the Kennington-road. The figure of the Queen is of colossal proportions, being more than 8 ft. in height, seated. Her Majesty is in her full robes of State, with the sceptre and orb—emblems of her dignity,—and is seated on her throne. The figure has a very dignified appearance. The material of which it is made is white marble. The canopy, which is 42 ft. high to the top of the finial, is of white Sicilian marble. It is of Gothic type, and well executed. The background of the interior is slightly relieved with a pale Sienna-tinted marble, enriched with a diaper incised, and an inscribed garter. The pillars on each side of the front are also of pale Sienna marble, richly chiselled. The base is composed of steps, the lowest of which is 18 ft. wide, and 22 ft. deep from front to back.



CANOPIED STATUE OF HER MAJESTY THE QUEEN: VICTORIA GARDENS, BOMBAY.
MR. NOBLE, SCULPTOR.

WELLCLOSE-SQUARE.

Sir,—The reason given by the Metropolitan Board of Works for its late decision in the matter of the proposed Wellclose-square Free Recreation Ground is so curious (if the reports which I have seen of it are accurate), as to require some notice. "The Board cannot recommend any steps to be taken in the matter, as the centre of the square has been sold for building on." This is the decision of London's only guardian of open spaces, the Metropolitan Board, respecting a suggested open space not now built upon, in a quarter of London where the people are so thick that if all London were as populous, the metropolis would contain 14,000,000 souls, and where the people are so poor that they cannot afford to waste the time in walking through the miserable streets to the nearest free recreation-ground, two miles off, for that walk would "cost a meal!"

The noble book of Mr. Robinson on the "Parks, Promenades, and Gardens of Paris," to a review of which book you lately gave such worthy prominence in your ever-gracious columns, had better be burned at once by the common hangman if the reason given for this decision of the Board for the Protection of Open Spaces in London is sound!

W.

THE ANGLO-ROMANO GAS COMPANY.

At a meeting of the directors of this company, held in Rome at the end of last month, to elect a new *gerant* in place of the late Mr. James Shepherd, Mr. Charles Ponchain, who had been with him as engineer for several years, and was expressly pointed to by Mr. Shepherd to succeed him, was unanimously elected. The following address to Mrs. Shepherd, determined on at the same meeting, serves to show the high consideration in which the late *gerant* was held:—

"Noble Signora.—The greatest consolation, under the loss of our dear one, is the esteem and consideration in which they were held by all who chanced to approach them. You may, in the very heavy affliction that troubles you, comfort yourself with the thought that to very few is it given during life to attain to the admiration and esteem that our much-loved Mr. Shepherd deservedly acquired for himself in the minds of all.

Our colleagues, who assembled on the 23rd of last June to consider their loss, charged me to express the feelings of lively grief which they all most sincerely share with you.

The demonstration, therefore, of the moving esteem and regret that they so deeply feel for his beloved memory suggests the erection of a monument in the place where, through him, our business sprang up and flourished.

The fear of preventing the afflicted family from honouring its head as it thinks best, withholds the partners themselves from directing any memorial to be erected in the place where his mortal remains repose.

Will you (noble madam, graciously receive these sincere expressions both of grief and regret, which, through me, the whole company of shareholders desire to show me to remain, madam,

Your humble and obedient servant,

President of the Council of Surveillance.
Rome, July 1st, 1869."

TREES IN KENSINGTON GARDENS.

The treatment of trees in this now invaluable park, has lately attracted much attention. In the *Times*, a letter complains that "a wanton riot was perpetrated in cutting down several of the finest trees (Scottish firs), just as they had reached their prime;" and again in Parliament the question was asked wherefore such spoliation had been done?

Any one used to plantations, or conversant in landscape gardening, and the effect of fine timber trees, would, on viewing the state of Kensington Gardens, say that the full-grown trees are too thick, being in many cases 12 ft., 10 ft., 8 ft., or even only 6 ft. apart; thus grown to a height of 50 ft. or more, without freedom for expansion, the stems are bare, or the branches interlaced, and the natural grace of arborage entirely destroyed thereby. In some parts it is a forest of deformed poles, with branches and foliage mostly on the top; many of them being decayed, and falling each other, from too close proximity. The spaces afforded portions of the gardens are little frequented, as there is in reality nothing picturesque in their aspect; and, in fact, throughout the whole range, great improvement might be assured by cutting away one full fourth part of the deformed timber. This would give room for the survivors to spread their branches, and create a shade, and redeem from desertion the groves of stately poles, so that an agræic wanderer might recline and luxuriate there like *Ulysses*, "sub tegmine fagi."

Now there are in these plantations very few Scotch firs, which are confined to about only one

small acre in extent; where the five decaying trees were cut down, and where there yet remain 28 more of similar growth. This group is anything but ornamental, the stems being bare to the top, which has but little garniture. It may, however, by its hungry aspect, lead attraction to other competing groves, and it is certainly more open than the forested portions.

Many of the trees, being from 100 to 200 years growth, are nearly defunct, some actually so, and many more are partially decayed at the top. The dead trunks ought to be cleared away, and the decayed branches lopped; and, for the sake of improvement, and free growth of the survivors, a selection should be made of the least ornamental of the compacted centenarians for their removal, so as to give place to the free growth and development of this our urban forest.

By such treatment this range of 200 acres of timber trees might be rendered more accessible, agreeable, and certainly more graceful; but some competent landscape gardener ought to have control in the arrangement of all park plantations, if only to insure good taste in the selection of trees, so that places of public resort may not be deformed, as along the Cromwell-road, &c., by rows of poplars, which are the most formal and least graceful.

It is clear that some damage has been done by drainage in several places. A finely-expanded beech tree, which shaded a traverse of nearly 100 ft. near the S.E. angle, is withered; so also others of ornamental growth near to the fountains. Some of these drains were made in compliance with remonstrances from vicinal residents who crossed the ground daily, and complained of the plashy surface beneath the groves. Other deeper drains were made for the Serpentine Waterworks. Now the clearance of unsightly trunks of chestnuts from 200 to 300 years old would give more open air, more freedom of growth, and improved scenery; besides that these now intramural woodlands would be more passable and enjoyable.

T. H. H.

BELLS FOR DISSENTING CHURCHES.

In a former communication published in the *Builder*, of the 17th of April last, I endeavoured to show that churches of every denomination had a full right to use bells. At the same time it was intimated that those bells might be made use of in such a manner as to create a nuisance.

Now, it is known that many Roman Catholic churches in England have each one or more tower bells, while some of them possess a peal of five, six, or eight.

The following statement may, however, be news to most persons. Since the communication referred to appeared, Messrs. Mears & Stainback, have informed me that they have cast bells for three Dissenting places of worship, namely:—

- Trinity (Independent) Chapel, Poplar.—a bell weighing 102 cwt., A.D. 1842.
- Independent Chapel, Hatherlow, Cheshire.—a bell weighing 74 cwt., A.D. 1853.
- Unitarian Church, Totmorden, Lancashire.—a peal of eight bells in the key of F, the weight of the tenor being 14 cwt., A.D. 1868.

I may add that this last is a new stone Gothic structure, at the west end of which is a tower surmounted by an octagonal spire, standing out conspicuously on the hill side. The cost of the building was about 12,000*l.*, the whole of which, it is said, has been paid by Messrs. Fielden, Brothers, who have also defrayed the expenses of the bells and other furniture.

THOMAS WALESBY.

THE THAMES TUNNEL.

The Thames Tunnel, which was opened on August 2, 1843, will be closed on Wednesday next, having thus been a public footway for a period of twenty-six years, less thirteen days. It has been purchased for 200,000*l.* (one-third of its cost) by the East London Railway Company, which line will be completed as far as Wapping in a short time. The new Thames Subway from Tower-hill to Bermondsey (Mr. Barlow's scheme) commenced on February 16th of the present year, is proceeding very rapidly, and, if all goes well, will be opened for traffic in three months' time. Its cost will be under 20,000*l.* The works of the old Thames Tunnel were commenced in 1825. Physical and financial difficulties delayed the opening for eighteen years.

W.

LOW CLASS COMPETITIONS.

Sir,—Allow me to call the attention of your readers to the terms of a competition now pending at a Wesleyan chapel and schools at Doncaster. The requirements are a chapel to seat 1,000, schools for 500 children, many vestries, &c., for 4,500*l.* In the instructions are the following articles:—

"The building committee for the chapel and buildings will pay to the architect producing the design most approved by them the sum of 50*l.*, and for the second best in like manner the sum of 25*l.*, and such designs will become the absolute property of the committee, who may at their option employ either of such architects to carry out the designs, or otherwise."

"If the architect be so employed his remuneration will hereafter be agreed upon, and will include the premium approved design."

"The successful competitor will not be entitled to any prize or payment unless substantial contractors undertake to execute the work at a cost of not more than 10 per cent. above his estimate of the cost, which estimate must be sent in with the plans."

Unfortunately such conditions as these are not unusual in Dissenting chapel competitions, which fact goes far to account for the ugliness of the buildings produced; for it is quite certain that no established architect would compete unless he knew beforehand that it was arranged that the work should be given to him whether successful or not; for, in the first place, the committee will not approve of any design which can be built for the 4,500*l.* in presence of many others much more showy and ornamented that cannot be carried out in their integrity for the money, made by persons who have no established character to lose.

Secondly, it is highly probable, even if the committee should choose a design capable of being carried out for the money, that the superintendence of the building would be given to some local architect (the committee have the power to do so by one of their conditions quoted above), who would thereby get the credit and remuneration justly due to the producer of the design.

Thirdly, if they employed the successful architect, by the second condition quoted above it is evident that they mean to haggle with him for his remuneration, or they would simply say the usual 5 per cent. would be given, about which there ought not to be any question.

The only architects likely to compete on these terms are artful pupils or clerks out of work, to whom 25*l.* for six or seven weeks' labour would be a great object for the best way of surely gaining in this competition is to send in a showy design, which could not be executed for the money, with the object of getting the second premium, as the cost of the second design will not be severely questioned.

My attention was called to these conditions by a pupil who intends competing for the sake of practice; and for young fellows in his position the chances are favourable. The wonder is, that committees cannot see that by such conditions as these they appeal to the very lowest members of the profession, who have neither means nor powers for making good designs, nor character nor position which would render it advantageous to themselves for them to "do" their clients in any possible way.

M. M. G.

A SCHEME FOR THE CHANNEL RAILWAY.

The following is a scheme for the Channel Railway, so that all the traffic is above water. To form a line of rails in the sea, from England to France. These rails are to be laid on arches, embankments, or some other suitable structure. The rails are to be laid far under water, that ships may pass without interfering with them. A skeleton framework of iron on wheels is to traverse these rails; this framework is to reach out of the water, so that the deck or platform on it is free of the ordinary tides. On this is accommodation for passengers, cattle, goods, &c.

The steam-engines to be placed on the deck and motion conveyed to the axes of the wheels by a vertical shaft. The screw-paddle wheels or hydraulic force may be also applied for propulsion.

T. T. L.

TECHNICAL EDUCATION.

Sir,—Will you allow me a small space in your valuable, impartial journal, to make a few remarks, in answer to "Jack Plaster's," on the late conference on the above subject. That much regret was felt that so little interest was taken in that important movement, I have no doubt. The gentlemen who introduced the scheme were trying to do good, but I fear they began at the wrong end. I will give a few reasons why: the first is, the masters in this age require men that can "work,"—not men with learning and skill; as I heard one master say to his men, "that he did not pay them for thinking; they must work, he would think." The second is, that men that spend the whole of their leisure time in study, naturally look for elevation from their present rank; and if you will only look in the advertising columns, you will see the field is overflowing already with (what they term themselves) competent and skilled men, and as there is not one out of every twenty learners in the country that has a foreman; if he has one, it is either a relation or a man that has no more money for it than the man that works; and some masters remark that they have "managed" before without, and they can still. The third is, the artisans are not likely to spend their time in learning, as there are a great many in the building trades (in London especially) that have not served one hour's apprenticeship. The way it is done is this; they reach about the age of twenty (a porter, perhaps, previously); they get a few shillings' worth of tools, and get a job in some building (they never go to a shop for a day), and "they do as others do." Then they do what they call "squaring" the foreman; that is, they give him 2*s.* or 3*s.*, and sometimes even 5*s.*, to stop on the job; and if there are too many on the job, it is these men that stop, as the dishonesty of the foreman keeps them in preference to others (however good workmen they may be), because, you know, it elevates his wages a great deal if there are five or six of this class of men, and that is a consideration to him. The fourth is, the masters have "managed" before without technical education, so they do not trouble themselves about it.

Indeed, I could give a great many more reasons, but I have almost taken too much space already; but I wish to suggest a scheme to which I hope you will give a helping hand. Skilled workmen ought to go through an examination from the same as some professions; and if a building were hired or erected, and workmen go to work there under a honest and competent person or persons, and a certificate

we got a sort of an anachronism, at the best, it discourages persistently shams of materials workmanship, and which has in this way an immense amount of good to art generally, and to architecture in particular. But since we prefer to see our church walls in order divested of plaster, and our woodwork of it, we must not, I think, reject or eliminate the materials altogether as useless shaminations. There has been an abuse of those materials in making them represent other materials, this must be looked upon as a misapplication of the properties and capabilities of plaster paint, and not as a reason for their being rejected shams or "abominations" in themselves.

A great mistake, as the writer of the article states, is in making plaster, for instance, do twice as a durable material, and in this light depending on it the design and artistic labour of plaster stone or wood. In the matter of external cornices and internal decoration generally a mistaken conception of the qualities and uses of plaster must be apparent. Running, or simple casting are the only methods ultimately sanctionable in using this material ornamentally. The first is perhaps the simplest mode of applying plaster to the upper angles of cornices, and if the members are artistically rounded with ample rests or plain surfaces for a relief of the eye, "run" cornices are as effective as those cradled down and blocked or dilapidated. The introduction of modillions and blocks is certainly indefensible, because it gives a cornice a constructional importance which a plaster cornice cannot possess, and it gives to plaster itself an assumption of cohesive strength which is false. The method suggested in this article on this material is one that must ultimately take the place of the flimsy and meaningless "agglomerations" of plaster, and enrichments that now find admittance even in first-class residences and public buildings erected from architects' designs. The plan suggested I have never thought of,—in fact, I do not see why the splayed ornament in the angle hollow of cornices could not be made of perforated wood out of the design intended, which should be always more or less conventional.

The dispersing suggested to the surface of things would vastly relieve the monotony of whitened plainness that now usually prevails in ordinary houses and buildings. Till a material end yielding and tenacious than plaster be found, we must accept that as a vehicle for finishing our walls and ceilings, and as a fire-proof and non-conductive medium of some value. We might extend the same argument to paint as preservative material, though it is a question whether it should be employed representatively in architecture at all, but rather conventionally as a decorative sense.

G. HUSKISSON GULLAUME.

PROPOSED DOCK IMPROVEMENTS FOR GLOUCESTER.

Two schemes of great importance as regards the trade of Gloucester, the Bristol Channel, Dean Forest, and South Wales, are now engaging attention. A plan of improvement has been proposed by Mr. Clegram, the resident engineer, and endorsed by Mr. T. E. Harrison, a London engineer, for an extension of the Gloucester and Berkeley Canal, from a point one mile above the present outlet to Holy Hazle Pill, three-quarters of a mile below. By an outlay of 150,000*l.*, according to our authority, the Gloucester Chronicle, a new entrance can be provided, with a tidal basin 700 ft. long and 300 ft. wide; inside this, a dock 2,000 ft. long and 355 ft. wide; and an extension to the existing canal 700 ft. in length, 150 ft. in width at the top, and with a depth of water of 19 ft. Thus accommodation would be given for the largest ships that can navigate the estuary of the Severn from King's Head to Sharpness. This scheme is regarded as offering the greatest improvement of which the port of Gloucester can at any time be capable. The Board of Trade has been consulted, and it is understood that the president, Mr. Bright, approves the plan. As the site is only some four or five miles from the trunk line of the Midland Railway, the docks and the line might easily be brought into communication.

The other, and somewhat kindred, project is the connection of the existing railways, east and west of the Severn, by a direct line, instead of having to go all round by way of Gloucester. A plan has been suggested for making a subway from the Severn and Wye Railway to a point

near the proposed docks at Holy Hazle Pill. This, it is said, could be done without interference with the traffic on the river, and it would materially lessen the distance between the metropolitan and the Dean Forest and South Wales coal-fields, while the result of a recent survey is said to be the calculation that by the construction of the new docks and of the subway, the Government mineral and woodland property in Dean Forest, 25,000 acres in extent, would be improved to the value of 40*l.* an acre, or in all 1,000,000*l.* sterling. The cost of the subway is set down at 250,000*l.*, not more than a third of the cost of the gigantic bridge at Oldbury, and not greater than that of the Newnham bridge. It would connect the South Wales and Midland systems, and would afford a constant export trade in coal and iron from the contemplated docks at Holy Hazle Pill. If the docks are constructed and the subway is made, ships will be enabled to load at Holy Hazle Pill, and the consequent improvement in the value of the Forest of Dean coal-field will be enormous. It is, therefore, stated that the Office of Woods and Forests is willing to recommend a loan for the construction of the subway.

The Gloucester and Berkeley Canal Company, it is said, will shortly decide whether they will apply to Parliament for powers to carry out so much of this great work as they are immediately interested in.

CHURCH-BUILDING NEWS.

Hertford.—Christ Church, Port Vale, Bengoe, has been consecrated. The style is Geometric Decorated. The church consists of nave, chancel, south aisle, north and south transepts, organ chapel, and vestry. The plan is cruciform, and is arranged to admit of lateral extension by the addition of an aisle on the north side, and the elongation of the north transept. There are two entrances, viz.,—one through a porch on the south side, and the other through a moulded doorway near the vestry on the same side, which also forms the entrance to the vestry. At the north-west corner of the nave a bell-turret of characteristic design rises out of the buttresses, which are carried up of greater width and projection than the other buttresses to form a base for the superstructure. The lower part is carried on disengaged circular shafts placed in the angles formed by the junction of the buttresses. These shafts have moulded bases, hands and carved caps from the top of which the turret begins to rise, the eaved sides being gradually enlarged by corbelling out until the turret forms an octagon on plan. Above the gable of the nave roof, the bell-story is formed by a light arcade composed of stone shafts, with moulded bases, and carved caps over which are trefoil-headed openings on each of the eight sides surmounted with carved gables, and a stone spire with an ornamental cone at the apex. The south window is a combination of two two-light windows under a single arched head filled in with tracery: the panels and caps of shafts are carved. The chancel has an apsidal end divided into bays, with single light windows. The roof is formed with moulded arched ribs, stained and varnished, springing from stone shafted corbels, and the intermediate spaces, or panels, are carved or coloured blue. The chancel arch is of large span, and lofty in proportion; the jambs have banded shafts in the angles, with carved caps, carrying a moulded arch. The nave and other roofs are open timbered, and are formed with principal rafters, and carved, moulded ribs springing from stone corbels. All the timbers are wrought, and covered with boarding and felt laid horizontally, the whole being stained and varnished. The seats are low, open benches, with cut bench ends, stained and varnished. The aisles are paved with black and red tiles laid in patterns diagonally. The windows generally are glazed with green cathedral glass, and chancel windows with rough plate-glass, with *flow-de-lis* pattern or quarries. The whole of the stone carving has been executed from natural examples. The architect was Mr. Thomas Smith of Hertford, and the works have been carried out under his superintendance by Mr. Harris, the contractor.

Barcheston.—The ancient Church of St. Martin, at Barcheston, is now in course of restoration, from plans furnished by Mr. Ewan Christian, of London. In the work of restoration as much of the old work as possible will be retained. New roofs to the chancel, nave, and two aisles will be provided, and new seats throughout. The work will be done by Mr. Alfred Groves, of Milton, near Chipping-Norton.

Avon Dassett.—The new parish church has been consecrated by the Bishop of Worcester. The new building consists of a nave, 44 ft. long by 17 ft. in width; north aisle, 44 ft. by 10 ft.; entrance porch to the south side, western tower, and chancel, 34 ft. by 16 ft. On the north side of the chancel are the organ chamber and vestry. The style is Early English. The chancel, which is on the site of the old one, is laid with Godwin's tiles. The chancel stalls and seats are of carved oak, most of which was given by the late Rev. W. C. Risley, of Deddington. The recesses of the church is a restoration of the old arcade, which was of the transitional date between the Norman and the Early English. The old church was in a very ruinous state, and very little of it was worth retaining; but that which was of any consideration has been replaced in the new church. Among the things retained is the tomb of an ecclesiastic of the thirteenth century, which, under a fourteenth century canopy, has been replaced in the chancel. The west window of the tower, too, is one of the retentions. The tower and spire rise to the height of 125 ft. The principal entrance to the church is by a porch, which is about 25 ft. above the level of the road, and reached by a flight of temporary steps. It is intended to erect oak gates, in keeping with the style of the church, at the entrance to the churchyard. The church is roofed with brown Staffordshire tiles. The seats are low-set benches of varnished deal, which can be moved about at pleasure. The roof internally is of plain tile, while that of the nave and aisle is of Baltic timber, neither stained nor varnished. The body of the building is laid with red 6-in. Staffordshire tiles. The font is of Purbeck marble. The warming of the church is accomplished on Mitobell's warm-air principle; that is, small fire-pits are placed at intervals under the floor, connected with a flue, which has been carried out by Mr. Hudson, of Leamington. Through the instrumentality of the Rev. W. C. Holbeck, who, besides, has contributed a great portion of the stone for the building, a peal of five bells has been obtained. They were furnished by Mr. Blews, of Birmingham, who also presented the altar candlesticks, which were designed by the architect. Towards the entire cost 2,400*l.* have been subscribed.

St. Michael's, Radnorshire.—The parish church of St. Michael's has been restored and reopened. The fabric had been condemned as dangerous some nine or ten months since, and had consequently been shut up, and when the work of restoration was commenced, so neglected had it become, that ferns and lichens were growing in almost their native wildness in many a crevice within. The building itself is one of those little "mountain churches" one is accustomed to stumble across on our hill sides. It is in the Early Pointed style of architecture of the thirteenth century, and consists of nave, chancel, south porch, and tower, the latter a massive structure with walls thick enough for a "donjon keep," or for the confinement of a state prisoner. Its restoration is now completed. The architect has copied as far as practicable the original structure in all its details. The outside coating of whitewash has disappeared, the joints of the stones have been repointed, a new roof with ornamental ridge tiles and iron finials has been put on, and a new porch has been erected. Inside the building has been treated in the same manner. The walls have been scraped and cleaned, new windows (Early Decorated) have been inserted. The roof of the chancel has two depressions, the second, or lowermost, over the sanctuary being canopied like Brilley Church, close by. The chancel originally possessed a double screen, and the roofs were celled; they are now open, and the old wood-work has been allowed to remain wherever practicable; the rafters of the nave were all pretty sound, but in the chancel nearly all the woodwork is new, stained dark to match old as nearly as possible; the whole, including the screen, has been newly varnished. The old "ramshackle" pews have been swept away, and seats of varnished pine placed in their stead, free and unappropriated. There is a new pulpit wrought in Farleydown stone, and pierced and fitted with an oaken reading-stand. The font is a plain, solid specimen of hollowed stone. The architect has given a small east window of stained glass.

Huttoft.—The parish church at Huttoft, which was in a very dilapidated state, has, through the exertions of the vicar, the Rev. G. Bryan, been restored, and it is now reopened for divine service. The fabric was in a sad state, involving

many years of neglect. The upper portion of the chancel arch was blocked up with masonry, and a ceiling thrown across the chancel; and two or three windows were likewise blocked up, and the stone mullions of others had given way to the domestic lead and iron work of modern times. The roof steps had been hidden with mortar. The north wall was in a dangerous condition. The mullions in the six oct windows were replaced with wood casements. The floor was partly common brick and partly hardened mud; and the gallery, though useful, had an unseemly appearance. The exterior of the building had a somewhat motley appearance by the decayed stonework being in various places repaired with bricks, and the roof of the porch was covered with red tiles, &c. There has been, however, a restoration in all of these particulars, and the entire restoration fund was about 600*l*.

Whaddon, Cambs.—The parish church of Whaddon has been reopened. With the exception of the tower, the edifice, which is in the Gothic style, has been completely restored: the outer walls have been refaced with pebbles, edged with stone, and new windows and a porch added; the walls of the interior are replastered, and the stone pillars renovated; the roof of the nave has been restored, those in the north and south aisles being new, as also that of the chancel. The floor is paved with red and black encaustic tiles, worked in large squares. A new lectern, reading desk, and carved oak pulpit have also been supplied; and the seats are for the present temporary, in consequence of the want of funds, which is also the cause, we understand, of the tower not being restored in correspondence with the remainder of the building. The lead on the roof has been reset and laid afresh. What has been done in the chancel will be defrayed by the Ecclesiastical Commissioners, who are the patrons of the living; that part of the edifice has had new oak choir-seats placed in it, a new altar-rail, &c. The communion-table was covered with a purple velvet cloth, with gold fringe; and the reredos was adorned with crimson cloth, above which appeared a three-light stained glass window, the gift of a gentleman in the parish. Beneath the new organ-chamber is the furnace for the hot-water apparatus, which is to warm the church when necessary by means of pipes traversing the various walls; the pipes are $1\frac{1}{4}$ in. diameter. Two coils of pipes, covered with iron pedestals, are placed at the tower end, and in the chancel the pipes are covered with iron trellis work. This portion of the work has been executed by J. L. Bacon & Co., of London. "The poor man's window" was contributed by the poor of the parish; it is in stained glass. The cost of the restoration is estimated at about 2,300*l*. The builder employed was Mr. Brown, of King's Lynn, and the architect Mr. Ewan Christian, of London.

Manston.—The chancel of the parish church has been restored and heated at the expense of the rector, the Rev. E. Anderson.

Milborne Port.—The parish church has been re-opened for public worship, after having undergone considerable alteration and enlargement. The building had been allowed to fall into a crumbling dilapidated condition in many parts, in addition to which there was scarcely adequate accommodation for the parishioners who attended divine service. The cost of the work done amounts to about 4,000*l*. Mr. Alfred Reynolds of this place, was the builder employed. The work has all been carried out in accordance with designs prepared by Mr. Henry Hall, of London, architect. The nave has been extended 28 ft., with two additional bays, whilst an aisle has been constructed on the north side, where an unsightly excrescence only before existed. Added to these improvements is a new roof, whilst the stained windows and ornamentation of the interior throughout give to the place quite a different appearance from heretofore. The foundations of the structure are of forest marble, which was brought from Toomer-hill, near Milborne Port, and above the string-course the building is of local stone, with portions of the old material worked in, and the dressings are of Ham-hill stone. Two perpendicular windows have lately been inserted in the chancel aisle, with buttresses unmounted by foliated pinnacles. The buttresses are as yet unfinished, the blocks left being no doubt intended to receive ornamentation. A window has been inserted in the east end of the chancel, beside which is a small lancet-headed window of Early English character. The south transept was rebuilt a few years ago, and only a partial restoration has now been found necessary. The large square tower stands

on four late Norman tiers, and is hatted, with pinnacles at the angles. The roof of the nave is covered with slabs of local stone, with a cresting of Ham-hill.

Hull.—The foundation stone of the new church of St. Silas has been laid, in the parish of St. Paul. The site of the building is in Barnston-street, on an open space of ground in front of the Kingston Cotton Mills. The church will comprise a nave, with north and south aisles, chancel, vestry, organ chapel, and tower. The nave will be divided into five bays by circular columns of Bath stone, with wrought moulded caps and bases, and having brick arches set in pattern. The chancel will be 26 ft., by 23 ft., terminated octagonally, and will have three two-light windows. The altar will be under the centre window, and be raised five steps above the nave. The exterior of the church will be of brick, with stone dressings. The tower will be opposite the end of Lincoln-street, and form a principal feature in the design, and is intended to be surmounted with a elate spire, bearing wood Lucerne lights, of ornamental design. The building is designed in the first period of Gothic architecture, and is to be carried out under the superintendence of Mr. Samuel Musgrave, architect. The contractors are—for brickwork and plastering, Mr. Muegrave; carpentry and joinery, Mr. Sissons; stonemasonry, Mr. Sweeting. The Clerk of the Works is Mr. Hull. The estimated cost of the building is upwards of 3,000*l*.

Battle.—St. Mary's Church has been restored and opened for divine service. The architect was Mr. W. Butterfield, of London, and the work has been carried out by Messrs. Gaskin & Godden, of Canterbury, at a cost of about 4,000*l*. The work has not yet been thoroughly completed; the tower is as yet untouched, and it is estimated that about 1,000*l*. are needed to complete the work. The Lady Chapel has been entirely restored, and the eastern portion screened off to form a vestry. The east window has been removed, and replaced by three lancets. The roof is for the most part new, and the exterior walls have been completely restored, excepting those of the tower. In the interior various changes and improvements have been effected. The old gallery has been removed, and the western arch thrown open. The floor of the church has also been lowered throughout, rendering the interior more imposing in its height. The old-fashioned pews have been replaced by modern seats, composed of oak, and the interior has been fitted up with apparatus for heating by hot water. Seats are to be appropriated in all parts of the church, but every third bench is to be for the free use of the parishioners. The sanctuary and chancel are paved with Minton tiles, and the tiles of the nave are by Peake. The carving of the foliage around the pulpit is by Mr. Barp, of London. Two new bells have been provided by extra subscription among the parishioners, and a new organ has been built by Messrs. Bevington & Son.

SCHOOL-BUILDING NEWS.

Walsall.—The memorial stone of a new Baptist school, which is to be erected near the corner of Stafford-street, in this town, has been laid. Want of accommodation in the chapel and the school, it seems, has been felt for years; and last year it was resolved to erect new school-rooms to accommodate 700 children, and to renovate and enlarge the chapel so as to seat 250 more persons, or in all to seat 750 people. The estimated cost of the whole, when finished, is over 1,600*l*. During the time the buildings are in progress Divine service will be held in the Temperance Hall, Freer-street. The designs of the new schools have been prepared by Mr. Ingall, of Birmingham, architect; and the building will be erected by Messrs. Trow & Sons, of Wednesbury, builders. The schools will be of a very plain character, and are to be built of brick, with stone dressings, and very little ornamentation of any kind.

Stoke.—The corner-stone of a new Sunday School building attached to the Baptist Chapel at Stoke-upon-Trent has been laid. The new building will accommodate about 400, with rooms for infants, senior children, and adult classes. The plans had been prepared by Mr. E. Penn. Mr. Natban Barlow, of Stoke, is the contractor. The entire cost of the school, including heating-apparatus, gasfittings, and furnishing, will be about 600*l*., which, with alterations necessary to be made in the chapel, will amount to 660*l*.

Sandy (Bedford).—The new national school, which have been just erected at Sandy, through the exertions of the rector, the Rev. J. Richardson, have been opened with some ceremony. The school building is situated on the outskirts of the town, and within easy distance of the church. The halls, of which there are two, are at right angles, and severally measure internally 56 ft. by 20 ft., being calculated to accommodate 150 pupils each. The main block is flanked on either side by residences, one for the master, and the other for the mistress, the whole of the premises occupying a site of about half an acre, inclusive, however, of an area in front, which is to be devoted to the purpose of a play-ground. The estimated cost of the entire erection, independently of the site, which has been given by the rector, amounts to 1,700*l*. The architects were Messrs. Haherston & Pite, of London; the builder, Mr. Field, of Sandy. The style participates of the Gothic character.

Stroud.—A school, with service-room, has been built at a cost of 500*l*. The architect was the Rev. W. H. Lowder, whose quaint designs have been carried out by the contractor, Mr. Restall, of Biele. The dimensions of the building are—length, 61 ft.; breadth, 18 ft.; height of walls, 11 ft.; class-room, 16 ft. square, and of the same height. The whole cost of the building, and also of a teacher's residence adjoining the school, was defrayed by Mrs. Kehle, of Biele.

PROVINCIAL NEWS.

South Shields.—The Post-office authorities have decided upon taking premises in Dean-street, adjoining Messrs. Wright's new buildings, for the purposes of a post-office, and the necessary arrangements will at once be made for effecting the required alterations. It is intended to pull the old building down, and upon its site rear a new erection, with all requisite accommodation for carrying on the postal business.

Epworth.—During the last two or three years the market town of Epworth has greatly improved in appearance. Many unsightly and inconvenient houses have been pulled down, and new habitations erected in their places. The boundary wall around the New Connexion Chapel and the new Temperance Hall, in High-street, have improved the appearance of the street, which a short time ago was considerably widened. A double row of flags is being laid on a part of the footpath, and the channel has been relaid. The Gas Company are carrying their main pipes along the whole length of the town, and the town will be lighted during the ensuing year, not partially, as heretofore. The town will be brought under the Lighting and Paving Act, and not be dependent on voluntary contributions, or a voluntary rate. Other improvements have been effected; and what is now most required is a new and commodious market-house. As soon as a suitable site can be secured, the building will be erected. Epworth being essentially the capital of the Isle of Axholme, a market-hall is necessary for the accommodation of those attending it. Amongst other improvements is the renovating and repairing the parish church, and others are in contemplation.

FROM SCOTLAND.

Glasgow.—The erection of the new university at Gilmorehill is steadily proceeding. Outside the building, the ground fronting the eastern elevation is being brought into order and neatness. It is now about two years and a half since the erection of the new university was commenced, but it is not expected that the halls will be ready for occupation before autumn next year. The eastern front, which is to be used as class-rooms, is the furthest advanced portion of the buildings. It has been under roof for several months, and the internal work is now being carried out. The octagon laboratory, at the south corner of the eastern front, is in the same forward state. The south front, forming a continuation of the students' class-rooms, has also been roofed, with the exception of the wings, between which is the central tower. These wings are, however, nearly ready for being covered over. In the north front, set apart for the library and museum, &c., the angle towers have been roofed, with the exception of the north-west one, which is not yet so far advanced. The library is externally complete, and the erection of the museum and reading-room has been carried to the commencement of the second floor. The founda-

plans for the great hall, which is to connect the northern and southern divisions, and to form the central space into two quadrangles, are nearly completed, as are also the foundations for the carriage-drive entering the great hall from the north. The erection of the dwelling-houses for the professors, to the west of the university, is also making progress. There are here a range of seven houses, three stories in height, and in addition, there are four in the north front, and two houses, including one for the principal, at the south end of the west block. Provision is being made for the heating and ventilation of the various halls and class-rooms.

Books Received.

Wrought-Iron Bridges and Roofs. By W. Cavertorne Uwin, B.Sc., O.E. London: Spottiswoode, 1869.

This volume contains a series of lectures delivered at the Royal Engineer Establishment, Chatham, to the officers of the Royal Engineers under instruction there; and they were afterwards printed at the press of that establishment for private circulation. That they were afterwards printed to those for whom they were originally intended we have no doubt, and they are now offered in a revised and rearranged form to a wider circle of readers. The author assisted Mr. William Fairbairn in some of his many researches, and the work is dedicated to him. It is illustrated with examples of the calculation of stress in girders and roof trusses by graphic and algebraic methods. The author has restricted the use of symbolical expressions as much as possible; and the work holds an intermediate place between practical and theoretical treatises.

VARIORUM.

“CHANNEL TUNNEL: Statement and Reports. Savill & Co., Printers, Chandos-street.” In the form of a pamphlet we have here a statement of the executive committee, with engineer’s report, and diagram; also address presented by the committee to the Emperor of the French, at an audience on June 17th, 1869; and report of the special commission appointed by the Emperor to examine the project.—“On the Supply of Animal Food to Britain, and the Means proposed for Increasing it, by Wentworth L. Scott, F.R.S., &c. London: Sampson Low & Co., Fleet-street.” This is a reprint of a paper read before the Society of Arts in February of last year, and noticed by us at the time.—“The Duties of a Royal Engineer Officer in Time of Peace, for the Organisation of the Staff of an Army. Book, Paternoster-row.” A wide range of details is comprised in this pamphlet. It deals *inter alia* with the position and duties of surveyors and clerks of works, in relation to the officers of the Royal Engineers, and suggests various reforms. It deserves to be read.

Miscellaneous.

Compensation.—An arbitration has been held before Mr. George Pownall to assess the compensation due by the Midland Railway Company to the Duke of Norfolk, for land required to be purchased from his Grace between Heeley and the junction with the Sheffield and Rotherham Railway. The claim was divided into freehold land not on lease, severance, reversion of land, and compulsory sale. These items the advisers calculated at 76,215*l.* altogether. The witnesses summoned on behalf of the company made the amount 41,371*l.* The award of Mr. Pownall has now been made, and it amounts to 47,333*l.*

Compensation Gate and Door Closer.—An invention has been patented by Messrs. P. P. & J. Nimmo, of Edinburgh, for closing either the heavy doors of banks, public buildings, churches, &c., or the interior doors of dwelling-houses, as well as garden and other gates. The power by which it acts is obtained from balanced weights. As with most other door-closers and springs, when fitted, it is placed under the heel of the door, and forms the lower hinge, on which it turns. As the door moves on its hinges in opening, a pinion, fixed on a vertical stand or spindle, engages with a curved rack or lever, and lifts a balance-weight. On the door being released, this weight falls, and brings back the door by the same means.

New Masonic Hall, Sunderland.—The foundation stone of a new Masonic Hall has been laid in Park-terrace, Sunderland. The total estimated cost of the building is a little over 1,500*l.*, which will be provided by the Sunderland Masonic Hall Company (Limited).—The design of the front elevation shows a white brick building, with stone dressings, in harmony with the remainder of the buildings in the row, which faces the new Park. The front will be pedimented with three tiers of three light windows. Above the second, or ground-floor window, is a projecting balcony opening out from the club-room on the upper story. The principal entrance is at the side. Ascending by a flight of seven steps, there is an Ionic portico, with columns on each side, and from the portico three steps lead to the entrance-hall. From the entrance-hall is a descent by a flight of steps to the basement floor, in which is situate a kitchen 24*ft.* by 13*ft.*, and 13*ft.* in height, in which will be a large cooking apparatus, capable of providing for 150 people. Immediately behind the kitchen is the refreshment-room for the use of the brethren, 25*ft.* by 42*ft.*, and 17*ft.* in height. Here the Masonic dinners will be held, and this room can be let for meetings of Free Gardeners, Foresters, Oddfellows, and other kindred societies. It will hold comfortably 150 people. On the ground-floor, in the front of the building, is a waiting-room of the same size as, and immediately above, the kitchen, and 12*ft.* in height; this will be subdivided into lodge nights for Masonic purposes. Two double doors, one on each side of the fireplace, open from this waiting-room to the lodge-room immediately behind. The dimensions of this room are 25*ft.* by 42*ft.*, with a height of 21*ft.* It will be ornamented with Corinthian pilasters and tall Corinthian columns. At the east end will be a raised semicircular dais, ascended by three steps, and ranged round the semicircle will be placed seven chairs in the form of stalls. The room will be lighted with gas, and ventilated by the patent ventilating sun-lights, and it will not be used for any other than Masonic purposes. Above the waiting-room is the club-room of the same dimensions as the one beneath. The building has been designed by Mr. John Tillman, architect, and will be carried out by Messrs. T. & A. Cooke, contractors for masonry; Mr. Thomas Armstrong, for joiners and carpenters’ work; Mr. Thomas Atkinson, for plumbers and smiths’ work; Mr. Danber, for slating; and Mr. Thos. Goddardson, for painting.

Improved Action in Pianofortes.—It is surprising that the piano should still be defective in its action, but such is the fact, and therefore improvements in it are of interest to every household. The space allotted at the South Kensington Museum for the exhibition of musical instruments, in which are combined the latest improvements, is at the present time crowded with many specimens. Prominent amongst these is a piano fitted with a new check-repeating action. The improvement consists in a particular position and action of a spring and loop, and in forming the “bopper” with an incline at the top, so that it may press on the front of the notch after escapement has taken place. The results obtained by these means are considered to be good, being a light and elastic touch, and instant repetition. The inventor, Mr. John Brinsmead, has patented this improvement throughout Europe and America.

Fire from the Sun’s Heat.—On Sunday afternoon a fire was observed in the upper part of a dwelling-house, occupied by Lieutenant Sutcliffe, in Park-road, Manningham, near Bradford. A few buckets of water extinguished the fire, which was almost confined to the wooden spouting running under the eaves. The heat sent out for a short time was so intense that a considerable portion of a leaden conductor was melted down. The fire was found to have been caused by the ignition, under the sun’s rays, of a couple of sparrow’s nests, which were just beneath the Welsh slates.

The National Cottage Hospital for Consumption.—On the 28th instant the Princess Louise will lay, in her Majesty’s name, the foundation-stone of the second pair of buildings of the National Cottage Hospital for Consumption and Diseases of the Chest, at Ventnor, Undercliff, Isle of Wight. Nearly 100 noblemen and influential gentlemen interested in the institution are announced as stewards for the ceremony and the luncheon, at which the governor of the Isle of Wight, and president of the hospital, is to preside.

West Derby and Walton Sewerage.

The Home Secretary has at last decided not to sanction the West Derby Board’s scheme for discharging their sewage into the river Mersey. He recommends the West Derby and Walton Boards to join and carry out a scheme for utilising the joint sewage, under the provisions of the 1867 Sewage Utilisation Act, “on the broad grounds that sewage should, if possible, be utilised, and that the pollution of even so considerable a stream as the Mersey by the discharge of sewage should be avoided as far as possible.” The proposed junction was recommended in the report to the Walton Board by Messrs. Reada & Goodison, on the disposal of the sewage of both townships, nearly eighteen months ago. Both Walton and West Derby are moving in the matter, but West Derby rather unwillingly. It appears from the proceedings of the West Derby authorities that, in consequence of the defective sewerage, Carr-lane has been in a most unsanitary condition for the last twelve months, and there has been fever there. The local health committee are of opinion that the easiest and best plan of remedying the evil, without hardship to the owners, would be to drain in a natural line at the back of the houses in a ditch. The district of the Dog and Gun abounds with nuisances of all sorts. The washing of the clothes of many of the Liverpool people is done in that locality, and fever has thereby been imported into Liverpool. The water is also contaminated, and well adjoining some wet middens is being sunk deeper, and more poison thereby obtained.

Opening of the Stratford Town-hall.

The new town-hall just completed for the use of the local board and parochial and general officers has been inaugurated by the Lord-Lieutenant of the county, Sir Thomas Western, bart., amid great rejoicings. The building is in the Broadway, the principal thoroughfare. It is Italian in style, freely treated, with statuary surrounding the principal entrance, representing Justice, Mercy, Art, Commerce, Fortitude, and Temperance. Two cupolas rise from the centre of the building, the vane reaching 100*ft.* from the ground. The lower portion of the building is rusticated. The entrance-hall is decorated. Over the entrance to the vestibule is a balcony, with red granite pillars. The vestibule is paved with Milton’s tessellated pavement, and from the vestibule a wide staircase leads to the upper rooms. The rooms in the basement are devoted to the Local Board of Health, parochial and local purposes, the board-room being decorated. The assembly-room, which can be used for public meetings, entertainments, or vestry meetings, is 50*ft.* wide by 75*ft.* long, and 30*ft.* high, with an orchestra at one end, and an alcove at the other. The decorations were carried out by Mr. Boobinder, in carton pierre. The building contains about 30 rooms, and has been erected from designs supplied by Mr. Lewis Angell, surveyor to the Local Board, and Mr. John Giles, of London. Mr. Ennor is the builder.

Congress of Trade-unions at Birmingham.

The list of papers to be read at the approaching congress of trade societies is being rapidly filled up. The Dublin Association of Trades will contribute a paper on “The Justification of Unionism.” The Manchester Trades Council has promised two papers—one on “The Hours of Labour,” and another on the question, “How far will Co-operative Production and Industrial Partnerships assist in settling the conflicting interests of Capital and Labour.” Mr. Heath, of the Amalgamated Glass cutters’ Society, will treat on “The Limitation of Apprentices.” Mr. A. Walton, Brecon, who represents a large trade association in South Wales, will handle the subject of “The Direct Representation of Labour in the House of Commons.” Glasgow, Sheffield, Leeds, and Newcastle will also be represented. The conference will open on the 23rd of next month.

New Church at Highbury.

The foundation-stone of the permanent church of St. Augustin, Highbury New Park, has been laid in the presence of a large assembly, by the vicar of the parish of St. Mary, Islington. The church, which is to be in the Gothic style, will cost 10,000*l.*, and be capable of seating from 1,100 to 1,200 persons. It is being built for the Rev. Gordon Calthrop, who has been labouring for the past five years in a temporary iron church close by the present building. The site on which the building is being erected was given by Mr. Henry Rydon.

Discovery of British Skeletons, Pottery, and Implements, under a Church.—About a month ago it was announced that Sir Tatton Sykes, bart., had razed the old Norman church at Fimber, to erect another in its stead, and that from under the western tower, and from beneath the floor of an earlier church (which seems to have been burnt down) were taken two urns, a flint axe, various flints, animals' bones, &c., leading to the conclusion that both churches had stood upon a tumulus. A day or two ago further finds confirmed this conclusion. At 35 ft. to the east of the urns named was a British skeleton, which the men destroyed. On hearing of this Messrs. Mortimer took up the work, and soon discovered a deeper burnt burial, part of which had also been removed. There were no relics. In going down through the forced clay (previously supposed to be in a natural position, but now found to be full of handstruck flints), Messrs. Mortimer first found in the rubby chalk beneath the clay the butt-end of a large and finely-formed leaf-shaped arrow-head of black flint. At a depth of 3 ft. into the rock the bottom of an oval grave was reached, on which lay the skeleton of a medium-sized adult in the contracted British fashion, the head being to the north-west. Under the body was a pavement of flat stones. Before the face of the skeleton was a very elegant "food vessel," and above the head were three small flint flakes. The urn is covered by alternate lines of hold coniform and herring-bone impresseions, which delicate lines of herring-bone work cover the whole interior of the lip. The tumulus being made of clay suggests an origin for the curionemeres which yet exist in an undudened capping of purple clay in Fimber village.

Chatham Dockyard.—At the recent visit of the Society of Engineers to the Chatham Dockyard Extension Works, it was seen that the docks, which are very extensive, are fast rising upon a large tract of marsh, formerly known as St. Mary's Island, which covers an area of about 320 acres, and lies to the north-east of the present yard. The works, when completed, will consist of four graving docks, each of which will be 510 ft. long, 80 ft. wide at the coping, and 41 ft. 6 in. from floor to coping level. They will have 28 ft. 6 in. depth of water at the highest level of the neap tides. There are also three large basins, the combined area of which will be seventy-four acres, and the depth of water in each 30 ft. at high water neap tides. The works are progressing; and the contractor, Mr. A. Gabrielli, expects to complete them by Christmas, 1870, in the time stipulated in the contract. In the first dock, the granite flooring is laid, and the sides are built up to half their intended height. The main culvert, in connexion with a pumping-engine, by which the docks will be emptied, is finished. In the second dock, the floor has been laid, and the entrance begun; the third and fourth docks have not yet been commenced. In the first basin, which is called the repairing basin, the walls are in an advanced state, and the river entrance is being made. The entrance from this basin to the second, or factory basin, is also being made, and the walls of the latter basin are being built. The chief object of interest in the yard was the plate-bending furnace, which is heated by liquid fuel on the Dorsett principle. A generator, in which creosote is distilled, is placed near the furnace, and the gaseous product is conveyed by pipes to the furnace, where it is burned in jets.

Petersburg Exhibition.—M. Fontana, architect to the Czar's Ministry of the Household, is charged to construct, on the model of the London Crystal Palace, the building for the exhibition which is to take place at St. Petersburg next year. A sum of 27,000*l.* is allowed for this structure, which is to be completed externally by the 1st of September next, and entirely by the 1st of May, 1870.

Royal Gallery of Illustration.—"No Cards" and "Cox and Box," after 100 representations, are as popular as ever. The present season is drawing to a close, and those who seek refinement with honour, and the enjoyment of delightful music, should not let the opportunity slip by of visiting one of the best entertainments Mr. and Mrs. German Reed have had for many years.

A New Lubricator of Machinery.—Black lead, with which certain parts of pianofortes are lubricated, is now extensively used in Paris as an emollient for oil in the lubrication of machinery. It is said to answer exceedingly well.

Slate Statistics.—The produce of the numerous slate quarries of North Wales is estimated at the present time to be not far from 350,000 tons annually, representing, in money value, about 865,000*l.*, or an average of nearly 2*l.* 10*s.* per ton. The produce is made up as follows:—Pestiniog and surrounding veins, 95,000 tons; Penrhyn and surrounding veins, 109,000 tons; Llanharris vein, 75,000 tons; Nantlle veins, 40,000 tons; Corrie veins, 20,000 tons; making a total of 342,000 tons. The number of hands dependent on quarrying is estimated at 9,400. Of this total the Pestiniog veins employ 2,900, Penrhyn 2,500, Llanharris 2,000, Nantlle 1,300, and Corrie 700.

The Velocipede Movement.—*Le Constitutionnel* announces the production by the combined ingenuity of M. de Cabriere, an enterprising gentleman, and M. Doirier, an intelligent workman, of a novel description of velocipede. The new vehicle has two wheels in front and one behind. It is worked by the feet and the hands simultaneously, or by either at will. The apparatus is said to be so cleverly constructed, and so perfectly under control, that the new traverser—we can scarcely call it velocipede in this instance—moves with great ease in every direction and stops instantly at will. It is by no means fatiguing to work. The rider is provided with a saddle or little seat, and is not embarrassed with the task of preserving his equilibrium as on a bicycle. We observe, from proceeding in a court of law at Birmingham, that a self-moving traverser has been invented there. This shows the direction that the movement is taking in England.

The Strike at Manchester.—A resolution, hearing upon this strike, has just been come to by representatives of the London and Manchester Bricklayers' Societies, at a meeting held in Sheffield. These representatives, eight in number, were in negotiation, with the view of removing some difficulties between their respective societies, and were assisted by Messrs. W. Allan, D. Guile, and George Odger, of the London Trades' Council, who acted as arbitrators. After disposing of the differences of the two societies, the meeting adopted unanimously the following resolution:—

"That in the interests of both employers and workmen, this meeting recommends that the dispute existing in the bricklaying trade of Manchester should be settled by the following mode:—That a Board of Conciliation be appointed, of an equal number of employers and men, and that a chairman be selected who shall be acceptable to both parties; and that the decision of the Board shall be binding upon both employers and men."

This resolution has given much satisfaction, not only because it affords a prospect of settling an injurious dispute, but also as a recognition generally of arbitration as the best means of adjusting trade disputes.

Unhealthy Dwellings in Newcastle.—At an inquest on the body of a woman who had committed suicide while in a low and dependent state of mind, the coroner remarked that the room and the house in Cox's Entry, where the deceased and other persons reside, were a disgrace to the owners, and never in the course of his experience had he witnessed such unhealthy dwellings; he was astonished how human beings could exist at all in such places. The jury also expressed themselves in strong terms about the unhealthy state of the dwellings. The verdict returned by the jury was "That the deceased had committed suicide while in an unsound state of mind."

The Market Question.—We hear the Statistical Society proposes, among other more active measures, to engage in the investigation of the markets question in the metropolis; and, at the last meeting, named a deputation, consisting of Mr. Newmarsh and two others, to confer with the record committee of the Society of Arts.

New Hospital at Hanwell.—A new hospital at Hanwell, founded by the Baroness Weld, was solemnly opened by Archbishop Manning last week. The hospital is 49 ft. long by 27 ft. wide. The architect is Mr. Welby Pugin. There were present on the occasion a large number of priests.

Art and Science at the Mansion House. The Right Hon. the Lord Mayor (Jae. C. Lawrence, M.P.) and the Lady Mayores will entertain the council of the Royal Society, and the members of the Royal Academy, at dinner on Wednesday, the 21st inst., and have invited a large party to meet them.

A Phenomenon in Peru connected with last year's Earthquake.—On the Locumba road, about twenty-two leagues from Tacna, there exist what is termed a *dry arroyo*, the bed of a former river, into which, from time immemorial, no water has been known to pass. During the earthquake which destroyed Arica and partly Tacna, the shocks were strongest in the neighbourhood of Locumba and the Arrieros. A mule-driver reported that one of the mountains near the *arroyo* had been split open, and a small stream of ferid water was oozing out of a mountain into the *arroyo*. No attention was at first paid to the fact, nor to the mortality among the animals that visited the neighbourhood. It was only when the people began to leave Tacna, and flee from the scourge of the yellow fever, which was devastating the cities of the Vallec of Locumba, that they became aware of the fatal effect upon their animals, at a distance of as much as eight and ten miles from the *arroyo*:—

"The stretch," says an informant, "I can compare to nothing else than old bilge water, of the smell of which you become painfully conscious. Within twelve miles from its source my horse dropped down water nos, and in five minutes he was dead. He vomited three or four times a thick black substance, similar in consistency and appearance to the black vomit. I was thus left to walk fifteen miles to the nearest house, two-thirds of which I may call a mules' graveyard, so thickly was the old road covered with them. The cause of this singular freak of nature is unknown; but it seems that the gases which have impregnated the atmosphere produce the vomit and death of the animals that inhale it. What these gases are composed of science alone can solve."

A commission has been ordered by the Peruvian Government to examine into this extraordinary matter and report upon it.

Exhibitions of Bavarian and Foreign Art.—The Munich season promises to be exceptionally brilliant this year; for, in addition to the interesting collections of works of art, there will be three large exhibitions open from the middle of the present month till October—namely, the General International Exhibition of Art in the Crystal Palace, and in connexion with it in the same building the Local Industrial Exhibition; and, thirdly, in the old building for the exhibition of works of art, an exhibition of painting of the old masters, the property of private persons. The arrangements made by the railway companies to issue circular tickets for thirty days will afford tourists ample time to visit Munich. The National Gallery has been re-arranged by Director Foltz. The large gallery at Schleissheim is also to be re-arranged.

The Pimlico Carpenters and Joiners Classes for Technical Education.—The balance-sheet for the first session, from June 17th, 1868, to May 14th, 1869, just issued, shows, on the side of income, 48*l.* 1*s.* 9*d.*; and on that of expenditure, 45*l.* 4*s.* 10*d.*; giving a balance in hand of 2*l.* 16*s.* 11*d.*

The New Atlantic Telegraph.—The *Great Eastern* has successfully accomplished her task. The cable was cut in order that communication might be made with St. Pierre. The reef of the work was done by the consort ships carrying the shorter lengths of cable. This insulation is said to be "eplendid." A message has been telegraphed from the American side to the Emperor, congratulating him on the completion of the work.

Funds of Trade-Unions.—Leave was given to Mr. Bruce to bring in a Bill to protect the funds of trade-unions from embezzlement and misappropriation. The Bill was read a first time, and the second reading fixed for last Thursday.

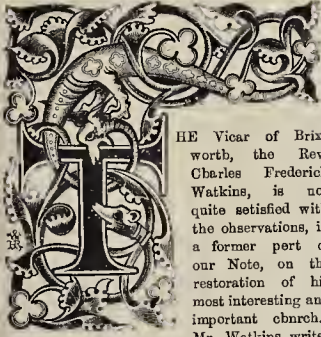
Staindrop.—The following tenders for the work to be done at the new Wesleyan chapel have been accepted, viz.:—Messrs. Ahdale & Stephen, Darlington, mason, plasterer, and slater's work; Mr. J. D. Martin, Darlington, joiner's work; and Mr. George Simpson, Staindrop, plumber, glazier, and painter's work. The chapel will be 41 ft. by 30 ft. inside, and accommodate 218 persons, with provision for enlargement. The architect is Mr. John Rose, of Darlington. The style is Romanesque.

Tudhoe.—The foundation stone of a new church and presbytery, to be called the Church of St. Charles, has been laid at Tudhoe, by the Roman Catholic Bishop of Hexham and Newcastle. The site selected is situated near the village of Tudhoe, and Mr. C. Salvin, of Burn Hall, has contributed 1,000*l.* The contemplated orphanage is for the purpose of gathering together from the entire district the destitute orphan children, and placing them under the direct instruction and supervision of the Roman Catholic community!

The Builder.

VOL. XXVII.—No. 1381.

A Note from Northampton.



THE Vicar of Brixworth, the Rev. Charles Frederick Watkins, is not quite satisfied with the observations, in a former part of our Note, on the restoration of his most interesting and important church.*

Mr. Watkins writes to us,—“There has been no ‘rebuiding of arches,’ as you suppose; reparations only have taken place, and either with remaining original fragments, or the thin stone of the neighbourhood, so as to maintain a clear distinction between the old and new work. Neither were there any ‘cubicula,’ as you report. You have mistaken foot buttresses upon which the side arches of the aisles rested, or locked into the piers of the nave-arcade, for sectional divisions.” And afterwards he says, “Not a brick or stone of the Saxon work has been displaced. It has been a restoration in the true sense of the word, as bringing out, the original, as far as it exists, to the eye of every beholder, and in a sound condition.”

We really found no fault with the restoration; but to say that “not a brick or stone of the Saxon work has been displaced,” is simple nonsense, and is contradicted not alone by eye-sight, but by the vicar’s own statement, that original fragments or the thin stone of the neighbourhood has been used in the new parts so as to prevent them from being confounded with the old. Mr. Watkins says he knew we should fall into error, and warned us we should, if we attempted to give an account of Brixworth Church from personal observation alone. The fact is, we have fallen into no error at all. Mr. Watkins is a little too dogmatical;—has it all his own way, probably, at Brixworth;—but he really has done so much good service that we will not find fault with him. All that is known of Brixworth is as clear before us as if we had had the thirty years of constant residence on the spot of which he speaks. We are not writing a history of Brixworth Church, or even giving an account of it,—simply writing a note, which has grown upon us, to show, amongst other things, what a wonderfully interesting building this is. As to the *cubicula*, we had before us a plan published in the Journal of the British Archaeological Society,† illustrating an interesting paper on the church, by Mr. Edward Roberts, wherein the *cubicula* are shown, the writer saying,—“Recent excavations have shown that these cubicula were five on each side, exclusive of those on each side of the tower.” We must leave the Association to defend its own plan. Mr. Watkins mentions that he discovered within the square tower (the lowest story of which is possibly of the same date as the nave) “the bases of circular columns which formed the propyleum to the Roman temple, or

early Christian church.” He also discovered in one of the piers a Roman eagle of the Assyrian type built in “and evidently taken from an earlier building.”

Putting aside the possibility of actual Roman work, we have, at any rate, in Brixworth Church a most interesting example of work in the Roman manner carried on in Saxon times. We ought to speak of the eastern apse, with its ambulatory, rebuilt on the wall of the crypt, it is asserted, which has been left entire; but we may not now give greater space to the subject.

It will be remarked by any visitor to Brixworth who knows anything of the matter, that the leading characteristics of the set of buildings we are contented to call Saxon are not present,—“long and short work,” as it is termed, and long pilaster-like slips of stone connected either by semicircular arches or corresponding slips diagonally placed. In the tower of Earl’s Barton Church, to which, after returning to Northampton, we now proceed, these are seen in full force, as well as balustrade windows, another characteristic feature. This tower terminates at the present time with an embattled parapet, comparatively modern. Originally it was probably finished with a four-gabled roof, like the tower of Sompning Church, Sussex.

We have before our eyes fine towns,—say in the fourth century,—at Silchester, Wroxeter, St. Alban’s, and numerous other places; we know that the Britons were incited by Agricola to erect halls, basilicas, and forums, and to ornament them with porticoes: Tacitus says so distinctly: we know that the Saxons built thousands of churches and monasteries; and yet some modern writers would almost have us believe that all the buildings erected between the time of, say, Silchester and the coming of Norman William, have been clean swept away. It has been urged often that the common use of timber in building is indicated by the Saxon verb *getymbrian*, to build, apparently formed from the name of the material commonly used. But if we learn from Bede that King Edwin, in the year 626 ordered a church to be built of timber, at York, for his own baptism, the same chronicler tells us that the king afterwards directed that it should be rebuilt of stone. The evidence afforded by old writers, illuminations, and existing remains that both the Britons and the Saxons erected stone buildings is not to be controverted, and these were executed, as might be expected, in the manner of the Romans,—*More Romano vel Romanorum*. They built of timber at times when it was more convenient, as we do now, but stone and brick were mainly used. Working on this *getymbrian* theory, the tower of Earl’s Barton Church, and other towers wherein the same sort of construction prevails, have been pointed to as suggesting the execution of a carpenter, or person accustomed to use timber, rather than that of a stonemason. The disposition of the large thin stones is adduced as resembling the framework or quartering of common partition walls, or those of half-timber houses where upright and diagonal pieces of wood constitute a sort of framing, and in which brick-nogging or lat-and-plaster is employed to fill up the spaces.

Even Mr. Fergusson sees no reason to dissent from this theory. “The Saxon,” he says, “in its ornamentation showed a tendency to wooden forms which we do not find in others. In Lycia, in India, and Egypt, we are able to trace a wooden architecture gradually developing itself out of one of stone; but here we can almost certainly detect a stone architecture becoming wooden from the two materials being constantly employed in juxtaposition, the meaner being generally predominant.” This is plausible; and is generally received: but is it true that this mode of construction resulted from the circumstance that the builders, or rather designers, of these churches had been used to deal only with

timber? We think not, and never could think so. The triangular-headed opening, the slender pilasters of stone, the alternate use of long and short blocks, with the interspaces filled with rubble, small balustrade-like columns, are all to be found in works of the late periods of the Roman empire. Sir Gardner Wilkinson, in a paper on “Long and Short Work,” read some years ago at a meeting of a county Archaeological Society (the too cautious honorary secretary of which refused to allow it to be printed, at the author’s request, in our pages, so that it might be confined to their own Transactions and remain unknown), took this same view, and pointed to a number of instances he had met with, notably during a tour through the Regency of Tunis in 1844. He there found whole towns, apparently of the time of Justinian and the subsequent emperors, the houses of which were built in this manner, whose walls consisted of upright shafts of long and short blocks, with the intervals filled up with small stones and mortar. The same style of building is met with in other places, and we have no doubt that this mode of construction was borrowed from the Romans by Saxon builders in this country. However, we must get on to see a building of more recent date, first adding that the Norman parts of Earl’s Barton Church are interesting, and that the whole structure is in a very bad condition.

Our ramble included the seat of the noble family of the Douglas-Comptons, Castle Ashby, which was bought by Henry VIII.’s Sir William Compton, from the third earl of Kent. It may be taken, always remembering that there are special times when the owner allows the House to be seen, in the same round with Earl’s Barton Church.

There are many places in England called Ashby: the term (written in Domesday book, *Ascehi*) is thought to be compounded of the Saxon for an ash-tree, and *by*, a dwelling; an addition being made, as at Canons Ashby, Ashby Ledgers, and so on, to distinguish one such locality from another.

The House at Castle Ashby stands in the midst of a finely wooded estate, with an artificial lake, formed by “Capability Brown.” The building was commenced by Henry Lord Compton in the fourteenth year of Queen Elizabeth’s reign, A.D. 1572, but was not finished till 1635, which date will be found in one of the parapets. The parapets, by the way, are formed of inscriptions, or texts, as was not unusual in buildings erected about this time.

Inigo Jones designed the part of the building last erected, without any great addition to his reputation in consequence.

The staircase is quaint, but less grand than some of a little more recent date. The carved uprights are apparently interpolations. The extent of the house is very considerable, the rooms and galleries are varied in size and height. Amongst the quite recent alterations, and, we may say, improvements, is a large and lofty built-up chimney-piece, of carved wood, in the drawing-room, the greater part of which would seem to have been obtained from abroad, and worked into a whole on the spot.

Some one has said, and many feel, that a home is no home unless it contain food and fire for the mind as well as for the body. So those have thought who, century after century, have gathered together the collection of works that furnish Castle Ashby. There is an admirable and extensive library, and the walls show many charming pictures.

The collection has this distinguishing feature, and the owners of other historic houses, ancestral homes, may usefully note it,—that the present marquis has added a large number of specimens of modern industrial art-work, both foreign and English, maiolica ware, and so forth, which are even now interesting, and a hundred years hence will be invaluable.

* See pp. 537, 538, ante.

† For December 31, 1863.

Two new lodge-entrances are in course of completion, one Gothic in style, by Mr. Street, the other of the mixed character of the House, only more so, by the architect of the Northampton town-hall. The upper part of the latter displays a large amount of heraldry, showing the various arms, crests, and mottoes belonging to the family, such as a fired beacon on a mound, inscribed *Nisi Dominus, for Compton*; a bear sticking between two oaks of an oak-tree, with a chain and lock holding them, and marked *Locksicher, for Douglas*; a considerable sprinkling of helmets; and the great Coat and emporters, with the motto,—

Se ne scerch; que ung.

The two elaborate sets of iron gates and terra cotta piers, of one of which we gave a view in our last year's volume,* stand within the grounds in front of the Mansion, and are to be regarded, perhaps, as a triumphal way or entrance of honour. Unless so considered, they seem wanting in purpose, the more so as the lofty and somewhat formidable-looking gates and piers have on each side of them a quite low railing over which entry would not be difficult. Sir Digby Wyatt, under whose able direction Mr. Blashfield produced these piers in terra cotta, has also co-operated with that manufacturer in forming a series of terraces, with parapets, pedestals, bastions, and fountains of the same material, a very extensive and important experiment. The parapets following the character of those on the House consist of letters forming inscriptions. The work is sharp, and for the most part seems to stand well. Here and there every now and then a failure takes place, probably through insufficient burning, or some accidental fault in the constitution of the material; but when time has found out such weak spots as there may be, and these have been reinstated, there seems little reason to doubt that the whole will long endure.

The gardens, some time neglected, are being brought into excellent condition. We would gladly talk of the contents of some of the glass houses, and the hundred or two varieties of roses outside, but may not give the space the comments would occupy. Some new houses have been built, and are now occupied, the outside of which is to be cased with terra-cotta, while, inside, the wooden uprights between the lights are lined with mosaic, orchids, and other flowering plants, with a charming effect resulting.

Some parts of the grounds are admirably laid out, and show the hand of a master in the art. There is something peculiarly pleasing in English landscape gardening. The wild charm and waywardness which in other countries Nature shows only when far away from the residence of man are here brought to his very door, and made to conduce to his most cultivated home delights.

We have made our Note from Northampton somewhat longer than we intended, and here it must end, without half exhausting the subject.

THE MILITARY ARCHITECTURE OF THE FUTURE.

THE amount of money which it is proposed to expend, within a short time, on various civil and military works under the direction of the Government, is so considerable as to give occasion for very serious reflection. A daily contemporary estimates the cost of six items, of a civil description, at from 10,000,000 to 12,000,000 sterling, a sum which is probably considerably within the mark. These are:—1. The New Law Courts. 2. The New Public Office, three times the size of the block already built. 3. The New National Gallery. 4. The New Natural History Museum. 5. The remodelling of the Admiralty and adjacent buildings. 6. The completion of Burlington House, of the Record Office in Foster-lane, and of the South Kensington Museum. To these distinct items has to be added an indefinite margin of approaches and thoroughfares.

Concurrently with these metropolitan demands on the service of the builder, we have to consider the demands made on the public purse for the completion of the national defences. Portsmouth, Plymouth, Pembroke, Chatham, Sheerness, each and all have to be considered. With the increase in range of ordnance, the cost of structural defence increases in almost equal ratio; nor does it seem as if the sense of security

was to be purchased at a lower price than that which is demanded for the governmental, artistic, and educational requirements of the metropolis. The provision for the poor,—casual, criminal, diseased, and lunatic,—again threatens to swell an expenditure, local and national, to a sum bearing an appreciable relation to the National Debt. And if we may hope to be so happy as to write off the amounts thus claimed from the results of an increasing and elastic revenue, still the total, representing so much taxation which might otherwise have been remitted, will be the equivalent of a national outlay of some three-quarters of a million sterling per annum for ever.

In the face of so large an outlay it becomes more important to consider the fact that we are on the threshold of a great revolution in military architecture. We are preparing, as we propose to show, a system of defence that will go far to obviate the necessity of very much of the costly structure of fortifications. Knowing, as we do, what great changes have occurred in this respect, both before and since the time of Vauban, we think it only ordinary discretion to arrest the progress of expensive forts, at least until we see with more certainty what will be the result of the nullification of the process of recoil in placing artillery in position, and in withdrawing it from exposure except at the actual moment of firing. Let us glance, for a moment, at some of the great secular changes which mark, or rather which constitute, the history of architecture.

Architecture, historically regarded, has been chiefly indebted for its progress to the impulse given by three patrons, or rather orders of patronage—the soldier, the priest, and the king. It is true that these distinct functions have been not unfrequently exercised by the same individuals. The great pile-up of fortifications have often been warlike sovereigns. The most perfect temples of pre-Grecian times were also royal mansions. Temples, as well as palaces, have been turned into strongholds, or even originally constructed with a view to military defence. But by whatever hands, or under whatever political conditions, these several orders of structure have been raised, they yet assert their distinct individuality. When we ascend above these humble efforts of the builders' art which merely aim at the provision of a shelter for the family, it is long before we find any trace of what we now call public buildings. Halls for popular assembly, debating-rooms, music-halls, mechanics' institutes, are creations of the present day. Theatres are some two thousand years older, but still do not date from an antiquity more remote than that which is commemorated by Horace; when rude carts served at once to convey the actors and their very slender "properties," and to form the stage: this locomotive theatre being, itself, an advance on the original trestles, mounted by the lee-stained actors. Amphitheatres, if built for the people, were yet the works of monarchs, or of those wealthy and powerful Roman senators, triumvirs, imperators, or incipient tyrants of whatever name, who ranked above barbaric kings. In a word, public buildings cannot be regarded as more ancient than the "public" itself. And the antiquity of our present idea of "the people" can hardly be pushed back to a more early origin than the literature which preceded the great French Revolution.

Apart, then, from that class of buildings which is daily assuming more importance in the present day, but which is, in its origin no less than in its adoption, essentially modern, the chief architectural works of the world have been either military fortifications and citadels; religious temples, tombs, and monuments; or royal palaces and seignoral *châteaux*. With the advance, or at all events, the change of man, of human civilisation, the change of man, and of creed has been faithfully reflected by these architectural mirrors. The general tone of social life may be gathered from an investigation of the work of the architect. At times, indeed, the result of his labours is so different from that which is sought by his successor at the present day, that we are yet in doubt as to the veritable purport of some of the most enormous, as well as the most ancient, buildings in the world.

The climate and the sands of Egypt have preserved structures reared four or five thousand years ago from the decay which, in other and less favourable circumstances, would have led to total destruction in less than a tenth of the time.

The earthquakes which so frequently shatter the northern shores of the Mediterranean, and the rapid and luxuriant vegetation of Central America, are agencies which, had they prevailed in Egypt, would have left little or nothing extant that was reared before the days of the Ptolemies, if even the pseudo-Egyptian works of that last of thirty-three dynasties had lasted to our day. Year by year the sands yield to those who attack them their long-buried records, preserved fresh and uncorrupted under their friendly veil; and long-forgotten history promises to assume not only a definite, but an unquestionable, shape.

But with all our knowledge of the kings and of the temples of Egypt, the Pyramids still remain almost as mysterious an enigma as the Sphinx herself. They seem to mock human curiosity. They partake of the nature of unfulfilled prophecy, inasmuch that they seem to afflict with madness, or at least with monomania, those who devote themselves to their study. No doubt can be entertained by any candid student of their monumental, ephemerical, character. That their builders had attained a not contemptible knowledge of the rudiments of astronomy, as well as of those of geometry, and a considerable skill in the builder's art, is undeniable; but the enormous disproportion between the solid and the hollow contents of their vast structures is altogether anomalous in the history of architecture. The existence of the small internal chambers and of the inclined and portcullised passages, as the only perforations left in these stupendous artificial mountains, is an arrangement so entirely unparalleled as to be barely intelligible. The preservation of the royal mummy, during a lapse of time equal to that of the great year mentioned by Plato, in a structure that should defy alike elemental and political change, is the only practical aim that we can now attribute to these great monuments of unstinted human labour. The point most interesting to the philosophic inquirer of the present day is, the extreme antiquity of the evidence afforded by the pyramids and sepulchres of Egypt as to the doctrine of the immortality of the soul, and of its return to its former body—the earliest known idea of the resurrection. It should be noted that, with all the toil and skill that was expended to make both the sepulchres and sarcophagi secure, there appears to be combined arrangements as if we would admit of their being opened, without violence, when the time which their preservation contemplated should arrive.

With this evidence of the early existence of a doctrine which has never ceased to exert a mighty social influence, is mingled the trace of another portion of the ancient creed of mankind, which is very contrary to most modern schools of thought. The divine character of the monarch was a distinct dogma of ancient sovereignty. As the cuneiform inscriptions of either the Persian, the Medo, or the Assyrian kings, enter their long-silenced messages, they all tell us the same tale. In Nemroud, as well as in Diopsolie and in Memphis, the temple and the palace constituted one building. The living king dwelt among the shadows of his departed ancestors, those tutelary guardians of the land and of the race, of whom he was only the terrestrial representative,—the link between the gods of the past and the fathers of the future. In these ancient structures, the architect, in toiling for the king, toiled also for the priest; and in proportion to the awe which attended the regal dignity, and the sacerdotal function, the strict requisite of military defence dwindle and disappear.

Defence, however, was the aim of the most ancient structure. To all that is Egyptian, it seems probable that we shall, by and by, be able to attach definite and positive date, although the chronology which is being slowly unveiled reaches back to a period which many persons are utterly unprepared to accept. But no data has as yet been assigned to the early Cyclopean structures. From the absence of evidence of the tool of the mason, in the ruder forms of Cyclopean masonry, we have reason to attribute them to a period antecedent to the use of iron or of bronze implements, and we are thus carried back to an era far antecedent to that of the fine granite-masons of the Pyramids. As yet, therefore, the soldier is the oldest builder who has left his architectural trace on earth.

The architectural history of the religious and the political state of mankind, as evinced by the remains of the structures reared by the king and by the priest, present, in one respect, a remarkable contrast to the military history delineated

* Vol. xxvi., pp. 44, 45.

by the buildings of the soldier. The reason may probably be found in the intensely practical character of the art of war. The soldier deals with facts,—he grapples with actual resistance, whether that of the human arm alone, or that of the human arm aided by structural defences. He does not seek merely to awe the mind, or to symbolise or shadow forth irresistible power; he displays all the power which he is able to command. Therefore his architecture follows hard upon the progress of science,—he cannot afford to be conservative, in the sense of abhorring innovation. Surprise is his most irresistible weapon. The commander who makes it a rule *stare super antiquas vias*, is apt to be convinced of his mistake by rude and summary lessons. If he is not awake to what is going on in the world he is liable to be roughly awakened. For these reasons military architecture is, for the most part, a faithful expression of the most advanced scientific knowledge of the date which it fears, and accordingly the remains of ancient fortifications show a steady and uninterrupted advance in the practice of the art of war.

With religions and palatial structures an opposite law prevails. Without saying that the functions of the priest are less important, in a social sense, than those of the soldier, it is yet evident that they contemplate an entirely different order of ideas. The object of the priest is the moral government of mankind. Not that he seeks to affect the imagination. Not that he less demands the service of the whole man than does the soldier. On the contrary, he demands more. He requires not only obedience but assent. He strives to found his dominion on a deeper and more imperishable basis than that of military discipline. He would make the soldier himself his minister, servant, and executioner.

The aim, therefore, of temple architecture, has been to impress the imagination: while the soldier sought that which was strong, the priest sought that which was sublime. But in this effort to subjugate the imagination, two elements came into play; and it is the alternating force with which one or other of these two distinct orders of ideas have from time to time been developed, that has stamped sacerdotal and ecclesiastical architecture with such varying and contrasted features. The contrast is a mark of race, no less than of time. Although the two ideas to which we refer are presented to our minds as instances of the sharpest contrast, it is yet easy to trace them to the same origin. The main subject of sacerdotal dogma has been invisible power. The object of sacerdotal architecture has been to impress upon the mind the actual reality, and the sensible proximity, of the source of this invisible power. This effort has been made in two opposite directions.

The Tonic tribes of the time of Tacitus, the builders of the earlier pyramids, and the masons of the stone circles of the prehistoric times, appear to have all regarded the invisible with that genuine awe which precluded any attempt at its representation. They were not iconoclasts, because they had not yet degraded the object of their worship by iconography. The forests were their most sacred temples, and the vast, solemn, heaven-pointing, durable structures which they raised were but artificial sacred groves.

Symbolism, however, is a mental action of spontaneous growth. In childhood it is the natural language of the mind. In the infancy of creeds or of natures it is no less simple and self-sprung. The most awful mystery may be denoted, and very naturally comes to be denoted, by a symbol. The veneration which it is sought thus more persistently to impress on the mind, tends unavoidably in the course of time to clothe the symbol itself with a portion of its sanctity. Thus symbols grow into idols. They did so in Egypt five thousand years ago. They do so in London to-day.

In the relics of ecclesiastical architecture we can trace the introduction and the growth of symbolism, until it assumes the forms of the grossest and most incredible idolatry. The extreme of splendour, combined, for the most part, with a very debased taste, marks this culmination of the effort to represent the invisible. Then comes a period of conquest or of reaction. Cambyses, or Constantine, or Omar, or Luther, strikes at the stone which had become defiled. The temples are decreased; the basilica replaces the Naos, again, it may be, in its turn to become adorned with images of celestial protectors; or to witness, as in the church of Santa Chiara, and in the chapel of Saint Jannarius, at Naples,

the paltry simulation of those rites which once were as real as they were universal.

While ecclesiastical structure has thus reflected the course of struggle between two opposite tendencies, military building has maintained a steady course, and has thus presented a truthful mirror of the science of the day. The state of the art of offence is faithfully recorded by the character of contemporary fortifications. When the battering-ram had been so far improved as to form an engine that would overthrow walls formerly impregnable, great builders, such as the magnificent Herod, erected towers with solid, megalithic bases, against which the ram would dash itself to pieces with no more effect than that produced by the waves on the promontory of *Misenum*. As the feathered artillery of the archer became more precise and deadly, walls and towers were crenellated and loop-holed for the service and the defence of the bowman. Solid square towers (as in the fortifications of Sorrento) projected from the curtain of a lofty wall at such distances from one another as to allow of the sweeping of the wall by the flight of the shafts. As explosive artillery gradually crept into use, this method of defence became antiquated, because cannon-balls fired along such a curtain would batter the opposite tower. Then came Vauban, to remodel the art of defence. The next great step was that of the increased range and precision of the artillery of our day. With every fresh increase of this power some ancient virgin fortress lost its proud distinction. Hills, once too distant to be regarded as military points, were found to dominate spots long considered impregnable, as at Gaeta. The introduction of heavy floating batteries has changed the value of maritime defences, and has led military men to reconsider the value of such stations as Gibraltar and Dover. Gaeta, indeed, though attacked from one commanding point by the *Cavalotti* guns, yielded to a sea attack. With the increased efficiency both of direct and of vertical fire, the lofty walls of ancient fortresses became but so many targets. Casemates sunk in live rock, trenches, batteries *à fleur d'eau*, *kaponier* defences, and iron or steel shields, are the chief features of modern fortification.

Military architecture, then, having descended from the heights on which it was wont to isolate itself in feudal times, having dismantled the towers of such strongholds as Rochester Castle, or the Papal Palaces at Avignon, the walls of Amiens, or even the lines of Chatham, has arrived at a point at which it seems about to obliterate itself altogether. Sunk fences and earthen banks can hardly be termed portions of military architecture, but they are becoming daily more essential characteristics of fortification. And the greatest step which has been taken in the art of war since the invention of gunpowder,—the utilisation of the recoil for the purpose of raising or depressing a gun, so that, after firing, it may sink into convenient obscurity, and present no mark for hostile aim,—is almost certain to render military architecture, strictly so called, a thing of the past.

It is worthy of attentive remark that, while the great perfection to which the artillery of the day has been brought has stimulated our engineers to attempt the defence of their costly and ponderous engines, first, by shields of iron and of steel (whether in land or in sea batteries), and then by concealing their position until the very moment of their discharge, the defence has become submarine as well as subterranean. Long lines of ditch, with a strongly-laid and well-protected railway at the bottom, for the traverse of the Moncrief Gun carriage, will replace certain walls in the fortifications of the future. Simultaneously with the inauguration of this revolution in the art of the military builder, the chemist assures us that he has perfected the torpedo, on which we may thus rely for the defence of our ports and harbours. These submarine infernal machines were had recourse to by the Russians for the defence of Sebastopol. The arrangements then made proved to be imperfect and unsuccessful. In 1859, and again in 1866, the Austrians adopted the same method for the protection of Venice. Their engineering was not, however, subjected to the test of actual attack. The War Department of this country has directed the attention of its able chemist—we disclaim any play on the word—Mr. Ahel, to the subject, and his researches have been attended with eminent success. He is now in a position to construct, and to lay, a nest of torpedoes, connected with a submarine wire, by means of which they can be rendered sensitive or not at will. Thus our own vessels might pass

over them in safety, while, if it seemed advisable for our fleet to withdraw, and to leave the coast apparently clear, the slightest graze of a hostile keel would cause an explosion that would blow out the bottom of the intruder.

The engineer and the chemist are thus removing the art of fortification from the province of the architect. We seem to witness the proximate close of a long and most instructive chapter in human history, a chapter every section of which will repay the careful perusal of the student. Palatial architecture is undergoing a change, ecclesiastical architecture is ramifying into branches as various as the divisions of sect and of school, but the great historic series of the building works of the soldier, regarded as picturesque elements of landscape, appears to be approaching its term.

THE ROYAL COMMISSION ON WATER SUPPLY.

ON THE PRACTICABILITY OF OBTAINING LARGE SUPPLIES OF WATER FROM THE MOUNTAINOUS DISTRICTS OF ENGLAND AND WALES.

FIVE engineering projects having this object in view, have been laid before the Commissioners. Four of these plans have for their object the supply of the metropolis.

They are proposed by the following engineers—

- 1st. Mr. John Frederic Bateman, F.R.S.
- 2nd. Messrs. Hemans and Haassard.
- 3rd. Mr. Hamilton Fulton.
- 4th. Mr. George Remington.

Mr. Bateman urges that the supply of water to London should be sought where it is purest, softest, and most abundant, and recommends mountains of hard and impermeable rocks where there is little land cultivation or manufacturing operations, and where reservoirs for storage could be easily provided at a sufficient elevation to give a supply of water to the greater part of London without pumping.

He considers the nearest high land fulfilling these requirements is to be found in Wales, and has selected the district supplying the head of the river Severn. The artificial conduit to bring the water to London would pass near the town of Stourbridge, Bromsgrove, Henley-in-Arden, Warwick, Banbury, Buckingham, Aylesbury, Tring, Berkhamstead, and Watford, and would end in a reservoir on the high land near Stanmore, ten miles north-west of London, capable of containing twenty days' supply at the present rate of consumption. 230 million gallons a day is the quantity proposed to be brought to London. The length of the conduit would be a little more than 180 miles. It would be chiefly an open channel, lined with masonry, but would be tunnelled where necessary through the hills, and formed by syphon pipes across the deep valleys. It would have a fall of about a foot in a mile, and would deliver the water at Stanmore at a height of 270 ft. above the mean sea level.

Mr. Bateman would make use of the present means of distribution, revising them, and adapting them to the constant supply system.

The aqueduct would pass within ten miles of the centre of the populous manufacturing districts of Birmingham, Wolverhampton, Dudley, and Walsall, and these places might be supplied on the way, for they are the most difficult towns to supply with water of any in England.

Mr. Bateman proposes to appropriate 204 square miles of drainage area. The rainfall has not been registered in the district, but Mr. Bateman assumes it to resemble that of other districts of similar conformation where the rainfall has been registered, and thinks it ought to be as great as the Highlands of Scotland, and of the Lake districts. In this way it is estimated that the average rainfall is 75 in. per annum; but as it does not do to lay out waterworks on the average, he takes two or three of the driest consecutive years, and puts down 60 in. as the fall to be reckoned upon. The loss by evaporation and absorption in such districts has been found to vary from 9 in. to 16 in. per annum, and 12 in. are taken as a safe estimate for this district, leaving 48 in. available, but for greater security Mr. Bateman again diminishes this to 36 in., and bases his calculations on that.

Compensation is the next question, not in this case, to mills, as is usual in the manufacturing districts of Yorkshire and Lancashire, but to rivers, in dry weather; for in dry weather probably all the water would be impounded in the reservoirs, and leave the rivers dry, except for this compensation. To compensate mills,

one-third of the available supply is usually given out; but merely for rivers having no millie requiring power, one-fourth is thought to be sufficient.

The Royal Commissioners examined Mr. Hawksley on this question of quantity, and he considers that the average rainfall would not exceed 45 in., but he says it is known to be impossible by any system of reservoirs that can be constructed to deal with more than the average of three consecutive years of minimum fall. The minimum year has about one-third less than the general average, and in the three consecutive driest years the average fall is one-sixth less. Therefore 45 in., less one-sixth, leaves 37½ in. as the quantity due to the three minimum years. Mr. Hawksley also, besides reducing Mr. Bateman's quantity, increases the estimated loss by evaporation and absorption, which he puts at 13½ in., leaving but 24 in. available instead of 36 in., as estimated by Mr. Bateman.

Mr. G. J. Symons, author of a work entitled "British Rainfall," has very good means of judging correctly on this question; and he tells the Commissioners that the mean fall in three successive dry years would probably be 44 in. or 45 in.

The Commissioners consider the storage proposed by Mr. Bateman a matter of great importance. There being no natural lakes, it is proposed to make reservoirs of a total capacity of 6,709 millions of cubic feet, which would provide from 120 to 140 days' supply. Here again Mr. Hawksley differs from Mr. Bateman, and considers that 170 days' supply should be provided for the three driest years.

As to the quality of the water, the Commissioners made an independent investigation, and intrusted the selection of the sites where samples were taken, so as to afford a fair average of the whole, to Mr. W. Fole, F.R.S. Fourteen samples were submitted to Dr. Frankland, F.R.S., and Dr. Odling, F.R.S. The ground selected by Mr. Bateman consists chiefly of the slates of the Silurian series of rocks, and its features are favourable to the purity of water flowing from it. The analysis of these waters bears out the favourable opinion that might be formed of them from the nature of the ground, and shows that there are only about 2½ to 4½ grains of solid matter in the gallon, and their hardness, by Dr. Clark's test, is only from 1 to 2 degrees. This organic matter is also small. Of five principal objections raised to this water there are but two that seem to be well founded,—the one that considerable tracts of peat exist within the gathering-ground, which give colour to the water, and that this colour would hardly be removed before it reached London, and if so it would not give satisfaction to the people. Mr. Hawksley says "it would not be tolerated." Water that comes from high lands is usually coloured by peat; but in manufacturing towns this is tolerated for the sake of its softness, which is so necessary for manufacturing purposes; while in London, "the white water," says Mr. Hawksley, would be much preferred. It appears to be admitted that the exposure of peaty water to the atmosphere in large reservoirs tends to clear it of colour. Filtration through sand in the ordinary way will not remove the colour. Dr. Angus Smith and Dr. Miller say that peaty water would not be injurious to health, and the chief objections to it are its bitter taste and its appearance. The other objection is, that the water, being soft, will act freely upon lead, and, while the doctors differ in their opinions on this subject, the Commissioners say that the evidence does not show that any injurious effects in this respect have resulted from the use of soft water in Whitehaven or Manchester and other towns.

Mr. Bateman proposes to make the outlay gradual by dividing the full quantity of 230 million gallons a day into four stages, viz.:

1st. 130 million gallons, to cost	£8,685,008
2nd. 170 " " " " " " " " " " " "	10,371,615
3rd. 200 " " " " " " " " " " " "	10,822,474
4th. 230 " " " " " " " " " " " "	11,400,023

These sums do not include the purchase of existing works or interests. On the other hand, certain property of the companies, to the amount of 1,000,000*l.*, might be sold when the gravitation system has been adopted, and Mr. Bateman states that each of the above sums ought to be reduced by that amount.

However large this outlay may seem, it is not more in proportion to population than has been incurred in Glasgow, Manchester, Liverpool, and other places, and is far below the cost incurred in many other places.

Mr. Bateman proposes to levy rates in the

metropolis, on account of the water supply, in the same manner as is done in the three towns named—first, a public rate, levied in consequence of the protection against fire which a constant supply and high pressure necessarily confer, and in consideration, also, of the great advantage which all property is supposed to derive from a full supply of water; and, secondly, a domestic rate, in respect of the water supplied for domestic purposes. The rates so levied are—

	Public Rate.	Domestic Rate.
In Glasgow	3d.	1s.
In Manchester	3d.	9d.
In Liverpool	6d.	4½d.

To carry out this financial plan, the water supply would require to be vested in a public body, with power to levy rates and purchase the interests of the several existing companies, and to introduce the new supply.

The Commissioners' "remarks on Mr. Bateman's plan" recognise it to be practicable in an engineering point of view, but doubt the sufficiency of the estimates, without, however, giving any reasons for that, beyond a vague surmise that the works would be subject to contingencies, and that it is impossible to arrive at any reliable estimate of the cost, without detailed surveys and sections, which they think would probably cost 10,000*l.*, and imply by that, apparently, that therefore Mr. Bateman could not have been expected to furnish a reliable estimate. But detailed surveys are never made in similar cases, and one would have thought Mr. Bateman's reputation sufficient to warrant the Commissioners in relying on whatever estimate he might give, unless they had made a detailed estimate of their own, which they do not say they have done, nor is it likely that they have.

The Commissioners agree that a tint of colour derived from peat would not be acceptable to the inhabitants of London. They also think the action of soft water on lead a serious objection to it.

They anticipate a "powerful and determined opposition" to this scheme, if brought before Parliament, on the part of the interests connected with the River Severn.

They object to London being dependent on one supply of water, which might be easily stopped by any one of several causes, such as "wild damage, frost, or the failure of any work along the line." Mr. Bateman admits these objections, but defends the plan against the first by showing that he has provided three weeks' storage within 10 miles of London to cover any interruption from accident or repair. He admits that as against hostile occupation no provision could be made to prevent the water being cut off, but considers the contingency so remote as not to weigh against the advantages of the plan. Mr. Bateman does not make so good a defence against the second objection, that of frost, for there is no analogy between this proposed aqueduct and that of Glasgow, which is nearly all in tunnel, and therefore well protected from the outer atmosphere. "In a river like the Thames the temperature in winter is kept up by the springs which feed it, an advantage an aqueduct does not possess." We shall return to this Report.

SUBTERRANEAN ROME.*

TAKING UP again Messrs. Northcote and Brownlow's book, we would mention the care with which the rude scribbings, or *graffiti*, of ancient visitors are now scanned. De Rossi calls them "the faithful echo of history and infallible guides through the labyrinth of subterranean galleries." Sometimes the writing is a mere name, with or without a title; others are exclamations connected with distant or departed friends; and others are invocations addressed to the martyrs upon whose tombs they are inscribed. The names are of two kinds, the most convenient parts of the walls being scribbled over with such classical appellations as Rufina, Felix, Polymeicos, Leo; and those higher up with more Medieval designations, such as Idebrand, Bonizo, Joannes Presb., &c. The ejaculations correspond with the simplicity of the earliest epitaph. They repeat "VIVAS, VIVAS IN DEO CRISTO, VIVAS IN ETERNO," and similar aspirations, over and over again. This custom is referred to one among the heathens that prompted them to write the names of those they loved on sacred places they visited, in the hope they might then

partake of any benefit to be derived from the attention. An inscription in the island of Phylis, Egypt, is quoted as an illustration, where Serapion, son of Aristomachus, wrote, "Having come to the great Isis, Goddess of Phylis, he makes a remembrance there of his parents, for their good." One Christian pilgrim can be traced, from sanctuary to sanctuary, by his masons. On the vestibule of the principal sanctuary he wrote, what was evidently the wish nearest to his heart, which we translate, "Sofronia, mayest thou live with thine own;" and when he approached the entrance he wrote and prayed, "Sofronia, mayest thou live in the Lord;" again, when he came to an altar tomb in another chapel, he scratched, "Sweet Sofronia, thou shalt ever live in God;" and before he left he added, "Sofronia, thou shalt live." Other *graffiti*, calling upon the martyrs, take the following forms among others. "Holy souls, have in remembrance Marcinnus Successive Severus, and all our brethren. Holy souls, ask that Veronndus and his friends may have a prosperous voyage. Ask for rest, both for my parent and his brethren; may they live with Good. Holy Sixtus, have ye in remembrance in your prayers Aurelius Repentinus. Have ye in remembrance Dionysius." We have selected these as extremely ancient examples. Sometimes they are cut off in the middle of a sentence by some alteration or renovation that has been made since they were written. As such works were executed chiefly by St. Fabian about the year 245, or by St. Damasus in 370, we get a tolerably precise clue to their date. One of them, De Rossi states, must have been written whilst the plaster was wet. This is an apostrophe to Pontianus, who was probably an exiled pope of that name, brought home after his death in Sardinia, and hurried here by St. Fabian.

Of the paintings in the catacombs, De Rossi ascribes two to the first century. These are the Virgin and Child, with the prophet Isaiah in the catacomb of Sta. Priscilla; and the tree and flowing vine covering the roof of the entrance to St. Domitilla. The decoration of the roof of the Chapel of St. Janarius, in the catacomb of St. Proxetatus, with the paintings of the fish carrying a basket, and the lambs on either side of a milk-pail on an altar, on the walls of a *cubiculum* in the crypt of St. Lucina he ascribes to the second; while the great bulk of the Biblical paintings he considers the work of the third century. He divides the paintings, generally, into six classes, those that are symbolical being the earliest and largest; the next, allegorical; the third, Biblical, depicting histories from both the Old and New Testaments; the fourth, pictures of our Lord, the Virgin, and the saints; the fifth, scenes from the lives of these latter, or from the history of the church; and scenes from the Liturgy being the sixth. There does not appear to be any addition to the known circle of symbols recently discovered, but the instances in which they are associated with one another, interchangeably, and sometimes with the names of the deceased on whose gravestones they occur, make the array large. One gravestone is illustrated, which the *fossor* inserted in the wall with the name upside down, but upon which the artist sculptured his dove correctly, showing it must have been executed after the stone was fixed in its place. The subjects of the Biblical paintings are limited in number, and are also treated in a symbolical manner. We have Noah in the ark, typical of baptism,—the ark a small box, with a man in it, and sometimes a woman, as in the instance in which a dead person's name is painted on it, Juliana; Jonas and the fish, a type of the resurrection,—the fish being a large-headed dragon with a long neck, perhaps, it is supposed to keep the representation distinct from the fish, which was so often employed as a symbol of the Saviour; Daniel in the lion's den, intended either to encourage the persecuted, or as an emblem of the resurrection, and used for both purposes by the Fathers; upwards of twenty examples of the adoration of the Magi; Moses striking the rock, whence issued the living water, which was Christ; and the resurrection of Lazarus, or the Victory over Death; and Moses taking off his shoes as he approaches the burning bush, typical of the renunciation of the world, the flesh, and the devil. This limited range of subjects occurs over and over again, as though they were current illustrations of the thought of those old times. No real portraits of Christ or of the Virgin have been found, though it is shown that there is always an adherence to certain leading characteristics in the faces of

* See p. 564, ante.

SS. Peter and Paul in the glasses found in the catacombs, as though from an attempt to maintain a likeness. There are representations of Christ, however, one of which is quoted by Kugler as the oldest portrait in existence, and, in consequence, is eagerly inquired for by visitors to the catacombs. This is a head and bust in a medallion, occupying the centre of the roof in a cubiculum in the cemetery of Saints Meniscus and Achilles. Its claim to the highest antiquity is not allowed by all. The liturgical paintings are very rare—quite, in fact, exceptional; they are found in the cubicles near the Papal crypt we have mentioned, and belong to the end of the second century. They are all illustrated in colours in the volume under consideration. Baptism and the Consecration of the Holy Eucharist are the subjects of representation,—the first mixed up with Biblical stories and allegories, and the second still further veiled and complicated by the sign of the fish, and both associated with full-length figures of fossors about to haw with their pikaxes fragments of rock. A man fishing, another baptizing a youth in the same water, and a paralytic carrying away his bed, are painted on one wall. On that which faces the doorway is a three-legged table with bread and fish upon it, with a woman on one side of it and a man on the other. The first is standing with arms thrown up and hands extended, which is called an attitude of prayer; and the second, partially draped only in the pallium, extends both hands towards the table, which he actually touches with his right. This attitude has been interpreted by some to indicate the act of consecration. Again, seven men sit at a table with two dishes of fish before them, and eight baskets of loaves upon the floor; and close to them Abraham is preparing to offer up his son. These last three scenes, which are painted side by side between two graves, have the figure of a bare-headed, bare-legged fossor on either side of them. The same series of subjects is introduced, slightly varied in details, in the other cubicles in the neighbourhood of the Papal crypt, which persistence again suggests some familiar homily or teaching. The authors quote Tertullian's explanation of their meaning as sufficient for their complete interpretation.

We must give a slight indication of the contents of the chapter upon the gilded glasses found in the catacombs; for at the present time there are some examples of them on loan in the South Kensington Museum, which, if examined by the light of this clever compression of the labours of Do Rossi, will give our readers some very precise information. There are about thirty specimens also in the British Museum, and a few others in the museums of Paris, Florence, and Naples; but the largest collection is in the Vatican Library. Mr. Wislizen, the owner of the specimens at South Kensington, possesses about twenty. In all not more than 340 examples are known; and Do Rossi's twenty-three years of labour in the catacombs have only yielded two fragments. In 1864 a fragment of a gilded glass-plate was found at Cologne, and in 1866 another fragment was discovered in a stone-chest in an excavation near the church of St. Ursula, in the same place; with these exceptions they have been so invariably associated only with the remains of the primitive Christians of Rome, that archaeologists have supposed the manufacture of them was confined to those people. They are, we need scarcely add, generally the bottoms of drinking-cups, with designs executed in gold-leaf between two surfaces of glass, so arranged that the figures and letters were seen from the inside. The cups of which they were the base were stuck in the cement round newly-made graves before it hardened; but as they were thinner than the double glass enclosing the gold-leaf and more exposed, they have in nearly every instance got destroyed; and sometimes in detaching the bases from the cement these have also perished. Boldetti records having found three glasses entire, and Bosio found about half a dozen perfect examples; the rest appear to have been fragments when first found. A clue to another cause of their destruction has been found in the fact that some portions of the gold-leaf between the coatings of some fragments recently found have been scraped away by some instrument; and as, according to Martini, there were deslers in broken glass in Trastevere, it is thought likely the glasses may have been destroyed for the sake of the gold and their value. The subjects depicted upon them are more numerous than those painted on the walls of the catacombs; and are minutely described by the authors of the

work we are now recommending to our readers. One of those in the possession of Mr. Wislizen has the Apostles Peter and Paul in the centre, with six compartments round them, each having a distinct subject. Another, belonging to the same gentleman, has Christ with the rod of power, changing water into wine; and, again, enabling the paralytic to carry his bed, and also protecting the "three children" in the fiery furnace; as well as Tobias with the monster fish. Our Lord is frequently represented as the Good Shepherd upon them. The Virgin also occurs very frequently, and in various combinations. There are inscriptions upon them, too, such as "Joyfully mayest thou live with all thine; happy mayest thou live for ever in the peace of God." Eighty of the known examples have figures of Saints Peter and Paul upon them; and some of these have inscriptions which are of a convivial character, as though they were intended for use at feasts, or especially at the feasts of those Apostles. The examples of these quoted are, when translated, as follows:—"A mark of friendship, drink, and [long] life to thee, with all thine. Mayest thou live [long]. A mark of friendship, drink, and [long] life to thee, with all thine, drink [or, live], and propose a toast. Mayest thou live happily with thine own. Life and happiness to thee and thine." We refer our readers to this chapter.

The Christian sarcophagi are another distinct department in the antiquities of the catacombs. By far the largest number of these have been transported to the great hall of the Lateran palace, where they were arranged by Padre Marchi, and have since been increased in number by Do Rossi. They are not so early as the paintings. Only eighteen can be identified by their inscriptions as belonging to the first four centuries, and of these only four are considered us anterior to the time of Constantine. The earliest, with a definite Christian subject depicted upon it, the nativity, has a consular date, which determines it as the work of A.D. 343. The cause of this tardy use of sculpture is attributed to the fact that the painter could prosecute his work underground safe from observation, while there would be not only the danger of drawing attention to any sculpture executed in a workshop, but the difficulty of getting it conveyed to the catacombs. But directly the Christian religion became protected by the conversion and profession of Constantine, the sculptor was freely employed. Sometimes, we know, a Christian desirous of placing some beloved object in a sarcophagus in preference to depositing the remains in an ordinary recess in the wall of a catacomb, bought a sculptured stone of a Pagan artist, and then effaced his work with a chisel, or turned the ornamentation to the wall that it might not offend Christian eyes when fixed. On the reverse of a tomb slah inscribed Irene, for example, was found a Bacchanalian scene; and a representation of Cupid and Psyche was found with signs of plaster upon it buried beneath the floor, as though it had been likewise hidden from devout eyes. This branch of the subject is also ably treated.

The mode of construction, and the gradual development of a cemetery is the next department broached. It is illustrated with several plans, which make it extremely clear notwithstanding its intricacy. Taking the catacomb of San Callixtus as an example, it is shown that after the Christian proprietor had scored a site 250 ft. along a road, with a depth of 100 ft., he caused a staircase to be dug down to a certain level, and then a gallery to be picked out which extended round three sides of the area, and was furnished at the extreme end with a second staircase to the surface. The second side, of course, connected the two throats, but at intervals down the length of footage there were two other galleries that extended and also communicated right through the site with both. Besides these, there were also four other galleries crossing the depth, but not quite extending to the opposite side. One of these shorter galleries led to the Papal crypt and its accessories; and opening out of the main passage close to the approach to this celebrated centre were formed three cubicles. Thus the plan is three sides of an oblong, with passages crossing from one side to the other, and others beginning to cross, but not completing the undertaking; and one of these shortened galleries widening out and opening into crypts, all alike being filled with graves. Afterwards fresh excavations, on a lower level, gained by steps, formed more galleries stretching across the area; and additional cubicles were made to open out of the first main gallery, uniform with the first set,

only instead of ascending a few steps into them as in their case, a descent of several was made. A third extension of the cemetery is visible when the fossors endeavoured to penetrate to a still lower level; but when they had made thirty-three steps down they found themselves through the stratum of *tufo granulare* in which they had hitherto been working, and in one of a friable *pozzolana*. They strengthened their wall with brickwork, and made some *loculi* with bricks, and pushed on, probably thinking to get through this unassailable stratum, but eventually abandoned the plan of obtaining space by this means. The tiles and bricks used by them are found to be all stamped with the mark of the imperial brick-kiln of Marcus Aurelius, and must therefore have been manufactured between the years A.D. 161 and 180. The fossors enlarged the crypt of the Popes at this time. By and by we find means taken to prevent approach to the cemetery by concealing the entrances and blocking up the staircases. About 6 ft. of the base of one staircase was removed, and several entrances were made from an adjacent sand-pit, so that, in case of pursuit, escape was facilitated. Finally, this cemetery was enlarged by communications made into others, into the history of which we cannot enter. And, after all, in the days of the persecution under Diocletian, the galleries that had been made with so much care and lined with the pious dead from the floor-plates to the headways, were purposely filled with earth, so as to baffle the tyrant's attempts to dishonour them.

The analytical description of this cemetery is that, perhaps, which would interest our readers most; but, as it should be studied with the excellent map of "Roma Sotterranea" opened before them, we have forbore to do more than touch upon these archaeological particulars.

The work is supplemented with an account of a relic intimately associated with the personages and period to which it relates,—the chair of St. Peter, so carefully guarded that for 200 years it was not seen by mortal man. There is an illustration of it, obtained from a photograph when it was exposed on the eighteen hundredth anniversary of the martyrdom of the apostles. It is an old yellow oak chair, formed of four uprights united by horizontal bars, two being higher than the others to form the back:—

"The four oak legs were evidently once square, but they are much eaten away by age, and have also had pieces cut from them. These time-worn portions have been strengthened, and rendered more ornamental by pieces of dark acacia wood, which form the whole interior part of the chair, and which appear to have hardly suffered at all from the same causes which have so altered the appearance of the oak legs. The panels and the front and sides, and the row of arches with the tympanum above them, which forms the back, are also composed of this wood. But the most remarkable circumstance about these two different kinds of material is, that all the ivory ornaments which cover the front and back of the chair are attached to the acacia portions alone, and never to the parts composed of oak."

Some of the ornamentation is attributed to the age of Charlemagne, and some, such as the Labours of Hercules in the ivory panels, is more ancient; the oak-work is deemed likely to be as old as tradition states it to be. Every known historical mention of the chair is quoted, beginning with Bede's statement:—

"King Cadwalla, the powerful in war, for love of God left all, that he might visit and see Peter, and Peter's chair, and humbly receive from his foot the cleansing water."

It is known that St. Damascus placed it in the baptistry of the Vatican, and considered probable that up to that period it may have been preserved in the crypt of St. Peter's tomb, or in the Basilica of Constantine. It was moved from chapel to chapel on the Vatican before the days of Alexander VII., who enclosed it in the bronze monument, where, until the anniversary mentioned, it has since been held. To account for the fact that the Abbot John, in the list of relics he gathered for Queen Theolinda, states that he obtained "oil from the chair on which Peter the Apostle was first enthroned" on the Via Salaria Nova, it is suggested there may have then been in existence a second chair, used by St. Peter, as he made two visits to Rome, and that both may have been at first equally treasured as relics. We avail ourselves of permission to reproduce the view of the chair, but give no undertaking as to the age of the relic.

The publishers have spared no pains to enable us to realise, with maps, woodcuts, and chromolithographs, the various remains of the momentous times when Christianity was a new and simple faith opposed to a gorgeous array of mythological deities.

PYRFORD CHURCH, SURREY.

This church has lately been reopened after restoration. Those features of the old building which were concealed by modern disfigurements have been restored to view, and the whole building has been put into a state of repair. The walls, which were badly cracked, have been buttressed and made sound as far as possible; the timbers of the wooden halfy, which was entirely decayed, have been replaced by new oak; the foundations have been drained; the roofs have been boarded and felted, and the tiling relaid.

The church, though small, possesses many features of interest. It retains throughout its fifteenth-century roof, and the greater part of the pewing of the same date. The east part of the nave roof has a curious boarded ceiling, of five casts decorated with yellow flowers on a dull red ground, constructed below the braces of the roof, which once formed the ceiling or canopy of a roof-loft. Several wall paintings have been discovered, and, where possible, preserved.

The elaborate Jacobean pulpit and sounding-board have been cleaned from paint, and restored and completed with a new base. They are partly of oak and partly of fir, with a strong red vein, and are curiously inlaid. The removal of the paint has brought to light the date 1628, which is inlaid with wood of a different grain in the centre panel.

The church has been paved with Godwin's tiles, and warmed; a new font has been given, and a vestry added. The architect was Mr. T. G. Jackson, of London. The builder was Mr. Durnell, of Brastead, Kent.

ON JEWISH SYNAGOGUES IN GALILEE.

The second quarterly statement of the Palestine Exploration Fund Committee contains some notes on this subject by Captain C. W. Wilson, R.E. No date is given, so that they may not be quite recent; but as we have not met with them in print before, and they are really so much more instructive, so far as they go, than what we are just now getting from the Holy City, we print the pith of them:—

"During the late expedition to Palestine, the remains of several undoubted Jewish Synagogues were examined, and it is proposed in the following paper to give some account of their arrangement and construction as shown by the existing ruins. The synagogues visited, nine in number, are situated in the district north of the Sea of Galilee at Nebartein, El Jish, Kefr Birim, Meiron, Um el Amud, Irbid, Tel Hum, and Kerazeh. Some other remains of the same description were said to exist in the hills above Tyre, but that part of the country did not come within the work of the exploring party.

In choosing sites for the synagogues in the different towns, the builders have by no means selected the most prominent positions. That at Nebartein lies below the old town; at Meiron a site has been excavated in the rocky side of the hill; and at Irbid the building is awkwardly situated in the lower part of the town, some distance down the northern slope of the hill, which has been partly cut away for it. Little is left of any of the synagogues. The stone has been carried away for more recent erections, and with the exception of Irbid, Tel Hum, and, perhaps, Kerazeh, they have not been made use of by the races who have occupied Palestine in later times. Those at Tel Hum and Kerazeh have possibly been turned into churches; that at Irbid, where the door is on the eastern side, has been used as a mosque. The entrances of the others being at their southern ends, which would have obliged a Moslem on entering to turn his back on Mecca, seem to have rendered them unsuitable for this purpose.

The buildings are always rectangular, having the longest dimension in a nearly north and south direction, and the interiors are divided into five aisles by four rows of columns, except in the small synagogue at Kefr Birim, where there have been only two rows of columns and three aisles. The masonry of the walls is well built and solid, of native limestone; the stones are set without mortar, the heads and joints being 'chiselled in' from 2 in. to 5 in., and the remainder rough picked; the exterior faces are finely dressed, but the backs are left rough, more readily to take the plaster with which the interiors seem to have been covered, and of which some traces remain at Tel Hum. Great attention was paid to the heights of the several courses, in the hope that some clue might be

obtained to the length of the cubit or other measure used by the masons; but they proved to be very unequal, no two in the same building being alike.

With the exception of Irbid, where the form of the ground necessitated a different construction, the entrances are at the southern end, an arrangement hardly expected, as every Jew on entering must have turned his back on Jerusalem. The entrances are three in number, one large doorway opening into the centre aisle, and a smaller one on either side; the small synagogue at Kefr Birim has only one entrance. The door-posts have peculiar architrave mouldings, the details of which may be seen in the plans and photographs. Those at Meiron and Kefr Birim are identical, and those at Irbid are of the same character. The doors have all been folding ones with socket hinges, and closed by bars on the inside. In the large synagogue at Kefr Birim, which is used as an Arab house, the modern doors are hung in the old fittings. On the lintels over the doors there is much variety of ornament. At Nebartein is an inscription in Hebrew, and a representation of the seven-branched candlestick, similar to, though of rougher workmanship than, the well-known one on Titus's Arch, and identical with one found in the catacombs at Rome. At the small synagogue at Kefr Birim is another inscription, and some defaced sculpture which evidently represents two animals lying down, one on either side of an open flower, possibly intended for the Paschal Lamb. At the large synagogue at Kefr Birim is a wreath with two lambs defaced in the same manner; and above this a moulding with a well-executed scroll of vine-leaves with bunches of grapes, and at one end a vase, perhaps the pot of manna. At Kerazeh, Meiron, and Irbid, the architrave mouldings of the door-posts have been carried round the heads of the doors. At Tel Hum, on one lintel is what appears to be the pot of manna, and on either side of it something like a reed, which may possibly be Aaron's rod. The sculpture on the main lintel is too much destroyed to distinguish its subject; on the top, cut in low relief, is a garland held up in several loops, over which is a flower. Above the centre door at Kefr Birim, there is a semicircular relieving arch, with several mouldings carried round its face. It is the only instance in which a doorway remains entire; but the others, judging from a curious slab found at Tel Hum, were in the same style, and it seems probable that the ornamented blocks uncovered at Kerazeh were situated immediately over the lintels of the doors in place of such arches.

At Kefr Birim there is a sort of porch with a sunk court in front of the entrance, and there appears to have been a similar one at Meiron. In the former synagogue, above the plain face of the enclosing wall, runs a small projecting moulding, corresponding in height and position with the abacus of the capitals of the porch; and as fragments identical in character were found at Tel Hum, Irbid, and Meiron, it seems to have been used in all the buildings. Above this moulding is an architrave of which there are also remains at Tel Hum and Meiron. It cannot be certainly determined what was above the architrave. At Tel Hum and Um el Amud a number of slabs with different floral ornaments were found, which appeared to have formed part of a frieze, and at the former several portions of a heavy cornice of peculiar shape, which may have run above the frieze; but the style of decoration of this synagogue is so different in most respects from that of the others that it would hardly be fair to take it as a general example; and no fragments of cornice were seen at any other place.

The floors of the synagogues are paved with slabs of white limestone. The arrangement of the columns is the same in all. The inter-columnar distances are excessively small; but whether this arose from want of constructive skill or an attempt to assimilate the buildings to something of the same kind in the Temple at Jerusalem, is difficult to say. There is one striking peculiarity to be noticed, that the two corner columns at the northern end invariably have their two exterior faces square like pillars, and the two interior ones formed by half-engaged columns.

The capitals are various. At Tel Hum and Kerazeh they are Corinthian, and the fillet round the neck has a pretty rope moulding. On the Tel Hum slab Ionic only are shown; at Irbid there are Corinthian and Ionic; and at El Jish, Kefr Birim, Meiron, Um el Amud, and Irbid, a peculiar description of capital, which seems to

be of pure Jewish growth. At Tel Hum and Meiron a number of blocks of stone were found which evidently went from column to column, and received the rafters of the roof. Their faces have architrave mouldings, and the soffits is also ornamented; the rafters, judging by the spaces left for them, 8 1/2 in. deep by 2 ft. wide, were of large size; but this would be necessary if the roof were flat and covered with earth. It may be objected that there is no large timber near; but the description given by Josephus of the fleets on the Lake shows that in his day there was no difficulty in procuring a good supply. This flat roof, with thick earthen cover, which seems also to have been adopted for the private houses at Kerazeh and other places in Palestine, is, perhaps, one reason for the closeness with which the columns are placed to each other. It is still used for nearly all modern Arab houses, and is the best adapted for keeping out the intense heat of the sun.

In the front of the large synagogue at Kefr Birim there are two small windows for lighting the interior; but whether there were others at the sides, and whether this was the usual mode of admitting light, there are not sufficient remains to show."

"Tel Hum, 'Capernaum'.—The whole of the surrounding wall of this synagogue was uncovered, and a number of pedestals were found *in situ*. It appears to have been rather better finished than the others, and to have been ornamented much more profusely. The capitals are of the Corinthian order, and there are remains of a heavy cornice and frieze. The exterior was decorated with pilasters, the only instance met with in this class of building. On the eastern side is a later addition, the walls of which have disappeared down to the plinth course. It consists of a rectangular building, having three entrances on the north side and one on the east, and the exterior was ornamented with pilasters similar to those on the synagogue. There is no doorway connecting the two buildings, and the walls meet with a straight joint, those of the later addition abutting on and hiding the corner pilasters of the original construction. During the excavations a portion of a curious slab was found, on which is represented the face of some large building, possibly a synagogue. The front, as here shown, has ten columns or pilasters with Ionic capitals set on a plinth course. Two of the pilasters form the jambs of the door, which has a circular head and ornament like those found entire at Kerazeh, and in fragments at Irbid and Tel Hum. The door is slightly open, and is panelled. The entablature, which runs above the columns, is carried round the arch of the door. Mixed with the *debris* were found several remains of a much later date, which may have been added if the synagogue was ever used as a church. There are no traces of a mihrab or of its ever having been turned into a mosque."

DOBROYD GASTLE, TODMORDEN.

We have before now mentioned this structure which has been built under the direction of Mr. John Gibson for Mr. John Fielden. The owner has now taken possession of it, and we avail ourselves of particulars given by the clerk of the works, Mr. W. Glover. It is in the castellated style of the Tudor period, with four angle hatching turrets, surmounted by a main tower, having a flag-turret at the north-west angle, and a spiral staircase up the same. The Castle is built of native stone, and about 1,500,000 bricks, made of native clay, have also been used on the works. The building is 223 ft. long, by 50 ft.; the height of the flag-tower from the floor line, 82 ft.; the top of the main tower is 27 ft. square. Entering at the tower (or principal) entrance, we are in the vestibule. The walls of the vestibule are carried up in Bath stone, with oak-panelled ceiling; the floor is of red and white Mansfield stone, and the dadoing round is in Riga and Pollard oak. Passing forward we find ourselves in the saloon. The columns and pilasters are of Devonshire marble, the capitals of the columns being carved with representations of English national sports. The panels over the doorways are of Caen stone, with representations—(1st) picking cotton, (2nd) packing cotton, (3rd) Arkwright, represented with a lathe, wheels, and mechanical instruments near him, in his father's barber's shop, apparently in deep thought upon some invention, (4th) working the cotton—girls in a mill. There are several carved shields in the saloon, each bearing the monogram of the founder and his wife, J. R. F.

THE ROYAL ARCHITECTURAL MUSEUM.

The new building in Bowling-street, Westminster, was inaugurated on Wednesday evening last. Mr. Beresford Hope, M.P., presided, and was supported by a large number of well-known and influential persons.

The President, on taking the chair, said the time has come at which we may formally open the proceedings of this evening. You are all of you, I hope, aware of the object for which we are met here to-night. This architectural museum of ours has existed now these eighteen years, which means to say that many of those who are studying at the museum,—and studying there, it may be hoped, with honour to themselves and good to their country,—were not born when this museum was instituted. Some of you will remember the good old times we used to have at Canon-row, and how, after we went to the ground, we were long at the South Kensington Museum, as lodgers and visitors, and not as proprietors. Well, we had our ups and downs, but, on the whole, we had a good time there; and now that we have left South Kensington Museum, we owe great thanks to those who were there for the many kindnesses and the many helps we received from them, and we have parted, shaking hands together in a spirit of the most perfect friendship and good will. And now here we are in our own building. Here we are pursuing the work that was laid down before us at first. And what is that work? It is the hard, humble, and yet good and glorious work of taking the young artist workman by the hand and training him in his important profession. We do not go in for any grand success—any great display. We are a teaching institution. We are a school. We are the machinery for knocking the details into the fellows' brains, so that being knocked into their brains they may come out at their fingers' ends. That is what we are for. We hear a great deal, both in and out of Parliament, about technical education. Technical education is a good thing, and we are the people who found it out a good many years before it was found out by those who are now boasting about it. We are the oldest school of technical education in England, and we hope we may be the most successful. You know who have worked this institution from the first. You know how Mr. Scott, whose time and thoughts are so valuable to him, has most successfully given up time and thought to us as our treasurer; and I deeply regret, that though he made every arrangement to be here to-night, a grievous illness in his family keeps him at home. You know also how Mr. Lomas, who is up early and to bed late, and here and there and everywhere, he is heart and soul devoted to your work. As to our council, our friends, and supporters, I say nothing. Their names [referring to the report of the museum for the year] are written in this book. But there is one announcement I am proud to make to-day, and it is that her gracious Majesty the Queen has in the kindest manner consented to be our patron, and has given further proof of her sympathy for us, for she has given the very magnificent donation of 50*l.* to our building fund, and I have no doubt that in a short time we shall soon formally have, what we virtually are now, the Royal Architectural Museum. I do not attempt to be the showman of all the things around this gallery, and around the ground-floor of this museum—specimens not only of the remains of ancient architecture, and ancient casts, but specimens of modern art generously contributed by many of those who are foremost in the good work of renewing art-workmanship in our day. Behind me, on this platform, there are many distinguished men,—men distinguished in the church, in the State, and in art; I shall call on them successively to speak. I shall impose upon them the role of giving short stirring discourses, of five or seven minutes' duration. The first I shall call upon to speak is an old friend, and earnest supporter of ours—one respected, venerated, beloved; and one who, with the good will of his country, has been placed in the second highest position which a British subject can fill—I mean the Lord Chancellor.

The Lord Chancellor, after alluding to the warm interest he naturally felt in the establishment of such an institution in that part of the metropolis with which he had been so long and intimately connected, observed that a few steps beyond the building which had thus been erected for the promotion of archi-

teetural taste, it would be found that there was great need for encouragement in that respect. It was true there were some most magnificent buildings in that part of the metropolis—some of the greatest buildings that were to be found in England, or perhaps in the world, such as Westminster Abbey and the Houses of Parliament,—but he was afraid that neither from Westminster Abbey, with all its ancient beauty, nor from the Houses of Parliament, with all their architectural ornament and scientific arrangement, had we derived much instruction with regard to the important work of building our domestic edifices. He recollected that in the earlier days of his residence at Westminster, when setting up house at Dean's Yard, he had a notable illustration of architectural taste from a person who supplied fenders and fireirons, and who recommended to him a highly ornamented Gothic fender, his reason for doing so being that it would match the Abbey. He was much struck with this illustration of architectural taste, and although it had something ludicrous in its aspect, it was architectural taste notwithstanding, and betrayed a love of art which deserved to be commended even in its faintest indications. There was something else now than a highly-ornamented fender to match the Abbey; there were very elegant architectural decorations; the museum contained many excellent specimens of architectural design, calculated to afford both pleasure and instruction; and it was to be hoped that the commendable efforts of the promoters of this institution to advance the cause of architectural science amongst us would meet with that appreciation which they so well deserved—that there would emanate from this institution a spirit which would animate and guide all those who were devoted to the study of architecture, so that, mastering and improving on the secrets of architectural art possessed by those who preceded them, they might turn them to account in their time, and perpetuate them for ages to come.

Sir H. Bartle Frere referred to the progress which had been made in the metropolis during the last thirty or thirty-five years, in this during the last thirty or thirty-five years, in the art to which this building was dedicated—an object of which his long absence in other parts enabled him to speak with some confidence. He could well remember the time when, to show a foreigner a new building in London, was to show him about the ugliest and most tasteless edifice that human ingenuity could devise. But when he came back to London, after a long interval of years, the scene was changed, and he was glad to find that our good old metropolis, with all its shortcomings, had in no respect fallen behind the other great cities of the world, so far as a tolerably extensive range of travel enabled him to judge. It was true that we missed in London the long straight streets and uniform buildings which were characteristic of other great capitals of Europe, such as Paris; but he found in London, as in other great cities of England, what was, perhaps, more precious to Englishmen—evidences of individual thought and liberty of action, which would go far to compensate for defect of architecture, and which, with respect to this particular art, he regarded as lying at the root of all excellence. He might be wrong; he spoke only as a layman; but the effort which had been produced on his mind by much that he had seen of the new buildings in foreign capitals of Europe was that they have too much of the impress of one mind. There was about them, so to speak, too much of personal government,—too much despotic ordering that this street should be here and that house there, and that the architecture should be of the same uniform character. But when he came to England he found in the great masses of new buildings which adorned our capitals the traces of independent thought and action, which, as already said, he regarded as lying at the root of all real excellence in architectural art generally. At the same time he saw in every part of England evidence that men entertained a real reverence for what was excellent in the architecture of ancient times. There was a time when what might be called the old churchwarden spirit used to rule in our church architecture as well as in other matters; and when, if an ancient carved stone were found, it was thought well to root it out of its place, and put up in its stead something of painted wood. But that day, which he was old enough to remember, had passed away, and now he found that amongst all classes, gentle and simple, educated and uneducated, wherever there was anything good in old art, there was a disposition to preserve it, and to make the

From the floor line to the top of the saloon is 34 ft.; the floor dimensions are 27 ft. by 44 ft.; the grand staircase rising from the saloon to the upper corridors. The billiard-room (31 ft. by 21½ ft.) is to the right; it is fitted up with oak. The centre flower over the gaslight is emblematical of the room, being composed of figures representing energy. All the chimney-pieces and fenders are of choice marble of different hues, the stoves all bearing the monograms of the founder and his lady. The inner portion of the chimney-piece, next to the stove, and the hearth, are of Milton tiles, porcelain, and burnished steel. All the floors are of oak; there is no painted wood nor papering in the building; all the walls are painted. The principal windows are fitted with Clark's patent revolving shutters, and Meakin's self-acting sash fastener, which is applied to 130 windows. The hot-water arrangements have been applied by Mr. D. O. Boyd, London. The gas arrangements are by Strode & Co., of London. The whole of the plaster work is done in Parian cement. Every room in the Castle is ventilated by a distinct ventilating shaft, and all the rooms have pure air thrown into them. The grates are also arranged that hot air is thrown into the rooms in winter and cold in summer; the grates are the patent of Mr. D. O. Boyd (mentioned above). Next we come to the breakfast-room (20 ft. by 22 ft.); the frieze in this room is ornamented with rose enrichment. The centre flower is also emblematical of the room. Next the breakfast-room is the drawing-room; the whole of the woodwork in the drawing-room is inlaid in designs in the following kinds of wood: walnut with satin-wood, ambona, Hungarian ash, purple-wood, and ebony. The drawing-room is lighted from the sides by gas-lights opposite to mirrors. The frieze is worked with passion-flower in enrichment. The chimney-piece is of statuary marble, inlaid with cameo. Between the drawing and dining rooms is the entrance from the oastle to the east terrace. The wall and arches of this entrance are in Bath stone, and the woodwork and floors are similar to those in the vestibule. Passing on to the dining-room it may be observed that the frieze and centre flower are emblematical of the room, with vine enrichment. In the staircase from the saloon to the corridors the banisters are gilt solid; the steps and landings are Spinkswell stone; the handrail is of Kiga and Pollard oak. Two massive Devonshire marble columns form the newel. The columns of the corridors are of Devonshire and Greek green marble, with carved capitals representing floral and animal life. The base of the saloon and the staircase is a square; it then forms into an octagon and culminates in a circle. It is lighted by a glass lantern-light by day, and at night by two magnificent and lighted by Strode. All the work here, inside, is carried up in Bath stone, and the top of the banisters round the corridor is covered with crimson velvet. In the sections between the columns, at the top of the staircase, are mirrors. Of the rooms along the corridors, the first to which our attention is drawn is Mrs. Fielden's hoidoir. The passion-flower enrichment is in the frieze of the cornice. Most of the woodwork is of Hungarian ash, the door is chastely inlaid with purple-wood, hirsch, ambona, and ebony; the wardrobe adjoining is entirely furnished with fittings of pencil-cedar. The bedrooms are of uniformly good character, all the woodwork being oak. The stables, fitted up by Messrs. Mnsgrave & Brothers, Belfast, have accommodation for seventeen horses, with a coach-horse, harness-room, &c., and a dog-kennel large enough to hold a pack of hounds. The stables are floored with bricks inside the stalls, and with Loch quarry stone in the passage; the walls are done with Milton tiles and oak. The stables, &c., are 100 ft. by 90 ft. The area of the greenhouses and vineries is 120 ft. square; one of the walled-in kitchen garden, 150 ft. by 130 ft. The total number of rooms in the Castle is sixty-six.

Designs at the Manchester Exhibition.

Mr. J. E. Watson, architect, Newcastle, president of the Northern Architectural Association, has been appointed by the Council of the Royal Agricultural Society of England one of the judges to adjudicate and report upon the merits of the different designs and plans sent for competition at the Society's exhibition, at Manchester. Mr. Watson himself was awarded the first premium at the society's exhibition at Leeds in 1861.

most of it, and, as far as possible, to follow its peculiar excellencies. These two things, freedom of thought and freedom of action, which Englishmen had in this, as in other things, joined to a reverence for the past, seemed to him to contain the germs of great future excellence in art, and especially in architecture. The fruits of this were seen everywhere in our buildings—not only in London, but in Manchester and elsewhere. He had been in Manchester last week, and having known that city thirty years ago he was quite astonished to see what excellent architecture there was there, not only in the public buildings, but also in the dwelling-houses. He saw one dwelling-house, belonging to a man who had himself wielded the hammer as a working mason, which for hearty and general conception would compare with,—whilst in details it would certainly far surpass,—any palace he ever saw in any foreign metropolis. In the midst of all this, there were few things, he believed, of greater importance, both to the architect and the workman who carried out his conceptions, than such a museum as had just been opened by the labours of the President and his coadjutors.

The Hon. W. Cowper said that having been one of those who fostered the early existence of the South Kensington Museum, he acknowledged that he rather grudged the day when this Architectural Museum left those hospitable walls; and yet, looking at the admirable lodging which the latter had found, he could not find it in his heart to say that it ought not to have made the change to Westminster. The public must necessarily take great interest in the proceedings of this society. We were living at a time when rich persons were willing to spend money on large and costly buildings in London; but although care and skill and science were exercised upon these buildings, it was to be regretted that comparatively few people who moved about the streets of London took the slightest interest in or cared one fig about the general quality of buildings that were erected to adorn our streets. There were to be seen in these buildings beautiful proportions, great massiveness, and scientific attainments; but there was something wanting to interest the people in our modern architecture. And why was our modern architecture not interesting to the people? He believed it was because there had not been in it free scope for the exercise of the skill and art of the workmen. Very few of our buildings had any decoration in stone. There was Pall-mall, that stately street, with its rich columns, showing successions of columns and windows resembling one another; but the only decoration of stone to be seen there was put up at such a height that without the aid of a glass few people could discern what it meant. What immense scope would buildings like the United Service Club, the Travellers' Club, and the Athenæum afford for decoration if artists were allowed to exercise their skill upon these buildings, giving to them such decorations as would remind us of the wars or travels of the men who constituted these clubs. He believed there was springing up in London a truer sense of what was calculated to interest people in our architecture; and now that this great and happy Gothic revival had begun to make itself known throughout the land, there was good hope that architecture would become more interesting, if not more in accordance with the canons and rules of criticism. There was a good future before us in many ways. There was in this country, in regard to architecture, entire freedom of competition. There was no canon or test which prescribed to people what sort of style might be adopted. In our streets we had a happy variety of buildings—a Classic building standing next to one of the Byzantine order, or an old red house of the time of Queen Anne, or perhaps, a house erected in no style at all, but consisting of a brown wall with a certain number of square holes in it. The architect who was likely to succeed was not the architect who clung slavishly to any particular style, but who studied to produce what would interest the public; but it must be remembered that if much was to be accomplished in architecture, it must be by sympathy, co-operation, and brotherhood. Those great cathedrals which adorned the country were reared by bands of men who were united together in sympathy, and in an earnest desire to produce something worthy of the purposes for which those buildings were erected; and so little was their desire of fame, that we did not know the names of the people who planned, much less the names of the men who reared, these magnificent

fabrics, which excited the admiration and increased the devotion of succeeding ages. We might still at the present day continue that form of combination and brotherhood which constituted the strength and the glory of the Middle Ages. That meeting was brought together by a common feeling for artistic beauty; by a common love of architectural beauty; a common desire to arrange forms of beauty in the exterior of our buildings which might render them more acceptable and more profitable to the inhabitants of our towns; and this museum afforded an instance of the sort of co-operation which could also be successful in attaining the object in view.

The Earl of Powis believed there was no art to which a museum was a greater necessity than to the art of working in stone, whether as regarded architecture or sculpture. Whether we took architecture or sculpture, we were obliged to go back to ancient and classical times; and so far from our having yet been able to improve upon or excel those classical works of the past, the greatest triumph men had hoped to achieve was to emulate, not to rival, the old masters. In Greece we found buildings which, even in their ruins, were our admiration, which we ourselves were not able to surpass, and which had furnished models of architecture for all civilized Europe. The worst specimens of architecture that disgraced England were those which our architects servilely copied without studying the spirit of the particular order to which the works belonged. Architecture was a study which required the whole energies and devotion of the mind, which must be taken up as a living art, and not as a mere trick of the servile copyist. He was not without hope that the efforts of this society would do something to arrest that decay which he believed began in the last century, and which had already in many respects been checked in the present century, and do something to redeem the character, illustrate the dignity, and promote the progress of the architecture of England.

Sir Chas. Trevelyan referred with satisfaction to many important architectural improvements that were now being carried out in the metropolis, instancing Threadneedle-street, the Strand, and the Thames Embankment, for which last-mentioned improvement he said that neither Government nor Parliament could claim the least credit, the credit being entirely due to the good sense and public spirit of Sir John Thwaites and Mr. Bazalgette. He contrasted the irregular but not unpicturesque streets of London with the long, straight, uniform streets of Paris; the latter, which had the worst of the contrast, owing their rigid uniformity mainly to the fact that the improvements of Paris proceeded from a single administration—he might almost say from a single mind; whereas, in London we had proceeded with all the independence, originality, and variety of the Anglo-Saxon race. He hoped these improvements would go on, and that the Government, the great companies, the clubs, and private builders, would be all found uniting in doing their duty. What he wished especially to call attention to was the houses of the working classes and the poor—the last and best result of the improvement which had been effected or was being effected in architecture. Architecture had an important bearing on domestic happiness and virtue; and he looked forward to the time when every man in London would be able to live in a house consistent with health and comfort, and, above all, with pure morality.

Sir Digby Wyatt, after referring to the necessity for co-operation on the part of employers, architects, and workmen, and especially to the necessity for the training of the workmen both in mind and in hand, in order to success in architecture, observed with regard to what had been said as to liberty of design in architecture, that that was a source of strength, but that design in proportion to its freedom involved the responsibility of refinement. You must learn to do much, but you must learn still more to do well; and you must make this or that particular style of work subservient to the great principles which ran through all styles of architecture. Do not let us leave behind us works which would show our minds to have been wandering and unsteady; that we had been blind followers of antiquity on the one hand, or had, on the other hand, turned our backs on it as something worthless. He had faith in the catholicity of the institution which had just been established, and he hoped it would be the means of handing down to posterity some specimens of architectural perfection which would be regarded as favourable attributions of the nineteenth century.

Mr. George Godwin said it had been his privilege to be one of the first to urge the desirability of establishing an architectural museum. So far as placing the idea upon paper, and inducing the late Marquis of Northampton and others to move in the matter, he might perhaps claim to have been the first. The museum he saw before him, however, was not exactly what he had desired, and still hoped to see. The history of architecture meant the history of a progress of some four or five thousand years. The works at present in that museum were mainly confined to one period of the art in particular, a period of four or five hundred years, and did not illustrate other periods of art. He earnestly desired to see for the metropolis an architectural museum, in which the Assyrian, Egyptian, Indian, Grecian, Roman, Byzantine, Gothic, Renaissance, and, in fact, the whole of those characters which architecture had assumed, should be fairly represented so that the progress might be seen, and the steps understood. He hoped that out of the present museum might grow such an institution as that to which he had aspired; and if the museum was to lay hold of the sympathies of those who wished to see a living architecture practised amongst us, and not a mere system of copying, it must eventually take that shape. With regard to the art-workmen themselves, he was afraid they did not take so much advantage as they might do of the facilities which were thrown in their way for instruction. The Society of Arts had offered prizes for works of various sorts, but they had not responded so cordially as might have been expected. It was no use their saying that they desired to rise, unless they took those steps which would enable them to do so,—unless they put their hearts in the work, and performed it with a will. He wished hearty success to the Architectural Museum; but it was not meeting there, coming in now and then and looking at these specimens of architecture, that would accomplish the object in view; he wanted to see a body of willing students, who would work and make the best of the materials that were before them.

The Dean of Westminster believed Lord Macaulay used to say that the greatest museum of architecture or sculpture in England was Westminster Abbey; and it was surely a great advantage to have established the Architectural Museum in such close connexion with that museum of which he had charge; and it would be a great pleasure to him if he could render his museum of additional value in the way of instruction by enabling the students at the Architectural Museum to come to the Abbey and finish their works.

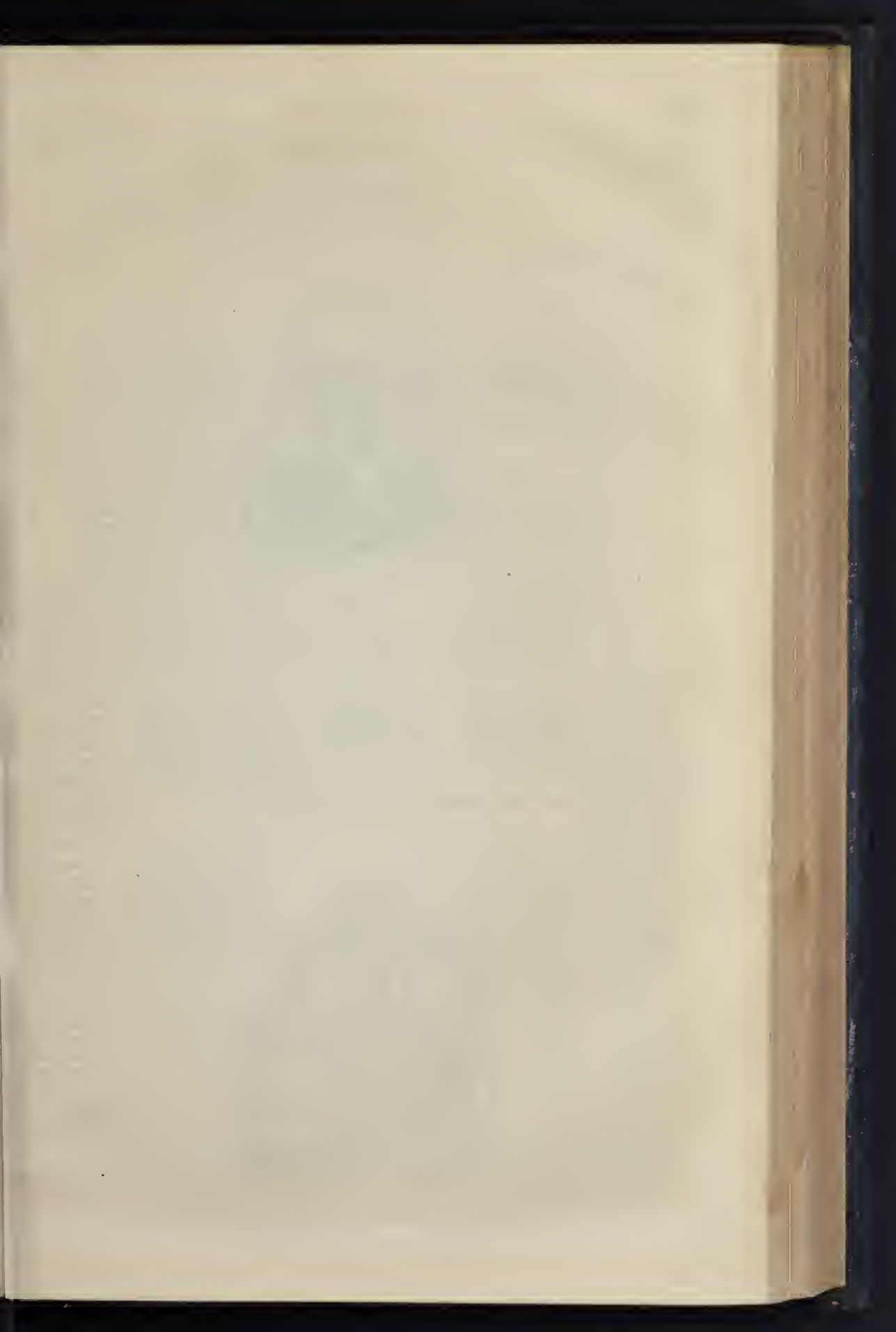
Lord Nelson having made some observations, Mr. S. C. Hall dwelt on the great antiquity of architecture—architecture having, in fact, preceded the fig-leaves. He spoke hopefully and ably of the future of the new museum as a medium of instruction, pointing out that it originated and was conducted mainly for the benefit of the workmen.

Mr. Franço Powell thought that of all the services which good citizens could render to their country there was at this moment no service more required, and none which if well done would bring greater benefit to England, than that which might be rendered by an architect, whether a scientific or a practical workman, who should devise means whereby cheap and commodious houses might be furnished to the working-classes, with the necessary accompaniment of life-giving light and air. If there was to be real or true advance, either in art or in any other department in which the human mind exerted itself, there must be reverence for the works that had gone before. We must learn to imitate what was good in them, and to correct their defects when once we had learnt to appreciate their merits.

Mr. Gambier Parry regarded the establishment of this institution as a matter of congratulation to all parties interested in the arts in this country; and he trusted it was but the nucleus of a more extensive organisation of the same nature which would hereafter arise.

Mr. G. Hubbard moved a vote of thanks to the President, who only acknowledged the compliment, and this closed the proceedings.

Late in the evening Sir William Tite, M.P., was present, and with his usual liberality gave (a second) 100l. to the building fund. We publish in our present number a view of the entrance front of the new building.





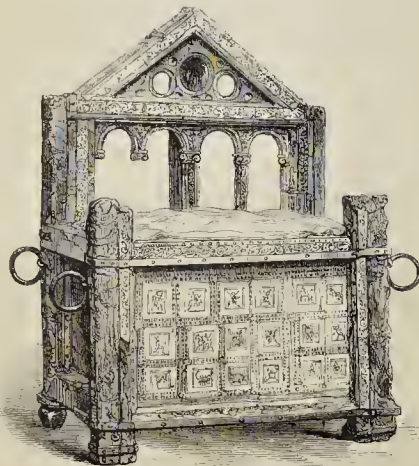
MR. THOMAS LEVERTON DONALDSON.

Emeritus Professor of Architecture, University College, London; Past President of the Royal Institute of British Architects.

PORTRAITS OF ARCHITECTS, WRITERS ON ARCHITECTURE, AND FRIENDS OF ART.

SOME few years ago we announced our intention to publish a series of portraits of contemporary Architects and promoters of architectural art. Modesty on the part of the two or three architects first applied to, and some other circumstances, led us to abandon the idea for a time. At the beginning of the present year, however, we revived the intention; and having now put ourselves into a position to proceed continuously, we publish in our present number, as the first of a series, the portrait of Professor Donaldson,—widely known and esteemed, not alone for his abilities and acquirements, but for the large amount of time he gives to the service of the public, and his constant readiness to further a good purpose or assist a colleague. He has recently returned from interesting travels in the East.

We do not propose, as a rule, to give any biographical particulars with the portraits. They will appear from time to time as occasion serves or circumstances dictate, and will be so selected that all our readers will know what is in the heads we represent.



"THE CHAIR OF ST. PETER," ROME.



THE ROYAL ARCHITECTURAL MUSEUM: BOWLING-STREET, DEAN'S YARD, WESTMINSTER.
MESSRS. CLARKE & CHRISTIAN, ARCHITECTS.

THE ROYAL AGRICULTURAL AND HORTICULTURAL SOCIETIES' SHOWS.

The Prince and Princess of Wales have received a right hearty greeting from many thousands of inhabitants of Manchester and its environs, and the many visitors who are straining the accommodation of hotels and private houses to their utmost capacity. The accommodation that was provided for spectators was something wonderful. Apart from walls, wall-heads, chimneys, and windows—there are no "battlements" available as "coigns of vantage,"—there were stands erected along the line of the royal procession to accommodate, not tens of thousands of spectators merely, but literally hundreds of thousands. The route included Stretford-road, a fine thoroughfare, formerly a "road" in the ordinary acceptation of that word, but now a wide street, of which there is a stretch of two miles in a straight line, one end of which is near the principal entrance to the Royal Agricultural Society's show-yard, at Old Trafford, of about 80 acres, which includes the site of the Art-Treasures Exhibition of 1857. In this fine road there was accommodation provided for an enormous multitude of spectators; "Alexandra" and "Victoria" stands, stands with other names, and without names, in front of the fine town-hall of Hulme township, of Holy Trinity Church, Chorlton town-hall, St. Andrew's Church, and on or in front of numerous open places, and public and private buildings. A stand over All Saints' burying-ground, at the junction of Orford-road and Stretford-road, was alone capable of accommodating 10,000 persons. In the city, also, extensive provision of the same kind was made, particularly in the neighbourhood of the infirmary; but these matters are more proper subjects for notice in the columns of the daily local and London journals than in the *Builder*, and it will be more fit to give a few notes suggested by the inspection of objects exhibited at the Royal Agricultural and Horticultural Societies, which relate more or less closely to structural art. Such objects and subjects are not so numerous in the two exhibitions as to be embarrassing. Our notes are made from visits to the exhibitions of both of the royal societies named.

As touching horticulture, among the exhibits,—very homely in appearance, but calculated to be very important in results,—are those of the plant protectors of Mr. W. E. Rendle, of Cavendish-square, London. This simple contrivance seems likely to revolutionise gardening operations entirely. It consists simply of an arrangement of grooved bricks, or of brick material, hollow tiles, with grooves at their upper edges, in which squares of glass are introduced, but not fixed, and can be slid with the greatest facility to regulate temperature. The materials used are of a common and inexpensive character; red earthenware and common orchard-house glass; no paint or putty is used; broken glass can be easily replaced by an ordinary labourer; ventilation is regulated easily; they cost much less than ordinary hard-glasses; and the protectors afford facilities to persons of limited means to grow almost all sorts of flowers, plants, and fruits early, and to a degree of perfection not hitherto possible, except to those of comparatively large means. We cannot doubt that this invention,—already very highly approved,—will rapidly force itself upon public approval and acceptance. In another department, but scarcely less important are the exhibits of Messrs. Major, of the Patent Tile Works, Bridgwater. These consist of numerous well-designed ornamental objects, moulded in the well-known Bridgwater clay, and thoroughly burned; but the special item that attracted our attention was their singularly corrugated roofing-tiles, 90 or 100 to a square, with ridge-tiles to match. They are laid upon laths, like the ordinary hollow tile by buttons, but make a much prettier and better roof, without pointing on the under side. They are produced either as ordinary tiles, or tinted with the colours burnt in, or with a metallic surface by treatment with lead burnt in. The perforated blocks of this firm for malt and paper pulp drying are also very meritorious: these are present, we believe, in great quantities to France and other countries.

Among the exhibitors of green-houses, conservatories, and vineries, we should mention the specimens exhibited by Mr. James Cranston, which have great merit in the principles of construction, and their system of ventilation. No propriety is used in the construction of these green-

houses, the glass being fixed between watertight grooved bars screwed together. The ventilation is managed satisfactorily on a principle peculiar to Mr. Cranston's structures. Mr. Messinger, of Loughborough, exhibits a model curvilinear conservatory, with a graceful outline and a good ventilating arrangement, which admits of numerous modifications, according to requirement. In the same class is the Tenant's portable Conservatory, by Mr. S. Titley, of Congleton, in which the glazing is done without putty, but by a different mode from that before referred to. No brickwork is used in this construction, and such conservatories may be easily removed by tenants. It is a neat and economical structure. Wheeler, of Nottingham, is also a notable exhibitor in this class; as is also Boulton, of Norwich, who exhibits a very handsome conservatory, in which the ornamental iron work, in ridge and finials, and in the formation of an elegant elliptical arch in the interior, plays a very conspicuous part.

WORCESTER MODEL DWELLINGS ASSOCIATION.

The general annual meeting of the Worcester Association for building Dwellings for the Labouring Classes has been held at the Guild-hall. The chair was occupied by Mr. G. W. Hastings; there being also present Rev. T. L. Wheeler, Admiral Sir Thomas Hastings, K.C.B., and other gentlemen.

Mr. Aldrich, Hon. Sec., read the report of the past year, the opening paragraph of which was as follows:—

"In presenting the proprietors their 15th annual report your governors cannot conceal the regret they feel in announcing that its tenor is not very satisfactory. From the depressed state of trade which has prevailed in Worcester during the past twelve months, a very large number of houses generally occupied by the artisan classes have been void, and there are at this time upwards of 150 unoccupied. This state of things has, as a matter of course, militated against the model dwellings, and the amount received by the association for rent has not been so much as usual, taking into consideration the rentals from the block of eight new houses, which were completed about the beginning of the present year."

The chairman said he thought they might fairly look forward, when the depression in trade had passed away, to being enabled to pay a fair interest for the money invested. If they had not succeeded from a financial point of view, it must be remembered that they had cleared away a block of miserable houses, and had erected in their place some model dwellings; and therefore they had succeeded in a moral and sanitary point of view.

The adoption of the report was carried unanimously.

In answer to one of the shareholders, Mr. Aldrich said that £100 had been paid altogether in dividends since the formation of the society. The shareholders must not be surprised at their not paying a dividend if they were to keep the houses as model dwellings should be kept.

The statement of accounts showed that after paying all expenses, amounting to 982*l.*, a balance of 42*l.* remained in the treasurer's hands.

THE TRADES MOVEMENT.

The dispute between the Yorkshire masons and their employers has terminated. The latter have withdrawn the demands they recently made as to the introduction of the bair system and other matters, and are willing to take back the men on the old terms.

As to the masons' strikes elsewhere, as well as in Yorkshire, a week or ten days since Mr. Harrott, general secretary of the Operative Masons' Society, reports,—“The strikes are now reduced to five—namely, Birmingham, 25; Chester, 7; Hanley, 2; Manchester, 218; and Newcastle-under-Lyme, 3; total, 249. The partial locks-out now pending are eight—namely, Coventry, 4; Liverpool, 190; Leeds, 20; Lynn, 4; Old Swan, 8; Sheffield, 4; Wigan, 4; and Wolverhampton, 6; total, 252. The aggregate is 501,—119 less than last return!”

Manchester.—An important resolution bearing upon this strike has been passed by the representatives of the London and Manchester Bricklayers' Societies, at a meeting held in Sheffield. After disposing of the differences of the two societies, the meeting adopted unanimously the following resolution:—

“That, in the interests of both employers and workmen, this meeting recommends that the dispute existing in the bricklaying trade of Manchester should be settled by the following mode:—That a Board of Conciliation be ap-

pointed, of an equal number of employers and men; that a chairman be selected, who shall be acceptable to both parties; and that the decision of the Board shall be binding upon both employers and men.”

Darlington.—About 150 delegates from the various lodges of the Bricklayers' Labourers' Accidental and Burial Society have had sittings at Darlington, the conference commencing on Monday and terminating on Saturday. Delegates attended from all the chief towns in England—Manchester, Birmingham, Leeds, Liverpool, Sheffield, Hull, Newcastle, &c., even places as distant as Torquay being represented. Mr. John Kennedy, of Halifax, presided over the conference, Mr. Hinman, of Hull, being vice-chairman. No question as to wages was raised, the meeting confining itself to carrying out the business connected with the financial affairs of the society, and making such levies as would be requisite to meet future contingencies. Members seeking work are aided by the society, relief is afforded in case of accident, whilst a bonus is given to the friends of a member on his decease.

Birmingham.—Arrangements are in progress for the second annual congress of trade councils and trade societies, to commence at Birmingham, on Monday, August 23rd. Up to the present time twenty-one trade councils and amalgamated societies have intimated their adhesion to the congress, including the associations in Dublin, Preston, Glasgow, Bristol, London, Manchester, &c. The programme contains a list of twelve subjects, upon which papers will be read by selected delegates.

THE GREAT AMERICAN PEACE JUBILEE AT BOSTON.

The Americans have been making a great noise in the world,—though we did not bear it on this side of the Atlantic,—with a grand chorus of 10,371 voices, 115 first violins, 100 second violins, 65 violoncellos; an equivalent force of trombones, bassoons, drums, &c.; and a grand chorus organ with 1,011 pipes, and a wind pressure of 4,000 lb. upon the reservoir. Not satisfied with all this piping and fiddling, they added the music of 100 blacksmiths' anvils! a park of artillery! and “all the bells of the city;”—everything “under the control of the leader.” It does not seem to have occurred to them to let us partake in the jubilee by ringing our telegraph bells in chorus. The audiences, for five days, during which all this was going on, were 50,000 to 60,000 people, inside a great building purposely erected, and a vast multitude outside. Madame Parera-Ross, whose portly dimensions well accorded with her gigantic surroundings, had the distinguished honour of singing a solo (Gomonada's "Ave Marie") in the midst of all the din, if that can be called a solo which was accompanied by 200 violins. Nevertheless, “she was heard throughout the building.” On the fourth day a little dancing was practised by 10,000 persons; and on the fifth day the voices of 8,000 children were added to the orchestral accompaniments.

In the preparation of the plans for the Colossium, as the building was called, architects were engaged for months beforehand.

“The structure was 600 ft. by 300 ft., and took the whole of St. James's Park. To add to the convenience of the public the city laid out new streets to the building, three foot bridges across other streets, erected lamps, &c. One of these bridges was 250 ft. long by 44 ft. in width, and roofed. Extra railroad tracks were put down, as well as gaspipes and water-mains. The building inside was 100 ft. high. The amount of timber used in the building was two millions and a half of feet, while the iron and glass was almost beyond computation. The roof comprised an area of 170,000 square feet. In this building the orchestra was 100 ft. deep and 115 ft. wide; the north or front balcony was 125 ft. deep, and the side balconies were each 75 ft. deep; the south balcony was 200 ft. deep. The parquet was 150 ft. in length by 175 ft. in width. Under the balconies were lobbies 36 ft. deep, and in the rear of the balconies there was a promenade 11 ft. wide and 1,600 ft. long. There were twelve arched entrances to the building, each 24 ft. wide. Besides this the building contained the executive committee's room, 125 ft. by 45 ft.; two reception-rooms of the same size; two refreshment-rooms, 75 ft. by 37 ft.; two large rooms for the reporters, and numerous smaller rooms. The building was illuminated by gas, for which purpose four miles of pipes were put up. The burners numbered 2,400 and about 1,400 cubic feet of gas were consumed each hour. Besides this, the building had an abundant supply of water, a steam fire-engine, and a perfect fire department, together with fifty patent fire-extinguishers.

The inside of the whole of this building was elaborately decorated and frescoed. The prevailing colours were gray, gold, and pink. The coats of arms of Massachusetts and Boston were conspicuously displayed, as well as the excellent motto, “Peace on earth; goodwill towards men.” Over the great chorus organ there was a design, representing a white dove bearing in its beak an olive branch, and in the spandrels of the arch upon each side there were floating angels, 18 ft. in length. The press-room was elegantly fitted up for the accom-

modation of the 300 editors and reporters who represented the press from all parts of the country. The reporters' tables were 180 ft. long, and at night were flooded with artificial light. A telegraph office was opened close at hand. Busts, paintings, flowers, &c., adorned the room. A branch post-office was opened at the Colosseum, and there was an hourly delivery of letters. The reception parlours were beautifully carpeted and supplied with black walnut furniture, while the City Forester filled them with rustic work, flowers, &c."

Before the opening of the concert, tickets sold at the rate of 100,000 dolls. a day, and it is estimated that on one day of the performance the tickets must have sold for a quarter of a million of dollars. And although the tickets of admission ranged in price from 2 dolls. to 5 dolls., yet they readily sold at a premium of from 15 dolls. to 25 dolls. The whole American people, as it were, have been music-mad on this great occasion.

The originator of the grand idea was an Irishman.

The festival appears to have shown that the volume of sound produced does not increase in proportion to the means employed. On this head the musical journalists of America are said to be unanimous. For example, an able correspondent of the *Musical World*, quoted by the *Pall Mall Gazette*, says:—"The 10,000 voices really produced no more apparent noise or power than 1,000 in an ordinary concert-room. Those present at the Handel Festival in 1867, and present also at this Boston Jubilee, declare that the chorus at the latter seemed less powerful than those at the former." The feeling appears to have been one of disappointment, the sound not being at all adequate to the vast numbers employed. The conclusion arrived at is, that "an average chorus of 5,000 voices is about all that the human ear will accept, and that further additions of singers only affect the eyes." According to *Dwight's Journal of Music*, "the hundred anvils [in the anvil chorus] were a failure. A single honest blacksmith's anvil has more ring in it."

ACCIDENTS.

THE Windsor goods station of the Great Western Railway has been totally destroyed by fire. The conflagration was remarkably sudden, and although no clear reason can at present be given for its origin, it is conjectured that the extreme heat of the sun may have ignited some of the contents of the building, which were consumed within half an hour; and, notwithstanding that in an incredibly short space of time the Windsor Volunteer Fire Brigade, with their Merewether engine, reached the terminus yard, their exertions were at first completely paralysed by the miserable supply of water. The passenger terminus, with the Queen's private waiting-room, was saved from destruction. The burning goods-shed was in the most dangerous proximity to the large gasometers of the Windsor Gas Company, but the wind fortunately drove the flames in an opposite direction.

A fire has also occurred at the Victoria Station, and was not extinguished until a good deal of damage was done. The cause is unknown.

In Stockport a house and shop in Park-street have fallen. The premises were in an unsatisfactory condition. The kitchen floor suddenly subsided in consequence of the giving way of supports underneath, disturbing the perpendicularity and involving the safety of the whole structure, extending also to the next shop and house. Fortunately no person was injured. Workmen are engaged in re-erecting and improvements, and providing for the re-occupation of the houses.

The roof of a large new weaving-shed for the Savile Mill Company, at Dewsbury, has been blown down by a heavy gust of wind, bringing down the scaffolding upon which masons and others were employed, as well as overturning the iron pillars on which the roof was to rest. Three persons sustained severe injuries, one being one of the firm of contractors, Messrs. Frith & Sons. Mr. Frith had a narrow escape from instant death; he was thrown to the ground along with scaffold-planks, roof-trees, &c., and was pinned to the floor by a beam of timber. His clothing had to be cut in order that he might be extricated, and when he was released it was found that his ribs were broken, and that he was otherwise seriously injured. Two working men were also injured in a similar manner. An examination of the ruins shows that the roof timbers had not been fastened into the masonry at the end of the building, but

were merely resting on the iron pillars until the stonework was completed.

The bridge which crossed the Leithen on the Galashiels-road, in Scotland, was recently taken down, as from its narrowness and steepness it was quite unsuitable for the extensive traffic that now passes along that road. The erection in its place of a more suitable bridge, of a single arch, as before, was begun, and considerable progress had been made, the mason-work of the arch having been almost completed, when the woodwork on which the masonry rested being insufficient to support the pressure, gave way, and the whole came to the ground, the woodwork being smashed to splinters. The masons fortunately had not begun work, and no one was hurt.

At Krenholm, near Narva, in Russia, a number of persons having collected on a bridge, the parapet gave way. Sixty-five persons were precipitated into the river, and twenty-one drowned.

The chain bridge leading to Vauxhall Island, Richmond, in Virginia, on a recent occasion, was so crowded that it gave way, carrying down about sixty persons. A prominent man, a candidate for the Senate, was instantly killed; also a policeman, who was on duty striving to prevent the crowd from rushing on the bridge. Seven coloured men were fatally wounded.

COMPETITIONS.

New Almshouses, Salisbury.—It has been decided to pull down the present dilapidated buildings at the top of Winchester-street known as Eyre's Almshouses, and to erect six new houses and a matron's residence to replace them. The trustees of the charity advertised for designs for the new building, offering a prize of 10l. for the one selected. No less than forty-nine were sent in, some of them, says the *Dorset Chronicle*, of a very elaborate character. They were exhibited at the council-chamber, and the building committee met, and after a careful examination of the plans, five of them were selected, from which reduced number the charity trustees will make a final choice.

New Schools, Eastwood, Rotherham.—The committee have selected the plans of Messrs. Blackmoor & Mitchell-Withers, in a limited competition, and the work will be commenced forthwith.

Isle of Man Legislative Hall.—We have received a number of letters and papers on this competition, tending to show that an erroneous and unfair selection has been made. The Manx papers seem to agree in pointing to Mr. Ellison's design as superior to that which has been selected.

SANITARY MATTERS.

Brighton.—In compliance with an advertised request of Mr. Hawkshaw, C.E., who has been selected by the town council to advise them upon the best course to pursue in order thoroughly and effectively to drain the borough and dispose of the sewage, several influential gentlemen have had a conference with him, in the council-chamber of the town-hall, to lay before him what information they possessed, or deemed necessary, on the subject. Mr. Hawkshaw, in course of the proceedings, stated that his hands were not tied in any way.

St. George's, Gloucestershire.—For some time past there has been a sewer authority in existence in this parish, but they have hesitated about doing anything, through fear that any arrangements they might make might be overruled by the inhabitants. Complaint, however, has recently been made to the Home Secretary, and by his order Mr. Rawlinson, C.E., recently investigated the state of the parish. As the result of his report, Mr. Bruce sent a letter to the sewer authority, giving them notice that, unless they carried out the duty devolving upon them within three months, he should make an order for the work to be done by an independent person, and the parish would have to bear all the expense.—In consequence of his notice a vestry has been held, and the inhabitants have resolved to leave the sewer authority to adopt the order of the Home Secretary or abide the alternative. The opinion was expressed, that the appointment of a local Board would be almost tantamount to a return to the close vestry system, as the parishioners would not have the control over such a body which they now have over the sewer authority.

Chester.—The town council are considering as to taking steps at once for the proper ventilation of the city sewers, and the preparation of plans for carrying out the system effectually. The total want of ventilation in the Chester sewers, and necessity for remedying this defect, had been reported on by Mr. Baldwin Latham, C.E.

Carlisle.—At a recent meeting of the Local Board of Health a letter was read from Dr. Elliot complaining of a case of typhus fever in a house behind the Blue Bell, at the low end of Rickersgate, which had been caused by stench arising from a midden and heap of slaughter-house refuse. The head of the house stoutly and stupidly resisted the doctor's advice that the patient should be removed to the fever hospital, and the young woman was left to struggle through it at home. The other three inmates were all similarly seized, but they were removed to the hospital, where the old man recovered to himself died. Dr. Elliot advised that the place be in the mean time declared unfit for human habitation, forthwith famigated, and done out thoroughly with quicklime. The letter was handed over to the deputy-inspector of nuisances for immediate investigation.

OBITUARY.

THE death of Mr. Charles Freeman, architect, of Lincoln's-inn-fields, will be heard of with regret by all. It took place at his residence, on the 16th inst.: his age was but 55. He is probably best known as surveyor to the Sun Fire Assurance Company, in which capacity he erected not long ago a handsome building at Charing-cross, to be used as a branch office; another also in Vere-street. Schools at Hendon, and the extensive buildings known as Tattersall's, at Knightsbridge, are amongst his works. Mr. Freeman had been greatly affected by the rapid death, one after another, of a number of friends, all in the prime of life, including the two sons-in-law of Mr. J. R. Planohé (the Rev. Henry Macharrese and Mr. W. Wholan, of Tenterden), and Mr. Halliday, the artist, and his brother. On hearing of the death of Mr. Whelan, he exclaimed with some vehemence, "God God, who next?" Within a very few weeks his own name was to be added to the list. Mr. Freeman was a Fellow of the Royal Institute of Architects (elected 1845), and was much respected for integrity of character.

Mr. Horatio Nelson Goulty, architect, who died in Brighton, on the 7th inst., was but thirty-nine years of age. In conjunction with his partner, Mr. Gibbins, he had executed several important works in that town, particularly the Norfolk Hotel (illustrated in our pages), the Turkish Baths, and a Congregational Church and schools at Hove. We published some time ago a design by him for an arcade in Brighton, but this has not yet been carried out. Mr. Goulty was a pupil of Mr. Herbert Williams, and had the prospect of a good career.

THE MAIN DRAINAGE.

SIR,—Mr. Bazalgette has drawn my attention to the account of the discussion on the "Ventilation of Sewers," at a meeting of the Social Science Association, in your impression of the 10th inst., in which I am reported as saying, "The great embankment sewer which had a fall of only 1 ft. in a mile from Fulham down to Abbey Wood, admitted only of a very tardy flow of sewage." Also to the remarks made by the chairman (Mr. Chadwick), at the conclusion of the evening, founded upon what I had said. Mr. Bazalgette points out that the upper part of the sewer, not yet constructed, will have a fall of from 3 ft. to 4 ft. per mile, while that already constructed in the embankment has a fall of 2 ft. per mile. I am sure, in justice to him, you will allow me to make this correction, and in justice to myself to state that I attended the meeting with a view rather of gaining information than of imparting it; but being called upon by the chairman by name, I could not refuse to state what had been done in the matter under discussion by the Metropolitan Board. In the course of my remarks I alluded to the sewer in question as showing how impracticable was the principle laid down by the chairman, viz., that no sewer should be constructed with a fall of less than 1 ft. in 60 ft., pointing out that, assuming the distance from Fulham to Abbey Mills to be 10 miles, such a fall would give the depth at the Abbey Mills end as 1-6th of a mile beneath

the surface of the ground; and stating that I believed the fall of it, although it was undoubtedly one of the finest pieces of sewer work in the world, was only about 1 ft. in the mile.

EDWARD RIDER COOK.
Metropolitan Board of Works.

DINNER AT THE MANSION-HOUSE.

SPECIALLY to do honour to the Council of the Royal Society, and to the members of the Royal Academy, the Right Hon. J. C. Lawrence, Lord Mayor, entertained in the Mansion House some 250 gentlemen connected with art, science, and literature, on Wednesday evening last.

In proposing the toast, "The Royal Society," the Lord Mayor, who discharged the duties of the position with his accustomed ability and force, said that it had been one of the chief pleasures of his year of office to look forward to this gathering of the members of the learned and literary societies; and, if it was sometimes said that they were not to be found so frequently as might be wished in palaces, he hoped, at all events, that in the palace of the City of London no year would pass without the recognition on the part of the chief magistrate of the position which the prominent members of these societies occupied in the affections and feelings of the people.

Lieut.-General Sabine returned thanks, as Sir James Grant did for "the Royal Academy." For the Lords and Commons, Lord Houghton spoke happily. Sir R. Murchison (for "the other Learned Societies"), and Mr. Hepworth Dixon and Mr. Martin Tupper (for "Literature") also spoke. The gathering was one to be remembered.

THE CARILLON AT BUFFALO CATHEDRAL.

The following paragraph, or some variety of it—copied from an American journal—is going the round of our English papers:—

"A carillon of forty-three bells was consecrated with religious ceremony at St. Joseph's Cathedral, in Buffalo, on the 1st inst. This is the only instrument of the kind in the United States, and there are only two others in the world."

Now, I happen to know that this is the very same instrument which was exhibited by M. BOLLÉ in the Champ de Mars, Paris, in 1867, and which gave great satisfaction to numerous visitors. Nevertheless, the assertion that "there are only two other instruments of the kind in the world," is, to say the least, fallacious and deceptive. It is true that there are very few carillons possessing so many bells as the one at Buffalo. But it does not follow from this circumstance that the latter is superior in a musical point of view to all the other instruments in the world except two, or even equal to some which have a shorter range of notes.

The magnificent carillon in the tower of Antwerp Cathedral, which has only forty bells, is perhaps the finest in the world. The instrument placed in the famous tower of Boston Church, within the last two years, has forty-four; but I do not hesitate to say that had a smaller number of bells been cast from the same quantity of metal, the result would have been far more satisfactory to competent judges of carillons and musical sounds.

To prevent the possibility of being misunderstood, however, allow me to say in conclusion, that the carillon at Buffalo is a very fine instrument, which does M. BOLLÉ great credit.

THOMAS WALESEY.

THE "DICTIONARY OF ARCHITECTURE."

SIR,—The "Dictionary of Architecture" is a work so important and valuable that I hope you will not object to deviate the attention of the profession, as well as of the public generally, to the proposal recently made by the Society to secure its early completion.

If within the next week I am favoured with a sufficient number of copies to the circulars which have been issued, the committee anticipates that the complete work, A—Z, can be supplied for 15 guineas—a very moderate sum, considering the magnitude and importance of the work.

It is quite possible that many persons who would desire to possess the work may hold back, in the hope of being able at a future time to secure it at a less price (by the sale of the remainder or otherwise) even than that at which it may now be obtained. This opportunity can never occur, because the number of copies printed being limited to those required, and the entire work being the absolute property of the committee, the price given, that not at any one time shall any portion be issued at less than the subscription price, will be strictly maintained.

It would be very discreditable to the profession that so

valuable and important a work should be allowed to remain incomplete, when a small exertion would place the committee in possession of funds to insure its completion.

Should it be found that sufficient response is not given to the present appeal, and that within the United Kingdom there are not 150 architects or others with sufficient interest in the literature of the profession to contribute (even by the easy instalments suggested) the small sum of 15*l.* for such a book, its further progress must be stayed, or the cost to the present subscribers must be much increased, should they determine to complete it.

ARTHUR CAYE, Hon. Sec.
Architectural Publication Society.

7*a*, Whitehall-yard.

THE GARRISON CHAPEL, PORTSMOUTH.

THE restoration of this interesting old church has been completed, on the whole, in a satisfactory manner, but attended with circumstances which have given much pain to many whose ancestors or relatives lay buried in the surrounding churchyard.

A most extensive removal and desecration of the old tombs have taken place. Some of them have found their way into petty builders' yards, and others are used in the repair of old pavements.

Who is to blame for this? Is it the architect, or is it the reverend chaplain who took so much interest in the restoration?

Whoever it may be, it is sorely the duty of the committee to inquire into the matter, and cause every inscribed stone to be replaced in the old cemetery, remembering that not only are these removals an injustice to the friends or descendants of those buried there, but that also serious questions of property may depend on the existence of an inscription on a grave-stone.

SULLA TOMBA.

CHURCH-BUILDING NEWS.

Hastings and St. Leonards.—The memorial stone of a new parish church at Ore has been laid. The site was given by Mr. Habershon. It is a little to the north-west of the old church, abutting on the south side of the turnpike-road, and a short distance from the boundary-wall of the borough cemetery. The architect is Mr. Edgar P. Loftus Brook; and Mr. H. Hughes is the builder.

Little Birch (near Hereford).—The church of this parish has been restored. The old edifice, if it can be so called, having only stood twenty-eight years, has been pulled down, and the new one erected on its site. Mr. W. Chick, of Hereford, was the architect, and Messrs. Coleman & Son, of Chaxhill, near Gloucester, were the builders. Though the new church stands as nearly as possible on the old site, it will be a trifle larger in dimensions than the old edifice, some little extra space being obtained by the lengthening of the chancel as much as possible, and by taking in a few feet from the churchyard on the north side; an additional aisle is thus obtained, and the nave is also rendered proportionate. The present building consists of a nave, 49 ft. by 18 ft., with aisle, 10 ft. wide, adjoining. The chancel, which is formed by a polygonal apse, is 15 ft. by 15 ft., and has on the north side a small vestry. The style of architecture selected is the Early Decorated. The principal entrance to the church is through a porch in the north side. The nave is lighted by two cinquefoil and two quatrefoil windows, built alternately for architectural effect. There is a west gable window, and in the aisle four small two-light windows. The chancel has five traceried windows, similar to the nave, except that they are more highly cusped. The west gable is surrounded by a bell-tower, in which is hung a bell, cast by Messrs. Taylor & Son, of Loughborough, and weighing over 4 cwt. The whole of the external stone dressing beyond what could be re-used from the modern church, was supplied by Mr. John Trask, from the Ham Hill Quarries. The internal dressings are worked alternately with Ham Hill and Bath stone. Throughout the church the moldings are undercut, so as to produce the effect of light and shade. The whole of the seats and the woodwork generally are of deal; but the chancel, stalls, and upper portion of the pulpit are executed in oak. The carving throughout the church has been executed by Mr. Welsh, jun., of Hereford, and the building is paved throughout with encaustic tiles, from the manufactory of Mr. William Godwin. Mr. Lewis Powell has been the clerk of works employed, and Mr. Halliday the foreman. A new wall has been built round the churchyard, with Ham stone piers, copings, &c. The whole of the windows have been filled with stained glass by Messrs. Hartland & Fisher, of London. The

roofs are all open-timbered, with boarding on the back of the rafters, a layer of asphalt being placed between that and the tiles. The whole of the timber exposed to view is stained and varnished. The principals of the roof are supported by carved corbels on each side.

Tydd St. Giles.—The parish church, recently reopened, is one of the most ancient and interesting in the Isle of Ely, the date of its erection being about A.D. 1200. The nave is late Norman; the aisles are partly decorated and partly perpendicular. The western doorway is considered to be the work of Alan de Walsingham, the architect of the original lantern of Ely Cathedral. The chancel, which was taken down about a hundred years ago, appears to have been Early English. The restoration has been carried out under the direction of Mr. G. Gilbert Scott, jun., and comprises new roofs to the nave and aisles, the taking down and rebuilding upon foundations of concrete 4 ft. or 5 ft. deep, all the five columns on each side of the nave, some of which were 8 in. or 9 in. out of the perpendicular, the construction of a new chancel within the two easternmost bays of the nave, the under-pinning of the western wall and all angles and buttresses, new floors and pews, new doors, and repaired windows, &c. The contractor was Mr. Wm. Brown, of Lynn, whose contract amounted to 2,300*l.*

Winford.—The church of St. Katherine and the noble Army of Martyrs, at Felton-common, has been consecrated by the Bishop of Colombo, as commissary of the Bishop of Bath and Wells. The church was completed and opened for divine service about three years ago. It is a small stone building, furnished with chairs, all the seats being free. It was built entirely at the cost of the Rev. J. W. Hardman, LL.D.

Carlisle.—The site and plans for the proposed new church of St. Mary's Without have been approved of at a meeting of parishioners. Messrs. Habershon & Brook are the architects. The building committee propose to raise 3,000*l.*, but for tower and spire inclusive the cost will be 4,000*l.* About 1,000*l.* more than what has been already subscribed will be required before the edifice is contracted for. The building will contain a nave and two aisles, north and south. It will be 95 ft. long and 55 ft. wide, and seated for 600. The chancel is 21 ft. square. The height of the side walls of the nave, from the floor, is 26 ft., and the aisles 12 ft. The height from the ground to the top of the spire is 115 ft. There are handsome intressees on each side, and on the ends and corners of the church. Between the intressees on the north and south sides there are two tracery windows, and on each side one three-light tracery window, over which is a gable. The main features in the church are ornamental tracery windows at the east and west ends. The east window, in five lights, is 14 ft. high by 9 ft. wide, daylight size. Looking east, there is also a large three-light tracery window, which lights the end of the south aisle. At the west end there are two ornamental tracery windows, three lights each, 15 ft. high by 7 ft. wide; and one three-light smaller window, filled with tracery, which lights the end of the north aisle. The clearstory is lighted on each side by twelve quatrefoil and cinquefoil windows. The walls are supported by five circular columns, and arches springing over. The chancel arch is 25 ft. high, and width 20 ft. The font stands at the west end in the centre of the nave. It is not yet decided what kind or colour of stone is to be used. The site is in Spencer-street.

Boroughbridge.—The corner-stone of the new aisle to the ancient parish church of Kirby-on-the-Moor, near Boroughbridge, now undergoing restoration from the design of Mr. Scott, has been laid. The workmen of Messrs. Shaftoe & Barry, the contractors, were afterwards entertained at a substantial luncheon, at which Mr. A. Roope, the clerk of the works, presided. During the progress of the works Mr. Scott's opinion as to the architectural interest attaching to this church has been established by the discovery of numerous antiquarian remains of Norman and Saxon date.

Ulster.—A new church is being erected here, with funds provided by the late Rev. Jonathan Cape. The style is Gothic, after a design of Mr. Grayson, architect, Liverpool. At the south-east angle rises a square tower, containing the belfry, surmounted by an octagonal spire. The tower and spire rise to the height of nearly 90 ft., and are protected by a lightning conductor. The east window has to be filled in by a firm in Manchester with stained glass, in memory of the late Rev. Joseph Cape and his wife Phillia. The

other windows are filled in with slightly tinted glass, and bordered with an edging of deeper hue. The cost of the whole will be about 3,000*l.* Messrs. Brough, Bromfield, were the contractors for the walling and mason's work; Mr. Sheffield, Wigton, for the joiner's work; and Mr. Joseph Mark, Wigton, the painting, plumbing, and glazier's work. Stones were obtained from the quarries of Mr. H. Richardson, on Uldale Fell and Faunds Brow, and certain portions from Howrigg.

Freeland.—A new church, situate in the hamlet of Freeland, in the parish of Eynsham, the gift of the family of Mr. W. E. Taunton, has been consecrated. The character of the church, which is dedicated to St. Mary the Virgin, is Early Pointed. It consists of a nave (44 ft. long and 21 ft. wide), southern porch, with parvise over, leading to parsonage on the north side, apsidal chancel (33 ft. long and 15 ft. wide), vestry, and tower on the north side of the chancel. The outside walling is local rubble stone, in unequal horizontal courses. The inside is Bath stone, and Bath stone is used for all the dressings inside and outside. All the roofs are covered with red plain tiles. The font is of Caen stone, as is also the pulpit, which has a carved cornice and green marble columns. The eastern portion of the nave is seated with open oak benches, the western part with chairs. The chancel is paved with Minton's tiles, and the other portions of the church with Staffordshire tiles. The nave is lighted by coronae of four lights each, suspended from the boarded ceiling on either side. Mr. Bartlett, of Witney, was the builder; and Mr. J. J. Smith the clerk of the works. The whole of the work was carried out under the superintendence of Mr. J. L. Pearson, of London, architect.

Dodleston.—The foundation-stone has been laid of Dodleston New Church, which is to be rebuilt on the old site, but will be somewhat larger than the old structure. Mr. Douglas is the architect, and Mr. Wigginner the contractor.

Lynn.—A plan has been proposed by the churchwardens of St. Margaret's, under the advice of Mr. G. G. Scott, architect, for the removal of the organ, and of the east and west galleries; and to authorise an application to the Bishop of Norwich for a faculty for these purposes. At a recent meeting of the vestry a majority were in favour of the scheme. It is proposed to abolish the west and east galleries (the latter cutting off the chancel); to remove the organ from the west gallery to the north transept; and repair it to the necessary extent; to remove the pulpit from the middle of the north side of the church to the north-east corner; to remove some of the Corporation pews; and to turn all the pews in one direction, *i.e.* eastward, which at present turn in every direction conceivable. The total cost of the alterations is estimated at 50*l.*, or 100*l.* at the outside, and of the organ repairs, 135*l.* The alterations will also form part of a plan for the entire restoration of the church, should this ever be entered upon. No steps towards the execution of the work, however, will be undertaken without the full consent of the congregation and the parishioners.

Walton-breck.—A reredos has been erected in Holy Trinity Church, Walton-breck, at the sole cost of Lieut. Colonel A. H. Brown, M.P., according to designs and under the superintendence of the Messrs. Hay, of Liverpool, architects, and executed by Mr. Rogerson, sculptor. It consists of an arcading in Caen stone, extending all round the five bays of the chancel, with crocketed pinnacles, gables, and arches set up on polished shafts of Irish red and green marble. The central bay, immediately behind the altar-table, is divided into three compartments, with the middle one widest, the marble shafts standing clear, and the recess behind filled in with a representation of the Last Supper in *alto-relievo*. This is cut in alabaster, and occupies the three compartments of the central bay, the arch and gable over the middle one rising well up, and terminating in a cross. The materials are left of their native colours, the white alabaster coming well out, the nimbus of the central figure of our Lord being alone touched with gold. The rest of the chancel is tinted of a light pea green, with a dash of brown, separated by a stencilled border of cinquefoils, with the top of the walls illuminated with texts and emblematic devices.

Castlemorton.—A new church for the outlying portions of the parishes of Castlemorton and Berrow, which are situated long distances from their parish churches, is being completed, and will probably be opened for divine service this autumn. Earl Somers allowed the stone to be

quarried free of royalty, Earl Dudley and others subscribed liberally, and the site was given by the Dean and Chapter of Westminster. The spot selected is the common near the Hollyhush Hill, about three miles from Castlemorton Church, and an equal distance from that of Berrow. Mr. Preedy furnished the plans for the building, which is to contain seventy sittings, will be 40 ft. long by 20 ft. wide, with a nave and chancel, open timbered roof, bell-turret, south porch, triple-light window at east end, and the other windows of two lights. Mr. Smart, of the Wells, is the contractor for the work, and the stone was partly got from Eastnor and Ombersley, with also some Bath stone. The total cost of the work will be about 650*l.*

SCHOOL-BUILDING NEWS.

Bradford.—The memorial stone of Moravian Sunday schools has been laid in Little Horton-lane. The estimated cost of the schools, with furniture, is 1,100*l.* A Moravian chapel is also proposed to be erected as soon as four-fifths of the estimated cost have been raised, which is 2,000*l.* In the meantime the services will be conducted in the school-room. The site presented difficulties in carrying out both chapel, schools, and minister's house, but these have been overcome. The architects are Messrs. C. S. & A. J. Nelson, of Leeds. A general hall on the ground-floor gives access to all the rooms, the main school-room being 40 ft. by 30 ft., well lighted by windows on two sides. In addition to this, on the ground-floor there is a vestry, 14 ft. by 11 ft., and tea and class room, 21 ft. by 14 ft. A broad stone staircase leads from the hall to the upper floor, where again is another large room, the same size as below, with open roof, and three class-rooms adjacent. The large rooms are about 14 ft. high. The designs are in the Italian style, the ground-floor windows of the school building having square heads, the upper windows being circular-headed. The main front and entrance to the new chapel will face into Little Horton-lane. On each side it will be lighted with long circular-headed windows. The contractors for the several works for the school buildings are as follow:—Masons and bricklayers, Messrs. Hey & Smith, Bradford; carpenter and joiner, Mr. William Ives, of Shipley; plumbers and glaziers, Messrs. Midgley & Jowett; plasterer, Mr. Benjamin Dixon; slater, Mr. James Smithies; painter, Mr. Edward Haley.

DISSENTING CHURCH-BUILDING NEWS.

Rochdale.—Trinity United Presbyterian church has been opened for divine service. The edifice is situated at the corner of Manchester-road and Gashouse-lane, and immediately opposite the road opened out in front of the new town-hall. The building is in the Gothic style, faced with Yorkshire parapets and dressings from Slaithewaite, near Huddersfield. At the north-east angle there is a tower, with buttresses. The spire is not yet erected, but when complete, will rise to the height of 140 ft. There are three entrances, one in the tower and the others in the centre of the front and side porch. The central doorway leading to the vestibule has a moulded arch, with label, terminated by carved bosses. In the front gable there is a five-light window, with double reveals and tracery head. The side windows to the nave are two-light, with tracery heads, varied in alternate design. The transept windows are four-light, with tracery heads. The chancel window is also a four-light, the tracery being arranged to symbolise the Trinity. The building is cruciform on plan, and consists of nave, transepts, and chancel; the inside dimensions of the nave are 74 ft. (exclusive of vestibule), and 43 ft. wide; the transepts, 24 ft. by 14 ft.; and the chancel, 22 ft. by 14 ft. There are no galleries in the church, with the exception of a small one over the front vestibule. The glazing, which has been executed by Messrs. Edmondson & Son, of Manchester, presents a series of geometrical designs in varied tints, all the windows having painted borders. The roof is open-timbered. The chancel is divided by a dwarf wall in Bath stone, and is intended to be surmounted with Medieval wrought-iron cresting and gate in the centre. The chancel arch springs from granite columns, with Bath-stone corbels and capitals. The whole of the wood-work inside is of pitch pine, and will be left free from stain or varnish.

The carving, which has been executed by Mr. Bonehill, of Manchester, is natural generally, but slightly conventionalised. On the four transept corbels are sculptured the four Evangelists. There is a school-room formed in the basement, but it is only intended for temporary use, and will eventually be converted into a lecture-room. There are about 800 sittings provided, and the cost will be upwards of 5,000*l.* The general contractor was Mr. Robert Rhodes, of Rochdale, the joiners' work having been executed by Mr. Crabtree. The whole of the work has been carried out from the design and under the superintendence of Messrs. Woodhouse & Potts, architects, Oldham.

New Ferry, near Birkenhead.—St. Mark's free and unappropriated Church, which was consecrated about three years ago, has been enlarged at the expense of Mr. Harwood W. Banner. The new north chancel aisle, which provides about eighty additional sittings, consists of two bays, and is built of Tranmere stone, with Storeton dressings. The seats are of pitch pine. The work has been carried out by Mr. J. H. Mallin, of Liverpool, under the direction of the architect of the church, Mr. E. Haycock, jun., of Shrewsbury.

Wibsey (Bradford).—The memorial stone of a new Wesleyan Chapel at Wibsey has been laid. Up to the present time about 1,900*l.* have been subscribed for the edifice. Mr. Samuel Ackroyd, manufacturer, of Great Horton, gave the site, which cost about 600*l.*, and, in addition to that, subscribed 500*l.* for the building fund. The site which has been selected for the new chapel is a piece of ground immediately in front of the old schools, and to make a suitable entrance from the High-street, two cottages, which previously hid the site from the street, have been removed. The new building has been designed by Messrs. Andrews, Son, & Pepper, architects, Bradford. The plan, which does not differ materially from the usual arrangement, is externally 82 ft. long by 50 ft. wide, and has in front a central entrance and vestibule, 8 ft. wide, and vestries in the rear. Two rows of columns divide the chapel into nave and aisle, and support the roof. They are also intended to carry galleries; provision also has been made, in the event of extension, for clearing away the vestries. The exterior is designed in the Gothic style. Above the central doorway is a four-light window with geometrical tracery, and the gable, which is brought forward in advance of the side aisles, is surmounted by a bell turret and flanked by pinnacles. Without the galleries the chapel will at present accommodate 450 persons, and the galleries could be made to contain 500 more. The cost of the building will be about 1,500*l.*

Hungerford.—The new Wesleyan chapel erected in Charnum-street, has been opened for divine service. The chapel is in the early Gothic style, situated at the entrance to the town from Marlboro' and Newbury, and seen from the town itself. It is built to seat 400, and has an end gallery. The seats are open, of stained deal, and the windows are of three tints of cathedral glass. Messrs. Wilson & Wilcox, of Bath, were the architects; Mr. Phillips, of Swindon, the builder; and the tiles for the chancel pavements were supplied by Messrs. Malkin & Co., of Burslem. The entire cost of the building will be about 2,000*l.*

Walsford.—The foundation-stone of a new Wesleyan chapel has been laid here by Mr. M'Arthur, M.P. for Lambeth. The site was given by the late Mrs. Petty, of Lady's Close, and a piece of land adjoining was purchased for a school-house. It was decided to build the school-house first, and to use it as a temporary chapel. A building fund has been raised. The estimated cost of the new (temporary) chapel, including the purchase of the land, is 1,900*l.*, which sum, with the usual extras, will probably be increased to about 2,000*l.* Before the foundation-stone was laid the sum of 1,100*l.* was provided for, leaving about 900*l.* to be raised.

Bognor.—A new Congregational Church has been opened here. Its architecture is Early English, from the designs of Mr. C. O. Blaber, of Brighton, and it has been erected at a cost of about 2,500*l.*, the building contract having been taken by Mr. Snewin, of Littlehampton, for 1,560*l.* The coping and finials are not included in the contract, and will cost 55*l.*, being a gift. The building is 60 ft. by 35 ft. in the clear, and accommodation is already effected for 350 persons, but provision is made for the erection of galleries. The walls are of flint with white stone dressings, the windows being of Box-ground Bath-stone, filled in with Hartley's patent quarry

colled plate glass and Moore's louvre ventilators. The roof is ceiled about half way up to the principal rafters, the bottom of which, together with the braces and principals, are open, and rest upon stone corbels. The seats are open deal and varnished. Mr. James Reed acted as clerk of the works under the architect.

STAINED GLASS.

Hazlewood Castle (Tadcaster, Yorkshire).—A stained-glass window has just been erected in the old chapel attached to Hazlewood Castle, in memory of the late Sir Edward M. Vavasour, bart. (who died in 1847 on his way to Rome), and his lady, who predeceased him many years. The window (which is the gift of the Rev. Philip Vavasour, youngest son of the late baronet) consists mainly of two lancet lights, containing representations of the patron saints of the persons commemorated. In one light is a figure of St. Edward, King and Confessor, and in the other light is a figure of St. Marciana, Virgin and Martyr, both the figures standing, surrounded by their distinguishing attributes or emblems, beneath foliated canopies of characteristic design. At the top of the window is a four-pointed tracery panel, which is filled up with a monogram, and across the bottom of the two lancet lights runs the inscription. The window was executed by Mr. Francis Barnett, of Leith and Edinburgh.

Sidmouth Parish Church.—The last plain glass window in this church has just been replaced by one from Messrs. Ward & Hughes, in memory of Emma Pennant, widow of the Rev. Thomas Pennant, who died June 9th, 1865. The new window consists of three lights. The centre one depicts above St. Peter attempting to walk on the water, and below the poor widow's offering, as contrasted with the rich men's gifts. The eastern side light pictures the miraculous draught of fishes, and the western side light the Saviour stilling the tempest.

Patcham Church.—Stained glass has been recently placed in the east window of the chancel of this church. The window itself is of the Decorated period of architecture, consisting of three main lights, and six openings above of tracery in stone work, which has been cleaned and repaired. In the lower and principal portion three scenes, in connexion with our Saviour's earthly mission, are delineated, and in the upper divisions His welcome of the good to the heavenly reward. The first group at the base represents our Lord as an infant in the manger. In the second, or central division, is depicted the crucifixion. In the third compartment are seen the holy women sorrowing at the tomb of the risen Saviour in the garden. In the top margin of the tracery is a figure of our Lord with outstretched arms, receiving the just, who, attended by their guardian angels, are seen ascending. These occupy the two largest quadrifolials. In the three trefoils are full-length figures of the archangels, St. Gabriel, St. Michael, and St. Raphael. The subjects in the lower portion are enclosed within decorated tabernacle shrines. The window is dedicated to the memory of the late Mr. H. C. Lacy, of Withdean Hall, and the artists who designed and executed the work are Messrs. A. & W. O'Connor, of London.

St. Andrew's, Norwich.—A stained glass window, by Mr. Hughes, of London, has just been placed in the south side of the chancel of this church. It is a memorial to the deceased children of the present vicar, and the subjects are—in the eastern light, Christ receiving little children; in the next one, His charge to St. Peter, "Feed My lambs;" and in the western light, Christ teaching by the example of a little child. Textual illustrations of the subjects appear in the tracery above. There is still too much light for stained glass to appear at full advantage; but it is an important step to darken the clerestory windows, and if, at the same time, money is forthcoming, it removes the block of old pews still standing in the chancel.

St. Peter-Port Church, Guernsey.—A stained glass window, to the memory of De Beauvoir de Male, has been placed in this church. The design is intended to illustrate our Lord's parable of "the good Samaritan." In the three main lights the parable is thus represented:—1st. Pouring oil into the wounds of the man who lay among thieves. 2nd. Bearing the wounded man on his beast to the inn. 3rd. On his departure commending the poor man to the care of the innkeeper. In the tracery our Lord and the angelic host are represented. The text is

"Va-toi aussi, et fais de même." The window has been executed by Mr. O'Connor, of London. This is the sixth window which the same artist has placed in this church. The insertion of the different compartments has been performed by Mr. Daniel de Patron.

Ecclesfield Church.—Another stained window has been added to the chancel of this church. It has been erected to the memory of Mr. J. F. Macben and his son, Mr. T. M. Macben. It has been designed and executed by Messrs. Hardman, of Birmingham. The three upper lights contain subjects as follow:—St. John leaning on Christ's bosom, St. Peter and St. John at the Sepulchre, and the Meeting of Christ and Mary Magdalene in the Garden. The three lower lights are taken up by as many subjects relating to the raising of the widow's son of Nain. The window is on the north side of the chancel.

FROM MELBOURNE, AUSTRALIA.

THE entire collection of the Fine Arts Exhibition includes 567 paintings in oil, and 237 in water-colours. There are in addition 114 sketches and drawings, 2 etchings, 15 engravings, 18 chromo-lithographs, and 286 photographs and photo-lithographs.

Some account of new buildings in Melbourne is given in the *Illustrated Australian News*, from which we select and condense the following:—Commencing at the eastern end of the city, and working our way westward, the first building that attracts our attention is the new residence in Spring-street of Messrs. Gerard & James, the well-known medical men of this city. This pile of buildings, which is now rapidly approaching completion, comprises two houses, and occupies a considerable frontage to both Collins and Spring streets. They are in the Romanesque style, built of brick and stone, cemented. They are of three stories in height. The grouped arched windows, supported by light columns, the balconettes, and the parapet all combine to produce an agreeable effect. The cost of the two houses will be, when completed, over 8,000*l.* They are from the design of Messrs. Barnes & Reid, architects; from which firm we have also another illustration of the same style of architecture, in the warehouses of Messrs. M'Arthur, Sherrard, & Copeland, situated in Flinders-lane. Here, too, the buildings are of brick, cemented, and the effect is produced by the grouped windows and the style of ornamentation peculiar to this order.

The next building which attracts our attention on returning to Collins-street is the new Tunnah, which is now beginning to make itself seen. Continuing up Collins-street we arrive at the site of the Victorian Permanent Property Building and Investment Society's new offices. To make way for them, the old Central City Hotel (Collins-street) is now in course of demolition. The new buildings will consist of a large office in front, of three stories in height, with a warehouse, auction mart, and store in the rear. The facade is to be in the Italian style of architecture, and will occupy a frontage of about 29 ft. The lower portion of the building will be ornamented with rusticated piers. The windows on the first story will be circular-headed, and embellished with Ionic pilasters, entablatures, and cornices, while those of the next story will be pedimented windows, ornamented with moulded trusses, Corinthian pilasters, architrave friezes, and cornices. The building will be surmounted with a balustrade. Tenders are now being called for. The architects are Messrs. W. H. Elliker & Co., of Elizabeth-street. A few doors farther on are the sale-rooms of Mr. H. Beauchamp, which are being rebuilt under the superintendance of Messrs. Crouch & Wilson, in a style which forms a remarkable contrast to the building it supersedes. The premises, which are of two stories, are built in bluestone and brick cemented. Immediately at the rear of the two last noticed premises, and fronting Flinders-lane, we come upon the excavations for the foundations of Messrs. Bank Brothers, Bell, & Co.'s new warehouses. These mammoth stores are to occupy a frontage of 65 ft. 6 in. to Flinders-lane, by a depth of 157 ft., and are to be of five stories in height, and will be, with the exception of Messrs. L. Stevenson & Son's, the largest warehouse in Melbourne. The superstructure is to be of brickwork, finished externally with cement, in the Italian style, and resting on a basement story of finely-worked bluestone. Though not very elaborately decorated, it will be of an appropriate character. The build-

ing will be somewhat loftier than either Messrs. Stevenson & Son's, or Lang & Webster's warehouses, its elevation from the pavement to the top of the parapet being 72 ft. The offices, next the entrance, are to be constructed of polished cedar. Iron columns support the wrought-iron girders of the floors, and the capacious staircases are to be finished in a style of great magnificence. The buildings are from the design of Mr. Charles Webb, of Collins-street. The contract has been taken by Messrs. Turnbull & Dick. Turning up Elizabeth-street, we arrive at the junction of Little Bourke-street, and here, too, we find extensive excavations going on, and on inquiry discover that two splendid three-story shops are to be erected, in place of the rickety wooden structure which had been removed. Returning to Bourke-street, and continuing our way westward, we pass two new brick shops, Nos. 40 and 52, the former of two stories and the latter of three, the basement in both cases being of bluestone, and the superstructure of brick cemented. Though they do not present any special architectural features, they are nevertheless great improvements to the neighbourhood. In Lonsdale-street we observe a private residence in course of erection, the principal features in which are the balcony and corridor which run round the building. At the old site of Westby's timber-yard, great changes and improvements have been effected. The front portion of the property has been leased by Messrs. Noyes & Read, on which they have erected extensive grain and general produce stores. The building, though presenting no very striking appearance to an outside observer on Collins-street, covers an area of over a quarter of an acre, and is provided with every convenience for carrying on an extensive business. The building, which is rat proof, being provided with an asphaltic floor, is capable of storing 3,500 tons of grain, besides other more perishable articles of farm produce, for which a cellar is provided.

The City Corporation determined last year to erect a meat-market. Plans were prepared for the building, and on the 27th of December last Mr. P. Cunningham, being the successful tenderer, became the contractor for the work. Since that time rapid progress has been made in the erection of the building, which is now fast approaching toward completion. The superstructure, which is of red brick, ornamented with white brick facing, rests on a foundation of bluestone, and has a surbase of finely wrought stone of the same description. It occupies an area of 73 ft. frontage by a depth of 132 ft. From the front the building exhibits no remarkable architectural features; the side view, however, is effective, the monotony of the wall being broken into arched recesses, surmounted by semicircular lights and ventilators. The roof, which is of iron, is in a single span, and with one exception the largest span in the colony. The approaches to the market are from Elizabeth-street and Queen-street. The centre of the market is devoted to a cartway 38 ft. wide, on each side of which is a flagged space 20 ft. wide, which is to be provided with the requisite appliances for hanging the meat exposed for sale. The water is laid on to all parts of the building. The cost will be about 3,800*l.*, and the revenue which will be derived from it will be something considerable.

Telegraph communication with the island of Tasmania has been successfully re-established, after having been interrupted for a period of nearly ten years.

The great Melbourne telescope has been mounted, and the building in which it is erected is nearly finished. The roof over the portion of the building devoted to the telescope is of iron, and is so constructed that it may be drawn over the telescope or removed to the other end of the building with ease. When the telescope is in use, the roof remains covering the southern half of the building. The great instrument, when ready for work, will be used in the first place mainly for the examination of the southern nebulae.

The Consumption of Australian Preserved Meats.—The greatest satisfaction has been expressed at Melbourne at the success of the Australian preserved meats. The London agents had not only sold all their stock and that which was afloat, but had booked orders to the extent of 213,000 tins, or 1,093,250 lb.; and they had, moreover, closed their books, fearing to commit the Melbourne company further. They report that they can with ease dispose of 100,000 lb. tins per week, and this would absorb 25,000

sheep a week, and is ten times the amount the company is at present able to produce. Besides, meat has been dearer of late at Melbourne, but this was not expected to continue long.

Miscellaneous.

Government Schools of Science.—On the order for going into committee of supply in the House of Commons, Mr. Samuelson called attention to the higher Government schools of science in the metropolis in connexion with the Science and Art Department, as there had been little or no criticism on the votes on science. The vote which was to be taken that evening amounted to something over 207,000*l.*, but that did not cover the whole expenditure annually made on behalf of science and art. Votes for buildings and for the University of London should be added in order to obtain an adequate idea of the amount spent on science and art. It was clear, however, he said, that the schools in Jermyn-street and Oxford-street, owing to want of sufficient space, could not be allowed to continue in their present position. He would not remove from Jermyn-street the lectures for working men, because it was essential that they should be delivered in the centre of London. It might also be necessary to continue the teaching of geology in Jermyn-street; but with these exceptions all the Government science schools should be concentrated at South Kensington. In the foreign polytechnic schools that was the practice that was observed. The result would be economy of teaching power, and in the buildings now in course of erection at South Kensington they would have all the space that would be required for some time for a polytechnic school. Mr. W. E. Forster appealed to the House to postpone the discussion on the question referred to, until the vote was in the regular course of business brought before them.

Consecration of a New Church in Newfoundland.—On 1st June the fishermen of Burnt Head, in the mission of Brigus, in the Church of England diocese of Newfoundland, witnessed the consecration of the church dedicated to St. Augustine, which has, after much anxious labour and painful waiting, been erected there. This is the third church consecrated by the present Bishop of Newfoundland in this mission of Brigus. The newly-consecrated church consists of chancel, nave, and vestry. The chancel is 16 ft. long by 14 ft. wide, fitted up with stalls for clergy, and singing-seats with carved finials, for twelve singers, besides panelled altar, credence, &c. The east window is a three-light one. In the centre light are the arms of St. Augustine's College—the cross upon a shield. The nave is 50 ft. long by 25 ft. wide, and is fitted up with two blocks of open seats, which will accommodate 300 people. The roof is an open pine one, of a steep pitch, as the position is a very exposed one. There is a cloistery of five small windows on each side, and five lancets on each side of the nave, finished externally with hood moulding. At the west end are three detached lancets, and a porch with a double door and parallel sides. At the west end of nave is an open belfry, from which rises a spire to the height of 75 ft. from the ground. Nearly one-half of the building is free and unappropriated for ever. The edifice, which is built of wood, is exclusively of native work, and was designed by the missionary, the Rev. R. H. Taylor, who was born and educated in Stockport.

Court of Common Council, London.—The Wright testimonial picture, "The Condemned Cell," has been lent to Mr. Davie, engraver, to complete an engraving of it.—Alderman Salomons proposes presenting a window to Guildhall.—A joint committee of the Corporation and the Metropolitan Board of Works for the freeing of bridges on the Thames has been appointed.—The subject of a new building for the library and museum is under discussion in the council. The question is, whether a new building be erected at the east end of Guildhall, at a cost not exceeding 25,000*l.*, or whether the large building need at *Nisi Prius* in Guildhall be devoted to the purpose in view when the Law-courts are removed.

The Greenwich and Woolwich Railway. The local committee, of which the Rev. Dr. Miller is chairman, for promoting the construction of the Greenwich and Woolwich Railway are, it is stated, about to take steps to enforce the formation of the line by the South-Eastern Company.

Iron and Steel Institute.—A meeting of gentlemen interested in this newly-formed association has been held at Middlesbrough. Mr. Isaac Lowthian Bell, Vice-president of the Institute, presided, and explained the circumstances under which the Institute had consented to hold its first provincial meeting in the Middlesbrough district. It was agreed, on the part of the iron trade, that the quarterly business meeting of the iron and allied trades, and which now stands for September 23, should be held one week earlier, so as to afford visitors a means of attending a business meeting of the trade, if they should desire to do so. The programme of the proceedings in September was discussed, and a general outline was adopted. An exhibition of models, specimens of iron or steel, or other matters likely to interest the Institute, will probably be organized in the large hall of the Exchange Buildings. It is proposed that the party should steam down the Tees, in order to see the various works on the banks of the river, and should land at Eston jetty; visit the iron-works and mines in the neighbourhood, and finally go to Salthurn-by-the-Sea. With respect to papers, it is likely that some of considerable interest will be contributed, including communications on blast-furnaces, the manufacture of rails, gas fuel, and others.

Monastic Buildings of Worcester Cathedral.—A short time ago some interesting discoveries were made at the western end of Worcester Cathedral, while workmen were engaged in making alterations in the late Canon Benson's residence. These premises were either the site of the monastic infirmary, or immediately southward of it. Professor Willis fixes the infirmary due west of the cathedral, but from documentary evidence in the possession of the Dean and Chapter, that office, the local *Herald* thinks, would appear to have been nearer to, if not on the site of, Canon Wynter's house. This house stands upon a substructure of excellent Norman rib vaulting, originally open from one end to the other, 70 ft. long, 13 ft. 6 in. wide, in five compartments, which opened to the ground without by as many arches. Two buttresses projected westward from the gable, which stands on a high bank next the Severn, and from its peculiar form and position near the river, Professor Willis believes this to have been the monastic "necessarium," as that office is similarly situated at Durham. These vaults under the infirmary were filled up in 1691, except such portions as Drs. Reynolds and Jephcott, the canons then residing there, preserved for their own use. The discovery just made consist of a small cell, a large room at the north end of the premises, containing some good Early English arches with groinings, double lancet-lights, &c., and another apartment of Transitional Norman work. The discoveries have been allowed to remain intact, for the inspection of the curious.

Health of Ireland.—The reports from the local registrars of births and deaths in Ireland show this year, as usual, the need of sanitary reform in that part of the United Kingdom. The registrar of Kilkenny writes that there has been much fever in that district this year, apparently without any other law than that banishing the ill-fed, the dirty, and the overcrowded. He finds it on the seashore and the mountain-side, but he cannot point to a case unassociated with either the manure-heap close to the dwelling, the open cesspool, the filthy pigsty, or the badly-lighted, ill-ventilated, and often overcrowded abode. These conditions, he regrets to say, are the rule. The poor of the district are very poor indeed, and to most of them animal food is an extreme rarity.

Sailors' Orphan Girls' School and Home. The ceremony of opening a new building dedicated to this institution, took place on Friday in last week, at Church-lane, Hampstead, under the auspices of Prince Arthur. The building which the children at present occupy is old and quite inadequate to the wants of the institution. Hence arose the necessity for the erection of the new edifice, the building of which, including the freehold land, has cost about 9,000*l.*

Schools at Anerley.—A visit is to be paid to the North Surrey District Schools at Anerley (this) Saturday, July 24th, to inspect infant schools, workshops, laundry, and children's drawings in the board-room; see the drill and exercises in the school-yard, and hear singing and music in the hall. The object is to show the advantage of mixed mental and industrial training.

Workmen's International Exhibition, 1870.—A public meeting to promote the objects of this exhibition was held on Tuesday, the 20th, in the Pimlico Rooms, Winchester-street, Pimlico, when a resolution was unanimously passed, approving the operations of the council of the exhibition; and a petition to Parliament, asking for legal security for new inventions exposed in the forthcoming exhibition, was signed by the chairman on behalf of the meeting. It was stated, in course of the proceedings, that local committees had been formed in the principal towns throughout Great Britain, one in Ireland, and others in various towns on the continent. Favourable accounts had been received from Denmark and Prussia. In the latter, the Crown Prince and Princess had placed themselves at the head of the movement. By the direction of the India Office, products from India will be displayed. The Earl of Clarendon, through the medium of our ministers and consuls abroad, has roused the interest of the Continental Governments in the success of the undertaking. A lively discussion took place on the present patent law.

The Rhewl, near Gowenow, Salop.—A mission chapel has been erected on an elevated spot in an outlying part of Whittington parish. It is built of brick, with dressings of Oeuf stone, and consists of nave and chancel under one roof, vestry, south porch, and western bell-turret. The style is Early English, and the building provides for rather more than 100 persons, in open seats. The cost has been about 500*l.* There is a reredos of marble and enamelled tiles. The windows are glazed with cathedral tinted glass, by Messrs. Dove & Davies, of Shrewsbury, and the work has been carried out by Mr. Sharmon, of Ellesmere, and Mr. Evans, of Oswestry, under the direction of the architect, Mr. E. Haywood, jun., of Shrewsbury.

Monthly Report on the Health of Saint Marylebone.—The report for June, by Dr. Whitmore, medical officer of health, and chemical examiner of gas for the parish of St. Marylebone, has been printed by order of the vestry. The returns are highly favourable, inasmuch as they show a death-rate of not more than 19.9 per 1,000, or something like 5 per 1,000 less than the average death-rate of this parish, and which means an annual saving—presuming the present low rate were to continue, which it will not—of 815 lives. The cause of this exceptionally low rate of mortality has been that whilst, owing to the improved temperature of the month, the deaths caused by bronchitis and whooping cough declined, the temperature nevertheless, had not yet risen so high as to favour the spread and fatality of summer diseases. Scarlatina was fatal in seven cases during the month. The reporter's attention has recently been called to an outbreak of this disease in Park Crescent-mews West. He found some of the stables in a very bad sanitary condition, and it was in the lofts of these stables that the disease existed. The converting of stable lofts into human habitations is very objectionable, nor should it be tolerated, except everything connected with the stables beneath as well as in the inhabited rooms, is in the best possible sanitary condition.

The Trade Unions Bill.—The Home Secretary's Bill to protect the funds of trade-unions from embezzlement and misappropriation has been printed. It is proposed to enact as follows:—"1. An association of persons having rule, agreements, or practices among themselves as to the terms on which they or any of them will or will not consent to employ or to be employed shall not, by reason only that any of such rule, agreements, or practices may operate in restraint of trade, or that such association is partly for objects other than the objects mentioned in the Friendly Societies Act, be deemed, for the purposes of the 24th section of the Friendly Societies Act, 1855, for the punishment of fraud and impositions, to be a society established for a purpose which is illegal or not to be a friendly society within the meaning of the 44th section of the said Act. 2. This Act shall not continue in force after the last day of August, 1870. 3. This Act may be cited as 'The Trade Union Funds Protection Act.'"

Reopening of Llandaff Cathedral.—The complete restoration of Llandaff Cathedral has been celebrated by a religious and musical festival in it, to which the choristers of Bristol Cathedral contributed. After service a luncheon was partaken of in the newly-erected school.

Smeatonian Society of Civil Engineers.—This society made an excursion down the river, and afterwards had an entertainment at Greenwich, on Tuesday, the 13th instant.

New Patent Brick Works in Worcester. Mr. D. W. Barker, formerly of Frome, Somersetshire, having some time since purchased a plot of land on Gregory's Bank, close to the canal on the north side of Worcester, commenced clearing the ground in January last, in order to erect a patent brick-work.

M. Gasser's Statue of Adam Smith.—This statue has been placed on a temporary pedestal in the ground-floor of the Randolph Gallery, Oxford, for public view.

The Roman Pavement found near the Poultry, London.—A further discovery connected with the fine pavement recently found near the Poultry was made while digging to the south or south-east.

Increased Value of Property in Newcastle.—The premises situate at No. 3, Collingwood-street, were sold by auction, and realised exactly double the amount obtained when the same premises were sold ten years ago.

TENDERS.

- For cleaning and restoring the exterior of St. Luke's Church, Old-street-road. Mr. J. Niblett, architect.—Winship (accepted).....£300 0 0

- For the Kennington and Lambeth Sewers, for the Metropolitan Board of Works. Mr. J. W. Bazalgette, C.E. Quantities supplied by Mr. A. J. Bennett:—Bloomfield.....£31,300 0 0

- For the new workshop at Edmonton, for the Strand Union. Mr. W. S. Cross, architect. Quantities supplied by Messrs. W. S. & Alfred Cross:—Gassitt's Work. Hammond & Co.£1,739 13 0

- Robinson & Cottam.....£3,430 0 0 Turner & Co.5,351 0 0 Harrison & Clayton.....5,275 0 0 Simpson & Co.5,243 0 0

- For Pedmore Church, Stourbridge. Mr. Frederick Preedy, architect. Quantities furnished by Messrs. Goodman & Vignall:—Goodman, Wilkes, & Co.£1,353 4 4

- For enlarging St. Job's Church, Buckhurst Hill, Essex. Mr. J. Tanner, architect:—Banner.....£1,601 0 0

- For the erection of a new lodge to the Chasevills Park Estate, Winchmore Hill, for Mr. Charles Stokes. Mr. J. C. Thomas, architect:—Farnham & Fulbrightham.....£379 0 0

- For pulling down and rebuilding mansion, No. 29, Park-lane, for Col. Farquharson. Mr. J. T. Wimpey, architect:—Fish (accepted).....£11,165 0 0

TO CORRESPONDENTS.

B. T. (cancelled: having appeared elsewhere).—Do not call next week.—E. S. (next week).—F. J. T.—G. F.—Mr. C.—R. H.—C. F. H.—J. H.—M.—E. H. Jan.—W. W.—S. W.—C. R.—R. N. H.—J. E.—F.—O. T.—R. C.—G. S.—J. S.—W. T. B.—A. W. R.—T. O. J.—C. O. E.—C. F.

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The Builder.

VOL. XXVII.—No. 1382.

Artificial Harvesting and Steam Culture.



READERS of the *Builder* will readily remember the treatment in our columns on various occasions, some years since, of the subject of the artificial drying of corn and hay-crops.

The attention which the dissonance of the subject attracted at the time was evidenced by the fact, that the farmers themselves entered the literary arena in defence of the conservative system of leaving the harvest to that evil chance which people are not ashamed to term Providence; and the discussion commenced in our pages was carried on in some of the local journals of agricultural districts.

The glorious harvest weather of July, filling, as it has done, the cornfields throughout the country with hourly augmenting wealth, offers fair promise of the best mode of ripening the crops of 1869—that of a beneficent sunshine. But, in our island, exposed as it is to such conflicting climatic influences, the weather is proverbially uncertain. And it is not to be wondered at, that one of our most anxious and most successful agriculturists should have taken this very occasion to call the attention of the public, in the columns of the daily press, to an arrangement for that artificial harvesting on the necessity of which we have insisted.

The gold medal of the Society of Arts, and a prize of fifty guineas, have been given, as our readers know, to the inventor of this aid to the garner. The description is not perfectly intelligible, a misfortune which is of ordinary occurrence when mechanical inventions are spoken of by non-mechanical men; and we are not quite clear what is meant by the "smoke box of a coke furnace." Also, the statement that the heat employed for the purpose of drying the crops will cost nothing, because it would otherwise be wasted, is hasty and erroneous. But these smaller sources of error being eliminated, enough remains to command the very serious attention of the agriculturist.

The process employed, as we have before mentioned, consists in the use of a fan, which drives air, heated to the temperature of above 300° Fahrenheit, through the grass as soon as it is cut, thus rapidly extracting 60 out of the 75 per cent. of water which it contains, and leaving a sweet, dry hay, charged only with its proper quantity of 15 per cent. of moisture. For corn, a perforated cone is made use of, on which the sheaves are impaled, and the heated air rushes out from the centre, carrying the superfluous water away with it. It is stated, on chemical authority, that the hay and corn which are dried by this rapid process, are superior in quality to such as are acted on by the uncertain and intermittent action of the sun and wind by day, and dew and cold by night.

It cannot be doubted that the adoption of a process of artificial drying is only a complementary or additional step in that progress of steam culture, which is becoming yearly so much more general in the country. The farmer who makes use of a steam-engine for ploughing, for thrashing, and for other agricultural services,

has only to add a fan to his machinery, in order to render him, as far as harvesting is concerned, to a great extent independent of the weather. The same, or very nearly the same, expenditure of fuel that serves to raise the steam that will drive the fan, may be a second time made use of, this duly effected, to heat the blast. It is well known that we are far from making a full use of the heat which we liberate by the combustion of coal. Having made it perform one act of service,—the heating of a single drop or teaspoonful of water, or the impulsion of one revolution of a driving-wheel,—we are in the habit of dismissing the slave of the lamp, and sending it to mingle with the elements with all the freedom which Ariol claimed of Prospero. The new drying process steps in at this point, and exacts a second act of duty from the dose of heat, as it makes its escape up the chimney.

There can be little doubt that it is only necessary to present to the contemplation of agriculturists an efficient, easy, and cheap method of applying artificial heat to the drying of crops, in order to ensure the gradual adoption of the system. The introduction may be slow, as well as gradual, for the more men dwell apart from each other, face to face with nature, the more slow are they, as a rule, to avail themselves of any innovation on ancient custom. How many a farmer, now hale and sturdy, will be gathered to the churchyard, as a steadfast disbeliever in steam agriculture? But the introduction is certain, because it appeals to the pocket. With the more thoughtful and enterprising men, it will be sufficient to lose the crops of a single year, at the same time that a neighbour saves his own by the aid of the drying-fan, in order to induce the sufferer to guard himself against the repetition of the misfortune. Let us have the statistics of the crops of a single farm, well harvested, well sold, and well spoken of, in the face of a wet season, and the spread of the method will be a mere matter of time.

For the farmer the boon is immense. But we look to a wider interest than that of the farmer. We think of the food of the people. How much discomfort, want, ill health, are caused by an ill-gathered harvest! Who has not experienced the disgust due to eating bread made of ill-saved corn?

Of the fifty-seven million statute acres of Great Britain, rather more than half are returned as being under cultivation. Of these about one-third are devoted to raising cereals and leguminous crops. The yield in bushels of dressed corn per acre of these nine millions of acres, differs in the proportion of nearly six to one, twelve bushels being a not unusual return from neglected, unmanured lands, and upwards of fifty-five bushels being attained by the application of artificial manure. A possible difference in return of 15L sterling per acre (equal to a difference of forty-three bushels at 7s. per bushel) over, say the half of our nine million acres, gives an amount equal to the entire expenditure of the State for a twelvemonth. We could not, indeed, under the most extreme case of dearth produced by a persistently wet harvest season, rate the loss of our corn crops at so large a total. But, on the other hand, we have to bear in mind that three and a half million acres are under green crops, and nearly fifteen million acres under grass; and that the loss of the hay harvest has its *replian*, or rebound, in the loss sustained by the owner of live stock. It is thus certain that in speaking of the question of insuring the harvesting of those crops which sun and rain have brought to a period of more or less precious maturity, we are dealing with a subject that affects the national wealth by tens of millions sterling per annum.

The main point is to impress on the mind of the agriculturist the fact, that Science can—and will, if he woos her to the concession—provide him a method of counteracting, in whole or in

part, the misfortune of a wet harvest season. Or, the sun, indeed, so long as we resort to the processes of nature alone for the production of food, we must ever remain to a great degree dependent. The want of rain we can, to some extent, and in most cases, supply by irrigation; the excess of rain we can remove by drainages. Poor land we can enrich by culture, and some day, instead of polluting our rivers by the refuse of our great cities, we shall turn poison into wealth. The influence of the sun on *growth* we are not likely, to any great extent, to be able to supplement. The cloudy skies and inclement east winds of the late spring, have taught us this lesson very forcibly, as well as very recently. The necessity of sunshine for the production of fruit of all kinds have been unusually evident this year. But when, for better or for worse, the crops arrive at that state beyond which no improvement is possible; when soil, and rain, and sun, and time, has all been utilized, by annual vegetation, to the utmost, for the existing season, then we hold that science may step in, and may render the crops, as a matter of ingathering, of drying, and of storing, independent of the weather. The value of that independence is to be measured by the large sums of which we have previously spoken.

It is impossible patiently and intelligently to regard the subject of agricultural development by the aid of chemical and mechanical science, without coming to the conclusion that we are only on the threshold of an immense and most beneficial revolution in our mode of dealing with the matter. Nothing is more striking to the engineer than the increase in the *manageability* of the steam-engine which has marked the last quarter of a century. The men to whom we are indebted for our present rapid rate of locomotion were great believers in finality. Neither Robert Stephenson nor his father could be brought to regard an attempt at applying steam traction without the use of rails as anything but waste of time and of money. The stationary engine, with its firm enshrouding of stone or of brickwork, and the substantial six-wheeled locomotive, calculated for service on railways laid with solid permanent way, at inclinations not exceeding from 16 ft. to 20 ft. per mile, were considered by those illustrious mechanics not only to be the *ne plus ultra* of their science, but to afford indications, from the experience acquired in their construction and employment, that it was idle to attempt to employ the steam-engine in any less costly and cumbersome manner. In fact, the Stephensons took up, in engineering, very much the same position that Cuvier occupied in natural science. Successful discoverers of so much, they considered that they had gone far to exhaust the subject of their study, and that, even if improvements of detail were possible, they had laid down permanently cardinal and unquestionable principles. Neither of these great men,—for each they undoubtedly were,—felt that he was but an infant progenitor of a giant race, who would as far exceed their own utmost triumphs, as they themselves had outrun their most illustrious predecessors. Thus it was that Robert Stephenson was so eminently safe as an engineer. His father had fought the great battle of steam, Chat Moss had been crossed, and the steam-horse had been driven at a rate limited only by the strength of the materials of which the two concurrent parts of the great invention,—way and locomotion,—were composed. The constant, unresting, extravagant, inspired genius of the Brunels, father and son, was strange to the cool Northumbrian blood of the Stephensons. Thus, while it fell to the lot of the latter to do more to advance mechanical science, in certain branches, than any other men, they were no less influential in spreading a tendency to consider the improvements actually obtained as final, and, as it were, stereotyped.

The great builders and contractors set the example of looking for the aid of steam in a new, and, as it were, in a domestic direction. The dangerous, painful, costly toil of our old friend the Irish labourer was found to be far more readily performed by the aid of a few scufflefuls of coals. Pumping from foundations was only a repetition in miniature of the process of draining mines. So it came to pass that miniature steam-engines were constructed and were found to answer for the purpose. The donkey engine was born, his work multiplied. Cranes and lifts, pumps, fans, saws, the rams of pile-engines, the hammers of smiths, the ventilation of galleries, the mixing of mortar,—to all these purposes the ever-ready service of steam proved economically adapted. Then the imprisoned demon was set to till the ground. The experiment showed that the horse may come to be regarded as an article of luxury alone,—as a costly superfluity for the farmer. All that now seems marvellous is the application of a kettle to the bicycle. We shall probably live to see that. We have seen, within the last week, a ponderous steam carriage, with broad ribbed wheels, creeping slowly along a Wiltshire turnpike-road, drawing after it three large ordinary wagons, each full of bricks. The machine came from the works of an engineer at Reading, and the reply to inquiries as to the reason of employing this method of sending such heavy materials by road, along a line to which both a railway and a canal run parallel, was, that it was cheaper than either of the other methods! How far this may be the case we are unable to say; but as to the fact of the steady progress of the unaccustomed convoy, again, and again, and again, we can speak from ocular witness.

The steam plough, the steam thrashing-machine, and the road traction-engine, are all of them more difficult and less promising applications of mechanical power to the service of the agriculturist, than is that of the hot-air blast to haymaking or to harvesting. Each of the former, notably the plough, might well have been considered likely to present insuperable obstacles to the civil engineer. The drying of corn by artificial means, on the contrary, has been long indicated as practicable. It formed a portion of the Austrian arrangements for the defence of the famous Quadrilateral. It has been, in a limited and peculiar manner, familiar to Englishmen from the distant time when beer displaced mead as a national drink. M. H., and D. H., and similar cabalistic letters, on the doors of our great breweries, tell us of the artificial fortification of the greater part of our annual crop of barley. And yet, ever since we first learned to brew malt and hops, we have been content to let our precious wheat crops germinate in the very shock, if St. Swithin came upon us in anger.

We shall be glad to hear more of the premiated machinery for harvesting. We must not be understood as committing ourselves to vouch for the excellence of this particular plan, or of any other which we have not had the opportunity of testing. But as to the importance of the object to be attained, and the perfect feasibility of attaining that object, as to the tens of millions sterling which the farmer may annually pocket at the cost of a few hundreds of guineas spent in fees to the civil engineer, and a few thousands or tens of thousands laid out in machinery, we have no more doubt than we have as to the combustibility of coal. Englishmen will have only themselves to blame, henceforth, for dearth caused by a wet harvest.

REPORT OF THE ROYAL COMMISSION ON WATER SUPPLY.

ON THE PRACTICABILITY OF OBTAINING LARGE SUPPLIES OF WATER FROM THE MOUNTAINOUS DISTRICTS OF ENGLAND AND WALES.

THE Cumberland Lake scheme of Messrs. Homans and Hassard is reported on less fully than that of Mr. Bateman, for it has many points of resemblance, and therefore the same remarks in many cases apply to both. The lakes of Thirlmere, Ulleswater, and Haweswater are the sources proposed in this scheme, and the water, having been brought through a tunnel $\frac{7}{8}$ miles in length, under a range of hills to a point above Windermere, would thence flow by gravitation through a conduit to London.

The rainfall has in this district been well ascertained, and Mr. G. J. Symons infers from

the whole number of observations, that the true mean rainfall may be taken at 77 in. per annum, and the mean of three dry years, at 61·6 in., or 80 per cent. less. In the driest year he would take 66 or 68 per cent. of the average, which would give about 53 in. During the ten years ending 1859, there was only one drought of more than forty days' duration, and more than 1 in. of rain fell during its continuance.

The available storage would be 5,563 millions of cubic feet, which is equal to 120 days' supply, at the rate of 250 million gallons a day, or to 157 days' supply, at 200 million gallons a day, after giving credit for the average minimum summer yield, and allowing for compensation.

From the south end of the tunnel above-mentioned, the conduit would pass by Ambleside and Kendal, along the east side of Lancashire, to the east of Manchester and of Birmingham, and following a route nearly parallel with the London and North-Western railway, would terminate in a reservoir to be formed near Edgware, at a distance of 12 miles from Hyde Park, containing fifteen days' supply, at the rate of 250 million gallons a day. This reservoir would not supply the higher districts of the metropolis, which must still be supplied by pumping.

The promoters of this scheme propose to supply 50 million gallons a day to the populous districts, on the route of the conduit. To compensate for water thus supplied, an additional supply is to be brought from Bala Lake to join the main conduit at Stoke-upon-Trent, and a reservoir is to be formed there to hold twenty-one days' supply. The cost of these additional works is estimated at 1,500,000*l.*, and the quantity expected to be obtained thereby 50 to 60 million gallons a day.

The total estimate is 13,500,000*l.*, of which 360,000*l.* would be required for the long tunnel at the head of the conduit.

It is proposed to levy a compulsory rate in this case, as in that of the Welsh scheme, and to purchase and incorporate the existing works and secure the companies in their present incomes.

The Commissioners have made a similar independent investigation into the quality of this water to that they have made into the quality of the water of North Wales. The results of the analyses are very similar to those of the Welsh waters, as regards softness and purity, but are open to the same objections that they are liable to be coloured by peat.

The Commissioners' remarks on this scheme are very similar to those on Mr. Bateman's—the plan is practicable,—the estimates are uncertain,—the quantity of water obtainable abundant,—quality of water satisfactory, subject to the same objections that are mentioned in the Welsh case. "There would probably be less formidable opposition to this scheme than to Mr. Bateman's on account of the less magnitude and importance of the river flowing from the district; but the objections from possible stoppages of the flow in the conduit would be increased in proportion to its greater length." (The length of Mr. Bateman's aqueduct is 180 miles; that of Messrs. Homans and Hassard 270 miles.)

The water would be delivered by this scheme at a level 37½ ft. lower than by that of Mr. Bateman, and therefore the necessity of pumping is increased to a greater extent by it than by the latter.

"There is no doubt that the lake district is a very fine gathering-ground for soft water; but it is deserving of consideration that this district is not unlikely to be claimed as the most natural source of supply for large and increasing manufacturing populations in the North of England, for whom soft water would be particularly valuable; and we hold it to be erroneous in principle that any one town or district should take possession of a gathering-ground geographically belonging to another, unless it can be clearly shown that circumstances render such a step justifiable."

This is the key-note of the report.

Mr. Hamilton Palton's plan is to take water from the upper sources of the River Wye in Mid Wales, having a drainage area of 410 square miles. From an assumed rainfall of 60 in., giving 30 in. available, it is calculated that there would be a yield of 393 million gallons a day. The conduit to convey the water to London would be 180 miles long, passing Glassbury and Hay, and thence near Kingston, Ludlow, Tonbury, Bewdley, Stourport, Bromsgrove, Henley-in-Arden, Warwick, Banbury, Tring, and Watford, to a point near Barnet, eight miles from Hyde Park, where a service reservoir would be con-

structed at a level 276 ft. above the mean sea level. The aqueduct is intended to be 15 ft. wide and 14½ ft. deep, with a fall of from 6 in. to 24 in. per mile, and it is calculated to deliver 230 million gallons a day. For the first portion of the scheme, to bring 130 million gallons a day, the cost would be 7,000,000*l.*, and for an additional 100 million gallons a day a further sum of 2,000,000*l.* The Commissioners have had no evidence on this scheme, except from the promoter himself. They consider, however, that from its general similarity to Mr. Bateman's plan it might be further investigated if any scheme of the kind for the supply of the metropolis should be deemed necessary; and we think so too.

Mr. George Remington's plan is to bring water from the source of the River Dove, in Derbyshire, by a conduit 135 miles long, to a reservoir to be made on Barnet-hill, at a level 300 ft. above the mean level of the sea. It is proposed to appropriate a drainage area of 262 square miles. By assuming a rainfall of 48 in., it is calculated that 100 million gallons a day may be delivered at Barnet at an estimated cost of 5,000,000*l.*

The Commissioners regard this scheme merely in the light of a suggestion, and say that in any case it could only form an auxiliary source; while, from the proximity of a number of important manufacturing towns, they consider such a source should be reserved for their supply, for which it seems to them well fitted.

In some "Remarks on Gravitation Schemes generally," the Commissioners say that there has not yet been a sufficient experience of these works to enable engineers to make accurate calculations, in all cases, as to their sufficiency.

The Rivington Pike scheme was expected to yield a supply to Liverpool of 12 or 13 million gallons a day, but "the Rivington works are practically a failure as gravitation works; three dry years in succession reduce the available water to 6 millions of gallons per day, and four successive years of drought, which may very possibly occur in future, would reduce it still further; and unless enormous reservoirs or lakes could be made, capable of storing the surplus waters of three or four years, these works must prove insufficient."

At Newcastle-on-Tyne the gravitation works failed, and after an enlargement are still insufficient, and a permanent pumping establishment is now in course of erection.

The supply to Bristol, from the Mendip Hills, established in 1851, failed in 1844, and recourse is now had to pumping from springs nearer the town.

All gravitation works in England were subjected to a severe test in 1868. From the end of April to the end of September there was scarcely any rain.

At Manchester the corporation, on the 3rd of August, limited the supply to 12 hours a day, stopped the street watering, and diminished the trade supplies by one half. They also made an arrangement with the mill-owners to reduce the quantity of compensation water by one half, giving money compensation for the deficiency. In the middle of September, the general supply to the town was further limited to 8 hours a day, and the quantity to trades also diminished. The 8 hours supply lasted 7 days, and the 12 hours supply 76 days.

On the 25th of September, after 150 days' drought, there were in store 435,000,000 gallons; but supposing the supply of the full quantity had been continued, the store would have been exhausted before that time.

The storage at Manchester is at present deficient; it is but 2½ million cubic feet per acre of the gathering-ground. At Liverpool it is 48,500, at Dublin 25,500, at Loch Katrine 30,000, and at Gorbals 52,000.

At Halifax, Sheffield, Bradford, and Rochdale, the water supply was also reduced in quantity during the year 1868, these all being gravitation works; and at Preston, Newcastle, and Kendal, the supply failed outright, and pumping was resorted to.

The Commissioners remark that "the causes of this difficulty may be either in an over-estimate of the available rainfall, or in an insufficient provision of storage. The sufficiency of water-collecting plans in these respects must be tested both by the concurrence of several dry years, and by occasional droughts of long duration; and to obtain the necessary data on these points for any particular district must require local observations on that district extended over a considerable time."

For these and other cognate reasons the Commissioners do not recommend the adoption of any

* See p. 579, ante.

of the four plans submitted to them for the supply of the metropolis. They then turn their attention to wells and springs, and finally to the river Thames.

EXHIBITIONS THAT CONCERNED US AT THE MANCHESTER SHOWS.

In addition to the comparatively small number of objects at the shows of the Societies at Manchester, that were noticed in the *Builder* of last week, there were other stands on the grounds, the contents of which were fairly entitled to a passing notice.

One of the exhibits meriting comment may have been seen by some visitors by accident, as it somehow failed to get placed, in any form, in the catalogue of 526 pages. Stand 244 contained a special attraction in a working model, exhibited by Messrs. Cockshott & Weatherill, of Manchester, of a new railway-brake. The model consisted of two quarter-sized railway carriages, fitted with the new apparatus, and which ran experimental trips upon a short length of narrow gauge railway, the carriage conveying a few passengers at each trip. The brake performed admirably, and stopped the little train with unerring precision after it ran down a steep gradient to a short level reach. Some of the visitors to this stand had their attention attracted by its floor, which was laid, in their concrete pavement, by the Liverpool Cement Company. This material seems to possess decided merit, and the specimen shown presented an excellent surface, perfectly smooth and very hard. It is alluded concerning it that it costs only from a half to a third of the price of ordinary flagging, and that it is being tried alongside of granite in the Liverpool New Exchange, where it has been laid for two years. If we mistake not, the cardinal virtue of the material lies in the circumstance that there is a proportion of oxide of iron in the clay used in the composition.

The most artistic objects in the exhibition relating to the building trade were probably the large collection of enamelled plate mantelpieces, shown by Messrs. Belcher, Gee, & Co., of Gloucester. The examples included imitations of serpentine, red and green, Rouge Royale, Egyptian green, red, and grey granites, with floral and fruit panels that might have come from Lancelotti's palette and pencil.

Messrs. Maugrave, Brothers, of Belfast, had a large stand well furnished with the improved stable, cowhouse, kennel, and piggy fittings, and apparatuses, for which they have achieved a high reputation. Their tumbling mangers and water-pots, sliding barriers between stalls, and loose-ho doors, were specially worthy of note. In the same department, there was a good show at Stand 190 of the prize stable fittings manufactured by Messrs. Cottam & Co., of London, including a variety of their excellent enamelled mangers and water-troughs, and general stable furnishings. The St. Pancras Ironworks Company were also large exhibitors at Stand 93 of the same class of good fittings and articles.

The exhibits of Mr. James Howorth's archimedean screw ventilator excited much interest. They were shown in great variety, of all sizes as adapted for the chimney of a cottage, or for the roof of a church or public hall. The arrangements for lubrication are ingenious, but the statement that the repositories for the lubricating agent will serve for seven years without replenishment should be received *cum grano salis*.

Messrs. Francis Morton & Co., of Liverpool, had a plentifully furnished stand, an excellent exposition of their manufactures, and of their application of iron to various structural purposes, including churches, schools, warehouses, volunteer drill-halls, ornamental sporting lodges, cottages, cricket tents, corn-shed roofs, bridges, and a great variety of other erections.

Mr. James Braggins, of Banbury, made an excellent display of oak park and field gates, hung with his patent hinges, and fitted, in some instances, with his patent gate-lock,—a useful contrivance for bridle-road gates, and much more convenient than the padlock. It can be locked without key, but requires the key to open it. It is sunk flush into the gate-post, and offers no tearing surface to passers-by.

To select, from such a host of objects, almost all more or less interesting and important, a necessarily small number for mention might seem invidious, and is certainly not an easy task. It may be mentioned, in general terms, that machines in motion seemed to attract the greatest degree of popular interest, especially those that were doing real work. On the shilling days

there were certain stands constantly surrounded by thick fringes of spectators, especially in the case of machines devoted to the working of wood and stone. Among the first were the beautifully made machines of Messrs. Allen Ransome & Co., of Chelsea, and the interesting exhibits of Powis, James, & Co., Ruston, Proctor, & Co., the Reading Iron Works Company, Clayton & Shuttleworth, Hancock & Foden, Samuel Worsam & Co., of Chelsea; Robinson & Son, C. Powis & Co., and numerous others in the same class. Of the stone working machines the most interesting was the stone-dresser of Messrs. Conlter & Harpin, of Huddersfield, for dressing granite, marble, delfstone, or free-stone, without chiselling. The dresser was exhibited at work, as was also Marsden & Co.'s stone-breaking machine. Near akin to the stone-breaker are the road-rollers, by which such a remarkable improvement has been effected, of late years, in the laying and repair of public roads. Of these there were two exhibited, one by Messrs. Aveling & Porter, with whom this important machine is a well-known speciality; the other, which met with an accident, by which it was unfortunately disabled from competing, by Messrs. Manning, Wardle, & Co., of Leeds,—a French machine. It may be mentioned on this subject, that Messrs. Aveling & Porter laid half an acre of solid road in ten hours at the commencement of the show for the principal approach. The more notable of the other machines in motion included a superb portable engine, by Ransomes, Sims, & Head, of Ipswich, and a beautifully-finished stationary horizontal engine, by Messrs. Clayton & Shuttleworth, of Lincoln. The brick-making machines of Clayton, Page & Co., Morton & Co., Scragg, Whitehead, and Middleton, exhibited, for the greater part at work, also attracted much notice and admiration; as did also the pumps of Tunge Brothers, J. & H. Gwynne Owens & Co., Warner & Sons, Norton, Tuxford, & Sons, Hayward, Tyler, & Co., Woods, Cocksedge, & Warner, and Williamson Brothers, with the productions of numerous makers of hand-power pumps.

A large number of articles and implements of American invention were displayed by English exhibitors; but further enumeration or reference to the exhibits of either English or other inventors is beyond the limits of space at disposal.

THE PEABODY STATUE IN LONDON.

The newspapers have told how that a statue of the magnificent George Peabody was unveiled, on Friday last, by H.R.H. the Prince of Wales, in company of the Lord Mayor. The Prince said happily and heartily,—“I can never forget the reception which I had in America nine years ago, and my earnest wish and hope is that England and America may go hand in hand in peace and prosperity.”

The American Minister, Mr. Motley, spoke like a scholar and a gentleman, though we quite agree with him that when he said he could not tell which was the more like, the statue to Mr. Peabody, or Mr. Peabody to the statue, he used “a confused expression.”

The committee went all the way to Rome to get a sculptor, Mr. W. W. Story, who is an American (and an able man too), and could not find a founder to put the work into metal nearer than Munich,—Fredk. Miller. After all this long travel, and the expenditure of some 3,000*l.*, what is the result? We answer, with regret, an entire mistake and disappointment,—at least, for the present. The excellent philanthropist sits hatless in an ordinary library-chair, without a single touch of ideality to make it other than a seated man most awkwardly placed amongst some irregularly-shaped buildings *à propos* of nothing, and square with nothing.

The first impression on seeing the figure is that it is something put up for sale; the second, especially if there be a number of persons gathered round about it, that it is an auctioneer, not for sale, but selling. We are not joking; neither do we desire uselessly to find fault. Our object is improvement if possible.

The figure cannot remain where it is. Before the permanent pedestal is ready to be erected a better site should be found for it, and a carefully-designed canopy should be put over the statue. The stalwart form of good George Peabody, in his coat and trousers, as he lived, sitting without his hat amongst the Insurance Offices at the back of the Exchange, in a pelting shower or pea-soupy fog, is a sight that surely cannot long be endured even in London.

GEORGE PEABODY,

MERCHANT AND HERO.

A Sonnet.

(In view of the City Statute, uncovered 23rd July, 1869.)

Rise, and the priceless blessing of the poor
Be with thee, in the land that gave thee birth;
No better fruit grows on the treading earth
Than such sweet thanks as spring beside the door,
Be it in populous town or lone some moor,
That human kindness wings its healing flight,
And waking beauty in the homes of night,
Floods as with angel-track the cottage-door;
Yet would we keep thine image near us still,
And, therefore, in the face of all our store,
We throne thee, and th' fortune good or ill
Go with the restless tribes that round thee pour,
Long shall that kindly face true message bear,
And turn to mercy all our greedy care.

ASACOR HAY HILL.

PROPOSED DESTRUCTION OF THE LIVERPOOL TOWN-HALL.

It appears from the Liverpool papers that a proposal has been made to remove the Town-hall containing the Mayor's Reception-rooms and the Council Chamber, and erect it on a vacant plot of ground behind the new Public Offices in Dale-street, with such modifications as will bring it into harmony with the latter building.

Considering the fate of this edifice as a matter not merely of local, but one of national interest and importance, and as such not unworthy the notice of the *Builder*, I beg to occupy a brief space with some remarks relative to the building, and the proposal in question. I do not believe the latter at all likely to meet with acceptance at present; but the mere existence of such a proposal, with the feelings or wishes that proposal induces, renders it high time to set forth the claims to continued existence of an edifice, the destruction of which should not even be named or dreamt of.

The Liverpool Town-hall, the design of Wood, of Bath, is not a building of historic interest, save so far as it associates itself in the mind with the growth and history of the town. But it is as genuine a specimen of Italian architecture as any the last century could show; exhibiting an obaste and harmonious combination of what is most noble and majestic in the Classic styles, with much of the picturesqueness of the Gothic; and though its beauty may not be so organic as that of Nature and the Gothic, it is nevertheless, I believe, genuine architecture also. It presents a grand square mass of building, fronted by a two-storied portico, and finished above with a poetically relieved rotunda, crowned by a dome,—for the successful treatment and application of which (the noblest feature of architecture), in the production of a most graceful composition, a rare merit now-a-days, I consider this structure remarkable; as it is also for its unique and effective sculptural embellishment, which fully satisfies the eye, and not the eye alone.

It has, in short, all the elements and qualities of a great work of structural art, and much that is wanting in examples which men cross oceans or continents to see, some of which would look tame or ugly compilations of undigested elements beside it. I do not know a domed composition either in this country, in France, or in Italy, so wisely and tastefully crowned as this is by, instead of the stereotyped lantern, the colossal figure of Britannia complacently looking down on the busy hating life below; or where sculpture and architecture are everywhere more skilfully blended.

Of the interior of the edifice I will only say that it is worthy of the exterior, comprising a noble staircase and a fine suite of apartments.

Such is the structure it is proposed to destroy. I say destroy, for there is no consolation in the promise of its reappearance at the back of the new Municipal Offices, but the reverse; so much so that I should pray, if the building is to come down, in mercy let it remain down. Let us have no reproduction of it as that proposed, which would be far worse than its final demolition. But let us consider for a moment what the scheme holds forth. It is proposed to remove the present Town-hall from the most respectable and proper position it could possibly occupy in the town,—in front of a grand quadrangle, where it is the central crowning feature of a noble group of commercial edifices surrounding it on all sides, which it unites and dignifies by its more majestic character and style, and which, without it, would stand like a family bereft of its head,—it is proposed to take it from this position, where it sits “like a king in the army,” and to re-erect it, despoiled of its old familiar face, now more beautiful from the rich tints of time

and weather, and modified to harmonise with a building of an entirely different composition,—on a site abutting upon some of the meanest streets in the town, which cannot and will not be remodelled for a century. What all this can result in, but the production of a spectacle such as those who had seen and loved the old building, streaming with life, and in sympathy with earth and sky, would be thankful even to an earthquake to bide from them, I am unable to imagine.

There are few objects, either of art or external nature, that so wind themselves around the heart as beautiful edifices, as the eye grows familiar with them. This one has wound itself round mine; and, I believe, their name is legion who could say the same. I know artists, now distinguished, born or brought up in this town, who with myself first awoke to the wonders of the world of art, and were inspired with a love of it, while roaming in boyhood about the old Exchange and Town-hall area, and round the beautiful monument of Nelson. By these, and by thousands who are not artists, would the disappearance of the Town-hall be felt like the loss of a beloved friend.

There is another consideration which I urged in defence of it a year or two ago in a paper read to the Architectural Society of Liverpool, and published in an influential local magazine, viz., its being essential to the very identity of the town. There are in every city certain buildings the removal of which would impair that city's identity in the minds of the inhabitants. Such are St. Peter's Church and the Coliseum to Rome; Notre Dame and the Louvre to Paris; St. Mark's and the Doge's Palace to Venice; their great cathedrals to Cologne, Florence, and Milan; St. Paul's and Westminster Abbey to London. They are, in each case, the pinnacles of the city; they are the image which its genius assumes in the mind or wears to the heart of every true native. And such is the Town-hall, Liverpool. You may mangle the Custom House; you may beat down the railway stations and a score of other public works, with but little violence to any mental impression of the town; but touch the Town-hall, and you touch the apple of its eye. Remove this, and you have changed its character; you have destroyed its identity. The Liver may fly over it again, but it is Liverpool no longer, and may receive a new name; or, as at Edinburgh and some other places, it may be called "the new town," save that, unlike these cities, it would be unaccompanied by any old one.

But the architectural qualities of the Town-hall should be its sufficient shield. Those who render it the Parthenon of Liverpool, whose architecture appropriately reaches its highest tone in the building of highest civil destination. The destruction of that building would be as great a disaster to the architectural status of Liverpool as the greatest enemy of the town or foe of architectural beauty, if there be one, could wish. A week's bombardment of the port from the Mersey might be less mischievous.

Let me respectfully submit these considerations to the attention of the Town Council of Liverpool, which numbers among its members many men of taste, and some who, from professional ability and culture, are, I know, fully alive to the merits of the Town-hall. The premium offered by the scheme of removal, which only shows how inferior the proposed site is deemed to the old one, were it increased tenfold, should weigh nothing against a building which is the chief architectural ornament and glory of the place, related to all inhabitants of taste and feeling by their sympathy with it, and possessed of a power to stir the memory, the heart, or the imagination of each, and which, once destroyed, the wealth of the Indies could not replace.

The insufficiency of space in the council-chamber complained of may surely be obviated by extension, for which there is ample space; and this is the only fault of the old building; for the protrusion of the front beyond the general line of street which has been urged, is a beauty rather than a blemish, for it heightens the effect as you approach the Hall from either direction. Let the street continue to bend round the building, which it may wish even advantage to itself, since the finest streets in Europe, and where the architecture is shown to greatest advantage, are not those bounded by straight lines, but those which, like the High-street of Oxford, are ever changing their direction.

I need scarcely say that I have no interest but that of art and the public taste to serve by

these remarks, and design no offence to any one. But having known and loved the subject of them from infancy, I should feel myself something like a traitor to my profession and to the soul-born art of architecture were I to see it menaced without protest. Should my protest eventually prove vain, I shall still be happy to have recorded it on the enduring page of the *Builder*.

SAMUEL HUGGINS.

THE ARCHÆOLOGICAL INSTITUTE AT BURY ST. EDMUND'S.

Great efforts were made by those in authority that the meeting of the Archæological Institute of Great Britain and Ireland (so called, although during the twenty-five years of its existence it has never been established or endowed in the latter country) should not be so meagre as that at Lancaster, and the result has been very considerable success. This is a great source of congratulation, seeing how busy death has been of late years among its members, and how few young men, unfortunately, present themselves to fill up the vacant places. A book that has just been published calls to mind some former meetings, when Crabb Robinson, and his kind-hearted contemporary, Hopkinson, of Stamford, used to join in a contest of wit and experience. Since our last meeting, too, we have lost Pettit, whose critical accuracy and artistic skill were ever given to the Institute with ungrudging liberality,—a loss which causes a void that cannot easily, perhaps never may, be filled.

The success on the present occasion is the more noteworthy, also, as the political exigencies of the times left us without many of our great men. The Marquis of Bristol and Lord Talbot de Malahide were not present at the opening meeting, and we were without even a member of Parliament. The most jovial of our members who had been engaged to return thanks for their attendance, had to waste the speech that he had prepared under his midnight champagne. We had the advantage, however, of one of the most genial of mayors, to whom no small debt of gratitude is due for the pleasure we experienced and the facilities offered for the attainment of the objects which the Institute had in view.

Lord John Hervey took the chair, in the absence of his brother, and spoke gracefully. The address from the corporation was cordial and poetical. The speakers who followed acquitted themselves in a way that made us forget the fears, which the absence of the "great ones" had engendered. Lord Arthur Hervey, on behalf of the Local Society, tendered a welcome in words replete with kindly sentiment. This was seconded by Mr. J. J. Beran. The Rev. J. R. Green returned thanks for the Institute in a good speech displaying local knowledge and illustrative of the polemics of the town in bygone days. The Rev. F. R. Chapman welcomed the Institute on the part of the clergy; and with a candour not always characteristic of the clerical mind, asked absolution for the neglect of the clergy in past years in allowing the buildings which had been entrusted to their keeping to go to decay. But he hoped that the care they were now displaying would atone for their former indifference.

The business being concluded, the members adjourned to the Angel Hotel, where they were hospitably entertained by the Mayor. We then proceeded to visit the objects of interest in the town under the guidance of Mr. J. H. Parker; the remains of the abbey being the first. The destruction of the monastic buildings has been so complete that scarcely an ashlar remains to tell its story, and a mass of rubble, or a mound, is all that is left to show where mired abbot sat in state, or pious pilgrim trod. The Norman Tower, the Abbey Tower, and the Abbot's Bridge, remain to illustrate more sadly the ruin that is around them. At Moyses' Hall, or the Jews' House as it is called, Mr. Parker took occasion to say that as the Jews were the richest, they were the first to build stone houses. This does not agree with our early reacting of the persecutions of the Jews, and how they were obliged to conceal their wealth to evade the outrages of kings, barons, and priests; and even in our own time we know till what a recent day they have had to "thank God that there was a House of Lords" that kept them from their rights of citizenship.

In the evening there was a sectional meeting, at which Mr. Morant, of Norwich, read an interesting paper on the Abbey. Mr. Leo Warner

read a paper on a petition, hitherto unpublished, from the Prior and Augustine Canons of Walsingham to Lady Clove, asking her to abandon her project of allowing the Franciscan friars to settle in their neighbourhood. It was a curious petition, showing in those good old pious days, which some are striving to revive, how pounds, shillings, and pence were mixed up with the glory of God, and the ease and comfort of the prior and his canons.

On Wednesday we made excursions; first, to Clare. After visiting the remains of the priory and the castle, we proceeded to the church. On my arrival there I was convinced, of what I have before suggested in another publication, (that Dowling, who is so often quoted as an illustration of the iconoclasm of Cromwell, said "the thing that is not." He writes "in the church of Clare I destroyed one thousand images in niches." It is a tall perpendicular church, with not a niche in it. He says also, I destroyed "the sun and the moon." I do not know how many suns and how many moons the good people of Clare required in the olden time; but there is a sun and there is a moon still in the east window. Mr. Bloxam, who, I believe, is an authority, avers that the yellow glass in the east window was of the reign of Elizabeth. If Dowling's attack on Clare church was so "thorough," how could he have left the monogram of the Virgin that is still on the finely carved wooden pew or chapel that remains? The glass that remains is more than in many places of which we have not such a detailed account of the destruction.

We then went to Long Milford Church, where Mr. Almack gave us a capital account of the manner in which he had restored the old glass. He also produced a very interesting "Churchwarden's hook," in which were entered the proceedings in connexion with the church in the sixteenth and seventeenth centuries. There are the particulars of the "cleansing of the church," in the reign of Edward VI., and the disposal and destruction of various articles. Among others it mentions an alabaster tablet, having on it a bas relief of the adoration of the Magi: this was "sold to Maister Clapton for two shillings." And, according to Mr. Almack, the said Maister Clapton buried it to prevent discovery, and it now adorns the north-east wall of the church. Very late the Reformers and the mercenary left very little for the Puritans to destroy.

We then visited the fine old halls of Kentwell and Melford, the owners of which displayed a most cordial sympathy with the curiosity that prompted our visit. The next place seen was Lavenham, where we were received by the rector, the Rev. J. M. Croker. The church had considerable attention, and a fine timber-house in the town attracted several sketchers, and invoked much interest.

In the evening there was a meeting in the Guildhall, at which a paper was read by the Rev. J. R. Green, which, I hope, will be published *in extenso*, illustrating the struggles of the Burgesses of Bury with Abbots on the question of jurisdiction, and the attainment by the people of their liberties, and the destruction of priestly domination.

On Thursday there was the annual meeting of members. The report stated that the financial condition of the Institute was very satisfactory; that efforts were being made to bring up the arrears of this Journal, so as to prevent the accumulation of papers which were read at meetings in 1869 appearing under the date of 1868. It was resolved that, in consequence of an earnest wish expressed by the corporation and other persons of Leicester, the Institute would meet at that place in 1870. The report also contained an earnest appeal for new members. Afterwards there was a meeting of the Historical Section, at which Lord Arthur Hervey (who was indefatigable in his exertions to make the meeting successful and pleasant) read an address. He pointed out the qualifications necessary for an historian, and said that "a good critical judgment was not always found in antiquaries;—" a mild reproach to those who manifest too great an intrepidity of conjecture.

A paper was read that had been kindly written for the Institute by Mr. John Bruce, V.P.S.A., on the biography of Sir Simonds d'Ewes. It was a model of what such a paper should be—short, but containing all the traits of character necessary to illustrate the mind and circumstances of the individual, the times in which he lived, and the social and political influences that surrounded him.

In the afternoon we went by invitation to visit

the Marquis of Bristol at his quaint mansion of Ickworth. After partaking of his lordship's hospitality, we proceeded to Little Saxham Church, with its round tower. Afterwards to West Stow Hall and Ikengrave Hall. The last we had visited when the Institute met at Cambridge, but time did not seem to have diminished the admiration of the fine old mansion. In the evening there was a *conversazione* in the well-stored and interesting museum. There were the cross and chain belonging to the Queen which had been found at Clare. In my poor judgment it does not seem of very ancient workmanship. That which was the source of most attraction was an autograph of Shakespeare discovered in a small book which had been sent to show the signature of Dryden and others. They had been pasted in by some collector.

On Friday there were sectional meetings, at which several papers were read. The most notable was that by the Rev. Dr. Margoliouth on "The Vestiges of the Historic Anglo-Hebrews in East Anglia." It displayed a large amount of learning and an immense deal of conjecture. He upset Mr. Parker's theory of Moyses's house being a private house, saying that it had been built for a synagogue. He even went so far as to identify the rabbi after whom it was named. The Jews did doubtless possess great wealth; but without some documentary evidence it is hard to believe that they would have employed the skilled Norman architects to raise a building that would have inspired the jealousy or cupidity of the neighbouring monastery. It may have been used as a synagogue in after years; but at its erection it was most likely a toll-house of the town, or a place where the abbot sought and wrung his dues from the people.

In the afternoon we were kindly invited by Lady Callam to Hardwick House to inspect the "Etruscan antiquities." They were described by Professor Churchill Bahington. In the course of his remarks he said it was now quite certain that the Etruscans obtained all their fiddle works from Greece; that in their bronzes and other works they had bodily copied the Greek forms and styles without any alteration or modification. He expressed great surprise that at this time any one should know so little of the subject as to describe those vases which were in the museum as Etruscan instead of Greek. The gentleman who exhibited them felt his toes trodden upon, and was sore accordingly.

After the lecture, we strolled about the lovely grounds, and forgot the disputes about ancient art, in the contemplation of modern cultivation and beauty. In the evening a large number of the members dined together. In the olden and most prosperous time of the Institute, it was the custom to have a dinner, but of late years it had been tabooed. On this occasion the experiment was again tried, and resulted in the greatest possible satisfaction and success. Mine host Guy, of the Angel, gave a most excellent dinner; every one was cheerful, and pleased. There were to be no speeches on the occasion, and of course, as is always the case when such a rule is laid down, there were plenty. But they were all of a gratulatory character, and no one could grudge that the arduous exertions of Mr. Tucker and his colleagues should be recognised with warmth of expression.

On Saturday we were again out early, pursuing our way to Framlingham. We first visited the church. The timber roof, vaulted from the corbels over the clearstory, with its fan tracery carving, caused a great number of "pattern books" to be put in requisition. We then proceeded to the castle, which was admirably, nay eloquently, described by Mr. G. T. Clark. He did not give a dry catalogue of measurements, but he re-edified it with the right historical colouring, and with appropriate sentiment, making the past give a lesson to the present. We then proceeded to Ipswich, where we were received by the Mayor, Mr. E. Packard, who entertained us at a most sumptuous banquet. Besides the usual complimentary speeches, the Town Clerk gave a useful paper on the treasures that the town possesses in the shape of old charters, books, and manuscripts. These were examined by many of the members with the greatest interest. We then paraphrased the town under the guidance of Mr. B. M. Phipson, concluding with a visit to Christ Church Hall, a very interesting and characteristic house belonging to Mr. Pommeroy, by whom we were kindly welcomed. On Sunday the members, preceded by the Mayor in state, attended service at St. James's Church.

For such as could stay on Monday, there was an excursion to Hangleby Castle, Cipping Witherden, Woolpit Hesse, and Rougham churches, and Rushbrooke Hall, showing that there was no lack of objects to exercise our criticism, improve our taste, or add to our knowledge. The meeting was more numerously attended than at Lancaster, though a visitor who travelled down on the Monday might have anticipated a larger congress from the way in which a few taxed the resources of the Great Eastern Railway Company. At Marks Tey Junction there was not an extra carriage to be obtained, and the crowding of the three or four carriages that ply between that important station and Bury was so great that a gentleman whose passion is for Early Italian Art was compelled to go in the luggage-van, and his wife and daughter were seen sitting on their boxes like servants waiting for an omnibus.

There can be no doubt in any one's mind that the meeting was a success, and if we inquire to whom this was due, the Ven. Lord Arthur Heryng must have the first place. His graceful courtesy and kind consideration of every one; his cheerful and unfeigned participation in all that was done, will be long remembered. The next place must be awarded to Mr. Thompson, the mayor, through whose instrumentality every one must have carried away a most agreeable impression of their pilgrimage to Bury St. Edmund's. F. S. A.

FOUL AIR IN A SEWAGE TANK AT LIVERPOOL.

It being intended to turn on the sewage into the tank at the Sandhill pumping station, a man in the employment of the Sewage Company went down into a tank to do something to a valve. Immediately on descending he was overcome by foul air which had accumulated in the tank, and fell down. On perceiving this, Mr. Charles Beloe, C.E., who is engineer for the works, bravely, but inconsiderately, went down to assist the poor man. Immediately on reaching the bottom of the tank Mr. Beloe was, of course, also overcome, and fell to the floor. Another person, as is usual, then went down, and also fell. All three were brought out in a state of prostration and insensibility. The last who went down was found also to have sustained a very severe scalp wound. It is very strange that the frequent repetition of this same sort of thing does not prevent its further continuance. Where one man is overcome by foul air, how can another resist it? If there be the least suspicion of the accumulation of foul air, a light should be lowered down first. Where a light will not burn, there a man cannot breathe. But if a man descend and become insensible, and another be induced to follow, he ought, at least, to be tied with a rope, and so soon as he can fasten one around the fallen man, both should be lifted out without a moment's loss of time. Where carbonic acid gas has accumulated, however, it ought, first of all, to be cleared out; and perhaps the best way to do so is to pump it out, for though invisible, it is like water in this and other respects. When pumping apparatus cannot be had handy, quick lime in large quantity might be scattered about so as to absorb the gas. Setting fire to anything to clear it away is worse than useless, for it only adds more carbonic acid gas to what has already accumulated. A not bad plan, where more effectual means are not at hand, is recommended in the *Albion*, namely, tying bulky carpets, &c., into a wisp, and plunging them in and out repeatedly. This may mix good air with the foul, but it will not clear away the foul air as pumping or a sufficiency of lime would do.

THE OFFICE OF WORKS.

In the House of Commons the other night, on the report of supply being brought up, —
Mr. Solator-Booth, referring to the report on the vote for the Board of Works, complained of the arrangement by which Mr. Pennethorne had been removed from his office, and another architect (Mr. Fergusson) appointed in his place. He contended that the arrangement was unjust to an old public servant, and led to an increased charge on the public funds.

Mr. Layard said, it appeared there was not a single person in the Office of Works to check any part of the enormous outlay on them. Mr. Pennethorne was a practising architect, and was receiving 5 per cent. on every shilling expended. The system was a false one which led to the employment of Mr. Pennethorne to look after the

buildings. Thinking it necessary to have some disinterested person attached to the office to give advice to the First Commissioner, he selected Mr. Fergusson, whose appointment had given general satisfaction, who had already effected a large saving to the public, and who, if appointed some years ago, would have prevented much extravagant expenditure.

After some remarks from Mr. Ward-Hunt on the one hand, and Mr. Ayrton on the other, the former condemning and the latter justifying the arrangement, the report was agreed to.

We have before us a Copy of Papers relating to the recent changes in the Office of Works, from which it would seem that there has been a bit of a mess. We cannot, however, just now go into the matter.

ANCIENT DECORATION.

At the recent successful congress of the Bucks Architectural Society, Mr. J. H. Parker made a suggestion that at these meetings a photographer should accompany the members, who might take instructions what objects were most worthy of being reproduced, and who might take photographs within the next week or two. Local societies might thus, by means of exchanges, know what was being done elsewhere. This plan was adopted in Somerset and Kent, and he hoped that it would be more widely extended. Archaeology was perhaps more indebted to photography than any other science. It was impossible that a drawing could represent, for instance, the joints of the masonry, which were often a guide to the date of a building.

The Rev. H. Bull read a paper on the Frescoes in Lathbury Church. The writer commenced by referring to the almost universal custom of decorating places connected with divine worship, and alluding to the catacombs, he observed that the earlier paintings, some of which reach back to an earlier date than is usually supposed, are characterized by a calm and cheerful tone. Very few forms of human suffering are here exhibited—not even the Crucifixion, the Passion, or the Day of Judgment. "The Good Shepherd," Miracles of Mercy, and similar subjects are chosen in preference. As we advance to Medieval times, we come to legends of the saints, the Day of Judgment, and subjects of a darker and severer type. The paper then proceeded to describe the remains of the frescoes, which are not properly so called, being done in what is termed distemper. Mr. Bull remarked that the chance being less visible to the people was probably on that account least profusely illustrated (but Mr. Parker observed that he had known instances in which the chance was more richly ornamented than any other part). In the chancel of Lathbury Church is a design representing a vine branch, and on the other side of the communion-table is the quotation from John vi. 53, "Whoso eateth my flesh and drinketh my blood," &c., which, belonging to the period of the Reformation, is worthy of notice. In the south of the chancel is a quotation from the Corinthians, in Wycliffe's Bible. The designs which occupy the arcade to the north and south of the aisle appear to represent the sacraments of the Church—one evidently referring to extreme unction. Another design represents the favourite subject of the weighing of souls, and another is supposed to represent Cain after the perpetration of his crime. It was perfectly clear to him from personal observation, that from the earliest period in the history of the Church, every place of assembly for Christian worship was decorated with colour, as far as the means were available. Up to the fourth century, when what was called the "peace of the Church" was established by Constantine, the early Christians could only meet in the halls of their own houses,—whence the name *basilica*. But from the earliest time when they were permitted to have churches at all, they were decorated with pictures and mosaics as far as possible. They were all aware that the early paintings were Scripture subjects, and it is not until the eighth or ninth century that we have the legends of the saints. With regard to the material used, he did not know what might be the case in this particular instance, but generally the ochres were employed, which, being the natural colour of the earth, never changed. These were fixed with sizes of various kinds. Properly, fresco was work done while the mortar was wet, and work done subsequently was termed distemper. In the catacombs were drawings certainly from the fourth and fifth century down-

wards. In the churches of Rome there was a series of mosaics which compare with those to be found in the catacombs. In the time of Charlemagne there was a great revival; many mosaics were put in the churches, and many new frescoes were painted in the catacombs; but whether some of these were in most instances repetitions of old ones it is difficult to say. Many of them were clearly additions, not corresponding at all with the early work. He did not attribute any dishonesty to the later work, but change of fashion made it different. The principle of decorating the House of God was one adopted by the Catholic Church from the very earliest antiquity.

THE OPENING OF LLANDAFF CATHEDRAL.

The ancient cathedral of Llandaff may be said to have been rebuilt between 1811 and 1870, mainly under the superintendence and from the designs of Mr. Pritchard, architect.

The last and most important part of the work of restoration has been the repairing of the north-western tower, and the erection of the south-western one. The north-western tower has been simply restored, repaired where necessary, but the main features remain as they were at the time of its erection by Jasper Tudor. It has been surmounted by an elaborate, lofty, pierced battlement. The greatest work of the whole is the erection of the south-west tower, the foundations of which were laid in 1853, but with not the least hope that the work would be accomplished in this generation. The new tower is built externally of wrought ashlar work, of different descriptions of oolites, harder in their texture than that of the Bath quarries. The bulk of these stones came from the Dundry and Campden quarries, the latter stone from its golden tint imparting a cheerful and warm expression to the work. The lower part of the tower, internally, up to its groined ceiling, is lined with Bath stone, but from its first-floor upwards it is lined throughout with strong flat bedded stones, from the Radyr quarry, which is composed of conglomerate of red limestone. At intervals there are thick, strong, bond courses of this material, formed of huge stones dovetailed together with lead. There is no symptom of a settlement, though the building has attained the height of 195 ft. 7 in. to the top of the vane, the lower stage of the tower being groined. To resist this thrust, massive buttresses project at the west, south-west, and south-east angles, which, as soon as they have discharged the duties required of them, terminate in open canopies, with pyramidal roofs. Each canopy contains a figure,—that of the west, St. Peter; that of the south-west, St. Paul; and the south-east, Bishop Olivant. The tower, exclusive of the spire, is 104 feet to the top of its parapet, and is divided into three stages. The first is within the church, and is groined over, being lighted by two windows in its west and south faces. The second forms the ringing-floor, and communicates with the passage in the triforium; then above this comes the grand heltry stage. It is recessed back within two broad piers at angles, forming a pannel, as it were, shelving up by laminated courses to the cells of the windows, and again brought to the original face of the work over the windows by a machicolated cornice. Above the machicolations runs a cornice, with angles adorned by the common insignia, acting as gargoyles, and over the cornice comes an arched parapet. The contractor was Mr. Williams.

SANITARY MATTERS.

The official inquiry into the state of the Thames at Barking, has been going on. Mr. Bidder and Mr. Hawksley were of opinion that the sewage outfall could not affect Barking or cause deposits to obstruct the navigation of the Thames. Mr. Gregory, C.E., saw nothing objectionable at the outfall works. Furthermore, Dr. Miller and Dr. Odling, who analysed the mud from Barking Creek and other points, reported that it was not exceptionally unwholesome. Mr. M'Dougall, one of the surveyors of the Metropolitan Board, was examined, and maintained that there were just such deposits of mud in Barking Reach, and on the Kent shore, and other parts of the river, before the establishment of the northern outfall works as now, and that the sort of mud was the same. Mr. Bazalgette said the memorial on which the inquiry was

based was purely imaginative and contrary to facts. No sewage from the northern outfall ever got into Barking Creek. The water at the town quay at Barking was worse than at the creek's mouth. He had seen a sewer discharging black and offensive mud into the creek at low water, and a barge of manure lay at the quay side, and gave off an offensive odour in the neighbourhood. The site selected for the outfall was the best that could be obtained, all circumstances being considered. Mr. Hawkshaw stated that in his opinion the sewage discharge from the northern outfall contributed very little, if at all, to the accumulations at the mouth of the creek. That portion of the river was prevented from being kept free by the form of the shore, and the Gas Company's pier now building would aggravate the evil. He considered the site of the present northern outfall the best that could have been fixed upon, bearing in mind the question of cost. He should, of course, prefer the sewage being wholly diverted from the river, provided it could be used for agricultural purposes, so as to prove commercially remunerative.

In the Commons, in answer to Mr. Dodda, Mr. Knatchbull-Hugessen has stated that the report of the Rivers Pollution Commission would be presented shortly, but he was afraid not before the end of the session.

Dr. Stephenson, one of the district medical officers of Mile-end has died after an illness of nine days' duration, from fever caught while in the performance of his duty. Ten days before his death he was in attendance upon two serious cases, one in the filthy houses in Edward-street, so emphatically condemned by the coroner's jury, and the other in St. Dunstan's-road. Dr. Stephenson was remarkable for his unremitting attention and personal kindness to the poor who were under his charge.

The *Clarkenwell News* reports a case to show how fever is engendered in St. Pancras. The owner of 56, College-street West, Camden-town, appeared before Mr. Barker to answer a complaint made by the Vestry of St. Pancras, for keeping a pony in the yard of 56, College-street West, so as to be a nuisance and injurious to health. In consequence of complaints having been made by the residents of College-street West, Dr. Stephenson, the medical officer of health to St. Pancras vestry, in company with Mr. Roach, the sanitary inspector, went to 56, College-street West, and found in the back-yard a small stable with a pony in it. The stable was about 6 ft. from the house, and was injurious to the health of the persons who resided in the house. The owner of the stable was cleaning it out, and a very offensive effluvia arose. The stable had been whitewashed since the inspector had called, but it was still a nuisance and injurious to health. It was stated that the pony was taken through a bedroom to get to the stable. Mr. Barker made an order for the removal of the nuisance in fourteen days.

Fever has broken out in Babylon, a place situated opposite the Waterside, Ely. The cottages where the fever exists are in a very filthy condition.

RUGBY.

Sta.—There are few Englishmen to whom Rugby Junction is not familiar, but there are many who neither know nor care what manner of place Rugby is. The people of Rugby, like Sir Christopher Wren, have gone to Rome or to Euston Station for their type almost to a man. The pediments and pilasters, cornices and cantilevers of the latter are repeated a thousand times, and the inhabitants appear to believe that no building is safe without these, and that the safety of the structure depends as much upon the proportion of them as upon the things themselves. The houses being all freeholds, this peculiarity can be accounted for in no other way. The only tenable one left is that there may be an impression that nothing without them would pass the local Board, which is certainly an error, or Mr. Butterfield's extraordinary design would not have passed, in which there is more invention displayed than in all the other buildings. Precedent is set utterly at defiance in it, both in its details and in the proportion of them. It stands like an oasis in a desert. It is well to make use of the brains of our forefathers and of the inventions of foreign brains when we lack them ourselves; but when we have them, let us use them by all means, and this Mr. Butterfield has insisted upon. His design displays thought, and stands like a protest against the works of the poverty-stricken brains

that surround it. Of course, these stiff sticklers for precedent condemn it as sensational, and "we are a prudish law-abiding people, who would not take a shunter down on Sunday, or use a brick that was not exactly 9 in. by 4½ in. by 3 in. to save a fellow creature's life, and we want no sensation here."

That Mr. Butterfield has been so successful in his design for the additional buildings to the great school as he generally is, admits of a doubt, but as an original work the design is highly commendable. Another word of praise is due to Rugby. The streets are broad, and so clean that one cannot help wiping one's boots before stepping out into them; they are likewise rendered deliciously cool by chestnut, sycamore, lime, laburnum, and beech trees, so that every street is a classic grove, in which Minerva peacefully passes her days, free from the excitement of Diana or the griefs of Venus. I.

DESIGNS FOR THE PLYMOUTH NEW GUILDHALL.

The designs sent for competition for the erection of the Plymouth New Guildhall and Public Offices have been arranged in the tea-room of the Loyal Hotel. There are twenty-six designs. The majority are Gothic in style. Many of them are adapted to the locality and for the uses to which the building will be devoted. Some of the designs are most elaborate, and the architects do not hesitate to say that if these were selected, the cost would exceed from 10,000, to 15,000, the stipulated sum as to the cost, fixed by the corporation at 20,000, to 25,000. Two modes of laying out the site have been adopted. In most of the plans the buildings are arranged in two blocks, the Guildhall forming one and the Public Offices the other, leaving a kind of court or public place between them. The Guildhall building in many of the designs is surmounted by a tower, and in some of them two towers are introduced; whilst in others the fine old tower of St. Andrew's Church has been thrown into conspicuous prominence in the arrangement. The designs are open to the public for inspection, by tickets, which may be procured on application at the Guildhall, until the 3rd of August next.

DRAWING AT A DISTANCE.

The account which you have given in your number for July 17th, p. 560, of the manner in which M. Revoll,—whose admirable work on the Romanesque Architecture of the South of France ought to be in the hands of every lover of Early Art,—has combined the use of the camera lucida, and the telescope, is interesting to every artist who desires to transfer to his sketch-book architectural details situated beyond the limits of ordinary powers of vision.

Justice to others, however, who realized long ago what M. Revoll no doubt honestly believes to be a recent invention of his own, obliges me to resist the claim of originality in this matter to which you apparently lend your countenance in the article I refer to. Thirty-four years ago Professor Miller, of Cambridge, recommended to me the application of a small speculum, or steel mirror, of about the eighth of an inch in diameter, to the eyehole of an ordinary telescope, for the purpose of presenting,—after the fashion of the camera lucida,—when inclined at the necessary angle, and on looking downwards, an enlarged reflection, on a sheet of paper placed at a given distance, of any object towards which the telescope might be directed.

I succeeded, after some trouble, in obtaining one of these small mirrors, from the watchmaker at Vienna who made them, and in adapting it, with Professor Miller's assistance, to a telescope of moderate power; and for seventeen years I used this instrument with the greatest advantage in all cases where the distance or the inaccessibility of the object to be drawn rendered enlargement necessary, my first successful effort with it being a panoramic drawing, 12 ft. long, which I still possess, taken from the roof of the parish church of Lancaster, of the opposite shore of Morecambe Bay, fifteen miles distant, extending from Peel Castle on the south-west to Arnsdale Knot on the north-east, and including the well-known outline of the Lake Mountains.

At the Great Exhibition, however, of 1851, I fell in with an instrument specially designed for and adapted to this object, and greatly superior to that which I had hitherto used. This instrument was invented, patented, and made by

Varley, the optician, and brother of the well-known water-colour artist; he called it the Patent Graphico Telescope. The advantages which this instrument possessed over that which I had formerly used, consisted chiefly in its portability; in the firm and convenient manner in which it was attached to the drawing-board; in its powers of adjustment; and in its diminished telescopic power, not exceeding that of an ordinary opera-glass; and in its consequently increased field of vision.

This instrument has been my constant companion for many years past, and I think I may venture to recommend it to M. Revell as, in all probability, a considerable improvement on that of which you have given a description, and which appears to me, from that description, to resemble more nearly in its combinations my earlier instrument of 1835.

I am not aware whether Mr. Varley is still living, nor have I ever met with any one else who knew of or used this instrument; but I quite agree with you in thinking that there are many uses—pictorial, military, and scientific—to which it may be advantageously applied.

EDMUND SHARPE.

SANITARY PRINCIPLES OF COTTAGE IMPROVEMENT.*

A FEW days ago, Mr. Edwin Chadwick invited the committee of the Ladies' Sanitary Association, the council of the Society of Arts, and a number of other distinguished persons interested in the sanitary improvement of dwellings, to his house at East Sheen, for the purpose of showing some new forms of construction, and especially for displaying a mode of ventilating with air—warm as well as fresh—arranged by Captain D. Galton, R.E., in a new model cottage, occupied as a gardeners' lodge, attached to his house, on principles which were explained in an address. We publish in our present issue illustrations of the lodge, including details of the warming arrangement, and let Mr. Chadwick explain them in his own words:—

I shall have difficulty in conveying, within any compass, for this occasion, my sense of the great importance of the rising movement which may be aided by the principles of the construction of the very humble-looking little cottage to which I have heaped the honour of your visit. The sanitary object attainable by the improvement of the dwellings of the wage-classes is no less than a reduction of nearly half the prevalent premature disability from sickness, and half their mortality, which is proved to be due to the conditions in and about their dwellings, including overcrowding. The Society of Arts has promoted new arts, such, recently, as pinculture and oyster-culture, which are being earnestly pursued, with a special solicitude as to the habitat of the creatures as the chief means, and it may really befittingly promote, as a new, or as a neglected art, one, in which the progress of other arts must depend, periculiature, for which earnest solicitude as to the habitat is also needed, and for the result of which there is great promise; for we have had of late evidence attested by medical officers and heads of establishments that is consolatory for past efforts of sanitary improvement, displayed in district orphan asylums of the metropolis, most striking to those who have visited them, as I have done, after lapses of time; that as the common lodging-houses have been regulated under Lord Shaftesbury's Act, and the low courts and dwellings—former fever-nests—from which these orphan and destitute children chiefly come, have been improved by rudimentary measures of a sanitary police, the type of children has been improved; they are less ugly, and ferocious, and repulsive in their aspect, and the school teachers attest that they are less difficult to teach and to train industrially. In this view I may, I hope, suggest to the noble ladies of the Sanitary Association that the principles in question have, moreover, claims upon them in respect to the extension of an improved order of marriages, and the reduction of a demoralising celibacy amongst the wage-classes; for, of the million and a quarter of men of the marriageable ages who remain single, has it been seriously considered how many are withheld from marriage by the want of heating homes? how many are deterred by having only places presented to them which are dark and filthy, deprived of due light and air (yet dear) to which

they could take a partner? how many are deterred by the aspect of squalid misery they witness on the part of the married, of whom, in Manchester, Liverpool, and Glasgow, even in times of prosperity, large proportions of the children are born only to die; and, of all born, one-half, as Dr. Farr's dire records show, are in their graves before their fifth year? Of a sound, well-trained, industrial, self-supporting, and productive population, I assert as an economist, that notwithstanding the present depression, our country needs more population, especially to supply the increasing claim by emigration, which is commonly of our best population, leaving larger proportions of the dependent, the pauperised, and the worst; but practical sanitary science affords brighter prospects. Large aggregations of orphan and destitute children in the institutions, such as those to which I have referred, were formerly, notwithstanding high dietaries, the seats of devastating epidemics; but now, with clean air, clean persons, and clean constructions—with yet much to do—these same institutions have become sanitary standards, with death-rates less than one-fifth of those prevalent amongst children of the same ages of the general population. My confident belief is that, by the rudimentary sanitary principles and practical sanitary art, to which I would now solicit your attention as applied in the model cottage, you will see the death-rate amongst children and the common insurable disability to work on the part of adults may be reduced to one-third of what it now is. In various model dwellings the death-rates have been reduced by about one-third, but, unhappily, with economical results which do not encourage, and, indeed, rather discourage, imitation. By the application of the principles of construction you will see displayed, I have a confident expectation that the greatest reduction may be effected, with a better promise of a "commercial return." The great sanitary evil to be contended against in cottage and house site and the habitat for periculiature is damp, which lowers temperature and lowers strength; generates painful diseases—rheumatism—and, lowering strength, predisposes to all other passing causes of disease, and especially to consumption. The first article to be insisted upon in a sanitary specification is, that by drainage of the site if it be necessary, the water-table shall be lowered not less than 3 ft. below the surface. Throughout the country it has been of late observed that a diminution of consumption has followed good subsoil drainage works. In this particular instance, the site being a deep gravel, in which the water-table is several feet below that minimum, there was no necessity for this precaution. My first condition of a sanitary preparation, as respects the construction of the house itself, is "that the flooring shall be impervious to rising wet, the walls to driving wet, and the roofing to falling wet or to snow, and that they shall be absolutely damp-proof." As illustrative of the conditions of the common construction, I may here mention that the common bricks of which cottages are made, absorb as much as a pint or a pound of water. Supposing the external walls of an ordinary cottage to be one brick thick, and to consist of 12,000 bricks, they will be capable of holding 1,500 gallons or 6½ tons of water, when saturated fully, which they sometimes are. To evaporate that quantity of water would require nearly a ton of coal well applied. These bricks give off their moisture slowly. It is unsafe to inhabit, in less than nine months or a year, the houses constructed of the common materials, and almost a double death-rate has attended recently the occupation of a brick-huilt model dwelling. When I examined, as a reporter, the model dwellings built at Paris by the Emperor, I found the appearances of damp on some of them that had been built two years. The cottages who showed one block had her head bound up, and was suffering from an attack of rheumatism, connected with the dampness of the houses. The Empress has since paid attention to the subject, as I am informed, and I hope with better effect. But it is proper to mention, as showing what may be expected, not merely from architectural science as it is, but from curative science when uncombined with preventive or sanitary science in construction, and also to show that the poor are not the only persons who suffer, that the medical officers at the recently-constructed hospital at Netley have been afflicted with rheumatic fever, arising from the excessive dampness of the brick construction of their quarters. Some military officers' quarters, constructed not long ago at Dover by an eminent

civil architect, chiefly, I believe, of stone,—which is often as bad as brick,—were, I am assured, so damp, that it was found to be impossible to occupy them, though they had cost 1,000*l.* each. A gallant friend who, the other day, examined the cottage I shall show to you, exclaimed, "What superior officers' quarters such cottages would make," though they would cost one-tenth the sum expended on the damp construction at Dover. I think it right to mention these things in illustration of the common state of information on the question. The opportunity of my constructing a model cottage, as I may call it, arose from the need of erecting a new lodge for my gardener and his mother, in lieu of one enlarged from a two-room to a three-room cottage, built by my predecessor as tenant to this house, my learned friend, the Hon. Augustus Liddell. He is a man, as every one who knows him is aware, of solid virtues, who would be the last to do harm to any living creature. If he happily had had a ray of sanitary science, he would have been aware that in keeping the poor woman in that cottage he was victimising her, as happened, with rheumatism, from the damp brick floor and the damp walls and ceiling. His regret at what he unwittingly did to this poor old woman by the common error will be sharpened when he learns that it was at double the expense of the construction by which I trust she will now be relieved. Parliament has—what shall I say—conferred great sanitary powers, not upon a Minister of Health, but, of all men, upon the Secretary of State for the Home Department, from whose visible occupation with other subjects you may see what is his power of attention to that subject. Now, it may be mentioned, as a point of observation for the Sanitary Commission now sitting, that his only adviser within the office, so far as I am aware, for the selection of sanitary officers and the exercise of very large sanitary powers must be, on very important questions for the health of populations, the permanent Under-Secretary of State, my predecessor here, the Hon. Augustus Liddell, who, I should be glad to hope might find, amidst the multiplicity of his other duties, any smallest scraps of time to amend his deficiency of sanitary knowledge, of which his old lodge, which you may see, may be presented as a monument. His late lamented Royal Highness the Prince Consort, with whom I had correspondence on this question, accepted completely the principle of the dry, damp-proof construction, and endeavoured to apply it by hard-burned hollow bricks, glazed for interior wall facings. I undoubtedly consider that a construction of vitreous tiles or bricks is the best possible, but for trade reasons, stated in my report on the exhibition of model dwellings at Paris, they are unattainable at present. The late Captain Fowke first directed my attention to concrete, as the most advantageous and the cheapest material available for cottage construction, and gave some specimens at the South Kensington Museum. Portland cement is a stronger material than Roman cement, and, as was shown at the International Exhibition, its use is extending throughout Europe. These who wish to be informed particularly in relation to it will find all about it in the report of the Children's Employment Commissioners,—that it originally imbibes less water than the common brick material, parts with it more rapidly, hardens, and becomes utterly impermeable to water. My specification, "that the walls and ceilings shall be impermeable to water or damp," is complied with in this instance by the contractor, Mr. Nicoll, with a new material of wall and roof construction, of which Portland cement concrete forms a part. You may imagine, as adopted for houses, the Crystal Palace principle of construction, with iron framing and h arers, but instead of glass opaque slabs, made of a web of straw compressed to about one-fourth the space of loose straw into a mat or web, which is spread over a framework of iron wire. Upon this compact web of straw, layers of hard bitumen are put on both sides. Over the bitumen is placed a layer of concrete. If the bitumen be of sufficient thickness and hardness, and properly spread, it appears impossible that wet can penetrate that walling, although the outer layers of concrete might, if not well made, for a time imbibe some portion of moisture. The straw, kept dry—and it should be kept completely dry,—by the bitumen—is, as we know, a non-conductor of heat, and the bitumen should be preserved in hot weather by the non-conducting power of the outer layer of concrete, which is an entire non-

* See p. 607.

conductor of damp. Mistakes have been made with the first attempts, in carrying the economy of the iron framing too far, and occasional cracks in the roofs; but two years and a half's experience of a lodge on this principle of construction at South Kensington is very satisfactory. The next articles of a sanitary specification applicable to cottage construction are, "that the wall shall be washable," "that it shall be such as not to harbour vermin," and "that it shall be of a light, agreeable colour."

It is a sanitary rule, as applicable to closely occupied dwellings, that the walls shall be cleansed at least once a year, and some authorities have required that it shall be done at least four times a year. To provide for lime-washing it has been provided that the brick walls of the Pashody and other model dwellings shall be kept here. At the Board of Health, at epidemic periods, when houses were struck with fever, we ordered the inmates to leave, and the houses to be cleansed. In some instances the orders were disobeyed, and fresh population came into the uncleaned houses, and they were attacked with fever, proving the deleterious quality of the deposit on the walls. The cost of lime-washing, as often as it is required to be repeated, is a serious tax. In hospital construction the cost of the washable wall-facings is often as much as 10s. a superficial yard. You will see the sort of wall-facings that have been given by Mr. Nicol in several rooms of the cottage, at from one-tenth to one-twentieth of the hospital prices. The way in which the sanitary specification that the floor shall be of good non-conducting material, and be watertight and damp-proof, you will see is attained by squares of the cheaper wood laid upon a layer of bitumen. The occupant alleges that this flooring, which you will see, is a great immediate improvement in comfort. So far as the shell of the cottage is concerned, it is submitted that it is an improvement in the principle and the quality of construction upon the common dwellings. If the workmanship be good,—and the contractor ought to be held to make good for a period of time all defaults from the sanitary specifications,—I do not see that the dilapidations will be greater, and I do believe they will be less, than in the common constructions. The contest is for reduction of price as well as for improvement in quality, and the economy may be achieved at the expense of stability, unless the point be guarded against; but at the worst I do not believe that the new construction can be so bad as the more common old one.

Constructions in most forms of entire concrete walling appear to be better in quality, and may be lower in price, than brick, where good sand or gravel, or other wall material, is close at hand. But if the 3-in. walls of this cottage construction have sufficiently good non-conducting power, or as good non-conducting power as the common 9-in. walls at the same price, they give an important gain in space. The cottage, you will see, has a gain of 564 cubic feet of interior space from 3-in. instead of 9-in. walls; and, by having the entire space up to the roof, there is a gain of 720 cubic feet, or 1,284 feet in all; that is to say, space such as in some constructions would be considered to suffice for two more persons. This is an undoubted gain for the next great point of a sanitary specification:—That the ventilation shall be (that is to say in cold weather) with air that is warm as well as fresh." All common modes of cottage ventilation ventilate by cold air, and are almost invariably contended against by the inmates. This method of ventilation, invented by Captain Douglas Galton, of the Royal Engineers, by a fresh-air flue, and warmed by it, has been experimented upon in this country, and tried in a number of barracks. It has been tested by Dr. Park, of Netley, as to the hygienical condition of the warmed air, which he pronounces to be satisfactory, and he tells me that he intends to apply the principle to his own dwelling. It has also been carefully tested in many experiments in Paris, by General Morin, of the Institute, and, undoubtedly, it is in principle a decided success. The soldiers in the barracks warmed by it declare that they are no longer, as heretofore, roasted in front whilst they are frozen behind. By this method the air may be changed three times an hour, and more; and nearly 50 per cent. of the chimney heat, now wasted, brought back into the room. Though the ventilation is, of course, the most active when the fire is alight, it was found, upon experiment, that from the continued warmth of the flues and the mass surrounding the flues, the change of air effected

was considerable, even as late as six o'clock in the morning. The concrete is peculiarly adapted for the construction of tubular smoke and air flues at a cheap rate. This, as far as I am aware, is the first instance in which the important principle has been applied to a cottage, and until we have a winter experience, it cannot be pretended that the best adjustment of the fresh-air flue, and the means of warming it by the chimney flue, has been attained. According to General Morin, it is a means of saving 50 per cent. of the coal consumed in domestic fires, and the estimated consumption of coals in our domestic fire-places is 50,000,000 tons of coals annually. I commend to your notice a newer arrangement, by Mr. Nicol, by which the same fire-place that gives radiant heat, and warming, and ventilation to the front room, keeps a boiler and an oven at work in the next. This is already reported, on trial by the housewife, to be a success. To those who are accustomed to the box-beds of Scotland, his new form of bed, folded up to save cottage space, may be commended for notice; also his mattress, made of seaweed, and his reversible table. In conclusion, I may state for consideration another article of a sanitary specification, which will be realized here:—"That the complete construction of the house shall be such that if it be left clean, unoccupied, and closed for any time, it shall remain dry, free from any close, mussy, or foul smell, and shall be immediately habitable, without the need of fires or of any special preparations for safe occupancy in winter or in summer." This cottage is detached, and unconnected with any system of sewers; and the plan in use here is a movable pail under a seat, into which pail is to be put all the soap-suds, house-slops, &c., which serve to dilute excreta, the whole being removed daily, or before decomposition can commence, and deposited in a trench, or applied at the discretion of the gardener as liquid manure, the principle of the plan being to take the manure to the prepared soil, instead of bringing prepared soil to only a part of the house manure, as is the principle of the earth-closet system. Where the house is connected with a public system of sewerage, which, it is to be hoped, would be a self-cleansing system of sewers instead of sewers of deposit, which are only extended cesspools, the fundamental item of a sanitary specification, I take occasion to state, would be in the following terms:—"The house shall be provided with a water-closet on the syphon principle, so shaped, and so provided with water as to be effectually self-cleansing throughout, and to remove at once from beneath the premises all fecal matter or waste water, and to be so trapped as to prevent the ingress of vitiated air from the sewer in the event of accidental stoppages, and to be at all times free from foul smells.

Now, as to the cost of this cottage construction, my conclusion is that an improved cottage construction, on whatever principle, will be only obtainable when cottages become a manufacture (which is not yet), with the advantage of much machinery for the repetition of numbers. I think acknowledgments are due to Mr. Samuel Sharp, the architect, and to Mr. Nicol, the contractor, for their steady efforts to reduce and to keep down prices. I am assured by them that detached cottages, such as the present specimen, with 4,800 cubic feet of internal capacity, may be repeated in half a dozen at a time for about one hundred pounds each; or, if a dozen cottages in a row (where it must be so, for I do not like cottages in rows) be taken of the same qualities, guaranteed damp-proof, but without decorations, at about eighty-five pounds each. These (apart from the present main question of quality and economy in use) are, as far as I know, important reductions in prices. To the members of the Ladies' Sanitary Association, who do so much with little money, who have circulated such admirable tracts on the sanitary treatment of children and on domestic management, I respectfully commend the promulgation of sanitary principles for the improved construction of the people's homes. The first of these principles are the requirement by specification of dry foundations, of dry and warm floors, of perfectly damp-proof walls and ceilings; walls washable and fair to see, and means of ventilation with air that is warm as well as fresh, a saving of half the common consumption of fuel, and really comfortable homes. To my colleagues of the council and to the members of the Society of Arts, I venture to commend the consideration of the perfectionment of the arts and appliances by which these several ends may be best attained for the poorest of the population.

THE GERMAN HOSPITAL, NEW YORK, U.S.*

This hospital is to be built on the ground enclosed by Seventy-sixth and Seventy-seventh streets, and Lexington and Fourth avenues. It will be constructed on the principle of separate pavilions, and, when fully completed, will consist of seven buildings, and cost about one million of dollars. The present project is to build two pavilions, an administrative building, a laundry, and an engine and boiler room.

Each pavilion will be 167 ft. long, and 52 ft. wide at the ends, and the centre, in which are the wards, will be 30 ft. wide. The pavilions will have cellars, basements, first and second stories, and attics. The principal wards on the first and second stories will be 106 ft. long, 27 ft. wide, and 16 ft. high. They will accommodate thirty-two patients each, allowing 1,431 cubic feet to each patient.

At one end of the pavilions adjoining the wards will be the physicians' and nurses' rooms, convalescent and dining halls, pantry, scullery, linen-room, hoistway, dumb-waiters, and a stairway 6 ft. wide, with a platform at half the height of the story.

At the opposite ends of the pavilions will be water-closets, baths, and lavatories, separated from the wards by a lobby.

The wards are to be warmed with hot air, the air being heated by coils of steam-pipes arranged in chambers in the cellar. The cold air is to be conducted by these chambers from a large air-shaft outside the building, receiving its supply some 30 ft. above the surface of the ground.

The basement is to be devoted to accident and ophthalmic wards, examining and store rooms, closets, &c. The attic is to be appropriated to private wards, attendants' rooms, tank, and ventilating chambers. Each pavilion is to have a surgical operating ward. The laundry will be 42 ft. by 60 ft. The administrative building will be 60 ft. by 80 ft., and will contain in the basement, the principal kitchen, apothecary's room, an laboratory, servants' dining-hall, and store-rooms. The upper stories will be used for offices, officers' sleeping apartments, &c.

On each side of the first floor of the pavilions will be balconies. There will be a dead-house, post-mortem examination-room, morgue, &c. The grass-pots, neatly laid out with fountains in the centre, will be between each end of the administrative building and Fourth and Lexington avenues. The building will front on Seventy-seventh-street. It will have a slated Mansard roof, and a high dome on the central building. The front will be of Philadelphia brick, and the cornices and window buildings of cream-colored stone, brought from the vicinity of Cleveland, Ohio.

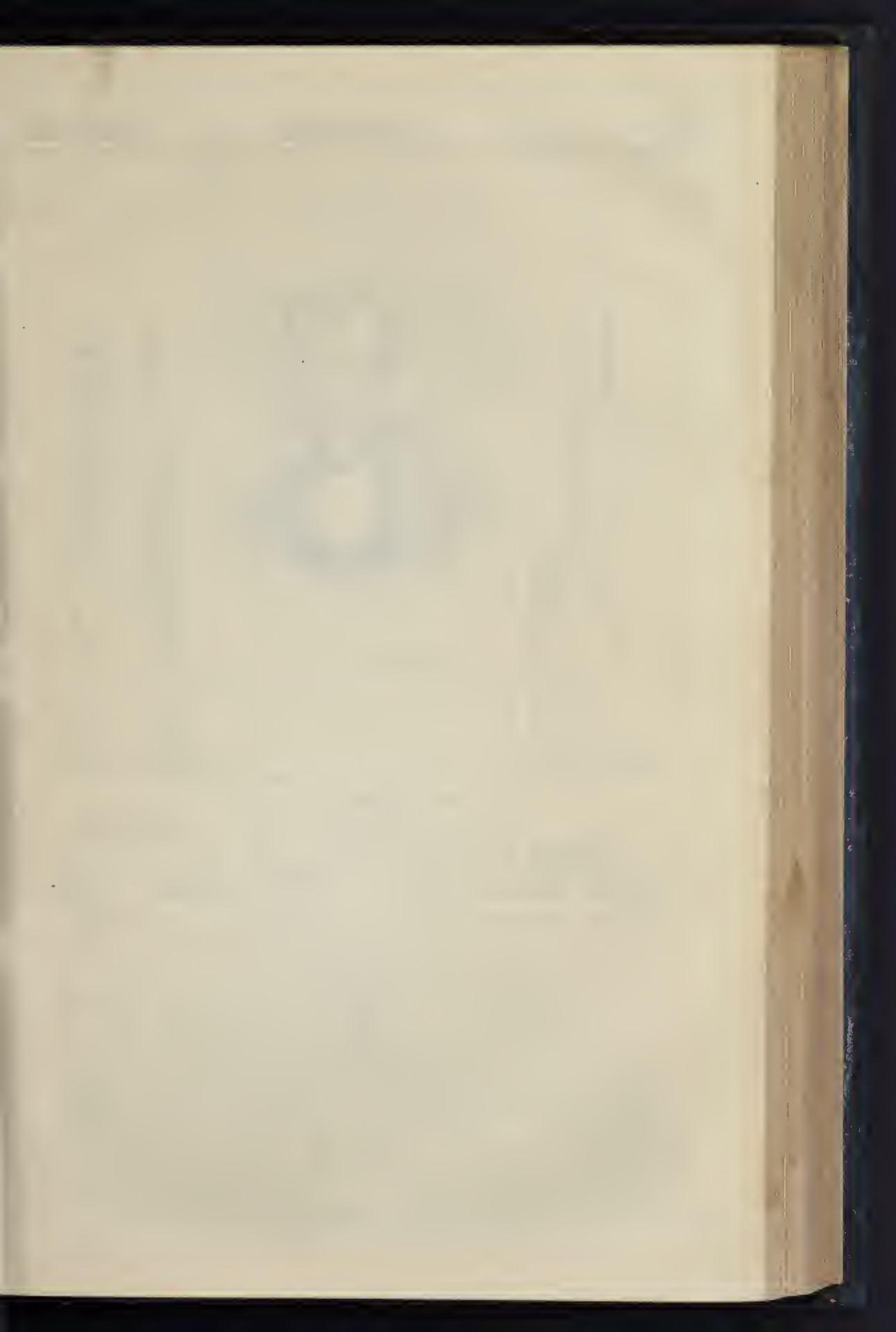
The funds for the erection of this hospital were raised by the private subscriptions of German citizens. It is intended for German patients, where those who cannot speak English will be attended and cared for by doctors and nurses to whom they will be able to make their wants known in their native tongue. Other nationalities will not be excluded; but the above is the primary object of the institution. The architect is Mr. Carl Pfeiffer.

REFERENCES.

A. Corridors.	T. Linen-room.
B. Vestibule.	U. Scullery.
C. Reception-room.	V. Ward.
D. Physicians' Room and	W. Stairs.
Library.	X. Bath-room.
E. Family Dining-room.	Y. Balcony.
F. Office.	Z. Wash room.
G. Family Parlour.	a. Laundry.
H. Hall.	b. Iron Heating Furnace.
I. Dumb Waiters.	c. Stairs.
J. Fireproof Closet.	d. Chimney.
K. Hoistways.	e. Hall.
L. Principal Stairs.	f. Dead-chamber.
M. Water-closet.	g. Post-mortem Examination-room.
N. Private Stairs.	h. Stair.
O. Principal Stairs.	i. Fountain.
P. Pantry.	k. Grass-plots.
Q. Convalescent Dining-room.	l. Heaters.
R. Nurses' Room.	m. Gates.
S. Physicians' Consulting-room.	

The Proposed Law Courts.—We are glad to hear it reported that the committee appointed to inquire into the respective merits of the Howard-street and the Carey-street sites for the New Law Courts have decided to recommend the Carey-street site, both on economic and aesthetic grounds. The report of the committee is expected to be out this week.

* See pp. 606, 607.

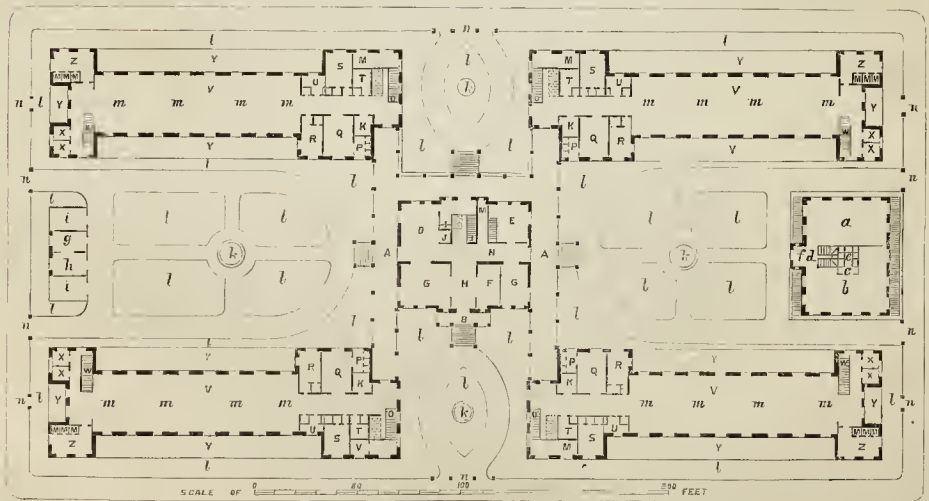




SIR WILLIAM TITE, F.R.S., M.P.,

President of the Royal Institute of British Architects; Architect of the Royal Exchange, London.

HOSPITAL FOR GERMANS, NEW YORK.



Ground Plan.

ENTRANCE LODGE, PARK COTTAGE, EAST SHEEN, SURREY.



THE GERMAN HOSPITAL, NEW YORK, UNITED STATES.—MR. CARL PFEIFFER, ARCHITECT.

BRIXWORTH CHURCH.

The esteemed vicar of Brixworth, the Rev. C. F. Watkins, writes as follows:—

"When I stated to you in positive language that 'not a brick or stone of the original Saxon work had been displaced by us' in the restoration, you charge it as contradictory to evidence and 'sheer nonsense.' Now, sir, I reiterate it as a fact that can be substantiated by the able and conscientious architects, Messrs. Slater & Smith; their able clerk of the works, Mr. Thompson; and the workmen employed.

You quote against me the use of 'original fragments' in the reparation of the arches. Those fragments were collected from the *débris* of former waste—first, by the Danes, who destroyed the aisles, and subsequently by barbarous innovators; and our reparations were of the mischief which they had wrought, and not alterations of the Saxon work.

You insist upon the *cubicula*, and quote Mr. Roberts, a very able architect and antiquary, and a man of genius and energy in pursuing his inquiries; but had he been present when I removed the bank of earth which had been heaped up against the north side of the church to cover the dislocation of the aisle from the arcade, he would then have seen that the transverse piers of the arched corridor-like aisle met the piers of the arcade low down, and rested upon these foot buttresses. Part of that evidence is lost from the necessity of underpinning the wall of the arcade, and filling in the holes which the Danes had left, with imminent danger to the north wall of the church. After Mr. Roberts had reported of *cubicula*, I had an interview with Professor Willis at Cambridge upon the subject, as he had seen the foundations of the destroyed aisle laid open by me for the inspection of the public many years ago, and examined everything very closely with Dean Peacock and others. He is equally positive with myself respecting these foot buttresses; and I need no better authority.

As to the lack of usual characteristics of Saxon work in Brixworth Church, we have not indeed long and short work; but we have two of the original pillars, with the arched window between, remaining to us of the eastern apse, which was semicircular within, polygonal without. We have also a three-light balustrade window in the west end, of the same kind and age as that at Earl's Barton and St. Bennet, Cambridge, of the ninth century. This is superimposed upon an original arch of the seventh century, the crown of which is cut away to receive it; and hence this wall must be earlier than the ninth century. We have also herringbone work in the walls. A clear proof that there were no *cubicula* is, that there have been no divisional walls in the aisle to enclose them, whereas the foundations of this longitudinal wall are clear enough.

Leaving these unpleasant differences, I heartily coincide with you in your view of the Saxons as a people far more advanced in the arts of life than has been generally admitted. Their illuminated MSS.; their works in jewelry and metals; the description of their churches by their early writers; their wise laws and customs; their agriculture; and the 4,000 churches existing at the Conquest, portions of many of which, especially in the towers, as the least liable to destruction, are sufficient proofs for any candid minds."

MISTAKES IN SILVER.

The Goodwood Cup for 1869, produced by Mr. J. W. Benson, has much to recommend it. It takes the shape of a fine old English tankard and cover, modelled by Mr. J. E. Boehm, the subject being taken from Frith's "Derby Day." The body of the cup is surrounded in high relief with the principal features of this well-known work. Commencing at the left hand, we have the gambling booth, the thimble-rig table, and the country bumpkin more than half disposed to stake his money on the little pea; the group of acrobats; the swells lounging round the carriage; and so on. These subjects are modelled with skill.

The lid is surmounted with a cleverly modelled group of three horses with their jockeys, rearing and plunging in too spirited attitude. The handle is formed of very large vine-branches, and the lip or spout has the shape of a jockey's cap reversed.

It is in these latter particulars that the mistakes have been made. The vine-branches are out of all proportion with the composition, and

the jockey's cap that disagreeably forms the spout is simply preposterous, and utterly ruins the cup, on which something like 500*l.* have been spent. The rest of the work is so satisfactory that we seriously advise Mr. Benson to remove, at any rate, the jockey's cap, and substitute a spout pure and simple.

BINSTED CHURCH, SUSSEX.

This church, which was in a very dilapidated and unsafe state, has lately undergone a substantial and decorative repair. The walls, which were dangerously cracked, have been secured by buttresses and grouted with cement, and a massive oak roof has been placed on the church throughout, of the same construction as the old one, which was entirely decayed. A new vestry and a porch have been added, and new windows inserted in the place of the sashed windows with red brick jambs, which had been put in in modern times.

The church has been resated, and the floor of the nave laid with Godwin's tiles. There is no chancel arch, but traces remain of a thirteenth-century screen, or rood-beam, which formerly divided the nave and chancel, and a new screen of oak has been placed in this position. The chancel has a pavement of a new material, invented by Messrs. Powell, of Whitefriars Glass Works, and used here for the first time. The stained glass for the east window was also supplied by Messrs. Powell.

Some interesting wall paintings were discovered on removing the whitewash, of which it has only been possible to preserve a figure of St. Margaret, and some decorations on the splay of a lancet in the chancel.

The architect was Mr. T. G. Jackson, of London. The builder was Mr. Booker, of Walberton.

THE TERRACE OF SOMERSET HOUSE.

Sir,—As the river embankment is now a splendid addition to the metropolis, we, who are neighbours dwelling in the same parish as yourself, ask your help to utilize the noble terrace of Somerset House as a public walk on Sundays. The red coated gentry who "har the entry" on other days might surely be allowed to open it for health and recreation one day in seven, and it would be a great boon to us, for whom no parks have been made. A trifling expense would prevent abuse, and make such a promenade enjoyable. Pray help us, Mr. Editor, to liberty which accords with the spirit of the age in which we live, and earn the gratitude of those around you.

ROUND ROBIN.

CASTLE ASHBY.

MR. SCRIVEN, the Marquis of Northampton's agent, confirms our remark as to the carved aprights in the staircase:—"They were put up by the late Marquis of Northampton, as it required support. The chimney-piece in the large drawing-room," continues the writer, "was brought as it is (except a piece on the top to make it higher) from Canonbury House, Islington, which came into the possession of the family through the wife of the first earl, who was the daughter of Sir John Spencer, of London, in the time of Elizabeth. It was her money, I believe, that fitted up that suite of rooms, the same arms being worked on the ceiling that are on the chimney-piece."

Mr. Scriven says the architect of the town-hall designed both the entrance-lobges. Mr. Street was the architect for the church restoration. "The low railing on each side of the entrance-gates is only temporary. I believe there is a design for continuing the terra-cotta work."

GREEN TREES.

Sir,—Knowing you are always ready to advocate any idea for the improvement and health of London, and, like yourself, having great faith in green trees, permit me to suggest that it would be an acceptable boon, if the Metropolitan District Railway Company could be induced to plant a few trees and shrubs in the open gravelled spaces fronting most of the stations.

It may be urged, it is a very easy task to suggest improvements as others' cost; but, I submit that, as the Company is well supported by the public, it would not be the loser by thus adding to the "picturesque" of the metropolis; and even should shareholders object to a small charge upon their dividends for such a purpose, surely if a collecting-box were placed in each booking office, many would drop in a spare halfpenny towards the expense incurred, and thus assist in making London "Beautiful for ever."

G. F. FRANKS.

DISTRICT SURVEYORS' RETURN TO BOARD OF WORKS.

The report of the Superintendent Architect, just published, shows that the total of the gross fees received for the year is 37,790*l.* 13*s.* 5*d.*, in respect of 21,915 works, of which more than two-thirds were done within the year.

The gross fees received in twenty-eight districts, vary from 1*l.* to 493*l.*, six being under 200*l.* each, seven under 300*l.*, nine under 400*l.*, and six under 500*l.* In thirty districts the incomes vary from 511*l.* to 1,869*l.*

The expenses of district offices are 7,039*l.* 4*s.* 9*d.* The fees remaining due for all arrears are 30,984*l.*, but probably are mostly of little value. The sums abated or lost are 1,837*l.* Compared with the results of former years the present abstract shows still a considerable increase.

	Works.	Fees received.
In 1856	14,654	£19,804 14 11
" 1857	15,530	20,969 11 4
" 1858	15,900	21,732 11 2
" 1859	15,658	22,385 9 2
" 1860	15,000	22,791 2 3
" 1861	14,000	21,653 2 8
" 1862	15,707	23,315 2 3
" 1863	17,951	28,410 9 0
" 1864	18,984	31,803 5 2
" 1865	19,251	32,272 7 0
" 1866	20,166	34,939 11 4
" 1867	21,303	36,974 6 0
" 1868	21,915	37,790 13 5

THE VALUE OF THE OVAL.

Sir,—I believe I am right in asserting that the ugly forms of round and square mts, in the development of architecture, give place to the oval and oblong, as they have in art. In the inclosed sketch (from a model prepared for the first Great Exhibition, but not sent to England in time), I attempted a building which should be cheaper in construction, should fill and empty quicker, be better fitted for sound, and which should last longer than any other of the same size; and also to induce my friends to think it possible that a new order might have some advantages, and that the value of the *true oval* in architecture and engineering was not sufficiently considered.

J. L. STATHAM.

** We will say nothing on our correspondent's theory, but certainly the example he sends will not recommend it. Anything more appallingly ugly was, perhaps, never seen. We are glad to observe that it is "entered at Stationers' Hall."

TECHNICAL EDUCATION IN THE BUILDING TRADE IN LONDON.

Sir,—I am induced to address a few words to your journal on the above subject, by seeing the letters of "The Plane" and "Resonance." Sir, I want to know what interest it would be to the journeyman joiner to acquire technical education? Would he be better paid, supposing he still remained journeyman (and you know we cannot all be foremen or clerks of works)?

The employers know, and we know, perfectly well, the less thinking or studying in the shop the better they are pleased,—that is, if you leave off work with the arms to work with the brain for a few minutes.

In this age of competition, sir, quantity is the order of the day, and quality quite a secondary consideration. A skilful handi-craft, who can execute his tool on geometrical principles, or a clever joiner who knows something about lines is valued no more and gets no more pay than some men who manage by a knack or rule of thumb to get over the work quickly, and do it now enough to pass.

I think, sir, this explains the reason why the masters are indifferent about promoting the technical education of their workmen. The more machine-like a man is the less likely is he to kick against the driving of a pushing foreman.

JACK RAYNER.

Sir,—I have for years devoted my leisure time to self-improvement, and gained distinctions in the Science and Art Examinations; but the only result as yet is to keep me in hot water with my employer, because the knowledge I have gained enables me to obtain a few shillings extra, with a less expenditure of physical force.

My impression is, that until the architects take up the matter, and insist that clerks of works and foremen should possess certificates of competency, things will go on pretty much as at present.

J. T.

THE MIDLAND RAILWAY STATION HOTEL, ST. PANCRAS.

Sir,—What on earth induced the architect, engineer, or whoever had the matter in hand, to erect such an eyesore as the heavy looking walling and parapet in front of the Hotel at the Midland Railway Station, in St. Pancras, with a steep roadway up to the offices? Surely no idea of any art in the brain of those concerned for our not over-powerful cab horses, especially after having performed a hastened journey with a cab containing six human beings and luggage for five. Perhaps the directors have provided a stationary engine to pull up horses, cabs, and all, in case there should be a stop-kay or less? By this parapet, or whatever name it may have a claim to, the Hotel is entirely hidden from the street; and all travellers who may chance to take up their temporary abode will be debared the view of the road traffic, but will have the benefit of the noise and the sight of the upper windows and chimney-pots of the unbecomely houses in front. Why not have made the ground floor of the Hotel level

with the roadway, with a neat terrace in front enclosed with iron railings and other trimmings, such as a grass plot, flowers, and fountain, with stairs to platform, and lifts for luggage? As it is now, the expensively bright red brick Hotel is entirely lost. S.

THE CROSSINGS.

ALLOW me to ask whether it is not possible that the vestries might be induced to give strict injunctions to their watering-cart attendants not to water the recognised crossings. It would prevent many a tumble and preserve many a person's temper, not mentioning the boots. Should there be dust on the crossing, it would soon fly to and be absorbed by the wet sides. S.

"16 A PRIME (?) NUMBER."

Sir,—Your correspondent "E. G." (June 19th) makes a mistake when he calls 16 a prime number. It is a composite number; and herein lies its value as a numerical radix. If he consults Kavanagh's Arithmetic (Longman & Co.), he will there see its clearly defined what a prime number is, and how to find such numbers.

In answer to his question respecting the decimal system of weights and measures, "why it has made the progress it has," I would say, 1st. That scientific men having long and abstruse calculations to make, found in decimal fractions an immense relief from the labour and tediousness of common fractions; and many of them, forgetting that the number 10 was a bad numerical radix, unwisely, therefore, thought that what was good for them in their calculations would be good for commercial and business men; not considering that, for the rough and ready purposes of practical occupations and domestic dealings, we want to halve and quarter our weighings and measurings again and again, which we cannot do with the decimal system. Hence they were continually urging its adoption in their hooks. 2nd. Some modern commercial men, thinking only of their own advantage, and how they may increase their dealings with foreign nations that use the metric system, have strongly urged its adoption; and for this purpose have tried to persuade the people of this country that it would be the best for national use. 3rd. A few enthusiastic men, in love with the decimal system, have kept hammering away, in Parliament and elsewhere, while those who would have to use it have been careless or asleep, until they have partially fastened it on the nation, and hope yet to fasten it still more on. Also they have been aided by some who can see no beauty in anything but uniformity, and who would have everything done mechanically and unvaryingly; not caring to see that nature presents the utmost variety in all things, and that there is an immense utility in that variety.

But division by 16 and its multiples and sub-multiples is not so scarce amongst us as would be supposed by reading the extract from Mr. Ferguson's work. Although not so systematic in our adoption of it as the Hindoos, yet we have a good deal of it. Our yard measure has a division of 16; our inch also. We have eight half-crowns to the sovereign, 16 oz. to the pound, and at one time there were 32 grains to the pennyweight. And I would just remark that the division of the pound into 16 oz., and of the inch into 4ths, 8ths, and 16ths, is the best for common and practical use; and, if ever abolished, it will be a source of great inconvenience to the public.

Sir, I agree with Mr. Ferguson when he says that "it was a mathematical misfortune when counting by fingers and thumbs,—that is, by tens,—was adopted," but not when he says we ought to have stopped at eight. We ought to have gone on to twelve, which number, I believe, is considered by most mathematicians as being the most practical and yielding the least number of interminable fractions. And, therefore, it is to be considered another mathematical misfortune that scientific men should have suffered themselves to be ousted by the notation of the savage (for counting by fingers and thumbs truly is such) out of a truly scientific notation, which, if adopted, would have been for their advantage and for that of the whole calculating world. But is it too late, as Mr. Ferguson says it is, to remedy this now? I think not. We have in our modes of calculating, the nucleus, or rather perhaps the remains, of counting by twelves. In our cross-multiplication rule we have a duodenary notation worked by a denary notation. Now, if this rule were worked by a duodenary notation, it would be a perfect sample of the duodenary system of calcula-

lating by twelves. De Morgan, in his Arithmetic, recommends the student to thus practise the working of cross-multiplication. Our year is divided into twelve months, our foot-rule into twelve inches. Then we have the dozen and submultiples of it much in use; also the gross, or square of twelve, and the great gross, or cube of twelve. These and other facts lead to the idea that counting by twelves was more prevalent amongst us, or those with whom we traded, and from whom we may have received it, than at present. And why should it not be further extended? As regards the division of our foot-rule into twelve parts, to have it reduced to ten would be productive of the greatest inconvenience. Consider the millions of small measurements that are made by it in the course of one day, and which could not be so advantageously made if it only contained ten parts. If working men would take a slip of wood, 1 ft. long, and divide it into ten parts, and one of these parts into ten, and practise with it so as to compare it with the present foot-rule, they would thus ascertain which would be the most useful of the two divisions, ten or twelve. The Roman foot was divided into twelve parts, and also into sixteen. Thus, 4 digits made a palm, 4 palms made a foot,—16 parts. Thus they had the advantage of both divisions. If our foot-rule were thus divided, would it not be advantageous for many purposes?

But our heterogeneous system, as some term it, is not so unworkable as many would make it to be. A good calculator in cross-multiplication can work the rule with advantage against another working by decimals, and in some cases with a less number of figures. Men of business have in their respective callings ready modes of calculating, which are oftentimes not found in school books, and by which they facilitate their business reckonings in a manner which many who are zealous for the decimal system are not aware of. Our present divisions of weights and measures can be ascertained in many instances to be founded on certain wants and requirements of our forefathers known to them at the time, and by which divisions they were able, with little knowledge of arithmetic, to make their calculations. It is amusing to trace those things, but they would occupy needless time and space to dwell upon them.

In answering the question of "E. G." which should in all his connexions be considered a national one, for it is not a trifling matter to change our modes of calculation, and make it necessary to alter or renew every weight and measure we possess, I have endeavoured to avoid intruding too much on your space. There is, however, much to be said respecting the best numerical radix. As regards the French metric system, I apprehend it would not be for our benefit to adopt it, notwithstanding all that has been said in its favour. But it is well to stimulate inquiry, and I shall feel pleased if this letter should contribute towards it.

In conclusion, allow me to add the following figures, which, I think, are correct. They are copied from a memorandum made some time ago, but which I have not now had time to verify again:—

	Ter- minal Fractions.	Inter- minal Fractions.
The Vicenary (20) notation gives.....	7	12
The Sedenary (16) " " " " " " " "	4	11
The Duodenary (12) " " " " " " " "	7	4
The Denary (10) " " " " " " " "	5	4
The Octary (8) " " " " " " " "	3	4

On first reflection it might be supposed that the Sedenary and the Octary notations, from the perfect subdivisions they are capable of, would furnish the most terminable fractions, in proportion to the interminable; but by the above table it is the duodenary that gives the most satisfactory results in this particular.

DUODENARY.

The Wolf Rock Lighthouse, Cornwall.—The last stone of the Wolf Rock light-tower, nine miles from the Land's End, has been laid by Sir Frederick Arrow, the deputy-master of the Trinity House. The deputy-master thanked the resident-engineer, assistants, and workmen, for the zeal they had displayed in this difficult and dangerous work, and gave each a gratuity as a memento of the interesting event. The resident engineer is Mr. W. Douglas. The men are now going on with the work of getting up the lanterns and fittings for the tower. It is expected that by September the light will be exhibited.

SCHOOL-BUILDING NEWS.

Chertsey.—The foundation stone of new schools has been laid at Ottershaw, about two miles from Chertsey. The amount proposed to be expended in the building is estimated at 1,300l. or 1,400l., the land being given by Sir Edward Colebrooke. Mr. Burns, of London, is the architect, the design being made by that gentleman free of cost; and Messrs. Knight & Son, of Chertsey, are the builders employed.

Sutton-on-Plym (Plymouth).—The foundation stone of new schools for girls and infants has been laid here. The parish of Sutton-on-Plym includes the south-eastern portion of the town of Plymouth, the manufacturing district of Cosside, and the village of Cattedown. The total costs of the schools will be a little over 1,000l. The building, which will be in the shape of the letter L, will comprise two stories, and accommodation will be provided for about 350 children. The plans have been prepared by Mr. O. C. Arthur, architect; and Messrs. Hodges & Martin are the builders.

CHURCH-BUILDING NEWS.

New Ferry (near Birkenhead).—We are asked to state that the free church of St. Mark, which has been enlarged under the direction of Mr. E. Haycock, jun., architect, was consecrated by the Bishop of Chester, and is not a Dissenting church.

Northampton.—On Tuesday, the 20th inst., the Countess Spencer laid the foundation-stone of the new church of St. James's, Dallington, Northampton. The building is being erected upon a site given by the Rev. William Thornton, and is designed to accommodate 500 persons, with facilities for extension, as the necessities of the district may require. The plan consists of nave, chancel, south aisle, south chapel, vestry, and turret. Mr. R. Wheeler, of Tunbridge Wells, is the architect; and Mr. Kightley, of Northampton, has contracted to build the church, at a cost of 2,355l.

Newent.—The restoration of Oxenhal Church is being completed. The chancel ceiling, just finished, consists of red deal, divided into panels. A battlemented cornice runs along both sides. The corbels, of Caen stone, are all carved, as are also the enrichments round the east window, which was erected to the memory of the late Mrs. Onslow. The carving was by Mr. Boulton, and the woodwork by Messrs. Spring & Son, builders. The architect under whose direction the work was executed is Mr. John Middleton, of Cheltenham.

Letwell.—The church at Letwell, a small village about six miles from Worksop, has been reopened. The old church was destroyed by fire on December 8, 1857, everything being destroyed except the tower and the outer walls. The new church has been built on exactly the same site, the same walls and tower being used, the interior being lined with Roche Abbey and Mansfield stone. The seats are of oak, in open sittings, all free, and facing north and south. The space under the tower has also been seated, and a gallery which formerly stood there has not been replaced. The roof, which is high pitched, is of stained deal, excepting the part over the chancel apse, which is to be painted light blue. The windows at present are of plain glass, but the three in the chancel apse and the west window under the tower are to be memorial windows in stained glass to different persons.

Tamworth.—The church restoration and other tenders were recently opened, when the following obtained the contracts:—Messrs. Wood, of Derby, for the church restoration; Mr. G. M. Holdrich, of London, for the organ; and Messrs. Edwards & Son, of London, for the heating apparatus.

Powerstock.—The foundation-stone of West Milton church has been laid. The old church, which stands at the eastern end of the parish, served as a chapel of ease to the mother church at Powerstock, and was a small building, consisting of nave, chancel, and western tower. The style was of the late Perpendicular period, and there are a few specimens of Norman work still remaining in the ruined structure. In the south side of the chancel is an old decorated window, which it seems a pity to destroy.

Heigham.—The design selected by the building committee of St. Philip's, Heigham, new church was prepared by Mr. E. Power, of London. It is in the Early French style applied to modern requirements, all unnecessary ornament being avoided. It consists of a nave, apsidal chancel, and side aisles, with a tower and spire at the

north-west angle. The western front will form a feature in the Heigham-road. The accommodation will be for nearly 800 persons. The total cost (inclusive of tower and spire), with architect's commission, gas-fittings, and the required repair fund, will be about 5,200l.

Bedlington.—The church here, which has lately been undergoing extensive alterations, has been re-opened. On making an examination of the tower the stones were found to be much decayed. These were removed and new substituted. The plain parapets on the top have been removed and battlements substituted. The old Perpendicular window in the tower, which was much decayed, has been removed, and a new one, filled with stained glass, substituted, the subjects being, "The Adoration of the Magi," and "The Queen of Sheba's Visit to King Solomon." This window is the gift of the rector, and is the work of Messrs. Clayton & Bell. The tower arch, which was partly blocked up, has been opened. The chancel has been remodelled, an oak screen being placed across the chancel arch, and the old stalls have been replaced by new ones. An organ-chamber has been built, and a new organ placed in it, with an illuminated screen in front. The old reredos and diapers have been taken down, and a new one, of mosaic, erected, some of the subjects being "The Flight into Egypt," "The Adoration of the Magi," and "The Holy Apostles." This is the work of Messrs. Harland & Fisher. A sedilia has also been erected. On removing the ashlars, part of the old piscina was found embedded in the wall. The old Perpendicular oak screen, which divides the chancel from the Carew Chapel, has been cleaned.

Egglestone.—The new church at Egglestone has been consecrated by the Bishop of Durham, and opened for Divine worship. The edifice, which is dedicated to the Holy Trinity, is cruciform, the nave being 52 ft. 6 in. long, and 21 ft. 6 in. wide. The north and south transepts are 13 ft. wide, and 9 ft. and 11 ft. deep respectively. The chancel is 26 ft. 6 in. long, and 18 ft. wide. On the south side of the nave is a large porch, engaged with the nave and the west wall, and south walls is a bell-turret, rising to a height of nearly 60 ft. The roof of this turret is slated, and decorated with wrought-iron finial-cross and gilded vane. On the north side of the church is the vestry, underneath which is a heating-chamber. The style is Early English, carried into Early Geometrical at the east end, which has a traceried window of three lights. The other windows are lancets, excepting the large circular west window, and a sex-foiled one in the gable of the south transept. The west-end circular window has seven smaller moulded circles within the outer inclosing arch, and forms a prominent feature both internally and externally. Entering the church we observe the font against the west wall, and the altar against the east. The benches are all open, of stained deal, the panels relieved by difference in depth of colour only. The transepts are separated from the nave by two stone arches, resting on pillars. The north transept is intended to be used as an organ-chamber. The chancel-arch, separating the nave from the chancel, has stone jambs, and the inner arch is carried by stone corbels with moulded caps. The pulpit is placed against the north jamb of the chancel-arch. The chancel seats are placed longitudinally, those on the south side being shortened to admit of the prayer-desk, which, with the lectern, is at the extreme west end of the chancel. The roofs are boarded inside. The height from the floor to the apex of the roof is 25 ft. 6 in. Externally the roofs are covered with Westmorland green slate, and the apses with ornamental red tiles. The stained-glass windows are private gifts to the church. The whole of the work was contracted for by Mr. Benjamin Hepworth, of Barnard Castle. The architect was Mr. F. R. N. Haswell, of North Shields. Mr. Adamson, of Egglestone, was sub-contractor for the carpenter and joiner's work. The smith's work has been done by Mr. Rutter, of Barnard Castle. Accommodation is provided within the walls for about 220 adults, and the outlay on the building alone, exclusive of professional charges, is between 1,300l. and 1,400l.

Ode Pitcauld.—The church here has been restored and reopened. The work of restoration includes the removal of all the floors and of the old pews, the substitution in place of the latter of new moveable deal seats, the cleaning and repointing of the walls (after the removal of the plastering which formerly disfigured them), the paving of the church throughout with Godwin's encaustic and inlaid tiles, the underpinning of

the walls, and the fixing of drains round the outside of the fabric; also new altar-rails and new stone pulpit, together with chancel stalls, having traceried fronts and carved ends. New windows have been inserted in the place of others destroyed; a new oak door has been placed at the north porch entrance, and new and ornamental scroll hinges have been fixed to all the doorways; the whole of the seats, stalls, &c., have been stained and varnished, and the oak doors oiled. The cost of carrying out the work is about 440l., exclusive of hassocks, mats, &c. Much, however, remains yet to be done if funds could be provided. The architect employed was Mr. Chick, of Hereford; and the contractors were Messrs. Lewis & Day, also of Hereford.

Liverpool.—The new church of St. Margaret, Prince's Park-road, has been consecrated. It is in the Early Decorated style, of grey brick externally, with red brick arches surmounting the various windows, and West Derby stone dressings. The roof is of pointed green slates, supported by a red ridge casing. It has also an octagonal turret, which stands over the junction of the nave and chancel, and contains the bell. In a niche in the centre of the west end is a carved figure of St. Margaret. In the interior, the church consists of a nave with five arches on either side opening into the aisles. These arches are supported on Devon marble columns with moulded caps and bases of West Derby stone. The inside walls are finished in plaster intended for decoration. There are small north and south transepts breaking the line of the interior, and separated from the aisles, each by two arches. The roof of the nave is polygonal in form, and is divided into panels by moulded ribs for decoration. The chancel roof is already decorated. The principal entrance is by two doors in the west end. There are large windows both in the east and west ends. The floor of the nave and aisles is laid with Staffordshire tiles, two colours, in patterns. The chancel is laid with encaustic tiles in variegated patterns, and it rises 4 ft. between the nave level and the altar. The chancel screen, which rises to the height of 4 ft. 6 in. above the nave floor, is composed of Isle of Man limestone, dark mottled alabaster, and Derbyshire fossil stone, and the chancel is separated from the nave by two wrought-iron gates, picked out in various colours. The chancel stalls are composed of English oak, and will accommodate a choir of thirty-eight. The seats in the body of the church are made of pitch pine, and are open, furnished, and free. The accommodation provided, including the chancel, will be for 1,000 persons. The pulpit is carved out of Caen stone. The font is of polished marble. The reredos is composed of alabaster, with Salvati's Venetian mosaics in the side panels and in the background of the subject, which is the Crucifixion, carved out of white alabaster by Mr. Earp, of London. On the north side of the chancel is the organ-chamber, which contains an instrument by Mr. Willis. Adjoining the church is the parsonage, with which it is connected by a covered way. The contractor for the whole of the works was Mr. Horsman, of Wolverhampton, with Mr. James Peers as clerk of the works. Mr. George E. Street furnished the designs for the whole of the works.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Sunbury.—A new church has been opened at Sunbury-on-Thames. The edifice is built of Kentish rag-stone, with free-stone dressings, and is in the style prevalent in England in the thirteenth century. The plan comprises an apsidal chancel, a nave of four bays, 60 ft. in length and 24 ft. wide, and an aisle with circular columns and octagonal capitals, supporting pointed arches. There is a window of four compartments with geometrical tracery over the principal entrance. The lateral windows of the nave are coupled lancet openings with quatrefoils in the arched heads. Those of the aisle are simple lancets, except the end window, which is of two lights with trefoil over. A chancel arch with sculptured capitals supports the gabled bell-turret. The roofs of the nave and aisle are of open timber work; the roof of the chancel is arched and boarded, stained, and decorated. The coloured glass in the lancet windows of the apse contributes to the adornment of the church. The temporary high altar has been translated from the old chapel, which chapel is henceforth to be used for the poor school. The church was built by Messrs. Whittle & Castle, of

Sunbury, from the designs and under the superintendence of Mr. C. A. Buckler, of London, architect. The sculpture was done by Mr. Earp, of Lambeth, and the windows of the apse were by Mr. Barnett, of Leith.

Manchester.—The corner stone of the new church of the Holy Name, at the corner of Ackers-street, Oxford-road, has been laid. The church is named after one of the oldest churches in Rome, and is the first church which the Society of Jesuits have set up in Manchester. It will be about 180 ft. in length from the west to the east end; nearly 80 ft. wide in the body of the church (including the aisles); and will be 120 ft. across the transepts. It is calculated to seat 1,500 or 2,000 persons comfortably, and will afford, on the occasion of a press, accommodation for upwards of 4,000 persons. The height of the roof in the nave at the west end is 100 ft. There will be a tower structure facing Oxford-road, opening into the church, which will be surmounted by an ornamental spire about 240 ft. high. The church will contain a great sanctuary, placed at the east end of the church, in which will be placed the principal altar, and on each side of it two chapels will be erected, each containing an altar, both opening into the transepts. On the side of the church, facing Ackers-street, there will be three chantry chapels, containing altars. In all there will be eight altars in the church. There will be a south approach to the building, and the great western approach will be from Oxford-road. The elevation of the church floor will be 5 ft. above the level of the road, and the church will be approached by a double flight of steps. At the west end of the tower the great organ gallery will be placed, covering an area of 42 ft. by 27 ft. At the south-west corner of the building the baptistery will be erected,—an octagonal building with a pyramidal roof. At the opposite corner there will be a large turret staircase leading up to the gallery. On the north side of the building there will be eight confessional rooms, which are approached by a distinct corridor, having separate access from the church. At the east end of the ground it is intended to build a large collegiate presbytery as soon as the church is sufficiently advanced to require it. The style of architecture of the building is Gothic of the fourteenth century. The exterior will be built of stone, and the interior of terracotta. The estimated cost of the building, exclusive of the erection of the tower, the completion of the altars, sacristy, and presbytery, is about 14,000l. The architects are Messrs. Joseph A. Hansom & Son, of London, and the contractors for the erection of the building are Messrs. Ibberson & Marshall, of Manchester.

Books Received.

A Manual of Machinery and Millwork. By WILLIAM J. MACQUEEN RANKINE, C.E., F.R.S.E., &c. London: Griffin & Co. 1869.

THIS is an entirely new work of Dr. Rankine's, the Regius Professor of Civil Engineering and Mechanics in Glasgow University.

The book is divided into three parts. The first treats of the Geometry of Machinery; the second, of the Dynamics of Machinery; and the third, of the Materials, Strength, and Construction of Machinery. Under the head of the Geometry of Machinery, machines are considered with reference to the comparative motions only of their moving parts; and rules are given for designing and arranging those parts so as to produce any given comparative motion.

Several problems in mechanism are solved by methods which appear not to have hitherto been published, and which possess advantages in point of ease or of accuracy. Such are those regarding the drawing of rolling curves, and of some kinds of cams; the construction of the figures of teeth of skew-bevel wheels, and of threads of gearing-screws, by the help of the normal section; and some improvements in the details of processes for designing intermittent gear, link motions, and parallel motions.

Under the head of the Dynamics of Machinery are considered the forces exerted and the work done in machines; the means of measuring those quantities by indicators and dynamometers; of determining and balancing the reactions of moving masses in machines, and of regulating work and speed; and the efficiency, or proportion in which the useful work is less than the total work, in the different sorts of moving pieces, and in their various combinations.

Under the head of the Materials, Strength, and Construction of Machinery are considered, first, the properties of various materials, as affecting their treatment and use in the construction of machines; secondly, the general principles of the strength of materials; thirdly, the special application of those principles to questions relating to the strength and the construction of various parts of machines; and fourthly, the principles of the action of cutting-tools.

The work is illustrated with numerous diagrams. We need scarcely say that any work of Professor Rankine's on a subject such as this cannot but be of great practical value. We have here simply to draw the attention of readers interested in machinery and millwork to its publication.

Recent Improvements in the Steam Engine: A Supplement to "The Catechism of the Steam Engine." By JOHN BOURNE, C.E. New Edition. Longmans & Co. 1869.

Examples of Modern Steam, Air, and Gas Engines, minutely and practically described. By JOHN BOURNE, C.E. Part XIV., July 1869. Longmans & Co.

ALTHOUGH the former of these two works was originally issued as a supplement to the Catechism of the Steam Engine, it now makes its appearance as a separate treatise. In this edition many examples of engines given before have been superseded by newer examples, among which are some of the more remarkable engines which figured in the Paris Exhibition of 1867.

"Steam Superseded" has for many years been a standing title of the press, announcing all sorts of new inventions; but the time has not yet quite come for that. Mr. Bourne, however, is of opinion that the steam-engine, which has always, he remarks, been a most imperfect machine, has now nearly fulfilled its destiny, and is on the eve of supersession by other motors, though steam may, he adds, be still used in them to some extent, but not exclusively, and only in combination with other fluids. Under this belief it is that the author has undertaken the production of the second of the works here under notice. As to the precise sort of engine which shall have the distinguished office of taking the place of the steam-engine, Mr. Bourne says:—

"The engine which will supersede the existing steam-engine will, I take it for granted, still derive its power from heat, which heat will be produced by coal, as heretofore. But the coal, instead of being burnt upon grates in the manner now practised, will be carried as dust into a suitable chamber and be converted into carbonic oxide gas, which gas may be burnt [into carbonic acid gas] as it issues in jets from the sides of hollow furnace-bars of the kind prescribed in my patent of 1835, the flames passing through an artificial fire of brick or pumice-stone, by the aid of which the gas will be effectively burnt, and the gas consumed may be used for generating steam in the same way as coal; and its advantage over coal is, that the combustion may be made much more perfect than is possible in the case of coal, and that the necessity of stoking the fires will be obviated. But the gas may also be used in other ways to generate power. It has often been before proposed to transform the coal into carbonic oxide, but never before with the antecedent condition of first reducing it to fine dust. When this preliminary is neglected, the gasifier is necessarily large and uncertain in its action from the eating of the coal. Its temperature is also low, and the incumbrance matter which would otherwise pass away in the gas in the form of dust, will be melted into slag, which may be run out through an orifice like an iron furnace, so that only pure carbonic oxide gas mixed with nitrogen and a little hydrogen will present itself for combustion. This, it is true, constitutes but a small part of the advance that is necessary for the supersession of the steam engine. But the improvement here indicated must be the first step, and there is no difficulty in taking it at once."

The Principles of Perspective Illustrated in a Series of Examples. By HENRY D. HUMPHRIS. Descriptive Treatise and Atlas of Examples. London: Chapman & Hall, 1869.

A Popular Outline of Perspective or Graphic Projection: Parallel, Diagonal, Pan-Angular, Graceful. By THOMAS MORRIS, Architect. London: Simpkin, Marshall, & Co. 1869.

MR. HUMPHRIS, who is the son of an architect well known in his locality, has issued what is rather a series of examples to illustrate the principles of perspective than an elaborate essay on the science. They are drawn out of good size, and will be found very useful to art-masters, architectural students, and others. Mr. Humphris rightly points out that it would be useless to read the letter-press and look at the plates, and to imagine that a knowledge of perspective is to be obtained by any such means: while to copy the figures line for line from the examples would be time as badly spent.

The student desiring to master the subject should read slowly and carefully through the description of each problem, so as to understand what is required to be done, with a general idea of the method of doing it, and then, recommencing, endeavour to draw each line as directed, referring to the plate to see if he be successfully accomplished. Having completed the problem thus, construct a different scale,—say half the size, and re-work it: this will be the first step alone, for, although the drawing will be identical with the example given, with the exception of its size, it will, nevertheless, involve a little more thought, and the student cannot yield to the temptation of taking his measurement from the plates, which should always be carefully avoided.

The whole success of the undertaking depends upon mastering the principles, and not copying the examples, those principles being few and identical in every case, although their application may be manifold.

The work is dedicated, with permission, to Mr. Gambier Parry; and can be recommended. The object that Mr. Thos. Morris has in view is obviously to give the general reader a general notion of the science, and to that extent his little volume carries out his intention.

Miscellanea.

Lighting Mines with Gas.—In improving the method of lighting mines, Messrs. M. Wilku and J. Clark, of Paddington, propose to use lamps, burning gas, oil, or other illuminating materials, with air propelled from a pump source at the bottom or top of the shaft, through air-tight tubes, to the interior of the said lamps. An overplus of air they cause to blow gently out by escape-valves or covers near the top of the lamps, thereby preventing the entrance of foul air, or air which has become mixed with fire-damp. By preference, they glaze the lamps about half their height with glass: the upper half they prefer to make of sheet metal to withstand the heat. When gas-lamps are used, the gas is produced, and conveyed in pipes in the usual way. The air is propelled through the tubes referred to by any well-understood method; such as by fans, air-pumps, steam-jet, &c. In lighting the lamps, they propose to use safety-matches, such as those manufactured by Bryant & May. After the match is inserted into the lamp by an escape-valve, it is struck, and the lamp is lighted, while the match is extinguished in a tube into which it is thrust.

The Mosaics in the Central Hall of Westminster Palace.—On a motion in the Commons for a Committee to inquire as to the contract or agreement made by the Office of Works with the Venice and Marano Glass and Mosaic Company (Limited), for the decoration of the central hall, it came out that Mr. Layard had aided Dr. Salviati, for the sake of art, previously to his connexion with the Government, and had taken shares in the Company got up for the sale of his art works, simply to help Dr. Salviati, but that these shares had been sold, and that while a member of the Government he had no pecuniary connexion with Dr. Salviati or his Company. Moreover, that the contract referred to was neither entered into by Mr. Layard nor by the Office of Works, but by the architect; and that the transactions with Dr. Salviati's Company had begun not since Mr. Layard became connected with the office, but previously. Mr. Layard said he had not the slightest objection to the inquiry, and made a suggestion for facilitating it; but the House was adverse to any investigation, and the mover of the resolution expressed his regret if he had given pain to Mr. Layard, and withdrew his motion.

To Clear a Room of Mosquitoes.—As some of our readers may be contemplating travel, they will like to hear what a writer in a South Carolina paper says:—"I have tried the following, and find it to work like charm. Take of gum camphor a piece about one-third the size of an egg, and evaporate it by placing it in a tin vessel, and holding it over a lamp or candle, taking care that it does not ignite. The smoke will soon fill the room, and expel the mosquitoes. One night I was terribly annoyed by them, when I thought of and tried the above, after which I never saw nor heard them that night, and the next morning there was not one to be found in the room, though the window had been left open all that night."

Improvement in Steam Carriages.—An invention was exhibited on Thursday, and an experiment made, before a number of professional men and others, of interest to the public and the railway world. We refer to trial trips of Mr. R. F. Fairlie's steam hogie carriage at the Hatoham Iron Works (Messrs. England's), Old Kent-road. The engine, carriage, and framing, all complete, in working order, but exclusive of passengers, weigh under 13½ tons, and including its full load of 100 passengers, 18½ tons only. The carriage, when finished, will have a broad step on each side, extending its entire length; this step is protected by a hand-rail on the outside, with an arrangement for lifting it on the platform side at the doors to allow the passengers to get in and out. The object of this platform is, as we have always urged, to enable the guard to pass completely round the train at all times. Passengers can also pass along the platform to the guard, so that in this manner there is an easy and perfect mode of communication between passengers and guard. It is intended, however, in the standard steam-carriage, to provide, alternatively, a central passage inside instead of out along the entire length of the carriage, leading direct from end to the guard's compartment. The compartments in the carriages will be quite as separate and distinct as they are at present, or as the most fastidious could desire. Passengers in the higher class compartments can pass to the lower, but the lower cannot get to the higher, while all can pass to the guard when required. These carriages, it is said, will convey their full complement of passengers at 40 miles an hour up gradients of 1 in 100, and will pass round curves of 50 ft. [not 500] radius, at a speed of 20 miles an hour with perfect safety. The carriage passed round a line that had been laid specially for the purpose. There were straight runs on the sides connected at the ends of the course by curves of 50 ft. radius. The bogies—one under the engine and the other under the hinder end of the carriage—took the curves quite smoothly, without grinding upon either the rail or the flanges of the wheels. A large number of gentlemen witnessed the experiments, and, in so far as we can learn, all agreed in pronouncing them perfectly successful.

Well-sinking with an Untoward Result. At Murat, a village situated between the valley of Mont Dore and that of St. James, a civil engineer had caused a rectangular well to be sunk to a depth of 53 metres through a stratum of hard tufa, which covers the primitive formation in that district. At this depth, which is insignificant compared to the shaft of a mine, the heat, nevertheless, became so intense that the workmen had to be relieved at short intervals. At last a loud rumbling noise was heard. The men in a fright jumped into the cage and called to be pulled up; but they had barely got to a height of a dozen metres, when a thick column of hot water, preceded by a violent report, rose up in the air, projecting huge stones upwards. The water in falling scalded the men grievously. The jet diminished, however, in getting out in time. In the course of ten hours the well got quite full, and from that time a rivulet of thermal water has been flowing from the spot into the Dordogne. Upon analysis it has been found to contain upwards of twenty milligrammes (nearly half a grain) of arseniate of potash per litre, a proportion unheard of before. The Minister of Public Works has sent a commission of engineers to the spot for further investigation.

The Clergy House of St. Mary's, Soho.—The foundation of the clergy house, or rectory, in connexion with the new church of St. Mary the Virgin, Crown-street, Soho, has been laid by Mrs. W. E. Gladstone, in the presence of a very numerous and fashionable assembly, principally composed of the friends and supporters of the House of Charity in Greek street. It is proposed to rebuild, on an enlarged plan, the church of St. Mary, with school-rooms for 600 children, and a house for the clergy connected with it. The cost of these buildings will be 10,000*l.*, towards which sum 2,700*l.* have been subscribed, including 1,700*l.* from the Bishop of London's fund. The new church will accommodate 700 persons, all the sittings being free.

Social Science Association.—The annual congress will be held in Bristol (as we stated would probably be the case), commencing on Wednesday, September the 29th.

Caversham Bridge.—This bridge has been opened for traffic. The work has been carried out by Messrs. Shaw, Head, & Co., of Stockton-on-Tees, and the ironwork was designed by Mr. Woodman, Borough Surveyor. There are five spans, the centre being 43 ft. wide, and the other four 62 ft. each. The roadway is 20 ft. wide, and there are two footpaths, each 5 ft. wide. The approaches on either side commence at a distance of 100 ft., and the incline is not greater than that of the old structure. Mr. Neale was the foreman to the contractors, and Mr. Dorrner the clerk of the works on behalf of the Reading Corporation. The bridge is built on sixteen piles, screwed into the ground about 8 ft. These piles are filled with Portland cement concrete. The piles, being in pairs, are connected together with wrought-iron bearing girders, which form the pier. The whole span of the bridge, in clear from Berkshire to Oxford abutment, is 290.9 ft. The girders are of lattice form, with cast-iron ornaments, giving it a Gothic appearance; and cast-iron ornaments are riveted to the gravel plates. Cross girders are riveted to the main girders, on top of which comes the flooring, which consists of Barlow rails and plates riveted together. The number of rivets in this flooring exceeds 12,000.

Drinking Fountains Association.—The tenth annual meeting of the Metropolitan Drinking Fountains and Cattle Troughs Association was held on Saturday at Willis's Rooms—the president, the Right Hon. Earl Grosvenor, M.P., occupying the chair. The report stated that the intense heat of last summer brought the value and importance of the society's operations very prominently into notice. Existing fountains and troughs were maintained in the most perfect state of efficiency throughout the year, and nine new fountains and 90 new troughs were erected during that time. Her Majesty had forwarded a donation of 100l. The ordinary donations for the year amounted to 1,687l., donations for special fountains and troughs 830l., and annual subscriptions 771l. There had been a steady increase of about 100l. a year to the annual subscription list, but the additional expenditures involved in the new work was far greater than that sum. In some cases the committee were paying 30l. a year for water to supply one trough. More than 1,200 horses alone (besides oxen, sheep, and dogs) frequently drank at one trough in a single day. The committee have now 123 fountains and 125 troughs under their care, and the amount required for these is 24,200l. a year. The report was adopted, and other resolutions agreed to.

Proposed Trade School for the City of Worcester.—A number of gentlemen interested in the promotion of education have had a meeting in the Guildhall, Worcester, to take into consideration the subject of a Trade School after the method of that so long and successfully established at Bristol, and to hear the statement of Mr. Buckmaster, of the Government Educational Department, respecting the whole question. The Rev. Canon Wood was in the chair. At the close of Mr. Buckmaster's address, several questions were asked, and elicited replies to the effect that the Government would help a committee to adapt school premises, or even under peculiar circumstances would build. It would also help to procure apparatus. It was probable that Worcester might receive 150l. from Government on the results of examination in a trade school. Mr. Spencer had been remarkably successful with the young men who attended his evening classes. It was not possible that such a school as was under consideration could interfere with any existing institutions, as the work to be done was quite different from that which is included in the scheme of either national, middle, or upper schools. A provisional committee was formed to give effect to the suggestions thrown out.

Proposed Restoration of the Parish Church, Watford.—A public meeting has been held in the Corn Exchange, Watford, in aid of the restoration of the exterior of the parish church. The attendance was not large, the chair was taken by the Bishop of Rochester, and there were present on the platform, the Earl of Essex, Viscount Malden, the Hon. W. Cowper, M.P., and various other influential persons. A general committee was appointed, with power to appoint a working committee. The estimated cost of the restoration of the exterior to make it worthy of the interior is 5,000l., of which 1,800l. remain to be raised. Mr. Christopher, of Watford, is the architect.

The New Convalescent Hospital at Eastbourne.—This new building has been opened by the Bishop of Oxford in the presence of a large and influential assemblage. The hospital is intended, when completely finished, to contain accommodation for about 300 inmates. It is situated on the east side of the Downs which terminates seaward by the well-known Beachy Head. In plan, the hospital consists mainly of a parallelogram, 340 ft. in length; this is divided by a party wall into men and women's sides or wings, which are for the most part alike, and consist each of a central pavilion containing stone staircases, which give access to all the wards, &c. On the ground floor are two convalescent day wards, two smaller rooms for patients requiring separate treatment, and a large ward for incurable cases. Every large ward has attached to it a nurses' and sisters' room overlooking it, and lavatories and baths and other ample conveniences in small projecting wings, ensuring thereby thorough ventilation. The south wing is the sisters' house. When the building is all completed a chapel and kitchen courts will be formed on the north side, but at present the kitchen court only is completed, funds still being wanted for the erection of the chapel and the dining-hall. Attention has been paid to the ventilation, drainage, and warming (with hot water). The hospital is built of red brick, with Bath stone doors and windows of Geometrical Gothic, and is covered with plain tiling, the blue or grey Forest of Dean stone being used for the main piers and steps of staircases, window shafts, &c. The cost of the building now constructed and the enclosing walls, gardener's lodge, and chaplain's apartments, will, it is estimated, amount to about 35,000l., of this about 26,000l. (exclusive of the amount contributed at the opening) have been already subscribed.

Accidents.—The fronts of several small houses, situated in Westbourne Park passage, Paddington, have suddenly fallen down, and a man who was passing at the time was buried beneath the debris. On being extricated he was taken to the hospital.—At Conpar Angus, on the occasion of the annual Highland games and athletic sports, the grand stand, which was fully occupied, gave way, carrying everybody with it. One person died about a quarter of an hour after he had been taken out of the ruins. Several others who fell received severe injuries.—One of the houses on the north side of Duke-street, Brighton, has fallen to the ground, burying with it a number of workmen. The building fell without a moment's warning. The men were employed upon a scaffolding and elsewhere at the time of the accident. A number of workmen engaged on buildings being erected in the same street, immediately rushed to the spot, and rendered valuable assistance in extricating the unfortunate men from the debris. Three of the men were found to be near the top, and were speedily recovered, all more or less injured, as were two others: one of these, a bricklayer, was entirely buried beneath a large mass of rubbish and timber. It was found, however, that, though he had sustained grievous injury, no bones had actually been broken. The height of the building when it fell was 40 ft., and the walls were 14 in. thick at the basement. The building was being erected by Mr. Joseph Saltor, for the business and private residence of a plumber and glazier. At the time of the accident there were sixteen hands employed on the building. It was extremely fortunate that the walls fell inwards. Workmen at once set to work to demolish the back part of the building.

The Irrigation Works at Harrogate.—At a recent meeting of the local improvement commissioners, the surveyor was asked whether the irrigation works were in such a state that the sewage could be thrown over the whole of the ground. The surveyor replied in the affirmative, and said it had been thrown over the whole of the land which they at present proposed to irrigate, ever since the 31st of May. It was working satisfactorily, and was effective in purifying the water, as would be seen by the bottles which he produced. Mr. Cotland said he had examined this water; and (having described it) expressed the opinion that the water, after it had passed the works, was purer and freer from organic matter than it was in the watercourse above where the sewer entered it.

Chesterfield House, Mayfair.—We understand that Mr. C. Maguire has purchased this property for 180,000l.

Physical Commotions.—As the time of year recurs when the dreadful commotions of last year took place, one feels anxious lest there should be a recurrence of them, perhaps nearer home. In this it is to be hoped we shall be agreeably disappointed; but there are not wanting indications of something being still wrong below the surface. There have been several slight shocks of earthquake at Comrie, in Scotland, where, however, earthquakes appear to be quite a normal phenomenon, especially in the month of July. But on the Continent there have been unpleasant indications. "A few years ago," says the *Morning Post* of a few days back, "certain phenomena which occurred this morning at Paris would have created great excitement amongst the ignorant. A leaden mist covered the city—the sort of atmosphere which those who have lived in lands where earthquakes occur remember as preceding a convulsion. Then the water of the public fountains and ordinary supplies was of a rose tint." In Italy, too, something similar is occurring. "For several days," says the *Corriere delle Marche*, "a singular phenomenon has been observed in Ancona. The sky has been covered by a mist so thick that, on the 10th, the sun appeared enlarged as an object deep immersed in water, and like an immense red ball." The same phenomenon was observed in Naples and the neighbourhood, from the 19th to the 17th inst. During this interval the Bay and the whole coast were enveloped in something like a London fog. The upper air was clear and cloudless. Not a drop of rain had fallen, not a clap of thunder been heard; but the heat was fearful, and the sun appeared like a ball of red-hot iron, always of a deeper colour in the afternoon. On the return of the troops from their exercises at Bagnoli, many soldiers fell in the streets, and some were sent off to the hospital, where one at least has since died. At an earlier period of the year we had a similar ominous fog in London, it may be recollected. The fog hung over the City, but the streets were clear. Mr. Claisher says that a recent London fog was of a density that was remarkable, as experienced while experimenting in the "captive balloon."

The Condition and Prospects of the Suez Canal.—At a special meeting of members of the Liverpool Chamber of Commerce, a paper was read by Mr. Edward Rae, on the actual condition of the Suez Canal, and on the probability of its being opened for general traffic at the time announced by the company. There was a good attendance. Mr. Rae was of opinion that the canal will be opened by the time appointed; and if not, in a very short time thereafter. He gave an interesting account of the canal. The dredges on it, he said, are the most enormous ever constructed—they cost some 20,000l. each—and one actually excavated over 110,000 cubic yards of sand in one month. There was no question about the financial position of the company. He believed the future of Ismailia would be a great one. It was proposed to create there a sort of universal market and exchange, where goods would be brought from all parts of the world (after the fashion of the great Russian fair of Novgorod, though on a far grander scale). He hoped the Prince of Wales would take a decoration with him for Mons. de Lesseps. Only vessels under 50 tons would be allowed to sail through the canal, larger ones being either towed or propelled. There were no locks. The whole of Mr. Rae's paper was intended to show that there was no reason why the canal should not be opened at the date announced. When opened, the canal would have a depth of 26 ft., as asserted. When last he looked, a month ago, the company's shares were selling in France at a premium of 15 per cent. Sufficient funds had now been supplied.

The Bavarian Art Exhibition.—The building is the "Glass Palace" in the Sophien Strasse and Botanical Garden, which was erected for the International Industrial Exhibition of 1854, and in which a similar exhibition to the present was held in 1858. About two-thirds of the building are devoted to the International Art Exhibition, the other third being given up for an Industrial Exhibition of Munich Manufactures. England only figures for 20 pictures out of 2,000. Austria is the largest foreign contributor, being down for 300. Italy sends 230, Paris 280, Berlin 220, Belgium and Dusseldorf 100 each, and so on in nineties and seventies, &c., down to ten for America, and the same for Russia and Sweden taken together, Munich bringing up the rear with 500.

The Sheffield Architectural Society.—On Thursday, the 22nd, there was an excursion of the members of this society to Hatfield and Fishlake. A large party left Sheffield by the noon train to Doncaster, and after visiting St. George's Church and other objects of interest, they proceeded in carriages to Hatfield, where they stopped to examine the fine old church. The president (the Rev. J. Stacey) read a paper describing the church, and giving an historical account of Hatfield Chase. The present church, dedicated to St. Lawrence, was mostly erected in the fifteenth century, though portions of the twelfth and thirteenth century work still remain to mark the existence of an earlier building. It has a large nave, with north and south aisles, a fine tower, a chancel, with side chapel, and a vestry on the north side, under which there is a curious crypt. The roof screen and the peculiar stone arches supporting the roof of the north aisle were specially noticed. Proceeding on to Fishlake, the party were met by the vicar of that place, and conducted over the church (dedicated to St. Cuthbert), which is similar in character to that at Hatfield, but in better condition, having been recently restored. The old Norman doorway in the south porch was an object of interest.

Inauguration of the New Western Dock at Hull.—This new dock has been opened by the Prince and Princess of Wales. It is 3,300 ft. long, is of a somewhat singular shape, being 430 ft. broad at its widest part, and only 130 ft. wide at its narrowest part. Its area is 23a. Or. 1p., so that it is one of the largest docks in the empire. There is a large amount of quay space all round the dock, and the average width of the quay is 100 ft. to 150 ft. On the north side, not far from the entrance to the dock, Custom-house offices will be built, and it is also proposed to erect in succession several warehouses and sheds, the first of which is being carried out under the superintendence of Mr. R. A. Marillier, resident engineer. Considerable difficulty has been experienced in getting a good foundation, and the walls of the dock have been laid in some places on no less than 20 ft. of concrete, and in other places on 8 ft. of concrete. The whole of the hydraulic machinery has been supplied by Sir W. G. Armstrong & Co., of Newcastle-on-Tyne, and it has been fixed under the superintendence of Mr. C. Waure. Mr. W. McCormick has been the general contractor for the dock works. The engineer, who designed the dock and its appendages, was Mr. J. Hawkshaw, who has been assisted and represented by his son, Mr. J. C. Hawkshaw.

Encaustic Tiles.—A novelty in the manufacture of encaustic and other ornamental tiles, has just been brought to our notice by the Architectural Pottery Company. The patterns which have hitherto been inlaid in self colours, have in this process been produced by an admixture of coloured materials very finely prepared, which give the appearance of inlaying of granites and Florentine mosaics, according to the combinations of colours used, and may also be applied either in the ornament or as a ground. This contrast of coloured ornament against the ground has a pleasing effect, and is capable of introduction in elaborate ornamentation. We are at the same time assured that this new process intensifies the hardness of the surface, rendering the pavement still more durable. We were pleased with the specimens we have seen of the patent encaustic tiles produced by the same manufacturers. The ornament is more deeply inlaid than is customary on this description of manufacture, and the outlines are symmetrical.

Purchases for National Gallery.—In reply to questions in the House of Lords, one of the trustees of the National Gallery, Lord Overstone, entered into particulars to show the probability that the picture representing Christ blessing little children, ascribed to Rembrandt, was a genuine specimen of that master, and stated that the trustees shared the responsibility of the purchase as well as the director. "The Warrior adorning the Infant Jesus," had been said to have cost 3,000l., and not to be entered in the catalogue; but it only cost 520l., and was entered in the catalogue; it never had been designated a veritable Giorgione, as was said, but a specimen of the school of Bellini. The "Ecce Homo" never had been ascribed to Correggio, as alleged, but to Ludovico Carracci; and it was not sold, as also said, but was at present in the private room attached to the gallery.

The Horse's Head in Acoustics.—A writer, in *Notes and Queries*, says,—“When an old ‘meeting-house,’ in Bristo-street, was taken down, I think about 1805, to make room for the church now occupied by Dr. Pedit's congregation, the old sounding-board above the pulpit was found filled with horses' heads—I should say five or six at least. I was a mere child at the time, and for long after the heads presented themselves to my dreams. The matter had long passed from my memory, till now vividly recalled by the recent articles in your columns.” Were they intended to take the place of the vases of the ancients?

Testimonial to a Foreman.—The other day, at Cholesey, the under-foremen and workmen in the employ of Messrs. Mansfield, Price, & Co., the contractors for the Berks County Lunatic Asylum, presented Mr. S. Rolfe, the general foreman of the works, with a chased silver tankard, having an appropriate inscription, a double set of silver mathematical drawing instruments in a rosewood case, and a large box of colours, as marks of their respect for him as foreman of the works.

Immersed Socket for Upright Tubular Boilers.—An improved socket for tubular boilers has been registered provisionally. The socket is immersed so as to be protected from the direct action of the fire, and the joint may be formed with india-rubber with flucolay or ashes above it; or it may still be made with yarn and iron cement, so that the cement would be at the strongest part of the socket instead of at the weakest, as in the present socket. Both socket and pipe expand and contract together, from both being in contact with the water.

The Manchester Albert Memorial.—An incident of the royal procession in Manchester last week has escaped notice. At the memorial in Albert-square, Mr. T. Worthington, the architect of the memorial, was presented by General Knollys to the Prince of Wales, who expressed his admiration of the work. Mr. W. H. Wood handed to the Earl of Sefton, from Mr. Worthington, for presentation to the Princess of Wales, a photograph of the memorial, which her royal highness very graciously received.

Cockermouth Board of Health Surveyorship.—At the proceedings for the appointment of a surveyor, there were for Mr. Thomas F. Taylor, Cockermouth, 5 votes; for Mr. Edward Routledge, Thirlak, 4; for Mr. Henry Piele, Cockermouth, 1. As it required a clear majority of members present to secure the election of any one candidate, a vote was withdrawn from Mr. Piele, and given to Mr. Taylor, who was thereupon declared duly elected.

The Albert Memorial, Exeter.—The new wing of the Albert Memorial Museum is now nearly completed, and it is expected that it will be out of the builder's hands in the course of a fortnight or three weeks. The building has been illustrated in our pages. We understand that the museum will be used as the headquarters of the British Association during their visit next month.

The Charges of Architects in Germany. We have received from Mons. Böckman, President of the Society of Architects at Berlin, through Mr. Charles Fowler, papers relating to the scheme for architects' remuneration, which was adopted by the last general congress of German architects, as we mentioned at the time. We may have occasion to return to them.

Porosity of Bricks.—Chemists in *Land and Water*, says that six years ago, being consulted by a maltster as to the best means of rendering the walls of his malt stores impervious to wet, he suggested the application of a mixture of one pound of tallow to one gallon of boiled oil, and that two coatings of this compound, applied hot, and while the sun was shining on the wall, have answered perfectly up to the present time.

New Small-pox and Fever Hospital.—It has been definitely decided, notwithstanding the opposition of the inhabitants, that one of the small-pox and fever hospitals proposed to be erected in the suburbs shall be commenced at once at Stockwell, in the Bedford private road.

New Workhouse for the Strand Union. The foundation-stone of the new workhouse at Tanner's End, Edmonton, was quietly laid on the 23rd inst. The anticipated expenditure is at about 60,000l.: Mr. W. S. Cross is the architect. The tenders for some of the fittings were given in our last.

West Australia.—News have been received at Perth, West Australia, from the settlements on the north-east coast. The pearl-shell gathering season was just at its close, after a fairly successful haul by most of the boats. Attention was being directed to the gathering of tortoise-shell, some samples of which have been sent home to ascertain the market value. Turtle are said to swarm upon the coast. Five beautiful pearls, found at the newly-discovered fisheries in Western Australia, have been brought to this country by the last mail.

TENDERS.

For the erection of a Small-pox Hospital at Homerton, for the Managers of the Metropolitan Asylum District, Messrs. John Giles & Hiven, architects. Quantities estimated by Mr. D. W. Young and Messrs. Richardson & Waghorn:—

Gannon & Son	£25,521 0 0
Nutt & Co.	23,774 0 0
Hornam	23,615 0 0
Howard	23,390 0 0
W. Perry	22,837 0 0
Tarrant & Son	22,547 0 0
Myers & Sons	22,506 0 0
Scrivener & White	22,444 0 0
Hill, Keddell, & Wadtram	22,938 0 0
Manley & Rogers	22,094 0 0
J. Perry	21,952 0 0
Kirk & Parry	21,540 0 0
Webb & Sons	21,400 0 0
Baton & Chapman	20,920 0 0
Mann	20,918 0 0
Chapple	20,815 0 0
Henshaw	19,954 0 0

For the erection of a Fever Hospital at Homerton, for the Managers of the Metropolitan Asylum District, Messrs. John Giles & Hiven, architects. Quantities estimated by Mr. D. W. Young and Messrs. Richardson & Waghorn:—

Gannon & Son	£35,740 0 0
Hornam	32,689 0 0
Nutt & Co.	32,228 0 0
Scrivener & White	31,794 0 0
Baton & Chapman	31,662 0 0
Myers & Sons	31,220 0 0
Tarrant & Son	30,422 0 0
Manley & Rogers	30,894 0 0
Kirk & Parry	30,814 0 0
Hill, Keddell, & Wadtram	30,174 0 0
Perry & Son	27,938 0 0
Webb & Sons	29,910 0 0
Chapple	25,440 0 0
Mann	25,037 0 0
Howard	27,450 0 0
Henshaw	27,320 0 0

For the restoration of St. Peter's Church, Mansfield, Notts. Mr. William Smith, architect:—

Frisby	£5,132 5 7
Law	4,346 0 0
Stevenson & Weston	4,289 0 0
Brown	3,567 0 0
Haldiday & Cave	3,515 0 0

For Kennington and Lambeth sewers for the Metropolitan Board of Works, Quantities by Mr. Joseph Sumners, Mr. Young, and Mr. J. J. Bennett:—

Hosgood & Morris	£21,000 0 0
Webster	31,200 0 0
Thurst	30,000 0 0
Pearson	27,700 0 0
Crockett	27,000 0 0
Dickenson & Oliver	24,800 0 0
Ford	23,000 0 0
Moore	22,500 0 0

For finishing twelve houses, St. Luke's-road, Badminton, Bristol, for the Mortgage, Mr. Wm. Cloutman, architect:—

Contract No. 1, for Six Houses.

Stevens	£595 8 0
Worsall	537 18 10
Banner	550 0 0
Shaplaid	532 5 0
Hill	529 10 0
Ridling	510 0 0
Tucker	482 0 0
Pool	483 0 0
Griffiths	465 0 0
Lloyd	443 0 0

Contract No. 2, for Six Houses.

Williams	£650 0 0
Worsall	625 13 6
Lloyd	580 0 0
Tucker	538 0 0
Pool	520 0 0

For repairs and alterations to house, and the erection of a greenhouse and vinery, at Olveston, Gloucestershire, for Mr. W. E. Bletchley, Mr. W. Cloutman, architect:—

General Greenhouse,		&c.	
Repairs, &c.	&c.		
Humphries	£228 0 0	£138 0 0	0
Polbs	25 10 0	115 10 0	0
Corb	217 10 0	157 0 0	0
Beavan & Son	212 0 0	153 10 0	0
Storkey	210 0 0	160 0 0	0
Edwards	209 10 0	112 0 0	0
Moford	200 0 0	126 0 0	0
Bussell	199 18 0	159 18 0	0
Banner	195 0 0	150 0 0	0
Covilla & Son	189 0 0	143 0 0	0
Low	180 0 0	149 0 0	0
Hill	179 0 0	142 10 0	0
Williams	177 0 0	159 0 0	0
Stephens	175 0 0	144 0 0	0
Marsh	165 0 0	138 0 0	0
Dunnet & Co. (inclusive tender)	£315		

For a memorial aisle to Bishop Jeremy Taylor, and north aisle, Drumore Cathedral, Ireland. Mr. Thomas Drew, architect:—
 Mardoch £1,600 0 0
 W. Lamb & Harvey 1,600 0 0
 Lowy & Son 1,543 0 0
 M'Creary 1,527 0 0
 Cowden 1,525 0 0
 Dudley 1,500 0 0

For building houses and outbuildings at Finchley, for Mr. Toyns. Mr. Shales, architect:—
 Auley (accepted) £3,340 0 0

For building two houses, Powell-road, Clapton, for Mr. Copeland:—
 Shurmer (accepted) £596 0 0

For building Malting at Brentwood, Essex, for Mr. E. B. Bradley. Mr. S. C. A. Frey, architect:—
 Shurmer (accepted) £4,285 0 0

For New Presbyterian Church Schools, Cadogan-terrace, Chelsea. Mr. T. H. Payne, architect. Quantities supplied by Messrs. Mann & Saunders:—
 Sprake £1,417 0 0
 Patman & Fotheringham 1,388 0 0
 W. A. Church 1,380 0 0
 Spimston 1,380 0 0
 Henderson & Cairns 1,280 0 0
 Scrivener & White (accepted) 1,189 0 0

For alterations and additions to 198, Kennington Park-road, and house adjoining, for Mr. Macfarland. Messrs. Glaser & Sons, architects:—
 Corbett £798 0 0
 Bentley 740 0 0
 Nightingale 680 0 0
 Newstead 671 0 0

For additional floor and alterations to railway arch, Villiers-street, Strand, for Messrs. Chaplin & Timms, wine merchants. Mr. W. Paice, architect:—
 Fish £673 0 0
 Sanson 667 0 0
 Kelly 647 0 0
 Clemence 594 0 0
 Nightingale 563 0 0
 Macey 510 0 0
 Grover 499 0 0
 Snowden 489 0 0
 Timewell 433 0 0

For house at Billingshurst. Mr. G. M. Hills, architect. Quantities supplied:—
 Jarrett £2,200 0 0
 Bushby 1,563 0 0
 Omitting Sand, Zeage, and Copper.
 Snowin £1,000 0 0
 Terry 1,038 0 0
 Burnes 1,293 0 0
 Omitting Bricks.
 Nightingale £1,299 0 0
 Wright (accepted) 1,206 0 0
 Fuller & Langley 1,233 0 0
 Quaker 1,289 0 0

For building factory, Sec. Holloway-road, for Mr. H. C. Stephens. Messrs. Bird & Walters, architects:—
 Henshaw £4,341 0 0
 Stephens & Watson 2,325 0 0
 Kelly, Hogg 2,282 0 0
 Brown 2,240 0 0
 Williams & Son 2,237 0 0
 Newman & Mann 2,200 0 0
 The Sons of England Iron Works 2,187 0 0
 M'Lauchlan (accepted) 2,184 0 0

For alterations and repairs to the "George and Gate," Gracechurch-street, City. Messrs. Bird & Walters, architects:—
 Newman & Mann £605 0 0
 M'Lauchlan 675 0 0
 Kelly, Hogg 672 0 0
 Williams & Son 607 0 0
 Ebbs & Son 525 0 0
 Brown (accepted) 498 0 0

For Hastings Pier, to be erected under Mr. F. Birch, engineer to the Company. Opened at Hastings, on Friday, the 23rd inst. No decision was arrived at:—
 The Lustran Iron Works Com-pany £37,855 0 0
 Campbell, Johnstone & Co. 34,000 0 0
 The London Engineering and Iron Shipbuilding Company 31,492 0 0
 Powell, Hogg 26,975 0 0
 Dixon 26,750 0 0
 Lloyds, Fosters, & Co. 26,905 0 0
 Thames Iron Works 26,900 0 0
 The Sons of England Iron Company 24,850 0 0
 Jackson & Co. 24,843 0 0
 Shaw 24,487 0 0
 Hogg 23,998 0 0
 Dowson 23,700 0 0
 W. Jackson 23,400 0 0
 Lawford & Sons 23,260 0 0
 Jukes, Goulson, Brookes, & Co. 22,128 0 0

For five blocks of buildings, containing dwellings for 110 families and 10 shops, to be erected on the Marguise of Westminster's estate in Ebury and Queen streets, Piccadilly, for the Improved Industrial Dwellings Company. Messrs. Beck & Lev, architects. Quantities furnished by Messrs. Webb & Atkinson:—
 Myers & Horner £23,325 0 0
 Lacey, Hogg 23,090 0 0
 Ayles & Son 22,617 0 0
 Hogg, Keddell, & Waldram 22,410 0 0
 Jackson 21,923 0 0
 Jackson 20,820 0 0
 Penhys 20,403 0 0
 Perry & Co. (accepted) 20,389 0 0

For building addition to a house at Willesden, for Mr. Peacock. Mr. Mickerson, architect:—
 Hyde £2,700 0 0
 Clements 2,457 0 0
 Myce 2,475 0 0
 Axford 2,436 0 0

TO CORRESPONDENTS.
 R. T.—H. V.—G. J.—S. T.—W. R.—L.—J. M.—E. J. W.—M. D. T.—S. W.—G. A. H.—H.—Mr. G. B. E. N.—A. W.—H. S. L.—H.—G. F. E.—C. W.—R.—W.—C. C. H.—E.—W.—W. L.—J.—F.—J.—T.—E. G.—T.—E.—L.—W.—U.—C.—F.—Yeaman, F. & Co.—L.—A.—R.—M.—Mr. S.—J.—W.—H. C. B.—T.—E. K.—G.—M. B. (posted).—J. & Sons (we do not profess to mention every tradesman employed on a building.—A Builder (the district surveyor could compel its removal, it being of wood.—W. S. (should send whole list).
 We are compelled to decline pointing out books and giving address.
 All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.
 Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

IMPROVED MACHINERY, combined with STEAM POWER, is employed by J. W. BENSON in the Manufacture of Church, Turret, Stable, and Tell-tale Clocks, Sun and Wind Dials, Perpetual Calendars, and every description of Clock and Watch Work. Architects, Builders, Committees, &c. can be promptly supplied with estimates. A descriptive Pamphlet on Church and other Clocks, post-free, 2s. J. W. BENSON, by special appointment, Watch and Clock Maker to His Royal Highness the Prince of Wales, Steam Factory for Clocks and Watches, 53 and 60, Ludgate-hill; Showrooms, 25, Old Bond-street, London.

STATE OF THE CROPS, 1869.
THE GARDENERS' CHRONICLE, and Agricultural Gazette of Saturday, August 7, will contain a FULL and PRACTICAL STATEMENT OF THE STATE OF THE CROPS throughout the UNITED KINGDOM. Order of any News Agent. A single copy sent for Six Shillings.
 Office for Advertisements, 41, Wellington-street, Covent Garden.

Just published, price 2s.
THE TREATMENT OF SEWAGE.
 BY JOHN HARR.
 A Pamphlet for Municipal Authorities and those interested in the Collection of Land.
 London: S. WICKES, MARK HALL, & CO., Ludgate-hill. W. WIFE, 21, Victoria Library.

“WORKING PEOPLE AND IMPROVED HOMES.”
 The new and illustrated edition of “The Dwellings of the Labouring Classes,” by HENRY ROBERTS, Esq. F.S.A. (author of “House Reform,” and “The Physical Condition of the Labouring Classes”), will be found a summary of the efforts at home and abroad to secure “Healthy Homes” for working men and women.
 A most valuable handbook.—The Builder.
 To be had of the Office of the Society for Improving the Condition of the Labouring Classes, 21, Exeter Hall, Strand. Price 7s. Also Desires for Cottages, unnumbered sheets, with Specimen Plates.

J. NEILL & SON,
 QUANTITY SURVEYORS,
 11, COOKRIDGE STREET, LEEDS.
 Highest testimonials from several eminent architects. Terms on application.

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GILDEBS, thoroughly experienced in House Work, and Decorative Painting, and residing in all its details, may be OBTAINED at the House of Cud, Martborough Inn, Blenheim-street, Oxford-street.—Address to the Secretary.

PARTNERSHIP.—The Proprietor of some of the Old Stone Quarries in the West of England, being otherwise much engaged, is desirous of obtaining a PARTNER who would take the entire charge of the business. None but principals will be treated with, and first-class references will be given and required.—Apply by letter, to 427, Office of “The Builder.”

DESIGNER for GOTHIC FIGURES
 AND ORNAMENTS of several years' experience, would be happy to make DESIGNS and CARVINGS for the above Art.—Address, 194, Office of “The Builder.”

CLERK OF WORKS, ST. PANCRAS.
 Middlesex.—The Guardians of the Poor for this Parish require a CLERK OF THE WORKS for the Infirmary now being erected at Highgate, salary, £5 5s. per week.—Application, on form to be obtained at these Offices, accompanied by not more than six original testimonials of recent date, are to be sent to me before TWO O'CLOCK in the afternoon, on FRIDAY, the 31st day of August, and candidates are to attend at first point THREE O'CLOCK, on MONDAY, the 1st day of AUGUST, but no travelling or other expenses will be allowed. Persons writing for a form of application are requested to send a directed envelope.—By order, JAMES MOORE, Clerk. Clerk's Office, Vestry-hall, St. Pancras, N.W. 27th July, 1869.

TO ARCHITECTS AND OTHERS.—Work-Book, Detail, and Competition DRAWINGS PREPARED, by E. L. 40, Norfolk-street, Strand.

TRAVELLERS AND AGENTS WANTED
 in London and the Provinces for the SALE of FITZ & LEES Patent Oil Charts Waterproof Washable PAPERHANGINGS. Apply, by letter only, stating full particulars of recent engagements and terms, to Messrs. FITZ & LEES, 25, Mark-lane, Strand, London.

TO CLERKS OF WORKS.—The Managers of the Poplar and Sherny Sec. Asylum district hereby give notice that they will meet at their Office, at the Station House, Workhouse, St. Leonard-street, Bow, Middlesex, on MONDAY, the 30th of AUGUST, 1869, at THREE O'CLOCK in the afternoon, to receive and consider APPLICATIONS from persons desirous of being appointed CLERK OF THE WORKS of the proposed Asylum to be erected at Hoxton, Middlesex. The wages will be £4 5s. per week. Candidates for the appointment are to attend the meeting of the Managers, at THREE O'CLOCK precisely, and to bring with them written testimonials, and not more than three original testimonials. No travelling expenses will be allowed.—By order, ROBERT BUCKETT, Clerk to the Managers, 28th July, 1869.

WANTED, an OUT-DOOR APPRENTICE, to the enamelling trade. Premium required.—Apply, J. WAINWRIGHT, Enamel Manufacturer, 13, A. Lower North-street, Blaine-street, Brompton-road.

WANTED, a Young Man, accustomed to Builders' books, accounts, and drawings, to ASSIST in FEW NIGHTS EACH WEEK after SIX P.M. Ready in shorthand-writing, to E. S. 15, Elm-road, Dulwich, S.E.

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WANTED, a thoroughly efficient General FOREMAN, to commence and carry out the erection of a large House in the country. No one need apply unless he can produce most satisfactory references from a Builder, testifying to a similar trust.—Apply to Mr. GEORGE FUSNETT, Contractor, Tottenham.

WANTED, a Young Man, as JUNIOR CLERK in a Builder's Office. Must write a good hand, and be quick at figures.—Apply, in own handwriting, stating age and salary and references, to A. F. MILNE'S LIBRARY, Chapel-street, Edinburg-square.

TO CARVERS IN WOOD AND STONE.
WANTED, a Man for CHURCH WORK. Apply, stating wages and competency, to W. M. BROWN, Builder, London-road, Lytle.

WORKING ENGINEER WANTED, at the Sussex Locomotive Asylum. Wages 30s. with home, coal, light, &c.—Apply by letter, stating age, condition, and experience, to Dr. ROBERTSON, Haymarket, Sussex.

WANTED, a LOCKSMITH and BELL-HANGER. Must be a good hand.—Apply to GILBERT & CO. High-street, Lambidge Wells.

WANTED, by a Decorative Artist, an ENGAGEMENT as FOREMAN, or otherwise, either in Town or country. Understands drawing, as well as plumbing, glazing, painting, gliding, paper-hanging, writing, masonry, and squaring up work, and book-keeping. Excellent references.—Apply to V. B. COMWELL, 20, Upper Holloway, N.

TO BUILDERS, PLUMBERS, &c.
WANTED, a SITUATION, as good PLUMBER or THREE-BRANCH HAND.—Address, PLUMBER, 25, Albert-terrace, Knightsbridge.

WANTED, by a GENERAL FOREMAN, a RE-ENGAGEMENT. Good references.—Address, ALPHA, 144, High-street, Borough.

TO BUILDERS AND PLUMBERS.
WANTED, by an experienced PLUMBER, a constant SITUATION, of Job, Paperwork or otherwise.—Address, A. B. 45, Aldersgate, Kensington Park.

WANTED, EMPLOYMENT, by a Carpenter and Joiner. Has a good knowledge of Plans, specifications and accounts. Urgent to perform making and jobbing generally.—Address, H. W. 73, Friar-street, Backrick-road, S.E.

TO BUILDERS AND MASTER PLUMBERS.
WANTED, by a first-class PLUMBER, GASFITTER, and ZINC WORKER, a SITUATION, as a RE-ENGAGEMENT. Has no objection in being up his time in painting and glazing. With good references.—Address, G. W. 7, Victoria-street, Paddington-green, W.

TO BUILDERS, &c.
WANTED, by a thorough PAINTER, PAPERHANGER, and GLAZIER (can do plain oak graining), a SITUATION as WORKING FOREMAN of PAINTER, or otherwise.—Address, FAIRFAX, 8, Harwood-terrace, Norwood, Middlesex.

TO ARCHITECTS, &c.
WANTED, a RE-ENGAGEMENT, temporary or otherwise. Is a really good draughtsman, and can read and sketch plans, and make drawings for construction, &c. Also well up in perspective and coloring. Good references. Salary very moderate.—Address, H. F. Hughes's Library, 3, Park-street, Regent's Park, N.W.

WANTED, by a good PLUMBER, WORK by the hour or piece.—Address, J. BULL, 14, Woodland-terrace, Charlton.

TO DECORATORS AND OTHERS.
WANTED, by a respectable Young Man, a SITUATION. Is a first-class GRAINER, WRITER, and PAINTER. Town or country. Good references given, if required, from last employer. Wages moderate.—Address, A. B. 14, Westbourne-street, Bayswater-square, London, W.W.

TO BUILDERS AND OTHERS.
WANTED, to place a Youth, respectfully connected, aged 15, as IN-DOOR APPRENTICE to a BUILDER, where he will be able to obtain a thorough practical knowledge of the trade in all its branches. Country not objected to, if within a reasonable distance.—Address, A. L. Beddall's Post-office, White End-road, near Stoney Green, E.

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WANTED, a RE-ENGAGEMENT, as Estimating, Quantity Taking, Measuring, and General Booking CLERK. Well up in Public competition.—Address, C. D. 5, Aston-road, Cornwall-road, Westbourne Park, W.

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WANTED, by the Advertiser, a RE-ENGAGEMENT, as CLERK OF WORKS, General Foreman or Foreman of Carpenters. Has been employed on extensive works the last five years. Good references.—Address, W. L. 75, Field-road, West Hampstead, N.W.

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TO PLUMBERS, BUILDERS, &c.
WANTED, by a Young Man, who is a good Plumber, a SITUATION of JOB, or as THREE-BRANCH HAND. Good references.—Address, stating terms, to A. Z. 3, Christians-place, Victoria-road, Peckham.

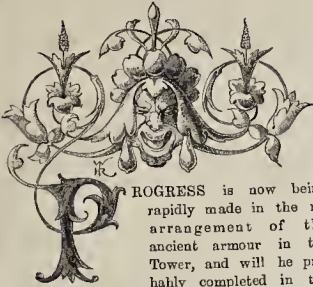
TO MASTER PLUMBERS AND BUILDERS.
WANTED, by a thoroughly practical PLUMBER, a JOB or CONTRACT. Well up in both, sheet-pump, and hot-water apparatus; good lead layer. Has done some first-class jobs. Good testimonials.—Address, 214, Office of “The Builder.”

WANTED, by the Son of a Builder, who has had 12 years' experience in the management of a Builder and Contractor's Business, and was articled to a London Architect and Surveyor, a POSITION of TRUST, or the Management of Works on an Estate. Unexceptionable references.—Address, A. B. 115, Fetter-lane, London.

The Builder.

VOL. XXVII.—No. 1383.

The Arms and Armour in the Tower of London.



PROGRESS is now being rapidly made in the re-arrangement of the ancient armour in the Tower, and will be probably completed in the course of another fortnight. To the mere sight-seers who stream through the building at the rate of from five to seven hundred *per diem* the alterations may be of little importance or interest; but the student and the antiquary who may have visited the collection in its previous state will immediately recognise the advantages afforded to them, and join us in thanks to Mr. J. R. Planché, Somerset Herald, under whose superintendence it has been effected. [Proceeding on the same plan which has given so much satisfaction in his arrangement of the Meyrick collection at South Kensington—the success of which, as an exhibition, at length woke up the Government to the discreditable state of the National armoury, and induced them to solicit his services—Mr. Planché has ferreted out the unappreciated because unseen rarities scattered and hidden away in various nooks and corners of the store-house, and classified and arranged them chronologically in the several compartments appropriated to the successive periods of English history.

The dingy, brick-dust coloured canvass monstrosities that did duty for banners, and were, all but four, inscribed with the names of illustrious personages, who never wore the armour attributed to them, have been completely swept away, and the wall above the arches is painted with the livery colours of the Royal Families of England, from the Plantagenets to the Stuarts, and bearing the names and dates of the sovereigns in gold from Henry II. to James II. Greater length is thus given to the vista, variety of decoration to the arcade, and, what is of infinitely more importance, useful instruction to the public.

The first compartment presents us with a most interesting series of helms and other head-pieces, from the twelfth to the end of the fourteenth century; portions of mail, iron gambiats, and swords, and specimens of all the early weapons, from the gaisarme of the battle of Hastings to the bill and glaive of the Middle Ages. The second compartment, ranging from the deposition of Richard II. to the death of Richard III., is rich beyond description with relics of the fifteenth century, which witnessed the battle of Agincourt, the Wars of the Roses, and the final triumph of the House of Lancaster on the field of Bosworth. Beside the beautiful armour of this period, which was of the most elegant and fanciful description, the attention of the antiquary will be arrested by a curious painted German helmet, of the class called *Saelder*; another, with its original ornamentation of velvet and gilt *four-de-lys*, and a saddle

of bone and wood, which is only surpassed by a similar one in the Meyrick collection. An exquisitely modelled articulated hack-plate and a long-toed solleret, with its original long-shanked spur attached to it, of the time of Henry VI., with examples of every kind of head-piece in and during the fifteenth century, the whole railed in with the glittering hills, partizans, and other weapons of the period, make of this second compartment an exhibition of Mediæval military antiquities which would alone repay an intellectual visitor for the trouble of his journey; but then he must be allowed to contemplate and examine it at his leisure, and not compelled to "move on" with a gaping bewildered crowd at the heels of the inevitable hee-fearer. This is a nuisance which must be abated if any benefit to art and education is to result from the scientific arrangement now making, and the conversion of a lumber-room into a museum.

With the third compartment commences "the Line of Tudor," distinguished by its colours of white and green, which alternately decorate the spandrels of the nine succeeding arches, in front of which, as formerly, are ranged a series of knightly panoplies, some mounted, some on foot, displaying the various changes in the form and fashion of defensive armour from the time of Henry VII. to the end of the reign of Elizabeth. Amongst the suits are those which actually belonged to King Henry VIII., to his brother-in-law, Charles Brandon, Duke of Suffolk, and to the great favourite of the "Virgin Queen," Robert Dudley, Earl of Leicester; that of the latter being elaborately engraved with his badge of the ragged staff. To these, our old acquaintances, have now been added a series of the tilting helmets, and examples of all the weapons in use during the successive reigns. Amongst the latter may be noticed two English long-bows of yew recovered from the wreck of the *Mary Rose*, a ship of war, sunk near Spithead in 1545. Examples of this celebrated and most favourite national weapon are exceedingly rare, and these interesting relics have been transferred from the obscure position to which they had been consigned, and placed in a conspicuous one amongst the armour and arms of the reign they were last used in. Fronting this line of Tudor, are ranged some exceedingly fine and perfect foreign suits of corresponding periods, Burgundian, German, French, and Italian, and in the recess formerly occupied only by the armour for man and horse, said to have been presented by the Emperor Maximilian to Henry VIII. on the occasion of his marriage with Katherine of Aragon, now stand also two other most interesting suits made for the same monarch, —one "rough from the hammer," the other highly polished and engraved with the collar of the garter and the Tudor rose, with laminated skirts or bases sliding on what were called *Almaine rivets*, a unique example of armour in fashion at the commencement of his reign. Stars and ornaments composed of modern swords and pistols have been replaced by cross-bows, helmets, and targets of the time. On the right, under glass, is a superb heart-shaped shield of embossed steel, representing the last battle of Charles the Bold, Duke of Burgundy; and, on the left, is a lantern-target used for night attacks, the interior painted with the story of Camillus, after Giulio Romano. This curious specimen of Mediæval art, purchased from the Bernal collection, was found by Mr. Planché covered with dirt, fastened at the top of a column in the ante-room to the Indian compartment,—"out of sight and out of mind!"

Eight more arches, surmounted by the yellow and red livery colours of the Stuarts, bring us to the end of what is called "the Horse Armoury," the last figure being that of James II., "in the armour," and, from its appearance, we should say, the wig, "which he wore at the Battle of the Boyne," so at least the warders assure us; and it would be petty treason

to don't those voracious personages, although it is difficult to reconcile the account of one with the other, each having his own story, illustrated by his own especial comments. In this particular instance, however, we may safely agree with them that the armour did belong to the second James, though it may possibly be questioned as to its being the identical suit which saw the Boyne water, considering that he was not taken prisoner, and that the armour he wore more probably found its way with its owner to St. Germain's.

The last weapons arranged on this line are those used by the rebels who rose in support of the misguided Duke of Monmouth, and which were, oddly enough, nailed up close to the tail of Queen Elizabeth's horses, in what is designated her armoury.

Appropos of this armoury whereto the public are conducted from the point we have reached in our review. It was originally called "the Spanish armoury," and supposed to contain the spoils of the Invincible Armada. Years ago Sir Samuel Meyrick demonstrated to the authorities that there was not a Spanish weapon in the whole collection; that "the consecrated banner presented by the Pope" was a leather shield or pavoise, with a cross cut out of a common playing-card stuck upon it; and that "the partizan of the Spanish commander-in-chief of the expedition" had, rather unfortunately, the arms of Sir Dudley Carleton engraved on its blade. He was only permitted to change the name of this apartment to "Queen Elizabeth's armoury," a figure of her Majesty on horseback, attended by a page, occupying a recess at the end of it. This, however, was its only claim to the title, as the chamber was merely made a receptacle of all the odds and ends which could not be conveniently disposed of elsewhere. A great change is now taking place in this apartment; figures representing every arm of the service in the reign of Elizabeth; the Bowman, the hillman, the halberdier, the musqueteer, the pikeman, the demilancer, the knight, in his full suit of tilting armour, ready to enter the lists against all comers, are now assembled in presence of their sovereign, and justifying for the first time the title of their hitherto gloomy chamber to the name of an Elizabeth armoury. Light by the way is here greatly needed.

Repassing through the magnificent Indian collection, which has been enriched by the transfer of several Oriental rarities which had been incongruously mixed up with the European armour below—notably the mounted figure which had been successively exhibited as "Edward the Black Prince," and "a Norman Crusader"—the public descend to the Horse Armoury, and are led down the passage at the back of the mounted figures to the door, by which they depart on their way to the White Tower. On their left the firearms, invented and adopted from the latest period to their first introduction, remain as previously arranged; but on their right the work of classification and chronological arrangement has been thoroughly carried out. Breastplates and helmets, instead of being crammed in the glass cases, under no regard to date, in the glass cases, under the platform, are now fairly displayed in due order, from the reign of Charles I., up to that of Henry VII., and on the platform are mounted, in corresponding rotation, a most interesting series of small pieces of artillery, from the cannon made for Charles II., when Prince of Wales, to the "iron gunne, with a touch," of the time of Edward IV.

Having long persistently and alone exposed the improper condition of the national armoury, and called for a revision and arrangement of it under competent direction, we may be permitted to feel a little gratification at the very successful result which has at last been brought about. The reform, however, must not rest here: the con-

stant supervision of a qualified person should be given to the collection, or in less than a year it will relapse into its former state of disorder,—labels will be misplaced, pieces when taken out to be cleaned will be put into wrong compartments, and so forth. Moreover, purchases should be made, so as to complete and enrich the collection, and this of course should be done under scientific direction. The public voluntarily supplies plenty of money, but at present this is misappropriated. Why, for example, should the armour be made to pay the whole cost of the 25 beefeaters, at 30s. a week each, or nearly 2,000l. a year in the whole? Surely, and to go no further, the other departments, the jewel rooms for example, should bear some of this cost, so that more of the money paid by the public to see the arms and armour could be applied to increase the efficiency of the collection. With the good result of the present experiment before them, the Government will surely take heart of grace and go forward in the same direction.

GUILDHALL LIBRARY AND MUSEUM.

The city of London is full of hidden treasures. We do not refer to the bars of bullion and other specie in the strongholds of the Bank of England, or to the heaps of precious metal in the safe security of the Mint, or, again, to the priceless collections of plate belonging to such corporations as the Goldsmiths' Company. It is not to her mines of wealth in gold and silver that our remark is intended to apply, but to her literary and archaeological treasures, in which the City is no less rich, though very few are aware of the fact. The reason is that these are hidden away in all sorts of obscure nooks and on-of-the-way corners. Few are aware of their existence even, fewer still have ever seen them. Literary searchers and students of antiquity are to some extent familiar with the valuable archives and rare collections we allude to, but to the public generally they are a sealed book. How many Londoners, for instance, have made a visit to the Armourer's Museum in Coleman-street—it will certainly repay one—or to the Trinity House Museum, with its interesting models of light-houses and apparatus of all kinds connected with seafaring life? How many have inspected that extremely curious gathering of heathen idols and other relics of savage life in the Missionary Museum in Finsbury, or spent an hour among the many historical curiosities of great value in the museum of the Herald's College? The library and museum of Guildhall may be said to be of far greater interest than any of these, yet who, besides the antiquarian or the enthusiastic book-hunter, ever visited it? Until the other day, who knew there was such a place? Extensive and highly valuable as are both the library and the museum—in some respects, indeed, unique—some correspondence which appeared a short time since showed that even eminent citizens knew nothing of the collection. Thanks to Dr. Sedgwick Saunders, this collection is no longer one of the hidden treasures of the City. In his capacity of chairman of the library committee, Dr. Saunders, at a recent court of Common Council, brought forward a motion recognising "the great importance of establishing a library and museum worthy of the city of London," and proposing to erect a new building for such purposes on a site now in possession of the Corporation at the eastern end of Guildhall, at an expense not exceeding 25,000l. Dr. Saunders has been so far successful in his project that, at an adjourned discussion, the motion, omitting that part referring to the site, was unanimously carried, and a special committee has been appointed to obtain plans and estimates, and report thereon to the court. Whether an entirely new building be provided, as this gentleman proposes, or whether the large building now used for the trials of *Nisi Prius* in the Guildhall-yard (which will be at the disposal of the Corporation on the removal of the Law Courts), can be made available, as another member of the Council suggests, matters not so much, so long as the Free City Library and Museum shall be comfortably lodged. At present it is not even decently housed, and it will be a grave reproach on a corporation which can be lavish in its generosity when it likes, should matters be allowed to remain as they are any longer. However, there is now no fear that this will be the case. A glance at the history and contents of the collection may be interesting as well as useful. The present is the second Guildhall

library. The exact date of the foundation of the original library is not known. We find it, however, spoken of by the famous Whittington, who was one of its earliest benefactors. John Carpenter, in 1441, also gave several important works during his lifetime; while in his will, proved the following year, he directs:—"If any good or rare books shall be found amongst the residue of my goods, which by the discretion of Master William Lichfield and Reginald Peckok Guildhall for the profit of the students there, and those discoursing to the common people, placed by my executors and chained in that library, in such form that the visitors and students thereof may be sooner admonished to pray for my soul." The inference is that this "common library at Guildhall" was then the national library, and, as Dr. Saunders remarks, in his able appeal to the Corporation, the citizens of London may fairly claim to be the parent of that monster Bibliothèque now annexed to the British Museum. Government took up the idea of the formation of the latter at a comparatively late period (1753). Stow refers to "a large and large library, furnished with books pertaining to the Guildhall and Colledge," and further informs us that in the reign of Edward VI. the books were "sent for by Edward, Duke of Somerset, Lord Protector, with promise to be restored shortly. Men laden thence three carriages [carts] with them, but they were never returned." This reminds us of the story of the Duke of Buckingham, who "borrowed" a portion of the stone provided for the restoration of St. Paul's, and built with it the water-gate at York House. Buckingham's transaction, however, was by no means so black as Somerset's. The handiwork of Inigo Jones is still to the fore at the foot of Buckingham-street. Whatever may have remained of the library after the Lord Protector's theft—if aught did remain, which seems doubtful—was destroyed in the Great Fire of London. Nothing was done to repair the loss until 1824, when the present collection was formed. It has been created by grants of money from the City funds, and donations from private individuals, and by the concentration of valuable documents from all the departments of the Corporation. The progress of the library has, indeed, been very remarkable. Even now it is one of the largest and most valuable in England, though up to the present moment it is the most meagrely housed. It contains a more complete collection of books and manuscripts relating to the City of London than even the British Museum, while the various departments of literature, science, and art are fairly represented. Among the more valuable features of this Bibliothèque, we found a complete series of the *London Gazette*, from their commencement in 1665 to 1732, purchased at a cost of 250 guineas, and another extensive series of ancient City triumphs, called "City Pageants," and also Royal Processions, serving to illustrate the progressive alterations and improvements in manners, buildings, and society in the metropolis. The first edition of Stow's "London" is here, also an original copy of Aggas's Map of London (1560), and a copy of that very scarce work, Higden's "Polychronicon." There are several thousand prints and drawings, consisting chiefly of metropolitan topography and portraits of eminent characters, including, among the latter, a series of the Lord Mayors, Sheriffs, and Records. In old tracts relating to the customs, laws, and privileges of the City, giving accounts of the great Plague, the great Fire, and other historical incidents, the library is particularly rich. In 1847 the institution received the munificent gift of 400 volumes of Hebrew and Rabbinical literature from a private source. These works—a library in themselves—have since been carefully catalogued. In 1863 the authorities of the Dutch Church, Austin-friars, handed over their ancient and valuable library to the custody of the corporation. The addition thus made to the Free City Library has enriched it with nearly 2,000 volumes of the literature of the early period of the Reformation—theological works for the most part, in Latin, German, Dutch, and English—and a large collection of manuscripts and letters, many of the latter by the founders of the Dutch Republic. A brief extract from the catalogue, descriptive of one portion of this priceless collection, will, we think, interest our readers:—

"There is also another collection of two hundred and seventy-two original communications, addressed to Abraham Ortelius, geographer to Philip II. of Spain,

from most of the learned scientific men of the time. Several of the letters are accompanied by engraved portraits; a portrait of Ortelius, and one of Christopher Plantin, the printer of the Polyglot Bible of Cardinal Ximenes, whose house at Antwerp was the resort of the learned of all countries; Gerard Mercator, cosmographer, geographer; William Camden, one of the most illustrious of English antiquaries; Dr. John Dee, Astronomer of Queen Elizabeth, mathematician and astrologer (his geographical collection is still preserved in the Cottonian manuscripts at the British Museum); a Latin physician to the same Queen; also letters and documents signed by Lord Burleigh and Walsingham; the Paris of Leicester, Sussex, and Lincoln, Lord Bacon, and other ministers. A Latin quarto Bible, written upon vellum, with titles and beginning of chapters illuminated. Another Bible, in Dutch, with illuminated titles, in two volumes, 1360; one printed at Delft, in 1477, in German; some early folio pieces, and the manners and customs of the people; and Blaeu's views of the several towns and villages in the Low Countries, printed in 1649."

In accepting the library of the Dutch Church, the corporation agreed to the stipulation that a separate room should be set apart for its reception. It has been put in a garret, though it is only fair to add that a sum of 300l. has been expended in binding and repairing the books, and in providing suitable cases for them. Another curious case of literary pilfering ought to be mentioned here. In 1861 Mr. Riley, in the course of his researches, discovered that a portion of the *Liber Custumarum* had been abstracted from the City's archives. It was found among the Cottonian manuscripts of the British Museum, whereupon the Library Committee wrote to the trustees of the Museum inquiring as to the circumstances under which the important MS. had been removed, and requesting its restoration. The trustees replied, and expressed their inability to surrender the abstracted folios. It would appear that Sir Robert Cotton, in the early part of the seventeenth century, borrowed several of the City's records under various pretexts, retained them for a considerable period; and they were only restored to the Corporation after much pressure, and then in a defaced and mutilated condition. The total number of volumes now in the library is about 30,000, exclusive of a large collection of maps, plans, prints, drawings, and portraits.

It is now time to say a few words regarding the museum. The resolution to form a civic museum was taken in 1820, and the foundation of this desirable object was laid by a donation of several Roman antiquities discovered in digging the foundations of the new post-office, and in the excavations for the new London Bridge, and the Guildhall Chapel. The local antiquities of the City are perhaps the most valuable and interesting we possess, and additions are being continually made to them, such as the Roman pavement lately found in Bucklersbury. This splendid relic is now in the possession of the museum, and it will surprise most persons, we dare say, when they find this young institution so wealthy in relics of the Roman era, the whole of course having been dug up within a stone's throw of Guildhall. A large portion of the curiosities of this class was added to the museum in a lump four years ago, when the Corporation authorised the purchase, for the sum of 200l., of a private collection of Roman and Medieval antiquities, selected with great care during the excavations carried on in the City for the last fifteen years. Other of the contributions have been acquired more gradually; a single precious bit here and another there. So far as the limited and crowded space allowed, the contents have been arranged and classified, though a large number of objects of rare interest have (of necessity) been stowed away like so much lumber. Still the visitor will find much to engage his attention and to excite his wonder. Under one glass case we have a collection of fine Roman pottery found in Thames-street in 1864, and we cannot but regret that it should be in so fragmentary a condition. Another case contains specimens of figured Samian ware cast up in the excavations for New-street, Southwark. It is ornamented with scrolls of foliage, of beautiful design and exquisite workmanship. In a third case we come upon specimens of Roman fresco or wall-painting and bits of mosaic work, earthenware urns in variety, many of them quite perfect and of shapes that we moderns are content to copy because we cannot surpass them. With what care, too, a batch of frightfully old shoes has been placed under lock and key! We soon discover, however, that these are worn-out crepeles of different kinds, most of the specimens showing the ordinary Roman method for making

soles of extra thickness by rows of nails driven through several layers of leather from the outside. The nails differ little in shape from what are used for navvies' boots in the present day. The shoes were found on the site of the Royal Exchange. There is a fine collection of Roman pins and needles of home and jet, and here we decidedly beat our ancient invaders in the matter of making stitches. They certainly never dreamed of the modern sewing-machine, but they have left us some whorls for spinning. Interesting also is a group of styli (iron and bone) for writing on tablets, with specimens of tabellæ found on the site of "Steelyard," spoons (cooblearia) with circular bowls and pointed handles, used by the Romans in eating eggs, extracting shell-fish, &c., almost identical in size and shape with some egg and salt spoons of these days, though of coarse manufacture; Roman knives with bone handles, fibulæ or brooches, armlets, rings, locks and keys. Cæsar's countrymen were in the habit of making use of that little article of modern utility, a latch-key, though it was not a Cubb. In addition to these we may notice a number of lead signa, or pilgrims' signs, dating from the time of Edward the Confessor, most of which were found in the Thames at Westminster; old English padlocks and keys from 1350; iron, bronze, and brass spurs, of different dates, some of them of so formidable and cruel a character that we pity the poor horses of the period; buckles and medals of Charles I.'s time; gold motto-rings and other trinkets and personal ornaments worn by our ancestors. There is a unique collection of tradesmen's tokens relating to London, Westminster, and Southwark, as also an attractive display of bronze medals commemorative of various events connected with the history of the City from the opening of the Royal Exchange by Queen Elizabeth, in 1570, to the entry of the Princess of Wales into London. Here may also be seen a massive tombstone erected to some Roman citizen who was interred in Ludgate-hill, then one of the highways leading to the City; the sign-stone of the famous Bear's Head Tavern, in Eastcheap, is preserved here, and a sword presented to the Corporation by Lord Nelson after the battle of the Nile. The manuscript documents in the museum are not many, but they are highly valuable. They include, among others, autograph letters from Queen Elizabeth (1589), Victoria, Napoleon III., Victor Emmanuel (in reply to the address of the Corporation in 1855), Count Cavour; a letter written by Dr. Johnson, dated Streatham, 1778; another of more interest, addressed to the "Commissioners of Public Works of the City of London," with reference to the Fleet ditch; from Sir Christopher Wren and Robert Hooke, and dated 1673. There are two letters written by Cromwell—one to the Lord Mayor, dated from the Cockpitt, 1653; the other addressed to the Gresham Company, requesting them to suspend the appointment of a Geometry Professor in Gresham College, until he should have an opportunity to speak with some of them. This is signed, "Y' loving friend, Oliver P.," and is dated Whitehall, 9 May, 1656. A letter, written in an unusually large but modern-looking hand, by the Duke of Buckingham, gives a description of the Great Fire then burning, &c., on the 6th of September, 1666. But unquestionably the gem of the autograph collection is the signature of Shakspeare affixed to a deed of sale of a house in Blackfriars, purchased by the poet from Henry Walker, dated March 10th, 1612. This deed was sold by public auction in 1843, and bought by the library committee for 145l. The signature is one of the best of the six autographs of Shakspeare in existence acknowledged to be genuine (omitting reference to the recent asserted discovery at Bury St. Edmund's), of which three are attached to his will in Doctors' Commons, one is in Montaigne's Essays in the British Museum, and one on a mortgage-deed of the 11th of March, 1612. For this document the British Museum, in 1858, gave the sum of 315l. It is unnecessary that we should again refer to the miserable accommodation afforded for the display of these treasures of antiquity. They are literally stowed away in a narrow and ill-adapted corridor, with bad light and worse ventilation. Not very long ago a distinguished American Professor visited Guildhall. Having seen the rest of our municipal buildings, and greatly admired the splendour of that temple in which "our civic hospitalities are dispensed with a profusion worthy of Lucretius," he was conducted to the library. The librarian hoped that, in the enthusiasm created by the literary gems

and treasures of antiquity there shown him, he had overlooked the squalor of the building. But on leaving, with many thanks to the librarian for the treat he had given him, the Professor said,—"If we possessed such jewels as these we should provide them with a more worthy casket." At last the Corporation has resolved in earnest to take the hint of the enlightened American.

THE GEOLOGY OF BUILDING STONES.*

The next division of the great Oolitic series in descending order is that of the Portland stone and sand, upon which the Purbeck beds are seen to rest in Dorsetshire, this indeed being the only county which possesses any good sequence of these Upper Oolites. Unlike the fresh-water conditions of the Purbeck, the Portland stone is of marine origin, as is also the accompanying Portland sand, as shown by the fossils. As its name implies, the great storehouse from which this world-wide building-stone is obtained, is in Portland Isle, near Weymouth, the particular merits of which were first seen by Inigo Jones, who chose it for the banqueting-hall at Whitehall, and used it largely all through his career. The beds are about six in number, and are called, beginning at the top,—the top-cap, skull-cap, roach, top bed, middle bed or curf, and bottom bed. The "roach" bed, in the geological division of Middle Portland, is valuable when great strength is required, such as for the bottoms of breakwaters; but it will not bear a close, even face. In this respect the "top bed" is best of all, and the "bottom bed" the worst. In fact, the building-stone underlies the whole island like a great floor, of which about an acre annually gets worked, and it is calculated that at this rate there is enough to last for the next two thousand years. About 40,000 tons annually are raised from the Portland quarries, and their destination is—everywhere.

The Isle of Purbeck, too, near Swanage, supplies good Portland stone, and furnished the material used in Goldsmiths' Hall and the Reform Club.

At Tisbury, in Wiltshire, the Portland stone is called the "Devil's Bed." When first cut, it is of a green colour, and soft, but becomes hard and nearly white after exposure to the atmosphere. Near Salisbury there are valuable quarries, which give the stone the name of Chilmark stone. It is of a greenish brown, and has been largely used in Salisbury Cathedral, and at Wilton.

These are the principal sources of Portland stone, although the formation is seen slightly developed and partially worked in other counties, such as Oxfordshire; at Great Hazley, where there are quarries; and in Bucks, near Aylesbury, where it is locally called "pendle," and is used in buildings in that town.

Underlying the Portland stone, and forming the base of the Upper Oolite series, is the Kimmeridge clay, useful to the builder, as the great sources for tiles, draining-pipes, and bricks, in the counties of Wilts, Dorset, Bucks, &c. The two former alone supply many millions annually.

The Middle Oolite is by no means of such economic value as the upper or lower divisions. It contains the Coral Rag and the Oxford clay, the former being subdivided into two, viz, the calcareous grit and the Coral Rag proper. It is so called because it is principally composed of petrified corals, which retain their position in great masses just as they grow in the sea; in fact, it is nothing less than a fossil coral reef. It is used pretty largely, but locally, in Dorsetshire for building, while in Oxfordshire and Berks principally for road metal. The higher beds, however, in the former county (at the base of the Kimmeridge clay) produce a coarse oolite freestone, quarried at Headington, which has been largely used for buildings in Oxford of later date than the fifteenth century; but the geological surveyors state that it does not answer well, partly from inherent defects in quality, and partly from sufficient attention not having been given to placing the stones in the buildings as they lay in the quarry.

In Dorsetshire it is a rough stone, but has been used a good deal. A large portion of Shaftesbury has been built of it from the quarries near Bruton and Gillingham; also Gillingham, Hinton St. Mary's, Marnhall, and Sutton Waldron churches. There are extensive quarries of Coral Rag at Swindon, Parton, and Melksham, in Wiltshire.

* See p. 559, ante.

The Oxford clay is generally recognised by the agriculturist, from its being usually laid out in meadows and permanent pastures. It is generally a dark-blue clay and shale; but in some places, as in Wiltshire, it takes the form of a concretionary limestone full of shells. Here it is called Kelloway rock; but it is seldom or never used for building.

The Lower Oolite is, perhaps, the most important of the whole series; not that the quality of the stone is better for the Portland stone cannot be excelled, but because it is spread over a larger surface of country. It is found all the way from Dorsetshire to Yorkshire, attaining its greatest development about Bath and the Cotswold districts. Like the other divisions of the series, it is subdivided into Corbrash, Forest Marble, Great Oolite, and Stonesfield Slate, Fallers' Earth, Inferior Oolite. Geological terms are often very vague and misleading, as in this case, when people would naturally consider the Lower and Inferior Oolite as the same thing, whereas the Inferior is really only a component portion of the Lower.

The Corbrash and Forest Marble are generally found together. The former consists of clays and calcareous sandstones passing down into the latter, which is usually an argillaceous limestone, although it is not always constant.

The Corbrash, when exposed to the atmosphere, becomes a rubly cream-coloured stone, and breaks into small blocks with uneven surfaces. It is not oolitic, and seldom yields good building-stone, but is useful for making lime. Agriculturally it is a remarkably good soil for corn, which Dr. Voelcker thinks arises from its containing a large amount of phosphoric acid suitable to wheat. The Forest Marble, on the other hand, is generally a cold wet soil, favourable for pastures, and particularly when clay predominates, as at Bradford (Wilt).

In some places it yields good building-stone— at Sherborne, for instance, where it is known as Crackmore Marble, of which the chancel steps of the abbey church are built. The Bath Forest Marble is mostly used for slabs for flooring and roofing, and also for road metal. In the neighbourhood of Cirencester it is also used for roofing and pitching stone. They are here frequently dug from a few feet beneath the surface, the gap being filled in again with rubbish, and the soil replaced.

Forest Marble is largely developed in Wychwood Forest, Oxfordshire, where it is generally yellowish at the surface, but when reached at some depth is of the usual blue colour. The beds differ a good deal in different places, sometimes being a fissile oolite, splitting into rough slates, and in others blue and grey flags with beds of clay. Frome and Blandford churches, with Trinity Church, Cirencester, are built of it, and the most important quarries are found at Sherborne, Milborne Port, Frome, Tebury, Wellington, Cirencester, and Bladon in Oxfordshire. The Great Oolite contains those valuable beds which yield the Bath freestone, which, like the Portland stone, is known all over the world. The term freestone, however, although usually applied to the Great and Inferior Oolite, has different local meanings; as, for instance, in Hampshire, near Alton, where a rock in the Upper Greensand or Upper Malm rock is called freestone; and in Cornwall the term is applied to the stone from a granitic dyke. The topmost beds of the Great Oolite afford beautiful road metal, and the bottom zone is geologically termed Stonesfield Slate, from the village, in Oxfordshire, where they are so finely developed. Everybody is familiar with the splendid slabs of freestone sent out from the Bath and Wiltshire quarries, and it is used all over the country for "dressings," and very largely as "ashlar," for partitions, &c. The Cirencester quarries produce walling, paving, block, and road stones, the walling stone being used for most of the buildings, such as the Town-hall, the Agricultural College, and St. John's Church. It is capable of being easily faced. The block stone is used instead of Bath stone when expense is an object; but it does not do for wet and frosty weather, for it must be kept dry, whereas Bath stone will stand wet and frost. There is much variety in the quality of the Great Oolite; for instance, at Chipping Norton, it does not produce good building-stone, whereas at Taynton, near Barford, in the same county, it is remarkably good, and furnished the material for Blenheim, and a number of churches in Oxford and thereabouts. These churches, of the dates of the twelfth, thirteenth, and fourteenth centuries, have stood better and retained

sharper mouldings than some of the later buildings, which are of Coral Rag. The same variations are found in the Stonesfield slate. At these quarries, which are getting exhausted and too expensive to work, the bed is only 1 ft. thick. The blocks are brought to the surface in early winter and exposed to the frost, which causes them to split along the planes of bedding. The equivalents of these beds are found in Gloucestershire, at Sevenhampton and Eyeford. Here they are sandy and fissile, and make good slates; but as they go east to Windmarsh and Taynton, they become quite oolitic, and fit for building. Burford Church is built of Stonesfield slate.

In Northamptonshire, the sands which yield such splendid beds of iron ore are all in the Great Oolite, and the stone is deeply tinged with the ferruginous stone. In fact, Wellingborough and the villages adjoining are built of oolitic iron stone, and at a pinch might be carted off bodily to the furnace and then smelted.

The principal Great Oolite quarries are at Bath. Combe Down furnished the stone for the restoration of Henry VIII's Chapel in Westminster Abbey; Farleigh Down supplied Buckingham Palace; Box, Corsham, and Baynton supplied Windsor Castle, Laycock Abbey, and Wilton House; from Shepton Mallet came the stone for Prior's Park College and the Orphan Asylum at Slough, close to the station. Besides these, there are well-known quarries at Bathampton, Bridgwater, Wellington, Yeovil, Stroud (where it is called Painswick stone), Tetbury, Eyeford, Sevenhampton, Bradford, Charlbury, in Oxfordshire (from which many buildings in Oxford have been supplied), Ancaster, in Lincolnshire (Belvoir and Wollaton Hall were built from hence), and Lincoln, from whence came the stone for Grantham, Boston, and Newark churches, and Lincoln Cathedral. The quarries near Stamford furnished stone for Ely Cathedral, and that known as Barnack Rag for Peterborough. In Yorkshire, the Aislaby stone was used for Whitley Abbey, Docks, and the New University Library at Cambridge; while those from Brough supplied Beverley Minster.

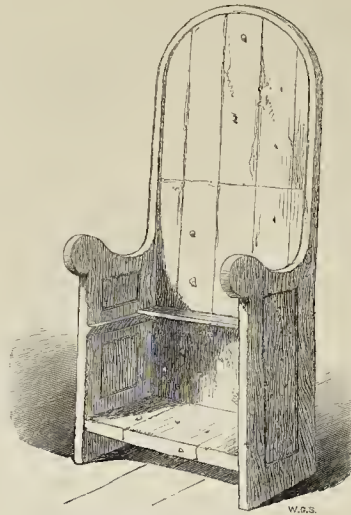
The Fullers' Earth is principally seen at Bath, at the base of the Great Oolite, and is not of much account to the builder, though it furnishes good soil for the farmer. The Fullers' Earth Rock in Dorsetshire is a limestone (not oolitic), and is burnt for lime.

The Inferior Oolite, the lowest of the oolitic series, is a calcareous freestone resting upon the lias. It is pretty constant in its range, although it differs very much in its development, being most splendidly seen in Gloucestershire, at Birdlip, Crickley, Leckhampton Hill (Cheltenham), Winchester, &c. To the east, however, in Oxfordshire it dwindles away, until it is only a few feet thick. Geologists again subdivide the Inferior Oolite into Ragstone, Pea-grit, Upper Freestone, Oolite Marl, and Lower Freestone. The ragstone is principally used for roads. The Upper Freestone at Leckhampton is about 23 ft. thick. It is not so constant in quality as the Lower Freestone; for at Stanway Hill it yields fine blocks, whereas at Broadway and Bourton it is fissile, and made use of as slates.

The Lower Freestone at Cheltenham is 127 ft. in thickness, and when carefully examined, is found to consist of fragments of shells cemented together by carbonate of lime. It is one of the most beautiful stones in the kingdom, rivalling Caen stone in purity of colour, durability, and capability of being moulded.

We close these few remarks on the oolite series of building-stones with a list of the weights (avoidpois) of a cubic foot of some of the principal ones, which we have extracted from the Mining Record of 1858, a valuable compendium of quarries and quarry-stones in the United Kingdom, a new edition of which, brought to the present time, would be of immense use to all concerned in building:—

Locality.	Formation.	lbs. oz.
Tisbury	Portland stone	111 2
Bath (Combe Down)	Great Oolite	116 0
Burford	"	118 2
Box	"	123 0
Dundry (Bristol)	Inferior Oolite	128 2
Aislaby	Great Oolite	128 11
Portland	Portland (Roach)	129 13
Ketton	Great Oolite	128 5
Shepton Mallet	"	130 4
Portland	"	130 4
Swindon	Portland (Bottom)	132 5
Taynton	Great Oolite	133 7
Barnack	"	135 10
Milton	"	136 12
Portland	"	137 10
Yeovil	Portland (Skull-cap)	140 3
Forland	Great Oolite	141 12
Eurbeck	Portland (Curf)	145 9
Chilmark	Portland	151 0
Chilmark	Portland	151 6



The Papal Chair stripped of its finery.

ST. PETER'S CHAIR, ROME.

IN contrast to the venerable chair of St. Peter, of which a recent number of the *Builder* contained an interesting representation, I send you a sketch of the present chair of St. Peter's successor, stripped of its finery, and reduced to the bare boards of which it consists, or did so in 1855, when last I was in Rome.

It happened that, strolling from the Vatican into the Church, on the 15th of January, I found the workmen preparing for a *capella papale* to be held on the 18th, the anniversary, it was said, of the return of the Papal See to Rome, though later by five days than the date assigned to it by Batista Platina. The drapery was being put up for the occasion, and the papal chair, the object of so much pious regard, was there in all the nakedness of its bare boards, a rough, unseemly seat of dirty deal, made up of odds and ends of old materials.

The idea occurred to me that this chair, thus exposed, was not symbolically a bad representation of the Papacy itself, made gorgeous to the sight by its showy externals, as this deal chair by its royal trappings of crimson velvet, and trimmings of golden tissue, so I sketched it and roughly measured it. It was 8 ft. high, 2 ft. deep, and about 2 ft. 9 in. broad. For the sake of Romanism I could have wished it to have been of less homely material, but, wooden as it was, it answered every purpose, was capacious, and had a firm bottom. *Au fond*, all orthodox religions are pretty much the same, the principles of humanity do not alter, nor human duties either, though the tastes and feelings of times and peoples may dress them up differently. Divested of its finery, no plain Protestant parson could desire a more humble chair than the wooden throne of St. Peter's successor: that it is of so perishable a material also suggests a moral, and a deeper meaning when spiritually discerned.

H. C. BARLOW.

ROYAL PRINCESS'S THEATRE.

THE interior of the Princess's Theatre, as left by the late Mr. Charles Kean, with whom the conductor of this journal was long connected in the production of his Shakspearean revivals, had become faded and dirty, and Mr. George Vining, the present manager, did not too soon determine to renovate and adorn. The house has been entirely redecorated at the cost of something like 3,000*l.* The architectural ornaments of the proscenium have been altered, and to the flat surfaces of the front of the dress circle and of the upper boxes, formerly decorated with painting, coupled griffins, and Italian scroll-work, in low relief, more elegantly modelled than we sometimes see them in this position, have

been applied. The whole is solidly gilt on light backgrounds, and so, too, are the enriched plasters that enclose the stage and the proscenium boxes. As a question of principle this substitution of ornament in relief for flat surfaces painted by good artists is open to discussion, but we are willing to admit the necessity for change and novelty that exists with reference to the adornment of places of amusement, as well as other exigencies, and to give praise to the decorative artist employed, Mr. MacIntosh, of Langham-street, for the successful manner in which he has done his work. The ornamental work in relief, we should add (of *carton pierre*), was executed by Messrs. White & Co. The front of the Queen's box and that of a box for the Prince of Wales on the opposite side, are heavily draped with crimson velvet and gilt ornaments, and there being no strong colour elsewhere in the house, look somewhat spotty. The drapery might be lessened with improved effect. The ceiling is painted with Cupids and flowers by Mr. Homan. The lighting of the house was entrusted to Messrs. J. Defries & Sons, and is very well done. The central light—a handsome work of its kind—is a combination of sunburner and glass chandelier, and in addition to this there are two smaller chandeliers with sunlights close to the proscenium, one on each side. The footlights, too, have been altered, and made to obstruct less the view of the stage than was formerly the case. Some improvements have been made in the seating, and Messrs. Telbin and W. Telbin have painted one of their handsome masses of white and red satin curtains for a drop scene; so that altogether the public have reason to be pleased with what Mr. Vining has provided for them before the footlights. Behind them, no less, Handel's "Acis and Galatea" (the words by Gay, Pope, Dryden, and others) is most successfully revived, Mr. Vernon Ripby, Mr. Montem Smith, and Miss Blanche Cole singing so well as greatly to surpass all that was expected of them, and Herr Formes very little disappointing even those who had formed extravagant notions of his fitness for the giant's part.

Mr. F. Lloyds and his assistants have reproduced very admirably the sketches of the late Clarkson Stanfield, including "The Rolling Wave" on the coast of Sicily by moonlight, view from a vineyard looking into a valley, and the Bay with the Temple of Neptune hard by.

London Bridge.—A correspondent again suggests that as the roadways of London-bridge are about to be taken up and relaid, an ornamental iron footway should be thrown out on each side of the bridge, so that the whole of the present footways might be taken into the roadways, to the great relief of the traffic.

THE ROYAL COMMISSION ON WATER SUPPLY.

SOURCES OF SUPPLY OTHER THAN THE MOUNTAINOUS DISTRICTS OF ENGLAND AND WALES.*

HAVING disposed of the gravitation schemes, the Commissioners consider the propositions that have been made to supply the metropolis from—

1. The river Thames and its tributaries.
2. The river Lea.
3. The chalk and oolite formations in the basin of the Thames.
4. Miscellaneous sources.

Mr. McLean proposed, in 1849 and 1850, to dam up the Thames above Medmenham by a series of embankments across the present channel so as to form reservoirs, from the lowest of which, at an elevation of 105 ft. above low water at London, he would make a canal 40 ft. wide and 12 ft. deep to bring the water to London, delivering it at about the level of the Paddington Canal or the New River Head, from which level the lower parts of London might be supplied, and the higher parts by pumping from this level to reservoirs at Hampstead and Clapham.

The drainage area of the Thames to the point selected for the reservoirs is 2,500 square miles, and the mean annual rainfall is taken to be 26 in. The quantity obtainable in this way is estimated by Mr. McLean at 200 million gallons per day.

Mr. Bailey Denton's plan is to collect the water from the oolite sources on the north of the Thames between Cricklade and Oxford, and from the various streams rising in the chalk throughout the whole area. The average rainfall is 26 in.; the minimum between 19 in. and 20 in., and that minimum is disposed of in this way:— 3 in. support the perennial supply of the river; that is to say, maintain the river in summer at the ordinary height." Of the remaining 17 in. a very large share runs off to the sea in winter. The ordinary winter flow as compared with the ordinary summer flow is as 21 to 1.

Mr. Denton proposes three sources of supply: the upper sources of the Thames giving 100 million gallons a day; the Lee 60 millions; the Wey and the Mole 40 millions; making in all 200 million gallons per day, exclusive of the Colne and Wandale, which may provide a share at some future time.

Using the North Wiltshire Canal, and the Thames and Severn Canal, which joins the Thames at Lechlade, for the collection of water, Mr. Denton proposes to bring the water from Lechlade to London by a conduit 127 miles in length. This conduit would collect the water from the various tributaries into a concentrating reservoir to be made just below Oxford. Then, taking in other tributaries, the conduit would bring the water to Hampton, to be delivered to the present Waterworks Company, and by them raised to high-service reservoirs for distribution by gravitation.

The cost is estimated by Mr. Denton at 5,320,000*l.*

Mr. T. C. Brown, of Cirencester, gives information of the rainfall in the upper part of the basin of the Thames from 1815 to 1868. It varied from 19.9 in. in 1854 to 48.8 in. in 1852, and the mean of the twenty-three years was 30 in.

Mr. Bravender says, in respect of some large springs, that Boxwell spring yields 1 million gallons a day. At Ewen there is another of

about the same strength. Ampney spring gives out from 20 to 30 million gallons a day. Bibury spring gives out rather more than that. At Abington a spring gives out more than 2 million gallons a day. A spring above Winson gives out 1½ million. These springs are at a level of from 300 ft. to 380 ft. above the sea. Mr. Bravender estimates that from 9 in. to 11 in. of the mean annual rainfall is available over the whole district.

Mr. R. W. Mylne proposes to bring 70 million gallons per day from the streams and chalk springs of the basin of the River Lea, at a cost of 1,250,000*l.*, in substitution of the present supply of the New River and East London Companies. Of this quantity 47 million gallons would be from the upper sources, impounded in reservoirs on Enfield Chase, and it is proposed to retain the New River channel for the flow of the Chadwell spring, and to collect all the springs issuing from the west bank of the valley between Amwell and Rye House, and lift them into the New River; also to purchase the water rights of the springs which now work Hoddesdon Mill, and to collect these and others in the locality, and lift them also into the New River. The quantity thus obtained would be 18½ million gallons a day, and from the gravel and sands near Hoddesdon 4½ millions additional might be lifted into the New River, making a total of 23 million gallons, which would increase the daily supply to 70 million gallons, in substitution of the present supply of the New River and East London Companies. Mr. Mylne says the advantages of this plan to the East London Company would be that they would obtain water from a purer source, and could distribute it by gravitation instead of pumping, as at present, and the New River Company would have an increased and improved supply.

The Commissioners then refer to the chalk formations in the basin of the Thames. Out of the 3,676 square miles drainage area of the Thames above Kingston, 1,047 square miles, or two-sevenths of the whole, consist of chalk downs. These strata absorb and store a large portion of the rainfall.

In some "general remarks on the sources and springs in the Thames basin," the Commissioners state the drainage area at Kingston to be 3,676 square miles, which receives an average annual rainfall of 27.2 in., and one-third of the quantity due to this rainfall flows down the Thames at Hampton. One-third of the area consists of impermeable clays, and two-thirds, or about 2,450 square miles, of permeable oolitic limestones, sands, and chalk. The rainfall on this latter area does not pass off into the streams at once, but is stored up, and its ultimate delivery through springs to the streams and rivers is spread over weeks or months. "To this cause is owing the permanence of flow of a river draining a permeable rock district, compared with the irregular delivery of a river draining an impermeable district, and it is a consideration of great importance in a question of water supply."

ON THE PRESENT WATER SUPPLY OF THE METROPOLIS.

London is now supplied with water by eight companies. On the north side of the Thames, the New River Company, the East London Company, the Chelsea Company, the West Middlesex Company, and the Grand Junction Company; on the south side, the Lambeth Company, the Southwark and Vauxhall Company, and the Kent Company. The particulars of the present supply are as follow:—

The quantity of water above stated is the daily average of the whole year, but in summer the quantity reaches the following maximum:—

	Gallons per day.
Chelsea	9,042,800
West Middlesex	9,776,707
Grand Junction	11,985,742
Southwark and Vauxhall	13,975,000
Lambeth	10,257,800
New River	26,710,000
East London	20,321,182
Kent	7,198,708
Total	108,312,909

ON THE SUPPLY OF WATER AVAILABLE FROM THE BASIN OF THE THAMES.

The minimum flow of the Thames at Kingston is variously estimated, but looking at all the circumstances, the commissioners conclude that a daily flow of 350,000,000 gallons is an exceptional thing, occurring only for a few days in the course of many years.

The companies are empowered to take the following quantities of water from the Thames:—

	Gallons daily.
Chelsea Company	20,000,000
West Middlesex	20,000,000
Grand Junction	20,000,000
Southwark and Vauxhall	20,000,000
Lambeth	20,000,000
East London	10,000,000
Total	110,000,000

The commissioners are led to believe that storage reservoirs could easily be made on the upper part of the river, to collect floods and equalise the flow, and so neutralise the effect of the severe droughts, and therefore to admit of a still larger abstraction of water if required hereafter.

But apart from the main stream of the Thames, it is also necessary to inquire into the additional quantity which may be obtained from the subsidiary basin of the river Lea. Its area is about 500 square miles, and the mean annual rainfall 25½ in. The upper part, above Hertford, is almost entirely chalk; the lower part almost entirely London clay. The New River Company take 15 million gallons per day from the upper part, between Hertford and Ware, and the East London Company, 19½ millions lower down, being on the whole 37½ million gallons per day, on the average of the year, the quantity in summer being increased to about 40 millions. Adding to this the 5 millions that the companies are bound to leave for the lockage of boats, the present demand on the river is 45 million gallons per day.

Mr. Beardmore, the engineer of the river, makes the quantity passing down the river at Field's Weir for the last nineteen years 108.8 million gallons per day; and in the months of June, July, August, and September of five dry years he makes it (including the companies' supplies) average 45.2 million gallons, which is increased by springs in the valley below the weir. It is therefore clear that without storage reservoirs no more water can be relied on. The Commissioners consider that even with proper storage the Lea valley cannot contribute more than 50 millions.

As to a subsidiary supply from the chalk, the Commissioners do not approve of tapping the reservoirs of water contained in the chalk that feeds either the Lea or the Thames above Hampton, believing that that would only be to reduce, *pro tanto*, the water flowing in those streams, and, therefore, little or nothing would be gained by that; but there is a reservoir of water in the chalk on the south and south-east of London that does not feed either of those streams, but whose surplus waters find their way by springs into the Thames below London.

Seeing that the Kent Company pumps from the few wells they have 7 million gallons per day, and are said to be capable of supplying twice as much, that the Grays Springs are said to be capable of yielding 10 millions, and that a small district near Gravesend has furnished an equal quantity, they believe they may safely estimate that an additional supply from this source of 30 millions gallons per day may be had. Combining these several sources, they estimate that, if ever required, they may calculate on getting from the basin of the Thames:—

	Gallons per day.
From the main stream, supplemented by the aid of store reservoirs, say	220,000,000
From the Lea	50,000,000
From the chalk to the south and south-east of London	30,000,000
Or, say, a total of	300,000,000

* See pp. 593-8, ante.

	Capital.	Approximate area of district supplied.	Number of houses supplied in 1867.	Estimated number of inhabitants supplied in 1867.	Average daily supply in 1867.
From the Thames:—	£	Square miles.			Gallons.
Chelsea	795,000	6½	26,875	170,000	8,087,258
West Middlesex	798,571	10	36,881	275,000	8,816,486
Grand Junction	85,000	24	27,190	245,000	9,533,432
Southwark and Vauxhall	1,100,449	30	71,558	468,000	13,029,758
Lambeth	736,245	25	33,320	230,000	8,975,530
					48,042,467
From the Basin of the Lea:—					
New River	2,609,418	19	113,462	800,000	23,790,867
East London	1,400,000	50	62,462	675,900	19,208,241
					43,088,908
From Chalk Wells in Kent:—					
Kent Company	489,240	60	34,504	240,000	6,468,873
Total	8,760,514	224½	441,442	3,100,000	98,600,248

ON THE PRESENT QUALITY OF THE WATER IN THE THAMES AND ITS TRIBUTARIES.

Mineral or inorganic contents, such as metallic and earthy salts, are found present in water at its first sources, while the organic contents have been added to it by accidental circumstances during its flow.

The mineral or inorganic contents of the water supplied by the companies from Hampton amount usually to about 15 grains per gallon of water, of which more than half is carbonate of lime, and the rest sulphate of lime, with salts of magnesia, soda, potash, and silica, and traces of alum and iron. The waters of the Lea Valley as supplied by the companies differ little from those of the Thames; but those of the Kent Company, being drawn from the chalk, contain a considerably larger quantity of the salts of lime.

The presence of lime gives the water the peculiar quality of *hardness*. Water charged with salts of lime has the property of decomposing soap to a certain extent, by the combination of the lime with the alkali, and this is what is meant by the popular description of the water being "hard." Dr. Clark, of Aberdeen, discovered a mode by which the hardness of water could be defined with great exactness. He first formed a series of artificial waters of several grades of hardness, each containing a known proportion of bicarbonate of lime; and when any unknown water was to be tried, he compared its effects on soap with these as standards, and so at once obtained an accurate measure of its hardness. He proposed to designate the hardness of water by the number of grains of bicarbonate of lime contained in one imperial gallon (or 70,000 grains) of a standard water producing the same curdling effect. This process is known as "Dr. Clark's test," the number of grains being called degrees.

The Thames water at its source is somewhat hard; but flowing water tends to part with a portion of the carbonate of lime it holds in solution, and after a flow of some miles the Thames water falls to a uniform standard varying from 12 to 15 degrees of hardness.

A gallon of perfectly pure water when exposed to contact with chalk (carbonate of lime) will dissolve only two grains of it. It is the carbonic acid gas in the water that dissolves the greater amount of lime, and when the water is boiled the gas is driven off and the lime falls to the bottom, in proportion to the quantity of gas driven off by boiling. The water of Hampton of 14 degrees of hardness is reduced to 3 degrees by boiling. It is the first five minutes' boiling that has the greatest proportionate effect, reducing it to about 6 degrees; but it will go on reducing in hardness by further time.

The professors of chemistry whom the Commissioners consulted considered that moderately hard water is not injurious to health. A change, however, from hard to soft, or from soft to hard, is sometimes injurious.

Water used for culinary purposes is mostly boiled, and thereby the Thames water is reduced from 14 to about 5 degrees of hardness. Water may be temporarily or permanently hard. It is temporarily hard when its hardness is caused by carbonate of lime, which is separated by boiling, while other salts of lime, such as sulphate of lime, are generally dissolved in water without the intervention of carbonic acid gas, and therefore remain in solution although the water is boiled, imparting hardness. The Thames water is of a temporarily hard character.

In making tea soft water acts more quickly and more powerfully on the leaves than hard water does.

With soft water tea is required to stand but a short time before it is ready for use—say five or ten minutes—and the action goes on until the bitter principle of the leaves is extracted, which is not agreeable to some people, while with hard water the tea is required to stand a longer time before it is ready for use, and the bitter principle will not be extracted at all.

For washing and manufacturing purposes all the evidence goes to show that soft water is superior to hard, and for house cleansing and personal ablution it is indeniably so.

So far the *entirely inorganic impurities*. The organic impurities and contamination of the Thames water, though more indistinct in their form, and less appreciable in quantity, render the water at least liable to suspicion.

Owing to the absence of minerals and the non-attraction of any large manufacturing interest, the Thames basin above Hampton is thinly populated. About 230 persons per square

mile, or rather less than 3 to the acre, is the present population.

The sewage from the towns situate on the river and its tributaries, that finds its way into the streams, is subject to a provision of nature for effecting spontaneously its purification. Some of the noxious matter is removed by fish and other animal life, and a further quantity is absorbed by aquatic vegetation; but, in addition to this, important changes are effected by chemical action, the great agent being oxygen. Running waters always contain much air dissolved in them, especially when frequent falls organic matters are seized upon and broken up, and their peculiar organic constitution destroyed, their elements being rearranged into permanent inorganic forms, innocuous and free from any deleterious quality.

All the professors of chemistry agreed with this view, but disagreed upon the question of degree to which water could be thus purified which had been contaminated with sewage, and of how far analysis of the water was a safe guide to its quality as affecting health. Dr. Frankland relies on analysis to indicate, by the presence of nitrates and nitrites, that the water had been in the same proportion subject to "previous sewage contamination," contending that these nitrates and nitrites are the skeletons of previous organic matters derived from sewage, while others consider they may be derived from other sources. The presence of these nitrates and nitrites in moderate quantity is not considered by any of them prejudicial to the consumers of the water, but it is just that degree of moderation which they cannot determine.

Sir Benjamin Brodie, Professor of Chemistry in the university of Oxford, does not rely on analysis for a proof of whether water is fit to drink or not, and thinks the only safe way is to keep the sewage out of the river. Mr. Simon, Medical Officer to the Privy Council, says of one has to do is not to take water out of a reservoir or out of a tap and give it to a chemist, and say, "Tell me, is this wholesome water?" What one has to do is to guard the supply with the utmost strictness against every foul admixture. It ought to be made an absolute condition for a public water supply that it should be uncontaminable by sewage.

With regard to the future influences likely to affect the quality of the water from the basin of the Thames, the Commissioners look forward to the prospect of a probable increase of the quantity of sewage from towns, and rely on the Thames Conservancy Act of 1866 being put in force to prevent sewage passing into the river, or into any of its tributaries, for a distance of three miles upwards. The Conservators have authority under the Act to enforce a penalty of 100l. upon any person or body who may do this, and a further penalty of 50l. for every day during which it is allowed to continue.

By the same Act the five metropolitan water companies drawing water from the river are bound to pay each of them 1,000l. a year to the Conservators in consideration of this Act being enforced.

As to the effect of sewage irrigation in purifying the water, most of the chemists agree that it would be effectual, and that the water, after passing over-land, would part with its deleterious ingredients, and become fit to be mixed with the river water that is supplied to London; but Dr. Frankland goes only so far as to say that four-fifths of the sewage matter is destroyed by irrigation under favourable circumstances.

The Commissioners consider that effectual filtration (that is, we presume, an effectual adoption of the ordinary mode of filtration through sand) is essential to the good quality of the Thames water. Analyses of filtered and unfiltered water show a decided improvement in the quality by the operation.

By the Metropolitan Water Act of 1852, "Every company shall effectually filter all water supplied by them within the metropolis for domestic use." All the companies profess to comply with this provision, but the evidence shows that the filtration has been imperfectly carried out in some cases from the want of a sufficient area of filtering surface, and the Commissioners call special attention to this neglect.

The Commissioners are of opinion that when the sewage and other pollutants are excluded from the Thames and the Lea, and their tributaries, and perfect filtration adopted, water taken from the present sources will be of suitable quality for the supply of the metropolis.

As to the population of London, it was 3,082,374 in the middle of 1867. Mr. Bateman estimates that in nine or ten years it will be 4,500,000, and the Commissioners agree nearly with this estimate, allowing more time than Mr. Bateman does for this population being attained. They assume an ultimate future population of 5,000,000.

As to the quantity of water required, ten gallons per head per day are sufficient for ordinary domestic requirements, including water-closets, but to this have to be added large supplies for street watering, flushing sewers, trade purposes, and other consumption, which, in London, have been estimated at another ten gallons. Then there is waste, often amounting to another ten gallons. Mr. Bateman takes forty gallons as the least quantity that ought to be reckoned on in the future. In Glasgow it is fifty gallons. Mr. Duncan says that in a large town where care is taken to prevent waste thirty gallons per head per day would be about the right quantity, but he thinks it will go on increasing to about forty-five gallons.

Mr. Hawksley thinks thirty gallons abundant. Mr. Simpson says thirty gallons, including all public wastes.

Mr. Hassard states that the Dublin Water-works are estimated to supply forty gallons.

Mr. Rawlinson conceives thirty gallons a head is sufficient, allowing for waste.

Mr. Muir has found ten gallons ample for domestic purposes, and twenty for all purposes; the difference between that and thirty, the present consumption, being entirely due to waste.

Mr. Graves thinks twenty-four gallons ought to be sufficient.

Mr. Beardmore considers that, for all purposes, including waste, the quantity required for London would not be less than thirty-five gallons per head per day.

On the whole, the Commissioners have arrived at the following estimate of the quantity to be provided:—

	Gallons per Day.
The present supply is, say, for 3,000,000 population, at 35 gallons per head, equal to.....	105,000,000
Assume the population to have increased to 4,000,000, and at the same time the additional waste due to the new introduction of the constant service to have increased the supply to 40 gallons per head, equal to.....	160,000,000
By the time the population has increased to 5,000,000 it may be hoped that the allowance may be reduced again to 35 gallons, which would give.....	175,000,000
Or for the maximum summer consumption, say.....	200,000,000
which they consider the highest demand that need be looked for to.	

As to the constant service system at high pressure, they come to the conclusion to recommend it for the metropolis, although the fittings, being adapted to an intermittent supply, will require great alteration. It would appear that the fittings of the London houses are unusually defective, for with a supply of only an hour or two a-day, the waste is very great, while if a constant supply were attempted without a change of fittings, it could not be kept up with the present means of the companies. But the Commissioners recognise the difficulty of introducing a constant supply while the works remain in the hands of private companies, for without constant inspection of the fittings waste could not be prevented; and this done by private authority would be looked upon as an intrusion, and for this and other reasons they recommend that the water supply of the metropolis should be consolidated under public control.

Meakin's Self-acting Sash Fastener.

This sash-fastener is designed to give greater facility for getting immediate ventilation to rooms by readily lowering and raising the large plate-glass sashes now in general use, and to provide a self-acting means of securing them when closed, irrespective of the height of the meeting rails from the floor, many of which are much above ordinary reach. The arrangement consists of two lines attached to the upper sash, passed over suitable pulleys at the top, and terminating in tassels or handles at a convenient hand height. One line passes through "the fastener" in such a manner that on proceeding to open the sash, a spring catch is withdrawn, and the sash is lowered at pleasure. On raising the sash, the catch engages in a locking-plate, and the two sashes are firmly secured, and proof against external violence by burglars. This invention, if the cords can be made strong enough, will supply a great want.

THE NEW LAW COURTS, BRISTOL.

The new buildings in Small-street are now approaching completion. The centre of the site, formerly occupied by a portion of Colston House and Messrs. Ashmead's offices, is now covered with a building intended for the Nisi Prius Court, 34 ft. by 49 ft., and 38 ft. high; and as this room forms the key to the whole plan, it was necessary to place it as nearly as possible at the back of the old courts, in order that the judges' rooms may be together for the purpose of consultation, which has been effected by means of an ante-room. Three doors in Small-street give access to the new buildings, the one under the tower being intended for the judge and barristers and the law library. Upon entering the doorway under the tower, in Small-street, one will pass into a small hall, 22 ft. by 20 ft., and from thence into the law library, formerly the printing-room of the local *Times* and *Mirror*, but now restored and forming a library. The old Norman arches and pillars have been retained in the walls, and parts of these show the marks of having once suffered from fire. An oak screen will divide this room from the barristers' room. The adjoining room (the old type room) will be thoroughly restored, and fitted up as a barristers' reading-room, with a doorway leading into the law library, the old room above it being retained as a consultation-room, and communicating with the rooms on the one pair, towards Small-street, by means of an oriel in the corner of the law library. Passing along the barristers' corridor, one will next come to a wing built upon what was the hack yard of the office, and containing the barristers' robing-room, lavatories, and barristers' clerks' rooms. The floors of this corridor will be laid with Minton's tiles, and the skylights be filled in with enamelled glass of a suitable pattern. The end of the corridor will be connected with the centre corridor into Broad-street, the roof of which will be lowered, and skylights similar to those in the roof over the barristers' corridor, be placed in the same. The rooms under the Bankruptcy Court will be converted into housekeeper's room, sheriff's office, and two consultation rooms, lavatories, &c., attached. The roof of the present court will be raised to the same height as the new court, and a range of windows formed looking over the corridor. The front towards Small-street will be a reproduction of the details of Colston House, and two statues of the Queen and Prince Albert will be placed over the judges' entrance. The whole of the buildings will be warmed and ventilated by Messrs. Haden, of Trowbridge. The Joanna Southcott chimney-piece has been refixed in one of the witnesses' rooms, and the two other large chimney-pieces have been retained in their original positions.

HUMAN FLIGHT.

Man shall fly. These three monosyllables are a clear prophecy of the next great coming event, and involve the only new invention worth mention remaining to be discovered. Man has subdued all his earthly heritage but the air; and his humblest vassals, the sparrow and the bee, are not perpetually to have the privilege of floating the lord of creation on their own domain, and his. But, how to do it? that is the question. How not to do it, though on a colossal scale, has hitherto been the proved triumph of aërostation. An enclosed cloud of wood-smoke, or of carbonated hydrogen, lifts itself up,—and man with it,—fill he over seas creation from its circling belt of upper firmament, and fancies he has flown there; but he has not: he has simply risen like a bubble, and is no more master of the air than a wandering thistle-star. We must manage flight on quite a different principle from that of Montgolfier or Glaisher.

How, then, to do it? Well, we must copy Nature. When Brunel found difficulties in nudertunnelling the rotten Thames, he took counsel of a beetle, which works its way through mud with a shield over its head; when a speaking doll had to be made for aristocratic nurslings, it must have bellows for lungs, a clapper for a tongue, and two nostril pipes to divide the syllables; when the constructor of the navy found it necessary to improve upon paddles,—a fish's side fins,—he added a tail, and forthwith there was a screw steamer. So, with flying, we must imitate birds, or rather bats, and not balloons or bubbles; and for this imitation, the one thing needful is increased muscular power. It is a common mistake to fancy much comparative lightness in a bird. Weigh your culinary

goose and judge; yet this heavy carcass, once well and strongly on the wing, can soar with eagles, and can cross an ocean. What we want is not so much levitation, as an enlarged and continued power of flapping. Give us hundreds of muscles like the breasts of birds,—add the caoutchouc hatlike wings, and the steel-elongated arms, and flight would be as easy to an ordinary man as—let us put it!—to the familiar goose on the common.

How then to give us muscles, and so to adapt them to our extraneous wings as to fly as aloft like Peter Wilkins, and enable a paterfamilias to call for his wing (with a reasonable expectancy of seeing them), as Ingoldsby's Baron of Shurland to call for his boots?

Now, we know that a little wheel, shrewdly cogged, will work a bigger one, and this a bigger still, and so on; until a child's finger, by multiplication of power, may work a mill. Why not apply this principle to the force of a waving arm, which, by help of wheels and springs contained in a breastplate, might work the flappers almost automaton-fashion, and, at slight effort to the man, might keep him energetically flying? The idea is to be well thought out and wrought out, and we shall soon have Sammel Brothers advertising Mr. Spurgeon in a flying suit.

To this Dædalus-and-Icarus theory and practice of the matter our thoughts are tending as to human aërostation. It is curious and instructive to find how true that earliest intuition was of flying, even as the birds fly; how, simply by feathers, and wax, and imitative wings, those practical philosophers, though falling, did their wisest for success; and how, sagely, in these deep days, a statesman, plus minister, plus duke, corroborates that wisdom of old Dædalus, and that filial heroism of young Icarus, in his Grace's "rule of law."

To the writer of these few lines the subject is not a new one. Some five-and-twenty years ago, in an earliest number of *Ainsworth's Magazine*, a certain "Flight upon Flying" from his pen goes fuller into the subject; and sundry lucubrations since have touched it parenthetically; but he now takes leave to throw his fancies once again thus into print off-hand, convinced that the time approaches for man's conquest of the air, as of the sea, the land, the fire; and that the only true principle for success in such a matter is a servile copying of Nature.

MARTIN F. TUPPER.

EDINBURGH.

BUILDING operations are by no means active in this city at present; no new work of any importance has been started since the spring, but there are several rapidly approaching completion. The large site cleared for the Caledonian Railway Station, at the Lothian-road, still remains a scene of desolation, although something is being done in the way of levelling up. There is a hitch as to the erection of the design prepared by Messrs. Peddie & Kinnear owing to the want of funds; but when the Government purchases up the telegraphs the Company will have a large sum in hand, and it will be greatly to their discredit if they erect an unsightly edifice on so conspicuous and admirable a site. In this neighbourhood Mr. Gowans is proceeding with the second block of houses in Castle-terrace; those already erected have an effective skyline broken by high pitched gables and ornamented chimney shafts; but we cannot reconcile ourselves to the so-called "geometric" details; its novelty is its only merit. In the interior arrangements Mr. Gowans has also departed from the usual routine, and here we meet with things more worthy of approval. For example, dark bedrooms in the centre of a corner block are entirely got rid of,—a consummation devoutly to be wished! The water-closets are all ventilated from the outside, and a ventilating pipe is carried from the drains up the chimney shafts to prevent the possibility of foul air entering the houses. Mr. Gowans is appropriating part of the garden-ground opposite the terrace for a boneward, which will be open to the public; the remainder is to be railed in, and laid out as a garden for the residents.

Free St. George's Church is almost ready for occupation, and so is West Coates Church. Mr. Bryce is not so happy in his ecclesiastical as in his secular designs. Neither of these churches is worthy of admiration. The former is classical, and might with perfect propriety be used as a concert-hall. The latter is Gothic, clumsy, squat, and badly detailed.

The Fettes College is progressing slowly, and forms a fine feature in the landscape; Mr. Bryce has been as successful here as he has been the reverse in the other two instances. The bank of Scotland now appears unfortified with scaffolding, and is a commanding and picturesque structure; a little crowded perhaps, but it must be kept in view that the old building had to be incorporated in the new one, and that the site is an exceedingly difficult one to deal with. The dome has been surmounted with a figure entirely gilt, which some facetious individual has designated "the imago of Mammon."

A new church has been erected in the Canonsgate for the United Presbyterian body; it is a plain, unpretending building, in the thirteenth century style. Mr. James Paterson is the architect, and this building is less amenable to criticism than other two more pretensions churches by the same architect in this city, which are miserable adaptations of Italian Gothic.

At the west end a new terrace has been commenced, overlooking the grounds of Donaldson's Hospital; an endeavour has been made to produce variety, by raising high-pitched roofs over oriel windows, and adding metal crests; with this exception, the detail is of the same commonplace character which prevails in the domestic street architecture of the fashionable quarter.

The city improvements in the Old Town are progressing slowly but satisfactorily, and the designs, prepared by Messrs. Cousins & Lessells, in the Scottish Domestic style, are in keeping with the surroundings, and group well. The tenement forming the angle of the Canonsgate and St. Mary's-street, is five storeys in height; the angle is splayed off, and has an oriel corbelled out from it, and is surmounted by a crown-stepped gable. The stair leading to the upper floors is continued in a tower at the south-west angle in St. Mary's-street, and is finished with a high-pitched roof, with an iron finial. The remainder of the buildings towards St. Mary's-street, are four stories high, and have gablet windows and string courses; but there is little or no attempt at enrichment, such being un-called for in the class of houses intended. To the south of these tenements a building has been erected for the Catholic Young Men's Society, which is in keeping with the rest, the only distinctive feature being large windows divided by mullions. This building is to cost about 5,000*l.*, and will contain a library, reading-room, lecture-hall, &c.

At Heriot-mount,—a street which stops abruptly at an eminence overlooking the Queen's Park,—are two notable tenements, as they form a feature in the landscape from their elevated position and bold detail. They are in the Scottish style, and were designed by Mr. R. Thornton Shields. Although possessing all the distinctive features of the ancient buildings,—a characteristic of which was broad wall surface,—this has not been acquired by ignoring the modern requirements of a sufficiency of light, but by taking advantage of the gable ends where few openings are required, and placing them irregularly where needed, and adding large angle turrets, which form useful additions to the interior.

To the west of the Meadows several new streets and terraces have been completed, and others are in progress; generally, they are of the usual stale, flat,—though, unfortunately, not unprofitable,—caste. In one instance, however, incised ornament has been used with good effect.

HOSPITAL CONSTRUCTION.

In the course of the meeting of the British Medical Association in Leeds last week,

Captain Galton said the first object of a hospital was that it should enable the sick to recover in the shortest possible time; and it was now recognised by all that, in addition to skilled attendance, medicine, and food, the essential requirements for insuring speedy recovery were:—Pure air, that was to say that there should be no appreciable difference between the air inside the ward and that outside the building; the air supplied to the ward should be capable of being warmed to any required extent; pure water, so supplied as to insure the removal of all impurities to a distance from the hospital; the most perfect cleanliness within and around the building, a hospital being a place that never rests from fouling itself, and all the products of its foulness being poison. In order to give effect to these principles it was necessary to consider

in the first place, the site of the proposed hospital. The qualities of a site most favorable to a hospital in this country were a situation in the open country, upon porous and dry soil, with free circulation of air round it, but sheltered from the north and east, raised above the plains, with the falling ground from the hospital in all directions, so as to facilitate drainage. The next most important question was the structural arrangement of the building, which must be such as to secure free circulation of air. The first thing was to obtain good healthy wards, everything else, such as administration, means of access, and discipline, being made subsidiary to the question how the sick were to get well in the shortest possible space of time and at the least expense. He spoke in considerable detail of the manner in which this would be best accomplished. Having considered the principles which governed the size and general form of wards, and having shown that, on the ground of economy of nursing power, a ward should contain thirty-two beds, the next point upon which he dwelt was the material to be used for the walls, ceilings, floors, and windows, after which he described what he considered to be the best kind of necessary apartments, such as bathrooms, &c., and spoke of the necessary sanitary accommodation. It was in the detailed application of the principles of hospital construction that so many errors were committed. The architect ought to make his whole design subservient to these principles, and his waterwork should be—light and air, speedy removal of refuse, and great facility of cleansing. The smallest number of parts compatible with the wants of the hospital should be arranged in the simplest form, and solely with reference to the wants of the patients, and to the way in which the service could be carried on with the smallest number of attendants. The architecture should be an expression of the need, and nothing more. Any sacrifice of sanitary requirements to architectural features was wrong. Ornament meant too frequently the creation of corners which delayed and stagnated the air; it meant present outlay and continual cost in repairs. While so much suffering remained unprovided for in the work, it was melancholy to see a large portion of the money gathered with much difficulty for the relief of that suffering diverted from its main object in order to create a monument of the architect's taste. In conclusion, he added another word of caution against building for a long futurity. Rooms used for the reception of the sick became permeated with organic impurities, and it was a real sanitary advantage that they should be pulled down and entirely rebuilt on a fresh site periodically.

Under ordinary circumstances, Capt. Galton's paper would have been received merely as a lecture or expression of advanced scientific knowledge with regard to the subject, and would have excited little or no discussion; but it happens that Sir J. Y. Simpson, as we have already told our readers, has lately called attention to an alleged very high rate of mortality in hospitals after surgical operations, as compared with the mortality after the same operations when performed in the homes of the patients. Sir James further asserts that the mortality after operations performed in hospitals containing more than 300 beds is greatly in excess of that in hospitals containing less than 300 beds; and his statements, if hereafter proved to be well founded, would go far to show that all surgical hospitals are absolute evils, and that great hospitals are great evils in exact proportion to their magnitude. At present, however, these statements command only a very limited assent from the profession. Sir James quotes an old practitioner in Scotland, who has kept no notes, but who says that he has performed fifty-four limb amputations at the homes of the patients, and that none of these patients died. In hospitals the mortality from all causes of limb amputations is considerable, rising in the case of the thigh perhaps to one in three.

A Statue to Cromwell at Manchester.—At a recent meeting of the general purposes committee of the city council, a letter was read from Mr. Noble, the sculptor, stating that some time ago he received a commission to execute a large statue of Cromwell, the condition being that the corporation of Manchester should find a suitable site for it,—inside the new town-hall being preferred. The town-clerk was authorized to assure Mr. Noble that the council would gladly find a site for the statue in the town-hall.

SANITARY MATTERS.

The Sanitary Act.—The Bill to facilitate the raising of money in certain cases for the purposes of the Sanitary Act (1868), enacts that the Secretary of State may certify the amount of expense incurred, or to be incurred, by any person appointed to perform the duty of a deponent local authority; and when such an expense has been certified the Public Works Loan Commissioners may advance the sum requisite on the security of the local rate. Any expense incurred in performing the duty of a defaulting local authority shall be recoverable as if it were a debt due from such authority. If the amount of loan raised be not wholly expended, the surplus may be paid to the defaulting authority. The Secretary of State may make orders for the payment of costs of the proceedings under the several Acts, and such orders may be enforced in the same way as orders for costs of appeals. The Bill is entitled "The Sanitary Act (1868) Amendment Bill," and is the production of the Home Secretary and Mr. Knatchbull Huggess.

Conference on the Sewage Question at Leamington.—A conference of the three Boards of Leamington, Milverton, and Lillington has been held, for the purpose of arranging matters with respect to the disposal of the sewage of the three districts. The clerk submitted an estimate of the works necessary to carry out the new scheme of sewage irrigation. The total cost would be 19,000*l.* in round figures. The annual repayments of instalments and interests, at 6½ per cent., would amount to 1,235*l.*; working expenses, 700*l.*; total, 1,935*l.*, less 450*l.* to be received from Lord Warwick; leaving a balance of 1,485*l.* to be provided for. According to the estimate, Milverton and Lillington would have to contribute from 18*l.* to 150*l.* in aid of the annual outlay. After some discussion respecting the details of the scheme, Mr. Bidde accepted on behalf of the scheme, Mr. Bidde accepted on behalf of the local Board of Milverton, and Mr. Haddon did the same for that of Lillington. The terms of the arrangements were subsequently embodied in a resolution, and adopted by the meeting.

The Water Supply of Bradford.—The residents in the district which is dependent for its supply of water upon the high-level service, have again been threatened with the serious inconveniences resulting from shortness of water from which they suffered last year. In consequence of the continued dry weather the store of water in the Stabden Reservoir had become much reduced, and the waterworks committee found it necessary to announce that, unless the greatest care were taken to prevent the waste, and diminish the use of water as much as possible, both for trade and domestic purposes, they would be under the necessity of placing the district on a short supply. They, therefore, prohibited the use of portable pipes, the watering of gardens, the washing of causeways, yards, or windows.

THE ARCHITECTURAL INSTITUTE OF SCOTLAND: A GRIEVANCE.

On the 1st of April last I, along with a number of architects' pupils, sent drawings in competition for one of the prizes usually offered by the Architectural Institute of Scotland, and we feel very much annoyed that they should be lying there all this time without any adjudication having been made. The usual meeting did take place, I believe, about the 20th of the same month, but no decision was then come to on account of the number of members present being insufficient to form a quorum.

Surely it would require but small exertion on the part of a few of the members to meet and come to a decision so that the drawings might be returned to their respective owners without any more vexatious delay.

P. A.

LITTLE MUNDEN CHURCH, HERTFORDSHIRE.

In our volume for 1868, we mentioned the restoration, under the direction of Messrs. George & Henry Godwin, of Brompton, of All Saints Church, in Little Munden, one among many of the Hertfordshire churches that have been recently brought again into a good state of repair and decent condition, after long years of neglect and outrage. In our present issue we give views of the church, internal and external. The manor of Little Munden, as we have before said, is very ancient. Domesday Book mentions the name of a vassal of Earl Harold, one Levine, to whom it belonged in Saxon times; and tells how

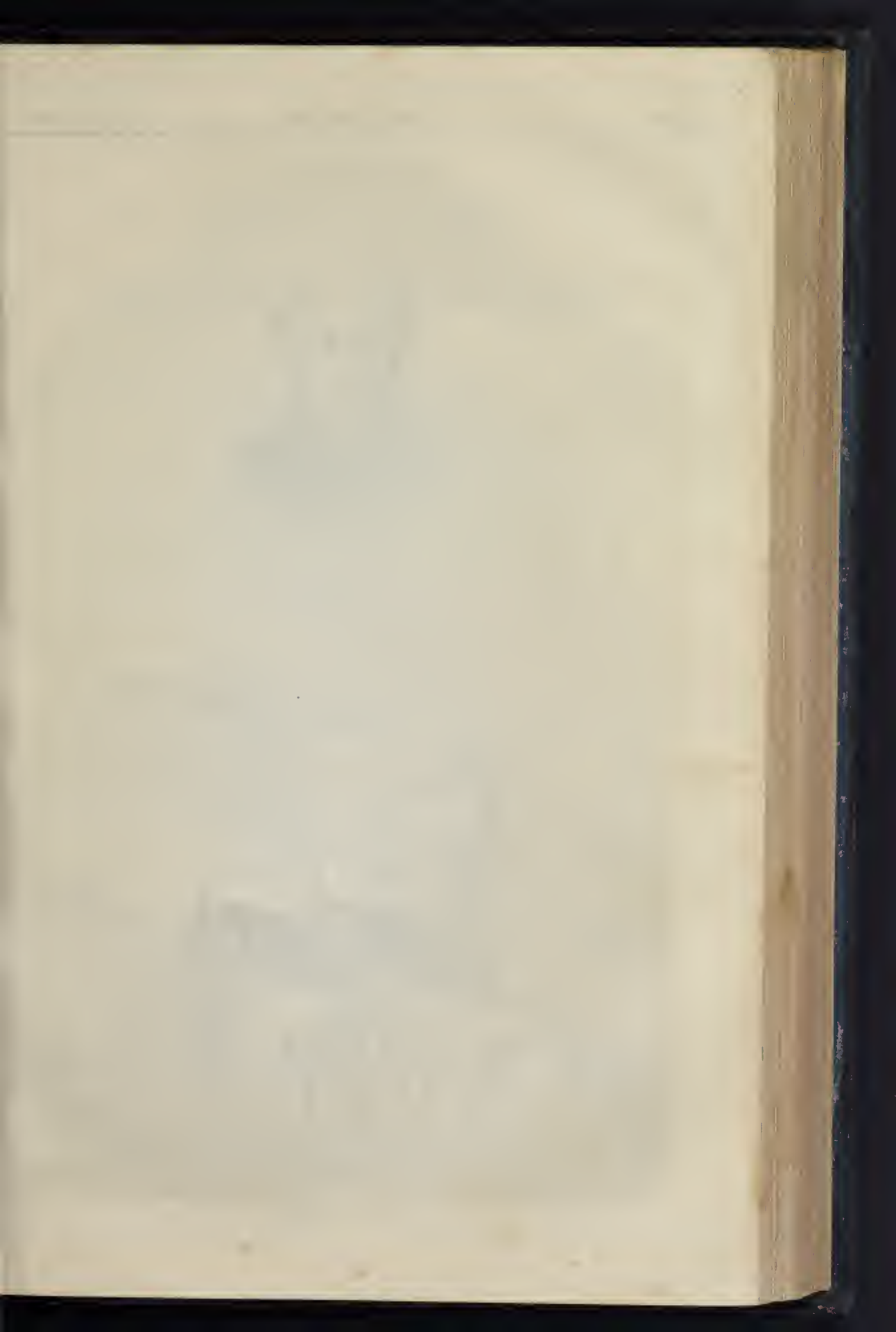
William the Conqueror afterwards disposed of it. The church belongs chiefly to the beginning of the fifteenth century. It contains some remarkable canopied monuments with sculptured effigies, seen in the view. (The church had fallen into a very bad state; the walls required re-facing; the stonework was decayed; the woodwork of the roofs had been disfigured by alterations and time; drainage and paving were bad; new seating throughout was required, with means to warm the church. Through the strenuous exertions of the rector, the Rev. F. A. L. Foster, and the parishioners, money was raised, and the restoration has been carried out.)

The church consists of a west tower, nave, north aisle, a north chapel, and chancel. There was doubtless a much earlier church on the same spot. Some vestiges of this are observable at the north-west corner of the building inside, and have been carefully preserved. The walls, which are of flint, with freestone dressings, have been re-faced, and the windows restored. The modern porches have been removed, and two new ones erected at the north and south entrances, constructed of the same materials as the main body of the building, and in accordance with its style of architecture. A stone groined vault, of which only indications remained, has been put in at the western entrance through the tower. This ought really to be the chief entrance to the church; but it is at present obstructed by a large raised pew, resembling an organ-loft, just over the door. This is private property, and the owner unfortunately could not be persuaded to allow the removal of the unsightly obstruction. The interior of the church and the porches have been paved with tiles. New open seats, of stained deal, have been substituted for the old pews, except in the north chapel and the chancel, where such of the ancient seats as could be used have been worked in. The pulpit and reading-desk are carved in oak. The rood is of tiling. The roof of the nave (one of the Hertfordshire king-post kind) is open, showing the rafters. The drainage has been attended to, and the interior is warmed by hot-water pipes. At the south-east angle of the church a vestry has been erected, the want of which has caused some inconvenience hitherto. The path through the churchyard leading to the north entrance, which was five steps above the floor of the church, has been lowered and levelled. Mr. Ginn, of Puckeridge, was the builder; and Mr. Leigh clerk of the works. The first contract was for something under 1,600*l.*, exclusive of the tower. Afterwards, and mainly through the liberality of the lay patron, Lieut.-Col. Loyd, the tower and spire were restored, and some other works were done, bringing up the total outlay to something under 1,900*l.*

In the churchyard are two yew trees, one comparatively young (seen in our view), the other an aged and noble tree, the hollow trunk of which is more than 19 ft. in circumference, measured 5 ft. 6 in. from the ground; it is reputed to be nearly a thousand years old. Near the west end of the church is a splendid oak of great size, and in the full vigour of its growth. Although "pollarded" many years ago, it promises to become a magnificent tree, and now measures from 15 ft. to 18 ft. in circumference, 5 ft. or 6 ft. from the ground; it has the huge spreading arms so characteristic of well-grown oaks.

At the back of this church, and seen in our view, is one of those fine mixed plantations of fir, larch, and other trees, that always prove so prolific to naturalists. In the early summer of the present year the Giant Morel (*Morchella crassipes*) abounded in this small wood, but with a few exceptions the specimens were allowed to perish ungathered: this enormous and delicious fungus attains a height of 12 in. or more, and a single specimen is sufficient for a hearty meal; with a little care, the morels can be dried and kept for winter use. Though probably not uncommon in this country, it has only been recorded from two localities, and in both cases by the same observer.

The Roman snail is also common throughout the district, but though introduced and "cultivated" with care by the ancient Romans, few people think of eating it now in this country; in other countries of Europe, however, it is used as food during Lent, and is exposed for sale in baskets in the markets of Rome and elsewhere, during the month of March. It is far larger in size than any of our indigenous species, and by this character alone may be recognised at a glance.





MR. GEORGE GILBERT SCOTT, R.A.
Professor of Architecture, Royal Academy.

LITTLE MUNDEN CHURCH, HERTFORDSHIRE.



View of Exterior from South-east.



LITTLE MUNDEN CHURCH, HERTFORDSHIRE: VIEW OF CHANCEL.
RESTORED BY MESSRS. GEORGE & HENRY GODWIN, ARCHITECTS.

BRITISH ARCHÆOLOGICAL ASSOCIATION AT ST. ALBAN'S.

THE Congress has gone on well. Lord Lytton, the President, delivered, as might have been expected, a fine address, in the Town-hall. In the course of it the President said:—The Romans were to the ancient world what the railway companies were to the modern—they were the great constructors of roads and highways. Again, to the Romans the Britons owed the introduction of civil law, and the moment the principle of secular justice between man and man was familiarised to their minds the priestly domination of the Druids, with all its sanguinary superstitions, passed away. It was to Rome, too, that Britons owed that institution of municipal towns to which the philosophical statesman, M. Guizot, traced the rise of modern freedom in its emancipation from feudal oppression and feudal serfdom. When the Romans finally withdrew from Britain, 92 considerable towns had arisen, of which 33 cities possessed superior privileges. Among the most famous of these cities was Verulam, which was a *municipium* in the time of Nero, and the remains of which were being more clearly brought to light by the labours of the association, under the skilful guidance of Mr. Edward Roberts. The members would on Wednesday be enabled, he believed, to see at least the stage, the proscenium, and the orchestra of the only Roman theatre yet found in this country. Lastly, it was to the Roman conqueror that the Briton owed, if not the first partial conception, at least the national recognition of that Christian faith whose earliest British martyr had bequeathed his name to St. Alban's. When they passed to the age of the Anglo-Saxons, their vestiges in that county surrounded them on every side. The name of place familiar as household words marked their residences. And here he might observe that the main reason why the language of the Anglo-Saxon had survived the Norman invasion, and finally supplanted the language of the Conqueror, did not appear to him to have been clearly stated by our historians. He believed the reason to be really this. The language that men spoke in after life was formed in the nursery; it was learnt from the lips of the mother. The adventures of Scandinavian origin who established themselves in Normandy did not select their wives in Scandinavia, but in France, and thus their children learnt in the nursery the French language. In like manner, when they conquered England, those who were still unmarried had the good taste to seek their wives among the Saxons, and thus the language of the mothers naturally became that of the children, and being also the language of the servants employed in the household, the French language necessarily waned, receded, and at last became merged into the domestic element of the Anglo-Saxon, retaining only such of its native liveliness and adaptability to metrical rhyme and cadence as enriched the earliest trances of our English poetry in the muse, at once grave and sportive, at once courtly and popular, which inspired the lips of Chaucer. In the county in which they were assembled were the scenes of fierce, heroic conflict between the Saxons and the Danes. Where now stood the town of Ware anchored the light vessels which constituted the Danish navy as it sailed from London along the Thames to the entrance of the river Lea. There they besieged the town of Hertford, and there the remarkable genius of Alfred the Great, at once astute and patient, studying the nature of the river, diverted its stream into three channels, and stranded the Danish vessels, which thus became an easy prey to the Londoners. Nor was the county destitute of memorials of the turbulent ages which followed the Norman conquest. When Prince Louis of France invaded England to strengthen, with the exception of Dover, resisted his siege with more valour, or with greater loss to the invaders, than the Castle of Hertford, and under the soil around its walls lay the bones of many an invading Frenoman. At St. Alban's, on the 22nd of May, 1455, Henry VI. pitched his standard against the armies of the Duke of Burgundy, led by Richard, Duke of York, and the great Earls of Warwick and Salisbury; and once again, on the 17th of February, 1461, Henry VI. was brought from London to be the reluctant witness and representative of a conflict against his Queen, who, however, delivered him from the clutches of the Yorkists, and sullied her story by a marriage under and cruelty as a few days afterwards insured the Crown to Edward IV. In the summit of Christ Church tower, at

Hadley, was still to be seen the lantern which, according to tradition, lighted the forces of Edward IV. through the dense fog which the expectation of the time believed to have been raised by the incantation of Friar Bungay, and the battle of Barnet, where the power of the great feudal barons expired with Warwick, the king-maker, and a new era in the records of liberty and civil progress practically commenced. But Hertfordshire had also furnished the birth-place or the home of no inconsiderable persons. According to tradition, Cassiobury was the royal seat of Casibelanus, and passing to the noble family that now held its domains, it found an owner as brave as its old British possessor in the first Lord Capel, faithful in life and in death to the cause of Charles I. King's Langley was the birthplace of Edmund de Langley, the brave son of Edward III., and close beside it was born Nicholas Brakepear, afterwards Pope Adrian IV. Moor Park was identified with the names of Cardinal Wolsey and the ill-fated Duke of Monmouth. Sir John Mandeville, the famous traveller, who, if he invented his travels, certainly beat them all in the art of romance, was a native of St. Alban's. Penshanger was associated with the name of Cowper, while the delightful essayist, Charles Lamb, boasted his descent from Hertfordshire. Future archæologists will revere at Brocket the residence of the two distinguished men who swayed the destinies of the country in our time as First Ministers of the Crown,—Lords Melbourne and Moreton by the English connexion, akin still more common,—an exquisite geniality of temper united with a robust and simple manliness of character. At Hatfield, members of the Association would find a place stored with brilliant memories and associations. There still stood the tower from the window of which, according to tradition, the Princess Elizabeth envied the lot of the humble milkmaid, and there was still seen the trunk of the oak under which she heard the news of her accession to the throne. And what Englishman—nay, what stranger from the foreign nations to which, conjointly with the posterity of his native land, Francis Bacon intrusted the verdict to be pronounced on his labours and his name—would not feel that he was on haunted ground when he entered the domain of Gorbamby, and examined the remains of the abode on which the Shakespeare of Philosophy united the most various knowledge of mankind with the deepest research into the secrets of nature and the elements of human thought?

SOUTH KENSINGTON IMPROVEMENTS.

ADVANCING in the style of its buildings, this western suburb is now distinguished by the importance of its wide thoroughfares, and the succession of open squares and spaces, which connect by spacious roads Kensington, with Thrice-square, and the Gore-road with One-square and Earl's-court. Nearly two centuries back the Royal Palace conferred distinction upon the gardens, and the unbroken woodland range to Park-lane, for a mile and a half, together with a dry gravel soil, sloping imperceptibly towards the south, secured a preference for this suburb as the abode of fashion. The foundation of the Exhibition and Horticultural Gardens, and afterwards of the Museum and the Hall of Arts and Sciences, soon transformed nurseries and market gardens into the richest site of residence for the aristocracy: the grand Boulevard of Cromwell-road, the Exhibition and Albert roads, were completed, lines of palatial houses erected, and now a fresh stimulus is given by the Metropolitan Railway, which has placed two stations at convenient distances, bringing Westminster Palace within fourteen minutes, and the City half an hour's journey; and so soon as the Embankment Railway is finished, twenty-four minutes will carry passengers to Cannon-street, when the returns of this portion of the line will be quadrupled. The original founders of this great quadrangle of fashion were, first, Mr. Peake, who built Princes-terrace and the Exhibition road, with the adjacent squares; then Mr. Jackson, who commenced the Albert-road, Queen's Gate-square, and adjuncts; and afterwards Mr. Aldin, who completed the whole extent, as far as Mr. Jackson's present works in Gloucester-road, and at Stanhope-gardens. The houses are all first-class private mansions up to this point; and here a new wide thoroughfare of nearly half

a mile, parallel to Cromwell-road, has been finished in direct line from the Brompton to Gloucester-road Station.

Opposite to the latter, an important range of fourteen shops has been erected, which are nearly all tenanted, and a spacious inn or public-house, which looks full upon the crowds issuing from the station. What that inn may be called—the "Metropolitan" or the "Gloucester"—is yet undetermined. The two spacious thoroughfares enter the Gloucester-road close to the station on either side, one being an extension of the Cromwell-road, 100 ft. wide, at least half a mile, as far as Earl's-court.

A vast improvement is now also in progress by widening the Kensington main street in the narrowest part, near the church. Here an obtruding angle has been cut off and added to the road, at the public expense, and by the Board of Works; but at the Kensington Gore end, opposite to where the old barracks stood, Messrs. Cubitt have made a total transformation. They have built a fine double range of houses, and opened a road leading in continuation to Gloucester-road, which at this point turned off in a narrow defile eastward. No one knew the object in view, until that firm bought the old Campden Arms, at the corner of Kensington Gore, pulled it down, shut up the old road, and then commenced a suitable range of private mansions facing the Park and Gardens, giving the public a straight thoroughfare in lieu of the old dingy hollow. Messrs. Cubitt, at their own expense, removed the dead wall and the quaint old summer-house to the Bayswater side; thus opening out the view of the long walk. Some years back the writer treated the subject of the barracks, in the public press, as most unsuitable for troops, and obtrusive upon public liberties of the Gardens; since which they have, under care of the Commissioners, given place to beautiful floral parterres.

The dry gravel soil, open south aspect, and healthy atmosphere of South Kensington secure for it the preference over the north side of the Park, and thus the houses, even in the lateral streets, are purchased or rented, and occupied as soon as finished. T. H. H.

THE NEW POST-OFFICE FOR SHEFFIELD.

THE Post Office authorities have submitted to the Mayor of Sheffield the plans for a new post-office in that town. The site is at the corner of Old Haymarket and the new street about to be made to the new Midland station. To the Haymarket frontage is 45 ft., and down the side street about three times that length. The corner will be occupied by a square building three stories high, bold in its architectural characteristics, and behind it will be an oblong one-storey building, 80 ft. long and 30 ft. wide, for the sorting of letters. Under the latter will be a basement floor, containing refreshment-rooms and other conveniences for the sorters and letter-carriers, with living-rooms for the porter of the establishment.

The arrangements of the office are briefly these.—On the ground floor, entered from the Haymarket, will be the front office, where the business with the public will be transacted; and behind it the sorting-office, where the letters will be received for transmission or delivery, and whence they will be despatched. In the front office applications for letters, money orders, the sale of stamps, savings bank business, the receipt of telegraphic messages, &c., will take place. The room for this purpose will be 32 ft. by 30 ft., and 16 ft. high. It will be occupied by a counter in the horse-shoe shape, 62 ft. long, with space for twelve clerks, instead of the four or five now employed. It is stated that this arrangement of transacting business at a counter instead of at a window, has been found in other places very much to conduce to despatch, economy, and to the keeping of good order. Behind this will be the box (in the new street) for the receipt of letters and newspapers, and the station for the postmistress, who will be so situated as to overlook all the business going on in the front office and in the sorting office behind. The mail bags will be received at, and sent out from, a door in the side of the sorting office next the new street. This office will be lighted with windows on each side and from the open roof. It will be 80 ft. long and 30 ft. wide, and will rise to the height of 30 ft. It will afford accommodation for 120 sorters, the highest number now required being fifty. On the first floor will be a room 30 ft. long

and 12 ft. wide for the telegraph instruments, and this floor will also be occupied by other rooms for subordinate purposes. The second story will be 14 ft. high.

The top story containing rooms 11 ft. high will be occupied by the Inland Revenue officers.

ART AND SCIENCE INSTITUTE FOR LEEDS.

A MEETING was held in the Town Hall at Leeds at the latter end of July, to establish an Institute of Art and Science for the town. A committee was formed, with the head-master of the Leeds Grammar School as chairman. A head-master, Mr. Walter Smith, and a second master, Mr. A. Stevenson, were appointed. It was resolved to commence operations with a school of art and science, the final object being stated to be to provide efficient schools for art and science teaching, and to establish galleries of art and museum of industry free to the public, and free also to the students of the art and science schools. It was determined to carry on the schools under the direction of, and in connexion with, the Science and Art Department of the Government, and eventually to erect a building wholly devoted to secondary education, with the advice of the Art Department.

This has long been required in the town, which is the last of the large towns whose schools have ceased connexion with other institutes not of an educational character.

The movement may be regarded as one of the first fruits of the Leeds Art Exhibition of 1868, and we hope will lead to a permanent record of the effects of that exhibition, in the form of a building to advance the taste and education of the district. The Art and Science School was formally opened on August 4th.

SOUND.

SIR,—In the last number of your esteemed publication are a few words on the effect obtained from 10,000 voices as "producing no more apparent noise or power than 1,000 in an ordinary concert-room." This can be accounted for on the following grounds:—The space of a room or large building regulates the amount of sound produced from a certain number of performers in proportion to its size, and where, like the Crystal Palace, the space is great, the sound diminishes on the ear through having so wide a space to traverse; and this is one reason why a chorus of 700 at Exeter Hall produces as much sound as four times the number in a building three times the size. While listening to a performance at the Crystal Palace I have observed one drawback in particular, that of the solos being partially lost in effect, like a vocalist singing in the open air; and until the division where the performances take place was partially enclosed it was worse than at the present time.

HAYDON WILSON, Professor of Music.

MEMORIAL OF THE LATE COUNTESS OF ELLESMERE.

THE memorial of the late Countess of Ellesmere, at Walkden Moor, Manchester, has been formally presented to the keeping of the present earl, at an open-air ceremony, which took place on the occasion.

The memorial stands in a large open space near Worsley Stocks. A view of the design was given in our vol. for 1868, p. 510. It is in imitation of the crosses which at the end of the thirteenth century were erected to the memory of Queen Eleanor. It is raised on a pyramid of steps, and the superstructure is divided into three stages. The lowest is square in plan, and consists of a solid basement on which rests a central column, surrounded by four groups of clustered columns, one at each angle, which carry pointed arches, trefoil cusped, and surmounted by pinnacles with crockets and finials. There is an enriched pinnacle at each angle, containing at its lower part a niche. The four statues which fill these niches represent a Lancashire operative, a collier, and two factory girls in their characteristic costume; these were copied from life studies. A parapet of open tracery finishes this stage at the top. The second stage is octagonal in plan, with buttresses on the four oblique faces which unite it in outline with the square stage below. The four direct faces of the octagon contain niches with

cusped and pedimented canopies in which are life-size statues of the four virtues—Piety, Charity, Munificence, and Prudence. This stage is also finished with a parapet of open tracery. The third and top stage is cruciform in plan, with pinnacles and crocketed gables on the four direct faces, and is surmounted by a spirelet and a stone cross. The total height from the ground to the top of the cross is 50 ft. The foundations, including 4 ft. of concrete, are 6 ft. deep below the ground.

THE EAST LONDON RAILWAY.

ON the 30th ult. the members and associates of the Society of Engineers visited the works of the East London Railway. The line, as at present laid out and nearly completed, commences at the Wapping end of the Thames Tunnel, through which it proceeds, running past the Grand Surrey Canal Docks and through Deptford to the Old Kent-road Station of the South London Railway. A branch which leaves the line near Rotherhithe runs to New-cross, where it communicates with the North Kent and the London and Brighton Railways. The Surrey Canal is crossed by these two lines, in each case by a lattice girder bridge of 80 ft. span, with two side openings of 13 ft. span each. So far, the line is nearly ready for opening, a preliminary notice to that effect having been given by the company to the Board of Trade. The works remaining to be executed consist of the portion of the line between Wapping and Liverpool-street, which latter place will eventually be the terminus of this railway. The completion of this section of the line, however, will occupy about two years, the works upon it being of a heavy nature. It will be seen that the East London Railway will unite the Brighton, South London, South-Eastern, and North Kent Railways, accommodating in its course the Surrey and Commercial Docks, the London Docks, and the east of London. The London and North-Western Railway will also be brought into this system. The line will thus open up the districts of Rotherhithe, Wapping, Deptford, St. George's-in-the-East, Limehouse, Stepney, Whitechapel, Bethnal-green, Bishopsgate, and Shoreditch, thereby affording an outlet by the principal railways of the kingdom for the most densely populated parts of the metropolis. The terminus is to be erected in Liverpool-street, close to the Bank and Royal Exchange. Mr. J. Hawkshaw is the engineer-in-charge of the line, the contractors being Messrs. Brassey, Wythes, and Lucas, Brothers.

ANNUAL INTERNATIONAL EXHIBITION.

HER Majesty's Commissioners for the Exhibition of 1851 announce that the first of a series of annual international exhibitions of selected works of fine and industrial art will be opened in London, at South Kensington, on Monday, the 1st of May, 1871, and be closed on Saturday, the 30th of September, 1871. The exhibitions will take place in permanent buildings about to be erected, adjoining the arcades of the Royal Horticultural Gardens. The productions of all nations will be admitted, subject to obtaining the certificate of competent judges that they are of sufficient excellence to be worthy of exhibition. The objects in the first exhibition will consist of the following classes, for each of which will be appointed a reporter and a separate committee: I. Fine arts; II. Scientific inventions and new discoveries of all kinds; III. Manufactures; and IV. Horticulture.

LOWESTOFT PUBLIC HALL AND ASSEMBLY ROOMS COMPETITION.

SIR,—Will you allow me to draw attention to some particulars of the above, a copy of which I send you? First, as to accommodation. Required, "a public reading-room, a class-room, with suitable cloak and retiring rooms, two lodge or club rooms, each to seat 150 persons; hall and cellars. A good elevation must be furnished. Roughly calculating the least space required for the above, I make the cubical contents 210,000 ft. Now as to outlay—"the cost of the buildings not to exceed £5,000; 1st outlay—"to be paid upon to superintend the erection of the building, such premium will be deducted from the commission to be paid for the same."

I shall make no remarks; such insults to the profession have been too often brought before your notice; but I think it is as well that this case should be made public.

F. A. KILLEN.

BRIXWORTH CHURCH.

SIR,—I believe the British Archaeological Association, while publishing its journal papers read at its meetings, by no means undertakes to become responsible for the correctness of the theories of the authors, nor even the implicit accuracy of the plans or drawings produced with the same; in this way acting like all other societies. In respect to the plan given in their journal for December, 1863, together with a paper, by Mr. E. Roberts, on Brixworth Church, and referred to in your Note from Northampton, in a recent number, I would say I was present when Mr. Roberts read his paper, did my best to demolish his theories on the building, and produced my correct, with a sketch-plan, rough, and not to scale, but open by the Rev. Mr. Watkins, its rector, for the British Archaeological Association, when they visited Brixworth. Mr. Roberts's plan is utterly incorrect, in so far as three of his five cubical never had an existence, but that a transept space, if one may so call it, finished off the end of the original north aisle, with a vestry space to east of it again, the top of the original door from which vestry into church is actually shown in Mr. Roberts's northern elevation.

There is also no doubt that the circular nave columns (dotted) shown on his plan are merely a fancy, as also his idea of the vaulting of the nave. As to its being a Roman building, I am desperately sure in this view is as little tenable as are those of Mr. Roberts.

As a member both of the Association and of the Northamptonshire Architectural Society, it seems to me such views should not quietly be allowed to pass unquestioned.

JAS. THOS. LEVING.

P.S.—In justice to Mr. Roberts I may mention, that the Rev. Mr. Watkins, to show that walls did not occur between all the piers and the original exterior north wall, had trenches also made in those places, and these cross trenches which here showed earth alone, are shown on Mr. Roberts's plan as walls, and probably led him into the mistake.

BUILDERS' BENEVOLENT INSTITUTION.

THE 22nd annual meeting of the subscribers and friends of this charity was held on the 29th ult., at Willis's Rooms, King-street, under the presidency of Mr. G. F. Frothingley, rector of the institution, in the chair. The secretary read the report, which stated that the directors are not able to announce an election of pensioners in November next, as a larger number of applicants than usual (12). The directors do not consider this circumstance to be owing to any decreased interest in the charity, but to the want of relief funds and 10s. 6d. for the building fund, making a total of 14,760. 9s. 11d. stock, divided as follows:—11,792. 9s. 6d. for the relief fund, and 3,014. 11s. 6d. for the building fund.

The above, together with the balance sheet, having been approved and adopted, Mr. J. M. Macey was elected president for the ensuing year.

The usual routine business was then proceeded with, and the meeting closed with a vote of thanks to the chairman.

ESSEX ARCHAEOLOGICAL SOCIETY.

THE annual excursion and meeting of this society have proved, in most respects, a success. The part of the county chosen this year for the society's visit—the district lying around St. Osyth—is full of antiquarian and historic lore, and the weather was genial. There was a large assemblage of members and their friends, including several gentlemen of extensive acquaintance with archaeology. It was arranged that, contrary to the usual custom, the excursion should partly precede the meeting for general business. Accordingly, the visitors were taken first to view the churches at Brightlinges and Thorrington. The principal objects of the two buildings were pointed out and explained by gentlemen forming part of the excursion.

The Priory erected in memory of St. Osyth and the grounds were then visited; and the "meeting" proper was held in a room over the gateway. The chair was occupied by Sir T. B. Western, bart., lord-lieutenant of the county, and there was a numerous assembly. Many objects of interest were exhibited, and some of them commented on. The report was read and adopted, and other business transacted. Mr. Watney, of London, then read a paper on the Priory, and Mr. C. F. Hayward communicated his ideas on the subject to the meeting. The examination of the Priory was resumed with interest, Mr. Hayward explaining many of its features in detail.

The church of the village was next inspected, and a luncheon succeeded in the schoolroom, the day's proceedings being wound up by visits to the churches of Great and Little Clacton.

It was resolved that the general meeting of the society shall be held next year at Braintree or Witham.

INAUGURATION OF THE REGENT'S PARK FOUNTAIN.

The new drinking fountain which has been presented to the metropolis by Cowasjee Jehangheer Ready money, Companion of the Star of India, has been inaugurated by the Princess Mary, of Cambridge and Teck. The structure is composed of ten tons of Sicilian marble, with four tons of red Aberdeen granite, the latter forming the four corner pillars, which are polished and surmounted with capitals carved in the semblance of flower leaves, &c. The four streams of water come from white marble lilies into as many polished granite basins, and the pediments over them are carvings to represent the Queen, the Prince Consort, and the donor of the fountain, the fourth side having a timepiece. A lion and a Brahmin hull are also among the ornamental sculptures. The whole structure rests on three hexagonal granite steps, and is surmounted by something resembling a steuple, and giving the fountain at a distance a Gothic effect. It is, however, not confined to any special style of architecture.

The address to the Princess stated that the fountain had been erected at the cost of Cowasjee Jehangheer Ready money, esq., a member of one of the most distinguished Parsee families of landed proprietors in Bombay, who had long been renowned in his own land for his assiduity and acuteness in financial operations, and his munificent support of all works of benevolence, and who during the last few years had contributed more than 40,000, to colleges and schools, 30,000, to hospitals and dispensaries, and more than 30,000, to other benevolent institutions in India. The design was prepared by Mr. Robert Kerrie, the architect of the Metropolitan Drinking Fountains Association. The works have been executed by Mr. Henry Ross, sculptor, the cost being about 1,400l.

PLYMOUTH PUBLIC OFFICES COMPETITION.

The twenty-five sets of designs sent in are set forth in the Tea-room of the Royal Hotel awaiting the decision of the Town Council. We take the liberty of advising that body to obtain professional assistance in arriving at this decision. The council have asked for more than they can get for the sum named (without asking for all that is needed), and this sum they have described sufficiently vaguely to induce the authors of some of the best designs to submit proposals for buildings that will cost more. All the circumstances should be duly weighed before the selection is made.

SOCIAL SCIENCE ASSOCIATION.

THE annual business meeting of members of this Association was held on Friday, the 30th ult., to receive a report from the Council, and to elect officers and standing committees for the ensuing year; Mr. G. W. Hastings in the chair. It was reported that during the session just brought to a close there had been thirty-six meetings for the reading and discussion of papers; representations by means of deputations or memorials had been made to the Government in reference to the control of criminals, the Bankruptcy Bill, the Endowed Schools Bill, the Scotch Education Bill, the Extension of the Contagious Diseases Act, the suppression of gambling farms in Hong Kong, and the registration of nurses. A deputation also waited upon the Earl of Mayo previous to his lordship's departure for India, to urge the necessity of instituting inquiries as Governor-General into the prison discipline of that country. Petitions were presented to Parliament on the subject of the Habitual Criminals Bill, the Endowed Schools Bill, the Beer House Licensing Bill, the Real Estates Intestacy Bill, the Evidence Further Amendment Bill, and the Married Woman's Property Bill. A communication was made to the Trades Union Commission, strongly recommending the appointment of a public prosecutor or the repression of outrages of the kind which had been brought under their notice. A form or the preparation of hospital accounts had been drawn up and circulated among the principal metropolitan and provincial hospitals, with a view to introduce uniformity, and render investigation comparatively easy. The Joint Committee of the Association and the British Medical Association had framed a schedule for presentation to the Sanitary Commission illustrative of

an inquiry into the whole subject, and for the United Kingdom. Officers and standing committees were elected for the ensuing year, and a vote of thanks was passed for the services of officers during the last year. The next annual Congress was announced to take place at Bristol on the 29th of September next.

COMPETITIONS.

Newcastle Industrial Dwellings Company, Limited.—In answer to their advertisement the directors of this company have received a large number of competitive plans and models, many of them possessing considerable merit. The committee appointed to adjudicate on them met on Tuesday, and unanimously selected the design bearing the motto, "As the home, so the people," as best adapted to carry out the objects of the undertaking. We understand they are by Mr. Johnson, of Clayton-street, Newcastle, the architect of the New Town Hall, and other public buildings.

Blairgowrie.—The Committee of the Working Men's Club have selected the design sent by Mr. Alexander Johnston, Architect, Dundee. As the site is fixed, the building is expected to be commenced at once.

CHURCH-BUILDING NEWS.

Reading.—The new church of St. Mary, at Mortimer, has been consecrated. In the spring of 1868, the old church was pulled down to its foundation, a temporary building having been previously erected by Mr. R. Benyon, M.P., at his sole expense, in the rick-yard of the Church farm. It had been decided that the new church should be erected on the site of the old one, but with a somewhat extended area. One curiosity, a sepulchral monumental stone of great antiquity, but, unfortunately, broken transversely, was discovered under the floor of the south aisle. It proved to be of the Anglo-Saxon period, and referred to the tenth or eleventh century. It is built into the wall of the vestry in the new obchuro. Mr. Benyon offered to defray the cost of the new building, which will amount to between 14,000l. and 15,000l. The approach to the church has been greatly altered and improved. The ground has been lowered nearly 3 ft., and now the church is approached from Mortimer-street by a good road 30 ft. wide. The church has a lofty tower and steeple. It is built in the Early Decorated style. The material is principally Swindon stone, the interior being lined with Bath stone. The church will seat nearly 600 persons. The whole of the work has been carried out by men employed on the spot, under the superintendence of the clerk of the works, Mr. William Rhind. Mr. R. Armstrong, of London, was the architect. There are two entrances to the church, north and south. The nave is about 70 ft. long by 21 ft., the aisles are 14 ft. wide, and the chancel is 30 ft. by 19 ft. The roof is throughout of American pitch pine, and hammer-beamed, with moulded principals, left unpainted and uncoloured. The roscodis is composed of a variety of marbles, including Emperor's red (Italian), Irish green, Sienna, Devonshire, Derbyshire spar, and jasper. The windows are mostly stained glass, and the geometrical tracery throughout is varied. The east window was subscribed for by the parishioners, as an acknowledgment of the liberality of Mr. Benyon in building the church. It is of stained glass, and represents several incidents in the life of our Saviour. Mr. O'Connor was the artist. On the south of the chancel is a double lancet memorial window, presented by the relatives of the late Capt. Gould. The west window of the north aisle is also in memory of Captain Gould, and the artists were Messrs. Clayton & Bell. In this window the three Graces,—Faith, Hope, and Charity, are represented; and there are three medallions, illustrative of the Relief of Lucknow, where the late Captain Gould distinguished himself. The west window in the south aisle is in memory of Mrs. Forsyth, and was manufactured by Mr. Hardman, of Birmingham and London. The window was the gift of Mr. Forsyth, Q.C., of Mortimer. The west window is large. It represents the four Evangelists, and was the gift of Mr. Benyon. It was executed by Mr. Clinterhuck, of Stratford, Essex. In the north aisle are memorial windows presented by Sir Paul Hunter, bart. The subjects are the Nativity, the Triumphal Entry into Jerusalem, the Resur-

rection, and the Ascension. They are double windows, and one is in memory of Sir Paul Hunter's father and the other of his grandfather. A portion of the glass belonging to the old church was removed, and has been used in the present building. The window in the north was the gift of Mrs. Bazalgette; that on the south by the sons and daughter of the vicar, in memory of their eldest brother; that on the north side of the west end by the vicar and Mrs. Gould, in memory of their eldest son; that in the west end of the north aisle, representing the Marriage in Cans (Hardman), by the two sisters of the vicar; the window in the south aisle (transferred from the old church) is a memorial to the Nohle family; and the window in the south aisle, to the memory of the late Mr. and Mrs. Fellowes, was the gift of Mr. Benyon. All the other windows were given by Mr. Benyon. This is the sixth church built or restored by Mr. Benyon.

Hungerford Newtown (Berks).—The foundation stone of a new school chapel has been laid on a site given by Mr. F. Loveleok Coxo. The building is to be erected from plans prepared by Mr. A. W. Blomfield, of London, the contract having been taken by Mr. Woodbridge, of Hungerford. It will afford accommodation for sixty or seventy children, the dimensions being 44 ft. 6 in. by 18 ft. wide, with a 10 ft. apse or chancel. The material used will be brick, and the building will be covered in with plain tiles. The estimated cost is 500l.

Lindfield (Sussex).—The first step has been taken in a movement having for its object the restoration of the roof of Lindfield Church. At present the interior is disfigured by a lath-and-plaster ceiling. It is proposed to remove this, and to repair the roof. A gentleman who recently visited the place, made the following offer to the rector, the Rev. J. Milner;—that he would give 20l. towards the repair of the roof if twenty-five others would contribute like amounts. This would yield a sum equal to the estimated cost of the work,—about 500l.

Rawmarsh.—The corner-stone of the new tower for the parish church at Rawmarsh has been laid. The old tower, which has now been demolished, formed part of a church which stood on the site of the present one some 600 years ago; the nave of the church was from time to time altered, until at last it was superseded by a new one, and then it was found that the old tower did not correspond very well with it. The architect, Mr. Pritchard, of York, now deceased, was consulted, and he was of opinion that the tower was strong enough to bear an addition being made to it. The advice was acted upon, but it was subsequently found that it would be dangerous to allow it to remain. The cost of the new tower will be about 700l., and will be defrayed by subscriptions and a voluntary rate of 6d. in the pound. The work has been contracted for by Mr. Harper, of Mashro'; the architects being Messrs. Blacknoor & Mitchell-Withers, of Rotherham. Besides the erection of this new tower, the interior of the church will undergo some alterations, and there will be a new pulpit and reading-desk.

Longsight.—St. John's Church, Longsight, has been reopened. It has been cleaned, painted, and decorated. The chancel, nave, and transept arches are surmounted by ornamented scrolls, containing texts from Scripture. On either side of the chancel arch the commandments have been placed. The walls of the chancel are painted in the style of the thirteenth century. The spaces are partitioned off in mimic masonry, crossed at intervals with hands, the spays and borders round the stained-glass windows having conventional representations of leaves and flowers. The roof is coloured deep Antwerp blue, spangled irregularly with stars of different sizes. The painting was executed by Mr. Joseph Bardsley. Most of the windows are filled with stained glass by Messrs. Lavers & Barrand.

Bampton.—The chancel of the parish church and other parts of it which have undergone restoration have been reopened for divine service. The contractor for the chancel was Mr. Luker, of Faringdon; the contractors for the transepts were Messrs. Lord, Williams, and Robert & David Plaster; Mr. Wakeford was clerk of the works. The heating apparatus was supplied by Messrs. Bacon & Co., London. The committee gave all employed a supper, at which one of the members took the chair. For the necessary expense of a forthcoming contract 700l. are already promised, and 1,000l. more are required. Of the sum already expended, 500l.

have been contributed by Mrs. Southby and her family; and the carved lectern was presented by a member of the same family. The interior fittings of the nave and aisles are being taken out, and the old portion will soon be subject to the operations of the contractor.

Kea.—A vestry meeting of the parish of Kea has been held "to consider the dilapidated condition of the church, and to ascertain the opinion of the parishioners as to the desirability of its being rebuilt." Plans and elevations from Mr. St. Aubyn, architect, for church and tower in the Early Decorated style, on the site of the present building, were exhibited, and the vicar expressed his belief that the body of the church would cost about 1,500*l.*, and the tower, which might perhaps be postponed, about 1,000*l.* The promised contributions at present amount only to about 700*l.* Eventually it was resolved that it is desirable that the parish church be rebuilt, provided the necessary funds be obtained, but that the work be not commenced until two-thirds of the estimated cost of the rebuilding shall have been subscribed.

Kinnersley (Herefordshire).—St. James's church here has been repaired and restored, under the superintendence of the diocesan architect, Mr. T. Nicholson. The old pews have been swept away and replaced by modern benches, new floors have been laid—black and red tiles and boards—and the floor itself, which was originally on one level, has been graded, being now divided into nave, chancel, and sacristy levels. A single window, to match others already existing, has been inserted in the west end of either aisle. The roofs have been stripped, new boarded and newly tiled, and the plaster ceilings which used formerly to exist, have also been cleared out, and the ancient woodwork, being considered of sufficiently sound character, has been cleaned and varnished, and allowed to remain; new pine cornices having been added. A new chancel arch, in the pointed style, has been added, that part of the partition above the chancel roof being pierced on either side with a lancet. Here, too, a low sub-wall has been added, dividing the chancel from the nave. The church is warmed with one of Gurney's patent radiating stoves. The whitewash has been cleaned off the interior windows and arches wherever necessary—the decayed state of some of the stonework necessitating a coating of plaster on the principal walls. A new organ, the gift of Mrs. Fenwick Reavely, has been placed in the east end of the south aisle. This instrument is by Bevington, of London, and contains open stop, diapason, dulciana, and principal. The work has been carried out by Mr. Powell, of Hereford, at a cost of close upon 1,000*l.*

Yelling.—Holy Cross Church, Yelling, Hants., has been re-opened, after having been closed for sixteen months, for necessary repairs. A great portion of the foundations had been discovered to be in an unsafe state, and the walls exhibited unmistakable signs of a tendency to fall. It was consequently found indispensable to rebuild the north aisle, and to strengthen a great part of the rest of the fabric. This has been done under the direction of Mr. Preedy. A window, also by Mr. Preedy, representing St. Paul before Felix, has been placed in the north aisle, as a memorial of a former rector.

Teddington.—The memorial stone of Christ Church (Free Church of England) has been laid here by Lord Ebury. It will be an Early English structure with nave and aisles, north and south chapels, and chancel. There will be a tower with broach spire at the west end, 160 ft. high. The walls will be of Kentish rag, with Bath stone dressings. The inside will be lined with the Burnham pressed bricks, and the spandrels of the nave arches will be filled with Pether's diaper bricks. There will be seats for 800 persons. The woodwork will be all stained and varnished. The works are being carried out by Messrs. Manley & Rogers, from the designs and under the superintendence of Mr. Thos. Goodchild, architect.

Highclere, Hants.—The Countess of Carnarvon has laid the foundation-stone of a church at Highclere, near Newbury. The old parish church being in a very dilapidated state, Lord Carnarvon determined to erect a new edifice, which is now being built on a site close to his lordship's park, and within a very short distance of the village of Highclere. Mr. G. G. Scott is the architect, and Messrs. Jackson & Shaw, of Westminster, are the builders.

South Hornsey.—The foundation-stone of a new church is about to be laid at Brownswood

Park, South Hornsey, opposite the entrance to the new Finsbury Park, in the Seven Sisters-road. The site chosen is a piece of land about midway between the Slince House and where Hornsey Wood House formerly stood, the whole neighbourhood of which—only a year or two since nothing but fields—is being rapidly built upon. The new church, which will be in the early pointed style, with a spire, is to be built from the designs of Mr. Frederick Wallen, and is to be dedicated to St. John the Evangelist. It will be built without galleries, and will afford sitting accommodation for nearly 1,000 persons, and the cost of the building will be about 7,000*l.*

Lapford Church (Devon).—This church, noted for a good perpendicular tower, and a roodscreen one of the richest in the West of England, and good cradle roofs, was in a very dilapidated state, and has recently undergone a good deal of repair. The chancel, which was thoroughly dehed, has been entirely rebuilt, in the perpendicular style. The church has been reseted, for the most part, with the old carved bench ends and fittings repaired, exhibiting great richness and variety in the devices. The chancel seats are new, of wainscot, and the pavement of Minton's tiles. The rich screen has been partially repaired and laid open, the north aisle roof repaired and opened; its covering was of oak shingles a good deal decayed. A new vestry hall has been erected, and the screens partially repaired, but further restoration is needed in the fabric generally. The architect was Mr. E. Ashworth, of Exeter. The Bath stone work was executed by Mr. N. Jones, the seating by Mr. Stamp, builder. The principal part of the costs of the work, exceeding 1,000*l.*, have been defrayed by the Rev. John Vicars, the rector.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Exton.—A new chapel has been erected by the Earl of Gainsborough on a site adjacent to Exton House, and has been opened for divine service. The new edifice is attached to the east side of Exton House, forming an extension of the south front, and communicating with the ground and first floors of the mansion by the ante-chapel, with trimmes above and below, in two stories. The plan is cruciform, 75 ft. by 20 ft. in the internal dimension of the main building, with an eastern apse for the high altar. The south transept forms the Lady Chapel. The north transept is devoted to the choir, and opens into the north aisle of the sanctuary, which leads to the sacristy. Beneath the entire area of the chapel there is a vaulted crypt, with a north porch roofed with stone, over the descending steps. The style of the architecture is that of the latter part of the thirteenth century. The walls are ashlar externally with Clifsham stone, and on the inside with stone from the park quarries. The windows of the apse are of two compartments, with cinquefoils in the heads, and cusped recess arches. The east window of north aisle is a sexfoil within a circle. Near the altar is a sepulchral recess, and in the pier of the arch a piscina. The south transept has a window of three lights, with geometrical tracery. In the gable is a shield with the monogram of the Virgin Mary, encircled with a wreath of lilies. The principal entrance to the chapel from the village of Exton is by a porch towards the north, by an ascent of eight steps. The windows of the nave are of two lights, with trefoils in the heads. The roof is of stone slates. The south front forms a feature of the gable facade on the terrace walk. The roof is a cradling of arched principals prepared to receive oak boarding, moulded cornice and ribs of the same. The masonry has been executed by Mr. T. C. Halliday, of Greenham; and the carpentry and joinery under the superintendence of Mr. John Fancourt, lately deceased.

Longton.—The new church here, which surpasses a humble structure erected by the Roman Catholics some thirty years since, has been opened with the usual ceremonial. The church, which is dedicated to St. Gregory, is 140 ft. in length, 60 ft. high, and about 50 ft. wide. It is built of red brick, with Bath stone dressings. The plan comprises nave, chancel, and sanctuary, with aisles and chapels to the Virgin Mary and her husband, Joseph. The chancel terminates in an apse of five sides, each of which is crowned by a gable dying into the roof. Between the gables are shafts supporting figures of Saints Peter, Paul, Gregory, and Patrick, and round the

apse are five two-light windows, the heads of two of which are filled with sexfoil tracery. Similar windows, of less height, are carried down the aisle, with variations in the tracery. In the eastern walls of the aisles are two wheel-windows of complex design. High up in the western gable is another and a larger window of this description. With one exception, the whole of the windows are filled with moulded and tinted quarries leaded in patterns, bright spots of colour giving warmth and character to the whole. Below the western window an atrium or corridor extends the whole width of the church, and is entered at each end by oak doors, fixed in deeply recessed arches. The sacristies and confessionals adjoin the north side, presenting two gables to the street; and the baptistry is projected in a similar way, breaking the long line of aisle roof. The presbytery is to be built against the western half of the south aisle, and the architect's plan includes a future tower and spire at the west end. A stained-glass window over the altar in the Lady Chapel is the offering of Mrs. Moore, of Longton. It is filled with representations of "The Mystery of the Blessed Virgin," and is from the works of Messrs. Hardman, of Birmingham. The church has been built, from the design of Mr. W. E. Pugin, by Mr. Heveningham, of Wolverhampton. The sum of 7,000*l.* has been expended upon it. The church will seat a thousand persons.

Seaham Harbour.—The foundation stone of a new church at Seaham Harbour, to be dedicated to St. Mary, Magdalen, has been laid by the Roman Catholic Bishop of Hexham and Newcastle, with the usual ceremonies. The site was granted on the usual terms of ground-rent, and a lease of 75 years. The erection of the church, which will accommodate 600 persons, and to which a presbytery and school will be attached, has been undertaken by Mr. Sedd, of Sunderland, the cost being estimated at 1,500*l.*

PROVINCIAL NEWS.

Middleton-in-Teesdale.—In addition to the public facilities and privileges of this quiet little town in the shape of railway and telegraph, water and gas, may be mentioned the establishment of baths and washhouses of the London Lead Company, at the west end of the town, for the use of their workmen's families, and the public generally. A penny per hour is charged for washing, drying, and mangling; and a cold bath may be had for threepence, and a warm one for fourpence, including a shower bath. Their workmen enjoy a reduction in these rates for baths, but the charge for washing is the same in all cases. There are three bath-rooms.

Burnham.—A new market-house has been opened here. The building is situated in Princess-street, a central position. The large room is 71 ft. long, 31 ft. wide, and 21 ft. high. Messrs. Hawkins & Son, Glastonbury, were the contractors, for the sum of 1,545*l.* Mr. Down was the architect.

Rendlesham.—The foundation-stone of the new mansion now in course of erection for the residence of Lord Rendlesham, has been laid. The new mansion, Rendlesham Hall, is to be in the Elizabethan style of architecture, of red brick, with stone dressings. Mr. Burn, of London, is the architect; and Messrs. Lucas, Brothers, are the builders. Mr. Chalk is clerk of the works; and Mr. Boase, superintendent.

Books Received.

Modern Art in England and France. By HENRY O'NEIL, A.R.A. London: Chapman & Hall, 1869.

The task Mr. O'Neil has set himself to perform in this brochure is from a survey of the pictures in the Salon des Beaux Arts, Paris, and in the Royal Academy, London, to point out the particular defects and merits of the respective schools. He finds little to applaud in Paris. He acknowledges the genius of the painters there who have recently passed away,—Delarocche and others,—but does not discover in the works of their respective pupils any proof of the superiority of this French system of education over that pursued (if there be any) at home. Mr. O'Neil correctly argues that the absence of completeness is one chief defect of modern art. Let us have freedom, by all means but let it be the result of an expe-

Miscellaneous.

ence which "knows when to leave off," and not the mere audacity of ignorance which knows not "how to go on." Until artists have the honesty to execute their works to the utmost of their ability, and will not content themselves with eluding ignorance, or satisfying a half-formed intelligence, there is little hope for the progress of art. Art is now a lucrative profession, and the belief is, that instead of doing their best, satisfied that when done reward will follow, modern artists are anxious to reap the pecuniary harvest the sun of popular favour has ripened, and will take no more pains than will entitle them to do so. Our author illustrates this with a had figure. "When I think," says he, "of those who, in all intellectual pursuits, have not fulfilled the promise of their youth, I am reminded of the tale in the "Arabian Nights," which describes the perseverance of a traveller climbing up a mountain, undeterred by the stones thrown at him, and I come to the conclusion, that those stones being guineas, the said traveller would have had less chance of ever reaching the summit." Of modern criticism he has a better opinion, and thinks that evil rather than good has been and is being produced; and he considers, but without giving any evidence in support of the opinion, that the evils arise from its anonymous character. The pamphlet is necessarily slight and incomplete; but it contains observations that may usefully be discussed at greater length.

Architect's Guide; or, Office and Pocket Companion for Engineers, Architects, &c. London: Atchley & Co., 1869.

Without being able to express entire contentment with the first edition of this work, we noted to it as containing a considerable amount of information in a handy shape, and we can repeat with somewhat greater satisfaction in mentioning the publication of a new edition. An added essay "On the Profession of Architect," by Mr. Billings, has much in it to deserve consideration.

Biblicial Quotations. By JOHN BARTLETT. Author's Edition. London: Routledge & Sons, 1869.

This book of quotations, originally published in America and now considerably improved, is more taken separately, beginning with the Gospels, and the extracts are made in sequence. To find a quotation, if the book went no farther, would be a work of difficulty, but by means of an "arkly" full index, about 170 pages in length of 524, the difficulty is altogether removed: the leading word of the quotation be correctly numbered, it can be found.

VARIORUM.

The Twenty-third Report of the Commissioners in Lunacy, to the Lord Chancellor, is summarized given in the outset of this report, and that the number of persons of unsound mind under official cognizance in England and Wales on 1st January, 1869, exclusive of 225 males, so found by inquisition, was 53,177. These the greatest number, 26,867, were in asylums and borough asylums. In workhouses there were 11,151, besides 6,987 out-door paupers; in licensed houses, 4,796; and in unlicensed houses, 2,352. The summary shows a total increase of 2,177, compared with the number on 1st January, 1868. The average proportion of deaths per annum to 100 of the number under treatment in the asylums was 7.80; from 1859 to 1868 the proportion was 7.50; in country and village asylums the proportion was 8.40; in metropolitan licensed houses, 7.80; in unlicensed houses, 5.47; amongst private patients, 4.01; and in criminal asylums, 2.41. "Cassell's Popular Educator," No. XXXI. of the new edition has the second part of a useful series of papers under the title of "The Natural History of Commerce." Attention is to convey just that special information which, at this day, is felt to be most necessary to the British artisan.—The talk of railroads and other tunnels across the British Islands has not yet passed away, as appears from a pamphlet on an "International Floating Railway," by E. W. Young, C.E." (Spou). This is to cost only nine millions sterling.—The August number of "The Publisher's Circular" (Sampson Low) contains lists of works especially designed for educational purposes, and is particularly valuable in that respect.

National Education League.—The first meeting of the London members of this society, whose object is the establishment of a system to secure the education of every child in England and Wales, was held at the Westminster Palace Hotel. It was numerously attended, and great unanimity prevailed as respects the general scheme of the league, which at present comprehends the following "platform":—"That local authorities shall be compelled by law to see that sufficient school accommodation is provided for every child in their district; that the cost of founding and maintaining such schools as may be required shall be provided out of local rates, supplemented by Government grants; that all schools aided by local rates should be under the management of local authorities and subject to Government inspection; that all schools aided by local rates shall be unsectarian; that to all schools aided by local rates admission shall be free; that school accommodation being provided, the State or local authorities shall have power to compel the attendance of children of suitable age not otherwise receiving education." A large provisional committee for the metropolis has been formed for the purpose of co-operating with the provisional committee of Birmingham, and of preparing for the first general meeting of the members of the League, to be held at Birmingham in the course of the ensuing autumn.

Tracing Paper.—Artists, architects, land-surveyors, and all who have occasion to make use of tracing-paper in their professional duties, will be glad to know that a new method has been promulgated by our clever neighbours across the channel, for rendering any paper capable of the transfer of a drawing in ordinary ink, pencil, or water-colours, and that even a stout drawing-paper can be made as transparent as the thin yellowish paper at present used for tracing purposes. The liquid used is benzine. If the paper be damped with pure and fresh-distilled benzine, it at once assumes a transparency, and permits of the tracing to be made, and of ink, or water-colours, being used on its surface without any "running." The paper resumes its opacity as the benzine evaporates, and, if the drawing is not then completed, the requisite portion of the paper must be again damped with the benzine. The transparent calico, on which indestructible tracings can be made, was a most valuable invention, and this new discovery of the properties of benzine will prove of further service to many branches of the art profession, in allowing the use of a stiff paper where, formerly, only a slight tissue could be used.—*Once a Week.*

Cohesion Figures.—Nearly ten years ago Mr. Tomlinson showed that when essential oils, kerosene and other liquids sparingly soluble in water, are allowed to fall drop by drop upon the surface of a wide vessel of perfectly pure water, films of peculiar and rapidly-changing form are produced. It appears that every liquid has a characteristic figure, but hitherto careful observation has been found impossible, owing to the very short duration of the phenomenon. Dr. Carter Moffatt has succeeded in fixing the evanescent forms by a very simple process. A sheet of lithographic paper is laid upon the surface of the water at the moment when the experimenter has obtained a suitable figure. The paper is instantly withdrawn, drawn through a plate of ink, and washed with water. Of a book of these *oleographs*, as they are termed, it is said that from the great beauty of many of the patterns thus produced, the process will ultimately prove of great service to paper-stainers and others.

The Preservation of Wimbledon Common.—The committee of the Wimbledon Common Defence Fund has just issued a report respecting Wimbledon Common. The report says Lord Whaler claims to be absolute owner of the whole common. The committee urge that the freeholders and copyholders of the manor, the inhabitants of the neighbourhood, and the public at large should co-operate with Mr. Peek and the committee in bringing this important question to a decision by the Court of Chancery, and, if necessary, by the House of Lords, as the final Court of Appeal. The committee are unanimous in their determination to preserve the common for the benefit of the commoners and of the public; 5,000. are required for the purposes of the suit, of which subscriptions to the amount of half this sum are already guaranteed.

The Work of Building the Wolf Rock Lighthouse.—Now that the masonry of this useful structure is complete, a brief chronological glance at the progress of the labour is given by the *Cornish Telegraph*. Mr. Douglas and his staff formally commenced work on the 17th of March, 1862, and for five hours worked at the preparation of its surface for the foundation of the pharos. Between this day and the last practicable time of working (Sept. 29th), eighty-three hours only could be spent on the part of the Wolf where any useful work could be effected. In 1863, from the first date of commencing work to October 24, the last date, 200 hours and 35 minutes were passed on the rock. August 6, 1864, the foundation-stone was laid, only 2 ft. 4 in. above ordinary low-water spring tides, and 6 ft. 8 in. below ordinary high-water spring tides. The men laboured 267 hours on the Wolf this year, quitting it on the 15th of October. In 1865, they had to discontinue a month earlier, after working for 248 hours and 5 minutes. By July 24, 1866, high-water mark was reached, but the Wolf was left on the 22nd of August, with 224 hours and 30 minutes of work done. In 1867, 313 hours and 30 minutes were spent on the edifice. Until October 14, 1868, the builders were 276 hours and 20 minutes on the rock. 23 hours and 50 minutes more would have completed the masonry, but these could not be gained till July 17 of 1869, when Sir Frederick Arrow fixed the opystone of the building. In all, 1,736 hours, and 50 minutes had been busily passed on the Wolf Rock, up to the fixture of the opystone.

Southwark Park.—We were in hopes that a scheme had been hit upon whereby the Metropolitan Board of Works might be induced to open spaces in various parts of London for the recreation of the people, by devoting portions of ground purchased to building purposes for the recoupment of the outlay; but we fear the desire of the Southwark people to appropriate the whole of the space purchased for their behoof will put an effectual extinguisher upon the hope of other districts being provided with such open spaces; for the Metropolitan Board, tired seemingly of persisting in their excellent scheme, the nature of which the Southwark people well know, have just rejected the recommendation of their Works and General Purposes Committee to persevere with their plans for building on portions of the Southwark Park site, and have referred the matter back to the Committee. It is to be hoped, however, that as this was done merely by the casting vote of the chairman, there being 17 votes for and 17 against the proposal, the committee will persist in their recommendation, and that the majority will reconsider their own opinions.

The Royal Polytechnic Institution.—The half-yearly general meeting of the Royal Polytechnic Institution took place on Tuesday, with the usual satisfactory results of a flourishing report and a substantial dividend. The directors felt justified in recommending the shareholders to declare a dividend of 10 per cent. on the paid-up capital of the company out of the earnings of the last half-year. The meeting expressed a cordial vote of thanks and confidence in the directors, Professor Pepper for his able management, and Mr. Tohn for the efficient service rendered during the period in question.

Working Men's College, 45, Great Ormond-street.—The annual excursion of the members and friends of this college took place on Saturday week, the party proceeding, as on several previous occasions, to Petersham Park, Richmond, a special train being provided by the South-Western Railway. The athletic sports, under the direction of Mr. Thomas Hughes, M.P., Q.C., consisted of various races, and of "putting the shot," the winner of the latter being Mr. G. Rosenthal, who threw the 20 lb. shot 27 ft. 9 in. After indulging in various games, the party, 271 in number, sat down to tea under the grand old trees in the park.

An Aerial Machine.—Is California to have the distinguished honour of acquiring dominion over the air for man? Detailed and minute particulars of a cigar-shaped, propeller-fitted, steam-moved, air-traverser, and of a perfectly successful trial of it, are given in the *San Francisco News Letter* in such a way as to render it doubtful, at all events, whether this be a Yankee hoax or not, ingenious and elaborate as these not seldom are.

A People's Park at Landport, Portsmouth.—At a recent meeting of the Local Government Board the Roads and Works Committee submitted a letter from the War Office on the subject of the proposed lease of the People's Park, with a recommendation that the terms thereof be accepted, provided the right to make another railway through the park be waived. The letter was to the effect that the War Office did not feel justified in granting a lease of the land until something had been done towards converting it into a park by completely enclosing it, and building two lodges to complete it; and by laying out roads and planting portions of the land with ornamental trees and shrubs; and making another line of railway to the park. The War Office were willing at once to enter into an agreement with the Board to continue them in possession of the land for seven years; and if these works are completed to the satisfaction of the Secretary of State for War within that time, to grant the Board a lease for a term of 99 years, at a rent of 50l. per annum. The report was adopted with the committee's recommendation.

The Proposed Pier at Hastings.—At the first ordinary general meeting of the shareholders in the Hastings Pier Company, Mr. Birch, the engineer of the company, produced the plans of the projected pier, and entered into explanations. He stated that the pier would be 910 ft. in length, and would be similar to the new pier at Brighton, but much larger at the head, and considerably less at the land end. As to the use of cast-iron piles, he referred to Margate pier, where these piles were found to be uninjured after thirty-five years' immersion. There was no oxidation, because the piles were protected by the action of the molten which covered them. The pier head would be 16 ft. above high water mark, and would not be touched by the solid water in the roughest weather. The meeting was then made special, to receive the tenders for the erection of the pier, and to decide thereon. There were 15, as appears from the list given in the *Builder* of 31st July. The directors recommended the acceptance of the lowest tender, that of Messrs. Jukes, Conlon, Stokes, & Co, for 22,126l., subject to the necessary inquiry. The recommendation was carried unanimously. In reply to Mr. Mann, it was stated that the engineer's commission would be 5 per cent. on the cost.

National Portrait Gallery.—On the motion for going into committee of supply, Mr. Disraeli said, with reference to a vote that had been passed in supply, that the trustees of the National Portrait Gallery had offered for the portrait of Hogarth at his easel, by himself, 355 guineas, but a Manchester gentleman bid a larger sum and obtained it. It appeared that the purchaser was not a private person at Manchester, but the well-known firm of Agnew & Sons. They had purchased the picture for their collection unaware that they were bidding against the Government, and they have therefore, they say, the greatest pleasure in waiving their claim, and allowing the National Portrait Gallery to obtain the picture.

Metal Coated with Copper or Brass.—Plates coated with either copper or brass, by a process that has been patented in England, the United States of America, and the leading countries of Europe, are now made at Southampton. These patented plates are said to present advantages compared with tinned or galvanized plates, as the newly-invented plates can be annealed, as much as is requisite, during the process of stamping, without injury to the copper or brass coating. Articles manufactured from them, too, are not so readily bent or deformed as when made of brass or copper. They are also said to be about 40 per cent. cheaper than sheet copper, or sheet brass, and they can be burnished, planished or spun, and so brought up to any required degree of finish.

Dusty Roads.—W. R., a correspondent of the *Leicester Advertiser*, draws attention to the fact that at our marine watering-places, sea water, used for allaying the dust on the roads, acts "with wonderful success; for long after its evaporation the roads retain a cool and refreshing appearance of moistness, with no dust visible;" and suggests that where no sea is at hand, limestone, treated with hydrochloric acid, mixed with common salt, and dissolved in water, might be used instead of sea-water. W. R. does not seem to be aware that he is here suggesting an encroachment on a process already patented by Mr. Cooper, of London, and brought into use in the metropolis and elsewhere.

Fall of a House in Everton.—In Rosemount, Breckfield-road North, Everton, Liverpool, about eight labourers were employed by Mr. Fredk. Southcoat, to pull down a block of houses in Rosemount, Breckfield-road, and they seem to have commenced with the bottom story, as, when they reached the attic, the space beneath was quite clear for their work. They began to loosen the bricks which formed the flooring of that room, when it suddenly gave way, and five of the men were precipitated to the basis. They fell amongst the *debris*, and it was with considerable difficulty that their fellow-workmen succeeded in extricating them before fatal consequences ensued. They received severe fractures of the limbs.

A Mortuary for the Poplar District.—At a recent meeting of the Poplar District Board of Works, the General Purposes Committee brought up a report recommending that the offer of the Tower Hamlets Cemetery Company to sell a plot of land for the erection of a mortuary should be accepted, and the plans prepared by the surveyor for the building adopted. Also that when built the mortuary should be open for the use of the three parishes comprised in the district, and that they should contribute towards the cost of erection on the same basis as was observed in regulating their payment of the general expenses of the Board. These recommendations were adopted. The chairman explained that the adoption of the committee's report would not in any way interfere with a future proposition to erect other mortuaries in the extensive district over which the Poplar Board presides.

Preservation of Historical Monuments in Ireland.—Mr. Layard having been written to by the Rev. James Graves, the secretary of the Historical and Archaeological Association of Ireland, pressing the claims of Ireland to be considered in any arrangement for a Government department of national antiquities, has replied that the Office of Works has no jurisdiction in Ireland, but that the Irish Board of Works is under the Treasury, and such being the case he is unable to take any steps in the direction indicated; but that if at any time hereafter he should have the power he will do his best in the matter.

Thames Embankment.—The committee upon the Thames Embankment and its approaches met on the 30th ult. to consider their report, and rejected the recommendation of Lord Eicho, the chairman, which he proposed with a view to control the erection of buildings. The committee also rejected his proposal for a committee composed of persons eminent in art to be consulted with reference to the erection of public buildings. It appears from the evidence that if the roadway which the committee desire from Charing-cross is to be made, it will be cheaper and more direct to pass over the site of Northumberland House.

Blackfriars Bridge and the Holborn Viaduct.—The opening of these two great works, carried out by the Corporation of London, at a cost of two millions of money, will, it is almost certain, take place the second week in September. It is the desire of the Court of Common Council, the Bridge-house Estates Committee, and the Improvement Committee, that the two great works should, on account of their close proximity, be opened upon the same day if practicable, and directions have been given to make the necessary preparations for the ceremonies attendant upon the double event.

Railway Matters.—It appears from the financial speech of the Secretary for India that it is contemplated, during the next ten or twenty years, to construct seven thousand additional miles of railway in India, being nearly double the amount thus far completed. Taking fifteen years as the average time over which the outlay is to be spread, it would thus be necessary to raise about 6,000,000l. a year throughout the whole period.—The National Congress of Costa Rica have ratified a contract for carrying a railroad across its territory from the Atlantic to the Pacific.

Local Boards and Local Architects.—A correspondent from Gorton, Manchester, complains that the Local Board pay their consulting surveyor 75l. per year, and, with a view to improve his salary, wish to monopolise all the business in the township; and he says they have almost succeeded, as most of the landowners and builders are afraid to employ any one else but the Board's surveyor.

Epping Forest.—A deputation has waited on the Chancellor of the Exchequer, with a view to obtain the assistance of the Government in preserving Epping Forest to the people. The reply of the Chancellor of the Exchequer was not encouraging. While admitting the desirableness of the object the deputation had in view, he said he could not accede to the arguments by which it was pressed upon him. The rights of the Crown over the forest were feudal rights, which it would be inexpedient to revive or enforce. He promised, however, to consider the subject.

An Arctic Exhibition.—The inhabitants of the coast of Norwegian Lapland (districts of Finmark and Troms), have resolved to promote the holding of an exhibition at Tromsø, during the months of August and September, 1870, of all the raw materials found in those districts, as well as of every description of work and industrial production of the inhabitants of those districts. His Majesty King Charles XV. of Sweden, has already made a considerable grant towards the formation of a fund conferring prizes for the best articles exhibited.

New Bridge at Gloucester-gate, Regent Park.—The vestry of St. Pancras resolved to construct a new bridge over the Regent's Canal at a cost of 0,025l., and a deputation was appointed to wait upon the Crown Commissioners of Public Works, and application ordered to be made to the Metropolitan Board, asking them to contribute their quota towards the carrying out of this great public improvement.

The National Cottage Hospital for Consumption at Ventnor.—On laying the foundation-stone of the second pair of buildings of this hospital, the Princess Louise, in her reply to the address presented by Viscount Eversley, the president of the hospital, said:—

"It has ever been the desire of her Majesty's self (and every member of her family shares it) to promote every enterprise for the relief of her suffering subjects. The special diseases for which the hospital is designed, those for which art can do least and nature most. May God therefore grant that the pure and health-giving climate of this beautiful district may be blessed to the restoration of all who shall be admitted to the shelter of this noble institution."

Brill's Brighton Baths.—The gentlemen's baths, designed by Mr. G. G. Scott, R.A., at which complete the scheme of baths for which this company was organised, were thrown open to the public for use, on Monday last. The contractors, Messrs. Jackson & Shaw, have laboured with the directors, and the directors with the public. Of the external features of the building the public can judge for itself. The pity is, that there is no good point of sight of the structure. The swimming bath is 60 ft. diameter.

Value of Building Land at Norwich. Messrs. Butler sold by auction, on Monday last, 4a, 2r. 5p. of freehold garden ground, lying in the Hamlet of Heigham, Norwich, for 3,500l.

TENDERS.

For building a wing to Lower Stoford Farmhouse, Bradford, Taunton, for Mr. John Henry Warren. Mr. Houghton Spencer, architect.—
Moss & Rendell (accepted) £360 0 0

For whitewashing, colouring, and painting the interior of St. Marylebone Workhouse. Mr. H. Saxon architect. Quantities supplied:—

Blackmore & Morley	£320 0 0
Manley & Rogers	287 0 0
Crabb & Vaughan	283 0 0
Elms & Sons	213 0 0
Till	191 0 0
Temple & Foster	173 0 0
T. G. & E. Howard	148 0 0
Brazier & Son	119 0 0

For rebuilding premises, Nos. 51 and 52, New B Street, Oxford-street, for Mr. Thos. Chappell. Mr. Lee Evans & Pain, architects:—

Clemence	£3,673 0 0
Seivener & White	5,478 0 0
Thompson	8,200 0 0
Foxley	8,200 0 0
Myers & Sons	7,800 0 0
Trotter & Sons	7,767 0 0
Farrick & Sons	7,615 0 0
Elms & Sons (accepted)	7,177 0 0

For alterations and additions to the Rev. H. Br house, Lyddington. Mr. W. Langley, architect, Highgate:—

Jeffs & Stanger	£737 2 4
Clarke & Dean	718 7 0
Drake (accepted)	647 0 0

For additions and alterations to Mr. Sharmans house, Lyddington, for the Ecclesiastical Commissioners. Quantities supplied. Mr. W. Langley, architect:—

Jeffs & Stanger (accepted)	£321 16 0
Clarke & Dean	819 10 8

For the erection of a national school and schoolmaster's residence, Lyddington, for the Rev. T. W. Gillham.
 Plans applied for by Mr. W. Langley, architect.—
 R. Jeffs £73 9 0
 Clarke & Dean 732 11 0
 Dore (accepted) 725 0 0
 Jeffs & Stanger (too late) 723 0 0

For alterations to No. 87, Whitefield-street, Fitzroy-square, for Mr. William Inglis, Messrs. Gasdian, Elliot, & Scovier, architects.—
 Perkins (accepted) £315 0 0

For the erection of a small poor hospital at Stockwell, for the managers of the Metropolitan Asylum Board, Mr. Henry Wyatt, architect. Quantities by Mr. G. Cowland
 Cowland £31,450 0 0
 Crockett 28,800 0 0
 Shearburn 26,500 0 0
 Myers & Sons 27,063 9 0
 Hill, Keddell, & Co. 27,493 0 0
 Henshaw 26,939 0 0
 Barrett 25,975 0 0
 Dove, Bros. 26,842 0 0
 Hart 25,885 0 0
 Higgs 26,712 0 0
 Bull & Sons 24,800 0 0
 Coll & Sons 24,497 0 0
 Howard 23,741 0 0

For the erection of a fever hospital at Stockwell, for the managers of the Metropolitan Asylum Board, Mr. Frederick Marriale, architect. Quantities by Mr. G. Cowland
 Henshaw £38,500 0 0
 Colls & Sons 35,365 0 0
 Myers & Sons 34,988 0 0
 Hill & Keddell 34,633 0 0
 Tarrant 33,930 0 0
 Higgs 33,624 0 0
 Dove, Bros. 33,283 0 0
 Howard 31,967 0 0
 Bull & Sons 31,750 0 0
 Dove 30,460 0 0

For new parish school, Cowfold, near Horsham, for Mr. Hoper. Messrs. Habraham & Brock, architects.—
 Fowler £1,219 0 0
 Shearburn 1,140 0 0
 Henshaw 1,099 0 0
 Sharp 1,088 0 0
 Nightingale 1,067 0 0

For repairing, repaving, painting, and graining chapel, school, &c., Queenstreet, Woolrich, Kent.
 Vickers £240 0 0
 Linger 240 0 0
 Leadbetter 235 0 0
 Carter 230 0 0

In the list of tenders for the Kennington and Lambeth sewers, last week, for "Mr. Joseph Simmons" read "Mr. Joseph Simmons."

TO CORRESPONDENTS.

C. (apply to the secretary of the Local Government Act office, Old Kent-bridge, Whitehall), C. F. H. (offer too late)—Paisley, who obtains are raised, district surveyor must have notice—H. B. E. R. T. M. R. G. G. E. W. Y. W. R. R. E. P. T. G. W. A. Col. S. Vigliani, J. H. S. H. S. C. V. M. F. T. A. R. G. O. H. H. W. E. A. C. L. H. & Son. P. G. R. H. R. H. R. W. B. J. W. T. H. & K. A. are compelled to decline pointing out books and giving statements of facts, lists of Tenders, &c., must be accompanied by name and address of the sender, not necessarily for publication.
 The responsibility of signed articles, and papers read at meetings, rests, of course, with the authors.

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Just published, price 3s.
 THE TREATMENT OF SEWAGE.
 By JOHN HART, Engineer and Surveyor, and Inspector in the Districts of London.
 London: E. & F. N. SWEET, 11, York-street, and W. & A. GILBERT, Victoria Library.

40, Finsbury Bowdler, price 5s.
 NEW LEADS AND TEMPLING, comprising the best of this valuable artist's sketches, with explanations.
 London: WILLIAM TEGG, Paternoster-lane, Cheapside.

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VOL. XXVII.—No. 1384.

The Amsterdam Exhibition.



HE more that we see of exhibitions, which may be said to be one of the characteristic features of the age, the more evident it is that their success or the lessons taught by them are not always to be measured by their size.

The present undertaking at Amsterdam is well worth

a visit, not on account of its size, heauty, or intrinsic value, but because, for the most part, it really is what it pretends to be,—an exhibition of the common articles of daily life, in which we see, as it were, a bird's-eye view of what is used and what is most in request in the middle and working class houses of the various countries. Holland, as mistress of the feast, and as being at home, shows to advantage, both numerically and in quality, and has arranged a series of exhibits of great interest, varying from a four-post bedstead to a besom, or even a bundle of straw. Other countries have followed suit, according to the fancy of each, and whatever may be the value of each display, the comparative results are interesting. France alone does not seem to have grasped the spirit of the occasion with great quickness, for not only was she shamefully late with her exhibits, as though the whole thing was an *arrivée pensée* on her part, but she has gone in too much for the show, and presents a great contrast to the plain utility of the Dutch section. We have jotted down a few remarks on those exhibits which would be most interesting to the readers of the *Builder*, merely adding, that when the Exhibition itself has been exhausted by the visitor, he will find much to interest him in the quaint streets of Amsterdam. The marvel of the whole city is the simple fact that houses should ever have been built at all, considering that there is literally no foundation, and that for the upper 10 ft. or 15 ft. of the surface there is nothing but loose bog, sand, and clay. Every house is built upon piles of great length, so that Erasmus, writing from Amsterdam, said that he had reached a city whose inhabitants, like crows, lived on the tops of trees. The Palace or Stad-haus (equivalent to our Guildhall) is built upon 13,659 piles driven 70 ft. into the ground; and we can scarcely marvel when we see the enormous mass of building that they have to support. We were informed by the manager of the gas works that even the gas pipes not uncommonly sank a couple of feet or so in the treacherous soil, and the engineer of the new dam at the entrance of the Zuyder Zee, which forms the commencement of the North Sea Canal, has seen his bags of sand disappear 6 ft. or 8 ft. at a single blow of the pile-driving machine. The amount of stagnant water that we saw between the piles of an old house in

course of demolition horrified us; but it can scarcely be wondered at, when we know that Amsterdam is built on ninety islands, to which the communication is kept up by 250 bridges. Drainage there is none; cesspools, which frequently have to be emptied out through the houses, being in common use. Indeed, if gas pipes disappear so, it is difficult to understand how drainage pipes could ever be induced to remain, let alone the difficulty of crossing the canals, which are all used for navigation, and yet could not be crossed below their bed. Of course the smells are very grievous, but these arise from the stagnation of the water, the gas from which bubbles up to an extent that makes one think it is raining. The streets themselves, which are all pitched with stone from Belgium and the Rhine, are, generally speaking, clean, the gutters being frequently formed of long wooden boxes with a hinged cover; so that at all events, whatever may be the state of the current inside, the pedestrian is not annoyed by the constant sight or smell of slops.

The English exhibitors in Classes I. and II. (building and household requirements) have evidently an eye to drainage or deodorisation. Of the former, Messrs. Cliff, of Wortley, show very large 36-in. draining pipes made of Yorkshire coal-measure fireclay, for which they claim an openness of texture capable of bearing great vibration. They also show crucibles and a good selection of terra cottas, in which sharpness of outline has been obtained with success. Next to them are the stands of Messrs. Doulton & Watts, and that of Messrs. Gallichan & Co., of Leigh, Essex, which contains a large selection of glazed drainage pipes, pans, interceptor traps, &c. Cargey & Co., of Newcastle, show cements; and Engert & Rolfe, of London, their asphalt for roofing and foundations. Roofing papers are also exhibited by Erichsen, of Copenhagen, and Lint, of Rotterdam, who is the only Holland contributor in this section. He has also drawing papers of small dimensions and coarse material, together with a rough concrete for foundation purposes, which in districts other than Amsterdam would appear to be of great use. In an annexe in the park he has a small piece of brick-wall, in which there is considerable taste, and we must remember that this is the material of which every house in Amsterdam, and indeed, in nearly all Holland is built. With the exception of a small quantity at Maestricht, there is not a square yard of building stone in the whole country, which, however, contains some good clay beds. The bed of the IJ furnishes most of the clay for Amsterdam and the towns on its banks, but it is not of snob good quality as that from the interior.

The decorative class is represented in England principally by Messrs. Maw, who have a small but excellent collection of tiles, and M. Szerelmy, who exhibits zopissa paper and artificial stuccoes. Durigneau, of Magdeburg (Prussia), has some exceedingly pretty medallions and imitation marble tiles. Mander, of Wolverhampton, shows varnishes and lacquers; and Stephens, of London, an interesting series of his wood stains. In the Belgian department, there are imitation marble mantel-pieces shown by Mignot & Siglitz, and the wall papers of Everaets, of Louvain. Mr. W. Cooke, of Leeds, shows paperings which, for beauty of design, are not easily surpassed; and Messrs. Klinkaert & Heysins, of Haarlem, have an exceedingly simple and easily applied paper for halls and passages. It is merely thin black tissue paper cut into wavy lines and placed over plain white paper. A child might make it, and improve a bare wall at the expense of a very few shillings. Blinds are, on the Continent, the object of a good deal of decorative art. With us the sun is rarely so troublesome as to require them; but a Dutch lusthaus, or an Austrian garden temple,

would not be complete without its blinds. Schnbert, of Vienna, has a large exhibit of them, the greater part ingeniously made of reeds, or thin rattans, by which flexibility is obtained, while the surface is close enough to allow any kind of painting upon it.

One of the specialties of Holland is the manufacture of hamboo and cane articles, which is largely carried on, one exhibitor having a large kiosk in the park full of bamboo chairs, mats, tables, and small furniture generally. It is perhaps in furniture and dress that the best points of the exhibition lie. England is by no means largely represented in the former, which is to be regretted. Peyton & Peyton, of Birmingham, have a fine display of spring bedsteads, which must be very attractive to Dutch eyes; and Heal shows a good collection of bedding, in which cheap hospital bedding is conspicuous. Holland is especially great in bedding, a love of which is one of the Dutch weaknesses. The Kapok struck us as being particularly good for stuffing, being exceedingly light, of silky texture, and cheap. It is the product of a plant from Java and the Celebes, and appears to be somewhat extensively used in Amsterdam. Hege shows a mattress stuffed with it for 16½ guilders, or 1l. 7s. 6d.; a bed, two pillows, and bolster, for 12 guilders, or 1l. 16s.; if a spring mattress, 6s. 8d. more. For the benefit of the poorer classes, Valletta, of Amsterdam, has a collection of the various materials used for stuffing beds, which run as follows:—

	fl. c.	s. d.
Dried seawrack ...	0 12	per kilo, = about 0 1 per lb.
Mountain grass ...	0 15	" " " 0 1½ "
Horsehair	1 29	" " " 1 0 "
Wool	1 50	" " " 1 3½ "

An upholsterer from Middleburgh, named Billerheek, shows a headstead of common painted deal, a projecting wing of which contains a cupboard and receptacles for the various toilet requirements. The price of the whole is thirty-two florins, or £2. 13s. 4d., which, as it includes bedding, cannot be said to be dear. Vogelpeel, a joiner from Haarlem, sends a bed and table in one—the legs of the latter being made to work within the posts of the former. It is ingenious, but scarcely an article required for practical life, except perhaps by snob people as the cobbler in "Pickwick," who preferred sleeping under a table, as it recalled to him the times when he owned a four-post bed. Belgium sends two exhibits worth notice; one a movable roof by Paris-Isaac, of Engbien, which, by turning a winch, is made to travel over a considerable extent of framework. This might be well applied to railway stations, when a portion of the building is wanted at a time. Roelants, of Antwerp, has garden-seats and tables, convertible at pleasure for two or four. The chief ingenuity is in the number of positions that the awning is made to assume,—such as letting down at the front, back, or on either side, and also becoming a water-proof umbrella when it rains. The price of the seat is 47 florins (3l. 18s. 4d.). He shows, too, a *multum-in-parvo* headstead, inside of which are convertible chairs, commode, table, and looking-glass,—no bad arrangement for small lodgings or a bachelor's room. The price in ordinary deal is 125 florins (10l. 8s. 4d.). In the Austrian section, Knoblock, of Vienna, has a good collection of polished bedroom furniture, cheap and pretty; a washing stand, charmingly fitted up with toilet appendages of opalescent glass, is priced at only 13 florins, 1l. 1s. 8d. Still cheaper, and of much commoner material, is the Gothenburg furniture, in its own special house in the park. Here the prices in stained deal are,—chair, 1s. 8d.; chest of drawers, 10s.; table, 3s. 4d.; combined table and working-stand, 5s.; large table (3 ft. 6 in. by 2 ft. 7 in.), 5s.; side-board, 6s. 3d.; sofa-bedstead, 12s. 10d.; garden-seats, unpainted, 5d. Everything else in the cottage was in the same proportion, and the workmanship, though plain, appeared strong and

good. Holland shows very cheap ware; while Belgium has a large number of tinned articles from the Cereheim Carpenters' Society, which, however, did not strike us as particularly cheap. Smisser, from Bergen-op-Zoom, exhibits coarse brown-ware tea-pots, at 10 cents, or 2d. An urn, with a rather pretty pattern in relief, and with hot-water lamp, costs only 6d. So that a Dutch cottage can be supplied with necessaries at a ridiculously cheap rate.

Workmen's tools are well shown, but in cutlery there is nothing which can approach the English. Sewing machines are an important item in the exhibition, every country sending a contingent. The chief English contribution is the Weed machine, the speciality of which is its capability of penetrating the thickest materials, not excepting lead. Class VI., that of instruction, is marked by a very large and interesting display of models, designs, and drawings from the various commercial and technical schools, which are numerous in Holland. The clay modellings for cornice-work of the Amsterdam Ambacht school (trade school) and of the Zaanbaar Brugher Avond School are remarkably clever. Deventer School is particularly good in wood-cutting, and Rotterdam in its building plans and elevations.

From the Hague comes a most minute model of the baths and wash-houses, which contain in one wing twenty-eight first and second-class baths for men and women, and in the other, boilers and apparatus for clothes washing. The minuteness of Dutch workmen is well displayed in this model. Each bath was represented with extraordinary fidelity, even to the taps, and the bells even rung. And, *devoos* of washing, which is the *de* *not* of every household, we must mention an ingenious copper, called the Niagara boiler, the hot water of which is forced through the clothes in a constant shower or stream, thereby saving an immense amount of labour and a good deal of wear and tear to the clothes. To match this, Hilgers of Rheinbrohl, Prussia, sends a particularly neat little wringing machine for small articles, so that washing will soon be denuded of most of its disagreeables.

THE DECORATIONS AT THE PRINCE'S THEATRE, MANCHESTER.

THOSE who hold, with ourselves, that "theatrical surroundings" in England are not, artistically, what they ought to be, would have recognised with pleasure a step in the right direction in the decorative treatment of the Prince's Theatre in Manchester, which was reopened on Friday, the 6th ult., after a temporary closing of some weeks. The house, erected some time since from the designs of Mr. Salomons, and which has enjoyed a prosperous career of late under the able management of Mr. Charles Calvert, had been found deficient in accommodation for the audiences which were attracted to it; and accordingly the management called in the assistance of Mr. A. Darbyshire (the original architect of the theatre having, for whatever reason, declined to undertake any alteration) to devise means for meeting the difficulty. Under his direction the ceiling has been raised 8 ft., and the "upper circle," which formerly consisted of only two tiers of seats, has been extended backward to the limit of the auditorium, filling the space before occupied by the "gallery," while the increased height obtained by raising the ceiling has enabled the architect to reconstruct the gallery over the upper circle. By this means three hundred additional seats are gained. But while this important practical improvement was carried out, it was determined, also, that the occasion should be seized, while the house was necessarily closed, for entirely remodelling the decorations. To this end the valuable aid of Mr. H. S. Marks was invoked, and the space over the proscenium, left by the raising of the ceiling, was turned over to him as a field for the exercise of his talent, with what result we will describe just now. The proscenium itself has been designed anew, and is now flanked by a massive square pilaster at each side, carrying an architrave, the main lines of which run right round the house, and form the front of the new gallery. The pilasters are partially fluted and partially paneled, with flat decoration in the panels, and surmounted by a form of capital which Mr. Darbyshire may claim as an invention, and which may be described as a combination of a bracket and a foliated capital. We are glad to see a new feature sometimes, but think the present one would be more satisfactory if the

capital were less cut into and more solid and homogeneous in appearance; the leaf under the bracket on each face does not satisfy the eye as a means of support. The rest of the decorations have been mainly from the designs of Mr. Gordon, with subordinate figure-subjects from the pencil of Mr. Phillips (both of London); all, however, subject to the general control and judgment of the architect, who has signified himself by a merciless raid upon nearly all the remnants of the time-honoured style of ornament which may generically be termed "pie-crust," and which has too long been the curse of theatrical decoration. "Sweet things in festoons" of plaster fruit and flowers have been ruthlessly excised, and the fronts of the various tiers treated as much as possible in flat ornament in colour. The front of the dress-circle shows a series of panels illustrative of Shakspeare's principal plays, consisting of a head of the principal character within a circle in the centre of the panel, the rest of the space being filled up on one side by a scene from the play, painted on a small scale, and on the other side by the name in a label surrounded with scroll-work in keeping with the assumed date of the play. Some raised panels over each column (part of the old design), which formerly contained medallion heads, now bear the initials W. S. in a monogram; but, though a monogram is a most appropriate decoration in a single central position, its unvaried repetition in this fashion is not, we think, a very happy idea. The upper circle is decorated with arabesque designs on a gold background, and the gallery by a simple but very effective and pretty design picked out with gold on a light-blue ground. The whole of this decoration is of the Gothic type so much in vogue with many architects at present, and which has a tinge of what one may call Egyptian character about it. If we were to say that we regarded this as the most desirable type of decoration for modern buildings, we should "say the thing which is not;" we look for something more of classical refinement and grace of form than are found especially in the designs for the panels of the ceiling of this theatre, and in the intermediate panels which alternate with those already described in front of the dress circle; both which appear to us also somewhat too large and coarse in detail: this particularly with reference to the dress circle, which, of course, is nearest the eye from all the best parts of the house. The two other tiers are excellent in their effect, and there is ground for great satisfaction in seeing the old meaningless style of theatrical decoration fairly broken through, and the whole of the work of decoration carried out in a consistent and painstaking manner. One of the most pleasing points is the way in which the curtains and bangings over the boxes have been "architecturalized" into harmony with the other decorations, instead of banging in those eternal festoons which we are used to see. The only bit of the "old heaven" is the act-drop curtain, which is splashed over in imitation of heavy folds of draped stuff in the old-fashioned style. It is a pity that this was allowed.

Neither architect nor decorator, however, will quarrel with us for saying that the most important feature in the new work is the painting on the frieze by Mr. Marks, before referred to. In the same manner and style as the painting at the Gaiety Theatre, it is nevertheless a decided step in advance of the latter. The composition, which is kept rigidly to one plane (without even such slight attempt at perspective effect as laid the painting at the Gaiety open to some criticism as a mural decoration), shows Shakspeare enthroned in the centre, Tragedy and Comedy seated at his feet to left and right respectively of the spectator, while the rest of the space is occupied at each side by the principal characters from his greatest plays. On the Tragedy side are to be seen Othello, Hamlet, Macbeth, Ophelia, Lear and the Fool, Romeo and Juliet, Coriolanus, Timon, and Julius Cæsar; on the opposite side Prospero, Shylock, Touchstone and Audrey, Puck, Falstaff, Benedick and Beatrice, Henry VIII., Richard III., Henry IV. The central figure on this latter side is Falstaff seated with a wine-cup in his hand, and with as much joviality of look and manner as could be consistent with a style of painting which must of necessity be removed considerably from anything like objective realism. Over his head rises a flowering plant in full bloom, typical of exuberant life, and he is balanced on the opposite side by the grandly conceived figure of Lear, marked by great breadth of treatment in the drapery and general pose; this is also a sitting

figure, and backed by a withered and blasted tree, which further emphasises the contrast of the two characters. These two seated figures, from their position, assist the artist in his skillful varying of the outline of the composition, which is not in the least chargeable with monotony. The rustic figure and pose of Touchstone's sweetheart ("bear your body more seeming, Audrey," is evidently the last sentence she has heard) form an admirable foil to the graceful and beautiful figure of "the gentle lady wedded to the Moor" opposite; the sentiment and gush of youthful love exhibited in Romeo and Juliet is contrasted with the light half-sarcastic attachment of Benedick and Beatrice (Benedick does not look quite gentlemanly enough, according to our conception of him); and the classic group on the extreme left balances very bappily that of the Mediæval English monarchs on the right. Prospero is a fine dignified figure (we should have liked to have seen our pet female character, Miranda, in the scene); Hamlet we think not so successful—a little too sentimental, and wanting in that manliness which, with all his philosophy, was an essential part of his character, but which painters and actors alike too often miss. The central figure of the bard is backed by a laurel tree which is of great value in giving breadth and importance to the centre group, and perhaps the most successful figure in the series is that of Tragedy, a refined and beautiful conception, as she sits with drooped head, not exhibiting such an image of horror as those which flank Reynolds's grand painting of Mrs. Siddons, but rather giving us the aspect of Tragedy when so far removed from the real into the ideal world as to be contempered with pleasure unmingled with anything of abhorrence. The satisfaction to be derived from a study of this fine work, however, is less perhaps dependent on the beauty of individual figures than on the harmony and completeness of the whole both as to colour, composition, and the amount of thought displayed in it; and highly as Mr. Marks is already esteemed by many, we should say that those who have not seen his work at the Manchester theatre are not fully conscious of his powers.

We ought not to omit mention of the side panels in the frieze over the boxes, which have been painted by Mr. Phillips, with subjects illustrative of painting and music in very fair imitation of Mr. Marks's style; the female figure in "painting," standing as a model for the artist, is particularly elegant both in pose and costume. The glaring mistake made at the "Gaiety," of having figures in the side panels on a different scale from those in the principal painting has been happily avoided here. A panel at each end of Mr. Marks's painting is filled with what the local papers, acting, we suppose, under proper information, describe as "conventional drapery," but which look to us as painfully like two big pocket-handkerchiefs hung up on high: something better might certainly have been devised for the situation. Beyond this, it is sufficient to say that Mr. Calvert delivered an opening address on the occasion; expressive, among other things, of a conviction that the stage was not in so deplorable a condition as critics are representing it to be; that the acting of himself and his clever lady, as *Benedick* and *Beatrice*, in the performance of "Much Ado about Nothing," which followed, went far to confirm his views; that there was a nice bit of part singing of Macfarren's "Who is Sylvia?" introduced in place of Balthasar's song, "Sigh no more" in Act ii.; and that the orchestral music was neither better nor worse than in most English theatres. Perhaps some enterprising artist may now attempt to do for English theatrical music what Mr. Marks is doing for theatrical painting, and endeavour to raise it to the level of high art. Let us add in conclusion that to those who were in any degree "behind the scenes" nothing could be pleasanter than to witness the enthusiastic and friendly manner in which manager, architect, artist, and decorators acted together, in endeavouring to produce a satisfactory result, and to do honour to the memory of the great poet whose name they have endeavoured specially to associate with this theatre.

Salisbury Cathedral.—The scaffolding by the aid of which the statues have been fixed in their several niches on the west front of this cathedral has lately been removed. Miss Caffyn Grove, of Zeals House, has sent to the treasurer of the restoration fund 100l. for the purpose of placing two additional statues on the west front.

VISIT TO ST. ALBAN'S ABBEY.

AFTER the address of Lord Lytton at the opening meeting of the British Archaeological Association's Congress in St. Alban's, the members repaired to the Abbey, where Mr. Gordon Hills became their guide. Taking them to the spot whence they could survey the northern side of the abbey, he asked them to observe the peculiar nature of the construction of the church, to take note of its vast proportions, its great length, and of the unusual circumstance that it is largely constructed of brickwork. The materials of which it was formed (he said) given it a character which no other church of its size possessed. The tower, which is covered with plaster, is built of brick, visible everywhere inside of it. All the exterior was covered over as the tower still is.

The company then returned to the western entrance, and attention was called to the singular appearance of the west end of the church, its unfinished character, and the beautiful and elaborate work in the porches. Having taken up a position in the nave, Mr. Hills proceeded to say that this noble church was one that connected, more than any other in this country, memories of the past with the present. It was founded on the spot where the first Christian martyr of Britain shed his blood. The date was not exactly known, but it might, with sufficient accuracy, be said to be within a few years of 300 A.D., in the time of one of the persecutions under the Emperor Diocletian. The ancient city of Verulam stood on the opposite hill, and from that city Alban was led out by one of the gates, and decapitated on the neighbouring hill, and on this hill the first church was founded. When Germanus and Lupus visited Britain for the purpose of putting down the Pelagian heresy, they visited this church, and the tomb of the Martyr was opened, and some sacred relics, brought by them, were put in it. The next that was known of the church was that, in the time of Bede, a church stood on this spot. Then there was a blank, until the end of the eighth century, when Offa, King of Mercia, founded a monastery on this spot. In the lapse of time, the memory of the first church had perished, and it was said that Offa was miraculously guided to the place where the remains of Alban were entombed. From that time there had been a church on this site. After this we came down, 300 years at a leap, to the time of the Norman Conquest, when Abbot Paul began to build the church, which, in the main, was that now before their eyes. This building was consecrated in 1115. It was particularly interesting to notice that the church was not only itself of great age, but that it was constructed of the fragments of other buildings that had fallen into ruins. Abbot Paul ransacked Verulam, and brought a great quantity of materials therefrom for the erection of this church. The interior walls were full of Roman bricks, and the outside wall was of Roman brick and very little else. Even where the brickwork did not appear, the flint and rubble were Roman materials brought to this spot. Two abbots before Paul had collected materials for the building of the church, but a time of famine coming on, they sold the materials to relieve the wants of the poor. In the time of John de Cella (1195-1214), the idea of improving the church was conceived. This abbot pulled down the west front, and proceeded to rebuild, but after collecting all the money he could, he was obliged to stay his hand for want of funds, and the work remained in abeyance till William of Trumpington took the rule in 1215, and completed the construction of four arches on the north side at the west end, and of five arches on the south side. The rudeness of the original Norman work, as compared with other works of the same period, was thus to be accounted for. Paul, in building the arches of bricks from the old city, had to use his materials as he found them, and was unable to mould them into the more graceful forms. In the newer work built of Tottenham stone, which was easily moulded by the skill of the mason, is seen the advantage gained in the change of material, as well as the striking advance which time had made in architectural development. In part of the newer work it would be observed that it had been commenced in an elaborate style, and then dropped from a high to an inferior style. The columns at the west end and on the south side were pointed out as illustrations of this, the columns beginning with seven marble shafts, and the number, as the work progressed, being reduced to two and three.

Mr. Hills next called attention to the bases of columns exposed on the north side at the west end of the nave, as openings into the chapel of St. Andrew, which was a church until the time of the suppression of the monasteries. The chapel of St. Andrew was a church of three aisles, and containing three altars. It seemed to have been a large structure attached on the north side of the abbey. At the suppression the abbey was purchased and made the parish church, and St. Andrew's was pulled down. He next pointed to the paintings of the Crucifixion on the piers of each of the arches of the older portion of the building on the northern side, remarking that it had been suggested there might formerly have been altars placed against these piers; but they had a description of the altars in the building of the date 1440, in which no mention was made of there having been altars in these places, and the character of the paintings precluded the idea that they were there, at any rate at a later date. He then called attention to the south wall at the west end, pointing out that there were no windows, as on the northern side, which arose from the abbot's house being against the south wall. He then described, by a reference to the construction of similar buildings, the probable character of the external buildings,—the abbot's house, the great kitchen of the monastery, in which provision was made for almost unbounded hospitality, and pointed out the door from the abbot's chapel into the church. Further on he noticed also the transept by which the monks descended from their dormitory into the abbey for midnight service. Attention was next called to that portion of the south side of the nave approaching the Virgin, where, in 1323, during the Mass of construction, two columns fell. This led to the construction of five arches totally different in character from those of Abbot William of Trumpington, on the south side, and those of Abbot Paul, on the north, and also to the construction of the beautiful screen across the nave.

Attention was then called to this screen, and to the altars on the right and left of it. The centre altar is wrongly called the altar of St. Cuthbert. It was really dedicated to the Holy Cross, the altar of St. Mary ad Colmanam being to the south, and that of St. Benedict to the north, the latter being also dedicated to St. Oswin. Notice was also taken of alterations made after Trumpington's time, on rebuilding the fallen tower, in which the arches had fewer mouldings, not so good and deep as in the time of that Abbot, and the windows were imitations of Trumpington's work, but much inferior in beauty. This attempt to imitate previous work was seldom made in Mediaeval times. The five columns (at the part indicated, on the south side of the nave) were erected in the time of Edward III., and it would be seen that the shafts were, like those of Abbot Trumpington, of an earlier style. But their caps and bases were of the later style. On the walls above the arches were heads of the King and Queen, the royal arms of England and France, and a shield which was supposed to be that of Offa, but coats of arms came into use about 1215, and there were none in Offa's time. That, therefore, was a fancy. Inasmuch as the abbot who constructed these arches had been prior of Tynemouth, which monastery had a shield identical with this one, he was inclined to think that the arms were those of Tynemouth. Another coat of arms on the wall was said to be that of Edward the Confessor. There were no coats of arms in his time, but when it became the fashion for great people to have them, they were sometimes invented for the illustrious of former days, who never had them.

Mr. Hills next proceeded towards the choir, and taking up his position centrally between the transepts, he remarked that they were now in a part of the church where they could see more of the original Norman architecture than in any other. He would not say that they could see more of the original condition of the church, for the part before them must be deplorably shabby when compared with what it was in other days. Everything that they saw in the transepts was characteristic of the simplest form of Norman architecture, and nowhere had he found any work which he could positively say was the building of Offa. There were, however, stones which there was good reason to believe belonged to his church. In the arches of the triforium they would notice the handed columns, which were of an obviously earlier date than the Norman buildings, and

which he could not help thinking had been taken from the Saxon building, and were used by Abbot Paul in the construction of the transepts. The columns could not be identified as having formed part of Offa's church, but he thought it very likely that they did. The great tower was, he believed, the work of Abbot Paul entirely. A timber spire was subsequently put on it by Abbot Trumpington, but that was swept away at an unknown time, and the tower reduced to its former proportions. It was not often they met with so tall a Norman tower of the early period. The doors on the side of the south transept were the entrances of chapels. In the fourteenth century the chapels on the south side were taken down, and larger chapels built outside. There were two chapels at this part in 1440, but between then and 1540 one of them was turned into a vestry, and a wall separating it from the other chapel was erected. A small archway in the south wall of the south transept, which led to a vaulted passage, was visited by the company. In this vaulted cell, as it now is, there are exquisite specimens of Norman arches, the round Norman arch being intersected and forming pointed arches. It was suggested that this form marked a period of transition, but Mr. Edward Roberts, who accompanied the exploring party, said that the intersected arch was found in the earliest Norman specimens. He, however, traced in the hands of the heads of the arches signs of incipient change. Some very beautiful carved work on the inner part of the doorway excited much attention. It was extremely minute, and of the most exquisite design and workmanship. It constitutes, Mr. Hills said, the only remaining fragment of the works of Abbot Robert Gorham, who rebuilt in this elaborate Norman style the chapter-house to which this passage adjoined. The passage-way had a door at each end, and led from the cloister to the monks' cemetery. This cemetery lay in the angle east of the south transept, and south of the choir.

Before leaving the transepts, he referred to the Roman materials employed in the construction of the building, remarking that there were two or three very peculiar tiles at the end of the north transept—flue tiles built into the wall. On examining the upper part of the tower he had found some curious marks on the Roman tiles. It was not unusual to find on Roman tiles the mark of a dog's foot, which was to be explained in this way,—the tiles had been laid out to dry, and dogs, with which the country abounded at the time, ran over them while they were in a wet state, and left the impression of their feet on the yielding material. But on one tile in the tower he had found the impressions of a pig's foot, of that of a bird, and of a cat's foot. In the last-mentioned case the tile had got nearly dry when the cat passed over it, and the impression was faint.

Mr. Edward Roberts said he was much gratified to hear the remarks made by Mr. Hills with reference to the use of Roman materials in the construction of the abbey. On another occasion it had been stated here that a great part of the building was of Saxon construction; and he had heard that the gentleman who said this challenged any one to contradict his assertion. He was not present at the time when the statement was made, or he should certainly have disputed it. He was happy to find that Mr. Hills had come to the conclusion to which every one acquainted with the subject must come. The assumption that, because some balusters and shafts which had been put in were of a Saxon character, the work itself was Saxon, was as idle as could be.

After listening for a few minutes to the tones of the great organ upon which the organist, with the consent of the rector, kindly performed, the company proceeded to the space before the high altar. Mr. Hills called attention to the elaborate work of the fifteenth century on the altar screen, mentioning that the shrine of St. Alban was originally so raised, and the screen so low, that the shrine could be seen by the priest when he stood at the high altar. There was at that time above the high altar an elaborately carved beam, with the crucifixion upon it. Abbot Trumpington, however, removed this roof beam, and put it across the south transept. It was the custom to have the aisle opening to the choir by arches, but this building was not so constructed, there being a solid wall between the aisles and the choir, the open arches having been added in Trumpington's time, and the solid wall panelled to match them. The ancient shrine must have stood where the present high altar was, Abbot

Trampington having lengthened the church eastward.

Attention was then called to the tomb of Abbot John, of Wheathamstead, who came to the rule about 1420. The roof of this part of the building was then referred to, and the decoration of it was said to be the work of Abbot Wheathamstead. The symbols on it were those of John the Baptist and St. John. The shields were used to conceal the junction of the wood and stone vaulting in the roof. The tomb on the left was built to Thomas Ramryge, one of the last of the abbots.

The company next assembled in the Saints' Chapel, at the back of the high altar, where Mr. Hills pointed out marks on the centre of the area of the chapel which they were able to recognise as the place of the shrine of St. Alban. The marks were those of the feet of the columns which carried the canopy over it. Most of them (said Mr. Hills) would probably come to the conclusion that the relics of St. Alban never were enclosed here. The history of these relics was very curious. He believed that Gervasius and Lupinus did see the relics of St. Alban, and placed others with them. Afterwards, in Bede's time, they still remained there, but subsequently the place of their deposit was lost sight of, and it was said to have been revealed to Olla by a miraculous light which led him to a spot where bones were found that were treated as the relics of the saint. Afterwards, the country was overrun by the Danes, who carried away the supposed relics. A monk of St. Alban's undertook to recover them. He set out for the Scandinavian monastery to which the relics had been carried, and, representing that he was led thither by the fame of the salutary effects of the relics, sought admission into the brotherhood. Having conducted himself satisfactorily for some time, he was admitted a monk, and in course of time advanced to the office of Sacristan, and, with what we should now consider doubtful morality, made use of his office to get possession of the relics. He made a hole at the bottom of the shrine of the saint, got out the relics, and having packed them, procured a merchant to deliver them up, sealed with his seal, to the Abbot of St. Alban's. After that England was again invaded by the Danes; and the monks of St. Alban's, becoming alarmed for their sacred treasure, the abbot took the relics out of the shrine, and made a hole in the wall under the Chapel of St. Nicholas, and buried them there. Having done this, he sent to Ely the bones of a monk, which he carefully delivered, pretending that they were the relics of the saint. This led to a curious dispute in after times. When the Abbot of St. Alban's restored his own relics to their place, and wanted these relics back, the monks of Ely refused to give them up, for they reverenced them as the true relics of St. Alban. The Abbot of St. Alban's, however, deceived them, and inquiry having been made from the Pope, it was pronounced that the supposed relics of the saint had not been removed from the Abbey of St. Alban's. The actual possession of the relics was further established in the year 1256 by the discovery in the church at this part of a coffin containing an inscription on lead, which averred that this stone coffin was the coffin of the saint. Other places, however, claimed some of his relics. Two canons coming here from abroad, said they possessed his shoulder-blade, given them by Canute, King of England. A church in Germany also claimed to possess most of his bones, and even now this possession is claimed for a church at Cologne, where, in a magnificent shrine of very ancient date inscribed to the saint, these relics may still be seen. The history of them is succinctly preserved, and would make them to be some relics actually taken from his tomb at St. Alban's by Gervasius and Lupinus about the year 400.

Attention was next called to the monument erected to Humphrey, Duke of Gloucester, on the south side of the Saint's Chapel; and, on the north side, to the closet erected for the reception of the articles given to the shrine, and to the quaint watching-chamber,—over a Medieval gem. The tabernacle work over the capitals of the pillars behind the shrine was particularly noticed as rarely to be met with.

From the Saint's Chapel, the company passed out at the south side, into the open air, and proceeding along the passage which now forms a thoroughfare, intersecting the abbey and separating the Ladye Chapel from the rest of the building, entered the vestibule leading to the

latter. At this point, just outside the door of the Ladye Chapel, Mr. Hills paused, and said they were now assembled in a part of the building which formed the ante-chapel to the chapel of the Virgin. At the end of the twelfth century a great change took place in the celebration of services to the Virgin Mary, which led to the erection of more splendid chapels to her honour than had formerly existed. They were now outside one of these which was begun by Abbot Trampington. To reach this place they had just passed along what was now a public thoroughfare, and which his lordship, the bishop, had this morning spoken of as a desecration of the place. He (Mr. Hills) was told that the public way through the building at this point was a great convenience, and that it was impossible to give it up. He hoped, however, that there was no insuperable difficulty in the way. When they heard of a project for making a tunnel under the channel to connect England and France together, it could not be impossible to construct a tunnel under the abbey, which would serve the purpose of the present thoroughfare, if, indeed, a thoroughfare in that direction were necessary. In this part of the building there were formerly three altars, one to St. Edmund on the north side, and another to St. Peter the apostle on the south side, with the shrine of St. Amphibalus to the west. Looking up to the roof, they would see, from the marks on the columns, that it was originally intended to have vaulting, but it never had any, and was covered with a flat ceiling in oak, of which there were, as they would observe, some remains. The work was begun by Abbot Trampington, and continued for a long period, but it was not finished until a century later, in the time of Hugh Eversden (1308—1326).

From the ante-chapel the company passed into the Ladye Chapel, when attention was called to the beautiful windows of Hugh of Eversden and the hall-flower ornament running round the window arches, and to the exquisite little statues, many of them but slightly injured, which was remarkable, considering that the chapel had been used as a boys' school for four hundred years. Next was noticed the partition which separates the Ladye Chapel from the ante-chapel, under the hoarding of which there were traces of an elaborate screen. This partition ought to be taken down with the greatest care, so that no injury might be done to the screen. All were happy to hear that steps were in progress for the removal of the screen to that part of the old building which formed the gateway of the monastery, and which had been used as a goal. Every archaeologist will rejoice at a removal which will facilitate the throwing of the Lady Chapel into the church, of which it was a part.

LABOUR SAVING MACHINES FOR BUILDERS.

IN our recent notice of the show at Manchester, we mentioned briefly the remarkable labour saving machines exhibited by Messrs. Allen Ransome & Co. They seem, however, to call for a fuller description than we could then give. Some time ago we described the "General Joiner" and other machines that had been set up for Messrs. Corbett and McClymont on the Redcliffe Estate, West Brompton, where they have raised a town of excellent houses. Messrs. A. Ransome & Co. have now, however, patented a new "General Joiner," of which they say that it will work saws up to 20 in. in diameter, and saw stuff up to 7 in. thick; it will cross-cut wood of any length, up to 4 in. thick; it will plane both sides and thickness, in one operation, boards up to 7 in. wide; it will cut single or double mouldings of any pattern in any kind of wood up to 5 in. wide; it will cut grooves from $\frac{1}{2}$ in. to $1\frac{1}{2}$ in. in width; it will make perfect planed tenons in one operation; it will make mortises from $\frac{1}{2}$ in. to 2 in. of any length in any kind of timber; and it will bore holes from $\frac{1}{2}$ in. to 2 in. diameter. In addition to the above, it may be used for relaying and moulding sash frames, mitring, chamfering, tonguing, heading, and a great variety of other purposes. It is worked by two hands, and will do the work (they assert) of at least thirty skilled joiners. The advantages it has over other machines of this class appear to be that the tenoning, planing, and thicknessing, and moulding operations, can be carried on without interfering in any way with those that are done at the sawing end of the machine, such as ripping-out, cross-cutting, squaring-up, tonguing, and grooving, &c.; the tenons are formed

at one operation by cutters, which finish them much more accurately than is the case where saws are employed for this purpose, as in other machines of this class; the wood to be tenoned, which may consist of several pieces up to a total width of 18 in., is cramped in a horizontal position upon a light sliding plate, instead of each piece being fixed separately in a vertical position, as is the case in other General Joiners; tenons can be formed with shoulders of unequal lengths, by simply altering the position of one of the tenoning blocks on its spindle; and it will plane both sides at once, and thickness boards up to 7 in. wide, and will cut single or double mouldings of any pattern in any kind of wood. In other machines of this class one side only can be planed at a time.

Without endorsing all the claims made for it by the patentees, we have no hesitation in asserting that it is a very valuable machine, and that every large builder ought to take an opportunity to inquire into its merits.

Parkinson's patent "Universal Joiner," made by the same firm, combines improvements never before introduced into machines of the class known as "General or Universal Joiners," for example, it will plane, groove, tongue, edge, and thickness boards up to 7 in. wide, or will work all four sides of a moulding at one operation, whereas the most perfect "General Joiner" yet produced will only plane two sides at a time; it is provided with a complete band saw for sawing circular work up to 10 in. thick; and it will mould and rebate circular sashes, or stick curved or circular mouldings of any pattern. The hand saw and table are attached in such a position as not to interfere with the working going on at either side of the machine; and as the planing arrangement and saw are driven separately, the lad operating either part can stop or start his portion of the machine without interfering with the working going on at the other side.

Frazer's patent equilibrium deal frames do a large amount of work. These machines are furnished with two separate swing frames worked from one crank shaft, so arranged that when one is at the top, the other is at the bottom of the stroke; and thus in ascending and descending, they counter-balance each other, and the result is that they can be driven at 400 revolutions per minute with less vibration than other deal frames driven at half that speed, and the necessity for a fly-wheel is obviated. The swing frames are made entirely of cast steel, thus combining great strength with the least possible weight, and the crank shaft and other working parts do not require to be nearly so strong as in other frames, in which a heavy swing frame is counter-balanced by a heavily-weighted fly-wheel.

The plain band saw machines, exhibited by Messrs. Ransome & Co., are intended chiefly for sawing curves, and among the many purposes for which they are peculiarly adapted may be mentioned sawing out hand-rails, gothic work, &c., for builders and contractors; cutting out buffer blocks, break blocks, curved supports for roofs of railway carriages and trucks, for railway carriage builders; preparing chair backs and legs, for cabinet-makers; and sawing out fellos and naves of wheels for wheelwrights, &c. By simply changing the saw it is equally adapted for cutting out delicate ornamental work, or for sawing through a piece of oak 15 in. thick.

We have before now spoken of their Self-Acting Saw Bench and their Planing and Tying-up Machine. In the latter the cutters are attached to a wrought-iron adze block, which revolves at a very high speed, and cutters of any form may be fixed to it so as to cut a moulding, band or rebate, upon the timber at the same time as it is being planed. The table is of cast-iron, planed all over, and fitted at intervals, with screw-cramps, fitted with gun-metal nuts and wrought-iron flanges, by which the timber is readily and securely fixed. The table is worked by a self-acting feed motion, giving it a forward speed equal to 12 ft. a minute, and taking it back much faster.

We advise such of our readers as are practically engaged in building operations not to content themselves with reading of such machines as these, but to inquire for themselves as to the expediency of making use of them. All are advanced ultimately by machines that lessen human labour.

The Ellesmere Memorial.—We may remind our readers that the architect of this memorial was Mr. T. G. Jackson, of London.

HOLME'S STONE-DRESSING MACHINE.

Mr. SHEARER, of the Dalbreath Granite Quarries, and Mr. William G. Freeman, of the Penryn Granite Quarries, having taken up the stone-dressing machine invented and patented by Mr. Joseph E. Holme (of the United States), have given us an opportunity to inspect it in action. The object of the machine is, of course, to facilitate the dressing of stones, and especially of the harder and more enduring class, enabling contractors and hinders, or quarry owners, to avail themselves of steam or water power for the more laborious part of their trades. The machine consists of a simple arrangement by which a block of stone can be made to travel beneath a transverse bar, carrying either a series of chisels or a single knife. To this bar (differing from other stone-working machines that we have seen), a kind of oscillatory motion is imparted by a crank axle, so that the action of a workman's hand and mallet is very exactly imitated, but with a speed and force that no workman can attain. Certain varieties of granite that has hitherto had no market value on account of their extreme hardness, the cost of dressing having exceeded the worth of the material, can be worked by the machine with facility. The ordinary process is first to subject the rough stone to the action of a row of chisels, separated by interspaces, so that the surface is grooved, and then to replace the chisels by a continuous blade, that reduces the grooved surface to one that is uniformly level. Two blocks of Portland stone were exhibited, measuring about 6 ft. in length by 21 in. in width, and 14 in. in depth. One of these blocks had been dressed by hand by a skilful workman, who completed his task in 15½ hours. The other was dressed by the machine, in the presence of visitors, in 2 hours only, and the machine-dressing was certainly superior in finish to that done by hand. The inventor considers that 1-horse power should be used for each foot in width of the surface acted upon.

With these machines, the quantity of stone dressed depends more upon the convenient arrangements for handling and turning over the stones, than upon the actual time of cutting. The forward feed over the surface of even the largest stones will be 18 to 24 in. per minute; if well quarried and scabbled, two or three cuts will finish a face of 15 to 20 superficial ft. in as many minutes. On smaller stones, of course the proportionate quantity dressed would not be so great. Beds and joints require but two cuts, if well shaped, and by using only the punches or grooving points, a regular matching or dovetailing of the courses may be obtained. A smaller machine is made to be worked by hand, in situations where power is not available, for making window caps, sills, and such small matters as are used in connexion with brickwork. This machine will take in a stone 5 ft. by 17 in.

There seems to be danger in trying to chip off too much at once, and care must be taken to keep the chisels in good order; but, with any little drawback of this sort admitted, the impression the machine gave us was very satisfactory, and we can scarcely doubt that it will come into general and advantageous use.

VERULAM AND POMPEII COMPARED.

ROMAN ENGLAND.

AMONGST the papers laid before the recent St. Alban's Congress,

Mr. J. W. Grover read one with the view of showing the similitude between Verulam and Pompeii. After introductory observations he proceeded to say,—"Verulam is variously named by the Roman writers. Tacitus, whom we follow, calls it Verulamium; Ptolemy, Urolanium and Verolanium; and Antoninus, Verolanium. It occupied an oblong area about three-quarters of a mile long by half a mile wide. Our excavations have traced the principal streets—running north-west and south-west; one of these formed part of the great military road from London to the north-west, and generally follows the present turnpike-road from Edgware, Elstree, Park-street, then Verulam, and Redbourne, Market-street, Dunstable. These streets were intersected by others running at right angles to them. One seems to have followed the hedge between the Rectory fields and Mr. Aldridge's farm; another was probably, though not certainly, on the site of the present Hemel Hempstead-road. Both these streets ran south-west and north-east. The first may be traced in the fields to the west of the city, on which side

Stukely says a gateway was formerly visible. This road, no doubt, formed the famous Camlet way; it ran in a straight line from the western gateway to the southern side of St. Michael's churchyard, and thence through Major Gape's garden, across the Fishpool, and straight for Oster hill; part of this road was visible in 1826, when it was destroyed, I believe. Now let us for one moment consider the shape of the city. It is an oval; the major axis of which is traversed by the Roman Watling-street, the minor axis by the Camlet way; the intersection of these two great streets is close to St. Michael's Church, and in nearly all the Roman Cities of Britain this seems to have been the site of the great Temple and the principal buildings. I will venture, therefore, to propound a theory which I believe is consistent with analogy—That St. Michael's Church occupies the site of the Temple, and that temple probably was dedicated to Apollo. In Bath, the city of Apollo or the Sun, we have two St. Michaels—one of which stood near the site of the famous temple. When the world became Christianized the saints received and perpetuated the attributes of the deities they superseded. St. Mary de Stall in Bath succeeded Sali Minerva. St. Sul was worshipped in Brittany in the place of Sol. The Templum Salutis in Rome became St. Vitale; the Pantheon, All Saints. Fire and light were the prevailing idea in the temple of Vesta, which is now the Madonna of the Sun. The twin brethren—Romulus and Remus—were perpetuated by Cosmo and Damien. Cases might be multiplied indefinitely; as in Bath St. Michael succeeded the worship of Apollo Baal, so I think he did in Verulam; the saint slew the dragon, as Apollo the python; the last drove the rebellious angels from heaven, the last destroyed the cyclopes. Moreover, it is curiously confirmatory of this argument to remember that both the St. Michael's monns in Cornwall and France, were said to have been consecrated by the Druids to the sacred fires of the Sun or Baal—Belien, as they are now called, and which still exist. The Romans especially adopted and engrafted their religion upon that of the nations they subdued. When they came they found this land devoted to the worship of the Sun and Moon, the Baal and Ashtaroth. So they built their temples to the Sun and the Moon,—divinities—Baal or Apollo here, Diana at Dunstable, and propitiated the Druids. Then came Constantine, and Christianity prevailed. We know that the Christians of the Roman Empire converted the temples into churches; and this fact accounts for the sites of several of our cathedrals in the very centres of the old Roman cities. Sir C. Wren supposed that St. Paul's stood on the foundations of a temple of Diana. Chichester Cathedral stands on Roman remains in the centre of that city. Stone-street points direct upon its spire for miles. The great Roman western road to Gloucester, the Ermine street, runs in a long straight line for miles upon the tower of that city's cathedral; other cases might be brought forward in support of the argument, but those I have named will suffice. In Pompeii the theatre occupied very nearly the same relative position as in Verulam; and a temple stood near it dedicated to Hercules, and occupying nearly the same situation as St. Michael's Church does to the theatre here. The principal forum in Pompeii was about 500 ft. long by 110 ft. wide; on the eastern side came the Basilica and Temple of Venus; this, no doubt, was the arrangement in Verulam, and would place the forum in Mr. Aldridge's meadow, to the south of the rectory paddock, where Stukely shows a large building. In Uriconium the same plan is followed. The western gate of Verulam, near the Hempsted-road, at the entrance of the Camlet Way, would correspond exactly with the Vesuvian gate in Pompeii, and the crater of the volcano, with regard to the shape of the city and its distance, would come at Langley Bury. In the case of the Campanian city the sea represents the fish-pool of Verulam, but it extended on another side also, viz., on that here facing St. Stephen's Church. The dimensions are most strikingly similar in both cities. The length of Pompeii is 4,300 ft.; of Verulam, 4,488 ft. The width of Pompeii is 2,400 ft.; of Verulam, 2,541 ft.; the area of the former being 167 acres, and of the latter 190 acres. But the shape is most singular, and this can be best understood by applying the plan of one to the other. It seems as if the municipal authorities of our British town had taken the Campanian city as their model. So in the streets a similar agreement seems to exist both as to position and width. In both cases they

seem to run nearly at right angles along the axes of the ellipse, and range from 24 ft. to 27 ft. in width. Verulam, however, has the advantage of the greatest regularity, being built evidently on one formal plan—as the American cities are now-a-days. The theatre of Verulam not only occupies the same relative position, but is, singularly enough, nearly the same size as that of its model, being 193 ft. 3 in. in diameter, against 195 ft. approximately in Pompeii. Mr. Wright estimates twenty rows of seats here: in the Italian example there appears to have been twenty-two rows, not including those within the proscenium of the orchestra, which in Verulam appears to be 70 ft. against 62 ft. in the other. The distance from the stage to the back is same in both cases. The stage in the Italian theatre is, however, much wider than in ours; so is the postscenium; the wall of one theatre at the side of the stage are placed at an angle, which is a difference. Both theatres appear to have been richly adorned with frescoes and marbles; at Verulam slabs of the latter material, thirteen-sixteenths of an inch thick, are found, and appear to resemble the material used for lining the fountain's basin at the famous Roman villa at Bignor, in Sussex. It is worth while remembering that at Pompeii a second and smaller theatre exists close to the large one; perhaps further explorations may show a similar one here; it should come on the northern side. The presence of this unique and interesting relic throws much light upon the manners and customs of our Romano-British ancestors. That civilisation could have been of no contemptible kind which enabled the inhabitants of this remote province to appreciate the drama of Plantus and Terrence, or the cadence of a Greek chorus. Remembering that every Roman town in Britain seems to have possessed an amphitheatre dedicated to the less humane pastimes of the gladiator, in Verulam also has a refined Greek stage been discovered. The position of the amphitheatre in Verulam has been promised us by an eminent local antiquary, so I will not speculate on its site. It stood, to judge from other cases, outside the walls, and Mr. Harris has pointed to a hollow between the town and St. Stephen's, which deserves attention. I refrain from any observations, however, pending further exploration. The streets of Verulam seem to have been composed of gravel metalling; on the top of this may be seen a quantity of oyster and mussel shells, which are always found in Roman towns; on the top comes a debris of burnt wood, the charred remains of the fallen rafters; then fallen walls and the Italian roofing tiles with the rolls. Large quantities of the fresco painting of the apartments may also be seen. The intonaco, or thin finishing coat of plaster, is very perfect; it is generally of a cream or white tone, with brown, red, and blue stripes, as in Pompeii, and sometimes painted with flowers. In the field where the theatre stands, which is still called the "black ground,"—probably from the quantity of burnt wood found there,—I am informed by the tenant, the plough frequently brings up a quantity of tesserae, showing the pavements are very near the surface. It would be trespassing beyond the province of this paper to enter into any discussion respecting the roads in the vicinity, yet I cannot help remarking upon the foss ways, one of which leads from the western gate towards Gorhambury, and another of which may now be seen in Beech-bottom, which points towards Verulam, and no doubt formed part of the Camlet-way. These curious sunk roadways were one of the peculiar features of Republican Rome, and they have lately been explored by Mr. J. H. Parker, and explained by him and Dr. Fabio Gori, for the British Archaeological Society of Rome. It is singular to find similar works in Verulam, and their precise object cannot be explained satisfactorily; yet their existence here proves the connexion which existed between our ancestors and the rising capital of the world, at a much earlier period than history records. One question has, I think, been determined by our recent explorations, and that is the existence of the wall on the Fishpool side, the remains of which may be seen on the property adjoining Major Gape's house. The pool itself must have formed an extensive lake, and in Gough's Camden mention is made of subterranean arched chambers running under the water; it is also stated that Abbot Ealred found on the hanks oaken planks fastened with nails, and pitched over; also ships' tackle, fir oars, rusty anchors, and so forth; showing that the water was deep enough for

navigation of some sort; a road probably passed between it and the wall. In conclusion, I would draw attention to the fresco painting; and trust that if there is any chemist amongst our congress he will be induced to make an analysis of its composition. What medium could have been employed so durable as to withstand not only the action of the fire but also of the damp of fifteen centuries. I believe the ancients employed wax mixed with oil in a warm state. The subject is one of much interest. Finally I venture to hope that the labours of this association may lead to the full explanation of this most interesting relic of antiquity—Verulam. Mr. Grover concluded by remarking, that the fields in question certainly contained most valuable treasures, and he hoped that some day this inquiry might lead some one to continue the excavations on the spot. The more they investigated the subject the more astounded they would be to see that this country was in as high a state of civilization 1,700 years ago as it was in the time of Charles, and certainly, as far as the means of communication were concerned, infinitely better. The Romans were a thoroughly practical people, and though they did not stand upon any ceremony in taking it, it would be admitted that they had introduced into it the highest amount of science and happiness compatible with the then existing state of things.

FINSBURY PARK.

On Saturday last Sir John Thwaites, chairman of the Board of Works, attended by many members of the Board, vestrymen, and inhabitants of the district, and heralded by the band of the Stoke Newington Rifles, opened in pleasant weather the so-called Finsbury Park, for the formation of which the Board purchased 120 acres (and some more), under a statute dated so long ago as August 17th, 1857. According to the official particulars, a well-known suburban recreation ground, known as Brown's Wood, or Hornsey Wood, and Hornsey House, also formerly called Coyt Hall, was selected as the site for the Park, and the lease having all but expired, after the Board acquired the property, the cost of buying up the business was avoided by waiting a short time. The ancient designation of the estate is the Prebendal manor of Brown's Wood, in the parish of Harringay, otherwise Hornsey.

The ground has a gentle southern slope from Highgate on the west, and towards Stoke Newington on the east, and is skirted on the south by the Seven Sisters' road, and on the east by the Green-lanes. The Great Northern railway bounds it by a cutting and embankment on the western side; and latterly the London, Edgware, and Highgate railway has been made, with a station adjoining the park.

Certain public footpaths had to be preserved for the use of the adjacent lands, and the course of the New River is through the northern portion of the land. Since the park was formed, Parliament has permitted the East London Water Company to form a great reservoir, of some acres in extent, under the surface, for the storage of water on a high level; but as the ground will be trifled over and belted with shrubs the public will not be losers by the arrangement. Contracts were made in 1866 for the drainage of roads, the formation of roads, footpaths, and ornamental water, the erection of the entrance lodges and the gateways, inclosure, and palings. Last year, also, the planting of trees and shrubs was completed.

The expenditure for the park up to 30th of June last has been as follows:—

	£.	s.	d.
For Parliamentary Expenses.....	4.	7	3
„ Property and Compensation.....	54,847	18	8
„ Professional and Office Charges, &c., during 11 years.....	11,252	0	10
„ Works.....	28,814	9	2
„ Trees, Shrubs, Planting, &c.....	2,381	8	2
„ Wages for Supervision of Works.....	451	12	10
„ Incidental Expenses.....	610	10	0
	87,275	3	3
Less moneys received on account of old materials, interest on balances, and rents ...	2,677	0	9
Total ...	84,598	2	6

The cost of the freehold land was about 4721, per acre.

The funds were raised by a loan in 1864 of 50,000*l.*, at 4½ per cent. for thirty years; with 43,000*l.* borrowed on debenture in 1868.

The necessary works have been done under the direction of the superintending architect of the Board, who has designed appropriate entrances and lodges, and has laid out the

ground picturesquely with the assistance of Mr. McKenzie. Two strips of land, one bordering the Seven Sisters' road, the other the Great Northern Railway, were purchased by the Board with a view to letting for building purposes, and so lessening the cost of the park to the public. A loud outcry, however, has been raised against this much as if the Board were endeavouring to flinch land that belonged to the public. Of course, if the rate-payers of the metropolis generally desired that the park should be made so much larger than it was at first intended, and were willing to pay for it, the Board would carry out this desire; but the wisdom of their original arrangement would not be impeached. In letting or selling the land retained for building on, and which is now bounded by the new road on the park side, sufficient margin ought to be retained to admit of planting out the enclosure wall. A very large amount of wood fencing is used in the park. We should have preferred to see something more durable. The land in this neighbourhood should now be brought under the control of the Metropolitan Building Act.

FROM PARIS.

STROLLING up to the Arc de Triomphe, at the *grand point de l'Etoile*, we examined the preparations made for the Napoleon *Mé* of the 15th of August. The nasal festoons of lambs are there, but in an increased number. In the *Tuileries* garden, which is to be dressed out as in the *Mé des Souverains*, so says the programme, 13,750 luminous globes, red and white, are to be affixed to 241 posts, sustaining the bouquets and garlands, all gas-lighted, as of old. Place de la Concorde and Champs Elysées, 24,705 globes, other sundry lights, 15,000; total, 53,455.

The Arc de Triomphe of the Etoile is to be crowned by an imperial diadem, 23 ft. high, electric light, Bengal light, &c. We give a few historic details of this arch. On the 29th of July, 1836, the Arc de Triomphe, at the *Barrière de l'Etoile*, was formally inaugurated. The first stone was laid on the 15th of August, 1806, without any ceremony; it took, therefore, more than thirty years to build, the works having been interrupted twice, and undertaken three times, viz., under the First Empire, the Restoration, and the reign of Louis Philippe. The total cost was 385,045*l.*, and the dimensions are as follows: height, 162 ft. 7 in.; width, 147 ft.; thickness, 75 ft. 6 in. It is the largest triumphal arch in the world, and the foundations are carried down to a depth of 26 ft. below the surface. The stone employed was that of Châteaufort; it is hard, resisting, and capable of receiving a high polish as marble. The architects employed successively were MM. Chalgrin, Gonst, Huyot, De Gisors, Fontaine, Labane, Debrat, and Blonet, who terminated the work as we now see it. The crowning of the arch by an allegorical group, so as to complete it, has been proposed ever since it was begun, and recently it has been talked of, but nothing done as yet.

The project of constructing a popular theatre for grand operas and opera comique is again brought forward. It is said that the plans have been elaborated by M. Adolphe Sax, and completed by MM. Laglaise and Gate. It is to be placed in the centre of Paris, and will contain 4,000 seats, 1,000 of which are to be at 1 franc each.

The restoration and rigilding of the dome of the Invalides has been so far terminated that the tarpaulins and scaffolds set up for many months are being removed. It is the work, as we all know, of Mansard, in the seventeenth century, and has been gilt three times, the last being by the present Government, the former one by Napoleon I. in 1806, and the first gilding by Louis XIV.

A sand accident took place on the 28th ult. at Enghien, at the very gates of Paris, and which is celebrated for its sulphureous waters, its lake, and charming villas. One of the stokers attached to the service of the baths having descended into the reservoir of sulphureous waters, made a false step and fell into the pit. In trying to save him, the second engineer, another stoker, and one of the chief bathmen, met with the same fate. Thanks to the exertions of M. Allègre, and the precautions taken by him, the four mentioned are the only victims, though many persons were in great danger in trying to save the first, seven having fallen in, and only four having been safely extracted. Three others exposed their lives.

At the same hour, in the same day, four men were killed in the cellars of a large brewery at Montrouge, in the Rue de la Voie Verte. The barrels of beer are kept in cellars in the catacombs at a great depth, from which they are hoisted by a steam windlass capable of lifting only 330 lb. at a time, and reserved exclusively for hoisting the beer. Four men, down below, instead of mounting by their ladder, heedlessly risked themselves on the hoist platform, and when they came near the surface the rope broke, and they were all killed instantly.

Several old sepulchres have again turned up in the quarter of the Gobelins, while excavating the foundations of some houses in the new Boulevard Arago. They appear to be of high archæological interest; the kists being of very hard stone, and covered with roughly dressed flags of the same stone. The vault measures about 5 ft. 7 in. in height, the arch being of rough stones laid in mortar. We remarked that there was no particular system in the disposal of the coffins; some were placed end to end, and others piled one over the other; and when we saw the spot most had been removed to the catacombs; but it was plain from our examination of two, one being of very small dimensions, and containing the remains of a young child, that they were either Celtic or Gallic;—perhaps, no relics forthcoming to denote the period: as distance lends enchantment to the view, so relics disappear by diggers.

One of the most interesting works now drawing towards completion in Paris is the new Orleans Railway terminus. What strikes forcibly a professional eye is the new carriage-shed, called here the *grands halls aux wagons*; the height from the rails to the apex of the iron-ribbed roof is 197 ft., the length is 984 ft., and the span about 200 ft.; a bold piece of work, yet without of graceful lightness. The immense ribs are of pierced wrought iron, designed by and executed under the orders of M. Edmond Renaud, to whom great credit is due for his architectural skill displayed in this gigantic structure. The roofing is of glass, and the general design, on the exterior, differs widely from that of the *Nord* or the *Est* termini, inasmuch as there is no attempt at monumental display; but, once inside, we observe a wonderful combination of great accommodation with good taste and comfort. In many of the continental railway stations the waiting-rooms are wretched affairs, in which absence of comfort seems to be the principal object. In the case, however, of the new Paris Orleans station, we find a comfort that we have vainly sought for elsewhere. This extends to the carriages. The State carriages for the Emperor and suite, built by this company, are very sumptuous, and they are the only ones able to pass through the "templates" or *gabaris* of all the lines. When he paid a visit lately to Chartres, by the Orest line, these State carriages were hauled by the circular railway to the St. Lazare station.

A VISIT TO PORTLAND ISLAND.

Nor many days since, in the pursuit of knowledge under difficulties, we shaped our course due south, booking from Paddington station for the pleasant watering-place of Weymouth, en route for Portland Island. We held a Government order for admission to visit the Convict Prison in our pocket; and, although still in a state of single blessedness, we insured our life against railway accident to the extent of the modest sum of 500*l.* Our return-ticket was a special one, and it extended for a couple of clear days. After starting on our journey, we proceeded at a moderately brisk pace, without encountering any delay or obstacle on our way, through Berks, Wilts, Somerset, and Dorsetshire. The early rye and oats were yielding to the reaper's sickle, and the sparrows and the rooks were enjoying a rich Sabbath plunder while man rested. The train whirled on through many a deep cutting, round many a war-shattered outcroachment, over many an historic stream, and hid in its thick volume of smoke not a few antique tenements by matted wood and straggling hamlet. A look upon an open country is pleasant, even through the medium of a railway-carriage window; but the sight of passing villages is flashed upon the eye too abruptly to make a very lasting impression. Yet one can see much, and enjoy much, even by rail in a journey of 150 miles. We reached Weymouth after a run of between seven and eight hours; but it was night, and our walk upon the

Esplanade was by moonlight. Resting for the night at one of the hotels convenient to the beach, we arose early in the morning for a look over the town before proceeding onward to Portland Island. Later in the day we proceeded by train to Portland. Leaving the station, we proceeded by a circuitous sweep, passing on our right a steep and curious ridge of shingle of all sizes and colours, known as Chesil Bank. In appearance and formation it is unlike anything else that you will meet with in any other part of Great Britain. It stretches for several miles from the island of Portland to Bridport, but it is separated from the mainland at Weymouth, and on as far as Abbotshay, by an estuary or inlet called the Fleet. Between Portland and Weymouth the stones are of a larger size than those forming the bank as you recede along the coast. This accumulation of pebbles has little variety in size in the vicinity of Weymouth and Portland, and falls little short of 200 yards in width. It is utterly and completely sterile; nor could we discover thereon, except at a few points, the least sign even of marine vegetation. The cottages that flank this dreary stretch of natural breakwater for miles are constituted of ragged stone. No green grass-plats—no sweet or blooming hedge-rows—no flowers “born to bluish unseen”—nothing but sand, sea, and shingle, squalid dwellings, and stricken human nature. Yet there is something to be seen and heard here and about that will interest the visitor; for his intellect is not of the idiotic Dunderdrey type. The Chesil bank is undoubtedly formed by the action of the waves, in conjunction with the south-western gales which sweep up the pebbly shingle from its ocean bed. The isle of Portland, as it has been remarked by others, contributes to this accumulation of pebbles, acting as a caterer or a collector of it, by the obstruction it offers to their farther drifting. Thousands of pounds have already been expended since 1849, by the aid of free and convict labour, to construct the Portland breakwater, a work certainly of considerable labour; but here, on the coast of Dorset, nature outpaces man in the formation of a natural breakwater, at once a miracle and a curiosity.

Many shipwrecks, in past and recent times, have occurred along the historic Chesil bank. From the fact of these disasters there is a particular part along this pebbly ridge, known by the ominous name of Deadman's Bay. Dead men, they say, tell no tales, but the *debris* of the well-attested wrecks in the vicinity of Deadman's Bay tells alarming tales indeed. Leaving the railway station at Portland behind, we proceed up the zig-zag road, and through a tolerably respectable village or town. On the brow of the island rock a new church, of the Methodist connection, is being erected. Hotel accommodation and every other usual or creature comforts required for summer visits, are to be had on Portland rock for the legal tender. Portland proper, that is, the island rock, is nearly 4 miles long, by 1 1/2 mile in breadth. At its highest point it is not much under 500 ft. above the level of the sea. The shape or configuration of the island can be distinctly seen by looking at the map. It is tongue-shaped, and probably for that reason its extreme point gets the name of Portland Bill, or “The Bill of Portland.” The circumference of the island is computed at about 9 miles. The west cliffs are very high, the fall considerably lower, perhaps under 20 ft. at some point on the south side of the island. Very little vegetation is observable upon the island. No green meadow, no golden corn, no smelling garden, no silvery stream; the hinc vault of heaven is above you, and black, barren, and rugged rock below. The carol of the lark, the chirp of the wren, the sound of the corn crane, or the voice of the cuckoo, each and all are unknown. Besides a human shout is heard, and a detonating report rumbles through the welkin; but nature affords no music. We are approaching now the vicinity of the Portland Quarries. There is quite a legion of them, and they are all distinguished by different names. In the vicinity of the convict prison the Government quarries are worked by convicts, who mostly procure the stone by a system of splitting. A thin channel has been cut along the edge of the rock first to a certain depth, and then an uniform tapping has been resorted to, assisted by the driving in of thin wedges. The quarries of the private proprietors are worked energetically. They are leased by the Crown, who takes 1s. royalty on every ton exported. The wages paid to the quarrymen is very low indeed. Considering

their heavy and wasting toil, and their summer and winter exposure to the atmosphere, it is to be deplored that the wages of these men do not average, the year round, more than 12s. per week. It will be recollected, however, that the Dorsetshire agricultural labourers are the worst paid in England. The ordinary system of blasting and quarrying is so well known to the majority of readers, that it is hardly necessary to describe it. After the vertical hole is drilled in the rock, and the gunpowder introduced and rammed tightly, a train is connected with the outside. When the explosion takes place, the rock is rent into several perpendicular fissures and blocks, from 20 to 50 tons in weight are detached. These are soon removed by the aid of winches, screw jacks, and other appliances, to their required position, where they are shaped, measured, weighed, and marked, and finally carried down to the wharf on iron cars for shipping.

There has been some considerable talk lately about the exhaustion of our coal fields: the question might be put also with a like anxiety concerning the exhaustion of Portland stones. However, we will quiet the fear of our gentleman amateurs and practical builders, by informing them that there is as much stone in Portland as will furnish all the requirements of the world for the next 1,500 years, and perhaps more. One acre, we understand, is annually removed. Portland stone has been used as far back as the twelfth century in some of our abbeys. But it was only in the reign of Charles II. that the quarries on Portland Island began to be worked with any activity. It was Charles who instituted the humane provision of enacting that half of the royalty exacted from the quarry proprietors should be put by as a trust fund for the benefit of the islanders. The provision, it is said, was intended by the king as a compensation to the islanders for the loss of their island pastures. If fruitful pastures ever existed on Portland rock they are no longer visible. Portland stone is much used at the present hour, and it is well adapted to building purposes from the facility with which it can be worked. But there is a very inferior description of it which often goes into the market.

Sir Christopher Wren gave the use of Portland stone a great impulse in London by using it in the erection of St. Paul's. The most of the Queen Anne churches in the City are of this material. Several recent public institutions in the metropolis are also built with Portland stone. In Dublin, Glasgow, Edinburgh, and several large towns through the three kingdoms, Portland stone has been used extensively.

The convict prison of Portland Island, which is rendered somewhat historic of late from the fact of the detention of many of the Fenian convicts there for the last three years, was erected in 1843.

It is capable of accommodating upwards of 1,500 convicts. The Fenian convicts at present confined in Portland are employed in working in the quarries. They work together, and not in conjunction with the ordinary convicts. Among their number at present are two editors of Irish newspapers, a couple of American officers, and several learned men, and some clerks, and several skilled mechanics. A short time since some of the Fenian prisoners confined here were amnestied unconditionally. The political convicts have to work the same and to go through the like discipline as the ordinary ones. Governor Clifton is rigid in carrying out the discipline laid down for observance in the prison.

On the score of health, the convicts could not have a better place. Infringement of the rules, or a refusal to obey a warden, is at once reported, and the offending convict—political or otherwise—is brought before the Governor, who, on hearing the charge, orders him confinement to his cell for a certain number of hours, and a reduction of his diet: probably bread and water for forty-eight hours.

We passed through several gangs of ordinary convicts during our visit to Portland Prison, and we certainly witnessed types of human nature, to whom Lavater would refuse a certificate of character if he took the face as an index of the mind.

The convict system, however, seems to have a brutalizing effect. We have seen Russian counts, some of them noblemen who but five short years ago were honoured with the friendship of the noble and the grand; youths who were made members of West-end clubs, and who, in their wild career of fast life, were tempted to do wrong, and fell. We have seen ex-bankers and members of Par-

liament in their convict garb, who have, since they entered Portland prison, “ceased to do evil and learned to do well.” We have seen many whose social life was once above reproach, and we shudder to think how fallen humanity grows debased in contact with criminal intercourse, and the penalties they have to bear for outraging society. We are not, however, going to write a history of the convict system. We merely look at it as we find it—think a little more than we write, and musically pass on.

Comprised within Portland Prison are a chapel, a hospital, a soldiers' barracks, and a number of warders' houses. Gas is manufactured within the prison. The prison is ruled over by a governor, a deputy governor, and, in addition to those, are a chaplain, schoolmaster, and a host of warders. The yearly cost of a convict is put down at 33l. 10s.

The Portland breakwater constructed by convict labour was laid by a man-of-war in the bay was here a an import spectators

EXCURS

The se in last y Club. A among th Mr. Gra Fowler, explained visitors crops, first acres (whic sewage farm ported on w. Lodge Farm, manager, the Ho. full information in first field contained wurzel and beans, and latter growing on land of potatoes had already h sugar-beet, which from year by Professor Voelck ent. of sugar in the sewe pected to be one of the i under sewage. There were onions, carrots, parsnips, and luxurious crops; also straw wheat growing the third year the same land; oats which the would produce 10 quarters to on a poor gravel; and Italian had already been cut six times ducing on an average 10 tons p crop, or 60 tons in all; the whole being produced by the applicati manure, London sewage. The n was a walk down the line of the co posed culvert, about a mile of wh constructed, to the outfall of the m works. The day was wound up by a dinner at the Ship, Greenwich.

ART-UNION OF LONDON.

EXHIBITION OF PRIZES.

We can cordially endorse the opinion of the Times, “that the present exhibition of works selected by the prizeholders of this Association shows a decided improvement on the average of the last few years.” There has been, in fact, a gradual advance in the character of the pictures chosen, in spite of the increasing difficulty of finding meritorious works of moderate price unsold, which proves that the Art-Union is accomplishing the chief object of its existence; that, in fact, which especially constitutes its *raison d'être*—the improvement of the public taste in matters of fine art; and though it has been objected that this argument loses much of its force because the same persons are not likely to have the opportunity of outliving their knowledge of art by making selections as prizeholders year after year; yet it must be remembered that the same persons do visit, as members of the body, the exhibition of prizes—in very many cases the only collection of pictures they have an opportunity of inspecting—year after year, and by comparing, and, as far as they are

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the acre estim. ry grass, whic er, are to each on of the one xt proceeding upany's produ has been

able, criticising the several works, cannot fail to cultivate their own aesthetic powers.

It is particularly worthy of remark, in connexion with the prize selections in question, that the sum thus appropriated to the encouragement of British art is not confined to the amount actually allotted by the council for the purchase of works, but that many persons are led to supplement the amount of their prizes by considerable sums, which, without this inducement, would not have been so expended. In the present instance, Mr. Shand, the winner of the 200*l.* prize, has been induced to add the sum of 150*l.* to acquire Mr. Ansell's fine picture of "Winter Shooting." In a similar way, Mr. Secker has paid an advanced price for Mr. Stanfield's "Saumur," and Mr. Robertson for the "Beatrice" of Mr. Ward, R.A., a carefully and elaborately painted work; but why Beatrice, and why any other lady of the time, is

Prince Albert, the "Puck," by and about at A., are charming little pictures, and somewhat chaly quality shown in Great Exhibition's recent works. Mr. Luker, and, for escapes with sheep, skilfully coloured. Ransacking the Old Cabinet, is a solidly and carefully re. Mr. Inyes, R.H.A., has three views, in which the transparency of the waves are capitally rendered. sgar-boy, by the late F. Y. Hurler, is the last work of his former days naturally exhibited by him. "Mending a pair of shoes," by J. Richardson, a care-Mr. M. Johnson, a solid piece of painting, with Mr. M. Johnson, naturally treated; "The Solo," by William, a fine sunset scene, Danby, are notable as being some- of an iron tray, a nice bit of contrasted and the shade, "The Market-House, Ross," by were me; and a fresh little picture of a fish- are, who is Ashore," by L. Smythe, all of good

THE BARKING OF THE FAIRM.

at Barking was, visited by the Land Agency and other eng- apny, including Mr. Baad work; "A Ghost Story," by T. Mr. M. Johnson, a solid piece of painting, with Mr. M. Johnson, naturally treated; "The Solo," by William, a fine sunset scene, Danby, are notable as being some- of an iron tray, a nice bit of contrasted and the shade, "The Market-House, Ross," by were me; and a fresh little picture of a fish- are, who is Ashore," by L. Smythe, all of good

crop of the water-colours, of which there are of each J. Hardy, jun., are specially worthy of each case a keeper's boy, with a T dogs, which remind one, of course "difference," of Frederick Taylor; "Evening," by G. S. Walters; "Water," J. Fahy; "The Night after a," R. Stubbs; and "A Bit of the W. W. Gosling, are all works which any glad to possess. We do not omit to draw attention to the plates from the series of 20 spirited ms of the Rev. C. Kingsley's "Here-Wake," by Mr. H. C. Selous, which will presentation work for every member of y for the current year.

THE GODDESS OF THE SEINE.

we were informed that the municipality had purchased the meadows in which are the sources of the River Seine for the purpose of placing a monumental grotto over one of them, with a statue of a recumbent nymph in it, by way of doing honour to the stream that has done so much for Paris, the undertaking had a sentimental tone about it that seemed to require some explanation. The Thames, we argued, has done rather more for London than the Seine has for Paris, and yet the corporation has taken no pains to conciliate Thames nor the water nymphs in his train, by the erection of grottoes and statues near his source. What appeared, however, to be rather a far-fetched idea, no longer appears so, when we hear the particulars of the facts that led to its adoption. These have been clearly narrated by Mr. Charles Lucas, first in a paper read to the Parisian Archeological and Historical Society, and subsequently in a pamphlet before us embodying that communication.* In the first place, it appears, so early as 1763 a discovery of a bronze was made which led to the supposition that the Romans had erected a temple to the goddess Sequana near to the sources of the Seine. This was a small Roman galley, with two rowers and marks that indicated the seats of three others, supposed to be a votive offering of a merchant

who had received some special grace. Drawings of this relic are given. In 1787 a second discovery was made of a large iron trident near the same spot; and in 1822 further finds of pieces of Roman pottery, coins of the reign of Aurelian, and the right hand of a stone statue holding the head of a dolphin, testified to the certainty that the site had been occupied in Roman times by a building of considerable pretensions.

In 1836 a committee was appointed to make explorations, and the foundations of an edifice were soon found, which is now agreed to be a building erected at the source of the river, in honour of the goddess Sequana, in the reign of Augustus, shortly after a temple was built at the confluence of the Saône and the Rhône, by the same emperor. Additional discoveries of coins seem to indicate that the temple flourished up to the end of the first century, but was abandoned or destroyed in the fourth. A plan is given of the foundations, which shows that the building covered a large quadrangular space, and was subdivided into several small cells, exactly as Pliny describes a river-temple dedicated to Clitome to have been. In some of these cells or chapels, he states, were fountains, and the sources of springs. In like manner it is concluded the statue of the goddess stood in one of the chapels, exposed in the explorations, where the capitals and bases of columns and other fragments of ornament prove that the decorations were more than ordinarily sumptuous. A large number of objects were found in the course of the diggings, which are supposed to have been votive offerings; and the enterprise was still further rewarded by the discovery of a seated statue, pronounced to be that of the goddess Sequana, and a torso of *Apollon Grannus*, the presiding deity over waters having a lucrative reputation. An earthen vase, also, was found, which was covered with lead, and on which was inscribed a statement that it was given to the goddess of the Seine by one Rufus. When opened, a second vase was discovered within, which contained 830 Roman coins. The space between the two urns was filled in with 120 *es-votos*. Seeing, then, that the sources of the Seine were thus honoured in old times, it was suggested to the municipality of the city that benefited most by the river not altogether to lose sight of this discovery; and it was ultimately determined that the land in which the springs arise should be purchased and beautified, and a modern monument erected on the site of the ancient edifice. A drawing is given of the grotto placed over the principal spring, under the direction of MM. Baltard and Daviond, and of the recumbent statue placed in it, executed by M. Jouffroy. The nymph represented lies upon a rock rising out of the water in the cavern or grotto, and in one hand steadies an urn from which issue the waters, whilst with the other she holds a fragment of vine with clusters of grapes, significant of the fertility of the land through which the river wanders. Mr. Lucas concludes his account with a copy of the inscription engraved upon the façade of the grotto:—

"SOUS LE REGNE DE NAPOLEON III, EMPEREUR DES FRANÇAIS, LE CONSEIL MUNICIPAL DE PARIS, AVEC LE CONCORD DU CONSEIL GÉNÉRAL DE LA SEINE, SUR LA PROPOSITION DE M. LE BARON HAUSMANN, SÉNATEUR, PRÉSIDENT DE LA SEINE, GRAND-CROIX DE LA LÉGIION D'HONNEUR, A PAR DÉLIBÉRATION DU XXVII. AOÛT MDCCCLXV., ÉRIGÉ CE MONUMENT AUX SOURCES DU FLEUVE QUI A BONNE SON NOM AU DÉPARTEMENT DE LA SEINE ET AQUELLE PARIS DOIT SON ANTIQUE PROSPÉRITÉ. MDCCCLXVII."

A HINT TO FLORICULTURISTS.

"POWDERED charcoal, flowers of sulphur, gypsum (sulphate of lime), and other substances slow to dissolve, will," says a contemporary, "modify the colours of flowers, when spread round about their roots: Petunias, Clarkias, and antirrhinums are wonderfully sensitive to the influence of these dressings." In the *Builder*, about sixteen or eighteen years since, we gave an account of some experiments of this kind, which the writer of this had made in his garden, our purpose being to suggest means of obtaining varieties in flowers, by causing them to "sport," or tend to vary, by means of such experiments. For example, a white dahlia, by means of charcoal, was made to have a variety of different-looking flowers on one stem; one red, another striped with orange and white, another orange, and so on. The experiments we did not repeat, and we gave them to the public in the hope that some

flowers might be made of them by cultivators of flowers. Similar experiments were afterwards made in France, and a few years since an account of such experiments was given in the French and English papers; but no result of any great importance seems to have as yet been attained. We are still of opinion, however, that such experiments might be of service to florists if systematically and perseveringly carried out. Perhaps they might thus obtain their much-desired blue dahlia or hollyhock for example. The aniline dyes, for one thing, might be good substances to work with.

HOUSES OF PARLIAMENT AND GOVERNMENT OFFICES, SYDNEY, NEW SOUTH WALES.

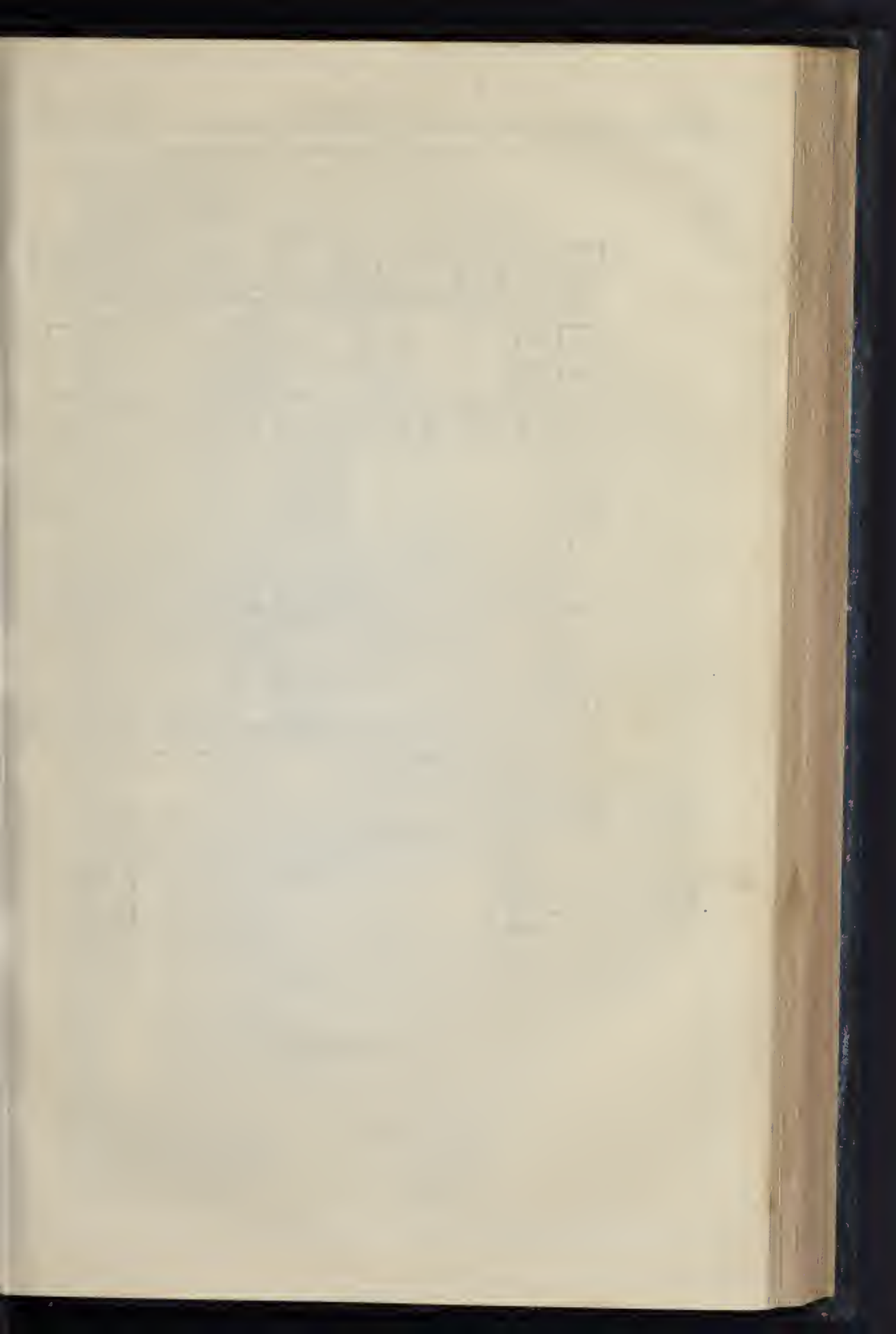
We illustrate in our present number the Government Offices and Parliamentary Buildings now in course of erection in the Domain, Sydney, from the designs of Mr. W. Henry Lynn, of Belfast. The cost, it is estimated, will be about 650,000*l.*

The building is divided into two main blocks,—the Government offices and Parliamentary buildings. The Government offices are placed on the west, towards Macquarie-street, as this side affords more ready access, at different points, from the direction of the city. The main entrance, which forms also a general entrance to the entire buildings, is placed in the centre of this front, with additional entrance, besides axis towers; by which, and the arrangement of staircases and corridors, any one of the departments may be approached directly without passing through others. The offices of the chiefs of principal departments are placed on the ground floor, the subordinate offices above.

The Parliamentary buildings—occupying the eastern portion of the site—are divided from the Government offices by two spacious court yards, direct communication, however, being preserved on the level of the upper floor by staircases connecting both blocks. The principal entrances to the chambers will be from these courts, which will be approached by gateway towers on the north and south sides,—the former, the entrance to the legislative council, being immediately opposite the entrance to the governor's residence, from which a straight avenue will lead to the north gate-tower. A state-carriage porch entrance is also provided on this side in the wing beside the large tower. The entrance to the legislative assembly occupies a corresponding position on the south side. The legislative chambers will be placed east and west, the centre of the Parliamentary block being occupied by apartments common to both Houses, such as library, record-rooms, refreshment-rooms, &c.; over the latter and the smoking-rooms will be placed a large apartment, available as a picture gallery and reception-room. These rooms, together with retiring-rooms for President, Speaker, &c., will occupy the east front, overlooking terraced pleasure grounds, the whole commanding a fine view of the entrance to the harbour. The ground floor of the large tower—beside the state entrance—will form a state chamber; the upper portion of the tower will be available for fire-proof rooms for records. The assembly committee-rooms (on upper floor) will occupy a portion of the south front, and extend into the wing overlooking the pleasure grounds. The council committee-rooms will be placed in a corresponding portion on the north front. Accommodation will be provided at convenient parts of the basement for messengers; also a large kitchen, and offices, in connexion with refreshment-room. The south front will make one side of a grand square, which is proposed to be formed by the removal of some small houses intervening between the site and the present chambers; the opposite side of the square will consist of a new wing connected at the Macquarie-street end with the present chambers, which can then be applied to other purposes. Adjoining this, on the south side, will be situated the Hospital grounds, Loyal Mint, and Hyde Park Barracks, so that the chief Government establishment would be placed in convenient proximity. The centre of the square will be immediately opposite the line of Hunter-street, which runs at right angles from Macquarie-street, westwards; this line, continued eastwards through the domain, strikes exactly at the entrance of the Botanic Gardens.

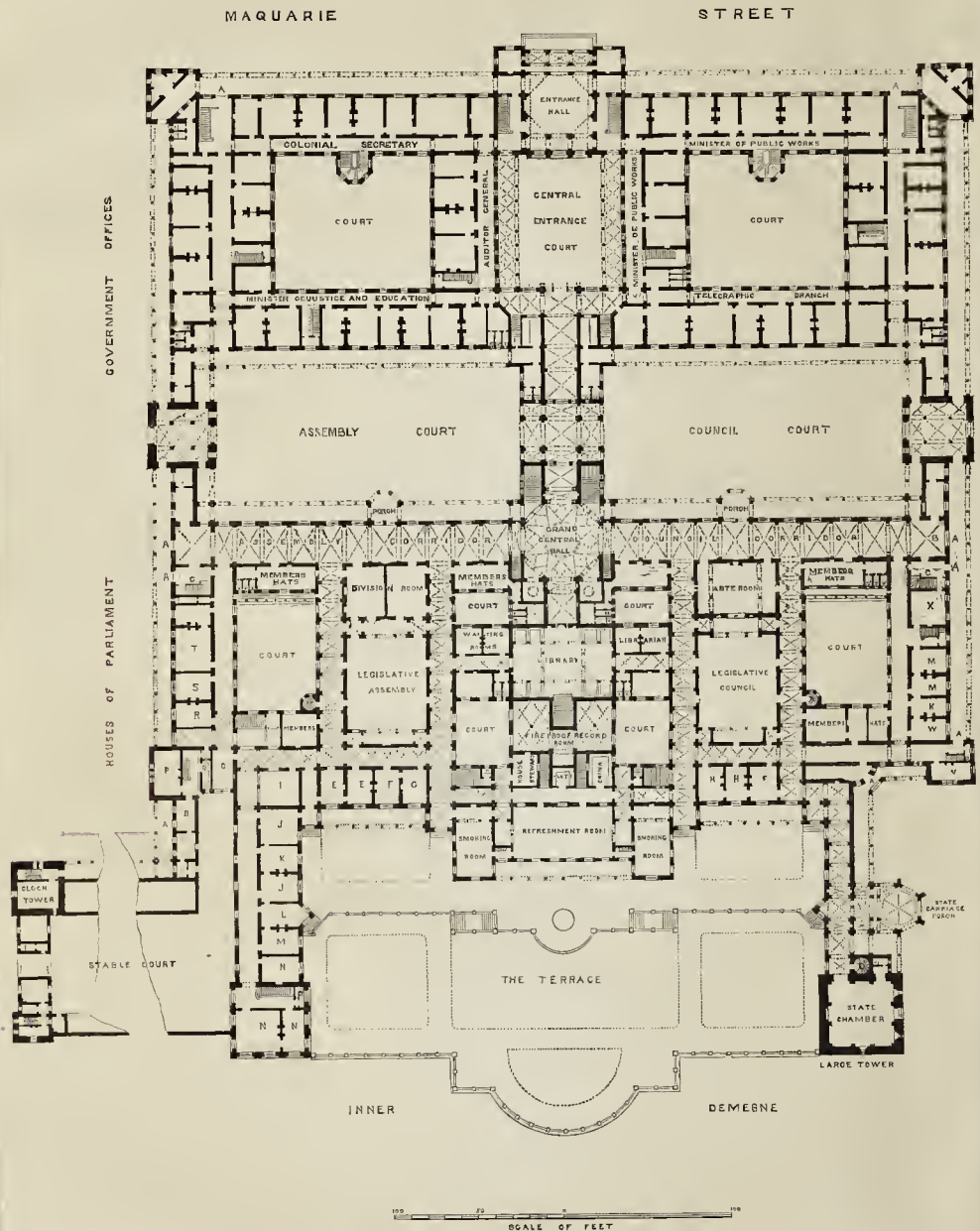
Sandstone of a good quality is available as a building material: in fact, the foundation of the structure is sandstone, which is found at a depth of about 5 ft. below the surface.

* Sur le Monument des Sources de la Seine, Ina à la Société Parisienne d'Archéologie et d'Histoire (Paris, le 12 Mai, 14 Juillet, 11 Aout, et 8 Décembre, 1863.) Par Charles Lucas, Architecte, Paris. Firmin Didot, Frères, Fils, & Cie, 1868.



HOUSES OF PARLIAMENT AND GOVERNMENT OFFICES, SYDNEY.

Plan of Principal Floor.



REFERENCES.

- | | |
|----------------------------------|-----------------------------|
| A. Entrance. | M. Clerks. |
| B. Hall. | N. Extra. |
| C. Stairs to Strangers' Gallery. | O. Serjeant-at-Arms. |
| D. Stairs to Committee-room. | P. House-steward's Parlour. |
| E. Speaker. | Q. House-steward's Pantry. |
| F. Minister. | R. Messenger. |
| G. Under-Secretary. | S. Printing. |
| H. President. | T. Copying and Reading. |
| I. Stationery and Store-room. | U. Records. |
| J. Clerk of Assembly. | W. Clerk of Council. |
| K. Ante-room. | X. Waiting-room. |
| L. Clerks' Assistants. | |

HOUSES OF PARLIAMENT AND GOVERNMENT OFFICES, SYDNEY, NEW SOUTH WALES.—MR. W. HENRY LYNN, ARCHITECT.



ACTION FOR ALLEGED NEGLECT AGAINST AN ARCHITECT.

In the Cork Record Court, before Mr. Justice Fitzgerald and a special jury, the case of Stoker v. Hill was tried on 26th July. The action was for negligence, and the damages were laid at 1,500l. The plaintiffs were Messrs. Stoker, provision merchants, and the defendant Mr. Henry Hill, architect. The case, as stated for the plaintiffs, was that in 1858 plaintiffs, having taken the premises formerly occupied by Mr. M'Sweeney, resolved to have them rebuilt, and engaged Mr. Hill to prepare plans and specifications. The tender of Mr. D. Barrett, for 800l., was accepted. One of the plaintiffs had an interview with Mr. Hill, and said to him, "Now, as the contract is arranged to be given to Barrett, is it not better for me to go to some attorney to draw up a letter of agreement?" and Mr. Hill replied that there was no necessity, and that he would do it for him. "Then," said Mr. Stoker, "mind that you bind him to give sufficient security for the due performance of the work." Mr. Hill prepared an agreement, which he got signed by Mr. Barrett, and which he accepted on behalf of the Messrs. Stoker. One of the adjoining tenants saw that the party wall was bulged in, and consulted an architect of experience, who pronounced it to be in the very worst possible state. Messrs. Stoker's attention was called to the state of the wall. Mr. Barrett saw it, and pronounced it bad. Mr. Hill said to Barrett, "Go on with the work, and I will bear all the consequences."

Evidence was led to establish the view of the case; and for the defendant it was denied that Mr. Hill was guilty of gross neglect, or any neglect at all. To relieve Mr. Stoker, and to relieve Mr. Barrett, Mr. Hill offered to contribute 50l. towards the rebuilding of the premises. He, on the part of Mr. Hill, repudiated all liability. What induced Mr. Hill to offer the 50l. was this: his medical adviser told him that he had a tendency to heart disease, and that he in consequence should avoid excitement and annoyance of all kinds. Sooner than run the risk of any trial (though he knew he would succeed if the case came to trial)—sooner than expose himself to any annoyance, he willingly offered to contribute his profits on the building towards repairing the damage that had been done. As to the conversation about the agreement relative to the builder's securities, Mr. Hill's recollection was exactly at right angles with the Stokers. Mr. Hill said that he could not draw a special contract; that if they wanted such a thing, they should go to an attorney. Mr. Hill drew up this agreement, and forwarded it to the Messrs. Stoker and Barrett. Now, the Stokers allege that they never read the agreement until the action was commenced, although they swore that they told Mr. Hill to get securities from Barrett. Mr. Hill gave instructions with the view of obviating the defects in the wall remedied, but the same night the storm commenced, and the All-ruining power frustrated Mr. Hill's good intentions by tumbling down the whole thing. Surely Mr. Hill was not responsible for that? Up to what time there was there any neglect on the part of Mr. Hill? He erected the structure on what he, a man of experience, considered quite a sufficiently good wall. The only question that the jury was—Did Mr. Hill exercise sound judgment or not? Did he exercise *bona fide* judgment in giving his opinion for the retaining of the old wall? Now, Mr. Hill was paid by the outlay on the building, and if he wanted to put money into his pocket, he would be in favour of having all the walls pulled down, because the more extensive the work was, the more money would Mr. Hill get.

Mr. Barrett, the contractor, a witness for the plaintiff, in his cross-examination admitted that Mr. Hill's plans and specifications were properly prepared; they could not be better prepared; Mr. Hill did everything he could in the way of work and direction during the progress of the works; the proper time to fix up an old wall is when there is a roof on the premises to protect it and the wall from bad weather; it would be better, however, to do it in the first instance when it is feasible.

John Delaney, another witness for the plaintiff, said he was engaged in the building of these premises as mason; saw the bulge at the commencement of the work; the mason work was efficiently done; the storm that blew the house down was nearly as great as the celebrated "roarer" of 1839, which left almost all work in ruins; the mode by which Mr. Hill pro-

posed to remedy the defects in the wall was the proper one.

For the defendant, Mr. Robert Walker, architect, and Mr. Osborne Edwards, civil engineer, were called. Mr. Walker said the plans and specifications were properly drawn; when the roof was covered in was a proper time for the defect to be remedied; he had examined the premises, and apprehended no immediate danger from the condition of the wall. Mr. Edwards said the plans were carefully prepared and the agreement in the usual form; the building could not resist the gale in its temporary position; the new front wall seemed to have gone down first and pulled the side walls with it.

The jury returned a verdict for the defendant on all the counts.

SAUCE FOR GOOSE NOT SAUCE FOR GANDER.

A WELL-KNOWN builder writes to us as follows:—

I observe by the published reports that in the plan submitted by the City architect on behalf of the Markets Improvement Committee of the City Corporation for utilising the site of old Newgate Market, it is proposed to form streets on the site of the market by the erection of four blocks of building, divided by cross streets, one of 20 ft. and the other of 30 ft. in width, and surrounded by a narrow passage; and that the Building Act Committee of the Metropolitan Board of Works, considering that by the plan proposed an improvement will be effected, having recommended that the plan be approved, the Board, under the circumstances, set aside their standing orders as to the width of new streets being of 40 ft., and sanctioned the plan.

Now, sir, either it is necessary that streets should be 40 ft. wide, or it is not. If it be necessary the Corporation ought not to be allowed to supersede the rule; and if it be not, other persons who have less influence ought not to be compelled, sometimes at great sacrifice, to adhere to it. I applied to the Board some time ago for leave to make a good street 30 ft. wide in lieu of some of very bad property (by which an improvement would certainly have been effected), and I was unconditionally refused. On reflection I came to the conclusion that the Board had no alternative, had adhered to their bye-law, and were not to be blamed for so doing. If the report I have quoted as to the streets on the site of Newgate Market be correct, I shall not be able to resist the impression that I and others have been unfairly dealt with.

TREES ON THE THAMES EMBANKMENT.

WAITING for the completion of the Metropolitan District Railway, the opening of this causeway has been deferred, and the whole extent of reclaimed land has been kept in desolate waste for three years. The works are now, however, progressing, and will be carried out with that rapidity which characterises the Metropolitan Railway engineers.

The steam-boat piers are for the most part complete, and exhibit an advance upon the old floating barge principle; there remain, however, on the wide reclaimed spaces, piles of waste lumber, sand, and other "décombres," which ought to be removed, as advised early last year in the *Builder*, in order to make way for plantation, also on the off side of the causeway.

A range of Oriental planes has been planted along the wide footway, at 30 ft. intervals; but they are flagged over, having an open space of only 3 ft. square to admit water and atmospheric influences; therefore it is only by the water jet that vegetation is kept up, and the trees, although well chosen, are barely struggling for life. These ought to have been set outside the paved range, or should have been alternated at intervals of 40 ft., by a second range of, say a different species; keeping the distance of only 10 ft. between each row. Now, as this causeway will be, when complete, the principal walking route between west and east, it is of importance that it be made as ornamental as possible; and as there is ample space throughout the whole length from Westminster Bridge to Blackfriars, there surely ought to be a double line of planes planted along the north side; if alternated at the distances recommended, there would be sufficient room for a footway on that side also, with space for the natural growth and expansion of the foresters (for which the site, save the flagway, is particu-

larly favourable), and the shade in our summer season, whilst the trees are in leaf, would be a real elixir to the professional and saunterers, who will regard it as "*un chemin du luxe*."

The expense of iron gratings for each tree is wholly unnecessary, for they might be planted outside the pavement, and the external footway gravelled, so as to give the election of a softer and cooler walk; besides that, the double range must give a better aspect, whether viewed from the river or any other position; and in case this plan is adopted, the treble range of trees will impart to it a woodland effect quite unrivalled. Whatever buildings may be erected along the reaches between Hungerford and Waterloo, and thence to the Temple, the trees will confer dignity and grace upon them; and the new soil, if duly prepared, must promote their rapid growth under riverine influences.

The hints given before in the *Builder* were quite in time for spring plantation, one full year before it was effected. The present suggestion is offered in order to secure, if possible, the autumnal preparation of the ground, which now lies in repliable waste, although the demarcation and allineation of an outer boundary need in nowise interfere with the advance of works in progress.

T. H. H.

EPHING FOREST.

SIR,—The discouraging reply given by the Chancellor of the Exchequer last Monday to the deputation introduced by Mr. Samuda, M.P., is a sad damper to the hopes which the First Commissioner of Works had previously held out on a similar occasion. It is the more provoking, too, as Mr. Lowe did not have his denial of Government aid on the ground of expense, but of liberal principles. Now, sir, it is obvious from the tone of general remark on the subject of inclosure, that the historical and legal knowledge that may be made to hear upon them is very much locked up from ordinary readers.

But in connection with building operations, we are accustomed to scan with interested eyes—nay, almost to think light reading—a class of documents in the shape of specifications and bills of quantities, which not merely to novel readers, but to many more solid students, must seem more utterly dry as dust than any possible studies of old laws, charters, and usages. I suggest, then, if the *Builder* would be kind enough to point out the passages, whether in Blackstone, Coke-upon-Littleton, or in still less known books that bear upon so interesting a subject as Epping Forest, there would be abundant ability in your readers to understand them. In such a case I indulge a hope that it is quite possible that as strong a case may be made out for Mr. Layard's view of the subject as for Mr. Lowe's.

Mr. Lowe said, "Ceasing the reason of the law, the law itself ought to cease." Might not a special pleader answer, "Well and good. Lords of manors were officers who led out to fight for their king and country those bands of commoners who vegetated on the wastes of the manore. If the commons are enclosed, and the commoners are all gone to Australia, or to be pent up in stifling town lodgings, is not 'Othello's occupation gone,' as regards the lord of the manor? Ought not his demesne lands to be put up for sale, or taken possession of for a national park?" Ceasing the use of a lord of the manor, the lord of the manor ought to cease.

G. M.

EXCURSIONS OF ARCHITECTURAL AND ARCHEOLOGICAL SOCIETIES.

Northumberland and Durham Archeological and Architectural Society.—One of the most successful meetings which has yet been held in connexion with this society has just taken place. On this the third excursion of the year, the historic district which includes Holy Island, Norham Castle and Church, Ford Castle and Church, and Eal Castle, was selected for a two days' excursion. Through the liberality of the North-Eastern Railway Company members were granted return tickets at a single fare. The spot fixed for the assembling of members was Beal Station, near Belford. The members were taken in carriages to Holy Island, which was reached at one o'clock. Unfortunately the weather, which up to noon had been brilliant, changed, and by the time the village of Holy Island had been reached the rain fell in showers, and so continued during the afternoon. The members, however, proceeded to the site of the

monastery. In the old parish church adjoining, the president, the Rev. W. Greenwell, of Darham, delivered an interesting address. The Rev. J. F. Hodgson, at the president's request, then commenced an examination of the chief architectural features in the old parish church, describing the different parts as his eye rested upon them. The Rev. J. L. Low delivered a brief address in the ruins "On the Life of St. Guthbert," and the Rev. Mr. Hodgson gave a succinct sketch of the ruins. The time being limited for the visit to the island, the members then returned to Beal Station, and proceeded thence to Berwick, which they reached about five o'clock. At this place the members and their friends dined at the King's Head Hotel, at the conclusion of which a meeting of the society was held, the chair being occupied by the president. During the evening the members proceeded to examine the various objects of note in connexion with this ancient historic town. The parish church, built during the Commonwealth, was minutely examined. The walls of the town next came under notice, the inner series of which date from about the time of Elizabeth. The second day's excursion of the society was to Norham Castle and other places fixed in the programme.

Kent Archaeological Society.—The annual gathering of this flourishing society was held at Town Malling, one of the most picturesque and historically interesting villages in the county. Every facility was afforded by the society and the railway company for reaching the spot, and the Assembly-room was crowded by a large company from all parts of the county. In the absence of the president (Lord Amberst) Sir Walter Stirling was unanimously voted to the chair, and the secretary (Mr. T. Godfrey Fansett) read the report. Mr. Geo. Gilbert Scott was then proposed and elected as an hon. member, and about thirty other gentlemen were unanimously elected as members. The company afterwards proceeded to view the various objects of antiquarian interest to be found in the neighbourhood, including West Malling Abbey, the church, St. Leonard's Tower, Leybourne Castle, and the church. At four o'clock about 200 ladies and gentlemen sat down to dinner in a spacious tent, erected in the grounds of Malling House, lent for the occasion by the Hon. Ralph Nevill. Sir Walter Stirling presided. The company afterwards adjourned to the Assembly-rooms, to examine the various objects of interest there collected, and to listen to various papers.

ARCHITECTS' COMMISSION.

At a recent meeting of the Guardians of the Preston Union a matter of very grave importance connected with architects' charges and claims was introduced, and led to a long discussion. It appeared that according to an agreement made in February, 1866, with the Guardians of that Union, when Mr. Leigh Hall, of Bolton, was appointed architect for the erection of the Preston Union Workhouse at Fulwood, that gentleman was to receive 2½ per cent. on the buildings, and 1½ per cent. additional for taking out the quantities for the contractors, and that these percentages should cover all his charges and claims of every description. It very recently transpired, however, that a few months after the commencement of the building Mr. Hall made a certain demand on the contractor, Mr. Saul, for what may be called "consideration" money. He alleged verbally to Mr. Saul that as his contract with the Guardians did not sufficiently pay him for his labour, and as he could not obtain an increase from them by legitimate means, he must endeavour to make up his commission in some other way, and hence his demand upon the contractor. Various sums—first, 100*l.*, and afterwards three 50*l.*s.—have been paid to the architect by Mr. Saul, and this having come to the knowledge of the guardians, has led them to suspend further progress at the new workhouse in order to afford time to all parties to come to a settlement on the points in dispute. It may be stated that while the architect sets forth in a communication to the Guardians that not very much in excess of 1,500*l.* is owing to the contractor, the contractor himself says that there is a balance due to him of upwards of 4,000*l.* What makes the matter of more importance at the present time is the fact that Mr. Leigh Hall is the architect for several workhouses in Lancashire, contemplated or in course of erection, and the Guardians of the Preston Union, at their meeting recently, were on that account much more guarded in their expressions than perhaps, under other cir-

cumstances, they would have been. The agreement, which was read and commented upon at length, clearly states that the 3½ per cent. above specified was to include all charges of every description, and under all conditions. It may be observed that the new workhouse at Fulwood has been constructed at a cost of about 50,000*l.*, upon which sum Mr. Hall has already received upwards of 1,000*l.* as commission, exclusive of the 250*l.* he has received from Mr. Saul.

Thus far we have been quoting the *Times*. To show the opinion of the profession on such a charge as is here made against Mr. L. Hall, it will be sufficient to say that "the receipt or acceptance of any pecuniary consideration or emolument from any builder, or other tradesman, whose works he may have been engaged to superintend," subjects a member of the Royal Institute of British Architects to immediate expulsion from the body. Guardians and others who by competition seek to obtain the services of an architect for less than the recognized rate of payment may take a lesson from the above statement.

THE TRADES MOVEMENT.

Mr. R. HARNOTT, general secretary of the Operative Masons' Association, has issued his fortnightly return, which states:—

"More than three months have now passed away since the majority of the notices expired, and of the 25 or 29 towns threatened with the hour system by the Master Builders' Association, in 7 only is the contest still proceeding. At present there are on strike at Birmingham 11, and at Manchester 165, or a total of 176; while on lock-out there are—at Coventry 5, Old Swan 8, Liverpool 116, Lynn 2, and Wolverhampton 2, or a total of 137. Thus the aggregate number on strike and lock-out is 313, or a reduction of 575 since May 27th, the date upon which the greatest number of members was upon the funds. So far the struggle has been decidedly in favour of the operatives."

—Six thousand working masons have just struck at Berlin for higher wages.—The masons' strike, which has lasted seventeen weeks, makes no approach to a settlement, and, like that at Birmingham, seems to be dying out. According to the *Manchester Guardian*, there are now close upon 500 non-union masons at work in Manchester; and, although at least 300 more are required, any chance of the masters giving way is not entertained. They seem as firm and determined as on the first day of the strike. There is evidence that a goodly number of men are at work. Many of the buildings that have been standing are now progressing: in fact, we are informed that no building is entirely at a standstill, and the whole of the good work in the town is in the hands of the associated employers. So far as the bricklayers are concerned, the strike, though not settled, is virtually over. There are plenty of bricklayers to be had who are willing to work for 8*d.* an hour, and they have established a new society in Manchester, based on the rules which have for some time existed in London, and to which the Manchester employers do not object.

OUR RUNNING BROOKS.

WHOLESALE poisoning! How long shall this be easily possible with the utmost impunity? How long shall such outrages on society be actual all over the land, and yet so entirely unavenged? When shall it at length be made a felony to spoil and pollute the purest gift of nature, and to pervert her simple and most needful blessing into something little better than a curse?

Our kindly and pious, but uneducated ancestors loved a welling springhead, and usually consecrated that spontaneous mercy of our hounteous mother earth to the honour of some one of her sainted children; they were wont to build an arch over the fountain, and sacredly preserved the runnel from all manner of pollution. Earth received into her purifying bosom whatever would taint or could offend, and the clear brook was let to dance and sing through the country,—ay, and through the town,—ministering life and health in its happy course, and no one daring to desecrate that blessing by deliberately making it the vehicle of all manner of abominations. But we, their irreligious though enlightened children, in these days of hypercivilization, think and act quite differently. A running stream with us is mainly looked upon as a convenient drain to every sort of nuisance; no one cares for his neighbour's weal, so he can but win some small convenience for himself;

and so it comes to pass that from their very sources our running streams are allowed to be common sewers, as well as the only public aqueducts any neighbourhood possesses. Why, then, should not some wise law now at last be soon enacted, making it highly penal to pollute running streams? Why should the water we drink, and the stream we bathe in, be redolent of horrible infections through the selfishness and folly of society in general, and no paternal government despotically order in to stay this plague by a wholesome step in Council.* It is an unavailing subject altogether that sewage question; but the way in which it is practically mixed up with our water supply obliges us to urge that no time should be lost in correcting the frightful state of most of our little streams—nay, of our big rivers—both in towns and villages. Let nothing but the surface rainfall be suffered to drain into a stream; let the thousands of cleaves that now fringe every brook be denounced as illegalities, and swiftly be swept from their water-sides through the energy of covetous informers; let every poison-bearing sink and drain be sealed from the channel wherefrom neighbours lower down must drink; let heavy fines be inflicted after some set day on those who make no land-pits for their nuisances; and let us all exercise common sense, common charity, and common decency in the matter of a general crusade over the land for the preservation of our running streams from every kind of infection and pollution.

MARTIN P. TUPPER.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

On Wednesday, the 4th of August, the members of the Birmingham Architectural Society made their annual excursion to Banbury, and from thence visited Bronghton Castle, Compton Wynyates, and Wroxton Priory, which, by the special permission of the respective owners, Lord Saye and Sele, the Marquis of Northampton, and Colonel North, M.P., were thrown open for their inspection. These noble mansions, together with the churches in the neighbourhood, are well worthy of the study of the architect and the archaeologist; and from their excellent state of preservation were examined with great interest. The party dined at Banbury in the evening, and returned to Birmingham after a most enjoyable excursion.

PRIVATE BILL LEGISLATION OF THE LAST SESSION.

SOME of the bills that have become Acts during the last session are worthy of comment. That may be given to them in a future number, but meantime a brief *resumé* of the business of the session may be acceptable to our readers.

For several years past, since the last of the series of outpourings of speculative fever in 1866, the number of private bills petitioned for has become small by degrees and gradually less. In 1866, not to detail the facts as touching intervening years, there were 633 bills petitioned for, of which 337 became Acts; for the session of 1868-9, just closed, there were 217 private bills petitioned for, of which 160 have received the Royal assent, including about a dozen on Monday last. Scarcely any of the private bills passed in the last session are of much general interest, and few of them involve much expenditure in new works. They may be classified, according to the classification directed by Parliament itself, as follows:—

Railway Bills	58
Tramway Bills	3
Roads Bill	1
Bridges Bills	4
Waterworks Bills	22
Ports, Harbours, and Docks Bills	11
Canals and Inland Navigation Bill	1
Churches and Chapels Bill	1
Cemeteries Bill	1
Faving, Lighting, and Town Improvements Bills	26
Markets Bills	2
Estates Bills	1
Naturalization, Royal Bills	1
Miscellaneous Bills	20
Total	169

The twenty miscellaneous Bills include such as the Brighton Aquarium and Improvements, the Great Tower-hill, the Imperial Fire Insurance, and others that would require enumeration to give any idea of their character.

* The law is already sufficiently strong to prevent this, if rightly put in motion.—Ed.

THE LATE M. BERBRUGGER.

LOUIS ADRIEN BERBRUGGER, an eminent archaeologist and philologist, conservator of the Library and Museum of Algiers, and inspector of ancient monuments of Algeria, corresponding member of the Institute of France, and Commandeur of the Legion d'Honneur, died at Algiers, on Friday, the 2nd of July, in the sixtieth year of his age, and after a sojourn of thirty-four years in North Africa. The whole population of Algiers, headed by Marshal McMahon, the Sub-governor-general Darrien, and the civil and military authorities, the staff of the militia, the corps of sappers, and the battalion of Freres tireurs, accompanied his remains to the grave, in testimony of his virtuous private life, and of the great literary services he had rendered.

Mr. Cherbonneau, the epigraphic archaeologist, and director of the Imperial Arabic College of Algiers, pronounced an eloquent discourse suited to the occasion.

GLASS IN BLANK WINDOWS.

Sir,—Permit me to thank your correspondent "Pro" for his suggestion in your issue of 24th of April last. Adhering strictly to his instructions, I put in a dozen squares, one only of which is broken. I have since inserted a number of squares in oak frames, the frames being related, and sunk flush in the mullions, and the glass stopped in with putty in the usual way; these are all sound. There is, however, an objection to this method,—the stopping will require occasional painting in order to preserve the wood; and it does not present so neat an appearance as where the glass is let into the stone. W. B.

ACT TO AMEND THE METROPOLITAN BUILDING ACT, 1855.

THE "Metropolitan Building Act, 1859," which has just now received the royal assent (62 and 33 Vict., c. 52), is simply for the transfer of the powers over dangerous structures from the police to the Metropolitan Board of Works, who will, after the 1st of October next, have the appointment of persons and making of regulations for carrying into execution that part of the Act which relates to such structures.

ROCHESTER CORN EXCHANGE COMPETITION.

We learn from the local papers that the committee have decided in favour of the design marked "Perseverando," by Messrs. Flockton & Abbott, of Sheffield. The plans "Che sara sara" are considered to be entitled to the second place; and the architect who sent them in, Mr. H. H. Collins, will receive the premium of forty guineas. The other competitors who will receive for their plans twenty guineas each are Messrs. J. Young (architect of Chatham Cemetery), A. Baker, F. W. Porter, and J. Taylor, jun.

TECHNICAL EDUCATION IN THE BUILDING TRADES OF LONDON.

Sir,—Are the employers expected to provide for the education of their workmen? This would indeed be a work of supererogation. A journeyman when engaged is supposed to be already perfect in his trade, or at least to be able to take up and finish his work in a skilful and workmanlike manner. He cannot do this, he is below his profession, and ought to serve another apprenticeship. But how is it that there are so many dullards? I think that carelessness on the part of the workman has a great deal to do with it, and that carelessness is in a great measure produced by the absurd trade society rules by which they are governed. I mean those establishing an inequality of wage and an lishing of piecework. There is no incentive for a man to improve, except to be chagrined by seeing the vessel which carries the same wage as himself, and that with as much cheek and impudence as himself. It is to be expected, therefore, that the sooner this state of things is remedied the better; and we can only expect it as the bulk of workmen get educated so as to counterbalance that at present overwhelming majority, whose interest it is to uphold such unjust and overbearing laws.

But are we to expect the masters to do this for us? I think that as British workmen we have the means within our own reach, and as we care to advance we have every facility for doing the best in our power. Your correspondent of week before last on this subject seems rather bit, because his excellencies have not been properly appreciated and rewarded. Let him cast the blame where it lies. I, however, proficient as he may be, should always remember that no amount of head knowledge will supply the deficiency of the hand. If our superior learning is not to be of any use, we are better without it. Both in theory and practice, who wishes to do a "fair day's work for a fair day's pay," knowledge must be beneficial as enabling him to perform whatever he may be put to do with greater ease. Such a one will always be prized by his employer, and will command the highest possible wage. Such has been my experience. A STONEMASON.

LIGHTING MINES.

Sir,—In your journal of 31st July, page 612, I find a paragraph stating that Messrs. M. Wilken and J. Clark have proposed a new and improved method of lighting mines, which consists in supplying pure air to gas or oil lights in such a way as to prevent them ever coming in contact with the foul air of the pit.

Allow me to state that the very same plan was proposed by me about two years since, and being persuaded that by this means explosions in coal and other mines would be altogether prevented, and, consequently, a great saving of life effected, I communicated it to Mr. Walpole, then Home Secretary, who proposed a preliminary consideration of it by one of the inspectors of mines. Since then other engagements have prevented me pressing the consideration of the matter.

I trust that your usual impartiality will insure the insertion of this note in the next issue of your journal. R. DONALDSON.

DECORATION OF THE PRINCESS'S THEATRE.

Mr. W. HOMANN writes as follows:—

"In your notice concerning the decoration and embellishment of the above theatre in the modern Italian style, you have inadvertently stated that praise must be given to the decorator artist employed, Mr. M. Vining, of Langham-street, for the successful manner in which he has done his work. Permit me to state the actual facts. Mr. Vining and myself were joint contractors in the execution of this work. The whole designs of the decoration belong to myself, and were selected by Mr. Vining, the enterprising lessee of the theatre. I likewise undertook the superintendence of the execution of the same. I beg that you will be so good as to insert these facts in the next issue of the Builder.

We have stated nothing "inadvertently," and must refer Mr. Homann to Mr. Vining, who advertises the name of the decorator precisely as given by us.

LOWESTOFT PUBLIC HALL AND ASSEMBLY ROOMS COMPETITION.

Sir,—The profession is certainly indebted to Mr. F. A. Klein for bringing into general notice this competition. Having obtained the particulars myself, I can fully endorse his statement as to the unsatisfactory nature of the conditions and the insufficiency of the amount proposed to be expended by the committee. If they really want all the accommodation they ask for, I should say 7,000*l.* would be nearer the cost of the building than 2,500*l.*

As I am well informed that upwards of 100 applications have been made for the particulars, I think it behoves all who have applied to consider well what they are about before going to the expense and trouble of preparing designs under such unsatisfactory conditions, and, unless they can see their way more clearly than I can mine to an honourable conclusion, to decline the competition, and thereby hold the example of

ONE WHO LOOKS BEFORE HE LEAPS.

CHURCH-BUILDING NEWS.

Hoylandswaine (Yorkshire).—The new church of St. John the Evangelist, Hoylandswaine, has been consecrated by the Bishop of Ripon. The plan of the edifice comprises a nave, 41 ft. 6 in. long by 19 ft. 6 in. wide, with north aisle, 17 ft. 3 in. wide, and chancel, 20 ft. 6 in. by 19 ft. 6 in., with north chapel for organ and vestry, divided from each other by an open traceried screen. The tower is at the west end of nave, and is 20 ft. 6 in. square, and the porch opens into the westernmost bay on the south side. The body of the church is 44 ft. high to the ridge, and the tower is 65 ft. high, finished with crocketed pinnacles and embattled parapet, and covered with stone weathered roof. The whole of the masonry is of dressed stone, from the Thurlstone quarries. The roofs and seats are open, and of pitch pine, and the roofs are covered with green Westmoreland slates. The chancel floor is laid with encaustic tiles, supplied by Mr. Godwin, of Lurgardine, and the nave and aisle passages, with rubber flags. The church will accommodate 308 persons, including eighty children. The chancel is fitted with stalls of pitch pine, and is divided from the sacrum by a stone traceried aisle screen. Mr. W. H. Crossland, of Leeds and London, is the architect; and the contractors are Mr. Benjamin Swift, of Cawthorne, for the mason, slater, and plasterer's work; Mr. Thos. Wade, of Horforth, for the joiner's work; Mr. Joshua Snowden, of Ossett, for the plumber's work; and Mr. Moore Westerman, of Horforth, for the painter's work. The cost of the church, about 4,000*l.*, has been principally defrayed by Mr. Walter Spencer Stenhope, of Cannon Hall. The site was given by Mr. Vernon Wentworth, of Stainborough.

Gumfriston (Pembrokeshire).—The interesting church here has lately been restored from the very neglected and ruinous state into which it had been allowed by several generations to fall. The nave and chancel have been new roofed throughout; and the stone roofs of the other parts of the building, which are formed of masonry within and without in the Pembroke-

shire fashion, have undergone some repairs. The pavements have been laid with Godwin's tiles, the interior walls have been replastered, and new wooden floors properly ventilated have been prepared for the seating, which is to be of oak, and is being completed by instalments as fast as the restoration fund will allow. Two windows in the chancel have been filled with stained glass supplied by Messrs. Powell & Sons. The whole has been carried out from the designs and under the superintendence of Mr. T. G. Jackson, of London. The builders were Messrs. Morris & Co., of Tenby.

Checkendon.—The churob here has been reopened for divine service. The restoration has been carried out by Messrs. Honour & Castle, builders, under the superintendence of Mr. Burton, of Oxford, architect. The restoration now completed involved the placing a new open timbered roof on the chancel, and repairing the vault and walls of the apse, repairing the stonework of columns and arches of chancel and apse, the stonework of the several windows in chancel, apse, and nave, and the placing a new parapet and moulded cornice upon the nave. All the external faces of the walls and the internal face of the walls of the chancel have had the roughcast and plastering removed, and the original pointing restored. The walls were evidently built with flints nearly on their ends, but slightly inclined, one course leaning to the right and the other to the left, and between them was a broad band of mortar nearly 2 in. wide. This has been restored. Wherever alterations had been made in recent times the flints were not laid in courses as in the original work. In the course of the work traces of colour were discovered, and the architect found the remains of the twelve apostles and our Saviour painted upon the wall and vault of the apse. These paintings were of the date of about A.D. 1300. They have been restored by Messrs. Clayton & Bell. Other remains of paintings were discovered, but none that could well be restored. The south doorway, which is of the twelfth century, had been built under and blocked by a doorway of the sixteenth period. This was discovered by removing the plaster, and has been restored.

Alfreton.—The ancient parish church of Alfreton has been reopened, after being restored and enlarged under the superintendence of Messrs. Bine & Sons, of Nottingham, architects. The reredos is of alabaster and polished marble, with a large white Latin cross in the centre. The organ is new. The church will seat 500.

Rochdale.—The church-building movement in Rochdale is going on rapidly. All Saints' Church, Hamer, is built and consecrated. Milnrow Parish Church has been rebuilt, and is just ready for consecration. St. Mary's Church, Balderstone, is nearly ready for the roof. St. Peter's Church, Newbold, has 5 ft. or 6 ft. in height of masonry built. St. Edmund's Church, Falingo, and Shaw Church have just been begun; and St. John's Church, Facit, is to be commenced in a few weeks. Mr. Drew and Mr. Street, of London, have respectively in hand the churches at Shaw and Milnrow. The architects for the other five churches are Messrs. Medland & Henry Taylor, of Manchester. Newbold Church is to seat 670 persons, and to cost about 3,500*l.* It is being built mainly of the local stone, with coigns, hands, and cornices of red brick. The window traicing and other ornamental features will be of Yorkshire stone. The church will have a hexagonally-ended chancel, aisles to both nave and chancel, clerestory windows above the aisle roofs; and at the west-end a large porch, steeple, and baptistry.

Sharrow (Sheffield).—The church just erected at Sharrow, and which adds another to the list of churches which have been erected in the town by the Sheffield Church Extension Society, has been consecrated by the Archbishop of York. The edifice is capable of accommodating about 750 persons. The site, which was presented by Sir John Brown, occupies an elevated position above Shirle-hill, and the edifice can be seen from a great distance. It has been erected at a total expense of about 5,600*l.*, by the Sheffield Church Extension Society, aided by a local subscription of 2,500*l.*, and a grant from the York Diocesan Society of 400*l.* The plan is cruciform, and consists of north and south aisles, a chancel, organ chapel, chancel aisle, and vestry. The length of the edifice is 124 ft., the nave is 21 ft. wide, the aisles 13 ft. 6 in., and the width across the transepts, 9 ft. The style is Early Decorated, carried out in a simple manner. The interior arcade of five arches is moulded, and is

carried on clustered shafts with conventional carved capitals, and surmounted by a clearstory of circular windows filled with plate tracery. The roofs are open timbered. The chancel has a window, filled with stained glass, the gift of Mr. Charles Gould, as a memorial of his late wife. The subjects in the upper tier are the Nativity, Baptism, Crucifixion, Entombment, and Resurrection of our Saviour; Christ blessing children, the Transfiguration, the Lord's Supper, St. Thomas, and the Charge to Peter. In the tracery are the evangelistic symbols and the Agnus Dei. The window is the work of Messrs. Clayton & Bell. The floor is laid with tiles by Messrs. Maw, of Broseley, in the geometrical pattern, the sanctuary being encaustic tiling. Under the east window is a recess of various coloured marble, combined with alabaster and Hopton wood stone, which is the gift of the architects. Turning westward, the vista is completed by a window filled with stained glass. Two lights represent the calling of the Apostles on the Lake of Galilee, and other two, the charge to Peter—"Feed my lambs." A lower tier of subjects represents the Widow's Mite, the Women at the Sepulchre, the Charity of Dorcas, and the raising of Tabitha. In the centre of the tracery there is a medallion, upon which is a representation of our Lord in the act of benediction. The window is the work of Messrs. Heaton, Butler, & Bayne, of London. The church will be warmed by means of Messrs. Stuart & Smith's hot-air apparatus. The masons' work has been done by Mr. Harper, of Mashrough; the joiners' work, by Messrs. Badger & Holmes; the carving, by Messrs. Farmer & Brindley; and the gas-work, by Messrs. Ward & Jackson. The architectural designs were furnished by Messrs. Blackmoor & Mitchell-Withers.

Walkley (Sheffield).—The church of St. Mary, at Walkley, has been consecrated. This is another church, for the erection of which the local public is indebted to the Sheffield Church Extension Society. Its building was commenced so long ago as 1861, when the work was proceeded with so far as the erection of two bays of the nave, the chancel, and the vestry, the whole forming a temporary church, where divine service has been held for some time. This portion of the work was completed at a cost of 900*l.*, when the Church Extension Society undertook the completion and extension of the edifice to the dimensions which had been originally intended. The building, as now completed, is of the simple decorated period, and is erected from the plans of Messrs. Weighman & Wilson, architects. At the west end of the building is placed a tower, 17 ft. square, surmounted by a spire, which is again surmounted by a vane; the height from the ground to the top of the stone finial of the spire is about 86 ft. Beneath the west window is introduced an arcade, which affords light to the seats under the gallery. The dimensions of the interior are—Nave, with north and south aisles, 45 ft. wide, 82 ft. long, 21 ft. high to the square of nave, and 38 ft. to the ridge. The roof is formed of framed combs or rafters. The chancel is increased in length, and is now 21 ft. wide and 28 ft. long. The size of the vestry is as originally intended, viz., 11 ft. by 11 ft. The organ-loft, 15 ft. by 18 ft., is enclosed by a wood screen, giving a side entrance from South-road. The principal entrance to the edifice is by the tower, approached by a broad flight of steps from South-road. A separate door, with a stair turret, is provided for the children's approach to the gallery, which is 21 ft. the width of the nave, and 13 ft. deep. The church is warmed by heated air, the apparatus for its production being placed at the west end of the building, and fitted up by Mr. Firth, of Mashro'. The church will accommodate a congregation of 700, and all the sittings are to be free and unappropriated. The entire cost of the building is 3,200*l.* The contractors' work has been executed by Mr. Benjamin Carr, masons' work; Mr. Spink, carpenters' work; Mr. Bisset, plumbing, glazing, and gasfitting; Mr. Stamford, slaters' work; Mr. Samuel Smith, painting; Mr. Dorey, of Manchester, ironwork; and Messrs. Harrison & Chadwick, plasterers' work.

Polesworth (near Tamworth).—The ancient church of St. Edith, Polesworth, has been reopened after extensive restorations and additions, under the direction of the architect, Mr. G. E. Street. The church is a portion of an old Norman abbey dedicated to St. Edith, a princess of Saxons times, who is described as having been the first abbess, and is represented in some accounts as the daughter of Egbert, whom historians usually treat as having first exercised regal

sway over the whole of England. An ancient archway leading to the former monastery grounds, the remains of a Norman cloister on the south side of the church, a sundial on the same side, and the refectory, which forms part of a house close to the church, with many other remnants, suggest the existence of an extensive religious establishment, which was dissolved in the reign of Henry VIII. Previous to the recent restoration there was no chancel, and the church consisted simply of a nave and a north aisle, with a tower placed at the east end of the aisle. This, being the newest part of the church, has been left as it was. The building was in a very dilapidated condition. The north wall was entirely pulled down, and the other walls have been faced and lined with new stone; whilst a new chancel has been built within the foundations of the previous tower and church, which originally took the form of a cross, with the tower at the centre. The roof is new, and is covered with red tiles. The interior has been fitted with open seats. The chancel is raised by successive steps above the level of the nave, and is fitted with oak stalls and paved with encaustic tiles. A small window in memory of St. Edith has been placed in the north aisle. Mr. Street's plans have been carried out by Mr. Fox, builder, of Abberstone. Some needle-work in the chancel was specially designed by the architect. A new organ, by Mr. W. F. Jardine, of Manchester, who built the organ in Eocleshall Church, has been placed within the tower, at the north-west corner of the chancel. It has cost 260*l.* The total cost of the restorations is about 3,000*l.*

Malton (Yorkshire).—The North Riding of Yorkshire has made great strides in church building and church restoration during the last few years, and in no portion of the riding has there been more activity than in this neighbourhood. The two churches in Malton, St. Michael and St. Leonard, have each undergone considerable restoration, both exterior and interior. Crossing over the Derwent, we have in the neighbourhood, although in the East Riding, the churches at Ackham, Westow, and Burythorpe, all of which have been rebuilt within a few years. Scrayingham Church has been restored, and a new church built by Mrs. Cholmley at Howsham. Then, returning to the North Riding, we have a new church at Butterwick, another new church at Hutton, and also a new church at Appleton-Moors, and new churches at Whitwell and Flaxton; the church at Helmsley has been rebuilt by the Faversham family; the church at Stonegrave has undergone a restoration, both exterior and interior; the church at Hovingham has been rebuilt by the Worsley family, at a very considerable cost; and the Hon. Admiral Howard has just completed the rebuilding of the church at Slingsby; Ampleforth Church has been rebuilt by private subscription, promoted by the incumbent; and the principal inhabitants of Terrington are about to expend 2,000*l.* in the restoration of their church. The small Norman church at Barton-le-Street, now closed in consequence of its dilapidations, is to be immediately rebuilt, by Mr. Meynell-Ingram, the proprietor of the parish; Admiral Howard has notified his intention to rebuild the ancient church at Bulmer, which is in very bad repair, and a new church in the village of Welburn, also on the Castle Howard estate, has been erected. Sir Tatton Sykes has just laid the foundation-stone of a new church at Finher, one of a series of churches which his family have built or restored on the Sledmores estates during the last few years.

Elton (Yorkshire).—St. Mary's Church, which was re-opened in November last, after being restored, chiefly by the expense of Lord Hotham, and which had previously possessed but two bells, has just been provided with a third bell, the gift of Mr. James Hall, of Scarborough. The new bell was cast by Messrs. Mears, of London, and was rung by Messrs. Simpson & Malone, of Hull. We understand that so long ago as 200 years it was intended to add a third bell to this church, but the complete execution of this intention was frustrated by accident. The bell was ordered, cast, and shipped for Hull, but was lost in the Humber during transhipment.

Hedon (Yorkshire).—The church of Hedon has been reopened for divine service, the south transept having undergone a restoration. Mr. Street, architect, prepared the plans, and Messrs. Shaftoe & Barry, of York, contracted to carry out the work. The entire front of the old south transept was taken down, and the whole of the

old roof, and renewed in the Early English style. The windows have been rebuilt. The flooring of the transept is laid with cesselated pavement, from the works of Messrs. Godwin, Hereford.

Howden (Yorkshire).—The ancient church of St. Peter, at Howden, has had the nave restored. At first it was intended only to clean the walls and arches; but the original plan was extended, and the result has been the renovation of the interior. The whole of the masonry was covered with various coats of pigment and colour wash. By a series of chemical and mechanical processes, superintended by Mr. Saville, this has been removed. The clearstory has been brought out, the proportions of the tower arches and the arches separating the nave from the aisles, with their mouldings, are now more clearly defined. Similar results have been attained with the arcades at the west end, and with the chancel screen, which forms the reredos. The organ has been removed to the north transept. By this removal two windows in the south aisle have been opened out, and they have been glazed with cathedral glass. The old tower, 135 ft. high, was erected by Bishop Skirlaw. Its roof has been replaced by a new one. The bells are eight in number; three of them were found on examination to be cracked, and have been recast. The tenor bell weighs 27 cwt. The estimated cost of the restoration is 800*l.*

DISSENTING CHURCH-BUILDING NEWS.

Mark.—The foundation of a new Wesleyan chapel has been laid at Mark. The old building was erected in 1797, and has long been too small for the congregation. The new chapel, which will be built by Messrs. Hawkins & Sons, of Glastonbury, from designs by Mr. H. F. Price, of Weston-super-Mare, will be erected near the old site. It is to be in the Decorated style, and the total cost will be about 1,000*l.*

Old Hill (Dudley).—The memorial stone of a Primitive Methodist chapel has been laid at Old Hill. The chapel will be 60 ft. long by 40 ft. broad, and when the galleries are put in will seat about 800 persons. The architect is Mr. William Keen, of Crayley Heath, and the builders are Messrs. Stockton & Sons, of Oldbury.

Rechester.—The memorial-stone of a new Wesleyan chapel has been laid at Rechester, a goodsized village, pleasantly situated about 3 miles south of Wellingborough. The site faces the village street. The building is to consist of a chapel and a schoolroom. The internal dimensions of the former are 40 ft. by 30 ft., and of the latter 20 ft. by 30 ft. The chapel will be 22 ft. high in the walls, and the schoolroom will be 13 ft. high in the walls. The extreme height of the chapel from the apex of the roof to the floor will be 30 ft. The chapel is to have a gallery at the north end, and there will be accommodation for about 400 persons. It will be built of Wellingborough pressed brick, with freestone arches. The style is a mixed one, but approaches more particularly the Italian, with circular-headed windows. The fitting up of the interior is to be of stained deal. The estimated cost is between 600*l.* and 700*l.* Mr. C. Day, of Bedford, is the architect, and Mr. L. B. Moore, of Bedford, is the contractor.

SCHOOL-BUILDING NEWS.

Ratlinghopa.—A new district school has been opened at the Bridges, Ratlinghopa. The building is the design of Mr. Smalman Smith, of Stonbridge. The walls are of the Norbury shelly limestone, mixed with Stiperstone granite, quoined with a mixture of red and white brick, which is also carried around the windows. A bell-turret rises to a height of 55 ft., and is roofed with majolica and encaustic tiles, supplied by Messrs. Maw, of Broseley. The one principally used in the work is termed the "Amber." The tiles are banded together horizontally at intervals, with blue and white, and capped with the same colours. The summit of the turret is surmounted with a gilt cross. The school-room is lighted by four windows, with cottage panes, of cathedral-tinted glass. This part of the work, together with the supplying of three chandeliers, was done by Messrs. Done & Davies, of Shrewsbury. In the school-room is a Gothic chimney-piece, in Bath stone, by the architect. Adjoining the school is the master's house, with rooms for boarders, and good yard, garden, and other conveniences. The school is half surrounded by a

group of beeches and other forest trees. The whole of the work was carried out by Mr. Cook, miller, Critten.

Clayton.—The congregation worshipping in the General Baptist Chapel, at Clayton, have determined to erect new and more commodious school premises. A committee has been appointed, and has set to work in earnest, with a resolution to raise at least 1,000*l.* before May next. A site has been obtained at a cost of 500*l.* in an eligible situation. Plans have been prepared by Mr. T. Horsfall, architect, Halifax. The entire school premises will occupy an area of 1,700 square yards, and the building itself will be 28 yards by 14 yards, comprising one large room 18 yards by 12 yards, with four classrooms at each end. The style of architecture will be English-Gothic, and the estimated cost, including the ground, is 1,500*l.*

Devonport.—St. Mary's National Schools have been opened. Mr. Piers St. Angh, of London, was the architect; Mr. H. Moorhead, of Devonport, the clerk of works; and Mr. T. Jenkin, of Devonport, the builder. The design is plain Gothic. The building comprises two large rooms of an L shape, each 18 ft. wide, and every requirement in regard to ventilation has been observed. The rooms together will accommodate 500 children.

Hendon Mersey.—The existing schools are to be enlarged by providing for an infants' school and parochial reading-room. The present schools consist only of two rooms, with glass-rooms, and the larger of the two has recently been devoted to the girls and infants. Encouraged by promises of assistance, the committee obtained plans and designs for a new wing at the north end, corresponding to some extent with the wing at the south, used as the boys' school, and giving to the ground plan the form of the letter H. It is intended that the girls' school shall be removed to the new wing, the centre room being applied exclusively to infant teaching. There is also a new committee-room, and a reading-room for the village, with lavatory. The nucleus of a reading-room, supplied with newspapers and periodicals, and in which draughts and other innocent games are provided, has been established some time; but it is hoped that the erection of a more suitable apartment will induce a larger number of working men to avail themselves of the opportunity of forming an acquaintance with the literature of the day. The new buildings are progressing, the walls having reached as high as the windows, and it is expected they will be completed about Christmas. The contractors are Messrs. Robinson, of Hyde. The estimated cost is 1,200*l.*

Coatham (Redcar).—The free school of the foundation of Sir William Turner, knight, removed from Kirkleatham to East Coatham, and just completed, at a cost of 4,000*l.*, in pursuance of a scheme of the Court of Chancery, approved in 1855, has been opened. The foundation-stone of the new building was laid on April 25th, 1868. The premises comprise school-rooms, master's house, and other requisites. The northern point of the building is towards Coatham, and surmounted by a tower rising to a considerable elevation. The style of architecture is Gothic, and the principal material used is red brick.

FROM SCOTLAND.

Dunfermline.—The plans and specifications of the new infirmary, prepared by Mr. Starforth, architect, Edinburgh, have been received from Mr. W. Waterhouse, of London, to whom they had been remitted by the governors, for his report on the expediency of the proposed structure. In the report Mr. Waterhouse says:—"I am of opinion that the specification has been carefully drawn, and that the materials and workmanship provided are good and sufficient for the purpose; and that the plan is, in my opinion, considering the space it occupies, an excellent one."

Selkirk.—For a twelvemonth past a new bridge has been in course of construction.—Mr. Moncrieff, Edinburgh, contractor—on the Selkirk and Galashiels branch of the North British Railway, in substitution for the wooden bridge which crosses the Tweed immediately below the confluence of the Etrick. The new bridge, which is now opened for traffic, has six piers, with iron girders. The former bridge was inspected by Colonel Rich in the winter of 1867, and his report on it, it is understood, has led to the erection of a new and more substantial one.

Stirling.—In consequence of the water in the reservoirs being lately much reduced, the local

water commissioners issued a notice intimating that, until further notice, the water would be cut off each evening at eight o'clock until six o'clock next morning. They also cautioned the inhabitants against any waste of water, and prohibited it being used for watering gardens.

Dumbar.—For some time past the drought had been telling very much upon the supply of water to this town. Some houses had not had any water for a week, and others had not any for three weeks. The Water Committee resolved that the public wells should be closed from 10 p.m. till 6 a.m. They also prohibited the water from being used for gardens, or in any other way not imperatively requisite.

Forfar.—The foundation-stone of a new hall which is to be presented to the inhabitants of Forfar by Mr. Peter Reid, a confectioner in the town, has been laid with Masonic honours by the Grand Master, the Earl of Dalhousie. His lordship also placed the corner-stone of a new court-house in course of erection for the county of Forfar. The day was observed as a general holiday in the burgh.

Glasgow.—Since the last annual inspection the Clyde Trustees have conferred a great boon on the shipping interest of the port by the erection of three light towers between the mouth of the Cart and Bowling, to indicate to pilots and others the head of the channel between these points. The light towers are of cast iron, on stone foundations. They are each upwards of 14 ft. high, 3 ft. 9 in. diameter at the bottom, 3 ft. at the top, surrounded by a 6-sided lamp, and are so placed that the lights are 24 ft. above ordinary high-water springs. The towers being painted white form conspicuous objects on the river banks. The light shown at night is red and white in alternate panes of the lantern. The oil used is paraffin.

Ballater (Balmoral).—Considerable difficulty has been experienced for a number of years in finding accommodation at the village of Ballater for the troops who form a guard of honour during her Majesty's residence at Balmoral Castle. The barracks are now all but finished. The ground on which they are built is situated at the west end of the village, about 120 yards off the main turnpike road leading to Balmoral, and has an area of upwards of 1½ acre. The barracks en masse may be said to consist of seven cottages built in a mixed decorated Anglo-Gothic style of architecture. They will only be used during the summer months, and efforts have been made to secure proper ventilation.

STAINED GLASS.

St. Mary's, Theford.—Two windows have just been inserted into the south wall of the chancel of this church. The stone used is Portland, and they are in the Third Pointed or Perpendicular style, to be in character with the rest of the church. The designs of the stonework were by Mr. Augustus E. Brown, of London, architect, and it has been executed by Mr. Robinson Cornish, of North Walsham. The painted glass which fills the windows was designed and executed by Messrs. Ward & Hughes, of London, who have already executed other windows in the church.

Chelmsford Church.—A new stained-glass window has taken the place of the old pane one in the west face of the tower. The work was done by Messrs. Clayton & Bell. The west window is divided into three bays. Each of these is filled in with two representations relating to the nativity of our Saviour.

Convent Chapel of the Good Intent, Birkenhead. In this small chapel there have recently been fixed two single-lighted stained-glass windows. In each richly attired and devotionally disposed figures of two early Christian martyrs, Saints Philomena and Agnes, are placed, surmounted in their semicircular headings by crowns of martyrdom, and under each figure are angels denoting with their respective devices what is traditionally ascribed to them. The whole is supplemented with a lily border. The artists were Messrs. R. B. Edmundson & Son, of Manchester.

Treton Church, Yorkshire.—This interesting church, the chancel of which has recently been restored by Messrs. Hadfield & Son, has had the complete series of windows filled with memorial glass. The style is that of the fifteenth century English glass, carefully studied from old models, and has been executed by Messrs. Lavers, Barrard, & Westlake, from the designs and direction of Mr. Bentley, the cartoons being the joint work of Messrs. Westlake & Bentley. In the east window, under canopies, is the Resurrection

and in side lights are St. Peter and St. John. This is in memory of the late Mr. John Wheat. The two windows on the north side have figures of St. Helen, patroness of the church, St. Alban, Protomartyr, St. Mary Magdalen, and our Blessed Lord. The former is in memory of the deceased wife of the rector, the Rev. B. E. Watkins, M.A., the latter in memory of Mr. May, of Catcliffe. In the south side window are figures of the Archangel Gabriel and the Virgin, with legends on scrolls, "Hail Mary full of Grace," and "Behold the Handmaid of the Lord." This is in memory of the late Mr. H. Sorby, of Rotherwood. The windows were carefully designed to suit the architectural specialities of the church, a due regard being given to the fragments of the original glazing, which was of the Perpendicular period.

Worcester Cathedral.—A new painted glass window has been placed in the great north transept. The masonry of the window is itself new, having been erected by Mr. Perkins during the present restoration. It is of four lights, with Decorated tracery in the head, consisting of trefoils and cinquefoils in circles. The glass just inserted is the gift of the Masonic body of the province of Worcestershire, and is the work of Messrs. Lavers, Barrard, & Westlake, of London. The cost is about 600*l.*, but this sum is said to be no measure of its actual value, as one member of the firm by whom it was produced being himself a brother of the Masonic craft, the work was accomplished *con amore*, and without absolute reference to profit. The subjects chosen for the window are the twelve Apostles, in three rows of four each. In the tracery above are emblems of the Master and his Wardens, together with those of other officers. In the sinister tracery are the Masonic arms, and in the dexter those of the Prov. G. M. Roys, and these are surrounded by Masonic emblems. The base of the window is occupied by an arcade work, underneath which are the figures of Hiram Rex, Hiram Abiff, and Solomon Rex, Zerobabel, with Esdras and Nehemia. On a brass plate inserted in the wall under the window is the following inscription:—

"To the glory of God, and for the adornment of this Cathedral, the north transept window is erected by the Free Masons of Worcestershire, Albert Hudson Keyds (High Sheriff of the county) Provincial Grand Master, A.D. 1868."

FROM AUSTRALIA.

The Victorian Water Supply.—Considerable interest was manifested both by the public and the contractors respecting the tenders for water supply, the former being anxious to know whether Government intended to proceed with the Coliban and Geelong schemes, and the latter being concerned personally in a business point of view. When the tenders were opened at the Board of Lands and Works, the room was quite filled with contractors. Mr. Grant, President of the Board, read out the list of tenders accepted. With respect to tenders sent in for contract 30, construction of outlet works for the Barker's Creek reservoir, he said the lowest tender is that of Mr. E. O'Keefe for 2,783*l.* 4s. 2d. It is accepted by the board, subject to his filling in the schedule as specified in the first clause of the general conditions. There were eight tenders for this work. For contract 31, for the completion of the dam across the Coliban, the construction of outlet tower, and other works for the reservoir at Malmsbury, there were 10 tenderers, and the contract of John Butler Dwyer, 21,823*l.* 11s. 10d. is the lowest, and is accepted, subject to his filling in the quantities in the schedule. There were five tenders for the construction of outlet works for the Stony Creek reservoir, and that of the Langlands Foundry Company, 5,685*l.* 5s. 2d., is accepted. For contract 33, construction of a service reservoir and filter-beds at Lovelybanks, the tender of Messrs. Simmie & Co., 5,508*l.*, is accepted: there were 12 tenders for this work. Seven tenders were received for the construction of outlet works for the Expedition Pass reservoir, and the board accepts that of John Stewart, the sum being 3,074*l.* 10s. 9d. For the completion of No. 4 tunnel the lowest tender is that of Gardner, Lyons, & Aherm, 19,814*l.*, which the board accepts. For the carriage of pipes from Geelong, and distribution along pipe track, *via* Lovelybanks, to Anakies, Mr. Robert Carrick's tender, 2,532*l.* 15s. 9d., is accepted. Respecting contract 39, construction of aqueduct, flumes, and tunnels, from Stony Creek reservoir to Anakies, he said the tenders received were all excessive, and the board had decided that the work should be re-advertised. The total amount of the tenders accepted was 64,531*l.* 7s. 8d.

Miscellanea.

Death of Mr. Roehling, C.E.—The death is announced of the eminent American engineer, John A. Roehling, which took place on the 22nd of July. While Mr. Roehling was engaged in making some measurements connected with the East River-bridge, on the 28th of June, a boat at Fulton Ferry caught and severely bruised one of his feet. The immediate result of this accident was the amputation of his toes, which led finally to his death. Mr. Roehling was born in 1806, in the city of Muhlhausen, Prussia. Among numerous works Mr. Roehling in 1848, undertook the construction of a series of five suspension aqueducts on the line of the Delaware and Hudson Canal, connecting the anthracite coal regions of Pennsylvania with the tide-water of the Hudson River. They were all completed in the course of two years. Public attention for some time past been directed to the problem of connecting the New York Central and Great Western Railway of Canada, by bridging the chasm of the Niagara River. Mr. Roehling was invited to make plans and estimates for the bridge, and was at the same time appointed the engineer. For four years, commencing with 1851, the work was continued without interruption, until, in March of 1855, the first locomotive and train crossed a railway suspension bridge, and it may be safely said that up to the present day it is still the only example of the kind of any magnitude.

Portable Gas Machine.—Mr. G. Flintoff, gas engineer, has patented a process in gas making, with the view of rendering gas consumers independent of gas companies. The machine is simple,—a cylinder fixed within another of larger size is charged with rock oil; provision is made for the oil to trickle from the reservoir to the bottom of the space between the outer skin of the machine and the cylinder. The bottom of this space is filled with wool, which absorbs the oil as discharged. When gas is drawn off from the machine, a piece of clock-work apparatus on the top of the machine is put in motion, and pumps in the atmospheric air proportionately to the consumption or discharge of gas. The mixture of atmospheric air and oil vapour constitutes the inflammable gas. Any number of burners may be supplied from the machine in the same way as from an ordinary meter, and the pressure regulated at the "main," that is, the discharge-pipe from the machine, and at each burner, in the usual way. The light was somewhat unsteady in the burner we saw, but this was said to be caused by a remediable defect in the clockwork. Two shillings and sixpence per 1,000 cubic feet is said to be the cost of the gas.

A Second Peabody.—An act of princely munificence on the part of a citizen of Birmingham has just been completed by the formal delivery to the trustees of Josiah Mason's Almshouses and Orphanage at Erdington. The amount of money expended in this benefaction is no less than 260,000*l.* A singular coincidence in the lives of the two men is that they were both born in February, 1795. In 1858 Mr. Mason began a set of almshouses and an orphanage on a small scale, and these have gradually developed till the result is the erection of two separate establishments, one for the residence of twenty-six poor widows, and the other a huge pile of buildings for the accommodation of 300 boys and girls. The orphanage building is in the Lombardic style; and it is sited on 13 acres of pleasure-grounds at Erdington, near Sutton. The cost of erection was 60,000*l.*, and the endowment consists of over 1,000 acres of land—yearly increasing in value, in and around Birmingham, and estimated to be worth over 200,000*l.* The present annual income of the charity exceeds 10,000*l.* Provision has been made for the exclusion of sectarian teaching, it being a special proviso in the deed that the Scriptures alone shall be the religious teaching of the children.

Alleged Defalcations by a Town Surveyor.—Several members of the Scarborough Town Council having been for some time dissatisfied with the manner in which the Borough Surveyor's duties were being conducted, particularly in their financial relations, an examination has been made, the result of which is said to be the revelation that upwards of 90*l.* remain unaccounted for, and proceedings are about being instituted against him by the Town Council.

Bituminous Composition.—Messrs. F. Labat & J. Meric, of Boulevard Bonne-Nonvelle, Paris, have specified their patent for a novel bituminous composition. The bitumen, the subject of this invention, is composed of white or liquid resin, otherwise galipot, of lampblack, and of sulphur and red sand from the pit or mine combined in about the following proportions:—For every 100 lbs. weight of bitumen—Sulphur, 37½ lbs.; galipot (or in case of necessity colophony), 25 lbs.; lampblack, 12½ lbs.; sand, 25 lbs. = 100 lbs. For bitumen to be applied on wood the quantity of sand may be reduced by about 5 lbs. weight, and it is preferable that the wood be rough—that is to say, not planed. In preparing this bitumen the sulphur must first be thoroughly melted in a sheet iron caldron or an earthenware pot: the galipot is then added, and when this has almost entirely melted the lampblack is introduced, and, lastly, the sand, and the whole is carefully mixed over a moderate fire. This bitumen may be used in the shape of bricks, or be laid as a coating upon any desired foundation. It is suitable for bottoms of reservoirs, for pavements of streets or terraces, and other applications too varied for enumeration.

The Position of Pre-historic Burial Grounds.—Everybody knows that it was the universal rule of English Gothic architects to build their churches east and west. But it was discovered some thirty or forty years ago that in some cases the line from west to east was drawn so that the altar faced that exact point in the eastern horizon at which the sun rose on the festival of the saint to whom the church was dedicated. Canon Greenwell, who has done so much in the Yorkshire Wolds with the ancient British barrows, now finds, on examining the Yarsley or "long barrow," that it was the custom of the half-savage tribes who raised these funeral mounds to place them east and west, but shifting their exact direction according to the point where the sun rose at the time they were piled together. Among other of the reasons on which this conclusion is founded, was the presence of a large number of acorns, indicating a late period of the year, and precisely corresponding with the point at which the sun rises, when, from the direction of the line of the tumulus, it is supposed to have been built.

Railway Travelling.—In 1866 the number of railway passengers of all classes was 238,137,000, and the expense of carrying them, without reference to the distance they travelled, was just 6*l.* ahead. As the total gross receipts from passenger traffic during the same year were 13,125,000*l.*, the average fare paid by each passenger, whether he travelled first, second, or third class, from one station to the next, or from one end of the kingdom to the other, was 13*d.* and a fraction. The average first-class fare was 2*s.* 6*d.*, and the average journey 15 miles; the average second-class fare 1*s.* 2*d.*, and the journey nine miles; the average third-class fare 8½*d.*, and the journey also nine miles. The average number of passengers per train was seventy-five, and the working expenses were 2*s.* for each train mile. As to goods, in the eight years between 1856 and 1864, the charges have been lowered on an average by 28 per cent.; the public have sent 2,706,000 tons more goods, while they have saved more than 800,000*l.* on the cost of carriage; and the public treasury has earned an increased net profit of 231,240*l.*

Somersetshire Archaeological Society.—The annual meeting will be held at Axbridge, on Tuesday, the 7th of September, and the two following days, under the presidency of Mr. Wm. Long, F.S.A. On Tuesday, after hearing papers, there will be an excursion to Cheddar Church and Cross, and Rodney Stoke. On Wednesday an excursion to Rowherrow Church and Manor House; Dolbry Camp; Burrington, Church, Combe, and Caverns; Hut Circles, Amphitheatre, Charter House; and the Cheddar Gorge, Cheddar Cavern; and on Thursday to Winscombe Church; Loxton; Christon; Banwell Cave, Church, &c.

Great Canal from Amsterdam to the North Sea.—The great ship canal which is to connect Amsterdam with the North Sea at a cost of 27,000,000 guineas is now in progress after a temporary stoppage of the works. The canal will be about 15 miles in length, at one part strongly embanked, and a harbour of refuge will be built at its mouth at a part of the coast where a harbour is greatly needed.

Stanley Park, Liverpool.—The new public park at Anfield, Walton, which has been constructed for the recreation and amusement of the inhabitants of the north end of the town of Liverpool, is rapidly approaching completion; and will shortly be banded over to Mr. Kemp, the landscape gardener, from whose designs it has been formed, preparatory to its being formally inaugurated and opened to the public. Although smaller than the Newsham and Sefton Parks (its area being not more than 100 acres, it is, nevertheless, in many respects, more picturesque than either of the former. It is favourably situated for a view of the surrounding country. There are four entrances. The park is enclosed by plintbing and iron railing 6 ft. in height, and outside this there will be an equestrian drive along Priory-road and Mere-lane. The intention of the corporation was to give the land now being converted into an equestrian drive to the Walton Local Board, in consideration of their widening the road and keeping it in order, but this the local Board declined to do, and hence the equestrian drive which is now being constructed. The only drawback to the appearance of the park is that it is out in two by Mill-lane, a public highway, and which the Walton Local Board refuse to give up. The Walton Board proposed that the corporation should give up an equal width of land at the Arkley-lane boundary of the park, which would thus have widened that thoroughfare; but to this proposal the corporation would not assent. The council intend to go to Parliament for powers to close Mill-lane and throw it into the park. The works in connexion with the laying-out of the park have been executed by Mr. Pearson Lea, and the buildings and general stone-work by Mr. Campbell.

The New Fish Market, Swansea.—The *Cambrian* is afraid the Corporation has made a serious mistake in the erection of the new fish market. The old market was simply a disgrace to the town, and the council was doubtless actuated by good motives when they voted some 600*l.* or 700*l.* for the erection of the new market. The new structure is, however, perched up over the hutchers' stalls at one end of the market; is only approachable by a long flight of steps; and until the past week or two was surrounded with glass, which made the place during the late intense heat a perfect hot-house, almost unheatable to the fishmongers. The large glass windows have now been entirely removed, but will have to be replaced if the market is to be made available in the winter. The market itself is commodious enough, but the fishmongers complain sadly that, in consequence of the long flight of steps, the ladies refuse to patronise the stalls, and several stall-holders have intimated their determination to give up their stalls.

The Honduras Railway.—Some statements having appeared in a New Orleans paper to the effect that though "a loan of 2,000,000 dollars has been negotiated in Paris for the completion of the Inter-oceanic Railroad in Honduras, not a rail has been laid, nor a sod turned toward commencing, neither has the route been surveyed." Mr. B. Baylis, an engineer engaged upon this line of railway, writes to us to refute them. He says,— "As one of the engineers employed on the line these last six months, I have to state that the first section of fifty miles has been surveyed, and the rails laid on a portion of the way. When I left the works, three weeks ago, there were six hundred labourers on the line, and the numbers were increasing every day. I may also state that the amount of the loan raised in Paris is two millions sterling instead of two millions of dollars only. The report evidently emanates from some parties not quite disinterested, perhaps some of those who have a stake in a rival line."

A Smart Young Architect.—The *Gazette de Cologne* is responsible for the following little anecdote. It seems that the basilica of St. Peter's, in anticipation of the Ecumenical Council, is undergoing some repairs. One morning the architect's son brought to the Pope some of the necessary plans and drawings connected with these repairs. His Holiness was highly delighted with them, and taking the boy by the hand, led him to a drawer, in which were lying some gold pieces, telling him to take as many of these as his hand would hold, in honour of the very beautiful workmanship of his father. "Please, holy father," said the unabashed boy, "let me have what your hand will hold—it is so much larger!" The Pope, adds the *Gazette*, good-naturedly did as he was desired.

Death of Mr. William Crawford, of Edinburgh, A.R.S.A.—The death of this artist is announced by the *Spectator*. Mr. Crawford was born at Ayr, his father being Archibald Crawford, the author of "Bonnie Mary Hay," and other popular lyrics. At an early age he was despatched to Edinburgh, where he became a student in the Academy under Sir William Allan. He would seem to have possessed his faculties with some distinction, and his success in copying one of Ely's great pictures secured for him a travelling bursary. The young artist was thus enabled to visit Rome, where he studied for two or three years. He then returned to Edinburgh, and settled down to the practice of his profession. As a painter, Mr. Crawford achieved his greatest successes in the department of portraiture. His forte was drawing in crayons. Among his contributions to the annual exhibitions at Edinburgh also were various sacred subjects, and a considerable number of genre pictures. Mr. Crawford was married about seven years ago to a lady who has since been known as a contributor to the Academy's exhibitions.

Conference of Engineers.—The annual congress of the Institution of Mechanical Engineers was opened in the theatre of the Literary and Philosophical Society, Newcastle, under the presidency of Sir William G. Armstrong, C.B. The attendance at the opening meeting was very numerous. The secretary read a paper on "The Mechanical Ventilation of Collieries," by Mr. W. Cochran. The paper was also illustrated by diagrams, and led to a very animated and lengthy discussion. The next paper read was by Mr. J. Daiglish, of Seaham, on "The Mechanical Firing of Steam Boilers." A long discussion ensued, in which Mr. Hawkesley, Mr. Compton, Mr. L. J. Bell, and the President took prominent parts. The members then adjourned to take part in the various excursions. In the evening a large and influential company, including many ladies, again assembled in the theatre of the institution for the purpose of hearing the annual address delivered by the president.

Prehistoric Archaeological International Congress at Copenhagen.—The *London Gazette* announces that the Committee of Privy Council on Education have received, through the Foreign Secretary, a note from Her Majesty's Consul at Copenhagen, relating to an International Prehistoric Archaeological Congress, under the special patronage of the King of Denmark, to be held at Copenhagen from the 27th August to the 3rd of September next. The programme relating to the congress has also been forwarded, and is given in the *Gazette*. Amongst other arrangements are excursions for some days, when dolmens, ancient kitchen middens, &c., will be visited.

Workmen's Trains.—A public meeting, convened for the purpose of promoting the extension of the system of workmen's trains upon those parts of the Metropolitan and Great Western railways which embrace the suburban districts of Kensington, Hammersmith, Chelsea, and Notting-hill, has been held at the St. James Hall, Notting-hill. Sir Charles Dilke, M.P., offered some suggestions. The Board of Trade was the department of the Government to deal with this question, and he therefore would advise the committee to form a deputation to wait upon Mr. Shaw Lefevre. They should request the Government to bring in a Bill for the object desired. The principal clause of the Bill should be one which should fix the maximum compensation in cases of accident at 100*l*. Resolutions approving the object of the meeting were adopted unanimously.

Two Men Suffocated in a Sewer.—In Dublin two men have lost their lives in a large sewer which was being cleaned. The men went down to begin work, and had scarcely reached the bottom when they were heard to cry for help. They then fell, evidently overcome by impure air. Without any delay two men were sent down in a bucket to their assistance, but they were also overpowered by the rush of poisonous gas, and had to be drawn up. Efforts were again made to rescue the poor fellows, but they were unavailing for upwards of an hour, when a young man succeeded in fixing a hook to the clothes of one of the deceased, and he was thus brought to the surface. The tide had meanwhile risen and carried the other body up the sewer for some distance, and it was not recovered for a considerable time.]

Industrial Dwellings.—The annual meeting of the Improved Industrial Dwellings Company (Sir S. Waterlow's) was held on Tuesday. The report showed an available total of 4,131*l*, and recommended a dividend at the rate of 5 per cent. per annum, leaving 1,623*l*. to be carried forward. The subscribed capital is now 125,000*l*, the amount to which the directors propose to limit it, and which practically represents an available total of 250,000*l*, a sum corresponding to the amount of the subscribed capital being obtainable at 4 per cent. from the Public Works Loan Commissioners. Until the whole of the 250,000*l* of subscribed and borrowed capital has been actually invested, the directors do not propose to recommend higher dividends than at the rate of 5 per cent. per annum. The report and accounts were read and adopted.

Holloway.—The foundation-stone of a new Roman Catholic church has been laid in Edengrove, Holloway. The edifice is dedicated to the Sacred Heart, and the stone was laid by Archbishop Manning. The new church is being built according to the designs of Mr. Pownall, in the early English style, and will be of red brick, with a tower. The size is 90 ft. by 50 ft. The site is a good one at the west end of Edengrove. The cost of the edifice, with glebe-house and schools attached, will amount to 7,000*l*. Mr. Carter is the contractor.

Free Libraries.—The Hon. Auberon Herbert (brother of the Earl of Carnarvon) proposes to devote a sum of 1,000*l*. to the encouragement of free libraries in Berkshire. To Reading, as the largest of our Berkshire towns, he says, I offer 250*l*. and 150*l*. to any other five towns (including Oxford) which are the first to comply with the following condition—This condition is that an amount equal to that received should be raised by each town. Should any part of the 1,000*l*. be unclaimed at the end of six months, it will be dealt with as may seem best under the circumstances.

Mortuaries.—At an inquest held in Clerkenwell, Dr. Hardwicke, the deputy coroner, spoke strongly of the necessity of carrying out the provisions of the Sanitary Act of 1856, which provides for the establishment of public mortuaries. The condition of the parish death-houses was, he said, disgraceful. The jury were of the same opinion. The report of Dr. Little, a medical officer to the Whitechapel Board of Works, calls attention to the necessity for a similar provision in that district—a want which was pressed on the attention of the Board more than two years ago.

Agricultural Improvement in India.—The Duke of Argyll held out to the Indian Committee of the Society of Arts last week the prospect of a liberal scheme for the promotion of agricultural improvement in India. It will most likely resolve itself into several large agricultural societies, in which the native princes and zemindars will be invited to join, and which will be largely subsidised by the Government, for holding exhibitions and carrying on model farms.

Demolition of City Churches.—Two churches in the City of London are doomed partly to disestablishment and disendowment, and entirely to demolition. One is the church of St. Mildred, in the Poultry, where there has never been a congregation of more than two or three for many years past, and the other the church of Allhallows Staining, which has not had a vicar during the last three or four years. Both these churches are now to be taken down under the Union of Benefices Act.

Drink for Workmen during Hot Weather. A tablespoonful of Scottish oatmeal put into a large tumbler or small jug, and filled up with clear cold water, well stirred up, and allowed to settle until the large particles of the meal fall to the bottom, forms a refreshing drink in hot weather, and quenches thirst well. English oatmeal is bitter, and will not be so palatable, unless it be to those who have a taste for bitter drinks.

The Proposed New Bridge at Ongar.—At a meeting in the town-hall, Chipping Ongar, to consider the report of the Bridge Committee and the plans prepared by the county architect, Mr. H. Stooks, relative to the proposed bridge over the washway at Shelley, it was decided that the plans be accepted and the work commenced forthwith. The bridge will be composed entirely of iron, and will rest on strong abutments at each end.

Northern Architectural Association.—The quarterly meeting of the Northern Architectural Association was held in the Old Castle, Newcastle, Mr. Watson in the chair. After transacting some business of a purely formal nature, the members present proceeded to St. Nicholas' Church. They were there shown over the works in connexion with the restoration of St. Nicholas' Church and steeple, by Mr. Snellgrove, clerk of the works.

The Whitworth Scholarships and Exhibitions.—The competition for the practical work for the ten scholarships of 100*l*. each will be conducted by Colonel Rich, R.E., Mr. Manby (secretary of the Institution of Civil Engineers), and Mr. Marshall (secretary of the Institution of Mechanical Engineers). In addition to these scholarships, tena for the present year, Mr. Whitworth has just offered to the Science and Art Department eighty exhibitions, of the value of 25*l*. each, to be awarded to students in the universities, colleges, and schools, public and private, in the United Kingdom. These exhibitions are to be held for one year, and the students must show an aptitude for mathematics, mechanical science, and drawing.

Conference Hall, Islington.—The first stone of the new Conference Hall, Midway Park, Islington, was laid on Wednesday, August 4th, by the Rev. William Pennefather, vicar of St. Jude's, Midway Park, before a large assemblage. Messrs. W. G. Hahershon & Pite are the architects; Mr. W. T. Turner, of Hornsey, is the builder; Mr. Daniel Smith is clerk of the works. The hall, when finished, will hold 2,300 people.

Works in Exeter Cathedral.—It is stated that the choir of Exeter Cathedral is to be restored by Mr. Gilbert Scott, at a cost of upwards of 12,000*l*., towards which the Chapter subscribes 3,000*l*., the Bishop of Exeter 1,000*l*., and the Dean 1,000*l*. This is part of a great work of restoration at a vast cost, which, it is hoped, the means will be forthcoming to carry out in portions from time to time.

TENDERS.

Accepted for conservatory andinery to the Hall, at Peckering, for Mr. James Mitchellson. Mr. J. Gibson, architect. Quantities supplied:—

Mason and Bricklayer's Work	
W. & G. Salton	4210 0 0
Carpenter and Joiner's Work	
Kirby & Kinsdale	218 0 0
Plumber and Glazier's Work	
Gray	92 5 0
Smith's Work	
Fletcher, Brothers	137 10 0
Painter's Work	
Firth	40 0 0

Accepted for villa residence, Rookingham-terrace, New Malton, for Messrs. J. Slater & Sons. Mr. J. Gibson, architect. Quantities supplied:—

Mason, Bricklayer, Plasterer, and Slater's Work	
Wood	4399 13 0
Carpenter and Joiner's Work	
Dodsworth	204 0 0
Plumber and Glazier's Work	
Leefe	36 13 0

For new shop-front and alterations to premises, at New Malton, for Messrs. J. Slater & Sons. Mr. J. Gibson, architect. Quantities supplied:—

Dodsworth	4305 13 0
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For building two villas, at Edmonton, for Mr. T. E. Lloyd. Drawings furnished by Mr. Pierce Arthur:—

Applebe	41,953 0 0
Sheldon	890 0 0
Livesey	975 0 0
Higgins	839 0 0
Woodcock	340 0 0

For villa residence, Hammersmith. Mr. Clarke, architect:—

Brown	42,560 0 0
Crabb & Vaughan	2,493 0 0
Thorpe	2,475 0 0

For laying out the grounds at Leavesden Asylum, near Herts, for the managers of the Metropolitan District Asylum. Mr. Alexander McKenzie, director. Quantities supplied by Mr. Strubsole:—

Carter	22,320 0 0
Meeston	2,076 0 0
Anderson & Son	1,955 0 0
Simmonds	1,925 0 0
Sutley & Home	1,925 0 0
Henshaw (accepted)	1,910 0 0
Nicholson & Goddard	1,741 0 0
Coker	1,710 0 0
Knight & Son	1,600 0 0
Coker, John, jun.	1,603 0 0

For the erection of a cemetery church, schools, &c., at Stonegrave, Derbyshire. Mr. S. Rollinson, architect. Quantities supplied:—

Table with 2 columns: Name and Amount. Includes 'Whole Tenders' for Farnsworth, Wright, Marr, Ware, Madin, Glosop, Heathcote & Son, and 'For Carpenter, Joiner, &c.' for Mills, Knight, Coker, Kirk, Blackmore, Green, M'Crea, Wilson.

For sea defence wall, for the local Board of Health, Bognor. Mr. Arthur Smith, C.E. Quantities supplied by Mr. J. J. Bennett:—

Table with 2 columns: Name and Amount. Includes Mills, Knight, Coker, Kirk, Blackmore, Green, M'Crea, Wilson.

For laying about 1,900 ft. of cast-iron sewer pipes, across the Poreshore, at Hyde. Mr. Francis Newman, C.E., borough surveyor:—

Table with 2 columns: Name and Amount. Includes Henrick, Neave & Fry, Barton, Meader, Hayer & Budd, Coker, Pritthead, J. & J. Langdon.

For building new tap, and other works connected with the Bush Hotel, Farnham. Mr. Hector Harding, architect:—

Table with 2 columns: Name and Amount. Includes Diamond, Goddard, Duke, Goddard & Son, Wells & Bachelor, Mesher, Birch.

For alterations and additions to Nos. 10 and 11, Whitehall. Mr. Ewan Christian, architect. Quantities by Messrs. Goodman & Vinal:—

Table with 2 columns: Name and Amount. Includes Ashby & Sons, Rigby, Braas, Myers, Jackson & Shaw.

For alterations and additions to the George and Dragon public-house. Mr. R. L. Rouman, architect. Quantities by Messrs. Welch & Alkinson:—

Table with 2 columns: Name and Amount. Includes Wame, Dove, Brothers, Lanson, Macey, Longmire & Burgess, Rigby.

For building first portion of R.C. church, at Camberwell, for the Right Rev. Dr. Grant. Mr. C. A. Buckley, architect:—

Table with 2 columns: Name and Amount. Includes Nightingale (accepted).

For the erection of a new workhouse, at Selby Oak, Worcestershire, for the Guardians of the King's Norton Union. Mr. E. Holmes, architect. Quantities by Mr. T. H. Mansell:—

Table with 2 columns: Name and Amount. Includes Marriott, Smith, Webb, Matthews, Moffatt, Parker & Son, Hilton, Hardwick, Briggs & Son, Jeffrey & Fritchard, Frow & Sons, Barsley & Sons, Bennett, Jones, Surman, Horsley, Brothers, Crosswell & Son, Lilley, Clarke, Parnell (accepted).

Table with 2 columns: Name and Amount. Includes Bacon & Co., Fraser & Co., Jenkes & Co., Smith & Sons, Cornell, Carter & Co. (accepted).

Kennington and Lambeth Sewers.—Sir: In your number for July 31, it is stated that Mr. Summers, Mr. Young, and myself took out the quantities for this work. Messrs. Dickinson & Oliver, the successful competitors, tendered upon my quantities, and, in fact, made up their estimate in my office, therefore I consider I have the right of saying the quantities were supplied by me.

JOSEPH J. BENNETT.

TO CORRESPONDENTS.

W. B. (what is the cost of the cottages?) J. S. (a point for site was mentioned in our pages not long ago?) T. G. J. A. V. G. J. B. B. B. J. F. M. O. M. E. T. R. T. B. J. O. S. J. G. B. R. T. M. J. O. M. E. P. G. H. A. W. M. E. T. W. H. C. C. H. J. W. O. Jack Place.—R. H. A. J. B. O. H. R. S. J. F. H. B. F. N. H. C. J. J. B. P. B. G. C. R. E. W. B. R. N. W. T. R. B. T. L. D.

We are compelled to decline pointing out books and giving addresses. All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. Note.—The responsibility of signed articles, and papers read at public meetings, rests of course, with the authors.

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A Pamphlet for Municipal Authorities, and those interested in the Cultivation of Food. London: SIMPSON, MARSHALL, & CO. LEAMINGTON: W. HEECE, Victoria Library.

New Edition, corrected to 1868. Six Col. 13s. 6d. half bound, 17s. BROOKES'S (R.) GENERAL GAZETTEER: A Geographical Dictionary, containing descriptions of every Country in the known World, the Cities, Towns, Rivers, Villages, &c. London: WILLIAM TEOB, Paternoster-Row, Chesapeake.

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CRUYDON LOCAL BOARD OF HEALTH.

WATER SUPPLY.—APPOINTMENT OF INSPECTOR.—Notices in previous issues, that the Local Board of Health for the district of Craydon are about to APPOINT an INSPECTOR to visit and report upon various duties in connection with their system of water supply. The services of an active energetic person are required, who will devote the whole of his time to the duties of his office, and whose age must not exceed 50. A list of the duties (a practical knowledge of which is indispensably necessary) may be obtained on application at any Office, at the Town-hall, Craydon, Salary 150*l.* per annum, with a yearly increase of 10*l.* up to 150*l.*—Applications, accompanied by testimonials, must be sent to me on or before MONDAY, the 30th AUGUST INST.—By order of the Board, B. J. CHEESWRIGHT, Cl. Ric. Town-hall, Craydon, August 10, 1869.

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The Builder.

VOL. XXVII.—No. 1385.

History from Marble.*



AMONG the literary treasures of the library at Stanton Court is a manuscript quarto, profusely illustrated with clever pen-and-ink sketches of churches, gentlemen's seats, monuments of many kinds with their epitaphs and arms, preaching crosses, pulpits, seals, coins, stained glass, and other objects in which architects, artists, and sculptors are specially interested. On its carefully set out title-page are two female figures—the one representing Sculpture, the other Painting—who are holding up a curtain, on which is written, "History in Marble, being Ancient and Modern

Funeral Monuments in England and Wales, by T. D. Gent." From dates appended to some of the sketches, we perceive it was the work of different years in the latter half of the seventeenth century; and from the signature of the author to others, we learn that T. D. was Thomas Dingley. There is scarcely a page in the volume that has not one or more sketches upon it depicting antiquities in different parts of the country, but most frequently in the counties of Herefordshire and Wiltshire, and the cities of Bath and Oxford. Thanks to the free-hearted generosity of Sir Thomas E. Wynnionton, this interesting record has now been published by the Camden Society. The new art of photolithography has been brought to hear upon the task by the council, and instead of printed copies of the notes, with woodcuts, or lithographs of the sketches, they have produced, with the aid of Mr. Vincent Brooks, *fac similes* of the work. Every page is reproduced by this process, line for line, stroke for stroke, erasures and mistakes; the only difference being that the red lines ruled round some of the drawings by way of finish appear to be as colourless as the rest.

Mr. J. G. Nichols, who has written an introduction to the work, tells us there are two other manuscripts by the same author in the library at Stanton Court. One of them is a journal of a "Journey in the Low Countries," and the other, "Observations in a Voyage in the Kingdom of France." Two more, relating to antiquities in Ireland and Wales, have been published recently by the Kilkenny Archaeological Society and the Duke of Beaufort, respectively; and a sixth, a commonplace book, likewise full of pen-and-ink drawings, is mentioned in a catalogue as having been offered for sale in 1864, but is now, unfortunately, lost sight of. From casual statements in his MSS., Mr. Nichols has been able to trace out somewhat of the history of the author, and having ascertained that he lived at Dilwyn, he visited that parish, and was rewarded for his trouble by finding in the register several frag-

ments that had once formed portions of this "History in Marble," relating to the monuments of the church, and those of the neighbouring parishes, stuck upon the first page of it. The biographical facts collected, however, amount to scarcely more than this. He came of the ancient family of Dingley of Woolvorton, believed to be a branch of a still more ancient family in Lancashire; was educated by James Shirley, post-laureate; admitted of Gray's-inn; travelled in the Low Countries, in France, in Ireland, in Wales, in the suite of the Duke of Beaufort, and perhaps in Italy; had a residence at Dilwyn; and died, while on further travels, at Louvain, an old bachelor, leaving his possessions to a niece.

Mr. Nichols also gives a brief account of works of a similar character to that which Dingley compiled for us. He reminds us that before the revival of appreciation of ecclesiastical architecture, church notes and monuments were held in high estimation by genealogists and biographers. He says professional heralds deemed such evidences among their most reliable materials, and when they went on their visitations they made a point of gathering church notes, as well as notes of the armoury displayed on the walls and windows of manor-houses, to assist them in the construction of genealogies. Their visitation-books are enriched with many such notes. Amateurs pursued the same course when heraldry was a favourite study. Camden, both before and after he was a professional herald, collected church notes. Stowe gave many of the epitaphs of the metropolitan churches. Strype, Seymour, and Maitland followed in his wake; and more recently Malcolm, the Lysons, and Hutton. Then we have Weaver's "Funeral Monuments;" the Diary of Richard Symonds, a cavalier in the army of Charles I., printed by the Camden Society; the magnificent work of Gervase Holles, a colonel in the service of the same monarch, preserved in the Harleian collection, though not yet printed; and Dugdale's most industrious labours, all belonging to the seventeenth century. Topographers took up the subject about this time, and made church notes a feature in their works. About a century ago Gough published his "Sepulchral Monuments;" and since then Stothard and Blome have worked in the same field. As we look down the long list of antiquaries and topographers who have taken church notes, Dingley's book falls into place and becomes a link in the chain of great interest.

The first entry in his curious collection is an alphabet of arms, or catalogue of the arms of families not mentioned in other forms in the course of his work. This is immediately followed by an east view of Bath Cathedral, and a note of "Advice from a Father to his Son in ye University:"—

1. Serve God, that will make you a good Christian.
2. Follow your study, that will make you a good scholar.
3. Keep within compass, yt will make you a good Husband.
4. Be humble and mecke, that will make you a good man.

By the careful performance of these—

1. God will be glorified.
2. Your college credited.
3. Your father comforted; and
4. Your self commended."

And on the next page we find the antiquary in the interior of the cathedral, sketching. He gives a view of the edifice, however, from the south-east before he stepped inside, and then goes on to note the position of the principal tombs, giving the heraldry, sketching the pulpit with its inscription, and copying a great number of the epitaphs. We give a sample of his mode of treating the latter:—

"Upon ye wall is seen this ancient inscription or Rebus, following which in the late times of usurpation of Cromwell, being read by a person of Quality, Loyaltie, and Honour, startled him; the words are—

The trees going to chase their King,
Said hee to us thou Oliver King.

But upon inquiry he was informed by one learned in the records that this was wrote in honour of one Oliver King, abbot of a monastery yt layed the foundation of this

minster. This inscription is allusive to a passage in Judges, where the trees consented to choose them a king, and pitched first upon the Olive, in French named Olivier, though at last the bramble carried it."

But for its length we would give the epitaph upon the "right virtuous and worthy lady Jane Lady Waller;" close by, which, he says, "though neither silly nor witty enough to deserve note, followeth." But we must pass on. The King's Bath, the Queen's Bath, the Cross Bath, the other places of note in the city, and the Roman antiquities, are all duly represented. There are two views of the King's Bath. We are shown a large oblong tank of water, in the centre of which is an arcaded erection surmounted by a spire and finial, and inscribed "This pump was set up directly over the Hot Spring at ye charge of the chamber of this city, by the advice, order, and direction of ye Honorable Sir Alexander Frazier, Principall Physitian in Ordinary to his Majesty." A walk with an ornamental parapet surrounds the water, and an archway gives access to the Queen's Bath adjoining. Near the door, too, of a pump-house, intended for those who drank the waters without bathing, was a long inscription, wherein Richard Roe testified to the healing qualities of the springs, which he also copied, calling it "a dull though honest acknowledgment of a Parson set out with poetry of the same stamp." Against the north view of this bath, "taken from ye Widow Walker's house," he wrote, "Here note that these baths are not in an wholesome condition to be used continually, but require a time of cleansing from ye sordid scum, not only exhaled from foul bodies wreaking and padding therein, but what by ye heate and working of yt is cast up. So that until they are drawn and cleused, entrances is forbid to the Patients resorting hither for health."

Mr. Dingley calls Bath the prettiest city in the kingdom, "in a double construction, for it is little and handsome." He describes the properties of the waters, and then states that the sole manufactures of the place are apothecaries' wares, and good mutton the only commodity. "But," he continues, "the people chiefly get their bread by their water,—I mean the baths; and those clownish fellows and ugly old witches who never knew how to govern themselves are yett guides to others. To these may be added also a masculine sort of *bona roba* women, which attend you at your lodgings and are called rubbers. The continued noise in the King and Queen's Bath is not unlike that at Billingsgate, London, in Maguaret's time."

Some of the monuments in Winchester Cathedral are next given; Southampton is slightly touched upon; Chippenham visited and "touched off," to use the author's quaint expression; and Rowd Charoh sketched from the road: "In it ye minister teacheth school, and by reason of ye intolerable cold of the winter 1684 he erected a chimney therein. Inscriptions in this church ure none of account." A stage-coach running between Bath and Bristol during the season, fare half-a-crown, appears to have afforded him facility to see Bristol, where he made sketches of all the best monuments. Against the drawing of the handsome Tudor tomb of Sir Charles Vaughan, he noted: "He heareth saith a chevron between three children's heads, coupled at ye shoulders, Argent, their perrigues Or enwrapped about the necks, with as many snakes proper by ye name of Vaughan. It is said (how true I know not) that some one of ye ancestors of this family was born with a real snake about his neck." Among other entries made when in this neighbourhood, he records a remarkable gathering of aged persons, longevity being, by the bye, a subject to which he refers more than once:—

"In Bitton Hannam parish, near Bristol, ten yeers ago from 1681, were twenty-four men able to ride in one day and capable of being jurymen at Gloucester, which made above three-and-twenty hundred and fifty yeers."

St. Mary's, Redcliffe, is sketched, and the monuments of Sir William Penn and William

* History from Marble. Compiled in the Reign of Charles II. By Thomas Dingley, Gent. Printed in Photolithography by Vincent Brooks, from the original in the possession of Sir Thomas E. Wynnionton, bart. With an Introduction and Descriptive Table of Contents, by John Gough Nichols, F.S.A. Printed for the Camden Society, 1867-8.

Canyree, the so-called founder, with their epitaphs, are given; and a recumbent effigy of Johannes Lavington, then in an office belonging to the school-house, was also made a note of. St. Antin's Church, too, was figured; and before he left the city Mr. Dingley seems to have peeped at the Mayor's sword as one of the sights, for he says the "best sword of magistracy" belonging to it is called the Pearl sword, on account of the pearls set in its scabbard. He quotes the inscription upon it:—

"John Welles of London mayor
Gave to the City this sworde faier."

Gloucester Cathedral is sketched from the south, and a list made of its curiosities, including the whispering place, a "picture of ye Virgin Mary painted in ye window glass," and the royal tombs. The monument of Robert Courthorpe, earl of Gloucester, surrounded with the arms of the nine worthies, and the sepulchral brasses of Thomas Payne, and his wife Ursula, are the chief objects in the interior that he depicted.

His stay here seems to have been short and insufficient, as he has added the initials of a friend to one epitaph, which he probably inserted afterwards to make his account fuller. Thence he took Oxford. This was the birthplace of Richard I., he records, at the palace there called Beaumont. When looking over Christ Church College he remembered to look for the carving over a window of the porch-tower which Cardinal Wolsey caused to be put up, representing a bull-dog gnawing a shoulder of mutton, about which there was some talk in those days. At St. Mary's he sketched the college arms and entered several epitaphs; and going on to Oriel College, he was shown the brown howl of the first provost, wooden, and tipped with silver about the brim, and ornamented with a boss in the centre of the same metal, with a Latin inscription on the rim. Wadham College, too, he saw, and copied the arms and inscription over the gate. But the last entries relating to his investigations here are interpersed with those made at his next destination, Windsor, an isolated achievement belonging to Cirencester, and the monument of Cowley, erected by the duke of Buckingham in Westminster Abbey. Among the curious epitaphs he gives as "somewhere in Oxford," the verses upon a bellows-maker, that have been attributed to Ben Jonson, and another of a similar light scoffing character, upon an ale-wife, called Gannier Trueman, who died of dropsy, after being tapped in the leg:—

"Here lyeth one, disprove it who can,
Who lived a woman yett dy'd a Trueman.
Amongst all her skill this was her cunning,
Whilst one leg stood still the other was running."

The cathedral city of Hereford enjoyed considerable care at our author's hands. He drew a group of cottages on the road, the cathedral, when it came in sight, the west front that has since fallen, the inscriptions on the bells, the preaching cross, now fallen, the white cross, which in our time has been restored by Cottingham as to its base, and by Mr. Scott in its upper stage, St. Ethelbert's well, now destroyed, the town-hall, and a large number of the brasses, marble monuments, and gravestones, and the silver mace of the cathedral. Among the effigies Dingley shows that of Sir Richard Pembridge, which was originally in the church of the Black Friars, but conveyed to the cathedral at the dissolution. It is placed upon a tomb between two pillars, and he shows his shield hanging upon that at his feet. It was then mutilated, one leg only being drawn. In these days his leg has been restored and his helmet taken away. The Rev. Lord Saye and Seal went to the expense of the restoration; and the jousting helme,—we speak on the authority of Bloxam's "Funeral Rites of the Middle Ages,"—has been taken down and presented to Sir S. E. Meyrick.

There are other vicissitudes of fortune to be made out by means of Mr. Dingley's record. Thus he sketched the font in Leominster church, where there is now a modern one; and that he delineated has been recognised by Mr. Curzon serving as a bowl in a cottager's garden. Curious questions of identity, too, arise as his pages are scanned. He sketches a recessed tomb and effigy of Robert Kilwardby, Bishop of Hereford, 1285, the recess of which is still to be seen minus the effigy, which has been replaced by that of a modern layman, although there was never a bishop of Hereford of that name. Mr. Nichols explains that a bishop died in the year

mentioned, but he was Thomas de Cantelupo, afterwards canonised, a fresco of whom is also shown, and that Robert Kilwardby was the name of the contemporary Archbishop of Canterbury. Another peculiarity belongs to some of his drawings. They are marked with letters for references to keys, and these letters sometimes spell out THOMAS DINGLEY; and some of his best drawings he inscribes with dedications to his friends, whose names are, in this way, handed down to us.

The second portion of the work opens with notices of the churches of Stoke, Edith, Stretford, and an account of the town as well as the church at Weobley. Of the last-mentioned place, he says, "This town hath more fair cellars than most market towns of its hignes in England, hence the Welsh of South Wales furnish themselves with ale, which they bought up in bogs-hods, barrels, kilderkins, and other vessels, and sold and feasted the friends with in Wales by the name of Coragh Dah. Since the increase of good eyder the Bell for Weobley's Ancient Ale." Part of the spire of the church in this town is shown as absent, it having been blown down in a tempest in the year 1640, and not repaired for many years. One of the bells Dingley thought must be Saxon, as he copied the rude characters of its inscription, in which conjecture, however, he was probably mistaken. Tedbury, with its church and hospital, with the portrait of the founder of the latter, Hugh Foliot, Bishop of Hereford; Pembridge church and almshouse, and Bradwardine visited; and we find ourselves at Dilwyn, the residence of the author. Here he surpassed himself in minute attentions to details. His view of the interior of Dilwyn church shows the nave with north and south aisles and chancel, a flatish open-timbered roof, the pulpit, "reading pew," the tablets inscribed with the Ten Commandments, the entrance into the chancel, and the seats of the leading inhabitants are indicated by letters referring to a key furnished below the picture. He gives an epitaph from the churchyard upon a child of Wm. Taylor, of Boisfield, buried there about the time he was making his sketches of the venerable edifice:—

"Here lies a Tailor, garments never made
A Taylor, yett no Prentice to the trade;
But Deare's his master, Parents never mourn,
For when his time's expir'd, he will return."

Monkland, Pershore, Evesham are visited, and other antiquities figured, before the author shows how Worcester Cathedral appeared in his time. When at Worcester he first gives us an epitaph on a gentlewoman who fell dead while striking a ball upon the palace-green, and then sketches a north view of the cathedral, which he calls a college. He notes, first, among the monuments six "fair figures" kneeling, two and two, in their ancient decent habits, which are the memorials of the Moore family, and then he goes carefully round noting a great many others, including the epitaph of Prince Arthur, son of Henry VII., and figuring most of them of any architectural, sculptural, or heraldic character. Queenhill Church, Spetchley, Ripple, Norton, Fladbury, are next taken in turn, and at Crowle Mr. Dingley sketches the coffin-lid of the celebrated Moore, last prior but one of Worcester. Then Burford Church, in Shropshire, with its fine monuments of the family of Cornwall, and its epitaph on the heart of Edmonde Cornwall, esq., who died at Cologne, 14 Henry VI., attracted his attention; only, however, to relinquish it in favour of the churches of Leominster, Harkirk, and Cropton. In the last-mentioned church there is a remarkably fine monument to Francis Dingley, upon which is set forth the descent of the family from the ancient kings of Scotland, and those of England, through his mother, who was a descendant of Edward I. This, with the manor-house of Charlton, the residence of the Worcester Dingleys, our author drew with great care, as being objects of especial interest to him. The epitaph of the representative of the family here mentioned shows that he, too, felt an interest in genealogy, like our author. Towards the close of a long inscription it says, he was "happily married with Elizabeth, the daughter of Tho. Bigge, esq., descended by his mother side of the noble family of Bruliges Salwey Bracey, at Brace, and Magdalene Hobbys wife, by whom he had eleven issue sons and eight daughters, and with whom, having spent the space of fifty years in comfortable wedlock, he died in peace, leaving behind him the precious memory of a zealous patriot, a worthy justicer,

a true friend to true religion, a great example of wisdom and valour. Elizabeth, his late consort, hath consecrated this mean monument of her love and his merits." No wonder Dingley was proud of his relative! Mr. Nichols compared his sketch of the old manor-house, in which this worthy resided, with its present remains, and found that about one-half of the structure is still standing, having survived a remodelling early in the last century. It had dwindled down, however, into a farmhouse since 1780, but has quite recently been purchased by Mr. Workham, who is having it restored to its original importance, with due regard for its ancient features.

As a pleasant change to the pagefuls of monuments of the dead, we read the bill of fare of a mighty banquet given at the installation of Archbishop Neville at York; but as Hoarne has also inserted it in the appendix to Island's Collectanea, it does not give us any new information. Mr. Dingley proceeds with his usual class of subjects at Tewkesbury, where he makes use of Dugdale's Baronage of England for some of his statements. His drawings here, too, are not so accurate as others. His monument of Abbot John is not so rich as the original, Mr. Nichols says; that of Abbot Richard Cheltenham is shown short of a shield in each spandrel; and the cross in that of Abbot Alan is totally unlike the actual one. Again, he confused the Bryans with the O'Briens or Fitz-Briens; and an effigy now assigned to Abbot Wakeman he attributed to a man found dead in Tewkesbury Park. His industry, patience, and regard for every record of the dead were by no means diminished, and his heraldry, notes, and sketches, are as numerous as in other instances. He lingered to draw the chapel of the Lady Isabella Le Despenser, who died in London at the convent of the Minories, 1439, but whose body was brought here and buried on the right hand of her father. The arms in the painted windows he also loitered over; and he copied the inscription of a tombstone even with the pavement, that he knew would interest his friend, Mr. Ayle, who furnished him occasionally with some of his information. The communion-table he did not pass unheeded, but sketched it for the sake of its "marble top not to be paralleled in England for its Bigness and Beauty, being in length 13 ft. 3 inches and an half, in breadth 3 ft. and half, and 9 inches wide." He took down the inscriptions on three bells, but as he left a blank space in which to state the total number, it is to be presumed he did not mount to inspect them personally; and he looked into the churchwardens' book of accounts:—

"In it I find these remarks A 1578. There is said Payd for the Playes Geer (for that playes were acted nere ye church) six sheppskins for Christ's garments. And in an Inventory recorded in the same book A^o 1585 of the same geer, there are mentioned in these very words and order, 8 heads of hair for the Apostles and ten beards, and a face or visor for ye Devill."

By and by, Mr. Dingley copies from his friend's paper an account of the opening of a tumulus at Leek, when some stones were required to pave the town, in which an urn with some writing on a parchment relating to some hidden treasure was said to have been found. Wolverhampton seems to have come under his own notice on his road, perhaps, to the next place described, Lichfield Cathedral. And here we have another break, consisting of a set of "Apothegms taken at several times from King James," from which, although not altogether new, we may make this selection, as a vindication of his right to the title of Solomon: "Much money makes a country poore, for it sets a deepe price on everything." At Lichfield he noted the stained glass figure of Anne (Neville), Countess of Stafford, the arms of Elizabeth, Countess of Kent, the lists of preachers and feasts, the monuments of Lord Paget and Colyngshed, the emblems of the Crucifixion that, perhaps, had formerly figured in miracle plays, and various inscriptions. Warwick, however, allured him, and he was there scanning the collegiate church, and sketching another lady on a stained glass window, Eleanor, Duchess of Somerset. Then Stoke Castle, Albrighton Church, and Whitchurch successively drew his footsteps towards them. Whitchurch, where Hotspur was torn apart by Richard, fell down in 1711, but the monument of the first Earl of Shrewsbury, drawn by Dingley, is preserved in the new building. Coming so close into Wales, he naturally transcribes a poem in praise of the leek. Lincoln is next visited, with, however, but slight mention; then Cheshire, with Malpas Church, Banbury Church, and the principal churches in Chester, with the cathedral, are

examined, and their monuments, brasses, and inscriptions entered in his journal. The monument he considers most noteworthy in the city he describes as being in Trinity Church, "in marble, in armor, with a shield, which I have touched off." It is the effigy of John Whitmore, who died 1478; one of whose descendants, George Whitmore, was Lord Mayor of London. We must give one of the Chester epitaphs he dotted down in St. John's Church:—

"1. To God, 2. To Prince, 3. Wife, 4. Kindred, 5. Friend, 6. The Poor.
1. Religious, 2. Loyal, 3. True, 4. Kind, 5. Steadfast, 6. Dear.
1. In Zeal, 2. Faith, 3. Love, 4. Blood, 5. Amicitie, 6. And Store.
He that so liv'd, and so deceas'd lyes here."

A large space is next given to the monuments in St. Paul's Church, London. Some he has copied from Dugdale; but, on the other hand, he gives some that Dugdale does not. Four gravestones, with brass plates in a row, especially are noticeable in this work which do not appear in the other. An epitaph on the tomb of Sir Francis Mansell he copies in St. Gregory's "by Paul's" and then, like a sight-seer as well as antiquary, he wended his way without loss of time to the Temple Church. Here he made a somewhat longer stay, captivated, doubtless, by the stores of archaeological treasure, and copied the epitaphs of Wye, Quatreman, Portman, and Selden, and some of the monuments, St. Bartholomew's, behind the Royal Exchange, detained him, to give an account of the monument of Sir William Capel, and transcribe the epitaph over Miles Coswade, bishop of Exeter; and then he made his way to Westminster Abbey. Here, of course, he would suffer from that embarrassment of riches that afflicts most collectors some time or other. His first selection is the mention only of the tomb of Edward I., erected over his father Henry III., and then he gives a drawing of Edward's own tomb. It would take up too much space to follow his footsteps round this great tomb-house, as it has been somewhat irreverently called; for he filled nineteen sheets before he thought it was time to cease his recordings. St. John's, Clerkenwell, at last tempted him away, for we find the shields on the gatehouse, and the shields over the gate of the Earl of Elgin's chapel in the church next "touched off." St. Bride's, Fleet-street; St. Olave's Church, Old Jewry; St. Dunstan's in the West; St. Stephen's, Walbrook; St. Andrew's in the Wardrobe; St. Olave's, Silver-street; Great St. Bartholomew's, the Charterhouse, Mercer's Chapel, Savoy Hospital, successively attracted him, only for cursory glances and notes, the remembrance of the riches of the Abbey willing him back again for further study. In this second batch of entries relating to Westminster he drew the cradle which represents the tomb of the Princess Sophia, the youngest daughter of King James, and the inscription upon the coffin-lid of her sister the Queen of Hearts, as her Bohemian subjects named her; also the epitaph upon the monument of her grandmother, Mary Queen of Scots,—three magnets of sufficient power to have drawn him from a still greater distance. The Inns of Court come in for mention of their arms; and, after notes of the arms of Philippa of Clarence in St. Katherine's Church, and the tomb of John Gower at St. Mary Overy's, his London visit appears to have come to an end. Among memoranda of antiquities seen in other parts of the kingdom, we find one glance sent back to the metropolis. It is an epitaph "on two fat men lying in one grave" in St. Sepulchre's,—

"Here lies Robert Digges and William Digger,
There's no living soule knew which was the bigger;
They fared well and liv'd easy,
And now they're both dead, and y^e shall please ye."

The close of this book brings us nearer to his own neighbourhood; and it is cheerful with views of pleasant manor-houses. Corsham, about six miles from Bath, is comparatively fully described. One monument in the church of this place the sexton told him had been drawn there from the quarry, one entire stone, by twenty-four yoke of oxen and steers, which number of yokes are represented on the monument doing duty for punctuation to the inscription. Lacock Abbey is also delineated with precision and profusion. There is a view of the exterior and of some of the enrichments of the interior. "The offices of the house," he says, "are very large, necessary, and faire, with aqueducts to each through leaden pipes from Bowden Hill, sending down admirable water. The kitchen is famous for a large potage-pot, founded of bell-metal, for the use of this abbey. It was cast in Malme-

or Mechlun, in Flanders, little less than two hundred years ago, as appears by the following inscription in Latin round it helly. It is capable of nine bushell of pease, Winchester measure. The shape I have touched off in this sketch;" and by the side of this note stands a huge three-legged pot, furnished with two handles, and enriched with a legend round the widest part of the girth. When he looked upon it, on St. George's day, 1684, there were turnips growing in it. He admired the "fair vaults" of this place, then employed as cellars, larders, and the immense trough in the wine-cellar that set every one who saw it wondering how it could have got there; and passing out into a quadrangular court enumerates the purposes of the buildings around it. The roof of the cloisters, with its figures illustrating the vices, and its arms, he also dwells upon. The monuments in the church are very numerous and rich, and occupy several sheets. The fine brasses of Robert Baynard and his wife Elizabeth are amongst those drawn. A pedigree of Richard Talbot, temp. William the Conqueror, and an epitaph for Robert Rich, third Earl of Warwick, inscribed to his son, are the last entries made by this persevering personage.

We must compliment Mr. Nichols for his careful editorship of this curious relic of hygone days.

ULTRAMARINE REFLECTIONS.

The *Revue des deux Mondes* for July 15th contained an elaborate article by M. Ch. d'Henriet, under the title "Les Ecoles des Beaux-Arts en Europe," which, in addition to the interest arising from the nature of the subject, and the very full information conveyed as to the regulations and practical working of the Parisian schools of art, is varied by occasional comments which may not inaptly suggest a remark or two in the way of criticism, both adverse and otherwise, on our part. On one point, at least, we are thoroughly with the French critic. After a very detailed review of the history and present state of the French School of Art, and the great facilities afforded for acquiring accurate technical knowledge, he says,—

"We must note one cause of decline which was seriously felt under the old organization, and is still sensible under the new: the greater part of the students are deficient in general cultivation. They even boast of this, and are very willing to mistake their ignorance for independence. Such a confusion of ideas is to be regretted. The Greeks, to whom in such matters one must always return, knew nothing of it. We know that Pamphilus, the master of Apelles, exacted from his disciples ten years of close study in his atelier, together with a profound knowledge of history, literature, and science. . . . Too many of our sculptors are fully persuaded that statutory demands nothing more of them than the knowledge of superficial forms, the study of antiquities, and the education of the hand. Those among contemporary artists who have not been content with this slender baggage, nor seen in simpler acquisition any danger to their originality, have no reason to repent of this. Their works have an unmistakable and readily recognized stamp upon them."

In days when shallow rough-and-ready critics, or would-be critics, amongst us are endeavouring to reduce all pictorial and sculptural art to the level of mere clever and exact imitation, it is well to give as wide as possible a circulation to any well-judged and temperate protest in the opposite direction. At the same time it is gratifying to learn that this disdain of general education is not the same in all branches of art. "Les architectes sont ordinairement fort portés à s'instruire. Ces ouvriers trouvent leur raison d'être dans l'ensemble des connaissances très variées que réclame l'architecture." This view of architecture, as the art which more than any other deals in recondite and abstract sources of beauty, not even cognisable save by a well-educated mind, has been so often and so strongly insisted upon in these columns, and is yet so little generally recognized, that it is quite refreshing to meet it again in the pages of what has been termed the "first review in Europe." But, alas! when will our own architectural students be "fort portés à s'instruire"? Further on M. d'Henriet justly observes that,—

"The ensemble of studies which is for the most part sufficient for a painter, is nevertheless a very different thing from that amount of precise knowledge which an architect, to be a complete artist, cannot dispense with. He must lay hold closely on his science, and make himself master thereof. He must, besides, have some notion of all that has been done before him, must institute comparisons, must travel, must in some measure, even as the pious Æneas and the wise Ulysses, have seen the cities and the manners of men. Mere natural acuteness will not enable him to comprehend or divine that which he is bound to know."

While giving credit to recent and present French Governments for their liberal patronage

of art and provision for art-instruction, M. d'Henriet is not, however, blind to the evils attendant on governmental interference:—

"Our architects," he says, "wait but the word to give proofs of their invention, their knowledge, and their taste. But they have hitherto been too much restrained and hampered by the caprices imposed on them by (Government) commissions; we have made an administrative architecture. Those artists who are not sufficiently pliable are removed, and replaced by others more amenable to discipline. The painters have not passed under the yoke to the same extent, but we could mention those, nevertheless, who have shod in their tents rather than submit to conditions which seemed to them unreasonable."

And elsewhere he observes,—

"The mistake of the administration has been to get into the habit of domineering over everything; the mistake of the artists has been to end in accepting this as the natural order of things. Art is not a botch-house plant, receiving as a beneficent dew the favours of Power. . . . That art may attain its brightest bloom, it is not necessary to contrive for the artist easy legitimacies and pleasant paths; art puts up ill with such niceties. We can connect it with the throne, as has been said, in placing it under the hand of an administrator or of a soldier; but we shall not by such means give it a more racy flavour (*plus de saveur*)."

In all which is wisdom. M. d'Henriet, be it observed, dates the popularising of art in France from 1789, before which there had never been any public exhibition save for academicians, whose works were hung "par rang d'ancienneté"; other painters having to content themselves with an annual exhibition in the open air, on the *place Dauphine*, and which lasted two hours. It is possible, however, to have too much even of patriotism in art, if we are to believe the statement, that some years ago the competitors for the prize for medallion designs in the French Academy were invited to represent *la France dotant l'Algérie de puits artésiens*. "Il faut supposer chez un artiste les facultés d'abstraction bien développées pour lui imposer cette patriotique, mais froide allégorie." Truly!

In the second part of the article, devoted to the art schools of other nations, we read that "l'Angleterre," which has done a good deal lately for popular instruction in drawing, seems little inclined at present to encourage art-study of a higher kind. Then follows some account of the Royal Academy, where among other things the writer notices the "faits caractéristiques" that the "jennes gens, à moins qu'ils ne soient mariés," are not admitted till their twentieth year into the studio where "one draws" from a living model "do sexe féminin." We might retort by a hint at some "faits caractéristiques," as to the choice of subjects in French art; still it must be admitted that our national character has in it a good deal of that false modesty called "pridishness," and which is certainly a quality very much adverse to a due appreciation of art. More astonishing is the reason assigned for the fact (if it be a fact) that the most promising of our art-students do not go much to Rome to complete their education, as the French do. Why, does the reader think? "Les Anglais ont si peu de goût pour le qui est l'Papauté." We venture to assure M. d'Henriet that our art-students do not trouble their heads much either about the Pope or Exeter Hall.

But what follows is worse still:—"Those who travel for the most part return very much as they set out; they know more, they have seen more; but they have very little changed their manner. *L'art étranger n'a guère pris sur le Saxon.*" Thinking of some of the developments of "l'art étranger," we are minded to say, "Thank God for that, at all events." But which manner does our French critic mean to say that we do not change? For we have twenty at least. And, seriously, the charge, coming from a Frenchman, is surely open to a retort of *tu quoque*. If there be one nation more than another which is bound down in its art to certain national types, which is incapable of judging of works of art save by its own national standard, that nation is the French. Our own fault is much more in the other direction, viz.—that we have no fixed path and no national style (unless a general absence of style be accepted as such); and French artists might with some justice bring against our art the charge made by Wordsworth against their own literature, as having

"No code,
No master spirit, no determined road."

But to return to M. d'Henriet's comments upon us, which we will give as far possible in his own words. If it be true that a considerable number of our artists go to study in France and Belgium, they are practically none the better for it, for when they return the last thing they think of is

of grand studies or beautiful compositions. "Ils s'entendent avec un marchand, et produisent couramment la peinture que réclament les acheteurs." We wish that examples of the truth of this statement were more exceptional than we fear they are. "Ils se complaisent aux effets de lumière dure et intense, comme les Russes du nord." (He means that there is some light and atmosphere in our landscape.) "Ils ont en bien et en mal certains préjugés esthétiques maisés à défrancher." This, we sadly fear, is as true a remark as ever was made; but "aesthetics" never were our strong point; it was because we had not the thing that we thought it well to borrow the name from Germany. "Ils detestent de toutes leurs forces la sauvage peinture des Espagnols, et s'prennent d'une ardente passion pour deux Français d'Italie, Poussin et le Lorrain." Here, the good man is dreaming, and has gone back thirty or forty years. Has he ever seen a picture of Vicat Cole's, and will he show us where Mr. Cole is indebted to "Poussin et le Lorrain" or Mr. Graham, or Mr. M'Whitner either, for that matter. He thinks we excel in painting animals, which we execute "avec une grande sincérité," and in *genre* and landscape (we cannot return the latter compliment), and in the representation also, notably, of fields of corn in which one can count the ears (*moissons dont on peut compter les épis*). Oh! M. d'Henriet, *fi donc!* We can laugh at that, though; but, alas! "Quand ils abordent l'histoire, ils sont plus de médiocres." Thinking of Mr. Ward, we should like to be a little more indignant than we find ourselves able to be at this judgment; but the remembrance of certain paintings "on the line" at the Academy checks us. "Pour l'architecture, on en est resté par-delà le détroit à l'art ogival de Normandie," as, indeed, we know to our cost; and there we suppose it will rest, until every bit of plate-tracery has been sketched and reproduced a score of times, when it will be time to turn to something else.

In sculpture we have done nothing but a few statues "hors ligne," some of which, when one sees them in public places, "appellent involontairement le sourire." Our best works, let us say, are not in "public places," and some of the worst of those which are have not been the work of Englishmen, both which facts M. d'Henriet ought to have known if he went into the subject at all. Looking to the sculpture-room of the Academy this year, however, we cannot but join him in wondering at the poor estate of the art amongst us, particularly seeing, as he says, that we have in the British Museum the very finest of ancient models ready to hand. As to the painters, he thinks they have some reason to complain that they have not what they want. "Les galeries publiques sont fort incomplètes, et dans les galeries particulières, véritables propriétés féodales, il est difficile d'être autorisé à faire des études."

So much for the critic of the *Revue des deux Mondes* on the state of English art. If his views are strongly tinged by that national vanity which belongs as much to French artists as to English shopkeepers, and that thorough persuasion of the unassailable position of their own school of art which characterises all Callio artists, whether musicians, architects, or painters, it is yet instructive to see how our art-education and its results appear in the eyes of people so peculiarly gifted in systematising as the French have always been, and who, with whatever shortcomings from restricted and narrow sympathies, have at least the credit, more than any other nation, of seeing clearly what they want to do, and devising deliberate and well-considered means to that end. As to *la France* need we say that she is tolerably safe, in the eyes of our critic? In painting she has names which "certainly will yield to none in the estimation of posterity," and we will leave posterity to decide the point accordingly, not without suspicion that the verdict may be as M. d'Henriet thinks. In sculpture "nous tenons sûrement le premier rang," a happy confidence which we allude to in order to supplement an observation occurring immediately afterwards. The writer is surprised that certain critics wish to place the contemporary school of Italian sculpture by the side of that of France. The latter is mannered, wanting in grandeur, &c., though M. d'Henriet admits its exceeding "cleverness" (*habileté*); "mais est-ce surtout de l'habilité qu'on demande à la statuaire?" Most assuredly not; and we can only regret that the popular admiration lavished on such productions as Monti's "Sleep of Sorrow" should have tempted any of our own

artists to try the same *tours de force*, as, for instance, in the figure of "Salrina," in this year's Academy, a subject fit only for painting or very low relief.

M. d'Henriet cannot conceal, however, that the "monopoly of art is no longer with his nation." Stranger artists come to France nowadays already formed, and merely to consult her traditions and perfect themselves in practical details. This, however, only proves that the general level of art education is rising, and M. d'Henriet and his colleagues will never have the bad grace to feel hurt at this. Their superiority, if more disputed, will not be less glorious than before. "Ce que nous devons désirer, c'est non pas de nous enorgueillir d'une supériorité solitaire, mais plutôt nous montrer les premiers parmi nos pairs. C'est la formule de l'émulation moderne." And with this magnanimous and consoling sentiment we will close our remarks, before we feel tempted to spoil its effect by any poor words of our own.

SCIENCE AND ART.

TEACHING UNDER GOVERNMENT.

THE march and movement of scientific and artistic education throughout the United Kingdom is indicated by the annual reports of the Science and Art Department of the Committee of Council on Education. Of these the sixteenth has just been issued, under the signature of Lord De Grey and Ripon, and Mr. W. E. Forster, and a copious appendix enables the reader to check the accuracy of the inferences which their lordships have drawn from the reports of their various subordinates.

The results of the efforts to promote education of a technical nature may be viewed under two aspects—the absolute and the relative. As far as the first is concerned, we have no great cause to feel content with our position among educating nations. The total number of pupils included in "every institution in which scientific instruction is given" (of course, the expression must be held to be limited to those educational establishments which come under the purview of the official examiners), is stated at 15,010 for the year 1868. The grand total of persons taught drawing through the agency of the Department, during the same year, was 117,000. Now if these numbers be regarded as proportioned to the population of the United Kingdom, the advantage hitherto derived from the labours of the "Department," can only be called microscopic.

The population of the Canton of Zurich is about 260,000. In the year 1864, 25,797 scholars, between the ages of seven and thirteen, attended the communal day-schools. Every one of these scholars is instructed in drawing, and in the elements of natural philosophy and of geometry as well as in the mother tongue, arithmetic, history, geography, hand-writing, gymnastics, and singing. The contrast thus presented to our own country is striking. On the other hand, our science students have increased since 1860 no less than thirtyfold, 500 pupils only, in nine schools, having been under instruction in that year. In 1867 the number was 10,230, which has been subsequently increased by 50 per cent. The number of persons taught drawing in 1867 was 105,529, giving an increase of about 11½ per cent. for the year now under consideration. The expenditure of the Department, exclusive of the vote for the Geological survey, was 198,701l. 5s. 11d. in 1868, against 179,954l. 6s. 1d. in 1867.

When we descend from the general statements of the Report to the details sent in by the professional examiners and printed in the appendix, we become more and more impressed with the conviction that the very bases of a satisfactory system of technical education have yet to be laid. Mr. Bradley, in reporting on examinations in practical plane and solid geometry, machine drawing, and building construction, complains that "the pupils in the various schools have apparently only been set to copy diagrams, without having the principles of building construction explained to them," and that, "as on previous occasions, the candidates have shown a reckless disregard of the general instructions placed on the paper." "The relation of plan, elevation, or co-ordinate projection is not explained properly to the pupils. They often place the plan and elevation in different parts of their paper, and often to different scales, and will select the plan of one subject, the elevation of another, and the section of a

third, in the most arbitrary and absurd manner, and do not appear to be aware of the futility of such proceeding."

In naval architecture, Mr. W. B. Baskcomb, the examiner, remarks on the rough character of the sketches, which ought to have been drawn neatly to scale, and on the attempts made to answer questions without the indispensable aid of diagrams; and remarks, that "the teachers, therefore, would do well to enjoin upon their pupils neatness and accuracy in drawing." Of what use are teachers who require this advice?

The examiner in elementary mathematics and theoretical mechanics, Mr. B. M. Cowie, complains that "young men are sent into examination who ought not to be allowed to try. Their knowledge is so small that they merely give trouble with no corresponding advantage to themselves." "Some candidates do not seem to understand that when a proposition is stated it is to be proved, not assumed." Mr. Cowie remarks on these defects as indicative of defective teaching.

In applied mechanics, Mr. Anderson observes that the general result of the last examination can barely be considered satisfactory; and that, from remarks made in several of the papers, it would appear that many of the students were scarcely prepared for the questions that were put to them. In geology, Mr. Ramsay remarks that a considerable number of the pupils do not know the meaning of the words *genus* and *species*. In physical geography, Professor Ansted says, "I have been obliged to reject nearly one-third of the candidates;" and gives evidence "proving that the teaching has been confined to mere cram." "It would not be difficult to point out special cases where the teaching has been exceedingly bad."

In animal physiology and zoology, Professor Huxley, after some dry remarks on the spelling and grammar of the candidates, says, that many of them exhibit obvious signs of having undergone the process of grinding instead of instruction, a defect arising from slovenly teaching. But we must take occasion to differ very widely from the view expressed by Prof. Huxley as to the proper outline of instruction in this department of science. He thinks it is "to be regretted that any attempt should be made to teach zoology to persons who have not already passed in physiology, and, at lowest, in the second class." If zoology is to be regarded merely in the light of an accomplishment, or of a subsidiary portion of the special study of the pure surgeon, or even of the physician, this view is very tenable. But we hold that the range and function of education in natural history, botany, as well as zoology, is far wider and more lofty. One of the greatest thinkers of modern times has pointed out an invariable double relation of all branches of human thought and study which can, since the distinction has been made evident, never be neglected with propriety. He has shown, and all experience of tuition confirms him, that formal knowledge invariably precedes physical knowledge. Thus formal astronomy had attained a high degree of comparative perfection long before Newton laid the bases of physical astronomy. The apparent movement of the heavenly bodies had been mastered and reduced to matter of calculation long before man raised the question of gravitation, or comprehended the laws of motion. In the same way the knowledge of the forms of life described by the zoologist must always far precede the knowledge of function and of organisation, which constitute the province of the physiologist. The intelligence of even the youngest children is to be stimulated, in the most natural and wholesome manner, by directing their attention to the common, but no less divinely taught, phenomena of animal life. The wisest of English men regarded natural history as a subject fit to form one of the very bases of general education, and the neglect of a course of instruction in natural history at once simple, intelligible, and based on truly philosophical principles, involves a great waste of the best facilities for tuition.

To suppose, then, that it is of more importance to be aware that the gastric juice is not alkaline, and that the diaphragm is not composed of cartilage, than to understand that man, endowed with the four limbs, and partially covered with with the hair, proper to those animals that suckle their young, forms a portion of one great constituent class of the vertebrate province of animal forms, is to our mind to invert the relative value of the knowledge of facts. The perfect zoologist must possess a sound acquaintance with the details, no less than with the theory, of physiology. How many admirable students and elegant describers of the

wonders of the animal kingdom have lived, and thought, and written, whose science was confined to that of form, and habit, and abode. Buffon, with all his drawbacks, is a better textbook for the earlier period of education, than Owen, with his sequepdalian terminology—a man of whom it seems impossible to write except in terms of the highest respect, and in words of the most unobtrusive sound. We shall much regret if Professor Huxley's view be allowed to influence the course of tuition, and thus infallibly to stifle the study of natural history throughout the country.

It will be observed that a perceptible difference is to be detected between the tone of the reports of the professional examiners and of the more permanent officers of the Department. To a certain extent such a difference is neither unnatural nor unjustifiable. In all cases in which difficulties have to be overcome it is necessary, in order to form a fair judgment of the degree of success which has been attained, to hear the accounts given by those who have actual experience of the struggle. Captain Donnelly's report is an endeavour to "correct several inaccurate impressions which appear to exist with regard to the action of the Department, some of which have found expression in the report of the committee of the House of Commons of last session on Scientific Instruction." It is well, however, to bear in mind that, while the abilities and devotion of the higher and more responsible officers of the Board may be deserving of the warmest commendation, the personnel on which they have had to work (as regards teachers no less than scholars), has often been of the rudest and most unprepared description; so that we may at the same moment deplore the actual state of things, and pay a just tribute to those who are endeavouring to ameliorate it; and to whom, in great measure, is due the improvement which has already taken place.

With regard to the Art-schools, we are not furnished with the same means of forming an unbiased opinion as to their condition and progress that is afforded with reference to instruction in science. The report of Mr. Bowler, the official inspector for art, is of the nature of an index or summary, not at all of a criticism or appreciation of results. The returns from the various schools give merely details of attendances, of expenditure, and of prizes obtained. It is much to be desired that, in future reports, all the officers should be directed to adopt an intelligible and exhaustive mode of enumeration. We have long and copious tables, which not only fail to give to the ordinary reader the information which might be readily supplied by the aid of this small additional trouble, but which can hardly be fully intelligible to the Committee of Council, in the absence of such distinct numbering. At all events, the labour of forming any distinct abstract idea of the import of the tables is considerably augmented by this want of precision. If the Report of Mr. Iselin, in which each institution inspected by him is clearly and distinctly numbered, be compared with the List of Science Schools in Appendix B, and with the whole of the series of tables and reports in Appendix C, the justice of the above remark will become very clearly apparent.

An admirable step has been taken with a view of imparting precision and tact to the examinations which are conducted simultaneously over the country under the superintendence of local committees, by means of papers prepared by the examiners of the Department. Many members of these committees are altogether without experience as to the duties of an examiner, and in the course of 1,150 examinations many mistakes and irregularities have consequently occurred. Great hardship is thus entailed on both teachers and pupils; and that the more so because the payments of the former depend on results. The late Government, therefore, arranged with the Commander-in-Chief that the services of a certain number of officers of the Royal Engineers, who were stationed in different parts of the country, should be rendered available by way of consulting and supervising the action of the local committees; and the experiment, the present Report states, has been perfectly successful. "At a comparatively small cost, and without interfering with their ordinary duties, these officers rendered much assistance to the local committees, and exercised a most wholesome supervision over a large proportion of the examinations."

The results of the munificent gift of Mr. Whitworth come for the first time into the province of the annual report of the Department. The original proposal made by that eminent manu-

facturer to found 30 scholarships of the annual value of 100*l.* each, dated 18th March, 1868, is to be found at page 7 of the Fifteenth Report of the Department, together with the acceptance by the Lords of the Committee, and the memorandum drawn up by Mr. Whitworth for the guidance of the competitors. The Sixteenth Report contains the text of a "deed of covenants and trusts for founding 60 exhibitions of 25*l.* each, and 30 scholarships of 100*l.* per annum each." This indenture is entered into between Joseph Whitworth and his Grace John Winston Spencer-Churchill, Duke of Marlborough, K.G., as Lord President of the Privy Council, and President of the Committee of Council on Education. It is followed by the regulations for the examination, in May, 1869, for any of Her Majesty's subjects under 26 years of age; by a statement of Mr. Whitworth's examination in the use of tools; and by a summary of the replies received from the towns and educational institutions to which the 60 exhibitions of 25*l.* each for the year 1868 were offered. With the exception of Chester College, which found "no eligible candidate," the offer is, in every instance, more or less gratefully accepted. We call attention more particularly to the examination in the use of tools, because it is the first example within our knowledge of an attempt to combine the precision of scholastic regulation with the traditional, practical, master-and-apprentice relation, of the craftsman and his teacher. Every candidate is required to perform one or more of certain clearly-specified pieces of work, with either the axe, the saw and plane, the hammer and chisel, the file, or the forge. Examples are, to square up (with the axe) a block of wood 1 ft. long and 6 in. diameter; to make a box 18 in. long by 9 in. wide, by 9 in. deep, planed on three, and the joints dovetailed together; to chip a piece of cast-iron 6 in. square over one of its surfaces ready for filing; to file up true a wrought-iron hexagonal $\frac{1}{2}$ in. nut; and to make the head of a hammer. The workman who reads this paper will not only at once understand it, but will also see that it has been written by a master.

With reference to the Royal School of Mines, Sir Roderick Murchison calls attention to the inadequacy of accommodation in the Metallurgical Laboratory, as well as in the Royal College of Chemistry, and to the report of Dr. Frankland as to the great advantages over this country, in that description of educational establishment, which, during the last thirty years, "have been possessed by Germany, France, Switzerland, and Belgium." The Prussian Government has recently expended more than 70,000*l.* in two magnificent chemical laboratories in Berlin and Bonn. The Government of Saxony has laid out 12,000*l.* in the building (exclusive of land or fittings) of a laboratory in Leipzig. The Federal Government of Switzerland has recently built a new chemical laboratory of instruction in Zurich at a cost of 20,000*l.* In our own college "the number of students working daily has been about 45, while the building does not possess sufficient accommodation for more than 20." The laboratory of the Royal School of Mines is "not adapted for more than nine or ten; as present 15 students are at work, and 12 have been refused admission."

Appendix D contains 113 pages on the subject of the South Kensington Museum. Appendix E gives the Annual Report of the Director-General of the Geological Survey, the Museum of Practical Geology, the Royal School of Mines, and the Mining Record Office, for the year 1868. The staff of the Survey has been augmented by 33 new surveyors, making a total of 57 persons. In England 2,152 square miles of country have been geologically surveyed. In Scotland 628½ square miles; in Ireland 1,033 square miles. Nearly 7,000 species of fossils have passed through the hands of the palæontologist. The visitors to the Museum of Practical Geology have numbered 49,132, against 43,402 in 1867. Index maps, showing the state both of the 1 in. and of the 6 in. surveys in England, Scotland, and Ireland, are conveniently appended to the report.

Professor Archer reports, in Appendix F, on the Condition and Progress of the Edinburgh Museum of Science and Art for 1868; which has been visited by 294,830 persons, being 20,739 more than in the previous year. The artisans' lectures, commenced in December, 1867, have been carried on with great success, and attended by 2,566 persons up to the end of the series of courses in March last.

Appendix G contains the report, by Sir Robert Kane, of the Royal College of Science for Ireland; and that of Dr. Sidney, the secretary. The council have arranged for the admission, under certain conditions, of female students to the lectures of the professors. The propriety of this step is evinced by the fact that a young lady took the first prize in the class of pure mathematics. The council rely, as the true test of the value of the college, not on the number of pupils who have gone through the curriculum, but on the practical success and tried efficiency of the students. Such a mode of challenging the verdict of the public demands a very hearty acquiescence. The programme of the educational arrangement for the session 1868-69 is included in the Report.

The Royal Dublin Society consisted, on the 31st of December, 1868, of 1,084 members. Lectures on musical and sensitive flames, on the diseases of cattle, and on painting, have been delivered on the invitation of the council, and the twelfth annual examination for general and commercial certificates of merit resulted in the granting of twenty-seven general certificates, and three commercial certificates, to thirty out of seventy-five persons who applied to be examined. The library has been open to the public on 283 week days, from eleven o'clock a.m. to six o'clock p.m., and on 228 evenings. The hotanic garden and museum have been maintained in good order. A large zoological collection from Utrecht, has been added to the natural history museum, besides other valuable additions of fossils, and of zoological, botanical, and mineralogical specimens. In addition to these educational steps, the society held during the year four exhibitions,—one in the spring, of breeding cattle and poultry, a show of horses at Midsummer, a show of breeding sheep in autumn, and a show of fat cattle, farm and dairy produce, and poultry, in winter.

The Royal Zoological Society of Ireland, the gardens of which have been visited by 127,000 persons during the year, and the Royal Hibernian Academy of Arts, with a modest expenditure of 467*l.*, close the list of annual reports. Appendix L gives "a statement of the expenditure of the several divisions of the Science and Art Department of the United Kingdom," from which we gather that the expenditure for the year ending 31st March, 1869, has been 155,012*l.* 12*s.* 6*d.*, and that the total national outlay on industrial education, from 1st April, 1853, to 31st March, 1869, has been 1,324,452*l.* 6*s.* 7½*d.*

THE CONTRACTION OR SHRINKING OF TIMBER.

In a "Cantor Lecture" on Applied Mechanics, delivered by Mr. John Anderson, C.E., at the Society of Arts, some information was given on the contraction of timber, which calls for transference to our pages:—

Notwithstanding the extent to which timber is used in the mechanical arts, it is singular that the natural law by which the contraction or shrinking of wood is governed is too much disregarded in practical operations. It is a subject which seems to have been entirely neglected by writers on the subject, for I am not aware of any book that explains the subject fully, and have only met with one individual (Mr. Wilson, of Patricroft), who has thoroughly studied it as a philosophical question, and reduced it into the every-day nattering practice of his own works. The wretched state of the floors, doors, and shutters in many of the London houses too plainly gives ample and complete evidence of our persistent disobedience of the law, more especially in this quarter, and the only hopeful consolation is that we do not go unpunished, as the penalty inflicted may in time lead to improvement.

An examination of the end section of any exogenous tree, such as the beech or oak, will show the general arrangement of its structure. It consists of a mass of longitudinal fibrous tubes arranged in irregular circles that are bound together by means of radial strings or sheaths, which have been variously named; they are the "silver grains" of the carpenter, or the "medullary rays" of the botanist, and are in reality the same as end wood, and have to be considered as such, just as much so as the longitudinal woody fibre, in order to understand its action. From this it will be seen that the lateral contraction or collapsing of the longitudinal porons or tabular part of the structure cannot take place without first crushing the medullary rays, hence the effect of the shrinking finds relief by splitting in

another direction, namely, in radial lines from the centre, parallel with the medullary rays, thereby enabling the tree to maintain its full diameter, as shown in fig. 1. If the entire



FIG. 1.

mass of tubular fibre composing the tree were to contract bodily, then the medullary rays would of necessity have to be crushed in the radial direction to enable it to take place, and the timber would thus be as much injured in proportion as would be the case in crushing the wood in the longitudinal direction. If such an oak or beech tree is cut into four quarters, by passing the saw twice through the centre at right angles, before the contracting and splitting have commenced, the lines *a, c, and c', b*, in fig. 2



FIG. 2.

would be of the same length, and at right angles to each other, or, in the technical language of the workshop, they would be square; but, after being stored in a dry place, say for a year, it would then be seen that a great change had taken place both in the form and in some of the dimensions; the lines *c, a, and c', b*, would be the same length as before, but it would have contracted from *a* to *b* very considerably, and the two lines *c, a,* and *c', b*, would not be at right angles to each other by the portion here shown in black in fig. 3. The medullary rays are thus

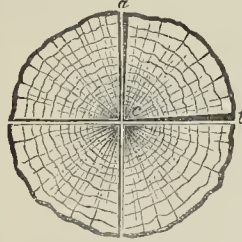


FIG. 3.

brought closer by the collapsing of the vertical fibre. But, supposing that six parallel saw-cutures passed through the tree so as to form it into seven planks, as shown in fig. 4, let us see



FIG. 4.

what would be the behaviour of the several planks. Take the centre plank first. After one

seasoning and contracting, it would then be found that the middle of the board would still retain the original thickness, from the resistance of the medullary rays, while it would be gradually reduced in thickness towards the edges for want of support, and the entire breadth of the plank would be the same as it was at first, for the foregoing reasons, and as shown in fig. 5.



FIG. 5.

Then, taking the planks at each side of the centre, by the same law their change and behaviour would be quite different; they would still retain their original thickness at the centre, but would be a little reduced on each edge throughout, but the side next to the heart of the tree would be palled round or partly cylindrical, while the outside would be the reverse, or hollow, and the plank would be considerably narrower throughout its entire length, more especially on the face of the hollow side, all due to the want of support. Selecting the next two planks, they would be found to have lost none of their thickness at the centre, and very little of their thickness at the edges, but very much of their breadth as planks, and would be curved round on the heart side and made hollow on the outside. Supposing some of these planks to be cut up into squares when in the green state, the shape that these squares would assume, after a period of seasoning, would entirely depend on the part of the tree to which they belonged: the greatest alteration would be parallel with the medullary rays. Thus, if the square was near the outside, the effect would be as shown in fig. 6, namely, to contract in the direction from *a* to *b*, and after a year or two it would be thin, as seen in fig. 7, the distance between *c* and *a* being nearly



FIG. 6.

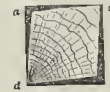


FIG. 7.

the same as they were before, but the other two are brought by the amount of their contraction closer together. By understanding this natural law, it is comparatively easy to know the future behaviour of a board or plank by carefully examining the end wood, in order to ascertain the part of the log from which it has been cut, as the angle of the ring growths and the medullary rays will show thus, as in fig. 8. If a plank has



FIG. 8.

this appearance it will evidently show to have been cut from the outside, and for many years it will gradually shrink all to the breadth, while the next plank, shown in fig. 9, clearly points



FIG. 9.

close to the centre or heart of the tree, where it will not shrink to the breadth but to a varying thickness, with the full dimensions in the middle, but tapering to the edges, and the planks on the right and left will give a mean, but with the centre sides curved round, and the outside still more hollow.

The foregoing remarks apply more especially to the stronger exogenous woods, such as beech, oak, and the stronger home firs. The softer woods, such as yellow pine, are governed by the same law, but in virtue of their softness another law comes into force, which to some degree affects their behaviour, as the contracting power of the tubular wood has sufficient strength to crush the softer medullary rays to some extent, and hence the primary law is so far modified.

But even with the softer woods, such as are commonly used in the construction of houses, if the law is carefully obeyed, the greater part of the shrinking, which we are all too familiar with, would be obviated, as the following anecdote will serve to show:—It was resolved to build four houses, all of the best class, but one of the four to be pre-eminently good, as the future residence of the proprietor. The timber was purchased for the entire lot, and the best portions were selected for house No. 1, but by one who did not know the law, and to make certain of success this portion of the wood had an extra twelve months' seasoning after it was cut up. The remainder of the wood was then handed over to a contractor for the other three houses, who had an intelligent young foreman, who knew the structure of wood, as well as how to obey the law, and who, therefore, had the wood for the three houses cut up in accordance therewith. The fourth house was built the following year by another man; but long before ten years had passed, and to the great surprise and annoyance of the proprietor, it was found that his extra good house, No. 1, had gone in the usual manner, while the other three houses were without a shrinkage from top to bottom. As Solomon says, "Wisdom is profitable to direct."

A similar want of correct knowledge of the natural figure and properties of the structure of wood, such as the oak, is constantly shown by the imperfect painting to resemble that wood, as exhibited on the doors and shutters of many of the houses of this metropolis. If we cannot afford to have genuine wainscot doors, as in France, but yet desire to have an imitation, it would surely be worth the trouble to have a block cut from the quarter of an oak tree, and to have each of its six sides planed and polished, in order to make plain their several features. The house-painter would then see what nature really is, and thus save us from the ridicule of other nations, when we mix up "silver grains" and all the other natural features upon one side of a board or panel.

NOTES DOWN EAST.

UPWARDS of two years ago, we drew attention to the bad and ruinous condition of many of the London steam wharfs. Our remarks led to the condemnation of some of them, and the reforming of others. One of the latest instances was the St. Katherine's Wharf, belonging to the General Steam Navigation Company. This wharf and its stores, after we had drawn notice to its unsafe state for shipping purposes, was at once shut up, on due investigation by the Government and harbour authorities; and at the cost of several thousands a new wharf and stores were erected, which wharf and stores were again opened for shipping traffic last autumn. The General Steam Navigation Company during the rebuilding were obliged to rent the use of the British and Foreign Wharf. The Irongate Wharf Company, whose stores were beside that of its neighbour, was snuffed in the interim to have reaped a good harvest of profit, to the other's loss, during its forced removal. Negotiations, however, were entered into by the General Steam Navigation Company with the landowners of the Irongate Wharf Company, which resulted in the purchase of the latter, over the heads of the present lessees, at the expiration of the lease, which takes place in about a year's time. The consequence is that the Irongate Wharf Company, whose term is unexpired, has come under an interdiction similar to the St. Katherine's Company, from the similar reason that its landing stage and stores are in the same unsafe state for traffic, as was its next-door neighbour before its condemnation.

A jealousy has sprung up between the companies, and Saturday, 7th, was the last day on which sailings were allowed to take place from the Irongate Wharf. The company of the latter removed on Monday their shipping traffic to the place known as Hour's Wharf, but now dubbed the "Hermitage Wharf," having already, in anticipation of their removal, purchased some property in connexion with it beside Hour's Wharf, for the rebuilding of their new concern. A temporary wooden landing-stage is here erected, and the foundations are being laid for the new Hermitage Wharf.

A litigation between the companies is not only likely, but certain to ensue. The Irongate Company accuse the General Steam Navigation Company of leading to the ruinous state of the wharf it is forced to leave, by the incautious method of piling adopted by the builder em-

ployed, which they ever led to the shaken condition of the stores and landing, now about changing hands. This charge is denied by the new purchasers, who aver that it is only a set-off made by the retiring company to escape the paying of damages, for not giving up the stores in the same condition in which they received them when they first occupied them. The General Steam Navigation Company, however, in view of their future possession, have thought it advisable to take steps for the better safety of the building and landing of their new purchase. So they have accordingly commenced sinking a row of piling some feet out in the bed of the river, with the intention of constructing a jetty in front, or in continuation of the present landing; thereby forming a bulwark or breastwork against the further spread of the present landing-stage or the certain dropping asunder of the stones. Apparently much of its ruinous condition is owing to proper care not having been taken in the construction of the new St. Katherine's Wharf. Had the landing-stage been brought out further into the bed of the river, the effects of the heavy pile driving would not have shaken the foundation of the landing-stage and stores of the Irongate Wharf.

The several wharfs along the river by Wapping are in anything but a good condition. They want a thorough overhauling, and we would advise an inspection of them at once by those whose duty it is to see after these matters. Without going down so far as Barking Creek, the Thames Conservancy would find on the beach of "Wapping Old Stairs," at low-water mark, a sufficient depth of indistinguishable "dirt-hed," to use a geological phrase, to afford those practical chemists and deodorisers work for a season to examine and pronounce upon.

In connexion with east-end matters, we may remark, the Thames Tunnel, which has ceased to be a footway, is fast assuming the appearance of the usual underground railway. The rails are laid on one side, and the other is in the course of laying. In the necessary cutting and levelling it has been discovered that the foundation of the tunnel and the structure altogether is a great deal stronger and more securely built than had been supposed, thereby evidencing the sagacity and skill of its engineer, Her Brunel.

The Tower Subway is being pushed on energetically. At the opening shafts, on Tower-hill, the engines are constantly at work in lifting excavated matter, and lowering materials of construction.

SHAM STONE WESLEYAN CHURCH IN NEW ZEALAND.

A LARGE church for the Wesleyans has been erected in Wellington, New Zealand, Mr. C. Tringham, architect. About 3,000, have been spent on it, with what little wisdom will be seen from the following flaming account written by one connected with the erection of it, and proud of what has been done:—

"I have enclosed to you a view of a new Wesleyan Church recently erected in this city, which I thought you would be glad to bring out in your paper, to show the progress of architecture in the colony. The building itself is universally acknowledged to be the finest church in any of the Australian colonies.

I will give you a brief account of it. The style is Gothic; the main building is 100 ft. long by 68 ft.; the sides and front have paneled buttresses; the tower and spire stand in the centre of the front, 90 ft. high and 16 ft. wide, with tracery windows in front, with stained glass. Round the spire are towers boarded frames, with tracery, and turret and finials. There is a highly-ornamental parapet running along the sides. The inside has a gallery all round, with handsome paneled work and columns, with arches beautifully carved, which give a very handsome effect to the interior. The pulpit stands on eight columns, and has beautifully carved panels all round. The cost of the pulpit will be nearly 2000. The whole of the building is erected in wood, and is sanded to imitate stone work. The building cost about 3,000. There are three handsome porches, with turret and finials, and carved work over each. The church will accommodate 1,600 people. The whole of the inside is varnished and painted, ceiling in centre only, which is a Gothic ellipse. The height of the main building is 43 ft. Mr. Corbett was the builder."

A more distressing example of "sham" could scarcely be quoted; and the *Wellington Independent* describes the church as "undoubtedly one of the finest in the colony." Years hence, when its architect and congregation have learnt to understand the absurdity of the structure, it will stand there with its sham buttresses and pinnacles, an object of ridicule, and, let us hope, a beacon to warn. Liability to earthquakes, and other circumstances, make wood the chief building material in Wellington, whether for public or private edifices, and we earnestly advise our friends in the colony to waste no more money in

trying to make wooden buildings look like stone. Let them use honestly the material they employ, and bring their skill and taste to bear upon it to produce an agreeable result. Wood is as susceptible of beauty as stone. We shall hope to hear from Wellington before long that a wooden church has been erected, looking like what it is,—well proportioned, elegantly shaped and fashioned, and showing here and there lovely pieces of carving that may serve to teach as well as delight.

THE HEALTH OF TOWNS.

At a recent meeting of the British Medical Association in Leeds, Sir William Jenner delivered an interesting address, in the course of which he referred to the important subject of the health of towns, and the effect of polluted water in propagating cholera and typhoid fever. He said:—"The proof seems complete that a large proportion of those who drink water containing a minute quantity of the intestinal excreta from a person suffering from cholera will suffer from cholera; and that a large proportion of those who drink water containing a minute quantity of the intestinal excreta from a person suffering from typhoid fever will suffer typhoid fever. Had the water supplied to the east of London been as free from organic impurity as was that supplied to the west of London, the death-rate from cholera at the east would have been a little larger only than was the death-rate at the west of London. The persons who died at these places from typhoid fever, and a large proportion of those who died at the east of London from cholera, were as certainly killed by the water they drank, and killed without need, as if the water supplied to them had been contaminated with arsenic; and I am sure we all agree with the most distinguished medical officer of the Privy Council, that "the distribution of fouled water by the Guildford Board is as proper a case for judge and jury on action for damages by any of the 500 people who had typhoid fever in that town, as any case in which a railway collision brings some score of passengers into harm; and the fact that these water purveyors gave typhoid fever to their customers would be brought home to their consciences, and be suggested as a warning to other water purveyors, in a far more conclusive and effective manner by such legal proceedings than it can by any departmental statistics and remonstrances."

The air of towns as well as their water has been receiving close attention. A report under Government authority has just been published by Dr. Angus Smith, on the operation of the Alkali Act of 1863, which contains some curious information. Dr. Smith tells us, "A great deal is now in our power which was before impossible." By examining rain we are enabled to discover what are the gases and substances which float in the air. When there is no rain it is possible to wash the air in bottles, and under this process to make it yield the foreign matters with which it is impregnated. Rain varies greatly in its character according to the source whence it proceeds, and the locality where it falls. Mr. Dancer has aided Dr. Smith with his microscopic skill, and has studied the character of the solid particles contained in the air of Manchester. Samples of the air were washed by Dr. Smith, and the fluid was afterwards examined by Dr. Dancer. A single drop of the water was computed to contain no less than a quarter of a million of fungoid spores. The fact was verified by examining an extremely small particle, and multiplying the result. The bottle of water having been kept for thirty-six hours, the quantity of fungi, already so great, "visibly increased," and on the third day minute creatures were observed moving about in the fluid. They found that 150 drops of water would contain more than 37,000,000 of the fungi, these 150 drops being the washings of 2,435 litres of the air of Manchester, which is about the quantity of air passing through the lungs of a man in ten hours! But this is by no means the whole of the story. The drops of water yielded a kind of dust which in the space of three or four days produced considerable numbers of animalcules, in which monads were most conspicuous. In this dust were particles of partially-burned wood, fragments of vegetation, filaments of cotton, and granules of starch. Spores and germs, acids, salts, and gases, dust and rubbish,—such is the air of cities! On the pages of this report there are sundry wood engravings representing the crystals obtained by

evaporating the rain-water of various towns. Here we see at a glance that Manchester is not as London, nor London as Newcastle. In colour and form the metropolitan crystals resemble nothing so much as the circular brush which forms part of a chimney-sweeping machine. The Manchester crystals look like a mixture of beads and broken glass, while Newcastle has much less variety in form.

The vaccination question has suddenly assumed gigantic and threatening proportions. It is evident that a very strong prejudice against vaccination, as at present practised, prevails throughout society; and fathers and mothers have displayed a determined resolution to defy the law of compulsory vaccination, and rather to suffer imprisonment, as well as fines, than allow their children to be vaccinated. They insist that the most hideous, heastly, and fatal diseases have been fastened upon their children by vaccinating matter; and even many who admit the utility of pure matter in diminishing the occurrence or the virulence of small-pox, still insist that the modern practice is so foul that other and still viler diseases are introduced. Without saying a word against vaccination, which has certainly been the means of saving the lives of thousands, we do think it is full time that an authorised inquiry should be made into the grounds of complaint against its present practice. We happen to have seen most violent, hideous, and difficultly-healed sores on young children, which were clearly contagious, and had been transferred to the mother, who had an invincible belief that they originated in foul vaccine matter. In one such case that we know of, the child ultimately died from such sores, but internal, and called "caruncle," and the mother did not get rid of the dreadful-looking sores on her feet for nearly twelve months, during all which time she was more or less disabled. In another case the child caught the sores at school from other children; and, strange to say, a grown person, who slept with this child, was also attacked, and in the feet too, with fearful sores!

The error, if it be so, of the idea that such cases have originated in foul vaccine matter cannot be too soon inquired into and confuted, else the law will be set at naught, and the unquestionable benefits derived from vaccination and inoculation be brought to an end by the prejudice of the public against the whole system. That it is but too possible that cattle diseases may be transferred with foul vaccinating matter to human beings, the very subtlety and wonderful multiplication of such matter render evident; and we know that human beings have been attacked by diseases of animals, such as glanders from horses, hydrophobia from dogs, &c. If Jennerism has degenerated, the sooner its foul practices can be arrested, and new rules established, the better; and if not, the sooner the public is convinced of its errand prejudice by an impartial and searching public inquiry the better. The researches of Dr. Blanc are said to show that a system of animal vaccination might be introduced which would at once afford the necessary protection, and remove the objections at present entertained by many persons to the use of humanised lymph. The public, which is so deeply interested in the matter, will wait anxiously the decision of the medical department of the Privy Council on this vitally important subject.

WELSH ARCHÆOLOGY.

At the opening meeting of the Cambrian Archaeological Association's congress, held on the 9th, at Bridgend, in Glamorganshire,

Lord Dunraven, as president, made a very interesting address, in the course of which he pointed out that the neighbourhood contained an unusual variety of objects of archaeological interest, extending in date through a great range of time, and of varied character. They may be said to commence, he remarked, if we include the excursion to Gower, under Mr. H. Vivian's auspices, with the annual and barrows of prehistoric times. Then we have the British or Celtic fortifications, such as that still remaining at Dunraven and other places along the coast; next comes a class of monuments which, I regret to say, are but scantily appreciated here, namely, the ancient Christian inscribed stones and crosses. This expression will not be deemed too strong when I remind you that they are, for their number and for the length of their inscriptions, unequalled in any portion of the kingdom where crosses of a similar date exist. Certainly, as Dr. Petrie

pointed out at Cardiff, there is no such collection within a few miles of each other in Ireland as is to be found in the group comprising Llantwit, Coychurch, Llangan, Merbyr Mawr, and Margam. At the last-mentioned place no less than eight are to be seen now erected within a few yards of each other; and yet little or nothing has been done towards identifying the persons they commemorate, with the different ecclesiastical establishments which must have once existed in this neighbourhood, and with which they were obviously connected. Passing to a later period, you will see some interesting churches containing characteristic local features, including among them the very peculiar church of Llantwit, and the remarkable semi-fortified abbey of Ewenny. Of abbeys of the first rank we have the ruins of Margam, with its beautiful chapter-house, and within our reach is the finest of Welsh cathedrals, so lately restored by the zeal and munificence of the inhabitants of this county. Of castles you will see a variety, ranging in date from the simple Norman keep of Ogmores to the latest portions of St. Donata. This most interesting castle, now happily saved from becoming a mere ruin, so beautifully situated on the shore of the Bristol Channel, with its ancient church and elegant cross, would alone repay the archaeologist many miles of travel to see. In addition, you will visit one of the grandest mediæval fortresses in the kingdom, Caerbylly, exhibiting even in its decay the most instructive example of military skill and of feudal power. In our excursions will also be included several examples of the domestic architecture of our ancestors, dating from the fifteenth to the seventeenth century. From this enumeration you will see the justice of a previous remark, that few places in the Principality afford so great a variety of objects to be visited, extending over so vast a range of time in the dates of their erection, and including among them several of peculiar interest and of considerable importance. Having touched upon what has been effected in the archaeology of Wales since the commencement of our association in 1846, may I be permitted to point out very briefly how much still remains to be done? First, for this country, a complete description, with accurate views and measurements of our cromlechs, and an examination of the ground within them, is still a desideratum. Our Roman roads and stations have not been thoroughly explored and mapped down; we have no accurate descriptions with measurements of the various earthworks which exist, particularly along the coast. When properly examined they will probably be found to be divisible into more than one class, and to belong to more than one age. It appears that the Rev. H. H. Knight read a paper at the Monmouth meeting, in which he advocated the idea that the coast forts or earthworks were erected by the Danes. This paper, unfortunately, was never published, and I am unacquainted with the arguments by which his theory is supported. One of the most interesting features in the archaeology of this country is the number of the inscribed Christian stones to which I have already alluded. This class of monument has been entirely neglected by our local antiquaries. May we venture to hope that the owner of the most remarkable group—that which stands upon the ruined walls of his noble chapter-house of Margam, a building which appears almost modern by the side of those venerable monuments of a ruder age, and a more primitive state of art—would give to the world accurate drawings or photographs and measurements of them; and, what would be better still, would include all the similar Christian inscribed stones of the neighbourhood, forming as they do the most important collection of the monuments of the pre-Norman Church to be found in England and Wales. Researches should be diligently made among the ancient Welsh ecclesiastical records such as the book of Llandaff and others, in order to try and identify the names which appear upon their inscriptions, so as to obtain a better clue than we at present possess of the date of their erection. By these means the foundations would be laid for obtaining some definite knowledge on the rise and progress of industrial art in this country before the Norman Conquest. This very interesting branch of archaeology is being admirably worked out for Ireland by one of the highest authorities on the subject of the accomplished author's labours, in tracing the progress of Irish monumental ecclesiastical art, may, by her kind consent, be laid before you, for the purpose of comparison, during the present meeting. Not one

half of our Mediæval castles have as yet been described, and scarcely anything has been done towards illustrating the manners, houses, and other examples of domestic architecture, so many of which are to be found in this country. To any one conversant with the early ecclesiastical architecture of Ireland, it appears curious that so few remains of the Welsh Church, prior to the eleventh century, have been as yet noticed; while, on the other side of the Channel, hundreds of churches remain, some tolerably perfect, many of them erected centuries before that date. It is not probable that any portion of these primitive churches exists in this country; but on the islands along the coast of Pembrokeshire, or in the most out-of-the-way portions of some of the western counties, small, early oratories, analogous to those on the western coast of Ireland, may be discovered. It must be very interesting to see whether any difference in the place or size of the building, or their mode of construction, is observable; whether there may be the same sort of difference in the primitive churches as exists in those crosses and monumental stones between those of Ireland, Scotland, Wales, Cornwall, and the Isle of Man. Lord Dunraven rightly urged the importance of forming a museum for Wales, that the national antiquities might find a suitable depository. There was a fine one in Dublin, another in Edinburgh, and the British Museum had made a good start in the same direction. He really thought Wales should start and get up one that would be worthy of the country.

The president, in the first part of his address, bore strong testimony to the merits, as an antiquary, of Mr. G. T. Clark (of Down), to whom the readers of the *Builder* have been often indebted for papers descriptive of our ancient Castles.

TECHNICAL EDUCATION IN THE BUILDING TRADES.

Sir,—In most Continental states the employers and their workmen are willing to improve their education, and are not asking what advantage it would be to them to attain a scientific knowledge of their trade. From what I read of their educational work they are not afraid of learning too much, as they know the benefits to them will be in proportion to their advance in scientific knowledge. A paragraph appeared recently, stating what has been done, and what is doing, in Wurtemberg, since the first French Exhibition. It appears the examination of various articles exhibited showed them their deficiencies, and they set on foot work to remedy them. Since then the scholars in the primary schools have been taught the elements of industrial science, and being thus early initiated into the fact that a thorough acquaintance with whatever they are engaged in is necessary to their well-being, they through life never lose sight of that fact, and are always ready to do their best to promote and develop industrial science and progress, and their employers are foremost in the good work.

What is doing in Wurtemberg is but a counterpart of what is taking place in every German state. I was somewhat surprised at the letter of "A Journeyman Joiner" on this question; and, as he put some questions, perhaps it would not be amiss to give a little information on the different points in his letter.

Technical education, as I understand it, means a thorough knowledge of all the principles connected with the trade; or, in other words, the highest science applied to the trade at which a mechanic works. For instance, the practical engineer ought to understand "the nature and application of mechanical forces." He should also be able to point out the various parts of the machines he works on; their action as well as the principles of their construction. The journeyman joiner, to be a thorough workman, should understand practical geometry, and yet how few there are who can draw an ellipse, bisect a circle, or give a definition of an angle. Although every man cannot be an employer or a foreman, he can and ought to be an expert workman, and take a pride in the craft to which he belongs. I am aware there are many joiners who can only undertake the commonest work, and yet get as much pay as the better workman. It appears to me that if it is no reason those who are able to see the others' failings should try to imitate or keep on a level with them. Sometimes it happens they are required to undertake higher work. It is then found they are out of place, and, after much roaming about, they find

out a nearer route than going straight, and a discharge is the result. I believed that when a man had a good knowledge of his trade it was less irksome to him than the same work was to the man who had neglected his opportunities, and who had to be continually spurred on by the foreman, whether pushing or otherwise. The technically-educated workman, if not better paid, has many advantages over the ignorant or inferior workman, as he can work with more ease to himself; his scientific knowledge enables him to take the nearest and quickest method; and while the other is puzzling his brain and thinking how he is to do it, the first has completed his, and, of course, under such circumstances as the second labours under, the less thinking in the shop the better it is for the employer's interests.

It is too true that masters have not as yet done much to improve the condition of their workmen. But I do not believe there is one employer who thinks ignorant workmen are best. But, supposing employers desire their "men should be machine-like," they, of course, would like them to be perfect machines. An imperfect machine is only half as profitable as a perfect one, and a great deal more trouble; and so it is with workmen,—the ill-educated one is always more trouble than the able workman. He, as a rule, is shifty, and requires a pushing foreman to keep him in anything like order; while the more perfect man, like a well-developed machine, goes about his work in an orderly manner. He requires but little looking after; he knows his duties, and can be trusted by the foreman. When a piece of work is given to him, it is done in a perfect manner, and without waste of time. It is the want of education that causes disagreement; and when the workmen are educated so as to be able to be foremen, it will be for the benefit of all concerned, and they will then work harmoniously together.

JACK PLANE.

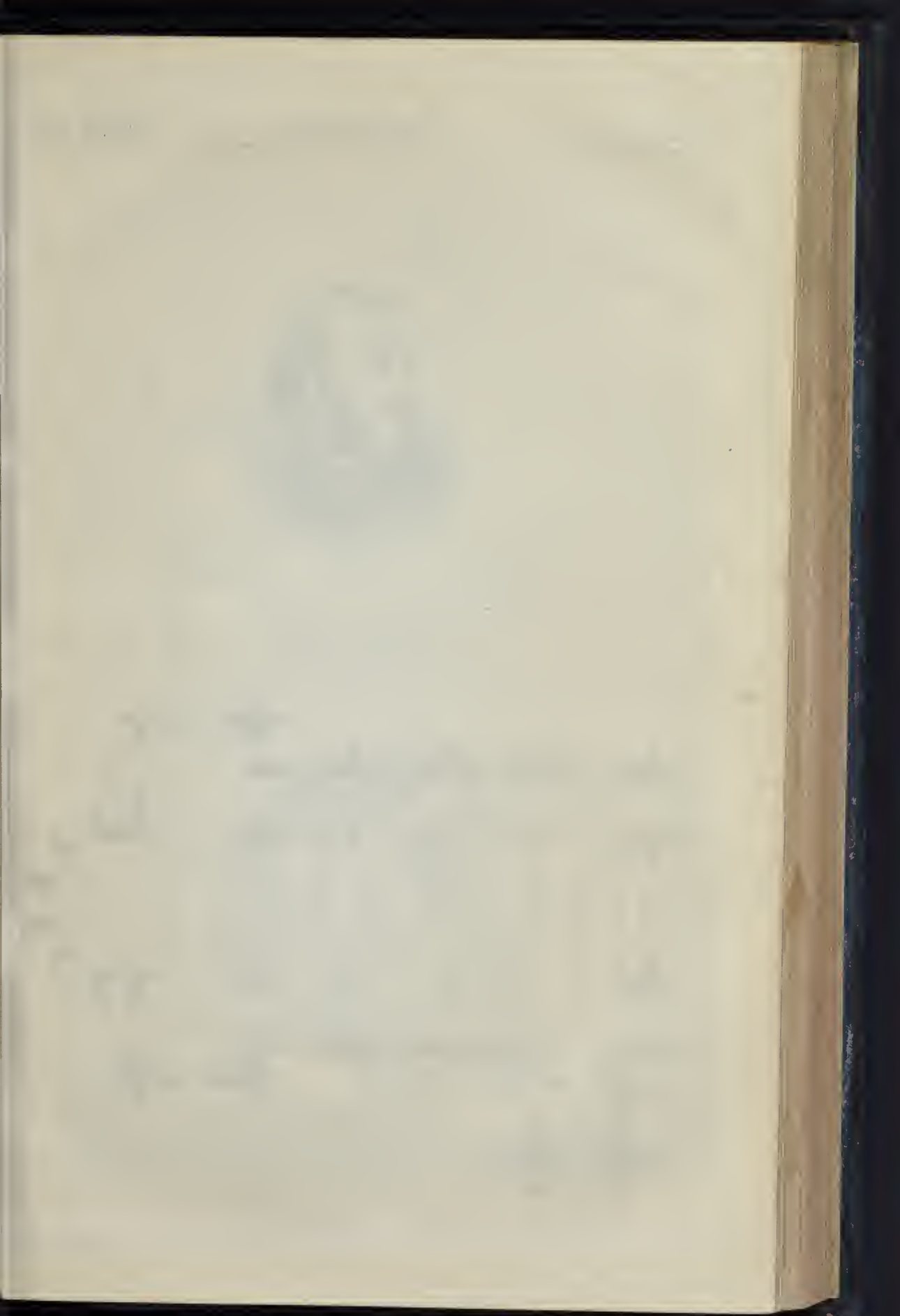
ALL SAINTS' CHURCH, DRESDEN.

This church, which has been built for the use of the English residents at Dresden, is erected in memory of Mr. W. H. Goschen, by his widow.

The church has a chancel, with polygonal apse, 35 ft. long by 21 ft. 3 in. wide, with gabled transepts. The nave is 64 ft. by 22 ft. 3 in., with a clearstory; the height of the nave to the apex of the roof is 52 ft. 6 in. There are north and south aisles the whole length of the nave, which have lean-to roofs, and are divided from the nave by arcades of four arches, which rise 19 ft. from the floor; the chancel arch is 32 ft. high. The entrance is on the south side, under the eave, forming a porch 9 ft. square. The tower is buttressed, and rises to a height of 58 ft.; the spire has angle pinnacles, which are panelled and crocketed, and rises 85 ft., making the steeple in all 143 ft. high. The roof timbers are all framed in fir, and will be open. The walls are built of sandstone of the locality; the window tracery and other dressed stonework are executed with finer stone from the same quarries. The walls are of dressed stone within as well as on the outer face. The chancel is correctly fitted with oak stalls; the floor has a rise of seven steps to the altar-table. The organ, by Walker, of London, is in the north transept, immediately behind the choir. The nave and aisles are partially seated, and it is calculated that there will be accommodation for 400. The west window, of five lights (the gift of Mrs. Goschen), as well as all the aisle windows and the five apse windows, will be filled with painted glass, by Hardman. Mr. Preedy, of London, has been commissioned to paint the windows for the south transept. Eventually, it is hoped that every window in the church will be filled with painted glass. There will be a sculptured retable of the Crucifixion by Birnie Philips; the architectural carving of the nave, pier-caps, and other capitals and string courses is by Earp; the encaustic tiles for the floors are by Maw & Co. The painted windows, retables, organ, carving, tile floors, and pavements, are the gifts of members of Mrs. Goschen's family and the English residents at Dresden.

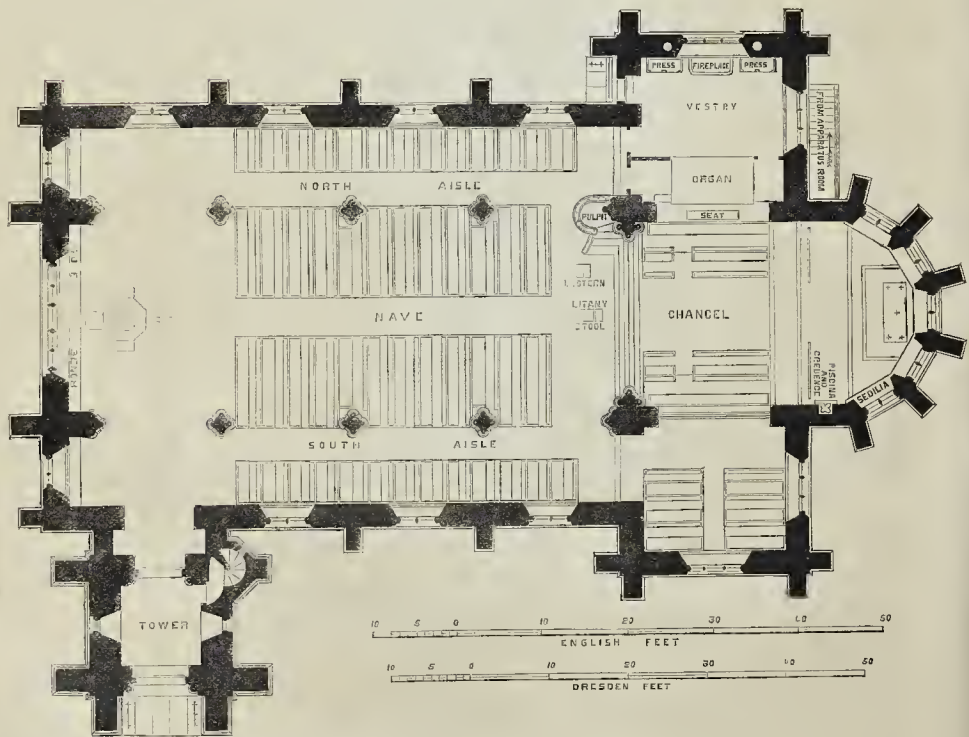
The church is heated with hot air, by Kolling, of Dresden. The works have been executed from the designs of Mr. J. P. St. Aubyn, of London; Herr Pieper, architect, of Dresden, superintending the erection.

The cost will amount to about 6,000*l.*, and it is hoped that the church will be consecrated during the present year.

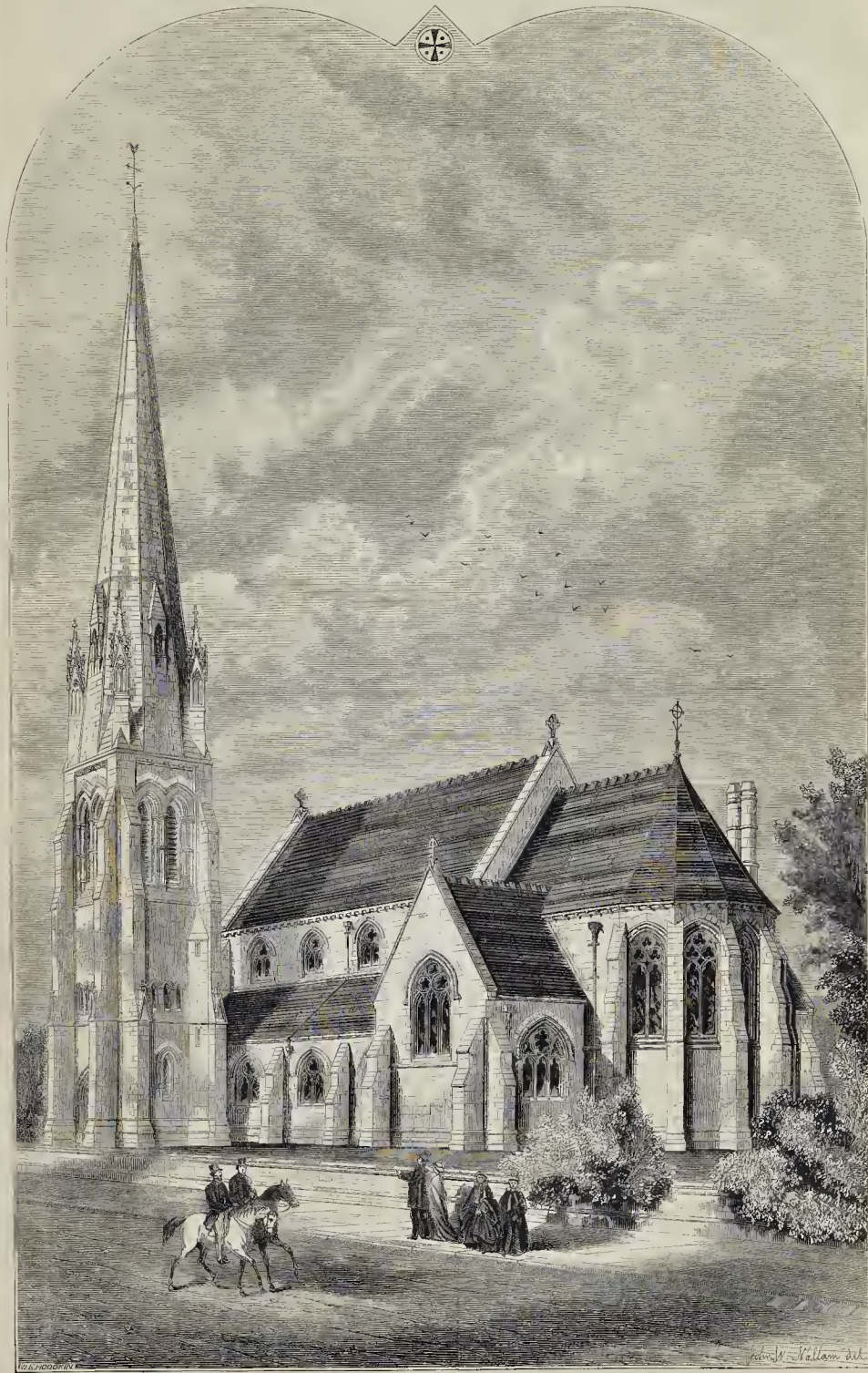




MR. EDWARD M. BARRY, R.A.
Architect at the Houses of Parliament.



ALL SAINTS' CHURCH, DRESDEN.
Plan.



ALL SAINTS' CHURCH, DRESDEN.—Mr. JAMES P. ST. AUBYN, ARCHITECT.

EXCURSIONS OF ARCHÆOLOGICAL AND ARCHITECTURAL SOCIETIES.

The Bells Archæological and Architectural Society.—The members of this society made their annual excursion this year to Sharnbrook, Odell, Harrod, Fardish, Hinwick, Podington, and Wymington. Odell church was first visited, then Odell Castle. At Hinwick House the party were entertained by Mr. R. E. Orlebar. At Podington Church, the Rev. J. Geldart, the vicar, directed attention to the features of the edifice; as did the Rev. W. Monk, the rector, at Wymington Church. The party then returned to Sharnbrook.

Surrey Archæological Society.—The annual excursion of this society took place on Wednesday in last week. The weather was extremely pleasant for travelling, with the exception of one or two heavy showers, and the country through which the excursionists took their way was beautiful. A special train left Guildford station at 11.30 a.m., and landed the visitors at Witley a quarter of an hour afterwards. The party was at once driven off to Witley Church, having a glimpse on their way of the King Edward Schools at Witley. They next proceeded to Chiddingfold, where the church and the Crown Inn were visited. Mr. Heales, F.S.A., delivered an address on the church; and the rector, the Rev. L. M. Humbert, read a paper on "Chiddingfold: its Registers, and its Rectors." A number of the excursionists accompanied Mr. Baily to the Crown Inn, an old manorial house of the fifteenth century, of which he gave a description. A luncheon was provided by Mr. Skinner, of the White Horse Hotel, Haslemere, in a large marquee. Mr. R. A. C. Godwin-Austen occupied the chair.

Mr. Butterworth, F.S.A., proposed the health of the hon. secretary, Mr. E. Vaughan Austin. He said the council, feeling that Mr. Austin had done so much for the society, and rendered it so many valuable services, had made up their minds to present for his acceptance a Mazer Bowl; and the members, hearing of this, insisted upon putting something into it. The bowl and fifty guineas were therefore presented to Mr. Austin. Shortly afterwards the party passed on their way to Dunsfold. At Burgate there was a pull-up to admire some famous chestnut trees of immense size, size, and beauty, and the old manorial house occupied by Mr. Chitty. A paper on Dunsfold Church was read by Mr. Baily. A special train took the party from Godalming to Guildford, all satisfied with their day's outing.

DRAINAGE.

Oxford.—The Thames Conservators have conceived a letter to be sent to the Oxford local Board of Health asking whether any, and if any, what steps have been taken by them to direct the flow of sewage from the Thames. The letter has been referred to the drainage committee of the board, while acknowledging receipt of the letter and referring to an application for extension of time for discontinuing the flow of the sewage, as well as informing the Thames Conservancy Board of the general proceedings of the Drainage Committee.

Leamington.—The local Chronicle states that the local board are on the eve of disposing of the town sewage to a neighbouring landowner, the Earl of Warwick, at what is regarded as an estimated loss of 30,000L, the terms of an agreement having been arranged by which his lordship undertakes to pay the board 450L per annum for thirty years, in consideration of their supplying, at their own cost, the sewage of the town to a farm belonging to his lordship, about two miles from Leamington. It is calculated that under this arrangement the loss to the town during the period mentioned will be as above stated, and that without including the large additional cost to the board of providing a separate system of drainage for the rainfall, without which economy and efficiency of working in the irrigation system cannot be secured. The local paper remarks on the fact that the local board are accepting this certain heavy loss as an inevitable condition of the settlement of the question, notwithstanding the profitable results which are said to have attended recent experience in irrigation, and in direct contravention of the last report (1865) of the Government Commissioners, who declared that "towns may derive a profit more or less considerable by the employment of their sewage in agriculture."

Windsor and Eton.—The official report of Messrs. Ripley & Simonds, the engineers who

have made the survey under the direction of the local Board of Health, has been printed. The engineers commence by showing the existing means of drainage. The whole of the sewage and rainfall is at present thrown into the Thames, but the Thames Conservators now require that it shall be otherwise disposed of. The towns in the Thames valley have therefore been diligently inquiring as to the best means of getting rid of their sewage. Eton has adopted the "separate system" advocated by Mr. Menzies, and is proceeding to carry it into effect at once, under the superintendence of the reporting engineers. The Board of Health at Windsor have now the same method recommended to them in the report. The report recommends that the present sewers should be retained for receiving the sewage proper, and that separate drains should be constructed to carry off the rainfall into the river. The cost of this latter is estimated at 4,200L. Then as to disposal of the sewage, which is calculated at 600,000 gallons daily; it is proposed to purchase a farm in the parish of Stanwell, lying between Horton and Staines, and on this to utilize the sewage matter. The farm, known as Moor Farm, consists of 12½ acres, which is said to be sufficient to receive the whole of the sewage from the present population of the borough. Its disadvantage is its distance (2½ miles) from the pumping station. This pumping station is proposed to be near the Old Windsor Lock. Here tanks would be constructed, to hold 150,000 gallons each, for filtering the sewage. The pumping is proposed to be done by a turbine wheel, with the overflow from the locks, provided the consent of the Conservators of the Thames can be obtained. The main through which the sewage is to be pumped will be 10 in. in diameter, and in the course of 2½ miles will have to cross the Thames twice, the River Colne once, and the South-Western Railway once. To carry the sewage to the pumping-station from the point where it is now discharged, will involve an expense of 4,500L. The alteration and reconstruction of the drainage is therefore estimated to cost 9,000L; the pumping-station, machinery, sewage main, and preparation of land, 9,200L; contingencies, plans, and supervision, 3,000L. Besides this, compensation will have to be paid to owners and occupiers of land; average estimate of the whole 33,000L, besides the annual cost of maintenance and wages to be paid. Against this must be placed the annual product of the sewage farm.

Doncaster.—The Town Council, anxious that the drainage of the borough should be improved, entered into contracts with Messrs. S. Pearson & Son, of Bradford, at the sum of 3,225L for the construction of entire new sewers. The works are in a forward state of progress. Mr. B. S. Brundell is the engineer. The outlet, instead of being below the wheel, as from time immemorial, is at Docken-hill, near the Gas Works. By this means the river Cheswold is free from all impurities, and the vicarage will not suffer from the sewage.

RAILWAY MATTERS.

Signalling.—A Hungarian paper, the *Hermannstädter Zeitung*, mentions a new system of railway signalling, invented by Herr Ednard Krejcsy, the special advantages of which are said to be the following:—1. A train, without slackening its speed, can communicate with any other train or station on the same track. 2. In case of accident the train itself can signal for assistance, and make the casualty known along the whole line. 3. A concussion is impossible, as two trains in motion can constantly exchange signals. 4. The working of the new system is very cheap. Herr Krejcsy has placed his invention in the hands of the Hungarian Government, with the stipulation that in case of its being sold he is to receive one-half of the purchase-money and the State the other. We recollect of an English invention of this kind many years since, in which the iron rails and electricity in the trains were concerned.

Whistling.—We are glad to observe that the intolerable nuisance of railway whistling, or screeching, to which we have repeatedly adverted, is now receiving more attention than heretofore. Mr. Justice Hannen, the other day, at the Camberland Assizes, complained that he not only could not do his duty by day, on account of the unnecessary screeching of locomotives, but that he could get no sleep by night by reason of the same nuisance; and Dean Close reiterates a frequent complaint

of his that divine service is interrupted, and that his sleep is also murdered by it. In truth, it is evident that railway directors just allow their stokers and engine-drivers to "use their own discretion,"—or, rather, their own want of discretion,—in this matter; because some of these employes habitually use the screech ten times more than others; and if the lesser amount of screeching be a sufficient quantity, then the greater must be outrageously excessive; and if the lesser had been insufficient, no doubt the amount would have soon been increased. Some idiots evidently make a hideous plaything of it, and strenuously and habitually try to initiate the crowing of cocks and braying of donkeys with their engine-whistles. We notice an excellent "Plea for Sleep" in the *Times*, in which all sorts of minor nuisances are brought under review, but, strange to say, no mention is made of this monster nuisance. Were some mere costermonger to cause a tenth part of the noise, even by day, he would soon be put down. It is to be earnestly hoped that when the District line past Westminster is fairly open, the ears of Parliament will be well dimmed. We shall then have some chance of shutting the whistle-mouths of railway directors. Their selfish disregard of the public comfort is abominable.

NETLEY HOSPITAL.

EARLY readers of the *Builder* who remember our strenuous and repeated warnings against the plan adopted for the costly hospital at Netley,—warnings given before the building was erected, and when alteration could have been made at little cost,—will not be surprised to hear what was stated as to this building at the recent Medical Congress.

Dr. Ramsey said he rose to give a little more in detail a fact to which Sir James Simpson had alluded. Two or three months ago he went over the magnificent hospital at Netley, and was at once struck with its grand defect,—namely, that all the wards were erected parallel, and that there was no possibility of thorough ventilation. As showing the defect of the corridor, he was told—he believed by Professor Longmore—that in the case of a putrid effluvia at one end of the corridor, the first announcement that the horrible smell was felt in the hospital was made at the other end of the corridor, a third of a mile distant, showing that the putrid air had been carried by the corridor that distance. He thought a stronger condemnation of the corridor walls, and of the parallel construction to which the corridor gave access, could not be brought forward. It was a most important element in the construction of pavilion hospitals that the pavilions, instead of being parallel, should diverge, as was the case at Swansea.

Dr. A. P. Stewart said that, owing to the high winds which frequently prevailed at Netley, anything like proper ventilation had been found to be impossible. He had been repeatedly over the hospital, and had been assured by the attendant that it was a matter of difficulty to keep the wards in anything like a healthy state.

We received but little support from any of the medical profession when we pointed out the defects in the planning of this hospital,—a considerable amount of abuse from some. Time brings its revenges.

PROGRESS AT ROYAL LEAMINGTON SPA.

It is rather remarkable with what rapidity some of our most beautiful resorts have been developed. Saltern-by-the-Sea has, since the year 1861, increased from a poor fishing village to a fashionable watering-place, so extensive that it now possesses two very large hotels, one of which, the Zetland, contains 120 rooms. As with Saltern so, in a great measure, has it been with Royal Leamington Spa. The great extensions which have been made in the town within the past 30 or 40 years are remarkable. While in its primal state it consisted of 45 mud huts. Now the handiwork of the builder and architect stands out on every hand. Its suburban residences, terraces, and spacious streets, were, including Milverton and Lillington, at the last census occupied by 19,277 persons, whilst at the present time, in the season, no fewer than from 24,000 to 25,000 persons find a home in a town which has been designated "a home for the homeless all the year round." But this great improvement, and this great influx of population,

cannot have taken place without producing corresponding results which the building trade has in no insignificant way contributed to. On every hand spacious houses have risen, and are still being built. The Assembly Rooms, which were erected in 1813, cost 13,000*l*. The Regent Hotel, which is a large building, and with no external embellishments, was built in 1819, at a cost of about 80,000*l*. Its ecclesiastical buildings and chapels are numerous, but, with the exception of the parish church, they are by no means distinguished by architectural skill. There are, however, amongst the many erections which are going on, several important works which, when properly developed, will add to the reputation of the town. Amongst others, may be noticed the additions which are being made to the parish church by Mr. Marriott, of Coventry, and which have been in the course of construction for some time.

Mr. Gascoyne, of Leamington, builder, is at present engaged in the erection of a new central post-office not far from the present building which does duty for the country. In the well-known Jephson Gardens, where stands the statue to the gentleman from whom they take their name, the work of Hollins, of Birmingham (in a temple), a memento to the late Mr. John Hitchman, who suggested the idea of planting the road-sides with trees, is now being erected near to the entrance to the gardens fronting the Parade. Workmen are also busy in the erection of a large mansion and a Roman Catholic chapel in Newbold Walk, which are being erected by Mr. Gascoyne for Major Seale, and it is said will cost 20,000*l*. New Dissenting chapels have just been added to the cemetery, and in the neighbourhood in which they are situated stands the Arboretum Hydropathic establishment, which was erected by the late Mr. John Hitchman, at a cost of many thousands of pounds, but which was scarcely ever used for the purpose for which it was designed, owing to the death of its promoter. Mention may also be made of a very large addition to what is known as the "Manor House," by Mr. Masters, builder. Judging by present appearances, there is plenty of work for the building trades at Leamington.

BAYSWATER IMPROVEMENTS.

ON this road, which forms in nearly a direct line the main central route of London from east to west, much has been accomplished both in widening and straightening the causeway, and in the erection of stately buildings suitable to the importance of their position. Throughout the whole extent, from Notting-hill to the Bank, the range is along the highest elevation of the London central plateau; and on the opening of the Valley viaduct next month there will be no perceptible variation in the level from end to end.

Newgate-street has been for the most part widened, a spacious causeway continued over a solid bridge, and the obstruction of Holborns cleared away; all this, done at an enormous outlay, so far as the City is concerned, reflects much credit on the civic authorities; and when the approaches to the market are taken into account, together with the immensely increased facilities for traffic, and the improved value of building sites, it will repay them with advantage.

The important line continuous from Oxford-street to Notting-hill is, however, of more value to residents in Town; and here, commencing at Lord Grosvenor's mansions, near the Marble Arch, and continuous along the whole park border nearly as far as Notting-hill Gate, the ranges of noble mansions, in terraces, have been completed along the Bayswater-road, which, facing the park and Kensington Gardens, and fronting the south, make them the most favoured residential abodes; shrubbed flower borders, and the open views of forest scenery, together with a dry sandy soil, offering attractions which no other suburb can rival.

The fine terraces of Lancaster Gate begin the more modernised ranges opposite Kensington Gardens, and are continued along the highest elevation of the whole line, at least 100 ft. above high-water mark, and 50 ft. above the South Kensington level; and here, where the road is widest and most elevated, two terraces of mansions, most commanding in style and position, have been finished by Mr. W. Marler, together with houses in Inverness and Queensborough terraces, to complete those roads which issue at right angles into the main Bayswater road. The style of these terraces is a decided improvement

upon the comparatively plain elevations of Hyde Park Gardens. A double range of balconies, on entrance and first stories, extends throughout, supported upon monolith columns, and the terminal houses of each terrace have also bay windows, plastered and finished in character with the rest, giving an air of magnificence to the whole; the interiors being decorated and gilded, whilst the division and allocation of the internal spaces discover a great advance upon former modes of distribution. Mr. R. W. Edis is the architect, by whose designs these buildings have been carried out.

The afforested gardens descend at an impalpable decline from these frontages, and glades open leading south-east and south from wickets of approach opposite to these terraces. Nothing can be more rural than the thick groves of ivy trees in the gardens, and a little cove on the part of the Commissioners would vastly improve the scenic effect, if they would only cut away the redundant and decaying trees; it would enliven the scene, and give purer air and light to promenaders, whilst it would liberate the healthiest of the struggling giants, and so allow the natural expansion of the aged forester to become an object of beauty.

A BAD ROOM FOR HEARING IN.

THE town-council of Lichfield have lately built a magistrates' room, the construction of which is such, that if you can imagine reverberations of sound caused by a few Lilliputians talking inside a big drum, you can imagine the kind of sound produced by as many ordinary persons conversing in the room.

This room is 38 ft. 6 in. long, 21 ft. wide, and 15 ft. high to the base of the roof. The roof is an open one of high pitch without a tie-beam, and without a lantern. Each side of it, having two skylights, inclines at an angle of forty-eight degrees, or less, with an imaginary line parallel to that of the floor; and consequently, the whole roof is eminently calculated to reflect sounds to the floor, at the same time that the floor, boarded over a hollow space, is remarkably sonorous.

The walls are plastered, and there is only one window in them,—a rather small window in the north wall. The south wall has but one break in it,—a door 4 ft. wide. The side wall surfaces are broken by two smaller doors; but all the doors lead into confined entrances.

Different causes, therefore, exist for transmission and reflection of sound in different measures of time; and hence the confusion of sound which every one complains of.

To me it seems that the chief sources of evil are the boarded floor and the open roof. But both these sources of evil may be done away with by substituting a solid tile floor for the sonorous wooden one, and by cutting off, as side-beams favour, more than the upper two-thirds of the roof-space by means of a panelled ceiling. This new feature of the room would be 18 ft. 6 in. high; and this measure added to that of the width would be only 1 ft. more than the measure of the length of the room,—a near approach to good proportion on acoustic principles.

The ceiling would cut off the skylights; but, as substitutes for them, four windows each 7 ft. high, might be inserted in the side walls, at a height of 7 ft. above the floor. The south wall surface, being immediately opposite the platform, requires to be broken; and it might be broken by means of sash-windows glazed with fluted glass, placed at a height of 10 ft. above the floor. These south windows would materially assist means of ventilation; but besides them, one full-sized hopper-shaped ventilator over the north window, and one over the south door, would, like the windows, be attended with benefit to sound, as well as to ventilation.

My notions, however, about any acoustic defect in a building being mere theory, I can only hope they will elicit instruction to guide persons who are as much puzzled over the matter as I am.

JAMES RAWSON, M.D.

Cab Reform.—An invention has been produced in Paris for settling disputes between cab-hirers and cab-drivers, which seems to deserve attention. A correspondent says it is a "compteur mécanique," or calculating machine, and that it not only reckons the distance traversed, but indicates as well the exact sum of money due to the driver.

SMOKE-LAND.

As with the water we drink, so with the air we breathe, some atmospheric Baron Haussmann is required despotically to rescue us from poisoners. We are not here hinting at the ordinary cabbage-cigar, nor at the supposed right that so many claim of blowing its miasma into other people's lungs: we will not vainly tilt against tobacco; but would parenthetically invoke a blessing on the man who will invent a pipe to consume its own smoke, or a "weed" chemically cured of its narcotic qualities as not to pour out headache on the air, nor trouble innocent inhalers with a land-imitation of seasickness. This by the way. We speak of far more wholesome methods of pouring poison on the atmosphere,—due, so far as the present writer is concerned, to a recent journey on the North-Western.

Who will devise a plan for clearing our midland provinces from their normal state of misery and dirt from gaseous exhalations? Wednesbury and its neighbourhood would have given Dante some terrible additional ideas for his "Inferno;" and how those wretched myriads can live and breathe in such an atmosphere, we denizens in a purer air can only plyingly guess; while we must pretty well be sure that rude health and ordinary cleanliness are to them well nigh impossible luxuries.

But is there really nothing to be done in the way of cure or mitigation of those cursed clouds of gloom and stench that overhang half Staffordshire and Worcestershire? Can no one find out how to give clarity to the air, greenness to the fields, ruddiness to the cheeks of children, and muscle to the withered frames of man and woman, by saving to the manufacturer's pocket all that half-consumed coal, and all those chemical salts, which blacken and pollute the firmament, and might, no doubt, be far better utilised in the all-voracious furnace? It may really be a matter of economy so to cleanse the atmosphere; and not idly to let tons of carbon sail away in stifling soot all over the neighbourhood of those tall chimneys, which by thousands are now seen belching out clouds by day and pillars of fire by night, to the destruction of vegetation, and by no means to the health of poor humanity. Birmingham would give a well-deserved statue of gold (if cash were preferred in that glorified form) to the clever pyrotechnical philosopher who could invent the scheme of a perfect combustion: so let somebody try again even to improve on Dr. Arnott, and to make it the economical interest of every ironmaster and copper-smith and potter to save his fuel by using up his smoke. In East London we have partially succeeded; why should they not stretch a wholesome piece of legislation, so as to include West Staffordshire? Surely the Midlands would be grateful. Surely those toiling myriads would rejoice in sweeter air, whiter skins, and a greener country. They are not so heedless of health and comfort and the decencies of life as to despise cleanliness; and if only their great capitalist-employers can be made (through self-interest, and as a mere measure of economy) to harm their own smoke and utilise all those escaping gases, the discoverer of such a process will speedily be rewarded with a fortune, and for ever after he hailed as one of the happiest of philanthropists. MARTIN F. TUPPER.

SIR WILLIAM ARMSTRONG ON THE SMOKE NUISANCE.

A TOWN'S meeting, presided over by the mayor, has been held at Newcastle-on-Tyne "for the purpose of considering and adopting measures to remedy and prevent the injuries to health, and the damage to vegetation arising from the escape of smoke and noxious vapours in the town and the country near to it." The meeting ended in the appointment of a committee to investigate and report on the nuisance complained of. Among the speakers were Sir William Armstrong, who said he stood up quite as much on behalf of those who produced smoke as for those who suffered from its effects. It was an undoubted fact, however, that the quantity of smoke that was produced was far more than was unavoidable. He believed that so far as black smoke was concerned, by far the greater portion of it was produced by steam boilers. He had himself at Elswick nearly fifty steam boilers in operation, and if there were no means provided for destroying the smoke of those fifty furnaces, the place would be

perfect pandemonium. But to every boiler was applied a smoke-consuming apparatus, and the effect was inadequate. The chief cause of smoke was the inadequate boiler power generally employed in manufactories, in which it was required that the fires should be stoked much more energetically than would otherwise be necessary. Sir William recommended the self-stoking smokeless furnace of Messrs. T. & T. Vicars, engineers, Newcastle-on-Tyne, which had been applied to all the boilers at the Elswick Ordnance and Engine Works.

PARLIAMENTARY DINING-ROOMS AND THE LADIES' GALLERY.

The report of the select committee appointed to consider plans for new refreshment and dining rooms for both Houses of Parliament, and for improvements in the ladies' gallery of the House of Commons, have agreed to their report, which has been published. The committee say that a change is much required with respect to the existing arrangements for the House of Commons' dining-room; that the accommodation is insufficient when there is a full attendance of members, the temperature of both dining-room and kitchen excessive, and the ventilation of the kitchen very bad. The estimates for the proposed change, amounting to 24,517*l.*, exclusive of furniture, seemed to the committee to be extremely high, and there was no time to test their accuracy in the usual way during the session just passed. They think the House should have an opportunity at an early period next year of fully considering whether such an expense should be incurred. In the mean time they are of opinion that some steps should be taken to lower the temperature and improve the ventilation of the existing kitchen. An estimate of 1,050*l.* and plan for improvement in the ladies' gallery have been submitted to the committee, and they are of opinion that this improvement should be carried into effect in the vacation. From the evidence appended to the report it appears that Mr. E. M. Barry guarantees that this can be done.

THE NATIONAL ARMOURY.

We observe, with considerable satisfaction, that Mr. Cole, the director of the South Kensington Museum, in his report to the Lord President of the Council, has adopted our suggestion (see *Builder* for 20th March, 1869) as to the union of the Meyrick Collection of armor with that in the Tower of London. Mr. Cole says of the Meyrick Collection,—"It is intended to be offered to the Department for sale. If purchased, and united with that in the Tower of London, the whole would be the finest in Europe. The Tower Collection is visited by upwards of 60,000 persons annually, who pay 6*d.* each, and the receipts more than pay the cost of attendants, &c."

DEATH IN THE WORKSHOP.

INDUCEMENT OR COMPUSSION?

Sir,—Having a liking to acquaint myself with the various modes and processes in factories and workshops, I have visited black-lead mills, emery and glass mills, pipe cutting mills, bark mills, grinders, felt makers, wool carriers, workers in cow hair, radiators, &c., &c.

In all these deadly occupations life is short and illness, improvements are seldom attempted, the owners aver they have nothing to gain, they are not amenable for the death of the man, and when one falls they have many applicants for the situation, that cannot afford to experimentally, the public would not pay more for an article produced without murder!

I maintain that most of these evils can be prevented or mitigated. Were Government to indemnify owners, improvements would be made.

R. T.

CHESTER SEWERAGE.

Sir,—On my return home from abroad, my attention was called to a paragraph in the *Builder* (July 24, p. 690), referring to the drainage of Chester, and stating that Mr. Latham had been called in to report on and rectify the total want of ventilation of the sewers.

It must be known to you and others, that Chester led the van (in 1848) in carrying out sanitary works, long before the General Board of Health, or their acute engineers, were called into existence, and descriptions of the works were published in the *Builder* at the time, and they were inspected by many professional men from Liverpool, Manchester, London, Warrington, and other places, and information was furnished to them as to the *modus operandi*. At the same time the sewers were being carried out, a system of ventilation was adopted, both at dead ends and in several places in their course; and these evidently must have acted well, judging from the Registrar General's returns, as Chester is classed amongst the healthy towns with a mortality somewhat below 20 per 1,000.

It is only recently that Croydon has been struck off the dirty list, and been classed amongst the healthy towns, after a desperate struggle, and doing and undoing of works for a period of years; and it is only three years since she commenced to correct the defective ventilation of its sewers, while a system of ventilation had been in operation in Chester since 1848. As well as a system of ventilation, other plans were proposed for the disposal of the sewage refuse, which is still thrown to waste and defiles the River Dee; and I suppose, with the usual obduracy of corporate bodies, it never will be done unless the Government or Parliament compel them to do it.

I trust the report of Mr. Latham will be made a public document, so that I may have an opportunity of reviewing it, and that the world may be enlightened on the very perfect system he advocates.

B. BAXLES.

THE STRIKE OF MASONS AT MANCHESTER.

A CONFERENCE of Manchester and Liverpool master builders recently took place in Liverpool, at which it was determined to insist upon the terms which brought about the strike and lock-out. Notwithstanding this, however, one builder in Liverpool, Mr. Hugh Yates, has withdrawn from the contest, and his masons resumed work on Tuesday last.

It appears to me, sir, that there has been a very great want of *esprit de corps* on both sides during the struggle. We have seen a large number of the master builders of this country associated together for the purpose of compelling the adoption of certain rules which the other side deemed unjust, and yet at the very first shock of the contest we have seen the whole of the employers in certain towns giving up their demands without the slightest reference to their fellows in other places; and we have, on the part of the operatives who are also associated, the same regular conduct manifested, neither party seeming to care how the struggle ended so long as they themselves were out of it. It seems to me to be selfish in the extreme, and to defeat the objects of either organisation.

B. G.

TRAVELLING THROUGH THE AIR.

Sir,—Mechanicians are waiting, like Mr. Micawber, for "something to turn up" in the way of a very powerful, compact, not too heavy means of obtaining a motive power, to adapt it to an aerial machine. None of our present known means are applicable, as involving too great an amount of dead weight. Steam, for example, requires boilers, engines, and coals, besides the framework of the machine—all too heavy. Inflammable gas, although better, is still unwieldy in its employment. It seems to me to be in the direction of electricity, as a motive power, that we shall find a solution. The science and its practice are very young as yet; and although it has done wonders, it is capable of doing infinitely more. That an amount of dead weight is necessary in the machine itself is now universally admitted, but it must bear about the same proportion to its power as the body of the goose does to the muscles of its wings, and not more. When that power is discovered, it can be applied at once: the means are known.

G.

AERIAL NAVIGATION.

Sir,—It is remarkable that your Number containing Mr. Tupper's "fancies" on human flight, with a description "how not to do it"—i.e., by means of balloons, contains in another column a notice of the Californian steam-propelled balloon, which appears to have succeeded as far as a model can in proving the practicability of aerial navigation by such means.

Your correspondent's idea "how to do it"—i.e., by bird or bat-like wings worked by the human muscles,—has been the motive of experiments from time immemorial, which have always proved abortive, except in fables. So lately as last year we were promised an illustration of human flight at the Crystal Palace by a member of the Aeronautical Society, but that gentleman found it inexpedient to air his wings in public. The most noble president of the society, however, exhibited a model to show that both the upward and downward strokes of a bird's wing assisted in propulsion. It consisted of mechanism somewhat like the "springs and wheels contained in a breast-plate" of your correspondent, attached to real wings from a bird. It certainly proceeded along a line with a movement resembling a very lame duck, but if intended as an example for human flight, showed in a very convincing way "how not to do it."

On the other hand, the steam-propelled balloon exhibited by M. Canalis Vert, of Paris, at the same exhibition, was as completely successful as the Californian model.

It is wise, doubtless, to copy Nature, but not too servilely. Our achievements in locomotion on land and water, by railway engines and steamboats, have not been attained by such servile copies of racehorses and fishes, but we have plainly no chance of moving in the air unless we closely imitate the birds.

Like your correspondent, I have studied the subject many years. In a pamphlet on "Aerial Navigation by Means of a Steam-propelled Balloon," published in 1861, I ventured to adopt some hues of his as a motto, and regret being compelled to dissent from him years ago the means of accomplishing this great desideratum. These views regarding balloons are shared by most members of the Aeronautical Society, and I believe have greatly retarded the good time coming.

If the reported enterprise be fairly undertaken by the American adventurers, I have no doubt it will succeed with a facility which will set the world wondering why it was not done before.

I hope the spirit of generous rivalry now manifested between England and America may produce a similar undertaking here, in which I should be most happy to co-operate.

J. LUXLEY.

THE TOMB OF HENRY VII.

The well-known central monument in the chapel of Henry VII., Westminster Abbey, has been cleansed and revived. The tomb itself is seen to be of black marble; the effigies and other metal adjuncts are gilt. The gilding is for the most part in an excellent state of preservation. The subjects of the sculptured groups in the circular panels round the tomb are now obvious, and the inscription is legible. The dark metal screen around the tomb would prevent its newly-restored brightness from interfering with the sombre harmony of the chapel as a whole, even were that brightness more glisten than it is. It was a decidedly desirable work to do. Nothing has yet been done to the screen; but doubtless it will be cleaned, and the small portions that are gilt brought out. Looking at the tolerably complete appearance of the monument at first sight, it is somewhat startling to hear that 1,500 pieces are wanting to make it perfect; yet such we believe is the case.

RESTORED PAINTINGS AT NORTHAW.

SOME interesting mural paintings in a mansion of James II.'s time, in the possession of Mr. J. J. Monney, at Northaw, Herts, have just been preserved from obliteration and decay. The paintings decorate the ceiling and walls of the principal staircase. They are attributed to the joint efforts of Sir James Thornhill and Maria Verelst. There was evidence that attempts had been made a century ago to clean off the thick coating of discoloured copal varnish with which the designs had been covered, but the operator failing in his efforts the greater part of the pictures were repainted in a substantial manner, and another generous coat of copal given to the whole. The double incrustation has now been removed. The original work is seen in an admirable condition, and there seems no reason why it should not keep so for many years to come. The restoration has been effected by Mr. Manfred Holyoake.

SCHOOLS OF ART.

The Maclesfield School.—At a meeting of the council, held at the town-hall, Mr. J. Ford, the master of the school, applied for instructions as to the sale of designs by pupils. The custom as to this varies in several parts of the country. The subject was referred to the Class Committee. It was resolved that all the hanks in the town be requested to receive subscriptions for the schools, and Mr. G. W. Clarke, the secretary, was instructed to arrange with Mr. H. Cole, C.B., the director of the Department of Science and Art, to accept the invitation of the council to a breakfast at the townhall.

The Wolverhampton School.—The annual meeting in connexion with this school, for the presentation of the prizes awarded to the pupils by the Government Department of Science and Art, has been held in the large room of the Institute, when the prizes were distributed by the mayor. There was a good attendance of the subscribers and parents and friends of the pupils, the number present being larger than at any similar meeting for several years. The general report congratulated the friends and supporters of the school on its continued efficiency, and also on the steady increase of pupils to the whole of the classes. One hundred and ten pupils attended the school during the past year. Forty-nine certificates of merit and prizes had been awarded at the examination, and on works submitted to London for inspection.

The Drawing Schools in Wurttemberg.—One of the most remarkable features in the primary schools of Wurttemberg (says the report of the French Commission on Technical Instruction), is the extraordinary attention paid to teaching drawing. The department of trade and manufactures has persuaded the Ministry of Public Instruction and Worship to add classes for industrial drawing to all these schools, and the ministry has had the wisdom to leave to that department the care of organising and superintending their progress. They were founded, after the Universal Exhibition of 1851, to enable the manufacturers of the country to compete with France in the industrial arts. These schools were at first gratuitous, but experience proved that attendance was better secured by requiring a small payment, varying, according to the means of parents, from half a florin to twelve

florins a year. The teachers are, as far as possible, chosen from among the workmen or masters of the chief industries of the place, who having been taught in the same schools have there acquired the requisite knowledge. But these workmen thus made teachers do not abandon their trades, and receive an indemnity of about two florins per hour's lesson. They generally give three a week of two hours each, from seven to nine o'clock in the evening. At Geisslingen, for instance, there is a school where 150 scholars are taught by a master mason. It has been remarked that artists of considerable talent have not succeeded so well, as masters, as they have as mere artisans.

CHURCH-BUILDING NEWS.

Goolse (Yorkshire).—The church here has been reopened. In 1868 the tower was completely gutted by fire, with the destruction of the clock, and the bell was cracked. At the time of the fire the building was insured in the Phoenix Office for 3,000*l.*, but the company paid the full amount of damage, 7,12*l.* Since that period the work has been progressing in the hands of Messrs. Kassell, contractors, Goolse.

Ryde.—Although it at present numbers 12,000 inhabitants, and is the largest and most fashionable town in the Isle of Wight, Ryde has remained till now without a parish church, both it and Ventnor having been included in the parish of Newchurch. The latter was, however, a short time since divided into three parishes, Ryde, Newchurch, and Ventnor, and since then efforts have been made to erect a new church. The corner-stone of the new edifice has now been laid by the Princess Christian. The church is to be finished within two years from the present time. Mr. G. G. Scott is the architect.

Linslade, Leighton Buzzard.—Linslade church, which was erected in the year 1848, has just undergone considerable alteration. A south aisle, with a large organ-chamber and a massive tower, have been added, the latter containing a peal of six bells, removed from the old church at Linslade (now used as a burial-chapel). The new aisle, with the organ-chamber at the east, is separated from the nave by a stone arcade, composed of four arches of bold and simple character. The works have been executed by Messrs. Car-side & Holdstock, builders, at a cost of 1,800*l.* from the designs of Mr. Ferrey, the architect of the original church.

Louth.—The parish church here has been reopened. The clearstory and arcades have been cleaned and underpinned where necessary. The west end of the north aisle has been rebuilt, as also have the north and south porches. (The south porch is the gift of Mr. Cornelius Parker, and has been built under the direction of Mr. R. J. Withers, of London.) There is new open seating throughout, with stalls for the corporation, the whole of oak, with sunk tracery panels to bench ends. The floors have been laid with Milton tiles of a costly pattern from the designs of the architect. There is a reredos of alabaster, Ancaster stone and serpentine, with piscina and credence-table of Devonshire marble. A new oak screen, carved, has been put across the east end of the north aisle, the gift of the architect, and the old screen on the opposite side has been restored. The roofs, which are of modern date, have been cleaned. The organ has been removed from the west to the east end of the north aisle. A new heating apparatus has been fixed by Messrs. Haden & Son, of Trowbridge. A stained-glass window has been fixed at the east end of the south aisle by Mr. Preedy, of London, the gift of Mr. J. L. Flytche; and another window at the west end of the north aisle, by Messrs. Clayton & Bell, in memory of Mrs. Barnard (Claribel), who was a native of Louth. A window, also by Messrs. Clayton & Bell, has been placed in the south aisle, in memory of General Sir George Patey, the gift of Mrs. and Mr. L. R. Lucas. Mr. J. Fowler was the architect of the restorations, and Mr. C. Clarke the builder.

Windsor.—Contributions to the amount of 3,050*l.* have been promised towards the renovation of the parish church. This sum includes donations of 100*l.* from the Diocesan Church Building Society, and 50*l.* from the Incorporated Church Building Society of London. It is intended to proceed at once with the erection of a chancel, then with an organ-chamber, the removal of the organ, reseating the church, and reconstruction of the western gallery, the estimate for which is about 3,600*l.* When these works shall have

been completed, and money sufficient contributed, it is contemplated to spend between 2,000*l.* and 3,000*l.* upon the decoration of the church, which is at present a very plain structure. Amongst the contributors are her Majesty the Queen, 200*l.*; and their Royal Highnesses Prince and Princess Christian of Schleswig-Holstein 50 guineas.

Workshop.—St. John's new church has been consecrated. The plan of the church consists of nave and aisles, chancel, vestry, and organ chamber, western tower, and north porch. The nave is 82 ft. by 22 ft. 6 in., and the aisles are 82 ft. by 15 ft.; the chancel, 30 ft. by 31 ft.; organ-chamber and vestry, 16 ft. by 13 ft.; porch, 13 ft. by 9 ft.; tower, 13 ft. internally. The height of the edifice at the bridge of the nave is 53 ft.; to top of spire, 140 ft. The aisles are lighted by two-light lancets. The pier arches are quatrefoil in plan, with carved caps and moulded bases. The chancel arch has three detached shafts and moulded arch and hood mouldings. The roof trusses are trefoil, ribbed principals, supported in detached stone shafts bases, with carved caps and foliage corbels under bases. The organ-chamber opens into the aisle and chancel. The tower is groined in stone with moulded ribs. The style of the church is Early English. All the windows have columns, caps, and bases. The belfry of the tower has a two-light window in it, and is arcaded all round. The spire is a parapet spire, with large pinnacles at the four angles, and two tiers of Fucane lights. Messrs. Robert Clarke & Son, of Nottingham, were the architects; and Mr. Charles Wright, of Nottingham, the builder. The carving has been executed by Messrs. W. P. Smith & Sons, of Nottingham. The capitals are carved in the broad type of Early English, chiefly from original designs. The upper carving in the clearstory is of the more cut-up style, a little more of the ancient carving being introduced. The new organ has been built by Mr. Brindley, Sheffield. The benches are open and stained. The windows are all of plain glass.

White Waltham.—The church of St. Mary, White Waltham, has been re-opened for divine worship, after extensive alterations and improvements. The edifice has been almost entirely rebuilt, according to plans by Mr. Street, of London. Mr. Silver, of Maidenhead, was the builder, and the work has been carried out under his superintendence.

Everton.—The ancient parish church of Holy Trinity, Everton, after undergoing considerable repairs and alterations, has been re-opened by the Bishop of Lincoln. The alterations just effected include the entire removal of the three lofts, and also of all the internal fittings except the communion table. Through the lowering of the floor some 2 ft. or 3 ft., the bases of the pillars, the walls in front sight, are now visible. All the walls in the interior have been repaired, and plastered. The arch leading into the tower has been opened, while the western door of the tower has been walled up, and in its place has been erected a stained glass window, the gift of Mrs. Metcalf (the vicar's wife), being a memorial of her parents. The subject of the design is Christ blessing little children. The other windows are of common glass, except the side panes, which are filled with glass stained in yellow, blue, and red. A floor for the ringers has been placed in the tower and filled up with open seats similar to those in the other parts of the church, all being of pitch pine. The old font, which was in a very dilapidated condition, has given place to a new one near the west end of the nave. The porch also has been restored and newly roofed. Additional seat-room has been obtained for about 40 hearers, or, in all, 250. The cost of the repairs and additions is between 600*l.* and 700*l.*

Eaton-under-Heywood.—The parish church has been re-opened. The plaster has been removed from the walls; the stonework has been redressed, and left bare; the old ceiling has been removed, and several new lights have been put in. Among the latter must be mentioned two small windows in the south wall, which were discovered on the removal of the plaster, and which correspond with two similar windows on the north side of the church. In each of these windows is a figure, in stained glass, by Messrs. Done & Davies, of Shrewsbury, representing an Evangelist, and the same artists have reglazed several other of the windows with tinted cathedral glass. A stained glass window, which was placed in the chancel in 1859, in memory of a member of the Pinches family, of Tickleton, has been restored by the artists named, and placed in this west end of the church. Its place

in the chancel has been supplied by three lancet windows, filled with stained glass, by Mr. Preedy, of London. This alteration in the windows of the chancel has been made in order to restore that portion of the church, as near as possible, to what it was originally; and, indeed, this has been the main object throughout the work. The whole of the stained glass in the chancel, together with a new oak communion-table, was presented by Mr. A. Sparrow, the lord of the manor. In addition to other improvements, one of the old bells in the tower has been recast, at the expense of the vicar, and the others have been tuned and otherwise improved. The masonry work in connection with the restoration was done by Mr. T. Clifton, Beam Bridge. A carved ambry door, and some wood crosses, are the work of Mr. William Hill, Smethcote. Six Mediaeval faces in the nave, together with a carved oak chair, are the work of Mr. Carter, who also stained the woodwork of the roof and varnished the seats. The other part of the work has been performed almost entirely by local workmen. The designs for the restoration were supplied by Mr. W. J. Hopkins.

Ashelworth.—St. Andrew's Church has been restored and re-opened for divine service. The works lately effected include the removal of the galleries and all the modern seats, and the substitution for the latter of benches of oak and elm; the repair of the ancient open seats, adorned with linenfold carving; the throwing open, cleansing, and repairing of the timbers of the roof; the cleansing of the stonework of the piers and arches; the restoration of the tower and spire and the external portions of the fabric; the removal of the plaster and rough-cast from the walls; the building of a new arch at the transept; the reseating of the chancel, and the laying of a tile floor to the passages, and the construction of new and open seats and enamelled tile floor for the chancel. A new vestry has been built on the north side of the chancel, in the place of one formed out of the lower floor of the tower, which is now thrown open to the nave, exposing the arch and west window. The church has been rendered dry by the removal of the soil from the walls, and the erection of proper spouting, with drains to carry off the surface water, and by the introduction of one of Garney's stoves to warm and air the building. The east window of the north chancel and the two windows on the north side of the chancel are filled with painted glass, as memorials of departed parishioners. In the three-light east window are represented the Birth, the Crucifixion, and the Resurrection of our Lord. In the north wall is a deeply-recessed window of one light. In this is represented the Virgin bearing the emblematical lily. West of this is a three-light window: the subjects are, Christ blessing little children, the Good Shepherd, and the Annunciation of our Lord's Resurrection to Mary Magdalene, Mary the Mother of James, and Salome. All these windows are by Mr. Gibbs, of London. Mr. Atwood has presented an organ of four stops, with pedals, to the church. It has been placed in the south chancel.

Whitfield.—The foundation-stone of a new church, in the course of erection at Whitfield, near Brackley, has been laid by the Hon. Mrs. Pierrepont, of Evelyn Hall. On the 1st of February last, during a very heavy gale of wind, the tower of the old parish church, supposed to have been built in the thirteenth century, was blown down. Mr. Harry Woodyer, architect, of Grafton, near Guildford, was consulted, and, in consequence of his report as to the insecure and dangerous state of the whole building, a meeting of ratepayers to consider the matter was held, and it was unanimously agreed that the old church should be pulled down, and that a new church should be built. When about 1,500*l.* had been promised, tenders were advertised for the erection of a new church, according to Mr. Woodyer's design. The lowest tender then sent in was 2,860*l.* The committee did not feel justified in entering into such a contract with the funds they had in hand, and new tenders were advertised for, the contract to be limited to the erection of the fabric, with the understanding that that portion of the work should be completed by Christmas next. A tender for 1,740*l.*, sent in by Messrs. Mansfield & Booth, of Buckingham, was accepted, and the work is now in rapid progress.

Heigham (Norwich).—A meeting of the parishioners has been held in the temporary church of St. Philip, Heigham, when the designs for

the Parish of Titsey, by Granville Leveson Gower, F.S.A. London: Wyman & Sons." This is strictly what it professes to be, except that it is a pamphlet rather than a book. It contains information as to the church and church monuments, the rectorship (of which Mr. Granville Leveson Gower is the patron), the parish registers, and the Gresham family.—"A House and its Furnishings: How to Choose a House and Furnish it at small Expense. By Mrs. Warren. London: Bemrose & Sons." This little volume is by the author of "How I Managed my House on Two Hundred Pounds a Year." The limit is still two hundred a year in the book under notice, with 100l. to lay out in furniture, &c., and as we dare say no young couple will ever come up to all the author's requirements, they may have all the letter for what they can retain of them; although, were they all she desires, we could scarcely regard them as an amiable young pair of housekeepers.

Miscellaneous.

Buildings of the "Improved Industrial Dwellings Company."—At the recent general meeting of this company, mentioned in our last number, the chairman said there was a point not referred to in the report, upon which he was anxious to say a few words. The shareholders would have observed that the buildings in Ebury-street, Picnic, were to be erected by Messrs. Perry & Co., of Stratford, who were now building the new St. Thomas's Hospital. It was right he should explain that all the buildings hitherto erected had been constructed by Mr. Matthew Allen, the designer and builder of the first block of Langbourn-buildings in 1853, the model upon which all the subsequent buildings had, with minor variations, been constructed. The charge had not arisen from any quarrel between the company and Mr. Allen. Although the directors were, as far as they could judge, satisfied with Mr. Allen's work and the prices paid for it, they felt that, as they were not spending their own money, but that of the shareholders, they were bound to determine by competition whether the price they were paying was the lowest market price. Mr. Allen, feeling aggrieved at the course taken by the directors, declined to tender with the others, and hence they had had to change their builder. It was due to Mr. Allen and to the Board that he should state that the prices to be paid to Messrs. Perry, who sent in the lowest tender, were rather higher than those they had been previously paying to Mr. Allen.

Rewards to Schoolmasters for Teaching Science and Art.—The Lords of the Committee of Council on Education, having by a minute dated the 3rd day of January, 1868, offered prizes, viz., one sum of 50l., three sums of 40l., five sums of 30l., ten sums of 20l., and twenty sums of 10l., to the head masters of the schools of art in the United Kingdom, in which the general amount of work, considered with reference to the number of students under instruction, should be found after the examinations to be most satisfactory, and having had the results of the recent examinations laid before them, have awarded the above prizes as follows, viz.:

W. H. Simes, Sheffield, 50l.; C. D. Hoader, Edinburgh (male), 40l.; Louise Gann, Bloomsbury, 40l.; J. S. Rawle, Nottingham, 40l.; Henry Woolner, Coalbrookdale, 30l.; Edward R. Taylor, Lincoln, 30l.; D. W. Rainbach, Birmingham, 30l.; Walter Smith, Bradford, 30l.; George Stewart, West London, 30l.; John Parker, St. Thomas's Charterhouse, 20l.; John Anderson, Coventry, 20l.; Edwin Lyne, Dublin, 20l.; Walter Smith, Leeds, 20l.; Joseph Kennedy, Kidderminster, 20l.; Robert Grosvenor, Glasgow, 20l.; W. J. Mutchley, Manchester, 20l.; John Sparkes, Lambeth, 20l.; Susan A. Ashworth, Edinburgh, 20l.; W. H. Stophord, Halifax, 20l.; W. C. Way, Newcastle-on-Tyne, 10l.; Walter Smith, Wakefield, 10l.; John N. Smith, Beeston, 10l.; Herbert Lees, Carlisle, 10l.; Robert Cochrane, Norwich, 10l.; W. L. Casey, St. Martin's, 10l.; John Bentley, Birkenhead, 10l.; James Carter, Hanley, 10l.; J. P. Bacon, Stoke, 10l.; William Stewart, Paisley, 10l.; J. P. Bacon, Newcastle-under-Lyne, 10l.; John Menzies, Aberdeen, 10l.; R. C. Puckett, Chippenham, 10l.; W. J. Baker, Southampton, 10l.; John Kemp, Gloucester, 10l.; David Wood, Cambridge, 10l.; W. P. Griffiths, Ipswich, 10l.; S. F. Mills, Spitalfields, 10l.; J. C. Thompson, Warrington, 10l.; and J. S. Goepel, Frome, 10l.

Art-Professorship, Oxford.—There were ten candidates, we hear, for the newly-created Slide Art-Professorship, from amongst whom Mr. John Ruskin has been elected.

Dock Extension at Leith.—The new Albert Dock, at Leith, will be opened this Saturday. This dock has been five years in construction, and has cost about a quarter of a million.

Presentation to Messrs. G. & A. Maw, of Benthall Encaustic Tile and Majolica Works.—The employees of Messrs. Maw have presented to each of their employers as a special mark of their esteem a two-handled enamel-cup and cover, both of porcelain, and manufactured at the Coalport works of Messrs. John Rose & Co. It stands, with the cover, about 10 in. high. The outline of the cup is an inverted ogee. The ornamentation is elaborate. On each side of the cup is a small medallion enclosing a geometrical ornament, flanked on either side by a large medallion, surrounded with a circular band, the inside of which is finished by a bead border, the band intersected with green foliage. In a space above the centre medallion is the family crest. Between these medallions and the border around what may be called the neck or upper part of the cup the interval is filled in with a diaper of flowers in proper colours. On the reverse of the cup, in the large medallions, are the monograms "G. M." and "A. M." in gold. On the reverse, in the large medallions, the following inscription:—"A token of regard presented to Mr. George Maw and to Mr. Arthur Maw, August 2nd, 1869;" the medallion on the right-hand side completes the inscription, "By the operatives in their employ at the Benthall Encaustic and Majolica Works." The prevailing colours are a deep red ochre, light brown ochre, and green. Messrs. Belfield, Bowdler, & A. Evans were the artists who executed the cups, from designs prepared at the workmen's request by Mr. J. H. Maw.

Sinking by Pneumatic Power.—On the invitation of Mr. L. T. Woodhouse, a number of the members of the Midland Institute of Mining Engineers have visited the sinkings at the Battersfield Colliery, at Baglit, in North Wales, where an application of pneumatic power, which seems to differ from previous uses of the same power in sinking, has been introduced. Owing to the influx of water, it has been found necessary to draw the water from the bottom of the shaft to a height over the sinkers' head, so as to allow them to work. The colliery shaft is 20 ft. clear in diameter. An iron tube, 6 ft. in diameter, is let into the shaft, passing through the water to the bottom, and into this compressed air is forced by means of a 17-in. cylinder and two 10-in. pumps. By this means the water is elevated or suspended over the heads of the workmen to a height of about 50 ft. They can thus continue working at the bottom; but the work is rather exhausting, and the men only work four-hour shifts. By the aid of dampers and doors the pressure can be so arranged that the buckets with the stuff excavated can be put in and taken to the top with very little loss of compressed air. Thus water is no bar, as hitherto, to sinking operations. According to our authority, the Engineer, those who had been to the colliery spoke highly of its efficiency.

Discovery of a "Trotter Floor" in Oxford.—A somewhat curious discovery has been made in one of three old houses in Broad-street, between Kettel Hall and Trinity College, now undergoing repair. Upon the removal of the flooring boards, in a room on the ground floor, having underneath them a considerable depth of earth and loose rubbish, the original floor of the room, which is 10 ft. square, was brought to light. It was laid with "trotter bones," in a pattern of squares arranged anglewise, within a border. The pattern, says the local journal, was defined by bones about 2 in. square, rubbed or sawn to an even surface, and filled in with the small bones of sheep's legs, the knuckles uppermost, closely packed and driven into the ground to the depth of from 3 in. to 4 in. It has been hastily and needlessly destroyed. Floors thus composed full two centuries since are now not infrequently discovered, during the alteration of the timber and plaster edifices of the early part of the seventeenth century. Oxford has supplied several examples. A specimen should be preserved.

Another Monument for Rome.—It is stated that a monument is to be erected in memory of the (Ecumenical) Council, and is to take the form of a column, the base to be of white marble, flanked with five statues, representing the five divisions of the earth, and on it are to be engraved the names of the hishops who attend the council. The column itself is to be surmounted by a statue of St. Peter formed of gilt bronze. The cost of the constructions for the meeting, together with the memorial column referred to above, is estimated at nearly 50,000l.

Muller's Orphanages on Ashley Down, Bristol.—This pious establishment still prospers in a wonderful way, which Mr. Muller as usual ascribes to "faith and prayer." There are now five buildings erected,—each one larger than the largest factory or warehouse in Leeds,—and costing in all more than 110,000l. They are of plain architecture, and will accommodate more than 2,000 children. The total sum that has been entrusted to Mr. Muller since the 5th of March, 1834, is over 430,000l. In his "Brief Narrative of Facts," just issued, he says:—

"The almost universal complaint of religious institutions and societies is the want of funds; but as to ourselves, we state joyfully, to the praise of the Lord, that through Him, our patron, we not only have had enough, but have abounded, though the expenses of the last three years amounted altogether to 113,622l. With regard to pecuniary supplies, I have, simply in answer to prayer, and without application to any one, obtained for this work 430,000l.

With this money nearly 17,000 children from all parts of England, Scotland, and Ireland have been taught in the various schools; 95,000 copies of the Bible and New Testament, and about 30,000 smaller portions of the Holy Scriptures, in various languages, have been circulated; as have also 33,000,000 of tracts.

A Great Chimney.—A huge stack or chimney has just been completed on the Earl of Dudley's estate, at Conegrove Works, near Dudley. It far surpasses anything of the kind in the neighbourhood. A patentee has in more than one instance fitted huge tubes upon the top of furnaces, and conveyed the heat, at one time thrown into the air, from thence underneath the boilers attached to the works. By doing this a vast amount of coal and much hard labour in the way of firing have been saved. The flames, too, stretch out along the surface of the boiler with greater regularity than "friers" could make them, and the boat-loader and unloader are dispensed with. It is necessary to have a good draught to carry out all this, and therefore the Earl of Dudley's agents have determined to give it a full trial. The stack alluded to is 150 ft. high, and 10 ft. 6 in. in the clear, both top and bottom. It is strengthened considerably by ironwork for a distance of 100 ft. from the ground. The whole work, which has been rapidly accomplished, was carried out by Mr. Harland, master mason to the Dudley estate.

Fatal Fall of a Scaffold.—An inquest has been held by Dr. Hardwicke at the Royal Free Hospital, Gray's-inn-lane, on the body of a workman who lost his life by the fall of a portion of a scaffold at the Midland Railway Hotel, Euston-road. It appeared that the deceased and another man (still in the hospital) were in the employ of Messrs. Jackson & Shaw, the contractors. Both were believed to be good scaffold builders, and the one in question had been erected by them. A brick wall had to be raised, and on its completion the scaffold was ordered to be removed. The deceased and his mate had the entire control. Some portion of the scaffold gave way, and both the men fell from a height of 29 ft., poles and boards falling on them. The jury endeavoured to discover why the scaffold should have fallen, but without result. One of the jurors, an architect and surveyor, was of opinion that the men had released the pulgots, and so caused the mischief.—Verdict, accidental death.

International Velocipede and Locomotive Exhibition.—This exhibition will take place at the Crystal Palace, Sydenham, and open on the 6th of September, to be closed on the 6th of October, 1869. Velocipedes with one, two, three, or four wheels will be exhibited; also machines having other motive power than the hands or feet, or both jointly; including locomotives to be used on common roads, having any locomotive power except horses. The grand prize will be a gold medal for the velocipede or loco-machie most applicable for business purposes, and especially for the use of country postmen and telegraphic messengers. We are glad to observe that both in this country and in France, as well as America, the application of some other power besides either feet or hands is receiving attention. At Birmingham and in Paris endeavours are being made to use the weight and general movement of the body, as in riding, by way of a motive power.

Bath Abbey Church.—During the progress of the works here some considerable remains of the Norman building that formerly occupied the site have been exposed to view. Although below the present floor level, means of access to them will be preserved.

Preservation of Antiquities.—A landable desire to preserve the products of the faith and piety of the old people, says the *Cornish Telegraph*, has been shown by Mr. C. D. Bevan, in some alterations at Boskenna, near Penzance. The former drive from the high road to the mansion is blocked, and a new approach formed by what was always known as Boskenna Gate, where three roads met. Here, from time immemorial, a cross has stood, half-buried, in the hedge. Each of the three roads has been widened, the cross has been placed on a pedestal, equidistant from the three. Within a radius of half a mile are three or four other crosses, as well as, at slightly further distances, huge monoliths known as pipers, boled stones, and nineteen pillars known to the country people as Merry Maidens. Had equal care been taken of Cornish antiquities for the last century, that district would have been invaluable to the student of early and pre-historic remains.

Proposed Memorial of Colston, the Philanthropist.—It is somewhat remarkable that although the inhabitants of Bristol have, for nearly 150 years, enjoyed the benefit of the munificent charities of Edward Colston, yet no monument has been erected at the public expense, as an expression of what Bristol owes to that great philanthropist. It is now proposed to remedy this neglect, by filling the large window in the north transept of St. Mary Redcliff Church with stained glass to his memory (at an estimated cost of about 500*l.*), and a sum has been promised in aid of the work. To render it a public act, it is desirable that as many persons as possible should take part in it; and, accordingly, all those who desire to do honour to Colston are invited to contribute to the undertaking; and it is hoped that by means of their united efforts a work may be produced not unworthy of the noble building in which it is to be set up, or the great and good man with whose name it will be associated. Contributions may be sent to the vicar or either of the churchwardens.—Mr. Warry or Mr. Arthur Baker, Redcliff Backs.

Yellow Fever from want of Ventilation.—H.M.S. *Eclipse* has just lost her captain by yellow fever, and the crew have had to thank the strength of their constitutions for having survived the pest. At the trial trip of this ship, says the *United Service Gazette*, it was found that the ventilation was seriously faulty, and the fact was reported, backed by the recommendation of the officers in charge at the trial. The engine-room hatch vomited all its hot air and impurities close to the ward-room door, and nothing was provided in the way of ventilation to carry off the poison. The Admiralty demanded an estimate for the additions necessary, and, finding that they would cost 300*l.*, preferred to poison men and officers rather than put such an item on the estimates! Nearly all the ward-room officers had the fever, and narrowly escaped with life, and the men also came in for their share. No wonder that the Navy detests the Admiralty.

A Charcoal Flower-pot.—A "scientific flower-pot" has just been brought out, and is thus described in *Scientific Opinion*:—"The object of it is not only to purify the water which is supplied to the plant—a process we should certainly question the advisability of,—but to condense ammoniacal gases. It is from this aspect that we think the new flower-pot deserves attention. Agriculturists are well aware of the effect of porous substances, like cinders, in, as it were, accumulating ammonia in the soil. There can be no doubt that charcoal absorbs ammonia in very large quantities, and possibly, by afterwards allowing it, when converted into a salt, to be taken up by the water of the soil, it may stimulate the nutrition of the plant." It may also affect the colours of the flowers either for good or for ill. Red colours it will probably intensify. The hues of white or yellow flowers it may totally change.

A Huge Steam Hammer.—One of the largest, if not the largest, steam-hammer ever made is now being constructed by Messrs. T. Swaine & Garbutt, of Bradford, for the Russian Government, and is intended to be used in the forging of steel gns. The total weight of the machine when erected will be close upon 1,000 tons, the anvil block will weigh 500 tons, the other castings belonging to the hammer about 300 tons, and the "tap" or hammer-head 42 tons.

Coal Getting.—A correspondent, "R. T." writes,—The highly dangerous practice of blasting down the coal in mines is fraught with frightful results. Hydraulic and atmospheric appliances have been suggested, but they are costly, complicated, and ill adapted to shift up the low drifts, cuttings, &c., amidst the falling coal. I believe any machine that is powerful, portable, and simple, not likely to be damaged by the rough and dirty work in the pit, would be eagerly adopted. I beg to suggest that the "Jack" be used, hoping it will prove the desideratum. I formed the above idea on seeing an old mason moving a ponderous mass of stone along the ground by the aid of a small jack; it will hit at any angle or posture, or upside down. What an immense amount of pressure two herculean colliers, by the aid of a *double Jack*, would bring to bear against the seams of coal. Almost any amount of power can be attained, if placed to the end of iron lever wedges, and no special skill is required to work them.

Close of the Burslem Art Exhibition.—The Art Exhibition, with which was inaugurated the Wedgwood Memorial Institute, at Burslem, and which was formally opened on the 21st of April by the Lord President of the Council, was closed last week. The attendance has been such as to leave it doubtful whether the revenue is equal to the expenditure. The debtor and creditor account has not yet been made up, but there is too much reason to fear that, if there is not a balance on the wrong side, there will be very little in the way of surplus. Recollecting the bungling way in which the committee have managed some departments of the affair, and their disregard of persons best qualified to aid in making the undertaking successful, we are not at all surprised to hear of this result.

Napoleon's Prize to Artists.—Our readers will remember that the Emperor of the French offered some time ago a prize of 4,000*l.* for the completest work of art executed in France within the past five years. There were nine competitors, whose claims were seriously considered: three painters, three sculptors, and three architects. After much voting, the prize has been adjudged to M. Duc, architect (firm of Duc & Domme), for the new Palais de Justice. Illustrations of this building, the design of which is remarkable rather for propriety and elegance than for novelty, are given in recent numbers of the *Gazette des Architectes et du Bâtime*. The architect of the new opera-house, it has been said, would have received the prize had his building been finished.

Drainage of Bromley, Kent.—The inquiry into the vexed question of the Bromley drainage, held before two Government commissioners—viz., Mr. Michael, barrister, and Mr. Harrison, civil engineer—is adjourned until October next. The scheme of the Board of Works to convey the sewage to Holloway Farm for irrigation was opposed by Mr. Boyd, whose park is near the outfall; also by Major Foster. Mr. Coles Child, whose mansion and estate are close by Bromley, visited Ealing, and was so well pleased with what he saw there that he offered to take Bromley sewage on to his land, to be dealt with as at Ealing, the receiving tanks to be within 2,000 ft. of his residence, the effluent water to be spread over the field adjoining. The rate-payers were stated to be much in favour of the Ealing system.

The New Public Buildings at Truro.—The inauguration of these new buildings will take place on the 16th and 17th of September. The great hall, which is intended for concerts and public assemblies, is 85 ft. long and 38 ft. wide. It is lighted with six large windows in the south wall, looking across the Green, and has an open roof of stained deal. It is estimated to seat about 1,400 persons, and has probably standing-room for nearly 2,000. A gallery is erected, reaching from the masonic entrance some distance into the room. On the north side there is a supper-room, 40 ft. by 21 ft. 6 in. The foundation-stone of these buildings was laid, with Masonic honours, on the 10th of December, 1867, and all the works are now in a forward state.

Columbia Market.—Some of our readers considered that we spoke but coolly of the advantages likely to follow from the formation of this costly affair. Unless we are greatly misinformed as to the condition of the neighbourhood, evidence will soon be given that the fears which led to our reticence were but too well founded.

The Asserted Discovery in Birch-lane.—In reply to inquiries still made as to the asserted discovery of a Roman tomb in Birch-lane, we find it necessary to say that the statement sent to the *Times* was an entire fabrication. It is much to be wished that the lying scoundrel who wrote it may be discovered and punished. The most carefully conducted papers are open to be similarly misled, and every member of the community has an interest in detecting the perpetrators of such deceits. The absurdity of the date given, of course, threw doubt on the communication; but this, it was thought, might be due to the stupidity of the writer; and many persons were led to waste time in seeking out the site of the supposed discovery.

The Delay in Opening the Holborn Viaduct.—Great dissatisfaction prevails respecting the postponement of the opening of the Holborn Viaduct. According to the *City Press*, a meeting of some of the principal inhabitants of Newgate-street has been held, and the speakers expressed themselves as much aggrieved. The deviation of the traffic, coupled with the removal of Newgate Market, had caused great loss and inconvenience to the tradesmen and others depending on chance trade. Several houses were entirely closed, and fears were expressed that rain would be the result to many unless energetic steps were taken to open the Viaduct.

The New Bridge at Saltburn-by-the-Sea.—This bridge, which spans the well-known Skelton beck gien, is within a day or two of completion. The whole of the ponderous girders, 85 ft. in length, are now fixed, and the roadway laid. The bridge is 800 ft. in length, there being seven spans and eight cast-iron piers; the highest point is 160 ft. and the width is 25 ft. The contractors are Hopkins, Gilkes, & Co., of Middlesbrough, who here had Mr. Charles Willman, C.E., as chief superintendent.

Statuary in Peel Park, Bradford.—The committee of the Bradford Band of Hope, as an acknowledgment of the generous manner in which the corporation have granted them the use of the park for their summer demonstrations, are about to present a statue of Ceres. This work has been executed in stone. The figure is tall, and it stands upon a pedestal of large size. It is hoped that the foundation will be laid of a fund for providing for the further embellishment of the park.

"Exeter: a Retrospect."—Under this heading the *Athenaeum* gives fourteen columns of exceedingly interesting matter concerning the annals and habits of Exeter; preparatory to reporting, as usual, the proceedings of the British Association for the Promotion of Science now at work in that city.

Shop-rent in Liverpool.—The Liverpool Recorder has given judgment in an appeal from Messrs. W. & J. Jeffery, the proprietors of the shop known as Compton House, Church-street, Liverpool, who had been assessed by the parish authorities at a net rental of 7,470*l.* The Recorder fixed the assessment at 6,000*l.*

Portraits.—The portrait in our present number is drawn from a photograph by Mr. John Watkins, of Parliament-street.

TENDERS.

For repairing and re-pewing Baptist Chapel, Queen-street, Woolwich, for the Trustees, Messrs. W. Gosling & Son, architects. Quantities supplied:—

Vickery	£240 0 0
Ginger	240 0 0
Ledbetter	255 0 0
Carter (accepted)	230 0 0

Accepted for the erection of Bungevine Congregational Church, Sheffield, Mr. J. Creswick Brameld, architect. Quantities supplied:—

Mason's and Bricklayer's Work.	
Norman	£350 0 0
Carpenter and Joiner's Work.	
Flowerday	737 5 0
Slater's Work.	
Harrison & Chadwick	109 0 0
Plumber, Glazier, and Gasfitter's Work.	
Norton & Son	153 0 0

Ironwork.	
Newton, Chambers, & Co.	145 0 0
Plasterer's Work.	
Unwin	110 0 0

Painter's Work.	
Standall	61 8 7
Warming.	
Newton, Chambers, & Co.	35 0 0

For erection of hotel to be built at New Swindon, Wilt. Mr. Thos. S. Lansdown, architect:—

Kimberley	£1,223 0 0
Drew	1,571 7 0
Dyer	1,620 0 0
Dover	1,416 0 0
Wiltshire	1,350 0 0
Phillips	1,348 0 0
Newcombe (accepted)	1,338 0 0

For rebuilding Nos. 11 and 12, Upper Lisson-street, for Mr. R. I. Hickman. Mr. C. Kales, architect:—

Credit of Materials	£20 0 0
Clark & Mannoch	£2,569 0 0
Fish	2,569 0 0
Yanson	2,547 0 0
Morsman	2,430 0 0
Kelly, Brothers	2,463 0 0
Serveney & White	2,457 0 0
Ebbs & Sons	2,387 0 0
Longmire & Burg	2,385 0 0

For two houses, with shops, &c., at the Brewery, Hampstead, Messrs. Bird & Walters, architects:—

Holland & Hauser	£2,248 0 0
McLachlan	2,543 0 0
Newman & Mann	2,465 0 0
Ebbs & Sons	2,437 0 0
Kelly, Brothers	2,421 0 0
Brown	2,380 0 0
Henshaw	2,380 0 0
Williams & Son (accepted)	2,357 0 0

For alterations and repairs to the Angel Hotel, Islington. Messrs. Bird & Walters, architects:—

Brown	£3,377 0 0
Gannon & Sons	3,115 0 0
Newman & Mann	3,455 0 0
Bishop	2,907 0 0
Henshaw	2,980 0 0
Kelly, Brothers	2,863 0 0
Ebbs & Sons	2,945 0 0
Williams & Son (accepted)	2,883 0 0

Accepted for the erection of a power-loom shed at Birstal, for the College Mill Company (Limited). Messrs. Sheard & Hanstock, architects:—

Mason	£639 0 0
Willans & Law	310 0 0
Joiner	310 0 0
Akeroyd	314 0 0
Plumber	34 0 0
Armitage	34 0 0
Ironfounder	93 18 0

Accepted for co-operative stores at Birstal, for the Birstal Industrial Co-operative Society. Messrs. Sheard & Hanstock, architects:—

Masons	£633 0 0
Joiner	314 0 0
Broole	314 0 0
Plumber	95 10 0
Nelson	45 16 0
Plasterer	79 10 0
Slaters	79 10 0

Accepted for chapel at Adwalton, for the New Connexion Society. Messrs. Sheard & Hanstock, architects:—

Mason	£510 0 0
Joiner	493 10 0
Turner	13 10 0
Plumber	83 0 0
Snowden & Son	83 0 0
Plasterer	83 0 0
Gott	83 0 0

For the restoration of All Saints' Church, Surrey-square. Mr. Robert Parris, architect. Quantities supplied by Mr. Samuel Field:—

Downs (accepted)	£3,720 0 0
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For Wesleyan Chapel, Portmadoc, North Wales. Mr. Thomas Roberts, architect:—

Masonry	£172 0 0
Hughes (accepted)	350 0 0
Carpentry and Joinery	80 0 0
Laid and Plastering	77 8 0
Glazing, Staining, &c.	77 8 0

For rebuilding 29, Great Titchfield-street, Oxford-street, for Mr. A. Giles. Mr. George Lettbridge, architect:—

Tracey	£639 0 0
Grover	675 0 0
Sheffield	633 0 0
Pope	805 0 0
Hyde (accepted)	749 0 0

For hotel and tavern, and a house and shop, at the corner of Charterhouse-street and Farringdon-road, E.C., for Mr. Hobbs. Quantities supplied:—

Wills	£5,983 0 0
Turner & Son	5,882 0 0
Shapley & Webster	5,469 0 0
Newman & Mann	5,293 0 0
Brown & Robinson	5,195 0 0
Longmead & Way	4,993 0 0
Serveney & White	4,948 0 0

For building villa, stabling, &c., at Wallham, Hertzs, for Mr. John Dorman. Mr. J. S. Gomme, architect. Quantities not supplied:—

Hentley	£674 10 0
Archer	821 0 0
Brunden	171 0 0
Deer (accepted)	754 0 0

For detached villa residence, for Mr. James Neal, at Wandsworth Common. Mr. S. Durrant, architect. No quantities. Mr. Neal binding all bricks, lime, and sand:—

Easton	£1,069 0 0
Heaver & Coxes	1,080 0 0
Strong	899 0 0
Hearn	795 0 0
Thornton	795 0 0
Atkinson	778 0 0
Cox	745 0 0

For the erection of premises, Basnet-street, Liverpool, for Messrs. Peck & Sons, drapers, &c. Mr. Joseph Brattan, of Liverpool, architect:—

£8,351 13 0	
Henshaw	7,877 0 0
Haigh & Co.	7,899 0 0
Tomkinson	7,767 0 0
Urmson	7,707 0 0
Witter	7,569 0 0
Richards	7,405 0 0
Black & Co.	7,417 0 0
Jones & Lon (accepted)	7,330 0 0

Accepted for the erection of five houses for Mr. John Watton, Chesterfield, Derbyshire. Mr. S. Rollinson, architect:—

Mason and Bricklayer	£630 0 0
Carpenter and Joiner	300 0 0
Plumber, Glazier, &c.	62 0 0
Including Smith and Founder	62 0 0

For alterations to premises in the Broadway, Hammer-smith, for Messrs. Hunt, Mr. Roberts, architect. Quantities supplied by Mr. Shrubsole:—

Extra for Cement Front	£249 0 0
Haudley	£1,690 0 0
Davies	1,580 0 0
Vine	1,600 0 0
Rogers & Walker	1,575 0 0
Hankin	1,323 0 0
Taylor & Co.	1,290 0 0
Pitcher	1,083 0 0
Turner	1,080 0 0
Knights	1,049 0 0
Parris & Soul	985 0 0
Snowden	968 0 0
Courbes	865 0 0
Wigmore (accepted)	840 0 0
Salter	844 0 0
Melville	748 0 0

For alterations and additions to 60, Rochester-terrace, Mr. Charles Dunch, architect. Quantities by Messrs. Osborne & Russell:—

I'Anson	£1,530 0 0
Rigby	1,514 0 0
Macey	1,397 0 0
Longmead & Borge	1,369 0 0
Keyes & Head	1,260 0 0

Hastings Pier.—The tender of Messrs. R. Laidlaw & Son, of Glasgow, for the erection of this pier, has been accepted for £2,250. Messrs. Laidlaw & Son have already erected several of these structures round the coast.

TO CORRESPONDENTS.

S. L. A.—W. B. R.—E. & S. S.—W. H. L.—P. F.—B. & M. P.—C. P.—C. H.—W. C.—W. H. C.—W. J.—W. J.—L. J.—J. H. M.—C. J.—A. Young Joiner.—O. R.—J. P.—W. G.—S. R.—W. D.—B. S.—T. R.—S. & W.—H. & C.—J. H.—G. & S.—J. W.—E. T.—E. F.—C. G.—E.—L.—F.—H.—A.—A.—R.—A.—S.—A.—E.—M.—F.—T.—A.—B.—A.—G.—L.—E.—C.—G.—B.—R.—S. & H.—G.—W.—R.—Metal Cast with Copper (we have a number of applications for address, but must leave the penman to make it known his own way.—architect (not).

Erratum.—The New Church in the Canongate, Edinburgh.—We are informed the name of the architect should be given as Robert Paterson, not James, as printed.

We are compelled to decline printing out books and giving addresses.

All statements of fact, lists of Tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests of course, with the authors.

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BOROUGH OF PENZANCE.—SURVEYOR WANTED.—The Corporation and Local Board of Health of the above Borough having with great regret received the resignation of Mr. John Dunnington, Surveyor, and the fact that he has a serious of twenty-five years, will be pleased to receive APPLICATIONS from any person who may be desirous of entering the office in that office at Michaelmas next. The duties consist of the superintending the management of the works belonging to the Pier and Market and other property of the Corporation, and of the water, sewerage, highways, lighting, and other works of the Local Board, and also the duties of a Surveyor, and also the duties of a Surveyor of Nuisance under the Public Health Act. The salary will be £100 per annum, and the duties will be expected to be performed with a view to the discharge of those duties. Arrangements have been made for the continuation of Mr. Dunnington's services in the capacity of Consulting Surveyor. Convenient Office are provided. Applications for the office should be made to the Secretary, accompanied by testimonials of character and ability, should be forwarded on or before SATURDAY, the 4th day of SEPTEMBER next, to Mr. O. H. B. at the Town-hall, Penzance, where a further particulars may be obtained. EDWARD HERBES BODD, Town Clerk. August 11th, 1869.

CRYDON LOCAL BOARD OF HEALTH.—WATER SUPPLY.—APPOINTMENT OF INSPECTOR.—Notice is hereby given, that the Local Board of Health for the district of Crydon are about to APPOINT AN INSPECTOR to superintend and perform various duties in connection with their system of water supply. The services of an active energetic person are required, who must devote the whole of his time to the duties of his office, and whose age must not exceed 35. A list of the duties (practical knowledge of which is indispensable) may be obtained on application at my Office, at the Town-hall, Crydon. Salary 100s. per annum, with a yearly increase of 10s. up to 150s.—Applications, accompanied by testimonials, must be sent to me on or before MONDAY, the 20th AUGUST, next.—By order of the Board, R. J. CHEESEWRIGHT, Cl. Sec. Town-hall, Crydon, August 10, 1869.

ESSEX.—LENDEN and WINSTREE HIGHWAY DISTRICT.—The Highway Board will, on SATURDAY, the 29th inst. proceed to the election of a DISTRICT SURVEYOR at a salary of 100s. per annum, to include 10s. per week conveyed with his Office. The person appointed will be required to devote his whole time and attention to the duties of the Office, and to the execution of the duties of the Highway Board, and to the duties of a Surveyor, and also the duties of a Surveyor of Nuisance under the Public Health Act. Applications, accompanied by testimonials, must be sent to me at my Office on or before SATURDAY, the 29th inst. next. Application for the office may be obtained at the Town-hall, Colchester, on the said 29th inst. at TEN o'clock in the forenoon.—By order of the Board, HENRY JONES, Clerk. Colchester, 14 August, 1869.

MARGATE PIER and HARBOUR COMMISSIONERS.—The Directors of the Margate Pier and Harbour Commission, having appointed a CHIEF CLERK to succeed their present one, who retires. The salary will be 100s. per annum, payable monthly. It would be desirable to keep all the books of the Company (except those of the Assistant Clerk), to attend all meetings of directors and committees, and to keep the minutes of all meetings, and to attend to all the landing and unloading of passengers by steam packets; to superintend the subordinate officers generally in the performance of their duties, and to be present at all meetings of the Commission, or any other occasion than that of the Company. A more detailed description of the duties of the office may be had on application to the Clerk, at the Pier Office, Margate. Applications to be made on or before the 7th SEPTEMBER next, to CAPT. BROWN, the Chairman of the Company, at the Pier Office, Margate, August 10, 1869.

The Builder.

VOL. XXVII.—No. 1386.

On the Pollution of Rivers.



N the year 1865 a Royal Commission was appointed to inquire how far the present use of rivers and running waters in England for the purpose of carrying off the sewage of towns and populous places, and the refuse arising from industrial processes and manufactures, can be prevented without risk to the public health or serious injury to such processes and manufactures, and how far such sewage and refuse can be utilised or got rid of otherwise than by discharge into rivers or running waters, or rendered harmless before reaching them; and to inquire into the effect on the drainage of lands and inhabited places, of obstructions to the natural flow of rivers and streams caused by mills, weirs, locks, and other

navigation works; and into the best means of remedying any evils thence arising; and the then Secretary of State for the Home Department directed the Commission to select several river basins illustrating different classes of employment and population, suggesting that these localities might be:—

1. The Thames valley.
2. The Mersey valley.
3. The Aire and Calder basin.
4. The Severn basin.
5. The Taff valley.
6. A river basin comprising a mining district in Cornwall.

In pursuance of their instructions the Commissioners took up the question in the order of, first, the river Thames; secondly, the river Lea; and thirdly, the Aire and Calder rivers, and made their report in March, 1866.

The River Thames.

The Thames basin extends from Shoeburyness to a point five miles west of Cirencester, and from Fernhurst, in Sussex, to Priors Marston, in Warwickshire, and embraces an area of 5,162 square miles, or 3,303,680 acres. The main stream of the Thames, which drains the water from this area into the sea, is 201 miles in length from the estuary to the source in the Cotswold hills, and the height of the Thames-head spring, in Trewsbury Mead, is 340 ft. above the mean level of the sea.

The Thames receives 22 tributaries in its course to the sea.

As the main river supplies most of the water that is consumed in London for domestic and other purposes, the Commissioners considered it important to distinguish the tributaries that come into it above where the water is taken, from those that come into it below the intake. Those below the intake are the Yeding, Brent, Lea, Roding, Darent, Ravensbourne, Wandle, and Hogg's Mill. The tributaries of the Thames above the intake of the waterworks companies

are the Mole,* the Wey, the Loddon, the Kennet, the Ock, the Cole, the Ray, the Colne, the Thame, the Cherwell, the Evenlode, the Windrush, the Coln, and the Churn.

On the Thames and its tributaries above the intake of the waterworks companies—subject to the note we have made on the Mole—there are 1,001 distinct places of settlement, containing a population of 888,088, including 89 towns above the number of 2,000 population. Of this population of 888,088, 179,881 are situated on the banks of the river, or on tributaries immediately at their junction with it, and after making every allowance for retention in cesspools and for villages and houses removed from the banks of the river or its tributaries, the number of persons whose sewage daily finds its way into the water from which London principally draws its supply, amounts to hundreds of thousands.

As the sewage travels down with the flowing water of the river, a process of oxidation goes on, which tends to purification. The volume of sewage is small as compared with the volume of the river; and upon analysis the water pumped into London proves to contain only a very limited quantity of organic matter. But neither the one nor the other is satisfactory ground of assurance that the metropolitan supply is wholesome. The process of oxidation which the sewage more or less undergoes in its course is no sufficient guarantee of its arriving at Hampden purged of its injurious sewage taint. The London drinker of Thames water may be drinking with it some remnant of the filth of Oxford.

Again, it is the general opinion of medical men that what causes the presence of organic matter in water to be poisonous is not its quantity, but its quality; and this special quality cannot, as yet, be detected by either microscopic or chemical analysis, and is indeed at present known only by its occasionally noxious effects.

The result seems to be that as a water supply the Thames, polluted with the sewage of the inhabitants of the river basin, is open in kind, if not in degree, to the same objections as well-water infiltrated by liquid from an adjoining cesspool. Well-water so tainted may appear to sight, taste, and smell to be harmless, and has been known to have been drunk for a length of time without apparent mischief; but beyond all doubt that same water is liable, under particular conditions, to become poisonous.

Oxford and Reading add largely to the pollution of the river; and Windsor and Eton, being more thoroughly drained, pour out continuously a much larger proportionate volume of sewage. The amount of pollution from Cirencester, Cricklade, and Lechlade, is apparently small, though it is impossible to estimate the amount of liquid which finds its way from cesspits into the river.

Where the sewage is drained into the river, much of the flocculent insoluble matter floats down the stream until caught by vegetation or deposited on the banks. The weeds and banks for a considerable distance thereby acquire a disgusting slimy appearance, and when exposed to the sun smell most offensively. The rest of the insoluble part of the sewage accumulates in the bed of the river at or near the point of discharge, and there lies, a mass of putrescent matter, sometimes of many feet in depth, until stirred up by boatsmen or raised in the form of the gases of putrescence, giving off an offensive exhalation, or is swept down by floods, and its corruption transferred to the banks at a lower part of the river.

The foul condition of the outlets of the sewers at Oxford and their noxious effects upon re-

* Two of the companies take their water below the Mole, but the other companies who take water from the Thames—viz, the West Middlesex, Southwark, Vauxhall, and Grand Junction—take it above the entrance of the Mole, and in any question affecting their interests in respect of the impurity of the water they supply, it is but right that this should be stated.

sidences in the vicinity are described by Professor Danbeny and Sir Benjamin Brodie.

At Windsor, Mr. Menzies says that in dry weather a nuisance occurs where the sewage is discharged into a river with a current as slow as that of the Thames. "There is a bend in the river immediately below the mouth of the sewer which has the effect of sweeping round all floating filth and lodging it against the bank; people have to be constantly employed to push it with rakes from this bank into the stream. The solid parts of the sewage float and keep on the top for about three miles down the river, until they lodge against something, and there become dissolved."

At Kingston the sewage is still discharged into the river, and although Sir W. Page Wood, the late Vice-Chancellor, refused to grant an injunction against the corporation, on the ground that a nuisance had not been proved, it needs only a reference to his judgment to prove, what is notorious, that a "nuisance" is a relative term. The Thames above Kingston was already fouled by sewage. It received the sewage of Surbiton immediately above Kingston, and about one-half of that of Kingston above the point where the new outfall was made; and merely to intercept the former by many outlets, and discharge the sewage at one outlet lower down, formed no sufficient ground for the interference of the Court. The case, therefore, properly understood, proves that the Thames was foul before rather than that it would be fouled by the additional influx of half the sewage of Kingston.

It should be stated, however, that both Kingston and Surbiton are below the intake of the waterworks companies.

Richmond, being within the midway of the Thames, has its sewage thrown back upon it, and not only its own, but that of the towns lying between it and the metropolis. In addition to this the low-water level has been somewhat permanently lowered at Richmond, and so a larger area of foreshore is exposed when the tide is out of the river. The low-water level at Richmond is now 3 ft. lower than it was formerly. This is variously accounted for, but the Commissioners are convinced that it is in consequence of the removal of old London Bridge and the constant dredging between that point and Putney, causing the stream now to run down from Teddington more quickly.

The navigation between Putney and Richmond was always a tidal one, but the period during which barges can pass and repass is now still further reduced. The channel available for boating purposes is considerably curtailed. Residences on the river's edge, once constantly accessible by water, are now at low tide cut off from the stream by an unsightly interval of offensive mud. Nuisance from sewage is greatly augmented. Not only is the stream more fouled by the volume of sewage thrown into it having increased, but the banks on either side are to a larger extent laid bare, and covered with sewage deposit.

In the manufacture of paper a large quantity of water is used in washing the fibre, nearly 250,000 gallons to each ton of paper; and in consequence of that being requisite, more than for the advantage of water-power, paper-mills are always located where there is plenty of water, and those in the Thames basin help to pollute the water of the river and its tributaries, although in a secondary degree to the pollution by sewage. There are not many paper-mills on the main stream; they are chiefly on the tributaries, where the water is purer and more suitable for the purpose.

The other special subject of inquiry was—"The effect on the drainage of inhabited houses and lands, of obstructions to the natural flow of the river caused by mills, weirs, locks, and other navigation works, and the best means of remedying any evils thence arising."

The interests connected with weirs are conflicting. Those of the owners of land adjoining the river and those of the navigation are directly antagonistic. The landowner requires the water to be kept down so as to afford an outlet for the drainage of his land; the navigation interest is to keep it up so that there may be a sufficient depth of water in every reach, from weir to weir. The owner of a fishery requires it to be penned up temporarily and then let go, the fish running with the stream being caught in "bocks" placed in the weir.

The interests of the miller agree so far with those of the navigation, that both require the head of water to be kept up in general, but the miller sometimes wants it drawn down so as to use more of the water for a short time than the ordinary flow yields. This is just before the time when he expects a flash to come down, which will again raise the mill-head quickly. This system of flashes is carried on chiefly in the upper parts of the river, where the navigable channel is defective. The water is let go from weir to weir, at intervals, to carry barges over the shoals on the wave thus caused, and the time being known approximately when this accession of water will take place, the miller for a short time previously makes too free a use of the water, and then impounds the flash. But he sometimes disagrees with the interests of the navigation in not passing on the water so soon as the barges are ready to pass on.

The water of a flash sometimes rises so high as to flood the land, and here the miller is on the side of the navigation as against the interests of the riparian proprietors. The millers again are diverse in their own respective interests. A miller increases his own head of water at the expense of increasing the height of the tail water of the mill above him, and so reducing its fall, while he sends down the water he uses, regardless whether the miller below him is ready to use it.

At the time this report was made, May, 1866, the upper part of the river, i.e., from Staines to Cricklade, was under the management of the Thames Commissioners, a very numerous and heterogeneous body, deriving their powers from Acts of Parliament, the first of which was passed in the reign of King George II., while the Conservancy Board date their powers back only to the year 1857. Since this report was made, the Thames Commissioners' powers have ceased in respect of the river, and the management is now placed in the power of the Conservancy Board from the mouth of the river to Cricklade.

The Commissioners draw attention to the fact that this report does not deal with the tributaries of the Thames, but this omission does not invalidate any of their suggestions; and had the delivery of their report been postponed till the inquiry into the state of the tributaries had been completed, it would have been too late to have been of service in any scheme providing for the immediate necessities of the upper navigation. For the same reason, the question of water supply and storage reservoirs has been left for subsequent consideration.

As to the latter subject, we may remark that it has recently been dealt with by another Royal Commission in a report of which we gave a *résumé* recently in the *Builder*.

In looking at these two reports, it seems on the whole preferable to draw a supply of water for a town from an unpolluted source, rather than set one chemist's opinion against another's as to the salubrity of the water we drink or otherwise, and try to find by a majority of testimony whether a water like that of the Thames is a fit and proper source of supply.

If sewage is to be kept out of the river, the question is, of course, what is to be done with it? and, although the "sewage difficulty" has been so long on the *tapis* , we will venture to roam to the subject of the disposal of town sewage as reported upon by the Royal Commissioners. They say that they agree with a report that had been made previously by a separate commission appointed to inquire into the best means of distributing the sewage of towns, the gist of which is that "the right way to dispose of town sewage is to apply it continuously to land, and that it is only by such application that the pollution of rivers can be avoided."

The Commissioners say that cesspits in towns corrupt the air and corrupt well-water; they are incompatible with health, and should be done away with. All attempts at deodorisation or disinfection have failed. As an instance of the beneficial use of sewage on land by irrigation Crofton is adduced (since this report was made

other places attest the propriety of this mode of disposing of sewage; Bedford and Banbury, for instance), and it is curious that the Commissioners in this report say that there were at that time, 1866, some objections raised against the practice of irrigation by Dr. Cresswell, a local practitioner, who thought that some peculiar cases of illness resembling ague that had occurred in the district near the irrigated land at Crofton, might have been caused by miasma from that land. Now, in the present year, an inquiry took place at Kingston as to the desirability or otherwise of irrigating some land in the immediate neighbourhood, and Dr. Cresswell was brought as a witness in favour of the scheme, in consequence of his having since found that he had been mistaken in his former opinion in respect of sewage irrigation, and has now satisfied himself that it is harmless when properly conducted; that it, kept constantly moving, and never allowed to stagnate.

Mr. Reynolds, who resides near the outfall of the Beddington irrigation, says he occasionally finds a smell; but, on inquiry, always finds it has been caused by neglect of the workmen to keep the sewage in motion over the proper areas of land. The same land will serve the purpose of sewage irrigation continuously. The process to the soil is one not of exhaustion, but of constant renovation. Sewage can be pumped any height and carried any distance. Its conveyance, therefore, to any point is merely a matter of cost. There is no real difficulty in dealing with sewage. On a clay soil, or wherever pumping is necessary, it is desirable to restrict the dilution. On a gravelly porous soil, on the contrary, as shown by Mr. Marriage, it is an advantage that the sewage should be largely diluted, since it is then much more readily distributed over the surface. If a farm be large enough, there is no time when some portion of the land may not be capable of receiving the sewage. The process of irrigation may go on day and night, in wet and drought, in summer and in winter. Sewage must be applied to land while fresh, not allowed to stagnate anywhere; and then there is no smell, the soil seizing upon the constituents and appropriating them to the uses of vegetation, and preventing the escape of foul gases into the atmosphere.

Filtration is not applicable to sewage. Town sewage cannot be filtered through an ordinary sand-filter, nor is it necessary in any case to attempt it. Deposition and separation of grit and flocculent matter are alone required.

The most profitable way of applying town sewage by irrigation is to sow Italian rye-grass, and to sell or use the crops fresh out for horses and cows. A field will in a year produce four or five crops, and 50 tons per acre have been grown in the year. But root crops and cereal crops are also beneficially grown with sewage. At Lodge Farm, near Barking, nearly every description of crop is grown with sewage by irrigation. For other than grass crops the sewage cannot be so freely or so often applied, and therefore a grass crop should form the staple; but sewage irrigation promotes the growth of all kinds of vegetation; and, where plenty of land is at command, any kind of crop may be grown with it. At Lodge Farm a large number of milking oows are kept on the premises, and fed with the grass out fresh.

Apropos to this subject, Mr. W. Hope writes a letter to the *Times* of August 12th last, in which he says, "Italian rye-grass is worth to a dairy-farmer, who sells his milk as milk, or who makes it into butter to be sold fresh, 15s. a ton. It is unnecessary to take into consideration farmers distant from towns, who are compelled to turn their milk into cheese, because a farmer within reach of sewage is within reach of his market."

STRIKING NOVELTIES AT SOUTH KENSINGTON.

A remarkable peculiarity distinguishes the South Kensington Museum from other exhibitions, temporary or permanent. Its wardens never sleep. Constant novelty—ever recurring change—is the law of the place. New objects of wonder, of beauty, or of luxury, are ever and anon making their appearance in the courts more especially devoted to the Loan Collection, which, when you seek to revisit, you find in their turns replaced by others of no less interest. Certain grand forms of Ancient and of Medieval art—the colossal Melpomene, the gigantic David, the majestic Moses—look down in unobscured grandeur on a constant whirl of minor but not

less beautiful objects. The *cachet* of the first Exhibition, the unrivalled and wonderful scene of 1851, seems to linger in the halls of its offspring, the Art Museum.

Since the halls and courts of Kensington were thrown open to the numerous and brilliant assembly that did honour to the invitation of the Council of the Society of Arts early in July, some striking additions have been made to the contents of the Museum. In *terra cotta* we are presented with rare and beautiful relics of the art of Magna Græcia, as well as with the results of the latest improvement of contemporary manufacture. From Japan we have one of the most perfect examples of the counterfeiting of nature which Oriental skill and untrifling patience have yet produced; and the present happy juxtaposition of two Madonnas by Raffaele—one the property of the nation, and one exhibited on loan—is an occasion such as no lover or student of the works of that most spiritual of painters should fail to seize.

Indeed, the noble room in which are displayed seven original cartoons, together with the actual tapestry representing the committal of the keys to Peter, possesses an unusual claim to the appellation of the "Raffaele Saloon." It is rich in relics of *Il Divino*. The great chalk drawing of the Transfiguration, executed from the original by John Casanova, is a work of the highest value, and of extreme beauty. It would be in many respects desirable that the magnificent tracing of the Sistina Madonna, the finest picture, beyond dispute, in the world,—could be removed from its altogether unworthy position on the staircase of the National Gallery, and hung in this saloon. Then we have the exquisite pilasters of the Loggia,—arabesques, and flowers, and birds, and human forms,—treated in a style which unites the quaintness of northern art to the love of beauty characteristic of southern climes. There are ten paintings from the Frescos in the Vatican, together with the conventionalised but marvellous scenes from Scripture history that recall the name of "Raffaele's Bible." Then we have a *Terra Cotta* sketch for the marble statue of the JONAH in the Chigi Chapel, in the Church of Santa Maria del Popolo, at Rome, a work which it is interesting to compare with the wax and clay models from the hand of Michelangelo in the court below. The Emperor of the French has contributed a magnificent specimen of the modern *Gobelins* tapestry,—a Holy Family, after that by Raffaele in the Louvre. The exquisite beauty of the face of the Madonna is such as to lead one to realise and to understand the importance which, in days when the sewing-machine was not, was attached to the instruction of high-born and delicately-nurtured women in needlework. It is more than questionable whether so perfect a representation of living female beauty could be produced, either in fresco, in oil, in water-colours, or even in crayons, as that which has been here wrought by the graceful fingers of the French women of 1855.

At a moment when questions as to the authorship and the authenticity of pictures, purchased at a very large sum, are so freely debated by the press, and even in Parliament, it is especially instructive to note the vouchers of the two Madonnas hung in this noble company. One of these, the Towseend bequest, was purchased by the Right Hon. H. Hare, at the sale of the collection of the Duc de Massa, after that officer's death. The name of Regnier, Duc de Massa (who, like his kinsman the Comte de Gronan, was one of the Buonapartie mushroom creations, and no relation of the very ancient noble family of Reigner), may be held to bear witness to the value of those works which he, like others of his fellow troopers, "collected" with such facility during the Imperial wars, in which what vulgar people call thievery was quite *selon les règles*. There was no time to manufacture originals, or to "discover" antiques for the grasping hands of the invaders; and notwithstanding all promises of restitution, much of the plunder of Italy never returned from Paris. As to the sister picture, the property of Mr. Verity, the evidence is unusually full and complete. The records of the monastery of Vallambrosa speak of the payment, in eleven installments, of the sum of sixty gold florins, together with a cask of wine, to the painter. The *Libro di Ricordanza* of the Institution mentions the picture down to the year 1808, when the monasteries were suppressed by the French, and the Madonna was "acquired" by M. de la Forêt, a gentleman in the service of the pseudo-King Joseph of Naples. This gentleman had it transferred from panel to

canvas, and it passed from the hands of his widow into those of the present owner thirty-four years ago.

The contrast between these noble works of the great Master is highly interesting and instructive. The condition of the two pictures differs in some important respects. In each the original azure of the distant landscape has faded into a sort of grey. Viewed closely, the flesh of the Vallambrosa group is somewhat—we must use the word—grubby; it asks to be cleaned, if cleaning were all that would result from the process. The Townsend Madonna appears to have undergone this peril without disaster, unless it be to the landscape. The limpid purity of the flesh tints, the perfect beauty of the left foot of the Virgin, and the grace, tender and significant, of the pose of the infant, standing on the naked right foot of his mother, are truly characteristic of Raffaele. The expression and outline of the face, however, in the children no less than in the mother, are inferior in dignity and in beauty to those of the companion group in the Vallambrosa "Holy Family" which, though less brilliant to the eye, is by far the finer picture. Even here, however, the expression of the Infant Christ is as inferior to that of the Garvagh Raffaele as if the child had been of a lower and different race. The latter is, as far as our knowledge extends, the most exquisite human infant ever painted,—for the infant in the arms of the *Madonna di Santo Sisto* is divine.

Turning to a more modern subject, we find the place of Mr. Woolner's marble statue of David Sassoon, which for some time stood under the shadow of the great Melpomene in the North-west Court, filled by a very remarkable work of art. The *soirée*, to which we before alluded as held by the Society of Arts in the courts and galleries of the Museum, gave us the opportunity of seeing this marble by artificial light; the result being, as might have been expected, a further illustration of the truth of the important canon that no work "in the round" should ever be viewed except in the position, and in the light, intended by the sculptor. With much humbler claims to rank as a high art work than those which are instinctively admitted on behalf of marble, the porcelain Palissy comes before us with the dignity of some man of the people borne to unexpected power,—a Masaniello, or a Rienzi, or a Garibaldi. Call the figure a bit of pottery, if you will,—it is of a noble *pâte*. The back is somewhat unfinished, and very probably was not intended to be exposed to view. The texture of the doublet is somewhat questionable as to the material which it represents,—the full trunk hose are slightly open to the same objection; the stockings cling to the well-turned limbs as to rich textile truth.

But as to the points on which the artist has exerted his higher skill, the verdict must be highly favourable. The face is not portrait, but idealization. The brow is thoughtful and well proportioned; the nose admirably modelled; the lips delicate and well cut. The hair and beard are good; they lack but a very little of being extremely good, and we think that little is rather the fault of the material than that of the artist.

With the hands we are less content. Not that they are not very distinctly and carefully treated, but they are not Palissy's hands. No man could have been an artist who had such rectangular fingers,—such square ends to them; such an elemental hand as is to be found only in a savage, or a man of the very rudest nature. For such a hand, too, the finger-nails are defined with too much sharpness. The sharp centering angle that marks the side of each almost fibret-shaped nail is, to our mind, inconsistent with the clumsiness of the joints. We believe that the hands have been modelled from imagination. If there ever was such a human hand, we cannot decipher what would have been the character of the owner. And what is the meaning of the sharp grip with which the finger and thumb of the left hand are squeezed together? Can it be that the great potter is represented as taking snuff? It looks horribly like it. Certainly that delicate nostril was never so misused.

Notwithstanding these minor criticisms, the statue marks an era in industrial art. The fine glazed white biscuit of which it is composed offers almost as fair a surface as marble, and is far preferable to marble when deformed by veins, or by the appearance of something like the blue mould in cheese. For our angry climate, and for any situation even partially exposed to the weather, the introduction of the material is a great boon. We must not forget that we have been applying a criticism by which not even

Luca della Robbia would be unscathed; the difficulties of the task are immense; they have been nobly grappled with, and, in the main, admirably surmounted.

A small furnace at the base of the figure bears the inscription—"C. Levy, exécuté pour la maison de Londres (the ordinary French scorning of English detail). Poyard, Vion, Baur, fait à Paris, 1869." Palissy holds in his right hand one of his well-known dishes, embossed with reptiles, although not stamped with the natural vigour of his actual work.

Turning our attention backwards from Mediaeval to ancient pottery, we read that the rare beauty of the objects occasionally found in that part of the Italian peninsula which was known by the name Magna Grecia, is but little known in this country. The Sicilian kings of the House of Bourbon, in whose blood there lingered a love of art that ever and anon broke out, now in worthy, now in grotesque activity, were so far aware of the fertility of this ancient mine as to insist with great precision on the right of the Crown (that is, of the reigning monarch) to all such treasure trove. Even in the concession of the railway from Naples to Brindisi a clause was inserted to maintain the rights of the king to all objects of antiquity found in the prosecution of the works. This in the fine terra-cotta fragments found at Canosa (the Bilingua Canosa of Horace's journey to Brundisium, where the bread is even now as gritty as it was in the days of Augustus), which Signor Castellani has lent to the South Kensington Museum, we have something rare and novel, as well as interesting from its intrinsic excellence.

The objects in question are for the most part of grey *terra-cotta*, many of them having been painted in different colours. In some the original tint seems to have been a pale red. The largest object is a globular vase or jar of the form called *assus*, with circular spout, and depressed, strap-shaped handle above. It is ornamented by masks of Medusa and other figures; and is in very fine condition. The date of the entire collection is stated at about 200 B.C.

There is another vessel, probably for mortuary purposes, with a lid ornamented with figures, of the form of a gigantic cold-cream pot, except that the lid overhangs the drum. Two curious masks, with a figure standing on each, and a strap-shaped handle behind the figure, seem to have been the covers or tops of vases or ewers of some description. Three statuettes of females, in short cloaks above the under garment, one with a hood, and all with the hair arranged in a close approach to the present fashion, are also noteworthy. Smaller figures may be regarded as *laves*, or memorials of the departed. There are also a few terra-cotta plaques, of inferior workmanship, which are said to have been found at Capua. But the chief glory of the collection is a group of male statuettes of men, horses, and other animals, engaged in a chase. The detached figures only have been preserved. They appear to have formed a sort of double band or frieze round a vase, or some similar vessel, which, if such were the case, must have been an object of no ordinary beauty and value. The fragments are much damaged, and probably were never very delicately finished, but the spirit and movement, in a word, the *go* of the entire group is wonderful. We can call to mind, at the moment, no exact parallel. That stag tosses his head as if he had been that moment transfixed by an arrow. Near him a man throws out both hands as if to exclaim, "Perito, ferito." Another figure stumbles and falls, with perfectly natural awkwardness. A man on horseback, looking over his shoulder, gives to his *monture* the air of a donkey. The bridles of the horses are adorned with the hoeses and knobs to be found in the country at the present time; a cumbersome, heavy bridle, pressing on the nose, and with no bit in the mouth. A wild hoar stands at bay viciously; and this little bit of Greek life comes out from the fragments of what was a great work of art 2,100 years ago, with a freshness as of to-day.

Interesting as is the comparison of examples of the earliest and of the latest exercise of ceramic art, a yet more striking contrast may be found, beneath the same roof, between Italian and Oriental *chefs d'œuvre*. From the ideal portraiture of the Holy Families of Raffaele, we are enabled to turn to one of the most emphatically realistic productions in the world. We refer to the Japanese painting on silk, representing a tiger crouching and clinging on a tree. It is very much to be suspected that the silk (which is adorned by a pair of very incon-

gruous bands of purple and gold arabesques above and below, though not on either side) has been dressed with a paper pulp, or in some similar way prepared for the colour. The tree on which the creature is perched, and the waterfall close by, are so Japanese as to require explanation, as they by no means convey to the English spectator the idea of either wood or water. But the marvel and miracle of the matter is the fur of the tiger. It is almost impossible to believe that it is only a representation. You find yourself blowing on the frame, and tapping the glass with your finger, to disturb the hairs. The closer the magnifying-glass is brought, the more perfect is the deception. Were it not that the artist has been entirely neglectful of shadow,—so that none is cast by the terrible, cruel paw, and so that it is impossible to distinguish the outline of the back of the head from the neck, or rather shoulder of the mighty Cat,—the portraiture would be closer than a photograph. Each individual hair of the long fur has been portrayed. The little radiating points, or "crowns," on the shoulder-blades, from around which the fur falls away in every direction, are so marked, that you note the soft undergrowth of the hair. The expression of the face of the brute, with its large eyes, like rough, uncut emeralds, its open mouth, and glistening *carassier* teeth) is such as to give the impression of the head of a snake. The tip of the tail, curling from beneath the tree, resembles pretty closely that of an ermine. Pass from a contemplation of this wonderful coat to that of one of Landseer's noble dogs, in the picture-gallery, and you find that however we may pity or affect to despise the narrow conventionalism of the Japanese artist (his name is Gauko, and his date was A.D. 1700), the coats of the animals depicted by the great English master,—and we use the expression in perfect good faith—look like more dashes of paint when viewed with the same minute attention that is again and again deceived by that matchless fur.

Certainly the close of the season may be said to be heralded at South Kensington by a very brilliant display of novelties.

ERWIN VON STEINBACH AND HIS WORKS, IN STRASBOURG, THANN, AND FREYBURG.

Strasbourg.—On arriving at Strashourg, and finding himself, for the first time, face to face with the great cathedral,—indisputably Erwin's master-work,—an art-student is involuntarily moved by a strong and yearning desire to know all, and more than all, that either record or tradition has preserved concerning the life and works of the great artist-mason; and he at once sets to work to hunt out all that can be learnt of the career and genius of the great artistic magician who, in the midst of what some have been pleased to call dark and barbarous times, was inspired, not only with the daring to conceive, but also the consummate skill to carry into practical execution, one of the most marvellous architectural dreams that ever stirred the towering fancy of a great and enthusiastic artist; a dream of exquisite combinations and marvellously intricate details, which were not destined to remain merely ideal, the "airy fabric of a vision," but to be developed by the cunning of his head and hand into a vast lace-work of indestructible stone, and to remain through the long course of centuries one of the most wonderful monuments of the daring and energetic art-spirit of the Middle Ages. It was under the influence of an active curiosity thus aroused that the materials for the present incomplete and fragmental notice of the life and works of the great Gothic artist were collected and strung together.

In endeavouring to estimate the share of glory in the production of the cathedral of Strashourg, which is the just due of Erwin of Steinbach, it becomes necessary to assess very carefully how much ought to be conceded to his predecessors and followers. Such vast works as the great Mediaeval cathedrals were in almost every instance the result of the successive labours of several generations of architects, and yet it not infrequently occurs that one great artistic name of more than ordinary celebrity absorbs all those that either followed or came before in the work; as, for instance, in the building of St. Peter's at Rome, the vast fame of Buonarroti has swallowed up nearly the whole of that which was due to Brunelleschi, Bramante,

San Gallo, Vignola, Maderno, and many others; even that of Raffaello himself among the number. Such, however, is not the case with regard to Erwin and the cathedral of Strasbourg. It is true that he had able coadjutors and still abler followers; but, after he had once taken the great work in hand, he may be said to have made it his own, and it was, in the main, in strict accordance with his designs alone that all future operations were carried forward. His master-share in the great work may be clearly traced by the characteristics of his peculiar and well-marked treatment of the Gothic style of his epoch; and it may be roundly asserted that by far the greater part of the vast structure bears the impress of the unmistakable signet which has stamped his well-defined individual style. The share of artistic merit and originality due to his predecessors and successors is equally well defined, and a careful estimate of the claims of each leaves, plainly enough, the chief glory to Erwin, and to no other.

The site of the present cathedral, now near the centre of the city, was originally occupied by a pagan temple, which Clovis is said to have converted into a Christian church about the close of the fifth century, that was greatly enlarged by Dagobert about a century later. That edifice, constructed in great part of wood, was eventually destroyed by fire, and several succeeding structures, raised upon the same site, were in their turn destroyed, either by fire or lightning, or by the ravages of war. It was not till the middle of the eleventh century that the nucleus of a building was raised, of which the present cathedral may be considered the ultimate development. At that period Bishop Werner, of Hapsburg, commenced the plan of a truly grand edifice, vast in its proportions and magnificent in the forms of its projected elevations—a structure which, had it been promptly completed, before the Germanic style of that period gave way to the development of lighter and more ornate schools of Gothic art, would have added one more to the list of great Romanesque churches, such as those which form the chief architectural glory of the Rhine country and the neighboring regions. That it was intended to be of truly colossal dimensions is seen by the proportions of the gigantic columns at the intersections of the transept, which are among the undisturbed and unaltered features of the building commenced at that epoch.

A variety of interrupting circumstances which succeeded each other with scarcely any intermission, prevented the advance of the works so ambitiously commenced by Bishop Werner, and they had, in fact, made no really hopeful advance towards completion, after two centuries of struggling but ineffective endeavour. At that period, however, an entirely new epoch was about to dawn upon the cathedral of Strasbourg. In 1276 the Bishop Conrad of Lichtenstein determined to make a great and energetic effort to complete the great episcopal church. He called upon Erwin of Steinbach, whose skill as a sculptor, was becoming celebrated all over Alsatia, to produce a grand and comprehensive plan for that purpose; and Conrad and Erwin being both men of energy and action, there was at last a fair prospect of the work being carried forward rapidly to completion, and no time was lost in taking the first steps necessary to the fulfilment of their common object. The period was precisely that at which Gothic art had attained to its greatest excellence—a truly classical period (if that term may be used) in the progress of its manifold developments. The architectonic sculpture of the period even rivalled that of the best days of Greece, after its own peculiar theories of the beautiful; for it thoroughly succeeded in fascinating the beholder by the quaint and charming *novelties* of its conception and treatment, and, perhaps, gained in that direction more than it lost by the absence of the grand idealistic graces of the Greek and Roman schools.

The main architectural features, with their subordinated enrichments of delicate ornamentation, had also reached a climax from which they afterwards declined; and the magnificent plan produced by Erwin at the command of his bishop proved him to be one of the greatest masters of his art at that great period, the final developments of which had probably owed some of their most beautiful characteristics to the special influence of his own works.

Bishop Conrad, fully appreciating the wonderful excellence and completeness of Erwin's grand design, and perceiving, at the same time, the

vast amount of labour that would be required to carry it into effect, felt that more than ordinary efforts must be resorted to for that purpose. Under these convictions, he despatched proclamations to all parts of Europe promising "indulgences" and other ecclesiastical inducements to all who should at once come forward and energetically assist in carrying the magnificent plan of Erwin of Steinbach into execution. From the chronicles of the time we learn that the appeal of the bishop was enthusiastically responded to, and that such great numbers flocked to the work under the influence of the proffered inducements, that the city of Strasbourg exhibited a most extraordinary and unwonted spectacle on the sudden assembling of a vast multitude of artists, artisans, workmen, and unskilled labourers of every description, of both high and low degree, all anxious to commence the vast undertaking. It will be seen by this statement of the chroniclers that the army of volunteers thus suddenly assembled to commence and carry forward the great work was not solely composed of skilled artisans of the various classes required, but also of vast numbers of all classes, anxious to work as common labourers in what was deemed a holy cause; and we are informed that even women and children were among the number of those assembled—each eagerly impatient to aid in the great undertaking according to his strength and capacity, utterly regardless of rank, station, age, or sex.

This multitudinous enthusiasm was, however, soon proved to have its inconveniences as well as its advantages, as may be seen by the following graphically recorded incident. When all had been prepared under the directions of Erwin for the laying of the corner stone, and the bishop himself had performed his part in the ceremonial by digging out the first spadeful of earth, several enthusiastic master-masons rushed forward at the same instant to secure the highly coveted honour of digging the second, and the two foremost being equally determined not to give way, hard words ensued, which led to hasty blows, and the weapons being heavy iron spades the contest soon terminated fatally for one of the combatants. This untoward event was regarded as a bad omen; and a great discouragement fell upon the assembled multitude; but the bishop, having announced his determination to devote nine days of continual prayer to the purification of the spot, and carried his declaration into effect, it was believed that the evil augury was removed, and the work was recommenced with undiminished spirit and determination. The accident was, indeed, turned to good account in the form of a fortuitous stimulant; for a band of priests, who were always present to incite both artist and labourer to the greatest possible amount of exertion, ingeniously compared the event which had just occurred to the story of Hiram, at the building of the temple of Solomon, who, according to the sacred records, was slain by his fellow architects, who were jealous of his superior skill. This kind of encouragement is said to have had wonderful effect, for the men belonging to the guild of masons were well versed in Scripture reading, and fully appreciated and relished the analogy thus set before them. The story of the building of the Temple of Jerusalem was, indeed, still further utilized after the same fashion, and the high rewards bestowed upon its constructors unctiously dwelt upon, especially those apocryphal ones described in the Medieval legends which in Roman Catholic countries have so closely associated themselves with the Biblical account of the building of the Temple.

Erwin was aided in his great undertaking by his sons, John and Wynkin, and also by his daughter, Sabine, whose features and figure are said to be reproduced in several of the decorative statues of female saints which enrich the decorative portions of the cathedral, and more especially in the delicately sculptured figures of the "wise virgins" in the niches of the great portal. Several of these are traditionally asserted to be her own work, for it was in the higher kinds of decorative sculpture that Sabine is said to have chiefly excelled. The general style of the extensive works undertaken by Erwin in order to carry the structure rapidly forward on its way towards completion are, naturally, stamped with the general impress of the phase of Gothic art which developed itself during the last quarter of the thirteenth century; but in general richness and infinite delicacy and refinement of detail it exceeds most other examples, and marks a decisive advance towards the more florid development of the fourteenth century, during which, in fact,

the greater part of the design was carried into execution.

In this great monument of Gothic art, not only do the lateral portals and those of the principal façade exhibit an excessive richness of design, but the whole external surface of the structure is elaborately enriched with delicate ornamentation in almost equal excess. The feature of detached columns in front of recessed portions of the work, such as windows and niches, which was one of the most charming general characteristics of the more richly decorated works of the period, is more profusely and delicately carried out at Strasbourg than in other great works of the same epoch. Erwin has, indeed, made this feature a very leading one in his system of external ornamentation, inasmuch that the vast number of detached columns, delicately slender, and combined with attendant ornamentation, might almost be compared to a profusely embroidered veil cast delicately over the entire face of the building. So delicate, indeed, is this profuse display of detached column-work, that one can scarcely understand how it should have withstood the wear and tear of time and tempest, in a severe climate, at the foot of the Vosges mountains, through a course of 600 years, with a comparatively small amount of injury. Yet this slight and almost detached work has, in fact, stood better, in many places, than the more solid portions of the building, and seem to require less renovation in the course of the careful restorations that have been in progress for several years.

The architectural critic Milizia speaks of the cathedral of Strasbourg as resembling in many respects those of Paris and Rheims, "*à un goût consistant à quello di Rheims e di Parigi*;" but the resemblance is by no means so great as might be inferred from the words of the Italian critic, its far more lofty proportions giving to it a general character very distinct from either of those well-known structures. For instance, the tops of the towers of Notre Dame are scarcely higher than the upper line of the main façade of Strasbourg, before the commencement of the upper part of the tower and steeple; the total height of the Parisian structure being about 202 ft., while the general mass of the main façade of Strasbourg is near 200 ft., and the total height of the building to the top of the steeple is 496 ft.* It is in this great elevation which removes it beyond the sphere of comparison with almost every other architectural structure in Europe; and we therefore find it occupying a prominent position in those diagrammatic compositions in which the relative heights of the greatest edifices of the world are estimated, and in which the height of Strasbourg challenges even that of the great pyramids of Egypt. It is, indeed, one of the most remarkable of the gigantic temples which the spirit of Christianity produced through the medium of the earnestness and enthusiasm of the great masonic architects of the Middle Ages. Felibien, in his "*Recueil Historique de la Vie des plus célèbres Architectes*," asserts, in his brief outline of the career of Erwin, that all the thirteenth and fourteenth century work of Strasbourg Cathedral must be attributed to the designs of that great artist, although he did not live to see the whole of his plans carried out. And Felibien is no mean authority, for although an architect of the most roccoco school of Louis XIV., at a time when Le Pautre was putting the finishing touches of his *bric-a-brac* fancies to the palace and gardens of Versailles, he had nevertheless a fine capacity for judging liberally, broadly, and critically of the architecture of all styles and ages. He was, in fact, a true cosmopolite in art, and expresses his regret, while speaking of the beauties of Strasbourg Cathedral, that he has not sufficient space at his command "*pour faire connoître avec quel art et quelle magnificence on bâtissait alors en diverses lieux d'Allemagne et en Angleterre*" while he frequently expresses great and genuine admiration of the architectural monuments erected by the Moors, which most of his contemporaries looked upon as neither more nor less than absolutely barbarous.† When the French critic goes on to speak in some detail of Strasbourg, he says, "*On ne voit guère d'édifices Gothiques plus grands ni mieux construits*," exclaiming, "*On ne saurait bien connoître la beauté de cet ouvrage sans en voir au moins le dessin*." He then enters

* Felibien states the height of the spire of Strasbourg to be 490 ft.

† Felibien's interesting work was published in 1696, and dedicated to the minister Louvois.

into many interesting particulars which have been made use of by Milizia without acknowledgment—especially those relating to the relative proportions of contemporary Gothic edifices. Milizia also appropriates the passage of the French biographer in which he states that the architect introduced his own statue among the decorative sculpture of the interior of the cathedral, describing the precise spot where the effigy of Erwin might be seen against the upper part of one of the great pilasters; from which position, on the level of the upper range of gallery-work, he appears in the attitude of taking a general survey of the interior of the building. The intelligent biographer, Felibien des Avans, who relates to us these interesting facts, was born at Chartres, and it may be that the remarkable cathedral of that city first aroused in him that general love of architecture which not only determined his choice of a profession, but at the same time developed that enthusiastic appreciation of Gothic art in particular which was so unusual in his time, both with architects and their patrons, that many most noble Gothic interiors were entirely encased in work of the fashionable Franco-Italian style of the Louis XIV. epoch; in which Vandalié process corbelles, canopies, statuettes, and tabernacle work of the most exquisite kind were ruthlessly chopped off close in order to make a smooth and convenient surface for the reception of the fashionable stone or stucco-work of the time, which was destined to form a courtly garment of white and gold, after the manner of the glittering chapel of Versailles.* Perhaps even Felibien himself may have been active in desecrations of this kind, when tempting "jobs" turned up; but however this may be, he was a genuine admirer of the great Gothic cathedrals. After describing the statue of Erwin, he goes on to state that among the more noticeable statues were the three equestrian figures of Clovis, Dagobert, and Werner of Hapsburg, the most illustrious among the successive founders and refounders of the cathedral. Such statues, as the works of Gothic art, are extremely remarkable and interesting; equestrian statues being rarely found of such considerable dimensions. These were, no doubt, subjects upon which Erwin lavished much of his own artistic labour, and were deemed the chief pieces among the sculptures of the great work in hand. It is in unusual features of this kind that the student feels the greatest interest,—comparing them, perhaps, with the equestrian statue of St. Martin above the chief entrance to the church, dedicated to that saint, at Laon, or to the celebrated life-size equestrian statue of Stephen of Hungary, supported by a great projection of corbelles against a massive group of columns in the cathedral of Bamberg; for, with the more general characteristics of Strasbourg Cathedral ordinary descriptions have already made him familiar. Among the external features, none strike the spectator more forcibly, or produce a more indelible impression upon the imagination, than the well-known exterior staircases, which, running up the angles of the towers, form a kind of perforated hexagonal turrets of the lightest and most attractive aspect, and are a peculiarly Erwinian feature, which, as will be seen, he was so well pleased with that he introduced it in subsequent works. The spire itself is also peculiar in treatment, the lower portion consisting of a series of pinnacles, rising one above another from the central cone, of acuminating stonework, until, within a certain distance of the apex, the cone itself becomes a grand central pinnacle or spire, formed of perforated work of very rich tracery. The general composition of this elaborate spire has been an object of admiration and curiosity ever since its construction, and the names of visitors of all countries are to be seen at the top of the internal staircase, more or less deeply cut in the stone, among which are those of Herder and Goethe. The final *bouton*, or finial, which crowns this lofty spire can also be reached by external climbing, the only protection being obtained by means of small projecting iron bars, which the adventurer clutches with a feeling that a tight hold is his sole chance of safety; yet many have successfully scaled this giddy eminence, and while there inhaled a bottle of Alsatian wine to the prosperity of the good city of Strasbourg.

Among other points of excellence that cannot fail to strike a visitor, notwithstanding a previous general knowledge of the main characteristics

of the structure, are the three portals of the great western façade, especially the two with the series of nearly life-size figures in the highly decorative niches, representing the "wise and foolish virgins," one of the subjects most favoured by the Gothic sculptors of Germany. In one of the niches devoted to the "foolish virgins" Satan appears in the character of the tempter, holding in his hand the typical apple. The Scriptural symbol of the serpent is most ingeniously blended, in Mediæval fashion, with the human form. As a tempter he presents a very pleasing and attractive front; but on looking to the back of the figure, the spectator perceives that its form is entirely composed of the coils of one or many serpents, the presence of which, it is supposed that his guile enables him to conceal from those on whom he is about to exercise the fascination of the tempter. The nearest of the virgins to this figure, the last among her companions remaining to be tempted, wears a self-satisfied smile as she meets the satanic advances, to the flattering blandishments of which she is evidently about to succumb, and adopt the pomps and vanities of the world which, under the symbol of the apple, are proffered to her. The features of those of her companions, who have already fallen away, are stamped with various degrees of despair and remorse, which the sculptor has expressed with wonderful art. This skillfully-wrought expression of the faces is powerfully supplemented by the apparent action imparted to the arms and hands, which is highly dramatic in character. It is true that the artistic treatment is marked by a certain stiffness inseparable from the naive realism of Gothic art, but at the same time full of a certain charm of quaint simplicity which equally belongs to it, and which modern art, in its attempts at reviving the forms and treatment of Mediæval sculpture, has signally failed to reproduce. The placid beauty of the "wise virgins" in the opposite niches, forms an exquisite contrast to the remorse-stricken forms of their fallen sisters; the quiescence of their easy positions and the expressions imparted to their features of sweet and confident repose and hope, are of the highest kind of that truly refined art which the sculptor-masons of the thirteenth century displayed in their architectonic sculpture; and in more than one of them it is probable that we may trace the face and figure of Erwin's artist-daughter Sabine.

The central entrance, though perhaps still richer, is not so interesting in its statue-sculpture; and the feature which formerly gave to it a fitting pre-eminence—namely, the superb doors of bronze, celebrated masterpieces of the sculpture of the period—are no longer in existence, having been melted down during the French Revolution, in order that they might be coined into pieces of one and two sous for the use of the republican government.

The interior of Strasbourg Cathedral, even after the most careful study of the various published descriptions, never fails to produce a striking impression on the spectator, on account of its great height, which, from the floor to the centre of the groining of the roof, is said to be 230 ft.; a height so great that the towers of Notre Dame, of Paris, or those of York Minster, might stand within this lofty interior without touching the ceiling. This enormous height has afforded the architect the opportunity of introducing the line of lofty and splendid windows which form such a noble feature above the line of the clearstory, admitting a flood of light and atmosphere to the upper part of the vast interior which produces an unrivalled effect of brilliant lightness; while beneath these spacious and magnificently traiered openings a richly contrasting effect is produced by the smaller line of windows at the back of the double arches of the clearstory. It would be idle to attempt anything like a detailed account of the general ornamentation and decorative sculpture of this well-known and often-described work; but in its profusion of remarkable features each fresh visitor finds something new to dwell upon which has been especially singled out for criticism or admiration by his predecessors. Among such special *morceaux* the writer of the present notice was especially attracted to the close examination of the exquisitely elaborated stone pulpit, which is perhaps one of the most intricately wrought pieces of delicate tabernacle work in Europe; and, although the treatment of some of the details would appear to suggest a somewhat later period for its execution than the time of Erwin, yet there can be little doubt that the design, in all its main features, and the disposition and

proportions of its details, is due to no other, although his design may have been carried into execution, and perhaps modified by some of his successors in the great work.

There is also another feature, and that a peculiarly Gothic one, which has been wrought out with more than usual richness and success in this wonderful interior, namely the corbelles and canopy-work attached to the columns for the reception and display of statuary. This device for varying the ascending lines of lofty columns was certainly a most happy thought of the Gothic architects, and is the more interesting as being entirely absent in classical architecture, in which the moderate height of the columns does not, in fact, admit of its successful introduction. In the great Gothic cathedrals, on the other hand, this device serves at once as a point of agreeable repose to the eye in measuring the enormous height of the columns, and forms at the same time a most graceful and picturesque means of furnishing the edifice with all the convenience for a gallery of sacred sculpture without trenching upon and crowding up the lower portions of the space for the accommodation of the congregation. One of the most remarkably rich examples of such displays of statuary, supported on lofty corbelles at the mid-height of the towering columns, to which they are made to appear almost necessary adjuncts by the addition of the elaborate canopy, is the series of sculptural figures, of life-size, and in fully-detached relief, which, tier above tier, cluster round a massive group of columns in the south transept, and which, in their own distinct style of form, an architectural feature fully as striking as the celebrated spiral series of marble pictures which wind round the wonderful column of Trajan from base to summit. The lower set of figures clustered round that group of columns at Strasbourg consist of the four evangelists, supported on very magnificent corbelles, the carvings of which represent, with a marvellous addition of intricate ornament, the well-known symbols of the four evangelists,—the angel, the lion, the lion, and the eagle. Above the figures are exquisitely-enriched canopies, surmounting which are four figures of angels, of remarkably fine execution, in attitudes of flying downwards, and in the act of communicating the inspired records to the authors of the Gospels. Above these is another tier of figures, the chief of which is the Saviour, descending from heaven, guarded by other angels. Such are a few of the more remarkable features of Erwin's great work, which, long before its completion, was awarded the first rank among the seven wonders of Germany.

THE NEW OPERA HOUSE, PARIS.

As all municipal buildings have almost stopped work, the New Opera remains in almost the same state that it was in a few months ago, except the principal front, which, a few days before the 15th of August, was denuded of its box-sockets, sheltering the four groups of statues at the entrances. These groups, one on each side of the doorways, are as follows: Music (by M. Guillaume); Lyric Prose (M. Jouffroy); Dance (M. Carpeaux); Lyric Tragedy (M. Perrand). Between these groups are four allegorical statues: Idyll, Cantata, Fable, and Elegy, the works of MM. Acelin, Chapus, Dubois and Vatinelle, and Falguères.

On the summit of the building, active operations are being undertaken to place the crowning statues, &c. At the angles of the façade, Lyric Poetry and the Muses occupy one; on the other are Lyric Poetry and the *Renouée*. These are due to M. Gumery. The colossal statue of Apollo, lyre in hand, has already been placed on the pediment of the great stage wall. It is by M. Aimé Millet, the artist to whom France owes the grand statue of Vercingetorix, set up in 1865 in one of the provinces. On each angle of the wall is a flying horse, or a Pegasus, by M. Lequesne. All these figures are of colossal proportions, and are executed in galvanoplastic bronze, with profuse gilding.

While the scaffolding and hoardings were up, the four fronts of the New Opera were a mystery to the Parisians, whose curiosity in matters of decoration and ornamentation is proverbial, and criticism was deemed both unwise and unfair. Now that the four fronts are thrown open to the public every one is at liberty to judge of the general external effect of the structure, especially as it is now unalterable in design.

Placing ourselves between the "refuges" in

* The writer has recently examined several interiors so treated, of which the cathedral at Wurzburg is perhaps the most notable example.

a line with the north side of the Boulevard des Capucines, we have a good view of the front elevation as far as the cast cornice-work which is the starting-line of the attic story for the rest of the building, but we see no more of the great pile. Passing to the eastern elevation, we find a totally different façade and of a style hard to be reconciled with that of the front elevation. At the rear the elevation is not devoid of boldness, differing, though it does, from any of the others. The same remarks apply to the western front. It seems that the aim of the architect has been to group together all the known styles of architecture, and to make as much use of them as he can, by disposing them conventionally.

By taking up a position, however, in the Avenue Napoleon (the new street leading from the Opera to the Palais Royal), there appears at one certain harmony of outline and details in the structure seen in perspective. It is lawful for an architect to make any two opposite façades, or building, of totally different aspect and style; but the adjacent fronts should harmonise so as to give no shock to the eye when seen in perspective. This M. Garnier seems to have understood; and the perspective lines of two adjacent sides of the quadrangular building are so conceived that the structure thus viewed seems to possess all the desired harmony, amplitude, and elegance. For instance, returning to the Avenue Napoleon, all the timidity of the low front elevation disappears; all the building rises up in its grandeur; first the cupola of the *salle*, then the terminal pediment of the stage; and the mascarons of the front correspond with the commencement of the gables of the roof of the building, above the attics.

Some cry has justly arisen against the "Dance" of M. Carpeaux on the principal façade, in which group he has given us the model, *in puris naturalibus*, of a drunken Bacchante, the attitudes and attitude of which are disgracefully impure and immoral. An official journal says that there is some rumour it will be removed,—1,500*l.* thrown away. Carpeaux's model was approved of by the Government, so that they are in fault for not having added a little drapery in time.

As to the interior decorations of the new Paris Opera-house, it is too early to criticise the work.

TENTERDEN, KENT.

A READER asks us to tell him something about "the stupid story that calls Tenterden Tower the cause of the Godwin Sands." It is a very old story, not quite so "stupid" as our over-clever correspondent seems to think, and we might refer him to the guide-books for an answer.

However, in a dozen words, the tradition is that the abbot of St. Augustine's, Canterbury, employed in building Tenterden Tower, stone that had been provided to strengthen the sea-wall of land belonging to Earl Godwin. The wall falling in consequence during a great storm, the land was submerged, and became the perilous sands of which we are speaking. The story was first told, so far as we know, by the witty and unfortunate Sir Thomas More, by the witty and "Utopia" and friend of Erasmus, and though probably a fable, is anything but "stupid."

"What great events from trifling causes flow,"—

trifling, indeed, if we could really get back to them and trace the connexion of events. A word casually uttered has set its hearer on a track that has led to a discovery of immense importance; and was there not once a great war because of the breaking of a brace-buttock that disconcerted an enemy, and prevented the completion of his speech? For want of a single nail in his horse's shoe, a man was ruined: we all know the story. And who shall say how the ruin of one man may affect the course of events? Sir Thomas More's statement, if not correct itself, includes a great and useful truth. If the building of the tower of Tenterden Church was not the cause of the Godwin sands, it might have been.

It is a fine tower, bold and lofty, that of Tenterden, Perpendicular in style and good in proportions. The church itself is partly of the thirteenth century, partly of the fourteenth and fifteenth. The nave has a paneled ceiling, and the tower arch is open, so as to show the west window. This was filled not long ago by the late Mr. William Curteis Whelan, of Heronden Hall, with a costly memorial in stained glass, by Lavers & Barrand, of his father and mother, the figures in it typifying their qualities.

By the care of Mrs. Whelan, too, a widow has been set up at the east end of the church, in memory of the late vicar.

Heronden Hall is a handsome mansion, good serviceable modern Gothic in style, designed by the late Mr. Donthorne, but recently much enlarged, the original architect sacrificing too much to a lofty open-roofed hall, certainly a striking feature. The park has in it a noble oak and the largest ash-tree in the county. No one supposed when the owner of Heronden set up the window to his parents that he was soon to follow them; but so, under the dispensation of Providence, it has been, and the Hall is now to be let for a time until recollections soften. The nearest station to London, by the South-Eastern line, is Headcorn.

Biddenden, on the way from this station to Tenterden, has a church ranging from the thirteenth to the sixteenth century in date. At Standen there is a good sixteenth-century timber house; and at Rolvenden a Perpendicular church worth looking at. These endings in "den" are noticeable. Kemble, in his "Saxons in England," gives some information on the point, which is quoted by Murray. The "dens," part of the Saxon Mark, or settlement, denoted pasture, usually for swine, and were within the unenclosed forest which surrounded the settled habitations. There was a Den Court, he says, for this part of Kent, which, up to comparatively recent times, had jurisdiction over forty-four Dens, for the most part still traceable.

SOUTH EASTERN RAILWAY MANAGEMENT,—OR OTHERWISE.

THE following communication has been addressed to the directors of the South-Eastern Railway:—

"Last Saturday morning, at 9.23, I took a first-class return ticket at Charing-cross station for Headcorn. My servant was with me to carry portmanteau to the carriage and to take back replies to a bundle of letters brought to me at the station. The officer at the gate, with a certain amount of insolence, refused, however, to let him pass with me to the carriage, although I explained the serious importance of having him by me to the last moment. The man admitted that if my servant, whose capacity was evident, had been in livery he could not have prevented him from passing through. The course pursued by your officer on this occasion caused a most serious inconvenience, and I must take the liberty of saying that, if he acted in accordance with orders, such orders are not calculated to serve the interests of passengers or company.

On the following evening, the 8.13 train, when it stopped at Headcorn, included but one first-class wagon, which was full, and I was compelled to return to London in a second-class carriage, having paid for first, amongst, as it happened, mewing infants and reeking men. At London Bridge, at Cannon-street, and at Waterloo Junction, we loitered to take up and send down passengers, and the result of this and previous proceedings was that we arrived at Charing-cross at 10.40 instead of 9.55 as advertised, or 45 minutes after time; and as my coachman had thought it necessary to wait only 40 minutes after the hour for which he had been ordered, I was left to the chance of a cab, with the consequent expenditure.

Any one of these incidents would reflect on the management of a railway: and, having been subjected to the series consecutively, I feel bound to complain gravely as well for the sake of the public as of myself."

THE EMPEROR-ARCHITECT HADRIAN.*

THE antiquaries who have espoused the cause of Hadrian v. Severus, as being the author of the great Roman wall in England, will be glad to hear that a French biographer of the imperial architect commences an enumeration of his works with mention of this great barrier. The writer in question, M. Charles Lucas, after stating that Hadrian was born in Rome, January, A.D. 76, and succeeded Trajan in 117, and enjoyed the supreme power for twenty-one years, gives a few of the opinions of ancient authors concerning his accomplishments. He was pronounced poet, painter, and architect. It is, however, only with this last capacity that M. Lucas deals. Without quoting any authority, or throwing any new

weight into the scale, he merely states as a fact, that after the year 120, to the end that he might preserve the Roman colonies in Great Britain from the incursions of the Picts and Scots, Hadrian constructed an immense wall to the south of the Cheviot mountains, which strong stone line M. Lucas erroneously believes to be the boundary between the two countries at the present day. Continuing the account, Hadrian built a temple in honour of Ploutine, the wife of Trajan, at Nîmes. At Tarracoe, he rebuilt the Temple of Augustus. He embellished Carthage, and added to it a new quarter which took his name. Between the years 123 and 125, during his first stay in Asia Minor, he reconstructed in great measure the city of Cyzique, which the Emperors Augustus and Tiberius had also attempted to improve. At Ephesus, he reared a temple to Roman Fortune; at Antioch, where he first heard of his elevation to the imperial power, he built a public bath, an aqueduct, and a temple, dedicated to Nymphs, in which water sources formed fine fountains. At Athens he built a new city, divided from the old one by an arch, which bore two inscriptions; the one looking upon the old city, of Minerva, reading, "Here is the Athens of Theseus;" and that facing the new buildings notifying "Here is the Athens of Hadrian." Among the edifices he erected here were two temples, whose magnificence we can picture from the account of Pausanias, who says that the porticoes were formed of 120 columns of Phrygian marble, that the walls were of the same marble, and the halls were decorated with sculpture, paintings, gold, and alabaster. Moreover, he restored the temple of Jupiter Olympus, in recognition of which task the Athenians placed a colossal statue of him near it. He made more than one visit to Athens, for in the second visit he consecrated some of the edifices he commenced on the first. At Corinth, too, in his day were built baths and an aqueduct; the tomb of Epaminondas was embellished by an inscription composed by the emperor; at Matinée was rebuilt a temple in honour of *Neptune Hippius*; at Hyampolis a portico which bore his name; at Abès he rebuilt the great temple of Apollo, and at Némée, the hippodrome. Visiting Egypt he built a monument to Pompey the Great. He ascended the Nile as far as Thebes, and visited the statue of Memnon with his wife, their stopping-places being handed down to posterity in inscriptions. Here he lost his favourite Antinous, to whose memory he built a city he called Antinopolis. On his return to Rome, A.D. 135, he only quitted it occasionally to reside in his celebrated villa. In the Eternal City he founded the Athenæum, restored the basilica of Neptune, the forum of Augustus, built a circus, threw a bridge over the Tiber, and placed on it the magnificent mausoleum intended for his remains. M. Lucas has not taken the trouble to collect evidences of his numerous works in other parts of Italy, although he states they exist in the form of inscriptions on many of great importance.

The villa built by Hadrian at Tivoli is described at some length, with references to the works of Ligorio, 1563; Antoinedel Re, 1611; Kircher, 1671; Contin, 1634; Piranesi, 1781; besides the more modern authorities, Bardi, Nibby, and Caletta; but a French account of it by M. Daunet is specially cited as exhaustive in an artistic point of view. This villa, or assemblage of buildings, grouping together all that the emperor had seen and wished to reproduce in the course of his travels in Greece and Egypt, it will be remembered, did not long survive its author intact, having been dismantled by Caracalla for the enrichment of his own thermae, and finally devastated by Totila, in his siege of Tivoli. About ten miles in circuit, containing a Lyceum, an academy, a Pæcile, a palace, a Serapeum of Canopus, Greek and Latin libraries, barracks for the guards, several theatres, numerous temples, fountains, a vale of Tempo, besides other landscape features in imitation of celebrated scenes, this remarkable villa provided the columns and other marbles for all the chænoles, palaces, and principal habitations in the neighbourhood; and its ruins have furnished antiquities for every museum of note in Europe. M. Lucas not inaptly couples it with mention of the South Kensington Museum and Sydenham (the credit of which last, with the usual French difficulty the matter of English titles he duly places to the account of "Sir Paxton?"), both reared within the last fifteen years for the purpose of gathering together, in like manner, though for a different purpose, specimens of the architecture and arts of the known world.

* L'Empereur-Architecte Adrien (Publius Ælius Adrianus). Étude Antiquaire par Charles Lucas, architecte. Paris: Ernest Thorin, 1869.

LONG SPAN BRIDGES.

PROFESSOR DE VOLSON WOODS gives the following tables of bridges having long spans, in the "Journal of the Franklin Institute":—

TRUSSED BRIDGES.

NAME OF BRIDGE.	Total length in feet.	No. of Spans.	Longest Span.	REMARKS.
Schaffhausen, Switzerland	365	2	193	Weisbach Mech., Vol. II., p. 253.
Trenton, N. J.	890	5	200	{ Wooden arch trussed. Haupt on Bridge Con- struction, p. 244.
Columbia, Pennsylvania	5,280	29	200	{ Burr's—destroyed during rebel invasion, 1863. { Mahon, p. 241.
Newark Dyke, Eng.	...	...	21' 1"	{ Longest span of Warren's Girder. Jour. { Frank. Inst., Vol. XXVI., 3d Series, p. 156.
Roset, Mass.	250	1	250	Mahan, Civ. Eng., p. 238.
Chepstow, Eng.	6 6	4	3 98	Queen Post—Theory of Bridges—Weak.
Niget, E. Prussia	3714	2	321	Jour. Frank. Inst., Vol. XXXIX., 3d Ser., p. 230.
Upper Schuykill	5,201	1	34 1/2	Mahan, p. 237.
Louisville Bridge, over Ohio River	...	25	370	{ Erected in 1778. Longest span of wooden truss { on record. Weisbach Mech., Vol. II., p. 53.
Wettingen, Germany	390	1	391	{ Iron lattice. Jour. Frank. Inst., Vol. { XXXIX., 3d Series, p. 229.
Dirschau, Prussia	2,383 1/2	6	307 1/2	{ Longest span trussed bridge. Official Rep., 1869. { Proposed wooden structure. Wies. Mech., { Vol. II., p. 84.
Kullenburg, Holland	...	...	615	
Derry, designed by Clans (never built)	...	1	650	

TUBULAR BRIDGES.

NAME OF BRIDGE.	Total length in feet.	No. of Spans.	Longest Span.	REMARKS.
Cowway, Eng.	...	1	490	Civ. Eng. Jour., 1848.
Brunswick, Eng.	1,513	4	400	{ Tubular Bridges by Dempster. Traité de la { Construction des Ponts Mécaniques, Pt. X. { Hunt's Mech. Mag., Vol. XXXI., p. 604; 24 { spans are each 212 feet.
Victoria, at Montreal, Canada	10,284	25	330	

ARCHED BRIDGES.

NAME OF BRIDGE.	Total length in feet.	No. of Spans.	Longest Span.	REMARKS.
Neuilly (over Seine)	more than 640	5	128	Mahan, p. 223.
Taff, South Wales	...	1	140	{ raised by rising of the crown. Woodbury on { the arch, p. 332.
London Bridge	784	5	162	Woodbury, p. 439—for railroad purposes.
Rica, Ayr	...	...	180	Jour. Frank. Inst., Vol. XXXIX., p. 231.
Chester or Gros-nover	...	...	200	Mahan, p. 228.
Great Washington Aqueduct	...	...	200	Sc. Am. 1859, p. 86. Cast iron, by Rennie.
Southwark	...	...	250	Smith's Lives of Engineers, Vol. II., p. 189.
Trizzo Adda	251	1	261	{ Longest stone arch on record. Treatise on { Bridges, Weak., Vol. I., p. 49. { Not yet built. The arch to be of steel. Rep. { by the Co. 1855.
St. Louis Bridge	1,509	3	515	To be made of iron. Weisbach, Vol. II., p. 86.
Proposed Bridge over the Thames, by Telford	...	1	600	

SUSPENSION BRIDGES.

NAME OF BRIDGE.	Total length in feet.	No. of Spans.	Longest Span.	REMARKS.
Niagara Carriage Bridge	...	1	1,264	{ Sc. Am. Vol. XX., p. 218. This bridge is { about a mile below Niagara Falls.
Cornwall (proposed to be built across the Hudson River, 42 miles above N. Y. City)	2,490	1	1,600	Jour. Frank. Inst., Vol. LVII., p. 165.
		When Built.	Span.	
Donau, at Oporto	1812	558	580	Sup. to Weale's Bridges, p. 144.
Ménil, Eng.	1825	580	580	Chain cable. Mahan's Civ. Eng., p. 255.
St. John's, N. B.	1832	612	612	Sc. Am. June 19th, 1852.
Nashville, over Cumberland	1850	656	656	{ Destroyed by Rebel Gen. Floyd, Feb., 1862. { Sc. Am. Mar. 30th, 1853.
Pesth, over Danube	1849	670	670	{ Total length, 1250. Jour. Frank. Inst., Vol. { XVII., 3rd Series, p. 300.
Niagara Railroad Bridge	1854	822	822	Jour. Frank. Inst.
Fribourg, Switzerland	1854	870	870	Ibid., Vol. XXIII., 2nd Series, p. 141.
Lexington (7 miles), below Niagara Falls	1856	1,043	1,043	Sc. Am. June 1, 1861. Blown down, Feb., 1864.
Lexington and Danville Railroad Bridge	1859	1,220	1,220	{ Jour. Frank. Inst., Vol. XXXIX., 3rd Series, { p. 230.
East River Bridge, N. Y. City	...	1,600	1,600	{ Proposed Jour. Frank. Inst., Vol. LXXXIV., { p. 213.

THE STATE AND PROGRESS OF MECHANICAL SCIENCE.

THE hearty vote of thanks which, on the motion of Mr. Ramshottom, of Crewe, was so readily awarded to Sir William Armstrong, for "the valuable and interesting address" delivered by that gentleman, as President of the Institution of Mechanical Engineers, at their recent annual meeting at Newcastle, is entitled to a sympathetic echo in our columns.

In portions of his address Sir William went over ground familiar to the readers of the *Builder*. It is a matter of just satisfaction to a public writer to find views which he has been long endeavouring to bring before the world so fully adopted, and so eloquently enforced, as in the present instance, by the President of the Mechanical Engineers.

The President referred, *apropos* of the use of steam, to that great problem of hydraulic engineering to which we have repeatedly called the

attention of our readers (*Builder*, October 28th, 1867, *et passim*), the great enigma of which M. de Lesseps is the sphynx.

The direct application of steam power to the excavation of the Suez Canal is indeed one of the most remarkable of the recent features of engineering achievements. Sir William observes that in quantity of material moved, the Suez Canal is far more vast than the Great Pyramid. Quantity, however, is a relative term. If we compare the actual amount of labour involved in the quarrying, the transport, the working, and the setting of the three millions and a half of cubic yards of solid masonry which the Great Pyramid approximately contains, with that required for the scooping out of the ninety-six millions of cubic yards estimated as the material to be removed for the sinking of the canal, the balance will incline heavily in favour of the former, notwithstanding the immense service rendered by steam to the latter work. But there is yet another feature not hinted at by the President. The

work of Soudhis has endured for some fifty-four centuries, according to the best modern calculations of dates. Having suffered the utmost violence that the caprice or the curiosity of man could inflict, it is as likely to endure for a second or for a third period of equal length, as the Nile is to continue to run through Egypt. Whether all the ingenious toil and unsparring cost of the enterprising French engineer will ever succeed in making a channel 28 ft. deep from sea to sea, and how long, if once made, this channel will last, are questions as yet entirely unanswered. The last attempt to elicit an authoritative statement, made in the House of Commons on the 2nd of August, entirely failed, as the Under-Secretary of State replied that the Foreign Office was not in the possession of any official information on the subject. In fact, Mr. Otway seemed to have no more recent guide than a report made, in the columns of the *Times* newspaper, by Mr. Fowler nearly six months ago, to which he added the statement from "other sources," that the intended depth of 26 ft. was reduced to 18 ft. As to the progress of the great experiment of the filling the basin of the Bitter Lakes, not one word of assuring information seems to have reached this country, the testimony of the last traveller (a man well fitted for forming an opinion) being in the last degree unfavourable.

From the Suez Canal, Sir William Armstrong passed to a subject very fully entered into in our columns last July, and introduced to public attention in the *Builder* of 17th August, 1867, as well as previously, that of the coal supply of the future. The additional information to be gathered from the address referred to the use of pneumatic coal-cutting engines in the Hetton Colliery, by which not only is human labour to a great extent superseded, but a supply of air, at a temperature of 7 degrees below freezing point, escapes into the mine, the influence of the expanding air that is discharged by each machine being sufficient to lower the temperature of the circulating atmosphere by one degree. The combination of pure ventilation with a supply of cool air affords a means of penetrating to greater depths than has been hitherto reached.

From the contemplation of these various and distinct portions of the field of mechanical engineering, the address passed on to that in which the President may be expected to be more especially at home,—the condition of artillery, and the present state of the ever open question of the relative strength of our means of attack and of defence. Here again we meet a subject not unfamiliar to our readers. (See *Builder* of February 3, 1866; July 27, 1867; and May 10, 1868.) The remarks upon the function of heat in increasing the projectile force of powder were such as to demand attention. By the discharge of fifty rounds in succession, a field-piece is made so hot that it cannot be touched. The actual flame contact which produces this effect is limited to the third of a second, or the 150th part of a second for each discharge. The calorific effect of the thin film of heated matter deposited in the bore at each discharge, may be set against the intermediate loss of heat by radiation. In small guns the area of absorbing surface surrounding the charge is proportionally greater than in large guns. The greater heat attained in the latter both adds directly to the explosive force of the powder, by expanding the gas, and acts indirectly by accelerating the inflammation of the powder. When the additional resistance to the expulsion of the projectile which is caused by the rifling of the barrel is taken into account, it is estimated that the pressure actually reached in guns of a large size when fired with English service powder, is not less than seventy thousand pounds on the square inch. It would be interesting to have some more distinct indication of the data which lead to so prodigious an estimate.

To resist this terrible harrowing pressure it becomes of the last importance to understand the most appropriate material, and the best method of manufacture, for a heavy gun. Krupp and Whitworth advocate the use of steel; but it is rather the hoped-for steel of the future, than any as yet produced by human hands, to which they can look with any confidence. The American Rodman gun is of cast-iron, the inside being cooled first, and the external portion of the metal being allowed to shrink upon the hardened interior; the object being to keep the metal in the interior in a state of compression, and that on the exterior in a state of tension. Sir William adheres to his opinion that coils of

welded iron, surrounding a steel tube, form the best guns. The main reason for the preference of iron is the fact, or at least the positive opinion, that steel, while possessing much greater tensile strength than wrought-iron, is less adapted to resist concussive strains.

The last point on which the address enlarged was one with which our readers are not unfamiliar. It relates to the mounting of guns, both for land and for naval service. The views which we have taken occasion to express as to the mode in which the fortifications of the future will be modified in consequence of the important invention of Capt. Moncrief were fully endorsed by Sir William Armstrong. Still more interesting was the accordance which he expressed with our opinion as to naval artillery. A mere floating gun-carriage, as small as possible, in order to carry a heavy gun, and the machinery requisite for propulsion, is that which we have indicated as the great desideratum of naval construction. Sir William not only agrees with this opinion, as theoretical, but illustrates it by the experience of the proving-bergs of the Elswick Works, which is a mere floating gun-carriage. This proving-bergs was the origin of the idea of Mr. Rendell's now well-known gun-boat *Staunch*, which is provided with steam power for propelling a twin screw, and for working a 12-ton gun. This vessel is so small as to be a very difficult mark to hit, and is, at the same time, very inexpensive. Guns of the largest size may be mounted in vessels similar to the *Staunch*, without increasing their tonnage in more than a proportionate degree.

We feel quite assured that our readers will share our own satisfaction at the reproduction, in an address which authoritatively sums up the recent progress of mechanical engineering, of so much on which we have insisted within the last three or four years. When we use the term reproduction we refer, of course, only to that community of results arrived at by different thinkers, starting from different stand-points, and advancing by different routes, which is one of the happiest triumphs of science. The lover of truth for its own sake will rather prefer that views which he advocates should be independently arrived at, than that they should be adopted on his own authority. The balance of probability inclines far more in favour of their exactitude in the former than in the latter case.

FROM PARIS.

A REPORT on the financial situation of the hospitals and asylums (*hospices*) of the French empire has just been issued by the Inspectors General of the establishments of *bienfaisance*.

On the 1st of January, 1869, there existed 1,557 hospitals and hospices, under the charge of 1,382 administrative commissions. The towns of Nancy, Rennes, and Saint-Omer have 4 establishments; Bordeaux, Valenciennes, 5; Lyons, 7; Paris, 32. Before 1790 there were 1,224 hospitals and hospices; 16 under the first empire; 53 under the restoration; 71 under Louis-Philippe; 11 under the republic; 172 under Napoleon III.; thus bringing up the number to 1,557. The number of beds available in 1847, viz., 126,142,—is now raised to 141,576; difference, 434. The towns which have the greatest number of beds in hospitals and hospices are as follows:—Paris, 18,785; Lyons, 4,176; Nantes, 2,716; and Lille, 2,188.

This document touches upon a question of importance: it is this, examples of which are daily brought before the public: the difficulties thrown in the way of the free admission of the indigent living in rural districts into hospitals; and, worse again, the insufficiency of out-door attendance on the sick at their own homes.

On the 18th inst., the works for constructing two new groups of public schools on the vast site left free by the demolition of the Grand Hospice des Petites-Ménages, were let in contract. This old building was situated at the angle of the Rues de Sèvres and de la Chaîsse, and was founded by Henri II. on the site of the ancient leper hospital called Maladrerie Saint-Germain, demolished by order of Parliament in 1544, and transferred without the precincts of Paris. With the exception of the *præaux* and shady trees nothing remains of the Hospice des Petites-Ménages now transferred to the new municipal building at Issy. There a certain number of aged married persons, one above sixty and the other not less than seventy years old, are received. In consideration of a certain sum once paid, the aged couples find there a comfortable repose for the rest of their lives.

During the excavations for a new sewer on the site of the above hospice a great number of human bones were discovered, among which were fifteen skulls. These remains were so phosphorescent that they spread terror among the men.

At the Église Saint-Vincent de Paul a new chapel dedicated to the Virgin is being constructed, at the end of the nave, behind the grand altar. M. de Niewerkerke, superintendent of fine arts, has presented to the curé of St. Vincent de Paul, at his request, the statue of the Virgin, executed by M. Carrier Belleuse, for which he gained the grand medal of honour at the Salon of 1867.

The ten marble busts of the crowned heads who have visited the Hôtel de Ville during the last ten or twelve years have been placed on marble plinths of coloured marble. They are in the gallery leading from the Salle du Trône to the grand apartments of the prefect, behind the Salon du Zodiaque, the splendid woodwork of which has been recently restored to its primitive grandeur. The busts are as follows:—Queen Victoria, Prince Albert, the Queen of Portugal, the Emperor François Joseph of Austria, the Emperor of Russia, the Sultan, Victor-Emmanuel, the King of Portugal, the King of Prussia, and the King of Bavaria.

The official statistical return of the number of persons who came to Paris to see the Exhibition of 1867 has just been published. It appears that the total number was only 682,205 persons, of whom 200,347 were strangers. Among the latter were 59,367 British, 48,865 Germans, 146 Oceanians, 27,368 Belgians, 33 Georgians, 4,289 clergymen, 4,779 persons of title, 50,335 independent proprietors, 320 jon-nalists, 115 post-masters, 222 ship-owners, 501 men of letters, 23 rabbis, 4 Cochinchinese, and 19,212 photographers! How was this found out?

Two new Jewish synagogues are being constructed in Paris, one in the Rue de la Victoire, with a front on the Rue de la Chaussée d'Antin, very vast and elevated. The second is being built in the Rue des Tournelles in the Marais, and is to be as important a building as the first; its site is a portion of that of the memorable palace of Tournelles which belonged in 1390 to the Chancellor d'Orgemont; there Leon de Lusignan, king of Armenia, lived and spent the last days of his existence in 1393. During the British occupation it was the residence of the Duke of Bedford, regent during the minority of Henry VI., about 1422. Bedford so increased and ornamented the Tournelles Palace, that, as history informs us, Charles VII., having been reinstated in the possession of Paris, preferred it for a residence to the Hôtel Saint-Paul. It was in front of the spot where the new synagogue is being built that Henri II., king of France, was mortally wounded in a tourney by the Count de Montgomery. The last vestiges of the Tournelles Palace were cleared away by order of Henri IV., to construct the quarter of the Place Royale.

In front of La Petite-Vilette, and the park of the Buttes Chaumont, the new iron bridge, of very bold design, by which the Rue de Crimée crosses the Chemin de Fer de Ceinture, has been opened for traffic. Under it, in deep cutting, pass the Chemin de Ceinture and that leading to the great cattle market of La Vilette, abattoirs, &c. This bridge is composed of several sections, one of which is in the line of the Rue de Crimée; another section unites the two portions of the Boulevard de Mexico. As was the case with the Pont de l'Avenue de Clichy, under which pass all the lines of the Ouest, the bridge carrying the Rue de Crimée was constructed without for a moment interrupting the traffic of the Chemin de Fer de Ceinture.

The new Clichy bridge over the Seine at Anvers is now open to the public; it is of cast-iron, of good design, and consists of three arches spanning the three branches of the Seine, divided by islands at that spot.

Monument at Rome Commemorative of the Coming Council.—The design submitted to the Pope by his architect, Count Vespignani, for the monument commemorative of the Council, has been approved of. This will consist simply of a column of African marble from the Emporium, raised on an hexagonal base, which will be enriched, on five of its faces, with bas-reliefs, representing five parts of the world, while the sixth face will bear the arms of the Council. The date of the opening and close of the Council. The column will be surmounted by a statue of Pius IX. pronouncing the benediction *urbis et orbis*.

THE RADCLIFFE INFIRMARY CHAPEL, OXFORD.

The Chapel of the Radcliffe Infirmary at Oxford, Mr. Blomfield, architect, has just received an interesting addition to its internal decoration, in the shape of four remarkable pictures, done by Russian monks. During a tour in Russia, in 1867, the founder of the chapel, according to the *local Journal*, visited the celebrated Monastery of Troitzka, or Holy Trinity, about forty miles from Moscow, in the midst of a wild forest. Its massive walls extend 4,500 ft. in length, are from 30 ft. to 40 ft. high, and 20 ft. thick. The building is flanked by eight towers, and forms a fortress of great strength, which has triumphantly withstood siege and assault. It contains a cathedral, ten churches, palace, university, convent, schools of art and industry, and all the requisite accommodations for its thousands of inmates. It is replete with objects of interest, and there are shrines of solid gold and silver, adorned with precious stones, frescoes, carvings, and pictures. The monks have a school of painting, from which are supplied all the pictures and decorative work for the Eastern Church in Russia. About sixty monks are constantly engaged, under the chief direction of the Monk Symeone, on the various pictures in progress, and there is besides a class entirely devoted to miniatures, which are exquisitely executed on mother of pearl, and for beauty of drawing and delicacy of colouring equal any we have in this country. There are three large apartments occupied by the artist monks and their pupils. In the first, are the novices who are instructed in drawing; in the second, the younger monks who have made some advance are initiated into the mysteries of colour; and in the third are the elder monks, proficient in their art. It was here that the four pictures which have just been placed in St. Luke's were produced. They consist of full-length figures of the Evangelists on panel, about 4 ft. 4-in. by 2 ft. They are painted, says our authority, with all the delicacy of miniatures on a golden ground, richly chased and adorned with an exquisite border, the rich colours sparingly introduced into which combine and harmonise charmingly in the general effect.

THE SPIRIT-LEVEL.

Its Invention.—He who first filled a glass bottle with a liquid, leaving a small quantity of air therein to form a bubble, then corked the bottle and laid it flat on one side, with the bubble floating against the upper part, was the unconscious inventor of the spirit-level, which is a very simple instrument in appearance, but of the utmost value, when properly made, to the astronomer, the engineer, and the builder; for when the bottle is placed horizontally, the bubble always mounts to, and rests at, its most elevated point; and the tangent to that point, when the middle or apex-point of the bubble coincides therewith, is a horizontal line; that is, a line at right angles, or perpendicular to the direction of gravity or the plumb-line passing through that point.

This was first perceived and applied, so far as is known, in France in 1666, by Melchisédec Thévenot, who was a great amateur of science and a writer of books of voyages and travels. In this respect he enriched the literature of France as much as Hakluyt enriched that of England half a century earlier. It was at Thévenot's house that the learned men who founded the Academy of Sciences of Paris met to assemble; and it was at one of their meetings that he propounded the spirit-level.

A description of the instrument, accompanied with figures, was first published in the *Journal des Savants*, Paris, November 15th, 1666, under this title:—"Machine nouvelle pour la conduite des eaux, pour les bâtiments, pour la navigation, et pour la plupart des autres arts." The instrument is there called an *air-level*; and is described as a glass tube, hermetically sealed at both ends, containing spirits of wine, which do not freeze, and a small quantity of air forming a bubble. It is stated that the instrument is capable of giving, with much exactness, the direction of the horizon, the perpendicular to the horizon, and vertical angles; and that it is easier to make, more convenient to use, and indicates a level line more readily and accurately than any other instrument. One figure represents the tube charged with liquid, and an air-bubble; a second shows it fitted, under the centre part, with a spindle dropping into a socket fixed on a staff so

as to turn in any direction, and with sights on the ends for levelling to long distances; a third represents it fixed to a square, and a fourth to a short flat bar of wood, as levels for workmen; and a fifth shows it fixed to a quadrant for navigation.

In this first publication the inventor is not named. But in a small work, called "Recueil des Voyages de M. Thévenot," Paris, 1681, there is a description of the instrument by Thévenot,* preceded by a statement that he invented it fifteen years before that time; and that he then gave a description of it to the public. This agrees with the description in the *Journal des Savants* referred to above, which no doubt was written by Thévenot himself. He also states that soon after his invention an account of it was sent to the Royal Society of London. The celebrated Dr. Hooke was then a constant attendant at the meetings of this body. By this means he became acquainted with it; and, seeing that it would be of the greatest advantage to astronomy, to navigation, to engineering, and to building, he had some excellent tubes prepared, and applied them to various instruments; and he subsequently produced the spherical spirit-level. From this circumstance the invention of the spirit-level, now in common use, has been ascribed to Hooke, but it is undoubtedly due to Thévenot. Much merit is due, however, to Hooke for aiding to perfect it, and to apply it to science. He was the best practical mechanician of his time, as is evidenced by his numerous valuable inventions. He, as well as Wren, whose name is displayed in the most prominent of red-letters on the fame-roll of British architects, were contemporary with Newton; and both Hooke and Wren were within an ace of seeing and propounding the principle of universal gravitation at the moment when the great intellect of Newton had grasped and mastered it,—dispelling for ever the mist that had obscured it.

As, however, the instrument was new, and there were difficulties in constructing it with precision, nearly a century elapsed before those difficulties were removed, and it obtained the preference it merited over the water-levels and plumb-levels then in use, as well as over those that were invented during the interval, most of which are now almost forgotten. It was first practically employed in this country in 1756 by Smeaton for levelling the foundation and courses of stones of the noble lighthouse which he designed and erected on the Eddy-stone. Thévenot's simple glass tube is now applied to nearly all the instruments used in levelling, and is the level *par excellence*.

Its Construction.—The spirit-level, as ordinarily constructed, consists of a short cylindrical glass tube, whose interior surface is, or should be, ground to a slight regular curvature lengthways, and then polished. The curvature, which is much exaggerated in the figure, is almost imperceptible in the tube, the radius being from 300 ft. to 600 ft. The tube is nearly filled with a very limpid liquid, leaving a small space occupied by an air-bubble. The open ends are then hermetically sealed by melting the glass around them with the blow-pipe.

Alcohol or sulphuric ether, whose specific gravities are respectively 792 and 715, water being 1000, are preferred for charging the tube,

because these liquids are much lighter, possess the property of fluidity in a higher degree, and are more sensitive than any others. Moreover, intense frost does not affect their fluidity—no observed degree of natural or artificial cold having ever frozen them; and they also have the property of wetting the glass more readily and completely than other liquids, owing to the greater capillary affinity subsisting between them and the glass.

If the tube's curvature were the same as the earth's curvature, the upper line or surface of the liquid would be truly level, and therefore no part of it would have a tendency to fall, or seek a lower position; nor would the bubble, which is considerably lighter than the liquid, have a tendency to rise or seek a higher one, but would remain uninflected at any part, because the action of gravity upon the surface of the liquid would be everywhere precisely equal. It is essential, therefore, that the tube should be made not only of equal bore, or perfectly cylindrical throughout, but with a uniform and sensibly convex curvature, lengthways, in order that the middle or apex-point of the bubble may rise to, and rest at, the middle or apex-point of the arc.

As, then, the bubble moves in an arc of a circle convex upwards, it may be regarded as a plummet of air, analogous to a plummet of metal or a pendulum swinging in an arc of a circle convex downwards; and the centre of gravity of the bubble is brought to rest, by the earth's attraction, in the vertical line passing through the centre of the circle in an arc of which the bubble moves, the same as the centre of gravity of the plummet or the pendulum is brought to rest, also by the earth's attraction, in the vertical line passing through the centre of the circle in an arc of which the plummet or the pendulum swings, or through the point from which they are suspended. When, therefore, the apex-point of the bubble coincides with the apex, or zero point, as it is called, of the tube, which is marked thereon, or the ends of the bubble mark equal distances therefrom, the instrument is in adjustment,—that is, the tangent to the tube at the zero point is horizontal, or at right angles to the vertical passing through that point.

Two symmetrically divided scales are usually engraved across the top surface of the tube—one on each side of the zero-point, or one from each end of the bubble when its apex-point is identical with the zero-point; so that when the bubble marks equal divisions on the scales, the tangent to the arc at the zero-point, as also a visual ray, a straight edge, or a line parallel thereto, is horizontal. When, on the contrary, one end of the tube is raised above the other, the bubble runs from the zero-point towards the elevated end, and the tangent to that point, or the visual ray, the straight edge, or the line parallel thereto, inclines upwards in one direction, and downwards in the other, from exact horizontality, while the tangent to the arc at the apex-point of the bubble, wherever situated, remains horizontal.

When, therefore, the radius of curvature of the tube is known, the scales across the tube are capable of measuring vertical angles with the same accuracy as a sector, whose radius is equal to the radius of the tube's curvature. Thus, when the apex-point of the bubble deviates from the zero-point of the tube, the value in seconds of the angle contained between the horizontal tangent to the bubble's apex-point, and the tangent to the tube's zero-point is

$$206263' \times \frac{\text{deviation of bubble,}}{\text{rad. of curv. of tube.}}$$

For example, let the bubble's deviation from the zero-point be three divisions of the scale, or $\frac{3}{10}$ of an inch, and let the tube's radius of curvature be 300 ft.; then we have $206263' \times \frac{3}{10} = 206263' \times 0.1 = 20626.3 = 34' 22'' - 65$, the value of the angle from horizontality.

The radius of curvature of the tube may be found by the formula

$$R = \frac{d}{h}$$

where R is the radius, d the deviation of the bubble, h the height traversed on a distant staff by the run of the tangent from the tube's zero-point to the bubble's apex-point, and D the horizontal distance from the bubble's apex-point to the staff. Let $d = 5$ inch, $h = 1$ inch, and $D = 600$ feet; then $R = \frac{d}{h} \times D = \frac{5}{1} \times 600 = 5 \times 600 = 3000$ feet.

Hence the longer the radius the less will be the curvature of the tube, and the more

sensible will be the bubble of any deviation of the tangent to the tube's zero-point from the horizontal; because the bubble must move over a greater length of the tube in proportion to any small elevation of either end. In delicate levels the curvature is very small, and the bubble quivers with the slightest touch or tremour; while in levels made for common use the curvature is more rapid, and the bubble is more readily brought to a stand, and remains steadier.

The volume and length of the bubble are affected by every change of temperature. The glass and the liquid both expand,—the glass very slightly, the liquid very considerably. If they expanded equally, the capacity of the tube and the volume of the liquid would be enlarged in the same proportion, and the volume and length of the bubble would remain always the same. But, as just observed, the dilatation by heat of the glass is only slight, while that of the liquid is very considerable. Hence the capacity of the liquid increases much less than the volume of the liquid, and hence the volume and length of the bubble become smaller as the volume of the liquid becomes larger. This may be verified by heating the tube; when, as the liquid receives heat and expands, the volume and length of the bubble will be seen to decrease; and also by cooling the tube, when, as the liquid parts with heat and contracts, the bubble will be seen to increase in volume and length. Alcohol expands regularly $\frac{1}{1000}$ for every degree of heat that it receives above 32°, and it contracts with the like regularity for every degree of heat that it parts with below 32°.

In common levels the tubes are used just as they leave the glass-factory. Those having an apparent uniform calibre, perceptible convex curvature lengthways, and smooth interior surface, being selected for the purpose; and after the alcohol or the ether is enclosed in sufficient quantity to form a suitable bubble, the ends are hermetically sealed. Now it is evident that if there be any irregularities in the arc against which the bubble runs, they will be imparted to the bubble,—one end of which will be broader or narrower than the other, and shorter or longer from the zero-point; and in proportion to the irregularities will the ends of the bubble be unequally distant from that point, and will the tangent thereto deviate from horizontality.

Should the bore of the tube be uneven or of irregular curvature, or should the parts on each side of the zero-point not be symmetrical, the ends of the bubble, as they augment or diminish in length by changes of temperature, would not rest exactly equidistant from the zero-point, or mark equal divisions on the scales. The tangent, however, to the zero-point would be horizontal, although the bubble would have an apparent inclination; and therefore, to bring the ends of the bubble to coincide with the equidistant divisions of the scales would be to give the tangent an inclination, and throw the instrument out of adjustment. This results more or less with all unground or defective tubes, and consequently sections plotted, estimates made of works, and works set out and regulated from levels taken or given by such tubes must be in error in proportion to their imperfection.

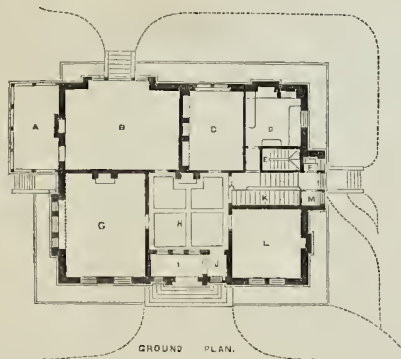
In levels of precision, especially those employed for astronomical and engineering purposes, the interior surfaces are made truly even and cylindrical, and with a sensible curvature upwards exactly to an arc of a circle, by grinding them with emery-powder and oil or water on steel cylinders, and then polishing them. This process is repeated until the bubbles prove, by turning the tubes end for end on a delicately-adjusted support, to be perfectly symmetrical, or until the ends appear at, or mark precisely equal distances from the middle or zero-point, the tangent to which is then horizontal.

Hence, in the preparation of these tubes the chief objects to be attained are, uniformity of bore, perfection of curvature, and smoothness of surface; and it should be observed, in conclusion, that whatever care and finish are bestowed on the exterior mountings of the tubes, if the interior of the tube itself be imperfect in the above respects, the tangent given by the bubble will not be horizontal. Tubes have been and can be made to indicate a point half a second of a degree from exact horizontality, or within one-hundredth of a foot of horizontality at the distance of one mile. This slight deviation is due, not to the principle of the instrument, but to mechanical defects, from which no instrument, however delicately made, is absolutely free.

JOHN PHILLIPS.

* C'est un instrument où l'air enflé avec quelque liquide fait un niveau, mais qui a ces avantages sur tous ceux dont on s'est servi jusqu'à cette heure.
1. On le trouve plus juste que les autres, car n'y a point de petite inclination qu'il ne passe connaître.
2. Il est ailleurs d'autant plus sûr pour la pratique, que les changements de l'air, le sec, l'humide, et le vent, qui altèrent les autres niveaux, ne peuvent en façon du monde compromettre sa justesse.
3. Le main de l'ouvrier n'est point occupé à le tenir lorsqu'il s'en sert.
4. L'on emploie moins de temps à s'en servir, qu'à se servir des niveaux ordinaires; ce qui est fort considérable dans une pratique que les ouvriers sont obligés de recommencer si souvent.
5. La construction en est aussi plus aisée que celle des autres niveaux. On choisit un tuyau de quelque matière transparente; un canon de verre, par exemple, dont les cotés soient parallèles; d'un diamètre qui puisse recevoir le petit doigt, et qui soit environ sept ou huit fois plus long que large. On le forme par un bout, et on y met quelque liqueur. L'esprit de vin y est fort propre, parce qu'il ne fait point de sédiment, et qu'il ne gèle jamais. On laisse du tuyau environ un peu moins de onde qu'il n'a de diamètre; on le bouche après, ou on le scelle par le lieu.
Lorsqu'on s'en sert, et qu'on l'applique sur le plan que l'on veut examiner, l'air qui y est enflé monte aussitôt vers la partie du plan la plus élevée, et demeure sans mouvement lorsque le plan est horizontal, et cela toujours avec la même justesse, quelque temps qu'il jasse.
C'est d'air qui donne l'horizon avec tant de justesse, et étouffe les différents angles, si vous y ajoutez les divisions sur lesquelles il les puisse marquer.—Thévenot, Recueil des Voyages.

"THE QUARRY," SEVENOAKS, KENT.—MR. T. E. KNIGHTLEY, ARCHITECT.



THE QUARRY, SEVENOAKS.

THE above engravings illustrate a mansion, together with the entrance-lodge, lately erected for Mr. Andrew Swanzy, in one of the most beautiful parts of Sevenoaks, Kent, on the Kippington Estate, adjoining that of Lord Amberst, and situated about four miles from Khole Park. The works were commenced in the autumn of 1867; the materials used being the Fareham red bricks and Ancaster stone.

The almost invariable practice in building a country house is to erect the offices on the ground-floor level, and lateral to the main building, and rightly so: here there are no trees to screen them. This, therefore, together with the slope of the ground (which naturally created a basement), was taken into consideration, and it was consequently determined to utilize the basement. The

house is surrounded by a broad open walled area and an earthwork terrace beyond, the latter sloping towards the grounds, which, with the new planting, prevent them from being overlooked by the windows of the servants' offices. To prevent the smell of cooking and the heat from the kitchen proving annoying, the dining-room being over the kitchen, a match-boarded false ceiling has been constructed, 10 in. below the ordinary one of plaster, and, by means of air-bricks in the external and cross walls, a current of air is maintained.

The basement contains a servants' hall, large kitchen, a scullery, dairy, store-rooms, &c. On the ground floor are dining and drawing rooms, conservatory, morning-room, and library; and on the upper floors are ten bed-rooms, two dressing-rooms, and a bath-room. Mr. T. F. Knightley was the architect, and Mr. J.

Scott the clerk of the works. The contractor employed was Mr. C. N. Foster, of Whitefriars; the carving being executed from the architect's drawings by Mr. G. Seal, of Walworth. The cost may be considered about 10,000*l*. Not having been able to obtain a scale, we must content ourselves with adding that the house is 56 ft. 6 in. in width and 45 ft. 9 in. in depth.

REFERENCES.

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| A. Conservatory. | L. Morning-room. |
| B. Drawing-room. | M. Lavatory. |
| C. Library. | N. X. Y. Z. Bed-rooms. |
| D. Butler's pantry. | O. S. Dressing-rooms. |
| E. Servants' staircase. | P. W.C. |
| F. W.C. | Q. Lobby. |
| G. Dining-room. | R. Bath-room. |
| H. Hall. | T. Corridor. |
| I. Entrance-lobby. | U. Servants' staircase. |
| K. Staircase. | W. Staircase. |

HILDESHEIM.

THE town of Hildesheim, in the lately annexed kingdom of Hanover, is situated in the centre of a province of the same name, which was, until the year 1802, the principality and bishoprick of a prince-bishop. The town is of great antiquity, and contains twelve churches, most of which are exceedingly interesting. The population is about half Catholic and half Lutheran, and the churches are divided amongst the two religions as follows:—The Cathedral, the churches of St. Godehard, St. Mary Magdalen, St. Cross, St. Maurice, and the Seminary Church, belong to the Catholics; and those of St. Andrew, St. Lambart, St. James, and St. Michael (except the crypt), belong to the Lutherans. St. Paul's Church is shut up, and St. Martin's used as a museum. The Cathedral, St. Michael's, and St. Godehard's are wonderful specimens of Romanesque church architecture; they are, perhaps, the most perfect examples of the Basilica form existing in North Europe. The Cathedral stands in a kind of close, planted with lime-trees, in the centre of which is an object which at first strikes one as being a model of Trajan's Column at Rome. This remarkable monument is about 14 ft. high, exclusive of the modern base upon which it stands, and is of bronze, ornamented with a series of figures standing upon a spiral curve, representing scenes from the life of Christ. A modern inscription on the base records the fact that this column was made by St. Bernard, Bishop of Hildesheim, in the year 1015.

The cathedral itself is externally rather a mean-looking church, and is not improved by the ground about it being 6 ft. above its original level, so that the building is buried nearly up to the window-sills. The west front has been rebuilt in a most detestable style—a kind of mixture of Romanesque and Third Pointed. There is a large porch called the Paradise before the western door, and another still more important, being nearly 60 ft. deep, leading to the north transept. Upon entering the church one is terribly disappointed, for the whole building has been thoroughly modernized during the last century, when the greatest pains seem to have been taken to convert every feature of the old church into some abomination of the "pig-tail" period. When, however, one has recovered from disgust at the heartlessness and want of taste of the architects and churchmen of the last century, much will be found to interest the architect or antiquary in the Cathedral of Hildesheim. The first objects worthy of attention are the noble bronze doors of the inner western doorway. They are entirely of bronze, 17 ft. high, and about 10 ft. wide. They are contemporary with the column on the Dom-platz, and are also the works of St. Bernard. The left valve is ornamented with eight square panels, separated by a semicircular rib, richly ornamented with foliage. Each panel contains a series of small figures representing scenes from the Old Testament: the right valve contains eight subjects from the New Testament. These little groups, although stiff and thoroughly Byzantine in character, are full of spirit, and have much more action expressed than is usual with works of such an early period.

Hung from the ceiling in the centre of the nave is the superb chandelier or corona represented in our engraving (A). It is composed of silver and copper-gilt, and is 22 ft. in diameter. It is said to have been commenced by St. Bernard; if so, however, little of his work remains, as the detail is evidently late twelfth century. The general design of this remarkable corona is intended to represent the Heavenly Jerusalem, and originally each of the towers, B and C, contained three silver statues, and each of the gates, D, one statue. These statues represented the prophets and apostles. They were, however, stolen by the soldiers of Constantine Adolphus, and so great was the violence used in tearing them down, that the corona now no longer forms a circle, but is a kind of broken horseshoe, and nearly all the towers are out of perpendicular. E, F, and G represent the perforations at the back and base of the towers. L, J, and H are patterns in enamel on various portions of the corona. The enamel is dark green, on a gold ground. I, M, and N are the arabesques upon the centre bar. K is a portion of wall showing the perforated ornament, &c.

The next object which demands our attention is the superb roof-screen. This is an early specimen of Cinque-cenio work, entirely of stone, and covered with the most

delicate and beautiful sculpture. It is divided into five compartments, from the centre of which projects a large pulpit, with a brass eagle for reading the gospel from. The side compartments contain metal gates of very elaborate design, leading into the choir, and low archways leading down to the crypt. The upper portion of the screen consists of a kind of open arcade, upon which is supported the great roof and attendant figures. In front of the screen is a small altar, and on the steps leading up to it is a singular column of red marble, bearing a crown of metalwork for holding candles, of late Romanesque work, and a modern statue. This column is said originally to have borne the statue of the Saxon god Irmen, and it is also related that Charlemagne fought two great battles to obtain possession of it. The choir is exceedingly rich in ancient furniture, and from the roof is suspended the second or smaller corona, represented in our engraving (O). The general design is very similar to the great corona; but it will be seen by the detail that it is the work of a later age, probably the fourteenth century. Like the large corona, it has lost the figures which once adorned it, and is very much beaten out of shape. Of the details, P and Q represent two of the towers; R, one of the gates; S, the back elevation of one of the towers; T, the alternate turrets; U and V, details of upper portions of towers; W, section of wall portion of corona; and X, the pendant. This corona is about 14 ft. in diameter.

On a future occasion we shall continue this description, and give other illustrations of works of art in the cathedral of Hildesheim.

GOOD WORKS IN GUATEMALA.

It may not altogether be uninteresting to many of our readers to hear something of the public improvements that are taking place in so distant a part of the world as Guatemala, the more so in consequence of the loan of 500,000, lately contracted in this country for public improvements, and the resources there are to be found in Guatemala, a wide field for emigration is opened there. With the kind assistance of Don Enagues, Palaces Chargé d'Affaires for Guatemala, and who is one of the munificent friends of the institution we are about to speak of, we are enabled to give a description of the Girls' Orphanage, which is one of the principal benevolent institutions in Guatemala, and for which a proposed chapel is about to be erected at a cost of 3,000, or more, from the designs of Mr. E. W. C. F. Schmidt, architect.

The design is Gothic in style, and well adapted to the site, and the requirements of the above establishment. The interior of the chapel, as Minton's tiles for the flooring, and the coronas, scones, and altar furniture are suitably designed to harmonise with the rest of the building. The orphanage was commenced in November, 1853, with six poor girls, and fifteen dollars collected in charity. To Donna Luz Batres de Aycinena, a member of one of the chief families in Guatemala, is due the honour that the execution of the noble idea of presenting the city with an asylum which now honours the capital, has been thus far carried out. Poor as its origin was, yet in due time it met with such support from the authorities and the public, that, in fifteen years, in November, 1868, the ceremony of removing "the orphanage, now consisting of 120 girls, from a private house to the present now building, which was purchased by the Government at a cost of 20,000 dollars, was celebrated in a manner becoming the occasion." A proof of the liberality of the citizens is given by the establishment being now capable of accommodating 300 girls. At present it is occupied by 120 orphans, maintained at a cost of 400 dollars per month.

The building is in the form of a parallelogram, 473 ft. in length, by 253 ft. in breadth, comprising twenty-eight rooms and seven quadrangles, distributed in such a way that out of 1434.6 square feet 12317.5 are occupied by the building, and by 921.3 ft. of corridors; 16192.7 by the quadrangles, and 14803.3 by the garden, which runs the whole length of the building, and separates it from the surrounding houses, and also gives light and ventilation to the classroom and dormitories. The main building runs north and south, and has on one side a corridor 440 ft. in a straight line, giving access to the temporary chapel (689 ft. in length), to two workrooms 60.6 ft. each, while situated

above is a dormitory 239.3 ft. in length. The refectory, occupying one wing, is 137.6 ft. in length, which has a terrace roof. Adjoining is the laundry. Another of the wings running east and west contains the kitchen, stores, and offices. The two wings divide the premises into three quadrangles, 4,875 ft. square. Parallel to the refectory and adjoining is a gallery covering the laundry, in which is situated the washing-tank, fitted with eleven divisions for washing the linen, containing also hot-water apparatus, hot-water baths, closets, &c., and it has a continuous stream of water running through it. In each quadrangle a fountain is erected, with running water, and in the garden there is a large bathing-tank for the use of the inmates. The establishment is partially maintained by the work of the girls, in washing, making lace, embroidery, and other needlework. Especial care is given in the training of the girls to fit them for domestic servants.

This state also contains a hospital, which relieves yearly 5,000 sick persons gratuitously. Another large public building is occupied by 100 orphan boys and 80 infirm people, amongst whom figures conspicuously an old king's messenger, who formerly rode from Guatemala to Mexico, and who is now at the advanced age of 100 years, and, with the exception of being deaf, in possession of all his faculties.

PENARD CASTLE.

THIS castle is situated in the southern part of Gower, upon the margin of Oxwich bay, and on a cliff which here forms the left bank of the brook which descends by the two deep valleys of Park-le-Braose and Ileton to reach the sea a few yards below the castle.

The bold abrupt cliff of rock occupied by the castle and indicated by its name, rises about 150 ft. above the water, and, in common with all the east or leeward side of the bay, is capped by a deep deposit of wind-blown sand. This sand, not now in progress, widens out into extensive harrows, parts of which are covered with short but fragrant herbage, while the remainder is arid sand, contrasting sharply with the fertile grass and woodland which occupy the west and more favoured side of the bay.

The castle is an oblong enclosure about 108 ft. east and west by 84 ft. north and south, at its longest and widest. The sides are flattened and the west end rounded. It is composed of a single court or ward, enclosed by a curtain-wall, upon which are the gatehouse and one mural tower.

The gatehouse is, out of proportion, large for the court, and occupies much of the east end. It is rectangular in plan, 40 ft. in front by 23 ft. deep, having two half-round towers, 15 ft. in diameter, between which is the entrance-gate, of 10 ft. opening. The sides and rear are rectangular. The entrance is beneath a flat porch, hacked by the remains of a vaulted roof, in which are the chase and usual grooves for a portcullis. On either side are loops; but the lodge doors, now broken down, were in the rear wall, towards the court. The towers have a basement and a low first and lofty second floor, with three loops outwards, 2 in. broad, and of the unusual length of 6 ft. There are also lateral doors opening upon the curtain. In the centre is the portcullis-chamber, and above it the usual battlement. The floors were of timber, and there do not appear to have been stone stairs. There are no traces of a drawbridge, though the ditch shows one to have existed. The rear parts of this gatehouse are in ruins.

There is one peculiarly about the portcullis worthy of notice. The lateral grooves, about 5 in. square, stop abruptly about 2 ft. below the spring of the arch, and 6 ft. above the sill, so that the grate must either have remained suspended at the upper level, which is improbable, or have been constructed with two shoulders, so that the lower 6 ft. would be about 8 in. narrower than the upper part, and be deprived of the steadiness given by lateral grooves. It does not appear from the ruinous state of the entrance what other defences existed besides this one portcullis. The gatehouse is not in the centre of the end, but has 12 ft. of curtain on its south wing, and 30 ft. on its north.

The curtain is about 3 ft. 6 in. thick, and 20 ft. high, within, to the rampart wall. The battlement is of unusual height, about 3 ft., so that the wall outside is at least 28 ft. high. The embrasures are far apart, the merlons being very broad, and some of them are pierced by a loop.

This curtain remains tolerably perfect from the gatehouse along the north side, and round the north-west corner. A short piece also remains on the south side. The rest is gone. On the curtain, near the north-west end, is the solar mural tower, half round, about 12 ft. diameter outside, and closed by the curtain, in which is the door. The upper floor was open in the rear, and entered from the rampart wall. There was no stone stair, and the roof was of timber.

Close east of this tower, in the curtain, is a small high recess with a segmental arch. There is a wardrobe on the inner ground level. Its place is marked the exterior by a flat pilaster buttress, in which is the shoot, opening at the foot of the wall. It is probable that a second shoot descended from the ramparts.

Outside and against the north-west corner of the curtain has been added a rectangular building, 18 ft. deep and 20 ft. broad within, with walls 3 ft. thick. This is of one floor of less height than the adjacent ramparts, and it had two large windows, one to the south and one to the west. In another position it might have been a chapel. It was probably some kind of hall, added when the country was at peace, though its position on the cliff would render it moderately secure.

The castle on the north and west faces is protected by a steep cliff. Towards the south and east was a ditch, now partially filled up by sand. There were probably lean-to dwellings round the court, in one place indicated by a loop. There are, however, no remains of buildings.

The material is the quartz conglomerate known as millstone grit. The workmanship is a very inferior rubble, only partially coursed. There is no trace of ashlar in the place, and, excepting over the entrance, probably never was any. This castle has no history, and enjoys the rare, if not singular, distinction of having been omitted in the Ordnance Survey of the district. Its general plan, and such details as remain, refer it to the reigns of Henry III. or Edward I., probably the former.

About 100 yards south-east of the castle, near other foundations, are the remains of the ancient parish church of Penard, now *Consumptum per Sabudonem*. This was composed of a nave 45 ft. by 20 ft. within, with walls 2 ft. 6 in. thick, and a chancel 20 ft. by 15 ft., in the broken-down walls of which are traceable a south window, with a deep splay and a 2 ft. opening, and a cavity for a piscina. The piers of the chancel arch were thick, with a narrow opening, and probably Norman. On the outside of the north pier is a thickening of the wall. Of the nave only the foundations remain, save of the west wall, which is tolerably perfect, showing the usual putlog bores, and the gap for a moderate west window.

Penman Church, in the adjoining parish, has in like manner been swallowed up and deserted, as here, for a later building, placed out of the reach of the sand. C.

MISTAKES IN TENDERS.

IN the Vice-Chancellor Sturt's Court, on Monday, May 24, the case of Neill v. The Midland Railway Company was tried.

This was a demurrer. The facts, as stated in the bill were these:—

In January, 1866, the Midland Railway Company advertised for tenders for the erection of certain buildings on their premises at Leeds, and at the same time they issued a form of tender with a schedule of quantities for the intended works. Shortly after the date of the advertisement, the plaintiff, James Neill, a contractor residing at Bradford, applied for a form of tender and schedule, which, having been sent to him, he filled up and returned to the defendants.

An agreement was entered into between the parties, and soon after its date the plaintiff began to erect the works, but, before their completion, disputes arose between him and the defendants as to the execution. An arrangement was then entered into that the defendants should complete so much of the works as remained unfinished, and charge the plaintiff with the cost.

The plaintiff, in filling up the schedule of quantities annexed to his tender, had inserted after each item what he considered would be the total amount of the cost in reference to the item. In calculating these amounts, however, he had inadvertently made several mistakes, some in favour of himself, and others in favour of the defendants. In one instance he had stated that

5,086 yards of concrete at 5s. per yard would amount to 55l. 19s. 2d. instead of 1,271l. 10s. In another he had set down 1,374 yards of concrete at 5s. per yard as amounting to 44l. 3s. 6d. instead of 493l. 10s. The result of these various mistakes was, that there was a balance of about 1,881l. 0s. 2d. too little.

The plaintiff alleged that the defendants' architect and engineer, or one of them, either before or immediately after the date of the agreement, knew of the mistakes; that he himself did not discover them till November 1868, when he immediately applied to the defendants to have them rectified; but this they refused to do, and insisted that he was only entitled to the sums mentioned in the agreement.

Thereupon the plaintiff filed his bill, praying that the schedule of quantities might be rectified.

In support of the demurrer it was contended that the Court had no power to relieve persons from the consequences of their own negligence. The plaintiff had offered to do the work for a certain gross sum, and on the faith of that offer his tender was accepted by the defendants. The agreement was binding on both parties. Plaintiff's allegation that the defendants' architect and engineer knew of the alleged mistakes was unsupported by evidence. They referred to *Wason v. Wareing*, 15 Beav. 161; *Story's Eq. Jur.*, s. 146, *et seq.*

The Vice-Chancellor said,—There is no pretence for this demurrer. It is the ordinary and well-established practice of this Court to grant relief in cases arising out of mistake. In the present instance the mistake is so palpable that it appears to me strange that the defendants should wish to take advantage of it. The demurrer must be overruled with costs.

A BUILDING ON CHAT MOSS.

THE 3rd Manchester Regiment of Volunteers have recently erected a new building at the shooting range, about eight miles from Manchester, and near Worsley Hall, and which is upon a portion of Chat Moss, noted as having presented one of the earliest and most formidable difficulties in railway engineering. Where the building is erected the moss was found to be 22 ft. deep, necessitating the use of piles, and upon these the pavilion was erected in the fifteenth-century style of timbered houses, of which so many good examples are found in this and the adjoining county of Chester. The style has the advantage of making the superstructure much lighter than a building constructed wholly of brick would have been. It is planned in four distinct compartments, forming quarters for officers, non-commissioned officers, members, and a cottage, with store-rooms and other conveniences, for the range-keeper, all having connexion with the bar. The officers' mess-room has an open roof exposing the timbers, and these, with other woodwork, are stained and varnished. In the upper portion of the tower are the prospect and smoking-room, and from which the officer in charge of the range has a perfect view over the ground. It is surmounted by a staff on which the flag denoting firing is hoisted. On the vergeboard of the centre gables is carved the motto adopted by the Volunteers of Great Britain—"Defence, not defiance." The building was designed and superintended by an officer of the regiment, Ensign Redford, architect.

OPENING OF A NEW IRON PROMENADE PIER AT DOUGLAS.

THE new iron promenade pier at Douglas, Isle of Man, has been opened with much *clat*, the ceremony of christening the pier being performed by Mrs. Loch, wife to his Excellency H. B. Loch, C.B., Lieutenant-Governor of the island. The pier runs up 1,000 ft. from the end of the present promenade, and at the outer end it is 35 ft. high, and in about 22 ft. of water at high water of ordinary spring tides. The pier is a light iron structure, similar in construction, but on a much smaller scale, to that at New Brighton, and is 1,000 ft. in length, and 16 ft. in width. The quantity of iron used in its construction was 301 tons, and of timber 5,000 cubic feet. It is supported by 76 piles, placed at intervals of about 14 ft. The principal entrance to the pier is from the shore road, and will be reached by means of a flight of broad stone steps, which will shortly be constructed. There are, however, two side entrances

from the promenade by means of a curved ascent. The pay-house, with entrance-gates, &c., is in the style of a Chinese pagoda. Each person passes through a turn-stile, which will only move by the pay-taker placing his foot upon a plate inside, and every time he does so it registers, thus keeping a check upon the amount of money received. The railings and posts along the pier are painted in variegated colours, and seats are placed at each side of the pier, and at the outer head a pier-head has been formed. This pier-head is 90 ft. by 40 ft., with a flight of iron steps leading down to a landing-place for small boats. There is also a refreshment-house erected here, with a flat roof, on which a band can be stationed. The engineer and contractor for the pier was Mr. John Dixon, of London; and the resident engineer by whom the work was carried out was his brother, Mr. Wayman Dixon. The contract was for 6,000l., or about 6l. per foot, and the work has been carried out for the estimate. Mr. John Dixon is engineer for the steam landing-stages in connexion with the Thames Embankment, and also for the extension of the Southport pier. The pier has been put to the tramp test, as a large body of the Douglas Artillery passed over it in military order. No shake or oscillation took place.

ARCHÆOLOGICAL EXCURSIONS.

The Sussex Archæological Society.—The annual general meeting of this society was held at West Grinstead. With the exception of the parish church, there is very little in this parish to interest the archæologist; but the park, belonging to Sir Percy Burrell, presents some beautiful scenery, and the society were favoured with delightful weather. Steyning Church was visited, and the Rev. T. R. Turner read a paper by his father, the Rev. E. Turner, of Maresfield, on the subject. Many of the visitors then went to the vicarage to see the carved wainscots there. West Grinstead Church was then examined, and the house and park, with the old oaks, under which Pope sat about the time when he wrote the "Rape of the Lock," were visited, as also the parsonage house and the ruins of Knepp Castle, a paper on which was read. After seeing the Shipley reliquary, the members proceeded to their large marquee in the grounds of Knepp, where the business meeting was held, followed by the usual repast, the Rev. E. Turner, chairman of the committee, in the chair.

Cambrian Archæological Association.—The last excursion of this Association for the season has taken place. The party went first to Laleston Church, and then to the church at Newton Nottage, Mandlam Church, Kenfig, and Margam Abbey, where they had luncheon in the oratory with the Lord Lieutenant of the County, Mr. C. R. M. Talbot, M.P. Afterwards they went through the grounds, and Mr. Freeman gave a description of the building. A business meeting was held in the evening.

Stafford Architectural and Archæological Society.—There has been an excursion of this society to Haddon Hall. In the old banquet-hall there were two papers read, the first by the president, the Rev. J. Stacey, giving an account of the early history of the place, which was followed by Mr. J. D. Webster showing its character and arrangement compared with buildings of earlier and later date. After partaking of tea at Bakewell, resolutions were passed deciding to have the *conversazione* in the autumn, and appointing a sub-committee to make the necessary arrangements.

DRAINAGE, RAILWAYS, AND SMOKE.

SIR,—Your last number is an interesting one. From page 669 I am glad to learn that they are about to erect a large water-wheel at Windsor falls (Eton side). I suggested it in the *Builder* some months ago. In the same column, Herr E. Kröjsey is mentioned as the inventor of a new system of signalling from train to train while running or standing on the line, by transmitting electricity along the iron rails. Perhaps you, sir, may remember a letter of mine on the above precisely. I hope the present promoters may carry it out.

Smoke-town fumes down trillion of blacks;
Millions of chimneys, millions of stacks;
Thousands languishing amidst the smoke,
Hundreds eye-simmer'd, and some quite coked.
One will arise and remedy bring—
Laud and reward him, genius slog;
A clear blue sky, the free air pure,
Honour to him who'll work the cure.

R. T.

ARCHITECTS' WRONGS AND RIGHTS.

"An Architect" writes.—"A builder, who is now carrying out a building from my drawings, has actually copied my plans in every respect for a client of his, and is now building the very house not a quarter of a mile from the one he is carrying out from my designs. This is very annoying. Can I not make him pay me the commission on the amount of his contract, inasmuch as the house is exactly the type of my plans?"

Some one or two of my clients have made a call for the plans and specification, and conditions of contract that I have carried out for them; and I have told them, in justice to the profession, that they belong to me, and have refused to deliver them up. Have I not acted rightly in doing so?"

By the custom of the profession, and the printed Declaration of the Royal Institute of Architects, the drawings and specification belong to the architect. As to the shameful theft of his design complained of by our correspondent, this law is in so had a state, that the case would have to be looked into very carefully before it could be said a remedy did or did not exist. If our correspondent will send the name of the builder who has given this extra publicity to his design, we will print it, so that at any rate other architects may know what builder to employ when they desire a similar result.

ARCHITECTS' CHARGES.

You will oblige by inserting the accompanying brief reports from the Dublin papers of two arbitrations recently held, in which I was concerned, and in which the rates of charge set forth in the Institute scale have been recovered. It is undoubted that in both these cases the opposition was grounded on the indecisive result of an important case tried in Dublin last year, in which two architects, one a member of the Institute, appeared and gave evidence directly contrary to the Institute scale. On this account I was given to understand that as these charges were thus publicly contradicted by members of the body who published them, they would not be recognised. However, as I was determined to bring matters to a proper issue, notwithstanding this, and the certainty that the same architects were ready to do the same again, my opponents gave way, and reluctantly consented to arbitration under orders of Court, but resorted, as a last device for evading payment, to the expedient of trumping up counter claims against me for damages for real or fancied defects in the work. These, as you will see, were soon exploded, and verdicts given in my favour for nearly the full amount in both cases, carrying with them costs against the opposite parties, amounting, in one instance, to three or four times the amount in dispute.

These cases will, I think, serve to show the mischief that the architects who gave evidence against the rates of charge now generally adopted throughout the profession have done, not only to the profession, but to the public, setting them by the ears on questions on which there ought to be no room for difference of opinion. However, though it is no satisfaction to me to have to go through these contents and to my opponents in enormous costs, it is some satisfaction to have decisions given in accordance with the principles contended for, and which I hope will form useful precedents, and prevent litigation on the same subject in future.

W. FOGERTY.

An Arbitration Room, Four Courts, Dublin, August 16-17.—Fogerty v. Hasleton & Others, Hasleton & Others v. Fogerty.—These cases, which came on for trial after sittings in the Court of Queen's Bench, and were ordered by Mr. Justice George to be referred to arbitration, have just been decided by the arbitrators, Messrs. John Shillburrp, Samuel Lloyd, and John McCarty. The first action was brought by Mr. William Fogerty, architect, of Harcourt-street, to recover his fees for the design and superintendence of the new warehouses of Messrs. Hasleton & Co., drapers, in Henry-street. His claim was for 5 per cent., on the total cost, nearly 8,000*l.*, and sundry incidental charges as per scale of the Institute of Architects. Of the 25*l.* had been tendered by the Messrs. Hasleton lodge nothing in Court, pleading that no work was done. The second action was a cross claim for damages, laid at 300*l.*, brought by Messrs. Hasleton & Co. against the architect for alleged negligence in overseeing the work, in consequence of which the builder (Mr. Michael Meade) had been allowed to execute the plastering in an improper manner. The architect denied the negligence, and filed a special defence that he had, under the contract, withheld his certificate from the builder, and employed another builder to remedy the defects, and that while doing so Messrs. Hasleton & Co. had entered into an arbitration with Mr. Meade on the subject of the alleged defects, which had not as yet been adjudicated upon; also, that he had been at

all times ready and willing to direct the remedy of said defects, but was prevented by plaintiffs; and that the said defects were not of the nature and extent alleged. After examining numerous witnesses on both sides, and viewing the premises, the arbitrators awarded to the architect in the first action the sum of 150*l.* beyond the amount paid, making 453*l.* in all. In the second action they found that Messrs. Hasleton & Co. were not entitled to any compensation from the architect. The costs of both actions and of the arbitration, to follow the award, and be paid by Messrs. Hasleton & Co.

The New Wesleyan College, Belfast.—An important arbitration was held recently at the rooms of the Church of England Young Men's Association, Belfast, between the committee of the above college and their architect, Mr. Wm. Fogerty. The result has just been declared. It appeared that the committee of the college having, in the year 1865, invited a limited number of architects to submit designs for the building, the design of Mr. Fogerty was selected, and the work has been since carried out under his direction, at a cost of about 16,000*l.* His claim amounted to somewhat over 1,000*l.*, out of which 656*l.* had been paid during the progress of the work. It was made up of the usual commission of 5 per cent., travelling expenses, and other items, in accordance with the scale of charges of the Institute of Architects. This the committee refused to recognise, alleging it to be excessive, and the matter having been referred, by mutual consent, to Sir Charles Lynton, the committee also brought forward several counter claims against the architect for alleged delay, and defects in the work. The matter having been carefully investigated, and the building examined by the arbitrator, he awarded the total sum of 840*l.* to the architect, the balance of which he is to pay him after giving credit only for the sum paid on account.

TILES.

Sir,—Will any of your correspondents inform me whether ribs (formed on the tile) to hang on the lath, or holes in the tiles for nail or pins, are best when flat fancy or tiles are used for roofing?
If holes, whether cast-iron pins, to hang over the lath, or copper or iron nails, to drive into the lath as they are used for slates, D. D.

THIN GLASS.

Sir,—I am the father of a small family, occupying a new house near Finsbury Park, rent 63*l.*, purchase 80*l.* Most of the windows are glazed in four large squares, with glass so very thin and brittle that it affords no protection from weather, and leads to daily breaking—a most expensive item on my purse. I see by your advertising pages that sheet glass is very cheap. Cannot you persuade builders to use something stronger, to save tenants' pockets (rents are dear enough) and injury, by constant knocking out, to the widow sashes? 23 Ounces.

A BUILDER'S "PLANT."

There is at present in the possession of Mr. George Terry, a builder in Clerkenwell, says the *Gardener's Magazine*,—

"a most remarkable plant, for which the owner has refused considerable sums of money. It is about the size of an ordinary gooseberry bush, and, although living and growing, bears no semblance of vitality. It has no foliage, but little pieces of flint bud out of the twigs and stems, which are likewise encircled with rings of flint at every joint. In some places the flint, which it appears, has exuded from the plant itself, causes the stems like a pipe. The plant looks black and dead, but the twigs, instead of being brittle like dead wood, are tough as leather thongs. It has been suggested that the flint, which forms so large a component of plant life, has, by some freak of nature, been extruded in this case from the natural vesicles of the plant, and developed outwardly instead. Several men from various public institutions and learned bodies have inspected this phenomenon, but without arriving at any conclusion respecting it beyond its indubitable singularity."

The "plant" here referred to is simply a large arm of black branched coral, the pieces of "flint" exuding from it are sea-shells naturally embedded in the coral; as to its living and growing, that is a mere invention, as it has not grown since it came out of the bottom of the sea. So far from its being the truth that scientific men can come to no conclusion regarding it, its true nature has been fully explained to the proprietor by competent persons; amongst others, by a gentleman attached to this paper.

The owner keeps it well watered in a large flower-pot, but he cannot be induced to turn it out, and thus expose the stump of the coral.

MARGATE CESSPOOLS.

Sir,—I have recently spent a fortnight at Margate, to which town thousands of Londoners flock, by steamboat and rail, during the summer, to endeavour to benefit their health. But, to my surprise, instead of a well-drained town, I found the most reeking cesspools abounded. In the higher part of the town, adjacent to Hawley-square, the houses have W.C.s built over these stagnating abominations; and the wonder is that fever and diarrhoea do not more prevail. Diarrhoea was the common complaint. On the road leading to the country, I was hurried to go over one of the new houses just finished, and the proprietor, who accompanied me, after

pointing out the advantage of two W.C.s, in reply to my inquiry as to drains, said, "Oh! there is a cesspool. The chalk is so porous that nothing more is required. If the contents were not emptied for twenty years, there would not be a husel of refuse!" When such is the opinion of the builders of the present day, what sanitary arrangement can be expected in the houses of the past?

Another advantage (?) pointed out was a small room in the upper part of the house without a fireplace, "which would just suit a servant!" *Punch* recently showed a sleeping-place in a cellar, but then it was only for a servant!
VISITOR.

ST. CATHERINE'S, BREDA.

The new church of St. Catharine, at Breda, in Holland, was opened with much pomp and splendour on Wednesday, August 11th. The church, which is the largest that has been erected in Holland since the Reformation, is of noble proportions, and consists of a nave, with double aisles on either side, large transepts, and a long and spacious choir. There is a central lantern, and we believe it is proposed eventually to erect towers at the west end. The whole church is vaulted, and there is a large triforium over the nave aisles, which serves the purposes of a gallery, likewise vaulted. We believe that the church is to be used as the cathedral for the Roman Catholic diocese of Breda. The architect of the building is Mr. Cuyppers, who has also just completed a fine church at Eindhoven.

CHURCH-BUILDING NEWS.

Warwick (Cumberland).—The parish church, which has during the last two or three months been partly rebuilt and repaired, has been reopened for divine service. The north wall has been rebuilt from the foundations, and the south wall from the window-sills. On the north side a vestry has been added. At the west end a temporary porch of brick has been erected. The roof has been replaced by a new one of slate and finished stone. The material used is red sandstone, which matches that of which the old walls were composed. Within, a new chancel arch has been substituted for the old one. It is formed of multi-circular pillars, with small floral designs round the capitals, and a carved stone face at each side. An old Norman arch in the west end, which has until now been closed up, has been opened out. The windows are double lancet, the glass being parti-coloured, and each window surrounded by a rim of coloured glass. The circular apse at the east end has not been interfered with, except so far as regards the replacing of the roof. It is lighted only by one small window of stained glass at the east end. The church has been re-seated with varnished open seats.

Waltham.—The church here has been re-opened. The new church has been built from plans by Mr. G. E. Street, of London. Mr. R. Silver, of Maidenhead, was the builder. The church, except the chancel and mortuary chapel, has been entirely rebuilt. The original Norman and Early English character of the building has been preserved. A north aisle has been added in addition to a tower with staircase turret at the north-west angle. The tower is opened into the church by a stone arch, and the ground ceiling under the floor of the ringing-chamber, and is lighted by a three-light window. The aisle is separated from the nave by an arcade of two arches on circular columns with carved caps. The floor throughout is laid with Godwin's tiles, and the chancel floor is laid with encaustic tiles inlaid with marble. The church is fitted with open seats of slightly stained deal, and the stalls in the chancel are of oak with carved poppy-heads. The pulpit is of stone, with Norman arches, and is circular in shape. On the south side of the chancel is the mortuary chapel, which has been restored to its original and Early Decorated character by Mr. C. Ellis, of Waltham Place. It is fitted with oak stalls and deal seats. On removing the colouring from the chancel walls, a mural painting, covering the whole of the surface, was discovered; and on taking down the walls of the old tower a group of carved alabaster figures was found embedded in the wall. These figures, it is supposed, formed part of the retables of the ancient church. Two stained-glass windows have been placed in the south aisle, in memory of the late Dr. Vanisart and his daughter. The subjects are "The Good Shepherd" and "The Sower." Mr. Wales, of

Newcastle, was the artist. There is a two-light window in the south aisle, by Mr. R. Silver, in memory of his mother and sister. The subjects are "The Baptism of Christ," and "Suffer little children to come unto Me." These windows were executed by Messrs. Clayton & Bell, and designed by Mr. Street. The whole of the iron work has been carried out by Mr. Leaver, of Maidenhead. The five bells will be recast by Messrs. Warner & Son, of London. The porch is built of old oak. The Communion cloth was designed by Mr. Street. Upwards of 1,000*l.* are still required to clear off the expenses incurred.

Uldale.—The new church at Uldale has been consecrated. It has been erected at the cost of the late Professor Cape, of Addiscombe College, Croydon, whose wishes have been carried out by Mr. Canon Cape and Miss Cape, of Peterborough. The church, which is seated on a slight eminence at the end of the village, is of the Decorated style of architecture, and is terminated by a tapering spire. It stands in a walled enclosure, and contains accommodation for 150 persons. It was built by Mr. Sheffield, after the design of Mr. Grayson. Immediately above the altar is a stained-glass window, the centre compartment of which represents the Crucifixion, while the miracles of Peter are depicted on the other portions.

Wootton Bassett.—The trustees of Sir Henry Meux, bart., at this place, have recently been granted permission by the Lord Chancellor to expend the sum of 5,000*l.* in the restoration and enlargement of the parish church. This sum will enable the architect, Mr. Street, to place painted glass in one or more of the windows. The trustees approve of the site for a burial ground, selected by the ratepayers. It is said that the owner of some property near this place, and who objected to it, has withdrawn his opposition.

Hawden.—The parish church is being restored. The cracked bells have been sent away to be recast, the whitewashed altar-screen is being restored, and the organ has been removed and repaired. The pews and woodwork have shared in the work of restoration. There is still a further sum of money required, but everything necessary to be done to complete the restoration can be accomplished for less than 1,000*l.*

Maidstone.—The temporary iron church which has for a long time done duty for this district, is shortly to be superseded by a more substantial structure. 820*l.* have already been promised by various church-building societies, and the work will be commenced as soon as sufficient funds are provided. Designs have been submitted by several architects, and one prepared by Mr. E. W. Stephens has been selected. The plan consists of nave, apse, chancel aisles, tower at angles, vestry, &c., in the Decorated style. The interior will have an arcade of five bays and range of clerestory lights, an open timber roof, chancel arch, and chancel, the latter formed for coloured decorations, both upon the roof and around the walls. The church is to be built of redstone, with Bath stone dressings, and at the south-west angle a tower, 150 ft. high, is to be erected. The tower is to be apart from the angle of the nave.

Handsworth.—The chancel of the parish church, which has suffered even more from the hands of modern church builders and renovators than from the decay of old age, is about to undergo a restoration at the hands of Messrs. M. E. Hatfield & Son, architects. The works comprise, amongst others, a new roof of the original steep pitch, of English oak, carved and moulded rafters, the removal of the modern debased windows in the south wall (which are to be reconstructed in a style conformable with the old architecture), and a new chancel arch. The stonework will be cleaned and repaired. These various alterations have a good authority in an old drawing taken about forty years ago by the late Mr. J. Hibberd, showing the then existing state of Handsworth Church; and this drawing has been a guide to the architects in the identification of various old features in the building. The works have been let to Messrs. Greenwood & Son, masons, Handsworth Woodhouse, and J. Hayball, joiner, &c., Sheffield, in the commencement has already been made, and the course of which a double sedilia of thirteenth century date, with a piscina, hagioscope, and other matters of interest, have been brought to light. The Norfolk Chantry will be opened out and seated with open oak benches, and in the chancel are to be oak choir seats and fittings of a suitable character. The church dates from early in the thirteenth century.

DISSENTING CHURCH-BUILDING NEWS.

Nottingham.—The General Baptist Chapel in Broad-street has been re-opened after having undergone considerable alteration and improvement. The seats were narrow and uncomfortable, and the gallery objectionable for several reasons. In addition to this there was no place in which to erect an organ, and these things, rather than the actual want of room, induced efforts to be made to entirely renovate and alter the building. The sum of 1,100*l.* was raised by the congregation, and the work was at once commenced, Messrs. Booker, of Short Hill, being the architects, and Messrs. Ellis & Son, the builders. The actual number of sittings has not been increased, but the area of the place has been extended. A new front in the Italian style of architecture has been built nearer the street, the seats have been improved, and the gallery made more commodious. The ventilation has also been made better. At the far end, behind the pulpit, an organ has been erected by Messrs. Lloyd & Dudgeon, on each side of which the singers are arranged. The organ will cost about 200*l.* The entire expense of the whole alterations, including the organ, will be about 1,600*l.*

Camelford.—The foundation-stone of a new Wesleyan chapel has been laid at the old Duloboy slate quarries, by Mr. John Allen, of Ivy-bridge. The present edifice which was erected in 1808, and enlarged about the year 1850, has now become too small, but it will be kept for the use of a flourishing Sunday school. The builders are Messrs. Hitchins & Pannell. The interior dimensions are, 54 ft. in length, and 31 ft. in breadth, and accommodation will be provided for about 275 persons. The entire cost is estimated to be from 600*l.* to 650*l.*

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Petworth.—A new church in Burton Park, has been opened for divine service. The church, which is dedicated to St. Anthony and St. George, is in the Transition style of architecture, and the total cost is stated at about 3,000*l.* On either side of the inner doorways there are ambreys, the porch itself being lighted by windows of peculiar construction, and fitted up with Caen stone benches or seats. In the gable of the porch are canopies, containing statues of the patron saints, and it is surmounted with a foliated cross. The slender columns that support the arcading of the nave are four in number, the arches being of Caen stone, with moulded caps and bosses. There is also a moulded arch carrying the organ-loft, and another of a similar character over the font. The chancel arch is supported by columns of polished Devonshire marble, with carved capitals representing the passion-flower and lily, and angels bearing scrolls. The roof of the nave is of Memel wood, stained and varnished. It is supported by trusses standing on corbels, the family arms and other heraldry being carved upon it. The roof of the aisle is of a richer character, with braces and wall-posts springing from moulded corbels. The chancel roof (as is the case in the Lady Chapel) is moulded and formed into panels and closely boarded. The floor and altar-space are paved with Minton's encaustic tiles. The altar was the gift of Mr. Morley, the steward of the Burton estate, the cost being 500*l.* In the recesses the sculptures represent the adoration of the Lamb, St. Anthony, and St. George. It is built of Caen stone, and was the work of Messrs. Farmer & Co., of London. The seats in the nave and aisles are open, and are made of deal stained and varnished. From the chancel and aisle are arched openings leading into the Lady Chapel, which is fitted up with altar, &c., and is lighted by a three and two-light tracery window, and finished with foliated cross on gable. Under the chancel is the family vault of the Biddalps, and above the chancel arch rises the bell-turret, containing two bells, and surmounted by a finial of brass. There is also a finial at the apex of the apse roof of chancel. The roof of the whole edifice is covered with brown tiles, and the ridges (which are from a new design) are of colour which blends with the other. The east window is composed of five lights, with a tracery head, under which are two moulded quatrefoil windows, and above a carved stone cross may be seen. The nave has three pointed and deeply moulded windows on the south side, and the aisle has two two-light on the north side, and a two-light window in the eastern end. The chancel is lighted by one double and

three single windows with tracery heads, and all the corbels spring from carved bosses. The whole of the glazing is done with Hartley's thick rolled glass, with coloured borders and panels, and devices. Hayden's patent apparatus is used to warm the building, the furnaces being under the sacristy. The walls of the edifice are faced with stone obtained from a quarry on the estate, and laid in random courses. The architect was Mr. Gilbert R. Blount, of London; and the builder Mr. John Ellis, of Chichester.

SCHOOL-BUILDING NEWS.

Newbury.—A new infant school has been erected, in connexion with the Roman Catholic Church of St. Joseph, London-road, at the cost of the Rev. F. E. Riley. The schoolroom, which is 35ft. by 17 ft. 6 in., has an open timbered roof of stained deal, plastered between the rafters. The walls are built of local red and grey bricks. The roof is slated, and has a red ridge cresting. The whole of the works have been carried out by Mr. S. Elliott, builder, from the plans and under the superintendance of Mr. J. H. Money, architect.

STAINED GLASS.

St. Peter's, Newcastle.—A memorial window of three lights has been erected in the north aisle of St. Peter's Church, Newcastle-on-Tyne, in memory of the late John Unthank and his wife. The subjects are—"The Agony in the Garden," "Christ and Mary in the Garden," and "The Three Marys at the Tomb." In the lower part types of the Great Sacrifice are introduced; viz., "Moses Lifting up the Brazen Serpent;" "Slaying the Paschal Lamb;" and "Sacrifice of Isaac." The tracery is filled with archangels. The window is of the Decorated period, and the groups are surmounted by foliated canopies. It was designed and executed by Mr. Bagley, of Newcastle. There are sixteen windows of stained glass in this church.

St. John's, Wainnesbury.—A painted window, to the memory of the late Mr. Ambrose Lees, has just been placed in this church by Mr. Thomas Bill, the people's warden. The window is similar to the others in the south aisle, is in two compartments, and intended to form a companion window to the one given by Mr. R. Williams. The subject of the new window is the declaration of the Angel to the three women at the sepulchre, telling that Christ was not there, but had risen. The artists were Messrs. Ward & Hughes, of London.

Banbury Church.—This church has been enriched by the addition of another stained-glass window, which has been placed there by the Vicar, the Rev. H. Buck, to the memory of his father. In the upper portion is the calling of St. Peter, encircled with the text, "Follow me and I will make you Fishers of Men." The centre compartment is Christ's Sermon on the Mount, with the text, "He opened his mouth and taught them." In the lower one is Christ healing the sick of the palsy,—"He said unto the sick of the palsy, Son, thy sins be forgiven thee." At the bottom, in the left-hand corner, is the crest and coat of arms of the deceased gentleman; and in the right is an ornamental circle with the words, "Via Tria, Via Tuta," centred with the monogram, "H.B." It has a border, with a groundwork of orange trees in leaf bearing. The window is from the firm of Heaton, Butler, & Bayne, of London, the same firm who did the decorations of the church and the stained-glass windows already erected.

St. Augustine's, Birmingham.—Five windows have just been completed by Messrs. Hardman & Powell for this church, at the cost of a few members of the congregation. Lightho St. Augustine's had only one stained window, erected by the firm already named, in the centre of the apse. By the additions just made the number of pictorial windows is raised to six, and the chancel lighting completed. The series which may be described as illustrating the history of our Lord, commences on the north side of the edifice, with the incident of the Agony in the Garden. In the dexter or right-hand light our Lord is represented kneeling in prayer, whilst below sleeps St. Peter, his hand on his sword, as if engaged even in dreams in defending his Divine Master. In the companion light appears the figure of the Ministering Angel, presenting the figurative cup alluded to in the prayer of our Lord. St. John and St. James are

seen peacefully sleeping below. In the second window is pictured the Procession of the Cross. In the adjoining light the three Marys and St. John are seen mournfully following the procession, whilst a number of Jews issue from the city gate in the background. The third window, illustrating the subject of the Crucifixion, is the one previously erected in the centre of the apse. The fourth window represents the sepulchre in which our Lord's body is entombed. Window number five depicts the Resurrection. In the dexter light our Lord is shown, rising in glory from the tomb, bearing aloft the cross and banner of Victory. In the adjoining division, beneath and beside the tomb in the companion light, the guards recoil in terror and amazement from the prodigy, whilst two angelic witnesses descend from above. The Ascension is the subject of the sixth and last window. In the tracery, over the third and fifth windows of the series, are inserted the symbols of the Lamb and the Pelican, typical of our Lord and His Passion. The glass employed is from the works chiefly of Messrs. Chance Brothers & Co. The designs for the whole were by Mr. John Powell, of the firm of Hardman & Powell. In addition to the works described, Messrs. Hardman are engaged upon the manufacture of a brass altar railing, which is being presented to the church by Mr. Joseph Gillett. It is understood that the congregation have provided for the completion of the chancel in all its details.

FROM SCOTLAND.

Peterhead.—A statue of Marshal Keith, who was a native of Peterhead, and became an exile along with his elder brother, Earl Marischal, in 1715, has been presented to the town by the King of Prussia, and was recently inaugurated. Keith was a Marshal in the Prussian army, and was killed in 1758 at the battle of Hochkirchen. The statue is a duplicate (in bronze, it would seem) of the marble monument erected by Frederick the Great. The pedestal is of granite, and was provided by the inhabitants of Peterhead. The statue is 7 ft. in height, and the pedestal 8 ft. The figure is in the attire of a Prussian Field-Marshal of 1758, and holds a marshal's baton in the right hand.—The foundation-stone of a new Court-house, in course of erection at Peterhead, has been formally laid with full Masonic honours, and in presence of a large concourse of spectators.

Edinburgh.—In the Civil Service estimates for the year ending 31st March, 1870, there is included a sum of 400l. for renewing the tracery and mullions of the four windows on the west side of the Parliament House. At present the windows in question are partially blocked up by buildings, but it is intended that these obstructions shall be removed. The present mullions and tracery are to be taken down, and the windows will be remodelled, so as to harmonise architecturally with the great south window put in last year. They will afford a considerable increase of light to the interior. It is hoped that ere long appropriate designs in stained glass will be introduced. The designs for the alterations now decided on are being prepared by Mr. Mathieson, of her Majesty's Board of Works, who designed the south window.—A granite fountain has just been erected at Boroughmuirhead, on the north-east entrance of Morningside. It is arranged in the pillar form, and hewn from Aberdeen granite. It comprises, besides drinking apparatus for pedestrians, a water-trough for the use of cattle, as well as a smaller one for dogs, &c. The design also includes an ornamental lamp on the top of the pillar. The fountain is the gift of Mrs. Nicol, of Hantly Lodge, Morningside.

Leith.—The Albert Dock at Leith has been completed. The new dock owes its origin to the rapid extension of the trade of Leith, more particularly within the last ten or twelve years. As the dock now stands completed, after five years of strenuous exertion, its leading features are briefly as follow:—The whole area, reclaimed from the sea measures about 36 acres, the enclosing embankment being 3,480 ft. in length. The area of water in the dock proper extends to 10½ acres; the entrance lock, at its eastern end, is 60 ft. broad by 350 ft. long; and the outer basin leading to the lock has an area of 12 acres. On the lock sill there is at high water of spring tides a depth of 26 ft. 5 in. In the dock the depth is 25 ft. 5 in.; and in the outer basin 27 ft. 5 in. The length of the dock is 1,010 ft., and its breadth 450 ft.; the extent of

quayage, 3,049 lineal ft., and the breadth of the quays, where narrowest, 200 ft. Of the whole 36 acres enclosed, the dock, lock, and outer basin together occupy 13, leaving 23 acres for wharfage, with a frontage of 1,800 ft. towards the town. At the north-west corner of the dock is provided a timber slip 80 ft. wide, with hydraulic power for unloading vessels. The lock gates are constructed of yellow pine and greenheart timber, bound together with iron bolts and straps. Each gate weighs 170 tons. By the use of the lock vessels will be enabled to leave the dock without waiting for high water. Keeping in view the construction at no distant date of the second basin designed by the engineers, provision has been made for the necessary entrance in the eastern wall of the dock just completed. The opening has been filled up with masonry. In the south-west corner similar provision has been made for establishing a connexion between the new basin and the Prince of Wales Graving Dock.

Prestonpans.—The Rev. Mr. Struthers, Prestonpans, has found a large and valuable assortment of old Scottish coins that have lain buried beneath the earth for the last three centuries. They were found a little to the east of Bankton House (Colonel Gardiner's old mansion), and are coins of the Stuarts—among others, a gold noble of the reign of Mary. Another discovery of a somewhat interesting character has just been made at Haddington, in the same neighbourhood. In the course of certain alterations made in the vicinity of the Mansion House, the workmen uncovered the foundations of what are conjectured to be the old walls of the nunnery that formerly stood here. They also came on an old well. An iron key, of a very odd pattern, was the only thing found in the well.

Janestown, Dumbartonshire.—A new Established church has been opened here. It is in the Early English style, and is from the designs of Messrs. Clark & Bell, of Glasgow. It is divided into nave and aisles, and there are three galleries, one on each side and one at the back. The interior dimensions are 60 ft. by 48 ft., and there are 800 sittings. The cost of the building is about 3,000l., which has been nearly paid by subscriptions. The spire is 130 ft. high. The large west window is divided by mullions, and has elaborate tracery. The other windows are simple lancets, with the exception of a wheel window, which rises over the pulpit, and this last, together with a lancet on each side, is filled with stained glass, while all the other windows have rough cathedral glass in quarries, with colored borderings. The whole has been executed by Messrs. Ballantine & Son, of Edinburgh.

PATENTS CONNECTED WITH BUILDING.

BUILDINGS.—*G. Woodhouse & J. G. McMillan's.* Dated July 30th, 1868.—This invention refers, first, to the construction of buildings in which arches are required. For this purpose girders stretching from bay to bay, or other such division or compartment, are employed, and from these girders arches are sprung. Another part consists in forming the arches of tiles, brick, or similar moulded article, manufactured to the required shape and dimensions, in one piece or in two pieces, with the addition, if desired, of a central portion or key. Another part consists in the use of cast-iron beams and wrought-iron girders. The beams extend across the building, and are supported by the walls with intervening pillars. Upon these beams, and below their top surface, are formed stops or brackets, for the reception of the ends of the girders, which are then secured to the beams by angle-irons.

BRICK MAKING.—*C. G. Johnson.* Dated August 4th, 1868.—A pug-mill is employed in combination with boxes or moulds, set in a circular or rectangular table, revolving or sliding reciprocatingly beneath an aperture in the pug-mill, in such manner that the boxes or moulds are, by the movement of the table, brought in succession opposite the orifice of the pug-mill, and are from it filled with clay, concrete, coal-dust, or other substance to be moulded into a block, when the moulds have been moved past the orifice of the pug-mill, the materials in the moulds are subjected to pressure by a piston which forms the bottom of the mould being forced upwards by its lower end coming against an incline or cam surface, whilst the top of the mould is at this time covered over with a lid or plate. The bricks or blocks are subsequently discharged from the moulds by cams or levers,

and are removed, it may be, either by hand or by appliances to push them off the table on to a creeper.

PUMPS.—*E. Edwards.* Dated August 6th, 1868.—This invention consists in making pumps with flexible rings instead of pistons or plungers, and flexible discs or plates for valves. For ordinary lift pumps a tube is formed, the upper part of which is expanded into a cup shape, and has a flange at the top. Upon this tube another cup, having a corresponding flange, is fastened. In the upper part of the lower tube, and in a recess just below the cup, a horizontal plate, perforated with holes, is placed, which forms the seat of a flexible valve; a bar is fitted, having a perforation through it of sufficient length and depth to allow a disc of flexible material to be passed through it, which disc, being held down by the bar, but allowed to bend up on each side of it, forms a watertight valve opening upwards.

BUILDING CONCRETE WALLS.—*J. Tall.* Dated 21st August, 1868.—The object of this invention is to dispense with angle or corner pieces, and also with the upright parting pieces, to which the long panels of the apparatus are attached, and also to simplify the fastenings, whereby the several parts of the apparatus are connected together, and further to construct the panels in such a manner that they may be lengthened or shortened as may be required to suit circumstances. This is accomplished by fixing the panels by means of bolts passing through tubes; the corners are composed of plates fastened to the panels in a similar manner.

SASHES.—*J. Sawyer.* Dated 20th August, 1868. Window sashes are constructed with rebated joints at the part where two sashes meet together when shut for the purposes of better excluding the air, rain, and wind. The window sashes have metal plates with teeth or cogs on one side thereof, or are formed with indentations or slots, forming racks. These racks are of the same length as the height of the sashes, and are let into grooves, or rebated in the sides or edges thereof flush therewith, or they may form projections therefor for the purpose of hanging or suspending the window sashes.

ARTIFICIAL FUEL.—*W. H. Crispin.* Dated 5th September, 1868.—The fuel is formed by taking about 1 ton of coal in a pulverized state, and adding thereto about 6 or 7 per cent. by weight of pitch, the same having been previously dissolved in about an equal weight of creosote or "heavy" oil resulting from the distillation of coal-tar, or in any hydrocarbon fluid or fluids possessing similar solvent powers. The coal and pitch having been thus combined, about 3 per cent. by weight of lime, and 3 per cent. of chloride of sodium (common salt) are added.

PRESERVING SUBMERGED IRON STRUCTURES.—*H. J. Turnbull.* Dated 14th September, 1868.—In order to prevent the oxidation of the iron it is covered with a composition, consisting of gutta-percha and resin dissolved in combination with pine varnish. The surface of the metal is first cleaned and prepared, and the composition is mixed and applied in the following manner. The surface of the iron is, first, to be made clean by the application of muriatic or other acid brought to a proper consistency by the addition of ivory black and pine varnish. This mixture is then applied with a brush, and after being left upon the iron for a few hours, it must be scraped or washed off with water in which a little soda is dissolved. When the surface of the metal thus prepared has become dry, the anti-oxidising composition is applied. The anti-fouling composition, for preventing the adhesion of barnacles and marine vegetation to the surface of iron or other submerged material, is made by dissolving four ounces of phosphorus in 10 ounces of bisulphuret of carbon, and 2 ounces of absolute vegetable naphtha spirit. Then 2 pounds of shellac and 2 ounces of gum benzoin are dissolved in absolute vegetable naphtha spirit, bisulphuret of carbon, or other solvent, to the consistency of thick paint, and the solution of phosphorus is added thereto.

MANUFACTURE OF GASFITTINGS.—*E. Sarjeant.* Dated September 15th, 1868.—This consists in connecting or joining together the parts of the gasfittings by the process of casting in metal or chill moulds.

FASTENINGS.—*F. F. Greenwood.* Dated September 16th, 1868.—The patentee combines the frame of the buckles with the frame or box of a lock, so that the whole forms one piece. Beyond, and raised above that part of the buckle which receives the free end of the tongue when closed down, he forms a bow-shaped bar or loop; or he makes a hole in that part of the buckle to

receive the tongue at pleasure, and he hinges the base of the tongue upon the bolt of the lock. When the bolt tongue is discharged from the lock he thrusts the free end under the bow-shaped bar. The protrusion and withdrawal of the bolt tongue may be accomplished either by the use of a separate key or by means of the mechanism of the lock handle itself.

FIRE-GRATES.—*G. B. Sharpe.* Dated September 16th, 1868.—The grate or fire-holder is made of bars of iron bent into a semicircular or other form, and the ends of these bars are riveted on to two upright pieces of iron. The bottom of the grate consists of bars riveted on to the lowest semicircular side bar. The ends of the top and bottom semicircular bar project beyond the upright pieces, and are bent down so as to form hooks, which fit into iron eyes secured by and fixed in or upon the fixed back of the grate.

COMBUSTION OF LIQUID FUEL.—*J. H. Johnson.* A communication, dated 15th September, 1868.—This invention consists in burning liquid fuel directly, and without any admixture of steam or water, upon a peculiar grate disposed either vertically at an angle or horizontally. When horizontally disposed, the liquid fuel is impelled or caused to flow over the surface of the grate by pressure. It flows in a number of small streams along the face of the several grate bars, which are grooved or channelled longitudinally for that purpose, and having connected to them at their upper ends small liquid fuel supply pipes. These several supply pipes are fed from a regulator above, which receives the liquid through pipes, and a stop-cock in connexion with a tank or reservoir situate at a higher level. The air for supporting combustion enters between the grate bars as in the ordinary furnace grates. The furnace chamber may either be composed of fire-clay or surrounded with water spaces, and fire-brick deflecting arches or bridges may be disposed therein as found requisite.

HOT-WATER APPARATUS.—*F. Dyer.* Dated 19th September, 1868.—This invention consists, first, in the use of the tubular fire-back made of malleable iron or other metal, cast in one piece from tubes crossed, or cast, or wrought in any other way, or constructed of pipes or tubes of any form or shape, and of any metal. Secondly, in the manner of connecting the tubular fire-brick with the hot-water cylinder. Thirdly, in the application and use of a return pipe with ball-valve inserted to prevent the upward flow of water in the return pipe. Fourthly, in the method or mode of connexions, by which all parts of a dwelling-house or other building can be supplied with hot water by the use of a hot-water cylinder, reservoir, or tank placed near the kitchen fire and in connexion with the tubular fire-back.

DOOR HANDLE.—*W. R. Lake.* A communication, dated 9th November, 1868.—This consists chiefly in the employment of a spring setting into a ratchet cut on the knob spindle. This spring is fitted in a chamber formed in the spindle aperture of the knob or handle, and ratchet teeth are formed on one side of the spindle at one or both ends, a longitudinal aperture being formed or left at that part of the spindle in which the said teeth are cut, in order to permit of the spring being forced out of the teeth when the handle or knob is required to be placed nearer the end or withdrawn from the spindle. A small hole is formed in the shoulder of the knob or handle, and near the working or loose end of the spring, to permit of the insertion of a braidawl or other simple instrument that will pass through the aperture or slot, and press against the said loose end of the spring, in order to force the latter from the teeth, and thereby release the said knob.

DISTRIBUTING SEWAGE WATER.—*O. G. Abbott.* Dated 10th November, 1868.—The centre portion of the apparatus consists of two lightly-constructed wheels capable of revolving upon a perforated tube, which constitutes the axle. The ends of the tube project from the wheels, and are provided with flanges, for the purpose of connecting additional perforated tubes thereto, and by means of which the range of the apparatus can be extended as desired, such additional perforated tubes being supported at their extremities by wheels, each of which revolves upon a short hollow axle, the same being loose and flanged on each side of the nave. The axle of the central portion of the apparatus is furnished with projecting bars, from which strengthening ropes of wire or other suitable material may be extended to the extremities of the additional tubes, for the purpose of keeping

them in position, such ropes being tightened by means of any suitable contrivance.

WALL PAINTINGS.—*G. E. Brownan.* A Communication, dated November 12th, 1868.—This consists in producing or effecting the painting or coloring upon metallic foil, by preference tin-foil. The inventor takes thin tin-foil, which possesses great flexibility; he spreads it upon a hard, smooth surface, such as glass, taking care to damp the glass, in order to facilitate the spreading and retention of the foil. The foil thus spread constitutes a very smooth surface, on which he paints or colours in oil, either plain or ornamental, as on walls or wainscots. The inventor now allows the colour to dry, and varnishes it. This portable painting, when removed from the glass with its lining tin, is ready to be applied in a house or otherwise.

Books Received.

Picturesque Examples of Old English Churches and Cottages from Sketches in Sussex and adjoining Counties. By WILLIAM YOUNG, Architect. S. Birbeck, Birmingham, 1869.

WHETHER the brilliant cover of this book, with the title "Picturesque Architecture" upon it, induced unreasonable expectations, or however it may be, we are forced to confess to a certain amount of disappointment with reference to it. It is, in fact, a collection of pen-and-ink sketches, thirty in all, of a number of buildings for the most part thoroughly well known, and more precisely delineated elsewhere. Several of the sketches are clever and pleasing; but what Mr. Young can find to admire in the frightful Thatched Cottage, Isle of Wight (pl. 21), or in the lumbering West End of Radpole Church, Dorset (12), we are at a loss to conceive. We speak thus candidly with less hesitation as the author informs us in his preface "that the first edition was nearly all sold when the work was no more than half done."

Every proper endeavor has been made to render the names appended to the views illegible.

Dictionary of Scientific Terms. By P. AUSTIN NUTTALL, LL.D. Strahan & Co., 1869.

At a time when scientific and technical education is so much needed, the issue of a dictionary of terms in use in the practical sciences is timely, and cannot but be useful; more especially a good one as this seems to be; although, no doubt, within the limits of it there are not a few omissions. Nevertheless, great pains seem to have been taken to render it as complete as possible, considering these limits. The work is preceded by a useful introduction to the classification and study of the sciences.

Report of the Metropolitan Board of Works, 1868-9. Waterlow & Sons, Printers.

THIS last annual report of the Metropolitan Board is not so voluminous as some previous reports have been.

Under the head of Utilization of the Sewage, the Board state their regret that the Metropolitan Sewage and Essex Reclamation Company, who had formed a portion of the culvert to convey the sewage to Maplin on the Essex coast, "have not been able to continue the works;" and the Board gives no hope of any immediate resumption of these works, or of anything to supersede them; except that under the head of South Side of the Thames they say that they trust that the "postponement of the question (as to the nutilization of the sewage on both sides of the river) will be only temporary, and that a revival of enterprise and the re-establishment of more favourable financial conditions will enable the subject to be successfully dealt with at some future period."

It is said, as to the Thames Embankments:—
"In reference to the Thames Embankment (North), the Board have before them the question of forming a subway under the Embankment roadway to the Westminster Steamboat Pier, in continuation of the one now in course of construction under Bridge-street, for access from the Houses of Parliament to the Metropolitan District Railway Station and the intended footway on the land side of the Embankment. The formation of the roadway still remains in abeyance, pending the completion of the works of the Metropolitan District Railway, which would materially interfere with and obstruct the traffic of the thoroughfare; but arrangements have been made for the construction, when the proper time arrives, of the entire roadway from Westminster to Blackfriars, the work being included in the contract for that portion of the Embankment east of the Temple Gardens, now being executed."

With regard to the Southern Embankment, the report says:—

"At the present time the whole of the river wall is complete, and the dam, with the exception of about 150 ft., has been removed. The Westminster Landing, Stairs, the dock entrances, and other incidental works, are either already finished or fast approaching completion. A footway, 200 ft. wide, extending from Westminster Bridge to Lambeth Church, has been open to the public since the 1st of May, 1868. About 8½ acres of the ground of the Embankment westward from Westminster Bridge has been purchased by the governors of St. Thomas's Hospital for the purposes of the new hospital, the construction of which is now being proceeded with. The amount of the contract for the Southern Embankment is 308,000*l.*, and the value of the works executed up to the present time is 238,000*l.*"

As regards the ventilation of sewers, the report states that the Board have hitherto not been able to adopt any mode of dealing with it sufficiently sure and practicable to enable them to apply it generally throughout the metropolis. The subject is now under the consideration of a committee of the Board.

VARIORUM.

"Van Nostrand's Eclectic Engineering Magazine. Selected from home and foreign Engineering Serials. New York: D. Van Nostrand, Murray-street." Several monthly numbers of this magazine, including No. 8 (vol. 1) for August, 1869, are before us. Being selected from standard sources, including English ones, such as the *Engineer*, the *Builder*, *Scientific Opinion*, and various others, the work, of course contains much useful matter, but we have little regard for "eclectic" publications, which, without either leave or payment, appropriate matter, right and left, for which respectable journals have incurred considerable outlay.—"The Fresh and Salt Water Aquarium," by the Rev. J. G. Wood. This little volume, by the well-known author of "Common Objects of the Country and Seashore," is full of interesting and curious matter, and forms a competent guide to those who wish to form aquariums for fish and shell-fish, sea and fresh water reptiles, and insects.

Miscellaneous.

Report on Health of St. Marylebone.—The annual report of Dr. Whitmore, the medical officer of health for the parish of St. Marylebone, has been issued in a printed form. On the subject of sanitary work, the report says:—"2,413 houses and 131 mews and stables were inspected, 9,298 ft. of new pipe-drain were laid down to supply the place of old and defective brick drains, 616 houses were wholly or partially cleaned, and 1,695 other houses underwent sanitary improvement in various ways; 1,841 yards were cleaned, repaved, and limewashed, and a water supply was laid on to 589 closets. By comparing these with the returns of previous years, it will be seen that the sanitary work of last year greatly exceeded that of every other: this is satisfactory as showing commendable activity on the part of the sanitary inspectors, and eminently so if considered in connexion with the reduced death-rate, to which this work, it may fairly be assumed, has materially contributed." But a very large portion of such sanitary work is but of very transient benefit, owing to the filthy and destructive habits of many of the destitute poor; with them there is an ever-recurring necessity for such work, and nothing short of the most unremitting care and vigilance will suffice to maintain, even at its present standard, the health of our local poor.

Proposed Abattoir for Bath.—The local officer of health, Mr. Barter, has made a report to the City Act Committee, in which he protests in the strongest terms against any plan of rebuilding the old slaughter-houses in Boatstall and Lott Lanes. He further recommends the local authorities to avail themselves of the opportunity which now offers for constructing an abattoir for the general use of the city, and thus removing from the centre of the town and the midst of residences, buildings which cannot fail to be an offence to the immediate neighbourhood in which they stand, as well as a detriment to public health.

Burns's Pew.—The pew formerly in St. Michael's Church, Duffries, used by Burns, and bearing in one part the initials R. B., cut with a knife by his own hand, was bought in at a sale recently, the reserved price 5*l.* not being reached in the bidding! What bad the auctioneer been about?

Inside an Abyssinian Church.—Dr. Blanc, in an interesting series of papers on Abyssinia in the *British Medical Journal*, writes:—Except in the province of Tigre, all the churches in Abyssinia are circular, the walls generally of mud and stone, the roof conical, and thickly covered with straw. The church proper consists of three concentric circles:—the first, a kind of verandah, wherein the congregation assembled; the second, the church itself, where the priests perform their ceremonies; the third, or innermost circle, the "Holy of Holies," containing the sacred vase and the "Tabot," a small square piece of wood, having on one side a cross, and on the other three stars, symbols of the Trinity, and on which are carved the name of the church, and that of the bishop by whom it was consecrated. The verandah is, for the stranger, the most interesting portion of the edifice. In some, like "Medani Alun" (Saviour of the World), the church we visited that day, the paintings that adorn the walls, all considering, are not hadly made. St. George and the Dragon in the church of Medani Alun held a prominent and conspicuous place; next came the Twelve Apostles and the Trinity, God being represented in the form of a benevolent-looking old gentleman. Several representations of our Lord's sufferings graced the walls.

New Chapel of St. John, Ripon.—On Tuesday, the 10th instant, the above new hospital chapel was consecrated by the Right Rev. the Lord Bishop of Ripon. The chapel is rectangular in form, with apsidal chancel, the total length being 72 ft., with across nave 24 ft. 6 in., the height to ridge 33 ft. The entrance porch is on the south side, and is of open timber-work in oak, with tracery sides and bargeboards. The vestry is in the north-east corner, and communicates direct with the chancel, which is paved with eucastie tiles. The altar wall and pulpit are of oak, and the seating throughout is of deal, stained and varnished. The ceiling is formed in panels of moulded timber filled in with plaster, and the roof is covered with green rag slates. The west gable is surmounted by a wrought stone bell-cot. The chapel is intended to accommodate 250 people, including children, and is carried out in the Late Pointed style, at a cost of about 1,300l. The architect is Mr. W. H. Crossland, and the contractors are—Messrs. John Chambers & Son, of Bishop Monkton, for mason, slater, and plasterer's works; George Grange, Pateley Bridge, joiner; Christopher Daniel, of Ripon, plumber; and John Burton & Son, Ripon, painters. The heating apparatus, which is fixed in a cellar under the vestry, has been fitted up by Mr. R. Nicholson, of Ripon. The chapel is lighted with gas, the fittings for which have been supplied by Messrs. Hardman & Co., of Birmingham, who also provided the lectern and pulpit-desk.

Omnibus Traffic.—There are one or two facts of interest in the report of the London General Omnibus Company. The number of passengers carried during the half-year was 20,157,926 against 20,313,821 the year before; and the average number of omnibuses working on week-days was 590 against 594, and on Sundays 460 against 461 in the same half of 1868. The company have been giving their horses maize instead of oats, and have saved by so doing about 14,000l. in the half-year! The gross receipts of the company during the half-year ending 30th June, 1869, were 270,925l. 16s. 8d., showing a comparative decrease of 13,854l. 17s. 10d.—The scale on which omnibus traffic is carried on in Paris may be judged from the fact that during the year 1868 the number of persons carried in these vehicles amounted to 120,000,000, or nearly 65 times the entire population of Paris; while during the same period the number of passengers conveyed by the French railways was only 115,000,000. The average fare was four sous and a half (six sous in the interior and three on the impériale). The gross receipts must have amounted to about 27,000,000f.

Public Drinking Fountains for Swansea. At the last meeting of the trustees of the Swansea Harbour, the Mayor, Mr. C. T. Wilson, asked permission to be allowed to erect two public drinking-fountains, one at each end of the South Dock, on the land of the trust. Permission was unanimously granted. At the meeting of the Corporation, also, the Mayor obtained the permission of the Council to erect a third fountain near the public weighbridge on the Quay. The necessary accommodation for animals will be provided for.

Erection of another Race-stand at Doncaster.—The stand for the special accommodation of county families is approaching completion. It is situate at the west end of the enclosure, just beyond the judge's chair. It is built of white pressed bricks, and is carried out in a style uniform with that of the other stands, with balustrades and pillars in front. The basement comprises weighing-room, an office for the clerk of the course, and reporter's room. The weighing-room occupies the principal portion of the lower floor, being 35 ft. 6 in. long and 17 ft. 3 in. wide. The second floor is occupied by the saloon, 61 ft. 4 in. in length and 17 ft. 6 in. wide. It contains thirteen windows, and communicating with it are two rooms for ladies. On the ground floor is a room for gentlemen. The roof of the stand will be divided into two parts, one portion to be appropriated to the lessees for whom the stand is erected, and the other to the reporters, trainers, jockeys, &c. The work has been let to Mr. Thomas Wood.

Free Libraries.—The free library question was thoroughly discussed last year in Leeds, and at a public meeting the necessary proportion of ratepayers' votes was obtained in favour of the establishment of such an institution. The scheme, however, met with considerable opposition in and out of the town council. A special meeting of the council was recently held to reconsider the subject, and it was resolved, after a long discussion, to carry into effect the resolution passed at the public meeting last year.—At Wokingham, a preliminary meeting has been held in the town-hall, presided over by the alderman, to consider the subject of establishing a free library, in consequence of a liberal offer by the Hon. Anthon Herbert in aid of the object. A discussion ensued, in which all heartily joined in the opinion that an effort ought to be made to enable the town to participate in the benefits which the foundation of a free library on a large scale was likely to confer. Windsor will also take advantage of Mr. Herbert's offer.

Philomatic Society of Paris.—At the sitting of the society on the 24th ult., M. Caligny made a communication on the subject of the means of utilising the force now expended uselessly by the waves of the sea. This subject has recently commanded a good deal of attention in America, where already an apparatus has been described and a patent, we believe, taken out for this purpose. M. Caligny stated that the question was raised as early as 1851 by the Philomatic Society. [A proposal to use the tides at Westminster as a motive power was published in an old volume of the *Builder*.] The machine described now seems to consist of a series of curved tubes which are so placed that the shock of the wave passes along their horizontal portion and sets in motion a column of liquid, which in its turn moves a series of pistons, and so transmits in any fashion that may be desired the force of the wave.—*Scientific Opinion.*

Another Railway Bridge over the Rhine. The great railway bridge which is to cross the Rhine, near the village of Hamm, a little above Dusseldorf, will probably be completed before the end of November. The structure consists of four arches, the upper part of which is of iron. The ironwork of each will weigh 14,000 cwt. The bridge is united to the main line on the left bank by a viaduct consisting of fifteen stone arches, but this does not immediately join the bridge, being separated from it by a revolving draw-bridge, so that the line can be rendered impassable at any moment. The first arch of the great bridge is completed.

Overcrowding in Barracks.—It surely cannot be true, as reported, that experiments are being conducted in the barracks at Gosport and Portsmouth to obtain data as to the possibility of increasing the number of inmates in each room without severe injury to health. Overcrowding in our barracks has long been a prolific source of disease, and has been proved to be one of the most powerful agents in the production of consumptive maladies. Every step taken ought to be in the opposite direction.

Official Building on the Thames Embankment.—We hear a report, the correctness of which we cannot guarantee, says the *Pall-mall Gazette*, that the sanction of the Government has been given to the erection, somewhere on the Thames Embankment, of a building which shall accommodate both the War Office and the Horse Guards.

Trade-Union Congress.—The second annual congress of trade societies of the United Kingdom has been held in the Odd Fellows' Hall at Birmingham. The list of subjects covered pretty nearly the whole ground of trade legislation. There were on the list 12 subjects, and 17 papers; and the number of societies represented was 32. Applications by Mr. Dixon, M.P., for the secretary of the National Education League, and by Mr. G. J. Holyoake, to read papers, the latter on co-operation, and the former on the League, were acceded to. The congress passed a resolution, by a large majority, in favour of courts of conciliation and arbitration.

Inverness Cathedral.—The cathedral of St. Andrew, Inverness, of which the first stone was laid in 1866 by the late Archbishop of Canterbury, is to be opened on the 1st of September. This new edifice is situated on the west bank of the River Ness, and nearly opposite the Castle. It is in the Decorated style, and has been built from the designs of Mr. A. Ross, architect, at Inverness, and consists of nave, north and south aisles, transepts, and apsidal east end, with an octagonal chapter-house on the north-east side. It is flanked by two towers at the west end, each 100 ft. high, and an ornamented iron *fiche* springs from the intersection of nave and transepts to a height of 110 ft. from the ground. The building with all its internal fittings and decorations, will cost something under 20,000l., it is stated. Various gifts have already been presented, such as eleven stained glass windows (by Hardman, of Birmingham), a pulpit carved in Caen stone, and ornamented with marble shafts, by native artists; an altar and reredos in Caen stone, marble, and alabaster, executed by Earp.

Preston House of Correction.—A range of 150 cells for male prisoners and a new hospital were recently erected at the Preston House of Correction, and a range of 72 other cells for females has been just completed from plans of Mr. Hughes, of Preston, architect; the contractor being Mr. Bickerstaff, of Preston, and the clerk of the works Mr. Chappell. The contract for the last-mentioned cells has been completed for a sum less than the amount of the accepted tender, some alteration in the work having been made during its progress which has led to larger deductions than extras. The original contract was 6,017l., and the bills paid amount to 6,005l.

The Velocipede Movement.—A short time ago an intimation appeared in *Punch* that a velocipede capable of carrying a man and his family would be useful, and a man employed at Staveley Works, named William Minkley, has acted upon the hint and has constructed for himself, during his leisure hours, a family velocipede. The machine is said to be capable of carrying himself, his wife, and family—four of them—and is very strongly built.—A new velocipede is being patented in Paris, which is to throw all others into the shade. It has five wheels, and the motive power is communicated to it by the mere weight of the riders.

Metropolitan Railways' Artillery.—"Nervine" writes,—Kindly urge the directors of these railways to be good enough to affix something like the following notice at the several stations:—"As the public in general, and females in particular, have nervous, the porters and guards are desired not to slam, bang, or crash the doors to, as they have got into the habit of doing, to the great annoyance of passengers, but to close them as gently as time will permit."

Evil Writings at Railway Stations.—The "Retracts" at railway stations are in many cases disfigured with indecent writings,—more shame to the contemptible perpetrators of the offence. A correspondent suggests, and wisely, that the porters should be instructed to use the white-wash brush once or twice a week. If an offender were detected, and the porter poured the contents of the pail over him, the whitened blackguard would get no pity from us.

South Shields Townhall Competition. The committee appointed to select a design from those sent in for the proposed new townhall, South Shields, have held a meeting in the Mechanics' Institute, South Shields, where twenty-seven sets of competitive plans were exhibited. A few of the designs, and only a few, deserve serious attention.

The British Association for Science will hold its next meeting in Liverpool. Professor Huxley will be the president.

A Machine that Reaps and Thrashes.—A private letter from California gives a description of the reaping-machine in use there, known as a harvester. It is pushed by six horses, and cuts, heads, thrashes, and delivers into bags at one operation, the grain being sufficiently dry to be thus dealt with. The straw is afterwards set on fire.

South Kensington Improvements.—A correspondent says the old summer-house was removed to the Bayswater side, and a portion of the dead wall taken down and replaced with iron railing, at the expense of Mr. Cawley, the holder of Prince of Wales-terrace, Kensington, opposite whose property it stood.

Harrogate Surveyorship.—At a meeting of the Harrogate Improvement Commissioners and local Board of Health, held on Monday last, it was resolved, on application from Mr. Richardson, the surveyor, that he be allowed to practise privately in conjunction with his public appointment as town surveyor.

TENDERS.

For minister's house at Paulersbury, Northamptonshire. Mr. T. Heygate Vernon, architect:—
Shelton £320 0 0
Shakespeare 615 10 0
Ansell 456 10 0
Leeper 443 17 0
Wheeler (accepted) 416 5 0

Accepted for five houses and two shops at Oasett for Mr. Joshua Whitaker. Messrs. Sheard & Hanstock, architects:—

Chapel Mason's Work £784 0 0
Lockwood Joiner's Work 250 0 0
Snowden Plumber's Work 61 0 0
Wilson & Co. Slaters' Work 80 0 0
Thornton 65 12 3

For dwarf wall and enclosure railing to lead belonging to the Clock and Watchmaker's Asylum, Colney Hatch. Mr. Henry Carpenter, architect:—

Foxley £230 10 0
Thompson 233 0 0
Clark & Hunt 343 0 0
Turner & Co. 331 15 0
St. Paneras Iron Co. (accepted) 320 0 0

For a new house on Wandsworth-common, for Mr. James Neal, who provides bricks, lime, and sand. Mr. S. Durrant, architect:—

Easton Brothers £1,000 0 0
Hearn & Cousins 1,089 0 0
Strong 899 0 0
Heron 795 0 0
Thornton 783 0 0
Atkinson 778 0 0
Coates 745 0 0

For alterations to two houses in Essex-street, Strand. Messrs. Clarkson, architects:—

Howard £890 0 0
Langmaid & Co. 871 0 0
Atford 845 0 0
Sykes 746 0 0

For the erection of a Wesleyan chapel at the Old Delabols Estate Quarry. Mr. Patterson, architect:—
Westlake & Cann £177 0 0
Hitchins & Paul 475 0 0

For roads and drains, Chaseville Park, Winchmore-hill, for Mr. Charles Stokes. Quantities by Mr. J. C. Tomlin:—

Haynes £1,348 0 0
Turner & Cole 1,114 15 0
Jay 1,083 0 0
Potter 1,050 0 0
Burgess 975 0 0
Crockett 960 0 0
Hubbard 945 10 0
Henley 888 0 0
Hookham 830 0 0
Cohen 823 0 0
Paice 818 0 0
Morris 810 0 0
Nicholson 810 0 0
Bloomfield 8 6 0
Keeble 775 0 0
Porter 760 0 0
Kent 759 0 0
Alford 745 0 0
Capper 688 0 0
Carter 640 0 0

For alterations to the Parochial Schools at Sarbridge-wood, Herts. Mr. Pritchett, architect. Quantities by Mr. Strubshaw:—

Hockley £519 0 0
Thackeray 512 0 0
Dickinson 455 0 0
Crabb & Vaughan 433 0 0
Clascock 397 0 0
Burton 359 0 0
Prior 378 0 0
Shirley & Horne 370 0 0
Bent 339 0 0

For detached villa residence, with tower, for Mr. J. Linder, at Nightingale-lane, Balham. Mr. Rowland Plumble, architect. Quantities supplied by Mr. C. W. Brooks:—

Wilson (accepted) £3,127 0 0

For new Parochial Schools at St. Paul's, Acreley (first portion). Mr. Elkington, architect:—
Perry £910 0 0
Buck 742 0 0
Langman 680 0 0
Bowyer & Sons 650 0 0
Hollidge (accepted) 635 0 0

For building warehouses in Camomile-street, for the London and County Land and Building Company, Limited. Mr. Robert Walker, architect:—

Bayer & Ramage £10,786 0 0
Sewell & Co. 10,371 0 0
Coils & Son 10,352 0 0
Browne & Robinson 10,176 0 0
Oxford & Willer 10,074 0 0
Newman & Mann 10,079 0 0
Myers & Son 10,028 0 0
Ashby & Sons 9,966 0 0
Macey 9,497 0 0
Hill, Keddell, & Co. 8,491 0 0
Kilby (accepted) 8,167 0 0

For new church in St. Andrew's parish, Hastings, for the Misses Sayer. Messrs. E. Habershon & Brock, architects:—

Paiss £4,053 0 0
Sharphington & Hole 3,889 0 0
Wilkins & Son 3,843 0 0
Nightingale 3,653 0 0
Viglar 3,691 0 0
Perry 3,489 0 0
Hughes 3,350 0 0
Langridge 1,131 6 8
Howell 3,235 0 0

For the erection of three shops and premises in High-street, Aldershot, for Mr. Phillips, jun. Mr. Mueselwhill, architect:—

Hughes £1,230 0 0
Siff 1,178 0 0
Scribbleigh 1,131 6 8
Mether 917 0 0
Wells & Batchelor (accepted) 811 0 0

For the alterations and additions to eight houses, and for erecting two new houses in the St. Mary's terrace, Paddington (being contract No. 1), for Mr. T. Dinnsdale. Mr. Albert Bridgman, architect. Quantities supplied:—
Bennett (accepted) £1,650 0 0

For the erection of a pair of semi-detached villas in the Loughton Park, Essex, for Mr. Henry Ellis. Mr. Albert Bridgman, architect:—

Bennett £1,969 0 0
Egan 1,906 10 0
Keppence 1,965 0 0
Knight & Sons 1,751 0 0
Pavitt (accepted) 1,734 0 0

For horse, stable, boundary wall, &c. at St. Waltham Cross, Herts, for Mr. J. Dormer. Mr. J. S. Gomme, architect:—

Bentley £274 0 0
Ar her 321 0 0
Brumden 371 0 0
Dean 754 0 0

For the erection of a villa residence in the London road, Reading, for Messrs. Sutton. Messrs. Wm. & J. T. Brown, architects. Quantities supplied:—

Wheeler Brothers £1,966 0 0
Woodroff 1,868 0 0
Sheppard 1,834 0 0
Strong 1,821 0 0
Mathews 1,777 0 0
Barnicot (accepted) 1,746 0 0

For the erection of a house and shop, London-street, Reading, for Mr. Lowjoy. Messrs. Wm. & J. T. Brown, architects. Quantities supplied:—

Mathews £1,095 0 0
Barnicot 1,031 0 0
Sheppard 999 0 0
Clisby 998 0 0

For alterations and additions to house and shop, Broad-street, Reading, for Mr. Pooley. Messrs. Wm. & J. T. Brown, architects:—

Wheeler Brothers (accepted) £300 0 0

For a pair of villas at Fortis-green, Finchley, for Mr. George Emden. Messrs. W. Wymouth & Son, architects. Merritt & Ashby (accepted) £2,068 0 0

TO CORRESPONDENTS.

Dr. B.—T. H. W.—C. V.—R.—C.—L.—W.—A.—J.—R.—F.—G.—T. H. V.—J. R.—B.—H.—C.—J.—R.—O.—T. C.—C.—E.—C.—T.—S. M.—A.—Co.—J.—S.—J.—H.—C.—H.—D.—D.—Bulmer's Apprentice.—E. J.—B.—S.—B.—W.—E.—T.—E.—K.—M.—R.—E.—F.—A.—T.—C.—S.—W.—S.—B.—S.—B.—W.—J.—A.—A.—T.—O.—R.—(thanks). No.—H. W. (something more is needed than mere assertion).—C. L. (next week).

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The Builder.

VOL. XXVII.—No. 1387.

The Harvest and "The Builder."



GLORIOUS spell of harvest weather has come, during the latter part of August, to raise the spirits of farmers, and to cheapen the loaf for the poor man. It was time. The

prospect of the harvest, till the occurrence of the recent welcome change of temperature, was far from cheering. It seemed as if what has been sarcastically termed our English summer, "three hot days and a thunder storm," had come and gone; and that our hopes of plenty, or even of the avoidance of dearth, for the next twelve months, had gone with it. The price of corn was creeping up. The price of bread, ever ready to rise with the slightest upward movement of the corn market, although by no means distinguished by a corresponding "alacrity in sinking," responded to the threat. The long succession of cold, sunless, ungenial days that frowned upon the corn plant, while the process of fertilisation of the seed was taking place, was thought to have so seriously affected the crop, both in quantity and in quality, that a very low average would be the consequence.

The result of the occurrence of a few days of not only seasonable, but really hot, weather, at the very crisis of the harvest, has been signally instructive. The effect is the more striking from the fact that the change occurred too late to have any appreciable influence on the swelling and increase of the grain. The sole effect has been to render the barvesting more commodious, and to present both grain and straw to the hands of the ingatherer in the very best possible condition for ingathering and for storing. In a word, the sun having failed to show much of his accustomed benevolence in the raising of the corn-plant, has come late to the rescue, as if with the express intension of showing how important is that particular part of his annual service which, and which alone, can be, to a very considerable extent, performed, in default of his smiles, by artificial means. The great Light having long turned his back upon the cultivator, has returned only in time to show the reaper how much depends on the one condition of dry harvesting.

We trust that the attention to this important subject which the *Builder* has to no small extent awakened throughout the country, will not be distracted by this timely benevolence of Nature. We rejoice to see that the question appears to have taken considerable hold of the public mind. Those veteran pioneers of agricultural reform, Mr. Meobi and Mr. Smith, continue their appeals, powerful in the logic of common sense, to their less enlightened and less economic brethren. They appeal to that sense which is rarely unimpressible, among Englishmen any more than among foreigners, the sense of fulness or emptiness of purse. They show how cheaply they can carry on cultivation, when the soil has once been thoroughly cleared of the most obnoxious and persistent weeds. One of these benefactors of his country, on a recent visit of a curious party to his model farm, offered to give a sovereign for every piece of conch grass that any of his visitors could find growing on his land! The area to which steam culture is applied

is annually increasing. During the present year one of the simplest and most useful mechanical aids to the farmer, the elevator, has been merrily at work, driven by horse power where steam was not at command. The unusually heavy supply of straw, which marks the present season, has rendered this method of superseding the most fatiguing part of the labour of the farm, namely, the pitching up of trusses, especially valuable.

We should not be remiss in gaining the full benefit of the lesson that a season so unusual as that of the present year is calculated to impart. The very irregularity of our climate has prevented us, in great measure, from taking steps to guard against the preventible evil results of bad seasons. If a farmer, for instance, had just laid out a considerable sum in buying machinery, he would think that the sun in Leo, in the year 1869, had been laughing him to scorn. When a danger can be certainly foreseen, it is the more likely to be prevented. If drought be a certain accompaniment of a known declination of the sun in a given country, the cultivator of the ground becomes aware that his sole chance of a crop depends on irrigation, and irrigates accordingly. The difference, in such a year as 1868, between an irrigated and a non-irrigated meadow, was simply that between crop and no crop. In the South of Europe, in Egypt, in many sub-tropical regions, this is always palpably and admittedly the case. Therefore, in these regions, from the earliest times, the well, the bucket, the scoop, the water-wheel, have been employed to feed the constant silver lines of beneficent moisture which alone convert a desert into a garden. But the farmer who, when *in extremis* for the supply of food to his stock, at the close of the summer of 1868, might have been led to say, "I really must see how best to utilize that large supply of water which I have hitherto allowed to be wasted, or worse," would have been more persevering and more resolute than most men, if he had carried out his wise projects in face of the heavy swathe of 1869. Thus, the past backward and perilous spring, adverse as it has been to the cereals, while highly favourable to the grass crops (of which there are nearly 33,000,000 of acres under cultivation in the United Kingdom), has been hostile to the progress of irrigation, although it should have furnished, if intelligently regarded, the strongest argument in its favour. In the same manner, with all but the most thoughtful and provident farmers, the fine harvest weather that succeeded will defer the adoption of facilities for artificial harvesting; although, in point of fact, the good effect of the late, but torrid heat, has been little more than that which, at the expense of artificial means, man may independently secure.

Another lesson of no little significance has been legible to those who have watched the vegetation of the present year. The entire growth of the United Kingdom, in a botanical sense, may be divided into the two groups, of indigenous plants, and of those cultivated vegetables which, sowed and reared by the hand of man, may yet be considered as only partially or artificially naturalized. Now, as far as the former of these are concerned, we have had a proof of the equitable compensation afforded by Nature herself for her apparent irregularities. The forest trees suffered scarcely less than the smaller and humbler plants from the drought of 1868. The ferns were generally baked. The grass was burnt up. The vegetative power, dominated by a heat which evaporated the usual liquid food of the plants, retreated into the stem and roots. It retreated, but it was not lost. It awaited but the return of the customary moisture, and the more direct rays of the sun, to burgeon and to bud, and to clothe the face of the earth with verdure. Accordingly, it is the testimony of all observers of the phenomena of natural history that rarely, if ever,

have they witnessed a year remarkable for such fertility in the flowers and seeds of the forest-trees. The hazels have been laden with nuts, the beech with mast. The key-bearing trees, ash, and plane, and sycamore, were hung in early spring with such a wealth of blossom as to be barely recognisable. Their ordinary barren, leafy, dicotyledonous branches were hidden by an unwonted bloom, lacking, indeed, the varied hues of the petals of the flower-garden, but not lacking either the beauty, or the promise, of abundant flower. The sycamore looked, in many cases, so like a gigantic currant-bush, that the observer was almost tempted to seek for the crimson *grappe*. The ash threw out its groups of apetalous flowers this spring, before the buds of the oak opened, and looked, in many instances, as if it was covered with a thick veil of greenish grey lichens. Nature, in these children of the soil, avenged herself, by an unusually wild riot of fertility, for the fast of last summer.

Farmers, they say, always grumble. We are happy to know some who do not. Those of that honourable fraternity who belong to the former class may, if they like, contradict us. Our pleasanter friends of the more complacent category will confirm the remark, that the grass, wherever it has had a chance, has this year emulated the vigour of the forest trees. Fruit-bearing trees, indeed, seem to follow laws and cycles of their own. Apples and pears, wall-fruit and stone-fruit, all the products of the skill of the horticulturist and of the orchard-grower, have each their own special seasons and reasons for fertility. But we are speaking of the indigenous vegetation, which offers a far surer test of the compensative power of nature than can be the case with any semi-artificial growth. None the less does such a recuperative power in the natural denizens of the soil indicate what may be done by the enlightened agriculturist. Nor can it be urged that the vigorous growth of the spring of 1869 is the result of unexpended, and, as it were, hoarded, vegetative power alone. The store of food available for the roots of all kinds of plants, was not drawn upon during the season of drought in the habitual manner, because it did not meet with enough water to hold it in solution. Of this food, therefore, an extra quantity may be thought to have been available during the present spring. Hence the unusual growth of the stem and haulms of the annual artificial grasses, which we call the cereals. Had the sun not played us false, the crop of 1869 would have been such as to cause that season to be denominated the year of plenty.

No better service can be rendered by any public writer to his time and to his country than the awakening of the general intelligence to the advantage to be derived by the farmer from taking counsel with the engineer. We spoke, in our recent article on Artificial Harvesting, of the yield of fifty-five bushels per acre as a high, though not the highest, result of careful steam culture. Since that time a competent authority, in estimating the unusually productive wheat crop of 1868, has averaged it at thirty-six bushels per acre. That of the present year is estimated at twenty-eight bushels per acre, a return which is more likely to be exceeded than otherwise. At the same time the area under corn crops is steadily increasing. From rather more than nine and a quarter million acres in 1866 (in Great Britain), we are advancing to a broader acreage. The margin, then, of that increase of return, which depends, not on the accidents of the season, but on the intelligent industry of the farmer, still exceeds the proportions of the annual public expenditure of the country.

Attention is, we rejoice to repeat, being now directed to the subject on all sides. The daily journals, which only occasionally can be regarded as leading, or even attempting to lead, public opinion, have for the most part a wonderful faculty of reflecting and intensifying its ex-

pression. The long library of unpublished letters which find their way to the waste-paper basket, furnishes the conductors and editors of the daily press with an infallible indication of the turn which thought is taking. The unprinted authorship of many an eager writer has thus its imperceptible influence in the spread of his opinions. The prominence which, in more than one of the most widely-circulated daily journals, has been given to the subjects of artificial harvesting and of steam culture, within the last few weeks, is thus a clear proof of the tendency of public interest in that direction.

With questions of tillage, of storage, and of desiccation,—with theories of irrigation, of sewage, and of chemical manures,—with efforts to preserve and utilise, for the benefit of agriculture, the rain which God sends from heaven, and the salts and other valuable products which are returned, from the costly laboratory of the human body, for the fertilisation of the soil (both of which invaluable gifts we now simply throw into the sea as rapidly as possible), is connected the discussion of a similar subject of no less universal interest. Man, in a state of barbarism, seems always to think himself wiser than his maker. He pities, or patronises, or strives to cajole or to frighten, the invisible powers. The negro will beat his fetish. Sir John Lubbock tells us of races who erect scarecrows to alarm their divinities. We have long ago heard of the prayer-mill, and it has even been suggested that it might prove a good commercial speculation to export, to countries where that form of Ritualism is not yet disestablished, prayer-mills to go by steam.

But in no respect is this inherent disposition of ignorant mankind to correct the errors, and to supplement the negligence, of the supernatural powers, more marked than in the war which is so unsparingly carried on between man and his natural partners and servants, the inferior animals, especially the insectivorous birds. In our own country there is not even that unanswerable excuse of the cravings of banger which leads the Chinaman to snare the small game which he converts into a savoury *saïmê des rats*, or the self-admiring Frenchman, eager for "le sport," to army himself in mighty boots and military *justa au corps*, to insert himself in the convulsion of a ponderous *cor de chasse*, to hang a *couteau de chasse* (another name for a veritable sword) to his side, and to sally forth to shoot a tom-tit. He would shoot a fox with the like avidity, if he could. It is not clear whether he would cook the latter. The savoury nature of the former morsel (after all it is as big as an ortolan), has much to do with the popularity of "la chasse." In France and Italy it is rather the desire of an addition to the *menu*, at no expense beyond that of powder and shot—or, may be, of hemp, wire, or horsehair, that sweeps the small birds from the fields. In England it is sheer ignorant brutality—unhappy birds-nesting among boys, followed up by yet more wanton and wicked slaughter on the part of those unblest adults into whom birds-nesting boys naturally are developed.

Mr. Dresser has been bringing the subject under the attention of the British Association. He regards it, not from that point of view which shall persons call the sentimental, and men of more serious thought consider to be the moral, or even the religious, aspect, but from the sure basis of physiological data. A hundred and eighteen sparrows have been offered upon the altars of science. As was the case with the Pagan sacrifices, their entrails have been carefully inspected, in order to furnish guidance to the inquirers. But it has not been in search of the cabalistic information to be derived from quaint contortion, or the credited, though impossible, absence of the heart, or some other vital organ, that the sacrificial knife has been bared. The contents of the stomachs of the victims have been examined, tabulated, recorded. Three culprits alone, out of this hecatomb of the favourites of Cythera were proved, by this unsparring search, guilty of having lived for the past four-and-twenty hours upon grain. In fact, there were three thieves out of the 118; all the other victims had worked more or less, for their living. Beetles, and grubs, and flies, and larvae of all obnoxious kinds, had been their diet. In 75 of the birds, infants of all ages, from the callow fledgling to the little Peckey and Flapjack that could just twitter along the ground, hardly any but insect *spoglie* were detected. What would the starved and industrious pioneers who have reared their wonderful temple and city by the Great Salt Lake have given for the aid of an army of English sparrows

against that greater and more formidable host of grasshoppers which thrice all but annihilated the settlement?

It is not alone the purely insectivorous birds—such as the titmouse, who eats a thousand insects (egg or chick) per diem, and whose favourite diet is that unscrupulous *Bombus Pini*, which, in its turn, preys on the young buds of the pine-tree—or the partially insectivorous birds, such as our friend the sparrow, that an intelligent regard to the works of nature bids man to spare. The same killing kindness, or, at least, an investigation of a similarly practical, if a less mortal nature, has been extended to the birds of prey.

In the romantic glades of Marlborough forest, near the cottage of one of the keepers of the Marquis of Ailesbury, is to be found a scene that recalls the terrors of the middle ages, of the times when the gibbet bore its terrible fruit, in the vain hope of deterring future practitioners of crime from the peril of their way. Stoat, and weasel, and owl, and hawk, and kite, and cat, domestic or otherwise, and jay, and magpie,—almost everything that eats,—are strung up in a long and most unsavoury line on the gylvan gibbet. We should like to have had a photograph of the spot exhibited to section D, and to have heard the eloquent appeals that would have been made to the intelligence of the most noble owner against the ferocity of his keeper. The bizzard, now almost entirely destroyed in Great Britain, lived upon frogs and reptiles. The kestrel and the merlin were not created by the Author of evil. The owl enjoys a rich diet of droning beetles, chaffers, moths, and nocturnal insects, together with his more familiar *pidés de résistance*, the shrew mouse. The grouse disease is attributed, or at least its unchecked spread is attributed, to the destruction by the gamekeepers of their useful, if well fed, allies, the natural surgeons and blood-letters of the game birds; and the flights of wood-pigeons, which, in some parts of the country, are becoming almost portentous, are due to the extinction of the bird which is naturally most *friend* of the wood-pigeon—the beautiful little sparrow-bawk.

Let us remember the character given to man, by one of the wisest of his race, *nature minister of interpres*. When he thus acts, he may cease the wilderness to rejoice and blossom as the rose. But when he becomes, as he so often does, *nature hostis et carnifex*, the case is altered. True, his blind cruelty brings its own reward, but the lesson. He vainly curses the wireworm, forgetful of the gins he has so unsparingly set for the mole. He sees a prodigy in a swarm of lady-birds, and gives them no thanks for freeing his hops from destructive blight. He looks with dismay on the ravages of the turnip-fly, and, instead of inquiring what bird is especially addicted to feeding on that active heeble, in the locality where the *Brassica Napa* is indigenous, he institutes a sparrow club! Entrusted with the rule over the birds of the air and the beasts of the field, he strives to act like him of whom it was said, *Solitudinem facit, pacem appellat*; forgetful that, if his impious warfare could ever prove thoroughly successful, his own race would, in its turn, be improved away from off the face of that planet the laws of which he so steadily violates.

MEDIEVAL CHRISTIANITY AND SACRED ART IN ITALY.*

MR. HEMANS has now supplemented his "History of Ancient Christianity and Sacred Art in Italy," with a volume on "Medieval Christianity in Sacred Art," in which he brings up the subject to the middle of the fourteenth century; and in his preface to this instalment of it, he announces his intention to carry it further on in a future work. Like the first-mentioned volume, the present undertaking consists to a large extent of notices of the events in the pontificates of the successive popes, with a list of the architectural and pictorial remains of each century. The author has striven to engraft upon these the history of religious institutions, and the aspects of Christian society, so as to make his narrative more comprehensive in its scope; but the nature of both of these divisions of his task brings them continually drifting into one or other of the first-mentioned branches. If

* A History of Medieval Christianity and Sacred Art in Italy (A.D. 800-1350). By Charles I. Hemans, Williams & Norgate, Henrietta-street, Covent-garden, London; Goodban, Florence; Fiale, Rome. 1869.

the social history of an institution is sketched, it is constantly affected by the events that likewise affected the head of the church, or emanated from his will; and when the structural history is given, it comes as closely into the category of existing remains of the art-work of the century to which it belongs. The field is too large and too crowded with figures for us to see more than patches of it; hence, perhaps, this tendency to drift towards the central and chief personages in it is no real disadvantage. We could not hope to see all Italy in the tenth century, for instance; consequently it is well that the fragment it presented to our view, represents the leading men in the foremost circles. The popes of the tenth century, however, have not left a pleasant reputation behind them, for Mahillon declares, with the exception of Stephen VIII., Leo VIII., Agapitus II., and a few others, they were all unworthy of the Holy See, and lived more like monsters and wild beasts than bishops. The art-works, too, of their period, very few in number, and of these many have since been destroyed. All that remains in Rome may be catalogued in half a dozen lines:—An aisle of the Lateran basilica; a wing of the monastery of S. Croce; mosaic from the tomb of Otho II., in the crypt of St. Peter's; paintings in the crypt of SS. Cosimo and Damiano; and perhaps some in the subterranean church of S. Clemente; the ivory statuettes in the capitol hall, St. Peter's; and some bronze crucifixes in the Christian Museum of the Vatican. The crypt and golden altar of St. Mark's belong to this same dark sterile age; Naples, Genoa, Piacenza, Spoleto, Subiaco, and S. Germano, have each a solitary trophy; and then the tenth-century art-work of Italy is all told.

The eleventh century bore better fruits. It was ushered in with comets and earthquakes, but as the end of the world was confidently expected to take place then, those were comparatively trifling occurrences which were soon forgotten. A general improvement was made in monastic institutions; wonderful abuses had crept in which had to be cast out; and there arose vigorous souls equal to the task. Many edifices that were in ruins were restored. Monte Cassino, that had been destroyed by the Saracens in the previous century, was in this the home of two hundred monks, and the seat of learning. There were twenty abbeys in Rome, besides many other ecclesiastical buildings. Only one new church seems, however, to have been built within the walls in this period, which was that of S. Bartolommeo on the Tiber island. A fragment of a fortified mansion built by Nicholas Crescentius for his son David, popularly known interchangeably as the palace of Pontius Pilate and that of Rienzo, belongs to this date; and there are some wall-paintings at S. Urbino, and some crucifixes and ivories in the Vatican that bring us again face to face with the artists of the time. Out of the Imperial City there is more evidence of the vitality of the century. Cathedrals were founded at Ravello, Matera, Bitonto, Salerno, Novaro, Parma, Modena, Luca, Pisa, Ancona, and Fiesole; those at Siena and Bari were enlarged and finished; St. Mark's, Venice, was built over the crypt of the preceding century; monasteries were perfected at La Cava, Monte Cassino, and Sosa; and churches built at Subiaco, Spoleto, Florence, Empoli, Piacenza, and Palermo. Sculptures at Spoleto, in the church of S. Pietro, mosaics at Capua in the cathedral, and wall-paintings in the church of S. Angelo in Formis, at the same place, are details of this period.

In the twelfth century there were wars that took the Popes into the battle-field, foreign armies encamped before Rome, crusades and anti-popes; nevertheless, sacred art lived on, in spite of the fact that the palace of the pontiff lay in ruins at one time and many churches were converted into fortresses. Our own countryman, Adrian IV., contrived but little to the structural triumphs of the Holy City, for of his pontificate there are only a solitary portico and a ruined chapel as memorials. Mr. Hemans strings the Roman monuments of this period into the following list:—

"S. Maria in Trastevere, rebuilt 1130—mosaics, 1153; S. Clemente upper Church, about 1113; SS. Quattro Coronati, rebuilt 1111; S. Maria in Cosmedin, 1123; S. Croce, rebuilt 1131; S. Giovanni a Porta Latina, 1107; SS. Giovanni e Paolo, portico (?); S. Eustachio, restored; Campanili of the above-named churches, of S. Lorenzo in Lucina, S. Eustachio, S. Maria in Monticelli, S. Bartolommeo, S. Salvatore alle Coppelle, S. Salvatore in Corte (?); Clusters of S. Lorenzo and SS. Vincenzo ed Anastasio, both extramural; wall-paintings at S. Sebastiano on the Palatine, and on the chapel of S. Christino; Paschal Cathedral at St. Paul's; antiques in Christian Museum of Vatican."

With the thirteenth century and the pontificate of Innocent III. came the highest elevation to which the papal power attained, and this was founded, not upon successful wars or the discomfiture of anti-popes, but upon the working out of Christian principles. Innocent III. it will be remembered, revived the name of the Roman curia, and on three days in every week sat to decide questions submitted to him by the great and small, when the poorest were heard and justice done them as inexorably as though they were sovereigns. With a charity that was probably little wiser than that it would be now, he maintained 8,000 persons by his secret alms, and with similar self-denial founded hospitals for infants and the sick. He is recorded, too, to have parted with all his silver and gold plate, to further the Crusades, contenting himself with wood or pottery for his own use. It was this pope who excommunicated our King John. He was equally energetic with his clergy, and weeded out from their practices many that should never have prevailed.

His cousin, who was an octogenarian, succeeded him, and lived to be nearly 100 years old, followed in his footsteps in several particulars, most especially in structural works for charitable purposes. He was also a sanitary reformer, and enlarged the sewers in Rome. The successive popes were more or less involved with the great crusading movement of the day, which now included attacks upon Christian monarchs, as well as upon infidel possessors of sacred territory. As if to exemplify that time and chance happen to all men, one pope of this century was killed by the fall of some buildings he had ordered for his palace. The architectural and other art remains of this century are more numerous than those of preceding eras. Many churches were rebuilt, and many beautified with mosaics. In the Papal States there were new monasteries founded. At Viterbo a municipal palace was built, as well as S. Domenico; at Civita Castellana the facade of the cathedral was erected; at Subiaco the inner cloisters of S. Scolastica, and the frescoes at S. Benedetto were added. The cathedral at Florence, S. Croce, S. Maria Novella, the baptistry, S. Trinita, S. Maria Maggiore, and the palace of Podesta and Priori in the same city; and the Campo Santo, Pisa, are some of the well-known works of this period. Mr. Hemans points out upwards of fifty more.

The commencement of the fourteenth century saw Rome continually full of pilgrims. Two millions of pilgrims are said to have been present on one occasion, when lives were lost in the crowds. Every Friday the Veronica of the handkerchief of Christ was shown to the faithful, and 200,000 pilgrims, besides the native people, says the traveller Villani, were present throughout the year, and properly supplied with food for themselves and horses, without tumult or strife. Two priests stood at the high altar with rakes in their hands, raking in the money laid in piles as offerings,—a very important part of the edifying proceedings. This was the year that saw Giotto at work in St. Peter's, and upon the frescoes in the church of St. George. As the century progressed Cola di Rienzo appeared upon the scene, and before it began to wane Roman society was so decayed and corrupt that a French cardinal, consoled with an Italian one on the occasion of his having been shot at, declared that "to regenerate Rome it would be necessary to destroy it utterly and then build it again." Notwithstanding the decay and corruption of the times art was still making its silent way. Niccolò built S. Trinita, Florence; S. Domenico, Arezzo; the Pieve and S. Margarina, Cortona; commenced S. Michele in Borgo, Pisa; and erected the wonderful four-storied campanile of S. Niccolò at the same place, besides enriching with his sculpture many other buildings. Giovanni Pisano was likewise at work, sometimes by his father's side and sometimes independently of him, specially excelling in the sculptural treatment of pulpits. The pupils of this last also worked worthily; one of them, Tino da Camaino, having left several noble monuments. Giovanni Balduccio, Andrea Pisano, Tommaso di Stefano, supposed to be the grandson of Giotto, were respectively engaged, too, upon work that has suggested many a bold master-stroke. All these things and many more are duly set forth by Mr. Hemans, who has worked sedulously for years. Those who are interested in sacred art would do well to study his gleanings and classifications of historical facts as a substantial basis for a more extended appreciation of it.

THE SEVEN CURSES OF LONDON.*

Has London only seven curses? we ask ourselves as we observe the title of a work just published by the adventurous endurer and clever describer of a night in the casual ward of Lambeth workhouse. Too well we know the ground over which Mr. Greenwood has walked in this volume, to be able to answer in the affirmative. Even as Cologne has seventy stenches, so has London an innumerable array of evils, not by any rough sifting process to be reduced to seven headings. Too well do we know of hundreds of dismal places, cellars and the like, full of unwholesome human beings; made so, more or less, by their horrible homes; too well do we know of cellar nurseries; of overcrowded tenements, to the extent often of three and sometimes of five families in a room; of houses crammed with inmates with no water supply; of cesspools under living-rooms; of living-rooms close to and over cowsheds and stables; of densely-packed workrooms; and many more miserable things not included in Mr. Greenwood's selection of horrors, all of which are curses. We can accept, therefore, the enumeration only as euphonical, or as a culling of seven of the most prominent evils, from the author's point of view. The particular metropolitan institutions he counts as curses are:—1st, Neglected Children; 2nd, Professional Thieves; 3rd, Professional Beggars; 4th, Fallen Women; 5th, Drunkenness; 6th, Betting Gamblers; and 7th, Waste of Charity. And under these respective headings he gives a series of glib, glossy, pictorial chapters, into which each subject is subdivided. Thus, the first curse, neglected children, has five chapters devoted to it, wherein paper children, gutter loaves in the streets, market prowlers, gutter children and their parents, baby-farming, errand-boys and their leading amusements, the penny gaff, and the ways to treat such cases, are glanced at. Not intended for a scientific investigation nor for a basis upon which to raise a code that should remedy the cases of such of these inheritors of woe, Mr. Greenwood's work may be called a series of ray sketches of the unfortunate, idle, and dissolute in London. When he comes to remedies he is somewhat vague. For baby-farming, in elucidation of which he repeats usefully the story of inquiries made by him in answer to specious advertisements and his detection of a gross case of brutality, he prescribes the issue of licenses, just as cowkeepers are required to be provided with them. But his grand general cure for everything is emigration, which, though a necessary thing in its way, does not, we all know, apply to all the curses of London.

The professional beggar, more than the professional thief, affords the author fair field for the display of humor. Some of the individuals and their callings he paints on his pages as curiosities with which the anthropologist could do nothing. The theory of the non-correspondence of the two hemispheres of the brain would scarcely account for the choice of the "shallow dodge" as a means of getting a livelihood. This calling was explained by one young casual to another in the course of the evening Mr. Greenwood spent in the casual ward. It consists of begging in as ragged and tattered garments as will hold together, leaving here and there patches of flesh exposed, which are powdered blue, to give an appearance of intense cold. It is only available in winter; but in a long frost a lucky practitioner, such as the mother of the young casual who explained the imposture, could make enough money to live on all the rest of the year. The operations of the Mendicity Society have, however, spoiled this branch of begging, to some extent, as Mr. Greenwood relates in the words of the young good-for-nothing:—

"Peeps are as soft-arted and as green as ever they was; and so they would shell out like they used to do, only for them — lurchers of the city. . . . Talking about the shallow lay; Lor' bless yer, you should have knowed what it was no longer ago than when I was a kid, and used to go out with my old woman. Ah! it was a summat to have winter then! . . . The old gal used to summat a wheeking lot in a big pocket she had in her petticoat, and I used to put away a 'dollop' in the busum of my shirt, which it was tied round the waist-bag hid under my trousers for the purpose. But, Lor' bless yer, sometimes the blessed trade would go that agrarvatin' that we should both find ourselves loaded up in no time. Lor', how my old woman would swear about the grub and sometimes. . . . Then somebody 'ud beckon us, and a p'rhaps it was a servant-gal, with enough in a dish for a man and his dawg. And the old woman 'bliged to curtsy and look pleased! They ought to have heard her! 'D— and b— am!' my old gal used to say between her teeth, 'I wish they had them broken wittles stuffed

down their busted throats! why the — can't they give it yer in copper?' But she could not say that to them, don't yer know; she had to put on a grateful mug, and say 'Gord bless yer, my dear!' to the gal, as though if it hadn't been for that lot of grub turning up that blessed tion, she must have dropped down dead of starvation."

The disadvantage of the reproduction of such revelations as these is, that people feel almost ashamed of themselves for having believed there was such a thing as real poverty in the world. They feel confident they must have been taken in over and over again, and resolve to cast off their hearts the heavy load and dark shadow that the sight of misery brings with it. They think they never need make themselves wretched with pity for the poor, or anxious about means to help them. They conclude that poverty is a hoax from beginning to end. On the other hand, this class of information is useful to show the absolute error of indiscriminate almsgiving.

Another kind of professional beggar is well touched off by the author. It is he who makes himself up to look like a respectable working man so long out of work, that, driven desperate by the hunger of his children, and the tears of his wife, he, at last, for the first time in his life, has darted out into the streets to beg. So unaccustomed is he to the sort of thing, and, indeed, so ashamed of it, that he does not know how to begin, and makes several false starts with preliminary clearances of his throat. "Hem!" he says at last, as with well got up emotion he dashes into the middle of the road, looks up at the windows, and states his case like a maddened victim. "Doubtless, my friends, you are astonished to see me in this humiliating attitude, addressing you like a common beggar," he begins; "but what is a father to do when his little one cry to him for bread?" and, continuous with similar appeals till a copper shower has fallen, when he begins afresh further on. Sometimes this shy, unpractised beggar, is acted by a whole gang at a time, got up to look as much like individuals of one trade all thrown out of employment at once by its depression as possible, when they merely lounge along the streets crying "Willin' to work, and got no work to do!" Concerning the gangs, Mr. Greenwood says, he does not wish to convey the impression that every one is of this imposture class. He writes:—

"It is not difficult to imagine a company of hard-up poor fellows genuinely destitute; mates, perhaps, on the same kind of work, resorting to this method of raising a shilling rather than apply at the workhouse for it. An out-of-work navvy, or a bricklayer, would never think of going out to beg alone, whereas he would see no great amount of degradation in joining a 'gang.' He thus sinks his individuality, and becomes merely a representative item of a depressed branch of industry. There can be no doubt that a stipend given to such a man is well bestowed for the time being; but it would be much better, even though it cost many sixpences, if the labourer were never permitted to adopt this method of supplying his needs."

And so we are thrown back again upon the two knotty points how to discriminate between real and mock poverty, and how to deal with the former so as to banish beggary and destitution. Mr. Greenwood also attacks the deceits of genteel advertising and letter-writing beggars. These, as doubtless many of our readers are aware, now enlist photography in their aid, and their begging-letters enclose portraits as further appeals to sympathy. One case the author describes in which were circulated the portraits of six young children neatly dressed and well groomed, with the startling heading to his application of "Children to save." Another, purporting to come from an Adelaide T., then in deep affliction and pecuniary embarrassment, enclosed the portrait of a young lady of captivating beauty, and of real rank and worth, as her own. The fraud was discovered by the accidental encounter with the original, who, however, could not throw any light upon the manner in which the portrait came into the possession of any one likely to have made such a bait of it.

Various police cases, fragments of magazine articles, and statistics are worked into the sketches depicting the seven curses. When treating of the fallen women of the metropolis, those of the great camp on Curragh Common are described at great length; and in every other section the work is made as varied and entertaining as the doleful subjects permit.

Our author condemns the Music Halls of the day in the strongest manner, and shows the way in which evil is produced by them. It is mainly at the refreshment-bars of these palatial shams that profrugacy may be seen reigning rampant.

"Generally at one end of the hall is a long strip of metal counter, behind which supple-stripped barmaids vend strong liquors. . . . Any night may be here found dozens of prostitutes enticing simpatons to drink,

* The Seven Curses of London. By James Greenwood, the "Amateur Casual." London: Stanley Rivers & Co.

AGRICULTURAL DISTILLERIES.

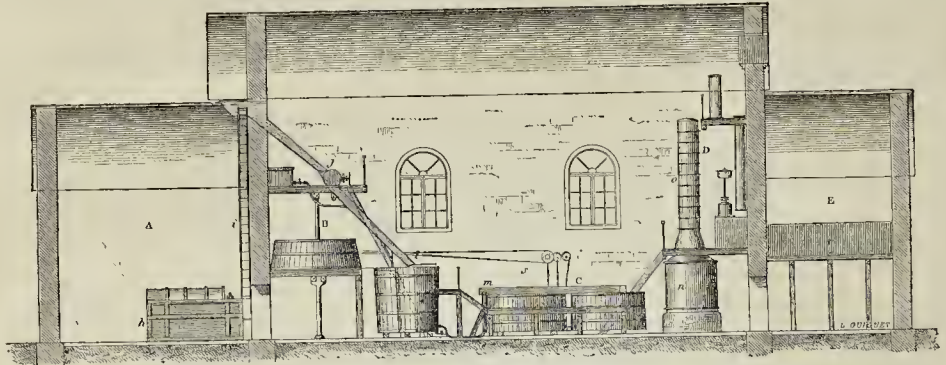


FIG. 1.—Elevation.

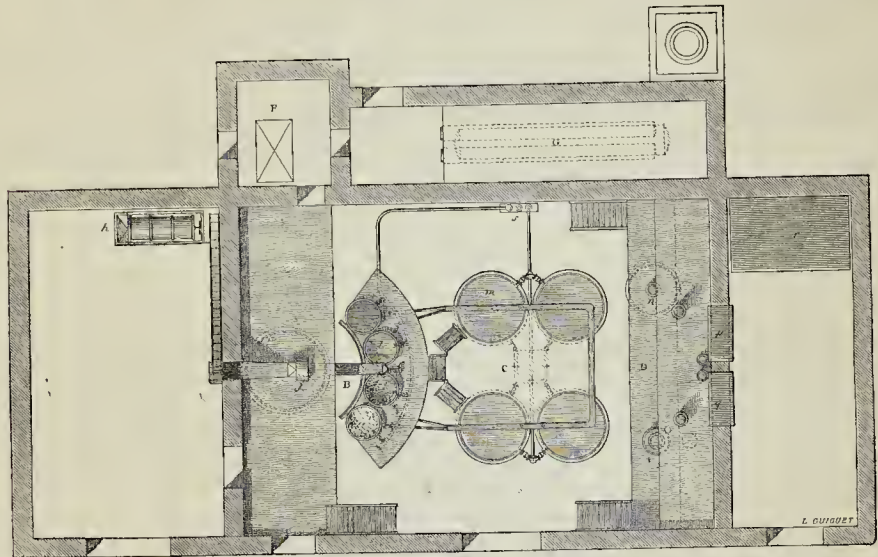


FIG. 2.—Plan.

while the men who are not simpletons hang about, smoking pipes and cigars, and merely sipping, not drinking deeply, and with watchful, wary eyes on the pretty game of fox and goose that is being played all round about them. No one molests them, or hints that their behaviour is at variance with the second and third of Victoria, cap. 47. Here they are in dozens, in scores, prostitutes every one, doing exactly as they do at the infamous and prosecuted Haymarket dens, and no one interferes."

The author picks out drunkenness as the crowning curse. This vice is still rampant, but it is gradually receding. It was once fashionable, but it is now vulgar. The son of the old country squire, who drank his two or three bottles of port every night before he was assisted to bed, now,—gested at the same table, in the same room,—wonders at the paternal performance, as he cautiously sips a glassful or two instead, and imputes much of his own indigestion to his parent's freedom. Fast novels need not now necessarily have a tipsy scene in them; nor need a screaming farce have a drunken character in it. Nevertheless, when there are still a hundred thousand persons summarily proceeded against in the course of the year for being drunk and disorderly, the attraction of the fatal vice should be fought against to the uttermost. To this end the author runs through the list of horrible ingredients with which the beershop keeper and pub-

lican adulterate their liquors, such as *cocculus indicus*, foxglove, green copperas, hartshorn shavings, henbane, jalap, nut-galls, nux vomica, opium, oil of vitriol, quassia, wormwood, yewtops, mostly bitter intoxicating poisons. Then the wine-merchant's contrivances to increase his stores are laid bare. All stories thrice told, of course, yet none the less appalling when told again. When all men are as intelligent and well-educated as the sons of the old unlearned fox-hunting country squires are now, and it is no more of a stride for all mechanics to make than it was for the former, the utter folly of such monstrous waste of health and opportunity will be too apparent to require a word of exhortation. Of newer growth is the wickedness of the professional gamblers, the tempters who hold out to silly lads that for the risking of a small sum they may obtain a large one—by betting on horses. And this Mr. Greenwood reviews in every phase. He explains "specs" and the "modus," turf characteristics, and the nature and treatment of welchers so fully, that all those who are wondering if there really be anything in the alleged "safe to win" often advertised, need do no more than study his interesting and useful pages for a reply.

Thus it will be seen that the seven curses Mr. Greenwood has depicted are bad enough, though, as we protested at first, there are others that are in equal need of ban and book. His curses are nearly all men, women, and children; those to which we allude are the conditions that have resulted in their being so contorted from the dignity, beauty, and grand intention of life.

BEETROOT DISTILLERIES.

AGRICULTURAL distilleries are indispensable to all well-established farms. In Germany the cultivators have understood better than we have done the necessity of creating such departments; already more than 16,000 agricultural distilleries exist beyond the Rhine, and new ones are mounted every day. In France there are only about 500. They produce pure alcohols, free from oil, and the remaining pulp is eagerly sought for by cattle, while the farmer has his manure for nothing.

In Austria, the return of farms, mounted with the Savalle or improved distilling and rectifying stills, has been hitherto up to 6 per cent. of fine alcohol at 58 over proof. In France this return has been 5½ litres of alcohol at 53 over proof

(Sykes) per 100 kilogs. of heatroot, pulp re-maining, 65 kilogs.

The following is the cost of production in France of 100 litres (22 gallons) of fine spirit, as witnessed by the books of an agricultural distillery operating upon 25 tons of heatroot daily:—

	f.	s.
Heatroot, 1,800 kilogs., at 18s.	32	40
Coal, 120 kilogs., at 30s. the ton.	3	60
Acid, 2 kilogs., at 20s. the 100.	9	40
Labour	3	0
Sundry expenses, interest on stock, &c.	5	60
	45	0
1,170 kilogs. of pulp, at 11s. the 1,000 kilogs., deducted.	11	70
	33	30
The 100 litres of spirit at 5s over proof are thus	33	30
Pipes and casks	4	70
	38	0

Now the market price varies from 66 to 70 for heatroot alcohol, so the benefit is enormous when the agricultural establishment is well mounted. In Austria several heatroot distilleries have been set up by M.M. D. Savalle, Son, & Co., of the Avenue de l'Impératrice, No. 64, with the same apparatus which we saw in Gallery 6 of the Paris Exhibition, 1867, consisting of well-finished pure copper columns, 20 ft. to 30 ft. high, for which they obtained a gold medal.

The establishment of M. Camille de Laminet, at Gattendorf, near Vienna, is shown in the figs. 1 and 2. Fig. 1 represents the elevation, and fig. 2 the plan. The same letters apply to both:—

- A. Heatroot store.
- B. Washing apparatus.
- C. Lift for the roots.
- D. Macerating vat.
- E. Root slicer. It is supplied by self-acting machinery, and lets fall the slices by their own gravity, through a pivoting shoot into each of the macerators.
- F. Series of macerators.
- G. Four fermenting vats, grouped together.
- H. Distilling and rectifying apparatus.
- I. Distilling column.
- J. Boiler, heated by a steam worm.
- K. Store and reservoir, where the pure alcohol is kept.
- L. Boiler-house.
- M. Steam-engine, for pumping, &c.

M.M. Savalle have put up, since the Exhibition of 1867, up to the end of 1868, 83 new stills, in America, England, Austria, Belgium, Spain, Brazil, France, Holland, Italy, Sweden, and Valakia. Some of them treating daily from 35 to 40 tons of heatroot, and yielding from 410 gallons to 1,500 gallons of fine spirit, from 68 to 70 above proof.

THE POLLUTION OF RIVERS.*

HAVING presented their report on the river Thames, the Commissioners proceeded to investigate the state of the river Lea, which drains an area of 500 square miles, equal to 320,000 acres. Within this area there is a population of 733,072, of whom 73,526 reside above the intake of the New River Company, between Hertford and Ware, and 153,030 above the intake of the East London Company at Ponder's-end. The Lea is navigable for twenty-eight miles; and the Stort, which joins it near Hoddesdon, for a distance of thirteen miles and a half; and two canals, the Lee Union and the Limehouse Cut, join the river at Old Ford and Bromley respectively.

From the watershed on the north of the basin down to Hoddesdon the ground is chalk, and thence to the ontfall London clay, in the main.

The average annual rainfall is stated to be 25 in.; but although averages are useful for comparison between one district and another, they are not to be relied on for the purposes of either navigation or water supply. The rainfall of the driest year is the test, and this was, in 1864, as follows, according to different gaugings:

	Inches.
Mr. Greaves, at the East London Waterworks	15.891
Mr. Beadmore, at Fields's Weir,	17.339
Mr. Muir, at Hoddesdon.	16.405
" " at Enfield.	18.400

These minima are about half the greatest rain-fall.

The relative areas of the Thames and Lee valleys are as 9 to 1 nearly; that is to say, the area of the Thames basin, including the Lee valley, is about 5,000 square miles, that of the Lee being 500; but the relative areas above the places where the water is taken by the London companies are as 8 to 1 nearly. The dry-

weather flow of the Thames at Kingston is 350 million gallons a day, and of the Lee at Lee Bridge 40 millions. Taking the areas above the points of gauging, there seems to be a dry-weather flow in the Thames of nearly 100,000 gallons a day per square mile of drainage area, while in the Lee there is but 80,000. Perhaps this may be accounted for by the fact that two-thirds of the area of the Thames basin is of permeable strata, while of the Lee valley only about one-half seems to be of that nature.

The two companies named supply 1,515,000 persons in the metropolis, out of a total of 3,037,991. The entire dry-weather flow of the Lea, except the small portion required for the lockage of boats, is taken by these two companies.

The Commissioners divide the river into three portions:—

1. That portion above the intake of the New River Company at Hertford.
2. The middle district, between their intake and that of the East London Company at Ponder's-end.
3. The lower district, from thence to the junction with the Thames at Blackwall.

The upper district contains a population of 73,000. The first great source of the pollution is the sewage and manufacturing refuse of Luton, a town of about 20,000 population, near the head of the River Lea. The sewage of Luton is treated with lime, and the solids precipitated, but the fluid which flows into the River Lea remains sewage, and if allowed to stagnate would become putrid and offensive. After the mixture with the Lea water, it becomes in a degree purified, and after flowing a few miles loses a further portion of its ingredients. Large quantities of various metallic salts, dya stuff, brimstone, &c., after use in the processes of cleansing, bleaching, and dyeing the goods, are discharged into the Lea. The poisonous character of the large quantities of oxalic acid that are thrown in is destroyed by the carbonate and sulphate of lime contained in the river water. But the Commissioners think we ought not to be dependent for a supply of water on such fortuitous protection.

The system of sewerage adopted at Hatfield, having a population of 4,300, is the dumb-well system, and the effluent must be more or less to pollute the subsoil water, which ultimately finds its way into the river.

At Whitwell the privies hang over the water; and at Welwyn the whole of the sewage runs in. Sheep-washing is carried on extensively in the Lea valley.

The middle district comprises a population of 79,000 persons.

The sewage of Hertford is dealt with by the New River Company. It is treated with lime, and delivered into the river below the intake, and they spare no trouble or expense to purify it, but being, as it is, the sewage of nearly 7,000 persons, it cannot be otherwise than a nuisance, and it is a constant cause of complaint to the people of Ware.

Ware, in its turn, shows no consideration for towns below it. It has a population of 6,000, and the sewage flows directly into the river without any liming or other process.

Every house on the River Stort drains into it, farmyards also, and carcasses float on the surface; the beds become silted up with refuse, and altogether it is yearly becoming fouler.

Below the junction of the Stort, the towns of Hoddesdon, Broxbourne, Cheshunt, Waltham Abbey, Waltham Crose, and Enfield discharge sewage into the Lea. All these places are above the intake of the East London Waterworks Company.

The Commissioners say that all sewers and house-drains should be fully ventilated. At Luton and other towns, where a system of sewerage has been carried out without proper ventilation, sickness has resulted from gases entering the houses.

"Sewage can very generally throughout the Lea basin be applied to land without difficulty, by gravitation. When pumping is required, towns may fairly be required to adopt it. The purification of the watershed of the River Lea from sewage may involve separate sewerage systems, and also the application of sewage to land for agricultural uses at several points, as at Dunstable, Luton, Stevenage, Buntingford, Bishops Stortford, Harlow, and several towns and villages in the lower valley, from Hertford and Ware downwards. Schemes to drain all the towns and villages below Hertford would probably be very costly in the first outlay, because

the subsoil is so full of water that large volumes would enter in the process of forming the sewers. On the other hand, under proper control, this abundance of water would eventually be an advantage, as sewage largely diluted is moved to the outlet more quickly and steadily, and in a fresher state, than when sewers and subsoil are drier. Combination of the sewerage of towns situated in the higher or middle districts of the valley would involve large and long expensive culverts; whereas small sewage farms would find a readier market for the produce than large farms removed from the population."

On the subject of the application of sewage for purposes of irrigation, the Commissioners say,— "Main carriers should be laid in nearly level lines, so as to command the area below; and secondary carriers, at from half a chain to one chain apart, should contour the whole surface. The main carriers may be covered in, having valves or sluice-boards, of a simple and inexpensive kind, to retain and let out sewage as required." "Small carriers may be formed with common agricultural tiles, but jointed and laid only three parts in the soil, so that one tile or more can be removed temporarily at any point to allow of the sewage overflowing at such point when the tiles are removed for this purpose.

All ordinary conduits may be open trenches, readily formed by hand labour or by the plough. These subsidiary contour gutters must not necessarily be looked upon as permanent. After one sowing of Italian ryegrass has run its course (this should not exceed two years), these minor conduits may be ploughed up with the rest of the land. Some farmers will probably clean the land by taking a root crop off it, and then lay it down again for a second course of grass, and so on. Proper irrigation and cultivation neither fouls the land nor exhausts it. Where sewage irrigation is the cause of a nuisance, it will be found to proceed either from use of old and putrid sewage in large and foul open ditch-like carriers, or from open tanks and large carriers being allowed to become foul."

"A sewage farm not only requires a peculiar mode of cultivation, but also special management in dealing with the produce. Tolerably good land under sewage will produce from five to seven crops of Italian grass per annum, weighing in the aggregate, when green, from 50 to 60 tons per acre. The grass is used to the best advantage on the day it is cut, and is most profitably applied to stall-feeding dairy cows." "Where there is sewage there must be population. Milk, butter, and beef will, therefore, necessarily be in proportionate demand; so that, when the true use of sewage is understood, that which is the cause of nuisance by being wasted, will be turned to profit on the land."

Looking at these reports of the Pollution of Rivers Commission, in conjunction with that of the Water Supply Commission, recently presented, it seems to us beyond dispute that it is highly advisable and proper, even if not absolutely necessary, to guard against a serious outbreak of illness in London generally, that all sewage should be kept out of the rivers from which we draw our supply of water. Chemists may analyze and may find nothing in the water that they can call injurious to health, but really this is not a chemist's question; it is a question of common sense whether we are to run the risk of using water for domestic purposes into which has been poured the enormous quantity of foul matter that we have here proof is daily poured into it; while all the protection we have that it is destroyed before it reaches us is that of the action of nature in counteracting our deeds by beneficent processes of oxidation and other chemical transformations, which are and can only be accomplished by a sufficient length of time being allowed for their action, and therefore the purification of the water we use is a matter of degree only, which degree may in most cases be sufficient, but in some may not be.

An Artist's Monument.—It is stated that a movement is on foot to erect a fitting memorial stone over the grave of the late Mr. Robert Scott Lander, the distinguished Scottish painter, whose death was recorded a few months ago. The initiative in this movement has been taken by a number of the younger Scottish artists, whom Mr. Scott Lander was wont to call "his boys." Many of these boys, both in Edinburgh and London, have now achieved fame and fortune, and are anxious to pay tribute to the memory of their old friend and master.

* See p. 677, ante.

SOUTH SHIELDS' NEW TOWN HALL
COMPETITION.

The designs sent in competition for this intended building were on view at the Mechanics' Institute last week. They are twenty-four in number, and of these six have been selected by the council from which ultimately to choose the one best fitted, in their opinion, for adoption. These six are distinguished by the following mottoes, "Always Ready," "Well considered," "Phoenix," "I Work to Win," "Northumbrian," and "Nota Bene." Taking them as they lie in order on the table, we find the design "Always Ready," with a blue cross and in a circle (for the same mottoes are appropriated by different competitors) to be comprised in a square of about 50 ft., and to consist of four floors, of which the basement is chiefly occupied by vaults suggested "to be let out" as cellars and such like. The cunning device is, no doubt, meant to go a long way with the worthy councillors, and perhaps it does suggest one reason why this design is placed among the lucky half-dozen; but it must, at the same time, be admitted that this is not its only recommendation, for the arrangement of the post-office and telegraph department on the ground-floor is excellent. The public on entering would immediately find three ways presented to them, which, at a glance, would announce themselves as leading respectively to the post, money order, and telegraph offices, and they could go from one to the other with great facility. If all the plan arrangements were as good as the postal, this design would be one of the best in that respect; but, as it is, the principal stairs are pushed back into a corner, and the council chamber, on the first floor, is too small, although 27 ft. by 23 ft. might possibly prove large enough to hold the assembled wisdom of the borough. Another drawback is the total omission of lavatories and other conveniences which ought to be attached to the council chamber; the nearest being only gained by passing through the mayor's parlour, or by mounting a flight of stairs. The town clerk's offices are conveniently placed on the first floor, and the borough surveyor's offices and housekeeper's rooms above.

The architectural beauties of this design, so far as the exterior is concerned, and this only is shown, are nil. A plain, bald, high-shouldered red brick building, intended, we presume, to be all Gothic, although some of the windows might be anything, is topped by a raised part which is too low to be a tower, and too high to be a mere gable. This "tower," however, although it does not contain the staircase, and is for no apparent purpose, is good, but only from its simplicity.

"Well considered," upon the whole deserves its title. If anything, perhaps, the design is rather too "well considered," and the consequences, in the shape of future cost, not considered quite well enough. Certainly, if South Shields get this design carried out in its entirety, with all its carving complete, for 6,000*l.*, it will get a bargain. Like the former, too, this plan appeals to the pocketed feelings of the council by devoting large spaces in the basement as cellars, "to be let." It also provides a fire-proof monument-room, which is certainly a desideratum in a town-hall.

The author exhibits two designs, one Gothic and the other "Classic." They are both good, and either would prove a handsome building. The front of the Gothic design shown in elevation is very elaborate. There is a hand of shields run along the entire front, which is a great mistake, as they are meaningless and certainly not ornamental. The clock-turret is too small, and, whilst pretty in itself, is insignificant in proportion to the building, and would look still worse in execution. Whilst in the former design the council chamber is too small, in this one it is too large; it is a noble room, indeed, but it is a pity competitors could not ascertain the number of gentlemen sitting in the "local parliament" before designing this apartment. The rest of the requisite rooms are well arranged; but the post-office, &c., is not so well planned as in the design first mentioned. In the alternative design the windows are very large, and, perhaps, might prove unmanageable in the smaller rooms: this design is bold and effective altogether, though failing in detail, the turrets notably, being too small and frittered away.

"Phoenix" does not offer any bait in the shape of cellars to let. On the ground-floor are given a fine hall and staircase, which lead to the council chamber, mayor's parlour, and town-

clerk's offices on the first floor. The last are decidedly too small, and the two former are ill arranged with regard to each other, and ought to communicate. This competitor seems to be the only one who has any idea of the proper size of a rate-collector or inspector of nuisances' offices; the others, apparently thinking that all the rates to be collected and all the nuisances to be inspected are to be brought to the offices themselves, have made the rooms so large. "Phoenix" disdains any such modern contrivances as sash-windows in the council chamber, and has carefully shown them all as casements,—a piece of true Gothic feeling which those who would have to use the room would probably not thank him for, especially as the windows in the room are very numerous. The borough surveyor's rooms are not well arranged, being separated from each other, and otherwise inconvenient.

Of the architectural merits of this design we can, without hesitation, speak highly. It is a temperate and well thought-out specimen of Gothic architecture. It is well grouped and, whether as to its general appearance as a whole, or as to its details and component features, does credit to the architect who created it. The chimneys are boldly taken in hand and disposed of in picturesque and pleasing groups, which really become part of the design; and a balcony running entirely round the building is so well worked that it has not the least appearance of cutting it in half, as is so often the case under similar circumstances. The interior views of the council-chamber and staircase show the same talent, and power of developing it. The chamber is a long room, with pointed windows on each side, and the vaulted roof and spandrelled ribs arching across are really excellent, the walls and splay, &c., of the windows being, we presume from the drawing, finished in stone or brickwork.

We are forced to regret that the plan is so immeasurably inferior to the elevation. Had this not been so, we think "Phoenix" would certainly be the fortunate winner of the prize, notwithstanding that a little more than the prescribed amount of money would be required.

"I Work to Win," taking it altogether and judging it upon its merits, is probably the one, of the six selected, most likely to work its way to the winning-post and receive the wished-for commission. Though not so good in an artistic point of view as the last-named, yet its arrangement is the best of all, and must on that account strongly recommend itself to the Council. It has four entrances, the chief one leading through a fine and spacious hall, and up a wide staircase to the council-chamber and other rooms on the first-floor. Another entrance leads to the post-office department, which has all the good points desired, in its planning, without any of the defects found in the other drawings ("Always Ready" excepted), if we correct one slip only, and that is, the telegraph office and the savings' bank ought to be reversed, which can easily be done, as both are about the same size. Another entrance leads to the rate collectors' and inspector of nuisances' offices, which are of moderate dimensions.

On the first floor the council-chamber, mayor's parlour, and town-clerk's offices are excellently arranged, and will work well together in execution; and on the second floor the borough surveyor's offices are prominent with regard to the public staircase, and any person seeking them will not be likely to wander inadvertently into the housekeeper's bed-room, as in some of the designs. The design itself is a substantial-looking Gothic structure, which, if not purely English, goes no further than our sister country, over the border, for its borrowed features. The tower is deserving of its name, and will show out well from the surrounding neighbourhood. We must advise the author, however, not to "shirk" his chimneys, and hide the flues in his tower, as he appears to do with some of them; but to bring them boldly out as chimneys, and make the most of them. In our opinion they will add to the attractions of the design, and, moreover, will obviate much misery to the occupiers of those rooms from which the flues in question rise, for, as they are arranged at present, the chimneys will inevitably smoke at the wrong end.

When we say that "Northumbrian" has a high tower and spire, which would show conspicuously for many miles all round, we exhaust its merits. For the rest of the exterior, it is a badly-imagined Gothic red-brick building set on top of a freely used Italian one. To build a

townhall of stone or white brick, half way up in one style of architecture, and to finish the top stories of red brick in another, the line where they join being straight and well defined, is certainly novel and startling, if not ingenious.

Nor do we find any redeeming merits in the interior arrangements. On the ground-floor the post and telegraph offices are not well planned, and the former is shown of so small a size as to make it quite useless in execution. The entrance-hall and staircase are small. On the first floor the council-chamber is rather small, and badly contrived with regard to the mayor's parlour: the stairs down from one and up into the other, in going to and fro between them are absolutely a fatal objection.

The sixth and last of the selected designs is marked "Nota Bene," and is inferior in most respects. Exterioy it is a red brick building, of a mixed style, in which the Roman, Grecian, Italian, and Venetian are discernible.

Of the rejected designs the plans and general drawings are not exhibited. Amongst the views we do not find anything very striking. "Architresque" and blue cross, is a good Italian design, and would look well in execution. The tower, however, is rather too florid for the rest of the building. "Always Ready" in a shield, is a handsome Gothic design, which would at once announce itself as a town-hall. The defects are the roof and tower, which look stuck on as an after-thought. "Foi" is rather good. It is a Gothic design "freely treated;" the roof line is picturesque; the tower and spire, however, look as if they did not belong to the remainder. "Always Ready" is a rather rough pen-and-ink sketch of a Gothic design, with a tower and spire, that would do credit to the town.

A hand of meaningless shields, however, runs in a line along the front, and somewhat spoils it. "As you like it" is an ecclesiastical Gothic design, which would suit well as a college building or library. It is quiet and tasteful, and only wants a good entrance and campanile to make it one of the best designs in the room.

As a whole, this competition seems to us below the average, only nine or ten of the designs out of the twenty-four being worth any consideration whatever.

THE EARLY MILITARY ARCHITECTURE
AND WEAPONS OF THE CELTS.

The military architecture and the military weapons of defence of the Saxons are pretty generally known; but until recently the military architecture of the Celts was a field which few cared to explore. Although there is much similar in the early history of the two peoples, yet when we come closely to examine it separately, there is a wide and distinctive field marked with peculiarities common alone to the Celtic race. As war is an institution coeval almost with the creation, and as the profession of the soldier is up to this our day looked upon with a feeling of pride, the study of that architecture hegot of warfare and appertaining to military life must prove more or less interesting. To begin, therefore, at an unequivocal point in our subject, let us ask what were the particular modes of military defence adopted by the Celts. The simplest modes of defence that could be adopted by the aboriginal inhabitants of any land would naturally be confined to the shelter and retreat that their forests, woods, mountains, and hogs could afford. Fences, of course, were next constructed, made of wattles or branches of trees; evidence as to these methods of simple defence having been adopted among the ancient Britons we have from Cæsar himself. The advent of the Gothic element into Britain led, no doubt, to improved methods of defence; for shortly afterwards we find that small forts were constructed on the boundaries that separated the territories of the different tribes. These forts are and were to be found at the entrance to woods and forests, on rocks, and hills, and other elevated places. These places, of course, were chosen with an eye to strategic effect. The forts of the Celts were known by the name of Rath. There were two kinds of raths, called respectively the *dun* and the *ban*. The former were isolated hills, or very elevated mounds, compassed by walls and entrenched with a rough stonework, without any mortar or concrete. Sometimes they were simply mounds of earth, square or circular. Many exist in the sister kingdom Ireland at the present day in towns whose name begins with the word Dun. The other description of fort called the *ban* or

babban, said to be derived from the Teutonic *bawen*, to construct with trees, were wide spaces or areas, surrounded with thick ditches of earth. Sometimes square, sometimes circular, these were impaled with rude stakes, perhaps improvised branches of trees. Until late years a great number of these forts were to be met with in Great Britain as well as in Germany, Sweden, and other places in Western Europe. Among the Celts the name of *dun* was likewise given to any entrenchment whose inside was elevated with the design of having an advantage over the enemy.

Some writers have remarked a very striking resemblance between the Pagan military architecture of the Celts and the early Pelasgic monuments in Greece. The forts or fortresses of the Celts are of Cyclopien architecture. The walls range in thickness from 3 ft. to 16 ft. The entrances to them are by a narrow doorway, with inclined sides, wider at the bottom than at the top. Although these forts were constructed of loose stones, they have stood from time immemorial without any being displaced. It is marvellous how some of the stones that went to the construction of the walls were mounted to their position, unless we imagine that a similar facility for lifting stones by mechanical means existed amongst the Celts and Britons as existed among the Egyptian workmen when the Pyramids were being erected.

The Celts, when on a military expedition, had other species of fortification for the protection of their camps and the route of their armies. These fortifications were mostly constructed of timber. The Brehon law, or ancient code of Ireland, compelled every chief to find timber sufficient for the construction of every description of fortress. Timber, however, was easily procurable in England and Ireland when the Brehon code was in force. The largest species of the Celtic fortifications were identical with those of Britain. They were called in the Celtic language *Cathair*, or cities; and according to the best account we are able to find of them, they were divided into the following important divisions: the *beallagh*, *dun*, *mote*, *ban*, *raib*, *uagh*, &c. The *beallagh* was the outward inclosure, which swept a circuit, like the baillium of the Norman Castle, or answering to it; only with the Celts it was not much more than a staked fence, and not always accompanied with an entrenchment. Within the inclosure the whole property of the chief was collected—servants, animals, &c. The *dun* was inclosed within the area of the *beallagh*, but elevated, and formed the residence, or habitation, of the chief and his family. The *mote*, or *mothar*, was the intrenchment which inclosed or encircled the *dun*. The *ban* was the rampart which (mostly situated with the *mote*) inclosed the *dun*. *Mothar* means an enclosed park, and *mote*, a mound. The court, or open space within the *ban*, was the *raib*, and herein was situated the Celtic *rightlann*, or Royal Palace, comprising several detached buildings. Lastly, the *uagh*, or *uagh*, was the cave, or under cellar, where provisions were kept, or where the chief and his retainers might retire in case of danger.

Some of the stone forts erected by the pre-Christian Celts may be seen in Ireland at the present day, in the west, north-west, and south-west. Perhaps the most remarkable one is that one in the island of Arran, supposed to be two thousand years old; there are some in Donegal, Mayo, and Kerry, similar in construction. In the massive walls of some of these forts there are chambers and stairs to be met in the interior, which lead to platforms varying from a few feet to upwards of 40 ft. On these platforms, doubtless, the defenders of the fort stood during attack.

Forts of dry wall masonry are very numerous in the south-west of Ireland. They were plentiful at one time all over the kingdom, but they have disappeared now except in remote districts. In Kenmare, near Derryquin Castle, there is a fort called *Staigna Fort*, of a very ancient date. It has a diameter of 80 ft. The stones forming the masonry appear to have been quarried, or, at least, split evenly off, from larger blocks. The stones are flatly bedded one upon another. So compact is this piece of dry masonry that you cannot even dislodge the filling-in stones without applying more than ordinary force. No masonry of the present day erected dry, as it has been, can compete with it for strength and durability. At Granard, in the county Longford, there is another remarkable fort of great antiquity. It is a good example of this kind of construction, and it exhibits traces of many

divisions with a view to defence. In the northern counties of England and along the Borders, a good deal of dry ordinary masonry may be seen, forming divisions to land. It stands well, but not having been erected with a view to military defence, of course there is no comparison.

The *cranogges* of the Celts, although evidently designed as a means of concealment, or a place for retreat, can hardly be treated under the term Military Architecture. Small islets of clay were formed in the centre of lakes. Into this were driven piles of wood, heaps of stones, and other material,—bones, for instance; for an extraordinary amount of bone has always been discovered in connexion with these structures. The *cranog* or habitation was used certainly as a place of retreat. They are to be found in close proximity to old forts and castles, which are not far removed from lakes. Those islets most likely were submerged in the winter. A causeway is found connecting some of them, though canoes were probably used in reaching them, as remains of such have been found mostly in or near these singular habitations.

Near to *Danshaughlin*, in the county Meath, was to be seen one of the earliest specimens of those singular structures. The Annals of the Four Masters mention the destruction of this *cranog* A.D. 933. It is recorded also in 1246 that *Turlough O'Connor* escaped from one of these keeps after he had drowned his keepers. This would argue that they might have been used as prisons or places for the concealment or detention of hostages. Again, we find in 1560 one *Teigne O'Rourke* is mentioned as having been drowned in his passage across to one of those island structures. So recent as the sixteenth century we have accounts of these *cranogges* (having been used in Ireland as a system of general defence.

The Round or Pillar Towers of Ireland have given rise to such an amount of controversy as to their origin and use, that we do not care to claim them as a piece of Pagan or Christian military architecture. We have an account of the destruction of many Round Towers in the Annals of Ulster in the year 448, caused by an earthquake. We have no authentic account in any of the Irish annals of the building of them since the Christian era. Whatever their history, we have no proof that the Celts and Britons did not know the use of lime and mortar long before the age of St. Patrick. Evidence of their knowledge of the building art exists in structures which are indisputably theirs, and which are evidently not of a Christian but a Pagan era.

Whether we can claim the Round Towers in part as here used or designed for military purposes, or as places used as a defence against sudden attack, they are singular and wonderful structures. Studding the island, though hundreds of them have disappeared, they are lasting like the Pyramids. There they stand, almost defying time, still pointing their cone-crowned summits to heaven, although they have forgotten the names of their founders.

Before treating of the military architecture that sprang up subsequent to the Danish invasion and the arrival of contingents from other Northern nations, it would not be amiss for our purpose to give some account of the warlike weapons in use among the Celts. Those weapons which were chipped into the form of a hatchet, axe, or spike, could be used for a variety of purposes, for specimens exist which would answer for arrows, knives, or mortise-chisels for framing purposes. The material was flint, and some of these stone celts or weapons exhibit great skill in their formation and felicity in the design. Taken in connexion with the early military architecture of the race we are talking of, they throw a flood of light upon our pathway; but of this we may speak hereafter.

C. H. C.

Proposed New Baths for Gloucester.

It is proposed to form a company, and plans have been prepared by Messrs. Medland & Son, for the erection of baths at the back of the Crypt School playground and near the Park. The plans contemplate the providing of a swimming-bath, 70 ft. in length and 35 ft. in width, with dressing-rooms attached, and six private baths, 9 ft. by 8 ft. The swimming-bath is to be so constructed that during the winter months the water would be let off, and the bath would then form a gymnasium or hall, 90 ft. by 45 ft.

PATENT-OFFICE REPORT.

THE Report of the Commissioners of Patents for Inventions for 1868 has been issued in a printed form. It states that,—

“The number of applications for letters patent, recorded within the year 1868, was 3,391; the number of patents passed thereon was 2,499; the number of specifications filed in pursuance thereof was 2,466; the number of applications lapsed or forfeited, the applicants having neglected to proceed for their patents within six months of protection, was 1,601; the number of patents void, the patentees having neglected to file specifications in pursuance thereof, was 34.

Thirteen thousand one hundred and one patents bear date between the 1st of October, 1852, and the 31st of December, 1868. The additional progressive stamp duty of 50s. was paid, at the end of the third year, on 3,692 of that number, and 9,400 became void. The additional progressive stamp duty of 100s. was paid at the end of the seventh year on 1,274 of the 3,692 remaining in force at the end of the third year, and 3,418 became void. Consequently about 70 per cent. of the 13,101 patents became void at the end of the third year, and about 90 per cent. became void at the end of the seventh year. The proportionate number of patents becoming void, by reason of nonpayment, continues nearly the same to the present time.”

The Commissioners thus conclude their report:—

“New rooms having been built for a library on the second-floor of the Patent Office building, the printed specifications, indexes, and scientific works were removed into them (without inconvenience to the general readers), and the library was opened to the public on the 16th of April, 1867. In the report to Parliament for the year 1865, it is stated that ‘the building at present devoted to the purposes of the Patent Office, with the recent additions and alterations, is not now, nor can it ever be made to be suitable for the requirements of the office.’ Experience has proved this statement to be correct; the building is now filled, and there is a continual increase of specifications and scientific works, for which provision must be made.”

ARCHITECTS' CHARGES IN GERMANY.

SOME months ago, at the time when the representatives of several associations of German architects were assembled at Hamhurg to discuss a scheme for the better regulation of their remuneration, we briefly alluded to their proposals. We now purpose to investigate and further explain the matter by giving a more detailed account.

Before entering upon the minutiae of the elaborate network before us, we will shortly apprise our readers of the main results embodied, and, we may almost say, hurried therein. Buildings are divided into five classes; the labours of the architect are detailed under six heads, and the building sums total have been arranged in nine divisions. Thus a table containing 270 categories has been produced, for which our friends over the water would find plain acceptance throughout the fatherland.

It becomes plain at a glance, that 5 per cent. is not looked upon as an adequate remuneration, being hardly sufficient for all purposes. While in the erection of a shed at a cost exceeding 30,000s., the architect would have to accept 2 per cent. only, it is clear that the average charge for all classes exceeds 6 per cent. (6.08 per cent. exactly). We shall not attempt to follow the compilers of the system into all its ramifications. To us it seems hardly necessary to instruct an architect as to the per-centage which he may rightfully claim when called upon to erect a building costing from 120l. to 300l., and we should not give a moment's attention to such points, were it not that they afford a striking instance of the zeal with which the German architects have attempted to make even impossibilities easy in the scheme before us.

The following is a short sketch. For brevity's sake we have appended a designation to each class, and have omitted six categories of building sums for the same reason:—

Classes of Buildings.	Per-centage for Buildings costing—		
	A few hundred £.	A few thousand £.	Above £30,000.
I. Rural Buildings...	6.0	3.0	2.0
II. Town Houses.....	6.5	5.0	3.0
III. Mansions.....	8.0	6.0	4.0
IV. Palaces.....	9.5	7.7	5.0
V. Ornamental Structures.....	11.0	9.0	6.0

The amount of care bestowed on avoiding mistakes as to the class to which a building belongs may be argued from the fact that there are about a hundred specifications enumerated in the original, besides the necessary et-ceteras. Class I. comprises warehouses, market-halls, temporary exhibition-hoofs and buildings; the most simple cottages, vaults, and coverings for large hollow spaces, workshops, &c.

Class II.—Villas, stables in connexion with them, greenhouses, dwelling-houses, middle-class family residences, public schools, simply constructed hospitals, barracks, baths and wash-houses, prisons, railway stations, &c.

Class III.—Superior residences, verandas, pavilions, large shops; buildings with fittings, for ventilation or other purposes, requiring special thought and attention; churches, museums, theatres, &c.

Class IV.—Palaces, rich churches and chapels, magnificent cithouses, triumphal arches, guild-halls, &c.

Class V.—Interior and exterior decorations; altars, pulpits, monuments, &c.

The labours of the architect are comprised under the following heads:—

1. *Sketches*.—Preliminary designs drawn to scale, with an approximate estimate, if desired.
2. *Plans*.—Elevations, sections, &c.
3. *Detail Drawings*.—Constructive as well as ornamental detail drawings.
4. *Estimate*.—A special estimate.
5. *Superintendence*.—Negotiations, &c., exclusive of special superintendence, which latter the client has to provide.
6. *Revision*.—Settlement and scrutinizing of accounts.

(Measurement excluded.)

In each class a special allotment is made for every one of the above items. These allotments are to some extent proportional, and, considering the source from which they sprang, we are at a loss to understand why they are not exactly so. When in Class III., line 4 and 5 (see detail table, lower down), we meet with a proportion like the following,—0·6 : 0·5 = 1·6 : 1·5, and many others similarly incorrect,—we are divided between two opinions. Either there is an essential reason for such anomaly, or there is not. If there be, it surpasses our comprehension, and we should have to put in on one side an account of its depth, that being too great for our limited capabilities to fathom; if, on the other hand, it is merely an expedient for avoiding two decimals, we are again at a loss to understand how such a thing could possibly have disturbed the scrupulous compilers. Failing

to see the depth, if there be any, we must presume that the irregularity here complained of by us is due to the nature of that particular kind of systematizing which never tires until a straight-jacket has rendered its victims motionless. It moves no more in that condition, but it writhes. Just so with the elaborate plans before us. We have round per-centages and fractions of per-centages. The latter are the straight-jacket, necessitating more fractions, more hair-splitting. At last the minute threads will not split any more, and it is at the time when they are brought to an almost inappreciable size that the necessity arises, always consequent upon a course of this kind being pursued, of darning and patching and filling up. No extent of system will do away with all disputes, and dealings between men and men cannot be reduced to rule. A leading principle, however, is needed, and of this we are as deficient as our neighbours. Both our practice of 5 per cent. and their system of 270 different percentages are extreme measures, the one too loose, the other too narrow. They will have to be blended so as to produce one sound and practical medium. In looking through any of the vertical columns shown in the detailed table below, it will be readily perceived how the percentages have been spread over the different labours composing the architect's duties. We will here quote one, the first one:—

Architect's Charges for	For Buildings valued between £120 and £300.
1. Sketches	0·7
2. Plans	1·0
3. Detail Drawings	1·0
4. Estimate	0·8
5. Superintendence	1·2
6. Revision	0·5
Total	5·0

It will be observed by noticing all the first vertical columns that while the item "revision" (0·5 per cent.) remains about the same throughout all classes, the charge for estimate varies little with the class of building. The per-centage for drawings, however, rises almost in equal proportion with the classes:—

DETAIL TABLE OF GERMAN ARCHITECTS' CHARGES.

ARCHITECTS' WORK.	Per-centage of Architects' Remuneration for Buildings costing (in Prussian Thalers) from—									
	800 to 2,000 incl.	2,000 to 4,000 incl.	4,000 to 8,000 incl.	8,000 to 16,000 incl.	16,000 to 24,000 incl.	24,000 to 40,000 incl.	40,000 to 100,000 incl.	100,000 to 200,000 incl.	200,000 to 300,000 incl.	above 300,000
CLASS I.										
Sketches	0·7	0·6	0·5	0·5	0·4	0·3	0·3	0·25	0·2	0·2
Plans	1·0	1·0	0·9	0·8	0·7	0·6	0·5	0·4	0·4	0·4
Detail Drawings	1·0	1·0	0·9	0·8	0·7	0·6	0·55	0·5	0·4	0·4
Estimate	0·6	0·5	0·5	0·4	0·4	0·4	0·3	0·25	0·2	0·2
Superintendence	1·2	1·1	1·0	1·0	0·9	0·8	0·7	0·6	0·6	0·6
Revision	0·5	0·4	0·4	0·3	0·3	0·3	0·25	0·2	0·2	0·2
Together	5·0	4·6	4·2	3·8	3·4	3·0	2·6	2·2	2·0	2·0
CLASS II.										
Sketches	1·1	0·9	0·7	0·6	0·5	0·4	0·4	0·3	0·25	0·25
Plans	1·2	1·2	1·1	1·0	0·9	0·8	0·7	0·7	0·6	0·6
Detail Drawings	1·4	1·4	1·3	1·2	1·1	1·0	0·9	0·9	0·8	0·8
Estimate	0·7	0·6	0·6	0·5	0·5	0·4	0·35	0·3	0·25	0·25
Superintendence	1·6	1·5	1·4	1·3	1·2	1·1	1·0	0·9	0·9	0·9
Revision	0·5	0·4	0·4	0·4	0·3	0·3	0·25	0·2	0·2	0·2
Together	6·5	6·0	5·5	5·0	4·6	4·0	3·6	3·3	3·0	3·0
CLASS III.										
Sketches	1·4	1·1	0·8	0·7	0·6	0·5	0·4	0·4	0·3	0·3
Plans	1·4	1·4	1·3	1·2	1·1	1·0	0·9	0·85	0·8	0·8
Detail Drawings	2·0	1·9	1·8	1·7	1·6	1·5	1·4	1·4	1·3	1·3
Estimate	0·7	0·6	0·6	0·5	0·5	0·4	0·4	0·3	0·25	0·25
Superintendence	2·0	1·8	1·6	1·5	1·4	1·3	1·2	1·1	1·1	1·1
Revision	0·5	0·4	0·4	0·4	0·3	0·3	0·3	0·25	0·25	0·25
Together	8·0	7·2	6·5	6·0	5·5	5·0	4·6	4·3	4·0	4·0
CLASS IV.										
Sketches	1·7	1·4	1·2	1·0	0·8	0·6	0·5	0·5	0·4	0·4
Plans	1·6	1·6	1·5	1·4	1·3	1·2	1·1	1·0	0·9	0·9
Detail Drawings	2·9	2·9	2·8	2·7	2·6	2·5	2·3	2·1	1·9	1·9
Estimate	0·7	0·6	0·6	0·5	0·5	0·4	0·4	0·3	0·3	0·3
Superintendence	2·1	1·9	1·8	1·7	1·6	1·5	1·4	1·3	1·2	1·2
Revision	0·5	0·5	0·4	0·4	0·3	0·3	0·3	0·3	0·3	0·3
Together	9·5	8·9	8·3	7·7	7·1	6·5	6·0	5·5	5·0	5·0
CLASS V.										
Sketches	2·0	1·6	1·3	1·1	0·9	0·7	0·6	0·5	0·5	0·5
Plans	1·7	1·7	1·65	1·6	1·5	1·4	1·3	1·2	1·0	1·0
Detail Drawings	3·7	3·7	3·7	3·6	3·5	3·3	3·1	2·9	2·6	2·6
Estimate	0·8	0·7	0·6	0·5	0·5	0·4	0·4	0·3	0·3	0·3
Superintendence	2·2	2·0	1·9	1·8	1·7	1·6	1·5	1·4	1·3	1·3
Revision	0·6	0·5	0·45	0·4	0·3	0·3	0·3	0·3	0·3	0·3
Together	11·0	10·2	9·6	9·0	8·4	7·8	7·2	6·6	6·0	6·0

We may here add that the taking out of quantities is not included in the architects' charges above enumerated; that, further, the client has to bear the expense of clerks of works (overseeing, keeping of journal, adjustment of calculations respectively), whether he engage them himself, or whether the architect does so. In the latter case expenses involved are debited to the client by the architect in addition to his per-centage. Special inspections or loss of time occupied in journeys are rated low, being about half a guinea in the one case (for seven hours in railway travelling), and double that amount in the other, besides actual outlay for lodgings, refreshments, &c. Drawings and designs remain the property of the architect. Money is to be advanced by the client in proportion to the progress of the building.

VENTILATION OF DWELLING HOUSES.

A CORRESPONDENT sends us some not very clear particulars of a plan of ventilation for dwellings that has been in use for two years in four houses in Keeton's-road, Bermondsey, and is said to answer expectation. He says:—"The houses are built on an improved plan of constructing the chimneys: one smoke-shaft for each series of rooms, instead of a separate chimney from each room, by the sides of the single smoke-flue, is built in the air-shafts, for the supply of fresh and pure air to each of the rooms; the used air is taken off at the ceiling line into the smoke-shaft. By this plan smoky dwellings are prevented, and draughts from windows and doors greatly decreased. The cleaning of the chimneys is done in the basement, saving the sweep entering any other part of the house."

POUNDS.

NOTHING to do with pence; no sympathy with scruples; no questions about troy-weight, or avoirdupois, or money's worth, or balances; but Pounds of that other sort, into one of which (to give a notorious classical instance) our dear old friend Mister Pickwick was ignominiously wheelbarrowed, when unconscious how far the cold punch—with or without lemon-peel—might have disagreed with him.

We speak then here of those innumerable little prisons, square and bare, and cruelly inhospitable, dotted all over the land (for where is there not a manor?) and everywhere handy for the incarceration—and semi-starvation—of innocent dumb creatures.

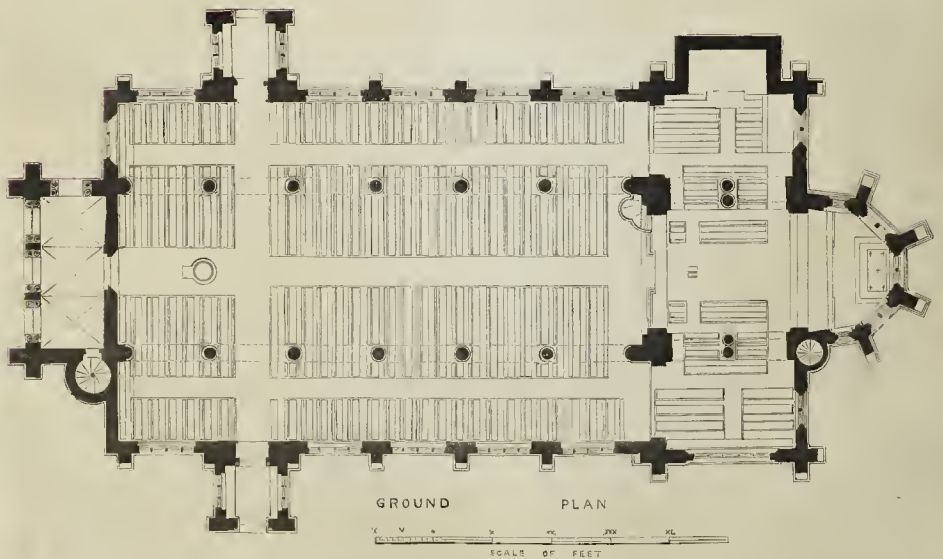
Of course, we know they must be incarcerated; for, through the carelessness of their ignomiser masters, they have strayed out of open gates, or got into ill-fenced corn-fields, and wander up and down the roads to the righteous indignation of waywardens; by all means, let them be impounded wherever found, and kept well till called for, and not let forth without payment of all dues. But, if impounded, is there any reason why the poor creatures should not also be sheltered? A slight modicum of food is enjoined by law, though frequently not provided; water, however, is a luxury almost out of hope to the unhappy beasts; but (and here is our heaviest grievance), shelter of any kind is quite unknown, and certainly not imperative, in any of our thousands of Pounds all over the country. Be it the fiery heat of summer, or the ice and chilling blasts of winter, in heavy rains, or snow, or hail, by night and by day alike, the poor estrays crouch miserably in their cruel pens, without a corner provided to creep into against the inclemency of our seasons, and patiently dying out before the nipping eyes of those who pass by! Surely, in these better days of humanity towards everything living, the old Pound ought to be improved by the small but most important matter of a shed in one corner; a mere roof to keep off rain,—and perhaps a side screen against the wind. This, as a piece of law and duty, ought to be imperative on every pound-keeper; and if any manorial magnate sees these lines, let him kindly accept the suggestion, and bid his bailiff tend more carefully those poor estrays imprisoned for their masters' fault, but certainly not therefore to be starved for want of forage and water, nor to be left unsheltered in our open Pounds till well nigh perished by the slow tortures of an English climate alternately tropical and arctic. It may be within the useful province of the *Builder* to improve upon the wisdom of our ancestors in even so humble an edifice as a Pound.

MARTIN F. TUPPEL.

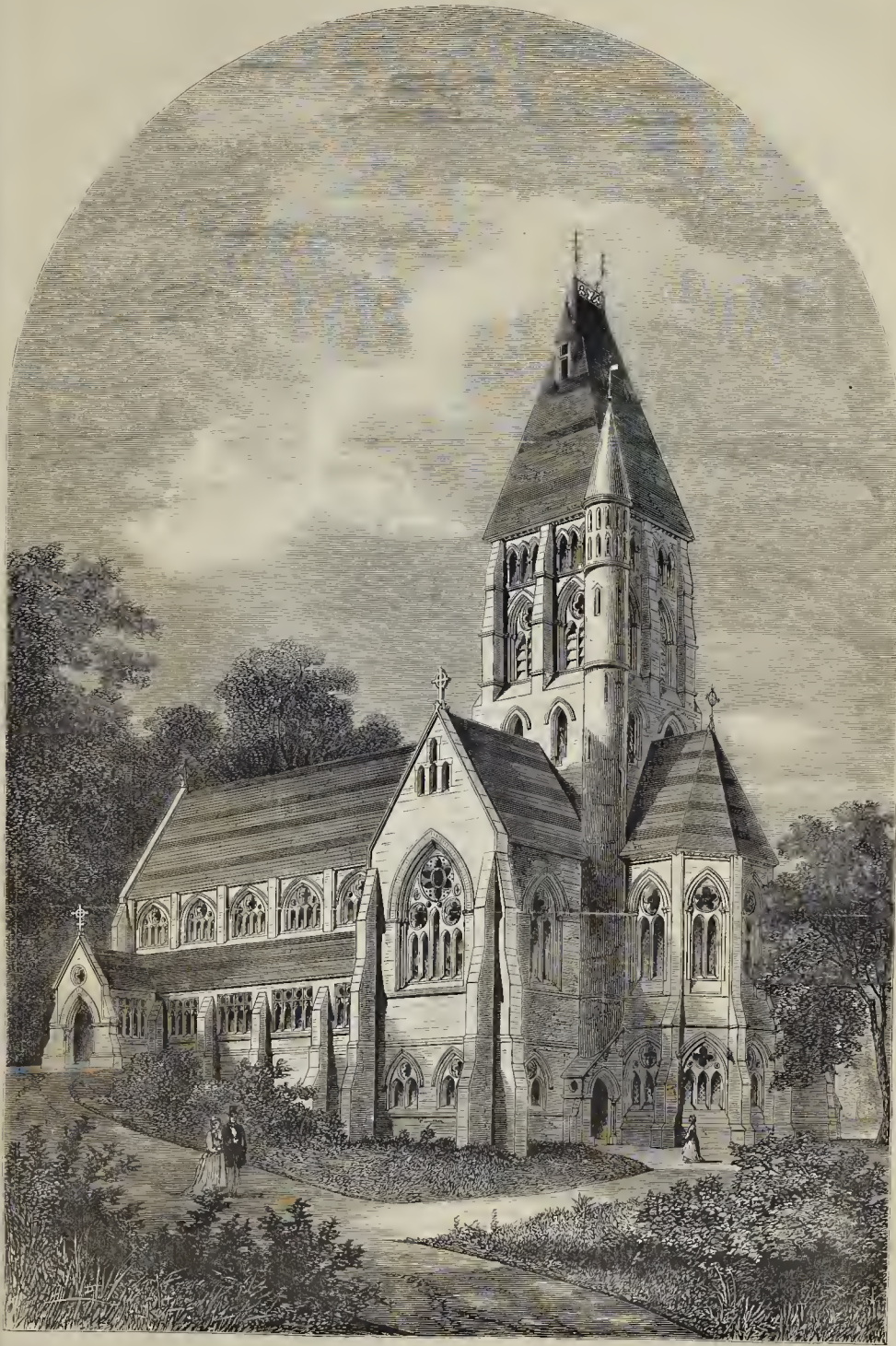




MR. GEORGE EDMUND STREET, A.R.A.
Architect Designate for the Proposed Law Courts.



ST. STEPHEN'S CHURCH, HAMPSTEAD.
Plan.



ST. STEPHEN'S CHURCH, HAMPSTEAD.—Mr. S. S. TEULON, ARCHITECT.

ST. STEPHEN'S CHURCH, HAMPSTEAD.

This church is now in course of erection from designs by Mr. S. S. Teulon, of Craig's-court, Charing-cross. It consists of a nave and aisles 90 ft. long by 57 ft. wide (the width of the nave itself being 26 ft.), with a tower 21 ft. square, internally forming a part of the chancel, which is completed by an apse eastward of the tower. The tower is to be flanked by transepts, but these and the aisles and the upper part of the tower are to be left unfinished for the present for want of funds. Advantage has been taken of the fall of the ground from west to east to obtain some spacious rooms for vestries and other purposes under the chancel. The character of the architecture inclines to that of the Early French ornithoses. The tower when completed will be nearly 130 ft. high.

The portion of the church in progress will accommodate nearly 600 worshippers. When the aisles and transepts are added there will be sittings for more than 900.

THE SOLICITOR-GENERAL ON ART AND MANUFACTURES.

At the opening of the Science and Art-Exhibition, in Devonport, lately, the Solicitor-General, Sir J. D. Coleridge, M.P., made first a very great flourish, and then an interesting speech. He started, as reported, thus amazingly,—"One of the first things we may learn from this collection is the inaccurate and hazy character of much of the talk we hear as to the union of manufactures and the arts. There is in correct language no such union. They are things in their nature altogether different and distinct." and then he went on to show throughout the whole of his speech, the practicability of this union, the fact of its existence in the Classical and Renaissance times, and its great value.

"No one will deny," said the speaker, "that if we manufacture he sound and useful, it is a great advantage it should be refined and lovely too. Now, why was it so formerly, and why is it not so now? Mainly, I think, for two reasons. First that the greatest men employed themselves, or were employed, in making beautiful models of things in ordinary use; and next, that these models were constantly followed and repeated. As to the first, we know, historically, that the fact was so in the finest periods of the mediæval and Renaissance art. Great artists in those times never thought it beneath them to devote beanty of design to things of common use, and the makers of such things availed themselves of the greatest men amongst their contemporaries to give beanty to their wares."

In other words, they wisely brought art into union with manufacture,—they carefully wedded genius to Vulcan. The mistake made by the Solicitor-General at starting, led those of his audience who knew anything of the matter to doubt the soundness of all that he said afterwards.

THE DUKE OF NORTHUMBERLAND'S BOOK OF ROCK SYMBOLS.

The late Duke of Northumberland and the present duke have caused a splendid and no doubt costly folio volume of plates to be printed, for special presentation, in which are depicted many of those curious markings on rocks and stones in Northumberland, Argyleshire, and various other parts of Britain, and in Ireland, as well as elsewhere, which have been associated under the general name of "Rock Symbols."* regarding which, as a class, a discussion took place in the Builder, as our readers may recollect, in 1864 and 1865. The plates are accompanied by a few choice pages of letterpress by Dr. Bruce, the Newcastle archaeologist, who had been employed by the late duke to superintend the work of preparing the plates for the press. The letterpress contains an account of the successive discoveries of the markings, but nothing of the least importance towards an explanation of their origin, meaning, or purpose. Most of what is said on this subject relates to suggestions which are admitted to be not satisfactory, such as that the holes pierced out concentric circles and radiate grooves, with central "cups," were for the flow of blood in sacrificial processes, whereas many of the

carvings are on rocks at natural angles, and anything but horizontally placed. It is a curious fact in idiosyncrasy, if not in archaeology, that the suggestions in the Builder on the subject are still, as heretofore, totally ignored by Dr. Bruce, and make no appearance whatever, even in his list of suggestions that are not satisfactory; unless, indeed, the solitary remark that "some papers 'On Circular Rock Marks and other Symbols' appeared in the Builder, from the pen of Mr. John E. Dove and others," he supposed to contain, wrapped up in it, an implied inference that the suggestions in these papers were not worthy of even being included in the list of those that are not satisfactory. This is all the more notable inasmuch as the suggestions in these papers, as has already been clearly shown in the Builder, included the germ, or key-note, of Dr. Bruce's own subsequent attempt, and those of others, to explain the meaning and purposes of the carvings; and they also include the first if not even yet the only suggestion of anything analogous or similar to them in known symbolism,—namely, the centre-and-circle symbol, of known meaning and of almost universal antiquity, which is absolutely identical with many of the rock symbols; and the "Sephiroth" concentric-circled symbol, which is also of known meaning, and closely resembles many others of the rock symbols. Surely these suggestions merited a place either amongst those which were not satisfactory, or amongst those which were, especially as considerable space is allowed for suggestions of the most improvable and unsatisfactory description, such as that about the blood of sacrifices. Why, then, is it that Dr. Bruce has ignored especially those suggestions which pointed attention to the remarkable similarity, or identity rather, between symbols whose meanings as well as forms are known, and those recently discovered symbol-forms whose meanings and purposes are held to be utterly unknown? Dr. Bruce himself says, "When so much obscurity prevails, every suggestion is worthy of consideration;" and he quotes approvingly a remark by the Rev. William Greenwell, who first brought the subject under public notice, that the Northumbrian carvings "differ from all other symbolical expressions with which we are acquainted, and seem peculiar to the Celtic tribes which once peopled all Western Europe: further inquiry may make known other instances of their occurrence; and it is not impossible that on being found, as it may happen, in connexion with other and known symbols, some light may hereafter be thrown on their meaning." Dr. Bruce also quotes a remark made to him by Mr. John Stuart, the author of "The Sculptured Stones of Scotland," that "the great thing is to trace analogies and correspondences in examples from different localities," and

"This [adds Dr. Bruce] was the principal object which the Duke of Northumberland had in view when he directed the preparation of these plates: still, something may be done to clear the way for the discovery of the true solution of the mystery: negative knowledge has its value; to ascertain what the incised markings are not, limits the channel of inquiry, and prevents, to some extent, the waste of ingenious conjectures."

The exclusion of similar or identical forms, whose meanings and purposes are known, from any consideration whatever in reference to the obscure subject under notice, was not the way either to carry out the enlightened intention of the duke, or to shed any light worth looking upon that subject; and Dr. Bruce's Introduction, notwithstanding the excellent advice admittedly given him, must merely be regarded as little else than a bald record of the times and places when and where the carvings represented in the plates have been discovered, and is of no other value whatever.

It is unnecessary for us to re-enter on the more important subject of the connexion of the rock carvings either with similar forms in known symbolism, or with the doctrines of antiquity with which these latter were associated. Not a spark of additional light on these interesting subjects is even attempted to be given here, where it was to be expected, and where it ought to have been; and all we either can or need do at present, is to refer our readers back to the papers in the Builder already alluded to, which gave the tone to all attempted explanations; and especially the papers of July 2nd, September 3rd, October 22nd, and December 17th, 1864; and April 22nd, 1865. In reference to the intimate relationships in which the ancient heathen religions in general stood to one another, we may specially refer to that of October 22nd, 1864; and as to these religions being

all essentially magical, and hence the practices connected with them also magical, as urged in these papers, we may here remark, as we had occasion to do on a previous occasion, that it is no doubt the most popular and sceptical, and hence the safest policy, to ignore all magical doctrines while attempting to unravel the mysteries of ancient practices such as the Celtic one of carving centre-and-circled, concentric-circled-and-radial-grooved, or other forms, on rocks, in sorcery halls or chambered tumuli, and on funeral kists; but there is no better ascertained fact as to ancient times than that pre-Christian and heathen nations in general, in all parts of the world, were deeply,—intensely,—and probably universally, imbued with magical practices and doctrines; and no archaeologist who is ignorant of these, or who attempts to unravel the mystery of ancient sculptures and structures without taking them into consideration, is at all likely to be able to evolve the true theory of the uses or purposes and meanings of such sculptures and structures. Of course the truth, error, or imposture of the practices and doctrines themselves, here referred to, is not the point at issue; and, except indirectly, has little or nothing to do with it.

THE TRADE-UNION CONGRESS.

MANY subjects closely affecting the future well-being of the working classes have been discussed by this Congress, who, in fact, have touched upon most of the topics comprehensively dealt upon in Mr. George Potter's paper on the "Disorganisation of Labour." Perhaps the most satisfactory issue that has been reached, is the resolution approving Courts of Arbitration and Conciliation, after a serious discussion following upon a paper by Mr. W. Owen, of Burslem.

Mr. Owen thus put the case of labour in its relation to capital:—

"It had been often said that labour was but a commodity, to be bought and sold as are other commodities, and it had also been maintained on the other side that labour was not a commodity, but a human power, from which all commodities resulted. The latter view was that to which he inclined, and he believed that labour, as the maker, was greater than that which it made. It seemed to him to be wrong to ask that labour, and the great producer, should be as passive in the hands of capital as the piece of ware that the potter had made."

Mr. Owen's account of the successes of Courts of Arbitration in various centres of industry (in Staffordshire particularly), is encouraging; and these successes will, it is to be hoped, be rapidly extended, by the influence of the resolution adopted by the Congress.

The subjects next in importance to that of conciliation by arbitration have been,—the legalisation of Trade-unions and the Commissioners' Report; reduction in the hours of labour; and the number of apprentices.

Mr. Potter made a sensible suggestion to his hearers to wage war against drunkenness among the working classes if they wished to improve their condition. For the rest, the prevailing idea of the unionists seems to be the abolition of all laws whatever affecting trade-unions, either with respect to their funds or against combination. They claim the right to morally coerce their fellow working-men, considering the ordinary laws of the land sufficient to deal with any form of physical coercion.

On the subject of the numerous papers read, and discussions carried on, our limits prevent us from attempting to enter; but we here give a number of the more important resolutions passed by the Congress on the several days of meeting:—

"That this Congress is of opinion that the establishment of courts of arbitration and conciliation would greatly conduce to the just and peaceable settlement of all disputes between employers and employed, and be the means of preventing strikes and lock-outs as well as being conducive to the commercial and industrial enterprise of the nation."

"That in any attempted legislation in regard to trade-unions, the following principles should be distinctly recognised:—1. The entire repeal of the combination laws. 2. Complete protection of their funds. 3. No interference with or attempt to separate benefits from trade funds. 4. In respect of the recommendation of the Commissioners to compel the registration of trade rules, and to open accounts to the registrar, this Congress would be against any exceptional clause from that enforced with reference to other legal societies in this country."

"1. That this Congress is of opinion that the working-classes have advanced their wages and shortened the hours of labour by strikes, when all other means have failed of settling such disputes, and believe that strikes and lock-outs have produced poverty to workmen and bankruptcy to employers. 2. The Congress is further of opinion that co-partnerships of industry will considerably improve the industrial relations between employers and employed, and are, therefore, worthy of general adoption; further it is the opinion of this Congress that nothing

*The Incised Markings on Stone, found in the County of Northumberland, Argyleshire, and other Places; from drawings made in the years 1863 and 1864, by direction of the Duke the late Algonern, Duke of Northumberland, and published by the Builder, London, printed for private circulation, 1869.

short of co-operative production applied to manufactures and land can be accepted as a cure for the conflicting interests of labour and capital. 3. The Congress is nevertheless of opinion that it is the duty of the working-classes to unite more closely in the future than they have done in the past, for their mutual protection will continue imperative so long as the interests of employers and employed remain antagonistic."

"That this Congress believes that nothing short of a system of national, unsectarian, and compulsory education will satisfy the requirements of the people of the United Kingdom; and expresses a firm hope that the Government will not allow the next session of Parliament to pass away without dealing with the question, upon the basis above suggested; and that copies of this resolution be sent to the Right Hon. W. E. Gladstone, the Premier; and the Right Hon. W. E. Forster, Vice-President of the Council on Education." A resolution was also passed, recommending the trade-unions to support the National Education League in their efforts to carry out the foregoing resolution.

"That this Congress is of opinion that in trades where the supply is in excess of the demand, the limitation of apprentices is justifiable, a fair proportion being allowed, in keeping with the number of men employed to teach them."

"That in the opinion of this Congress the great destruction of human life in the working of the coal and ironstone mines of this country calls aloud for investigation, and for further legislation for the protection of life; and the representatives here assembled deeply regret that the Mines Regulation Bill introduced last session by the Right Hon. H. A. Bruce, Home Secretary, should have been withdrawn, knowing that the miners of the United Kingdom have been, during the last six years, doing all in their power to induce the Government to pass a measure to prevent the fearful sacrifice of life which is constantly taking place. We are further of opinion that all trades and associations connected with this Congress should use their influence with the members of Parliament for boroughs and counties in their respective localities to aid the miners in passing an efficient bill for their protection next session of Parliament."

To this list of resolutions we may add a resolution recommending trades' societies to support the "eight hours' movement."

As we early brought the subject of industrial partnerships before our readers, we may here say that Mr. G. J. Holyoake, of London, read a paper on "Industrial Partnerships as a Means of Aiding the Objects of Trades-Unions." His definition of an industrial partnership was that it was a plan of conducting a manufacturing or producing business, in which the chief management was in the hands of those who supplied the chief capital, and the profits or losses were proportionately distributed between shareholders and workmen. He believed that both this method and the ordinary form of co-operation could be used to raise labour to a position of due equality in its bargains with capital. But it was industrial partnerships that offered to trade societies the advantages they needed. With industrial partnerships the men would have honour and security. There would be less loss, less care, less strife; indeed, great gain for them, and an honourable content around them. The employer would be a king, and every workman a citizen in the Commonwealth of Industry. But alas! that was not to be. That workman was only half conscious of his own interests, and only half informed how to advance them, who did not take into account the prosperity of his employer, and who pushed his own claims regardless of his master's. But the other half of the case should be stated with equal plainness. The employer who did not see that the competence, content, comfort, health, leisure, thought, and goodwill of his men were his interests also, and that he was not to push the claims of capital against the self-respect and well-being of labour, was ignorant of the art of snatching a fortune with honour and security. The fair consideration by the employers of the workman's interest, and industrial partnerships, were a means now at hand for accomplishing that. In conclusion, Mr. Holyoake expressed his belief that many employers would accept a proposal for industrial partnerships, but they could not do so at once, nor do it at all without the co-operation of the workmen.

The next conference is to be held in London. Nottingham was also proposed, but London was selected.

Ventilation of Mines.—Mr. Lloyd, the engineer of the Lilleshall Company, has invented a mechanical apparatus, which the company have patented, and which, taking advantage of the elasticity of the atmosphere, seeks to ventilate coal-mines by means of exhaustion, by using a centrifugal fan, driven by an engine. A model has been erected, with a fan, 18 in. in diameter, and 6 in. wide over the blades, which, measured by the anemometer, produces exhaustion at the rate of 1,500 ft. per minute. Mr. Lloyd first made a 2-ft. 3-in. fan, which exhausted 3,500 ft. of air per minute; and another, with a 5-ft. fan, 1 ft. 10 in. broad, which exhausted 26,196 cubic feet per minute.

STEEPLE JACKS.

"STEEPLE JACK" is commonly but erroneously supposed to be an individual, whereas, as we have before pointed out, he is a genus, or a species, though, it may be, few in number. As his way of working is not known to every one, we may here describe it in connexion with one or two of his more recent exploits. Some of the factory chimneys at New Swindon having got out of repair, the company resolved to employ a "Steeple Jack," who accordingly made his appearance at New Swindon and set to work. His plan of proceeding was to fly an Indian kite, with two strings attached. The kite rises nearly perpendicularly, and when above the chimney-top is guided over it. The second string is then pulled and thus a complete communication is formed over the chimney. By means of the string a double copper wire is drawn up, and by this wire some pulleys and tacking, "Steeple Jack" then ascends hand over hand, and places an iron hand around the chimney, which he secures tightly. Planks are then drawn up and laid upon iron projecting from the band, and thus in a short time a scaffolding sufficient for his purpose is erected, and at a cost very much less than that of a regular builder's. "Jack" had two or three assistants, and managed, in this aerial manner, to pull down one of the factory chimneys which had become so badly out of repair as to require rebuilding. He is still engaged in repairing others. His scaffolding looks at a distance like a huge indiarubber band, around the chimney, with ropes depending from it.

An exciting occurrence, displaying great intrepidity, and involving the almost peril to the person concerned, took place lately at Millbank Chemical Works, Carnagad road, Glasgow. Messrs. Burns & Son, of Ayr, who have been employed in similar duty at Townhead and other establishments, had been engaged to point a stalk at the works mentioned, measuring 260 ft. in height. The preliminary process of flying the kite was gone through no fewer than fifteen times, but on each occasion it failed, in consequence of the string being burnt through by the gas and flames emitted from the stalk. About an hour and twenty minutes were spent in these fruitless endeavours, when Mr. Burns, resolving that whatever personal risk might be incurred, the object must be accomplished, determined for this purpose to ascend the stalk himself. Accordingly, in spite of the remonstrances of his son, he proceeded to mount by the aid of the conducting-rod, but no sooner had he got safely at the top than the rope was again burnt through, and he was left hanging by the hands. Not a moment was to be lost. The son flew the kite in about five minutes afterwards, and having succeeded in once more fixing the rope, the father was got down; he was, however, in an extremely exhausted condition, and notwithstanding the leathern gloves he wore, he was much burned about the hands, while his left side was likewise considerably scorched.

A GOTHIC OAST HOUSE.

A LARGE oast-house (oast is a kiln for drying hops) has been erected in Bekeshourne, a pleasant hamlet in East Kent, by Mr. Sargent for the Marquis Conyngham, upon a piece of land nearly opposite Patrixbourne vicarage-grounds. The front, from end to end, measures 70 ft., and the kilns (three in number) extend about a like distance to the rear. The ground front is intended to be devoted to the temporary storage of hops, and for this purpose is cemented and laid with asphalt. A passage divides this place from the kilns, and here the fuel is stored. The *South Eastern Gazette* enables us to give a description of the internal construction of the kilns, which will perhaps interest some of our readers. The number, as mentioned above, three; and each is approached by a separate entrance opening into an arched pile of brickwork extending to about the centre of the kiln. In this brickwork are built the stoves, one on each side and another at the inner end, which open into the kiln. As an aid to the equal distribution of heat, and also to avoid the possibility of sparks ascending to the drying cloth above, roofs of metal are fixed above the open fires. There is, of course, arrangement made for ventilation; if necessary a strong current of air may be introduced into the kiln without necessarily interfering with the fires. The chief aim to be kept in view in the construction of hop-kilns is, it need hardly be mentioned,

a controllable and equally dispersed heat, and it has been proved by previous experience that the plan carried out in the building under notice is successful in this important particular. On the drying floor—really easily convertible into a first-class dancing-room—and in the green loft above, every device has been used calculated to lessen the tedious labours of the dryers, and at the same time to perfect the work of curing the hops. Over the upper landing-stage in front is raised a turret, Gothic in style, and the dormers are built in the same style. The overhanging gables at each end are artistically decorated, and the end walls are further adorned with a heraldic crown and armorial bearings of the noble owner.

NEW MUSEUM, BRISTOL.

The new Philosophical Institution at the top of Park-street, Bristol, is making rapid progress. The old institution at the bottom of this street did not meet modern wants, and the Bristol Library being, moreover, amalgamated with it, led to the erection of the new structure, which adjoins the Drill-hall, and is in the close neighbourhood of the Victoria-rooms, and the School of Art, both handsome structures. The design for the new institution is the joint production of Mr. J. Foster (Foster & Wood) and Mr. Panton (Panton & Cough), the former gentleman being responsible for the elevations, and the latter, we believe, for the arrangement of the plan. The building is in the French Gothic style, floridly treated. A contract has been entered into with Messrs. Warburton, Brothers, of Manchester, to erect the building for 10,000*l.* The design includes two fronts.

The building is set back 23 ft., and is entered on this side by a flight of Pennant steps, 32 ft. wide, leading to the ground floor, which is 6 ft. above the level of the road. The steps lead to an open portico, 11 ft. wide, and stretch the whole length of the front, 78 ft. It is supported on columns, with carved capitals and bases, from which spring seven pointed arches. The front of the building is thus divided into seven bays. It may be mentioned that the base of the building curves out a little instead of being perpendicular, as is ordinarily the case. The portico is laid with Coalbrook Dale tiles, and is built throughout of freestone. The front wall is divided into the same number of bays, each one corresponding in dimensions with the arch which faces it. The three middle ones are devoted to doorways, and the remaining four to windows which light the entrance-hall and offices. These windows each consist of three lancet-headed lights, surmounted with a hexagonal tracery light, the whole being enclosed in a richly-mounted pointed arch, resting on carved shafts, with foliated capitals. Passing through the entrance-doors (which slide on iron rails) we get into the entrance-hall, 53 ft. long and 18 ft. 6 in. wide, which is tastefully corniced and decorated. There is a committee-room to the left, and directly in front of the entrance is the door to the ground-floor museum. This is a large apartment, 52 ft. by 40 ft., and 22 ft. in height. Running down the middle of the room is a series of octagonal freestone shafts, from which spring arches, for the support of the floor above. The room is lighted by five windows on the Baskerville-road side, of geometrical tracery, exactly the same as those described in the front, and four on the opposite side, which looks into a small yard. Light is also borrowed from the entrance-hall and back staircase, so that there is no lack of that essential element. Each of the side windows is 14 ft. high, and 8 ft. in width. From the entrance-hall access is also gained to a spacious library, 60 ft. by 24 ft., and a reading-room, 40 ft. by 24 ft.; librarian's room, curator's room, and all necessary offices. The reading-room and library are lighted by means of a lantern roof, all windows being thereby dispensed with, and quietness and seclusion—the great requisites of this department—ensured to the students. The height from the ground floor to the eaves of the lantern is 36 ft. A gallery runs round both rooms, communicating with a ladies' reading-room, and on the same level as a mezzanine floor. A flight of steps from the entrance-hall takes us to the first floor, which is devoted to a larger museum, covering an area of 4,864 square feet, and 24 ft. high.

So much for a picture of the finished building. Under the superintendence of Mr. Clayhorough (Messrs. Warburton's manager) rapid progress is being made. All the first floor timbers of the work are laid, and the fronts are ready for the

sills of the first-floor windows. The library and reading-room are ready for the roof timbers, and the contractors expect to have the roof on by Christmas. We may mention that the building is being erected of Farley Down red-stone, supplied by Mr. Rogers, of Bradford-on-Avon; and the timber used is supplied by Messrs. Barnes & Son.

LOWESTOFT PUBLIC HALL AND ASSEMBLY ROOMS.

SIR,—As an instance of the great energy and profound wisdom which characterize many of the promoters of public competitions, I beg to supply you with the following particulars, which I trust, you will publish for the benefit of the public generally, and competitors in particular. The directors of the above company advertised in your columns a week or two ago for designs for New Assembly Rooms, &c., to be sent in on or before Monday, the 23rd day of August, in reply to which, twenty-four designs were received and duly exhibited in the Town-hall, Lowestoft. On the 27th, or just four days later, a printed circular was forwarded to the competing architects, informing them that their drawings "not having been accepted have been carefully re-packed and forwarded to your address," also that the first premium had been awarded to the design bearing the motto "Nil Desperandum," Oswestry; and the second to that marked with "Keystones, with interlaced triangles," Lowestoft. On looking over the pages of a local paper, I find a satisfactory solution of what at first sight appeared to me the possession of a somewhat marvellous amount of discrimination on the part of the directors. Quoting from the newspaper report. "The first prize has been awarded to Mr. W. H. Spaul, Oswald Chambers, Oswestry, a nephew of our fellow townsman, Mr. W. Spaul; and the second prize to our fellow townsman Mr. W. Oldham Chambers."

I would merely add that the name of the secretary to the company is Mr. W. Spaul, and with this intimation I leave the competitors to draw their own conclusions.

JUSTITIA.

THE NEW POPLAR WORKHOUSE.

ALLEGED BREACH OF CONTRACT.

The ordinary weekly meeting of the Poplar Union Board of Guardians, held on Friday, the 27th ult., was of a very exciting character, in consequence of a special report being presented by the workhouse committee, in which was the following resolution:—"The committee regret having to express their opinion that the timber materials used in the construction of the new buildings are not in strict accordance with the terms of the specification." It will be remembered that in March last the guardians and for the alteration of the present workhouse, in order to provide accommodation for 808 able-bodied inmates. Out of thirty-two tenders, Messrs. Hill, Keddall, & Waldram, of 24, Abchurch-lane, were chosen, and the works were forthwith commenced. The buildings have so far progressed, that the builders have already received payments to the extent of 4,000*l.*, and work valued at nearly 8,000*l.* has been accomplished. It appears, however, that during the past few weeks the members of the workhouse committee, amongst whom are three well-known timber-merchants, have expressed considerable dissatisfaction with the quality of the materials brought on to the premises. Hence the resolution presented to the Board last Friday.

The specification provides that "the timber is to be of the best quality, Danzig, Memel, or Riga yellow, and the sills to be the best Christiana—no Swedish deals to be used in the works."

The Board severely interrogated Mr. Weister, the clerk of the works, who said that 1,100 deals brought on to the ground had been rejected as defective, and had nearly all been carted away. Some Danzig and Memel timber was on the premises, but that which had been used was not first quality; in fact, he did not believe there was a piece of timber on the premises which would accord with the terms of the specification. He was well acquainted with the specification, and he was of opinion that there was not a first quality deal on the ground. The machinery work was also defective, and was not of first-class manufacture, as required by the contract. The timber used in the works had been used under a special meeting of the Board. He had called the architect's attention to the defective quality of the timber, and also of some bricks, and some Swedish deals. He believed that the 1,100 deals were Swedish deals.

An animated discussion followed this statement, and for long time it was a question whether the works should be suspended, and the matter referred to arbitration. Eventually it was decided to hold a special meeting of the Board on the following Monday, and to summon the attendance of the builders, the architect, and the clerk of the works. At the special meeting on Monday afternoon, Mr. Morris, the architect, was examined, and after making a few preliminary remarks, he said, in reply to questions, he had commended a quantity of material brought on to the premises to the builders, and had ordered its immediate removal. There was no doubt that the clerk of the works, who appeared anxious to have the contract carried out in its integrity, had experienced great difficulty in consequence of large quantities of defective material being brought on to the premises. In reference to the timber used, he did not think there had been any made use of that was not in accordance with the specification.

A Member.—The clerk of the works says that all the timber on the ground is of an inferior quality to that specified in the agreement.

Mr. Morris.—That is not a fact. A Member.—The clerk of the works also says that there is not a first-class quality deal on the premises.

Mr. Morris.—Allow me to explain that first-quality timber does not always mean the best timber.

Another member (Mr. Lenanton).—I have had many years' experience in the timber trade, and I am not aware of the distinction referred to. I have always understood that there are three classes of timber, viz., 1st, 2nd, and 3rd quality; or, in other words, best, seconds, and thirds. I am greatly astonished to hear Mr. Morris make that statement.

The chairman, who is a timber merchant, signified that the last speaker's remarks were quite correct.

Mr. Ravenhill (engineer).—Has any Swedish timber been used?

Mr. Morris.—No: we have used yellow deals, which are allowed by the profession to be stronger than Danzig of the same standard.

Question.—In your opinion, what is the quality of the timber being used?

Mr. Morris.—The best timber, first quality, free from all defects.

Mr. Morris was questioned as to the quality of the lime used, and it appeared that he had substituted "town-made blue lime" for Athertham blue lime, the latter being specified in the contract. He was next asked as to the quality of the bricks, and he said that they were according to specification. Several guardians were of a different opinion.

The architect then retired; and after a discussion it was moved and seconded that "After hearing the statements made by the architect, it was advisable to engage a practical man to decide for the guardians whether the materials used in the buildings were in accordance with the specification."

An amendment to this was proposed, namely, "That a letter be written to the builders stating that the Board's attention had been called to the fact that material had been used which was not in accordance with the specification, and calling upon them for an explanation."

The amendment was eventually carried, and the meeting adjourned until the following Friday, when the builders' statement will be laid before the Board.

CAUTION TO BUILDERS.

SIR,—Having to remove and reset the arch, and refix a chimney-piece and stove, of a house in Oxford-street, it never occurred to me to call in the district surveyor; for, during many years' experience as a builder, I had never heard that it was necessary so to do, and I am of opinion that the trade are generally as ignorant upon this point as I was.

Mr. Jennings, our district surveyor, has set the matter at rest by summoning me before Mr. Knox, at Marlborough-street, who consulted the Building Act, and decided in Mr. Jennings' favour.

I therefore venture to ask you to insert this letter in your journal as a necessary piece of information to builders who are desirous of avoiding the loss of time, vexation, and expense of attendance at a police court.

Yours, &c., JOHN W. SNOW, JEV. * * Builders who read the Building Act (and there are builders who do not do so) will not require our correspondent's caution. The Legislature regards with great jealousy any meddling with chimney breasts; and very properly so too.

LIGHT THROUGH GLASS.

SIR,—Will one of your correspondents be kind enough to inform me, through the medium of the *Builder*, as to the difference between the amount of light transmitted through ground glass and that through crown glass? Also the composition of a good cement for stopping large squares of glass in stone windows? A SUBSCRIBER.

INSURANCE OF THEATRES AND MUSIC-HALLS.

SIR,—Now that Mr. Lowe has taken off the duty on fire insurance, would it not be possible to form an insurance company for the special purpose of insuring theatres, music-halls, and other public buildings? The premiums at present charged for insurance are something enormous. In the *Era Almanac* for 1868, at page 45, there is a list of fires which have taken place in London theatres and other public places of amusement, from July, 1853, to December, 1867. In these 34 years the number of fires amounted to 53, but of these only 7 were totally destroyed, whilst in several others the damage to the buildings was only partial.

A late number of the *Daily News* (in June, I think) gave a list of the theatres in all the principal nations of Europe, and, if I recollect, in Great Britain there were 372. Modern theatres are much safer than the old ones, as stone and iron are so much more used in their construction.

CHARLES GATE.

THE SHRINE OF EDWARD THE CONFESSOR, WESTMINSTER ABBEY.

THERE is now on view at South Kensington, in the upper gallery next the Horticultural Gardens, a series of three drawings, showing a restoration of this unique relic of Medieval time. This shrine was executed by Italian mosaic workers, whom Abbot Ware brought from Italy. It was completed in the year 1269, so is exactly 600 years huilt. The ancient inscription recorded that it had taken ten years to complete, and that its maker was Peter of Rome (supposed to be identical with Pietro Cavallini, who executed several works of this kind in Italy). This restoration is by Mr. Thomas Henry Lingfield, of Dublin.

The drawings are very elaborate, and show zeal and ability. Without accepting the restoration in its entirety, we can offer Mr. Lingfield hearty commendation.

STRASBOURG CATHEDRAL AND ITS BUILDERS.

SIR,—The following quotation, being a note (p. 68, vol. i.) in Bader's "Badenia," may be read with interest after the article on Erwin von Steinbach, in your last issue:—"An old author says, 'Thereupon were given into the hands of the magistrates and of the priests in those lands certain money-hoxes, and on the four festivals of the Virgin these men did exhort the people, saying, My dear friends, give for the edifice of our Lady of Strasburg; whosoever would entreat her mercy, let him put money in this box; no matter whether it be unhallowed goods, or gotten by theft or robbery; and he shall have indulgence and pardon for his sins: it is a good gift unto our Lady!'"

This passage, in the translation of which I have ventured to imitate the quaint phrasology of the original, is not only curious, but edifying from a moral point of view, and was issued by Bishop Conrad, of Lichtenberg (not Lichtenstein), when he determined to finish Strasburg Cathedral, begun two centuries earlier by Bishop Werner.

ALFRED STRONG.

COMPETITIONS.

Bridlington.—The committee for the proposed new church on the Beaconsfield Estate invited five architects to compete in the preparation of designs, &c., for the new building, viz.,—Messrs. Atkinson & Son, York; G. Fowler Jones, York; R. G. Smith, Hull; Chambers, Sunderland; and A. Crouch, Bridlington Quay. The various drawings have been exhibited in the Victoria-rooms during the past week, and on Monday the committee held a meeting to decide on the merits of the designs. In addition to the plans of the before-mentioned architects, a set of drawings signed "Con Amore," was admitted to the competition. The decision of the committee was thus—1st voting, Fowler Jones, 2 votes; "Con Amore," 3 votes; R. G. Smith, 9. The work is to be proceeded with immediately.

The Hampton Schools.—We are informed, in respect of this limited competition, that the committee have selected the designs of Mr. Arthur Allom.

CHURCH-BUILDING NEWS.

Richmond.—The want of church accommodation in the neighbourhood of Richmond, in Surrey, has long been felt, and the inhabitants of the parish of St. John having some time since raised a fund for building a new church, application was made to several architects for designs, and from those sent in that of Mr. Raphael Brandon was selected. This is for a building in the Early English style, or Gothic of about the period of the thirteenth century. Messrs. Dove, of Islington, have taken the contract to erect the church, in the most solid style of Bath stone and Kentish rag-stone, for the sum of 5,000*l.* This contract includes the body of the church, which is calculated to seat comfortably 800 persons, and the lower stage of the tower, the spire being for the present not contracted for until the fund shall receive considerable accessions. The interior of the edifice will be 120 ft. in length and 56 ft. in breadth, including the aisles. The breadth of the nave will be 27 ft., of the chancel 24 ft., and of the transept 19 ft. On the north side will be a large vestry-room, and the tower will be in the angle formed by the chancel and the south transept. The apex of the roof will be 50 ft. from the floor of the church, and the roof will be constructed with open timbers. The foundation-stone was laid on the 26th ult. by the Princess Mary of Cambridge and Teck.

Sandwich.—An appeal is being made for subscriptions to the restoration of St. Clement's Church in this town. This church has been for years in a lamentable state of disfigurement and decay. Out of its twenty-four stone windows there were only four at the commencement of the present effort not filled up with unsightly wooden frames. Sufficient, however, of the stone-work remains to allow of exact restorations in nearly every case. The area of the church comprises nearly 7,000 square feet, and thus the thorough restoration involves a large outlay, far beyond the means of the parishioners or the immediate neighbourhood to supply. An attempt is to be made to restore in some measure the middle chancel, which is 40 ft. in length.

Mordiford.—The parish church of Mordiford, near Hereford, has been re-opened for divine service. Prior to its restoration the church was

filled up with high pews and galleries, fixed not many years ago, and the walls were plastered and limewashed not only inside, but outside as well; some of the original Norman and Early English features, however, remained, though they were greatly disfigured by having been plastered over, while in some cases the mouldings had been cut away to afford room for wood panelling. There was an ancient Norman entrance doorway to the nave on the south side, which has in the restoration been cleaned and repaired, and fitted up with a new oak door and ornamental iron hinges. An early Norman doorway of very simple character was also found walled up in the north wall of the nave; this has now been inserted in the outer wall of the vestry. An Early English lancet on the north side of the chancel has been taken out and reset; the arches to the choir and chancel bays likewise been taken out and repaired; the larger of the two, which is between the nave and the choir, was found to be in such an unsound condition that it was necessary to take it down and entirely rebuild it; but by preserving the old stones, the character of the original arch has been preserved. The roofs of the nave, choir, chancel, and porch, which were plastered internally, have been replaced by open timber roofs; an aisle has been added on the north side of the nave, and divided from it by an arcade of four bays, the pillars of the arcade being of blue Hamam stone, with carved capitals and moulded bases. The whole of the interior of the walls of the new aisle are executed in grey stone, ashlar faced, the windows and other external stone dressings in the north aisle, vestry choir windows, east window of chancel, and west window of nave, being executed in stone obtained from the quarries at Gainsbill, near Shrewsbury. The old font, which was a small basin placed on the top of a pedestal, has been replaced by a new one. The old oak pews in the nave have been converted into open seats, with sloping backs; the new aisle has also been fitted with new seats. The church is fitted with Moulle's patent warming apparatus. The passages between the seats throughout the church are laid with encaustic tiles from Mr. W. Godwin's manufactory at Widdington. The whole of the works have been executed from the design and under the superintendence of Mr. F. R. Kempson, the contractors being Messrs. Webb & Son, of Hereford; the carving was executed by Mr. Welsh, a son of the contractor. The three-light chancel window has been filled with stained glass, containing three subjects from the life of our Lord, namely, the Nativity in the first or left hand division, the Crucifixion in the centre, and the Ascension in the third or right-hand compartment. These are placed in panels of geometrical shape, intersecting. The window is the work of Mr. Charles A. Gibbs, of London, by whom, it may be remembered, the whole of the windows in the lady chapel of the cathedral were also executed.

Debenham.—The church of Debenham is soon to be placed in the hands of the builder for the purpose of being restored as far as funds will permit. Eight large clearstory windows have already been inserted on the south side, in the Perpendicular style. This work was executed by Mr. James Gunn, of Debenham, and was paid for by the parishioners through a rate. The church has an open roof of stained oak, which was partially restored by the Rev. J. Bedingfield. It is proposed to place the organ, which now occupies a gallery at the porch end, at the end of the north aisle, and to shift the pulpit and reading-desk nearer to the chancel arch, doing away with the sounding-board now over the former. As to the end of the south aisle, it is suggested that a vestry should take the place of the chapel. By removing the organ to the spot named, the present gallery, which is propped up, can be taken away, and the old Saxon arch exposed to view. It is intended, as soon as the required sum is forthcoming, to re-bench and re-floor the church. There are about sufficient of the old benches left to re-seat half the church. When the pews were erected the old benches were not removed, but covered over, so that,—excepting in instances where the poppy-heads have been awn off,—the old benches are perfect, and as the boards are of great thickness, they will admit of the required planing. It is estimated that the cost of reseating and re-flooring the church will be about 600*l*. The project has been in hand since last September, and about 230*l*. have already been raised in various ways. It has been determined not to begin the work until the sum required has been raised.

Milnrow (Rochdale).—The Bishop of Manchester has consecrated a church at Milnrow, a thriving village, containing a population of about 5,000 inhabitants, and situated between two and three miles from Rochdale. The new church has been built near to the old edifice, which was erected in 1798, and of late years found to be inconvenient and too small, as well as dilapidated. Now that the new one is completed, the old church is to be pulled down and cleared away. The late Mr. James Schofield, a wealthy manufacturer of Milnrow, bequeathed 3,000*l*. to the erection of the new church, and Mrs. Hannah Schofield and Capt. Schofield also contributed. The late Mr. Robt. Ashworth, of Bellfield, bequeathed 300*l*. for a memorial window, and there were other contributions. The church is built on an eminence, with a tower 90 ft. high. In shape it is a parallelogram, 64 ft. by 34 ft. It is divided into chancel, 31 ft. 3 in.; a nave, 79 ft. 6 in., by 28 ft. 2 in.; an aisle, that on the north, 86 ft. by 15 ft. 3 in., and extending the whole length of the nave; and that on the south, 79 ft. 6 in., meeting the Schofield chapel and another apartment, which increases the length to 105 ft. 3 in. On the north side of the chancel is the vestry, and also the organ-chamber; and the tower, with a bell-chamber, and peal of bells, is at the west end. The design is Decorated. The edifice is built of Huddersfield ashlar and of Dumford Bridge pier-points. It will seat about 1,140 persons, and the cost will amount at least to 10,000*l*. The church has been built from the designs of Mr. Street.

Horsmonden.—The foundation stone of a new Chapel-of-Ease to the parish church of St. Margaret, Horsmonden, has been laid. A suitable site having been presented by Mr. E. Wilson, and about two-thirds of the amount required to erect the building having been promised, a design was obtained from Mr. B. Wheeler, architect, and a contract entered into with Mr. Anscombe, of Maidstone, to erect the church, which, when completed, will accommodate about 150 persons.

West Kirby.—The old parish church of West Kirby, situated near Hoylake, at the mouth of the Dee, is about to be restored at a cost of about 3,000*l*. Some of the preparatory work has been proceeded with, and the foundation-stone of the new edifice has been laid. Messrs. Kelly & Edwards, of Chester, are the architects of the new building; and Mr. John Dobson, of Rock Ferry, the builder.

Pavenham.—During the last two months this church has undergone various alterations. A new roof has been erected on the chancel, an oriel window has been put up, and a communion-rail has been laid, the expense of these works having been defrayed by Trinity College, Cambridge, patrons of the living. In addition, the side chapel has been newly roofed, and a window erected, at the expense of the parish, Mr. J. Tucker contributing 50*l*. towards the fund. The repairs and alterations have been carried out by Mr. Cunvin, huilder, Bedford. The church has been re-opened for divine service.

DISSENTING CHURCH-BUILDING NEWS.

Swansea.—A new Congregational chapel has been opened here for divine service. It is the third opened in this town within some three or four years. The foundation-stone was laid about three years ago. The entire structure will not be considered complete until the addition of a tower to the chapel, school-rooms, &c., the total cost of which will be between 5,000*l*. and 6,000*l*. of which amount a considerable sum has already been raised. The site has streets on three sides of it; but owing to its shape and position, the chapel presents a side elevation instead of a front to the main road, Walter-street. The width of Humphrey-street at the west end of the site is, however, sufficient to allow of the front being seen in connexion with the side, and the building line is set back 15 ft. from the road boundary in each case. It is intended that at the south-west corner a tower shall appear, 85 ft. high to the foot of the spire, the latter rising 50 ft. above, or 115 ft. in all. The entire scheme includes a chapel capable of seating 1,000 adults, and measuring 95 ft. by 50 ft. within the walls; a school-room, 60 ft. by 30 ft.; a lecture-room, 44 ft. by 24 ft.; an infants' class-room, 24 ft. by 17 ft.; two vestries, and other apartments. At present, however, the chapel only and the vestries, &c., in immediate connexion with it, have been erected. When the whole group, including chapel and school,

is completed, it will present a line of building facing Walter-street 135 ft. in length. From the floor to the springing of the roof the chancel walls are 28 ft. high; and the apex of the ceiling, which is in fact an inner roof, is 46 ft. from the floor. The roof is one span, and the interior is not obstructed by columns. Side galleries are provided for, four seats deep, including a seat in the passage next the wall. The end gallery is eleven seats deep. Two tiers of windows appear in the side bastion, one below and the other above the galleries, all fitted with geometrical tracery. All the constructive timbers in the interior of the building are in view, and are stained and varnished. The walls are of native stone, faced with dressed wall-stones in level courses, and all the windows and doorway and all external angles have dressings of Bath stone. The style of the building is English-Pointed Gothic in the geometrical period. All the details are simple and inexpensive. The entire building has been fitted up by Messrs. Haden's warming apparatus, and ventilation and extraction of foul air will be effected by means of the tower and spire. The architect is Mr. H. J. Paull, of Manchester. The builders are Messrs. Thomas Watkins & Jenkins, of Swansea. The lighting fittings were done by Mr. Holmes, brazier and gas-fitter. The organ was manufactured and placed by Mr. H. S. Dane, of Swansea.

Dudley.—At Kate's Hill a new Wesleyan chapel is to be erected. Some time ago a meeting was held, at which the sum of 1,100*l*. was collected or promised towards the expenses of erecting the new chapel, &c., and renovating the old one in King-street. Messrs. Holland & Sons have contracted to erect the new edifice, which is to be in the Gothic style, for 2,020*l*. Two memorial stones have been laid in the presence of a large assembly. The work, including the renovation of King-street Chapel, new vestries, and class-rooms, will cost 4,000*l*.

STAINED GLASS.

St. Mark's, Broadwater.—This church has been enriched by the addition of two stained-glass windows, erected by public subscription to the memory of the late Earl of Abergevenny. These windows occupy the whole of the north and south transepts of the church, and the subjects are the Four Greater Prophets and the Four Evangelists. They have been executed by Mr. O'Connor, of London. The walls of the transepts have at the same time been ornamented with mural decorations in oil, forming a setting to the windows themselves. In addition to these windows the committee have had sufficient funds to fill with coloured glass the two smaller windows in the organ chamber and vestry, and also to add two additional stops to the organ, which was Lord Abergevenny's last gift to the church, which he had previously built and adorned.

FROM IRELAND.

New Roman Catholic Church of Crosshaven.—The foundation-stone of the new Catholic church of Crosshaven, co. Cork, was laid on the 22nd ult. The church is dedicated to St. Bridget, as patroness. The site chosen for the church is picturesque and commanding. It stands due east and west on a bill, opposite the entrance of Carrigaline river. In plan it has chancel, side chapel, nave, and aisle. The side arches of the nave will be supported by polished column of red Cork marble, and over the arches will run the clearstory. On the south side of the edifice will be the sacraments, and on the south-west angle a baptistery will be provided. The roof will be open-timbered work, with ceiling spaces, panelled. In length the structure will be 92 ft. by 42 ft. in width in the clear, and from ridge pole to floor it will be about 55 ft. The building will be externally faced with limestone, the doors and windows having Bath stone dressings. On the western or main entrance an outside porch is provided, and a lofty spire will stand midway in the length of the north elevation. A statue of the patron saint will stand in a niche in the centre of the lower part of the chancel gable. Over the niche, in the upper portion of this gable, and filling up the space above the high altar, as seen from the inside, will be a very large and well-designed rose window. Smaller windows of a similar form, but varying in design, will appear in the gable of the aisle. The style of the new church will be what is lately called Victorian Gothic.

the church will be from the designs of Mr. E. W. ... and the work will be carried out under ... personal superintendence of Mr. Collinridge ... The contractor for the building is Mr. ... Evans, of Cork.

Ballyhooley New Church.—The new Catholic church of Ballyhooley recently erected, of which we previously gave a description, has been dedicated by the Right Rev. Dr. Keane, Lord Bishop of Cloyne. As far as the exterior is concerned, the church may be said to be complete. Its appearance outside is effective, being built of limestone, alternated with bandings of courses of red sandstone. The inside, which is completed as to the fittings, which are at present in some cases nearly temporary, has received further additions, which give it more an air of comfort. The nave is diamond-paved throughout, and the aisles are boarded; the organ is also provided with seats to accommodate a large number of persons. The altar yet is nearly temporary, and is, of course, of wood. Hands are required to finish the intended internal ornamentation of the church.

Books Received.

Studies for Art Designers and Manufacturers. By JOHN GIBBS, Architect. Oxford, 14, Pembroke-street. 1869.

MR. JOHN GIBBS, of Oxford, best known as the designer of the Memorial of the late Prince Consort in Abingdon, the memorial of Sir George Arncliffe Lewis, and that of Sir Tatton Sykes, has commenced the publication of a large work, entitled, "Studies for Art Designers and Manufacturers,—being a Series of Designs for the details proper for Ecclesiastical, Domestic, and other Buildings, developed after the Manner of the Roman, Byzantine, Gothic, Elizabethan, and other Styles, up to the present Day." It is intended for the use of architects, sculptors, painters, masons, builders, goldsmiths, decorators, and artists, as well as for schools of art, and other places where the arts of designing and drawing are taught. The first part now before us consists of twelve large plates (in a cover), all drawn and printed in tinted lithography, including capitals, sculptured strings, paterae, places, scrolls, diapers, iron work (very good), foliage (bold and free), and aeredos. The drawings are printed on stiff paper. The author says, "The work will not be issued in any bound form, as each plate, being a picture and complete in itself, can be more conveniently handled; in some instances it may be found advisable to mount and suspend the plates." This being the case it would have been advantageous if each plate had borne some slight descriptive particulars. Three other parts, each containing the same number of plates as this, will complete the work. It is a costly and important undertaking, and should receive support from those competent to give it.

Arms and Armour in Antiquity and the Middle Ages: also a Descriptive Notice of Modern Weapons. Translated from the French of Monsieur LACOMBE, with Additions, by CHAS. BOUTELL, M.A. London and New York: Cassell, Petter, & Galpin. 1869.

MR. LACOMBE'S book is by no means a complete and satisfactory work, but it was desirable we should have in English what he had said: moreover it includes a number of very good wood engravings of arms and armour. Mr. Boutell, in order to supply some of the deficiencies, has added a sketch of the history of English Arms and Armour altogether omitted by the French author; also a number of notes at the end to connect the text with matters interesting to English readers.

The objection that may be taken to the book is the want of order and arrangement that prevails; the same thing is treated here, there, and everywhere. On the other hand it is very pleasant reading, and will doubtless lure many to a more precise study of the interesting subjects of which it treats. Moreover it is a pretty volume for the drawing-room table.

An Illustrated Natural History of British Moths. By EDWARD NEWMAN, F.L.S., &c. London: Tweedie. 1869.

This handsome volume one thing is much to be regretted, that its numerous and beautiful specimens of moths have not been chromolithographed. The want of the colours is a great

defect, though certainly the addition of colours would have necessitated the withdrawal of each specimen from its context; but this, we think, would have been a minor defect compared with the want of colours so characteristic as those of many insects are.

Each insect form is given of the full size, and the text is not a mere compilation, very much of it being original, and having no previously published source, in fact, from which to copy.

VARIORUM.

"Suggestions for a Railway Route to India." By Thomas Chenery, M.A., Ch. Ch., Oxford Professor of Arabic, and Barrister-at-Law.—Mr. Chenery is sanguine as to the success of a railway route to Constantinople, and right through Turkey in Asia and the South of Persia, to Kurrachee, or at least to Bunder Abbas. The time-distance he calculates at nine days, reducible perhaps to six. The scheme, he urges, would be one at least as practicable as that now accomplished in America. "From the information I have collected," he says, "on good authority, I believe that a railway constructed with real English solidity, and capable of bearing traffic at a high rate of speed, can be made through the whole of Asiatic Turkey, from the Bosphorus to the Persian Gulf, for 12,000,000 a mile; and a much cheaper one, he adds, could no doubt be constructed. As such a line would, he estimates, take ten or twelve years to complete, and as no doubt India will by that time be pretty well traversed by railways, now is the time to consider of such a project. The Turkish Government, he thinks, with the aid of the British Government would take an active interest in the opening up of Turkey in Asia by such a route.—"Borough of Salford: Report of the Surveyor as to the State of the Sewers in the Salford District." In this report Mr. Bowden, C.E., reports that the Salford sewers are in general acting satisfactorily; but the mortar is, in many cases washed out of the brick joints, and a great number of the old sewers are too near the surface, and too large in sectional area, thereby encouraging the deposition of detritus and filth within them, and turning the whole into a vast cesspool.

Miscellaneous.

Discovery of Roman Remains in Scotland.—At a railway cutting which passes through old Camelon, near Falkirk, a drain of remarkable size, built of squared blocks of freestone, and covered with slabs of the same material, was exposed. This drain had long provoked the wish of antiquaries for a further exploration. Mr. Wilson, of Banknock, with a band of workmen, recently devoted two days to excavation. Penetrating as far as was practicable on each side of the railway cutting, they reached strong foundations of walls, two on the south and one on the north side of the railway. The points on which they struck were the corners of buildings, which were found to rest on a pavement of flagstones bedded in clay. Above these walls, and all around, was an accumulated mass of debris of ruined buildings, through which were dispersed bones of the ox, sheep, pig, and deer, fragments of pottery (some of which were of Samian ware), handles of amphoræ—on one of which were distinct letters—many bricks, and bits of tile flues. A circular disc of bronze about the size of a florin, attached to a nail, was found in one of the buildings. On a large square brick was the impression of a dog's foot, a circumstance which has been often noticed in Roman bricks. It is to be regretted that circumstances would not permit of a more thorough search.

New Waterworks at Leeds.—The first sod of the Lindley Wood reservoir,—which is to be about a mile and a half in length, and capable of receiving 749,000,000 gallons of water,—has been cut by the Mayor of Leeds, in the presence of the members of the council. The reservoir is intended to gather the waters of the Washburn, from which the improved water supply for the borough is to be secured. It will supply about 10,000,000 gallons per day, of which 4,000,000 will be sent into the wharf as compensation water, and the remainder conveyed to the Arthington pumping station, and thence to the town through the Westwood filter-beds. The cost of the works will be from 60,000l. to 70,000l., and their completion will extend over from two to three years.

The Offices for the Poplar District Board of Works.—At a recent meeting of this Board, reported in the *Clerkenwell News*, the chairman directed attention to the fact that under the specification for the new offices, zinc would be used in covering the dome of the octagon tower, and upon the roofs of the main building. He felt himself that the material was not a proper one for the purpose, and that it would be better to use lead. He had seen Mr. Harston, the architect, on the subject, and he said that he should certainly prefer lead for the dome of the tower, but that he thought that 15 gauge zinc would do very well for the flats of the roof. The architect had roughly estimated the cost of substituting 6 lb. lead for the zinc, and he found that this over the whole roof would be about 279l. or 55l. for the dome only. Mr. Edinger adverted to the difference of opinion even among builders on this matter. After considerable discussion, it was moved that the dome should be covered with 6 lb. lead in the place of zinc, provided the expense did not exceed the amount specified by the architect, and that the contract was not in any way infringed by the change. The motion was put twice without a sufficient majority being obtained to carry it. On putting the question the third time there seemed to be 13 votes for and 12 against the motion; but a division was taken, and the numbers were reversed as follows—For, 12; against, 13. The motion was accordingly lost.

Parish Mortuaries and Dead Houses.—At the last meeting of the vestry of the parish of Greenwich, the state of the dead-house was discussed. It was ultimately resolved to convert the present toll-house into a dead-house, to be fitted with proper slabs, means of ventilation, a water supply, sinks, and other requisites. The present old dead-house had been in use in its present state for about fifteen years.—The Poplar District Board of Works, at its last meeting again considered the proposal to erect a public mortuary for the parishes of Poplar, Bow, and Bromley, a report from the works committee recommending that such a building should be constructed in accordance with the plan of the surveyor. It will thus be seen that the parish of Poplar has been added to the area for the use of which the mortuary was originally proposed. The recommendation of the committee was adopted. The *Clerkenwell News*, commenting on this decision, rightly remarks that there should certainly have been a separate mortuary for the spacious and populous parish of Poplar.

Alarming Occurrence at Manchester.—Twenty persons were thrown into the Irwell at Lower Broughton, Manchester, on the laying of the coping-stone in connexion with the new suspension-bridge connecting Congleton and Salford. The Mayor of Salford and the bridge committee were assembled on the Broughton side of the Irwell upon a platform erected round three sides of the stone pier, there being also a large concourse of other spectators. The Mayor was making a few introductory remarks, when that part of the platform on which he and the committee, together with ladies and others, were standing, and which projected slightly over the river, suddenly fell with a crash, forming a sort of inclined plane to the water, and tipping about twenty persons into the river. The water being only shallow in that part, there was little danger of drowning, but for a few minutes panic and confusion prevailed. The most serious injuries were to clothing, though some bruises and scratches were also sustained.

Boiler Explosion in the North.—A boiler in the kitchen of the house of Mr. Edward Pease, of Greencroft, Darlington, exploded without warning. The force of the explosion was so great that the boiler and grate were broken in pieces and blown in all directions, one part going through the wall at the back, and another into the kitchen. A large portion of the wall was blown out. The cook was severely scalded. We have before now asked the question, why there are so many more kitchen boiler explosions in the North of England than in the South, and wish some one acquainted with both districts would look into the matter, as it might lead to a remedy or preventive for such explosions.

Model of an Indian Gateway.—We understand that the Government of India has made arrangements for having a cast taken of the principal remaining gateway of the Sanchi Toppe, near Bhilsa, with a view of having produced several copies of this work, which is supposed to date about 250 years B.C.

Steam Fire Engine for Hamburg.—An engine on a new principle was tried on Wednesday in last week, at the Grand Surrey Canal, in the presence of a number of engineers and other gentlemen connected with fire-engines and fire-bridge matters. It is the first that has been made of the newly-patented Equilibrium Steam Fire-Engine. Materials for the fire being laid, and the boiler supplied with cold water, steam, it is said, was raised to a pressure of 100 lb. to the square inch in seven minutes and four seconds from the time of lighting the fire. The engine was then set to work, with two jet pipes, being one each, 10-16ths and 12-16ths of an inch in diameter; afterwards with four jets, being two each, 10-16ths and 12-16ths of an inch diameter, reaching an altitude of 120 ft. Then one jet, 1½ in. diameter, to a height of 150 ft.; a jet 1½ in. diameter was then tried, throwing the water over 100 ft. high, concluding with a jet of 1½ in. diameter.

A Self-supporting Gaol.—The annual report of Mr. James Caldwell, the governor of the gaol at Dunedin, New Zealand, dated the 14th of April last, states that the value of the labour of the prisoners during the year ending March last, more than covered the entire expenditure of the establishment, without taking into consideration the labour of such prisoners as were engaged in prison employment, such as cooking, washing, cleaning, &c., and various other works connected with the gaol, which contained, when the report was printed, 789 inmates, of whom 43 were debtors and 6 inmates. During the year there were received into the gaol 595 males and 147 females. The expenditure on account of the gaol for the year was 7,365l. 2s. 8d., and the value of the prisoners' labour was 8,778l. 3s. 7d., showing an excess of 1,393l. 0s. 11d. over the expenditure. A considerable number of the male prisoners are employed in dredging the harbour, reclaiming swamps, and even in sweeping the streets of the town, &c.

The Facade Sculptures on the New Opera House, Paris.—Carpeaux's "Dance," against the indecency of which we protested last week, has, we regret to learn, given occasion to considerable damage, both to itself and to others of the group of sculpture, as well as to the façade itself, from having been splashed with ink by some one who seems to have thrown a bottle of ink at the Bauchante. Endeavours are being made to remove the stains. This was not the proper way to get rid of an objectionable ornament, and we have no sympathy with the malicious scamp who did it, whatever his motive might be. Some ascribe it to envy of the sculptor, but that is not so likely a motive as the desire to get rid of an indecent figure by disgracing it. Another outrage of a similar description has been committed in the garden of the Luxembourg, where a bottle of ink has been thrown over the marble group of Acis and Galatea of the Médicis fountain.

Interesting Discovery.—A correspondent of the *Midstone and Kentish Journal* says:—"My attention has been called to an interesting discovery just made at the Palace. In repairing one of the old panelled rooms the modern wooden mantel-piece fell down, and exposed to view an ancient stone chimney-piece carved in Kentish rag. It is arched, and in the spandrels are two shields, which, on examination, I find bear the arms of the see of Canterbury, impaling those of Archbishop Warham—'Gules, a fesse or; in chief a goat's head couped argent, armed of the second, in base three escallops of the third.' The arms on the right-hand shield are curiously reversed, Warham occupying the dexter, and Canterbury the sinister side of the escutcheon. Warham held the see of Canterbury from 1504 till his death in 1532, and was succeeded by Granmer, the last episcopal owner of the Palace."

Working Men's Club Union.—On the 28th ult., in accordance with arrangement, some 200 members of the Working Men's Club and Institute Union paid a visit to the outfall of the London sewage at Crossness Point. They also went to Barking, but by some accident preparation had not been made there to receive them.

An Acoustic Dodge.—It is stated in an American paper that Mr. Ossian E. Dodge, of Minnesota, has invented an "acoustic register," by means of which he tunes concert-halls to the size of the audience, and makes a whisper audible whether there be ten or ten thousand to hear!

Lincoln Cathedral.—An improvement has just been effected in this cathedral, the north gate of the upper transept, leading into the choir, having been renovated at the cost of the Ven. E. Trollope, archdeacon of Stowe. This gate is of great age. The upright bars have been continued, and are unmounted by gas jets, forty-six in number; the wooden beam at the top has been taken away and iron substituted; and the whole of the ironwork has been cleaned and repainted a chocolate colour, the bands of the tracery being gilded. New scroll-work has been inserted at each side in place of the old wooden beams, and the wood skirting on which the gate rested has been removed, and ironwork of a similar pattern continued to the floor. The organ is undergoing renovation by Messrs. Hill & Son, of London, organ-builders.

Lighting Beacons by Electricity.—Mr. Thomas Stevenson, C.E., of Edinburgh, has had a submarine cable laid between the East Breakwater of Granton Harbour and the Chain Pier, at Trinity, near Leith. The operator occupies a station near the centre of the breakwater, and the light is shown at the point of the pier, the current being thus transmitted a distance of fully half a mile. Experiments, according to the *Scotsman*, have been satisfactorily made before the Northern Light, Trinity House, and Board of Trade authorities. The flashes were emitted with a rapidity which caused them to assume almost the appearance of a steady light, and again they came at intervals—one every one, ten, or fifteen seconds.

Action of Water on Lead.—A paper "On the Solubility of Lead and Copper in Pure and Impure Water," by Dr. T. L. Phipson, was read at the Exeter meeting of the British Association. Having said Dr. Phipson, tested a number of specimens of commercial lead used for domestic and other purposes, the result of my experiments is that lead, copper, and perhaps zinc, are metals which can be dissolved in water at ordinary temperature, and in presence of air when submitted to friction, and that the water need not be so pure as the Surrey spring-water in order to exert this solvent action.

The Edinburgh Improvements and the Lord Provostship.—Mr. William Chambers, who at the end of his three years' Lord Provostship was re-elected last year, has announced his resignation at the end of the current year. The London *Scotsman*, in reference to this announcement, says:—

"The same energy which carried him from the occupation of a dingy second-hand book-stall at the head of Leith-walk to be the head of one of the largest educational publishing firms in the world, was brought to bear upon his office as chief magistrate, and the transformation which he has initiated in the heart of the old town will be an enduring monument to his enterprise and philanthropy. The changes he has set on foot have been planned with a due and even a loving veneration for those characteristic features of the city which grow from the heart of Sir Walter Scott the epithet of 'mine own romantic town.'"

The improvements are still in progress. Mr. Law, the coffee merchant, of Oxford-street, London, and of Edinburgh, is named as Mr. Chambers's successor.

Proposed New Prison for Middlesex.—At a recent meeting of the Middlesex magistrates a committee of 17 was appointed to consider in what way the criminal business of the county can be expedited. A motion had been brought forward, but was withdrawn, to the effect that the prison is insufficient for the reception and confinement therein of all the untried and non-convicted prisoners of the county, and that it is necessary it should be enlarged.

French Science Congress.—The French Scientific Congress (which corresponds to the British Association) will hold its meeting this year at Chartres on the 5th of September. The directors are anxious to have the attendance of English men of science. The meeting will last to the 14th of September. The president this year is M. de Caumont, of Caen, Normandy, to whom letters may be addressed.

Drinking Fountain in Aberystwith.—A drinking-fountain was opened on Saturday evening, the 21st ult., by the mayor, Mr. John Matthews. It has long been needed in the town, which is well known as one of the most frequented watering-places on the coast of Wales. The stone-work is by Messrs. Ellis & Owen. The fountain was paid for by public subscription.

Thetford.—The Maharajah Dhuleep Singh is adding a new wing to his mansion at Elveden, near Thetford, Norfolk. The work is being executed by a metropolitan firm.

New Wesleyan Chapel in France.—The foundation-stones of a new Wesleyan chapel Asnières have been laid. The chapel is to be erected in the Gothic style of architecture, at the estimated cost, including the site, is about 1,000l.

The Tower Subway.—Mr. Peter Barlow estimates that the Tower subway will be able to convey fully 2½ millions of passengers annual working twelve hours each day. He says to estimate of 16,000l. will not be exceeded.

Bells, Milnrow Church.—The peal of eight bells, tenor 48½ in. diameter, about 19 wt. 2 note G, hung in this church, were cast by Messrs Warner & Sons, for Captain Schofield, of Greeroyd, near Rochdale.

Surveyor to the Sun Fire Office.—The directors have filled this appointment, left vacant by the death of Mr. Chas. Freeman, by the election of Mr. Fredk. W. Porter.

TENDERS.

For rebuilding the chancel of Frettenham Church, Norfolk. Mr. R. M. Phipson, architect:—
Cornish (accepted).....£617 0 0

For alterations and additions to Horing Hall, Norfolk. Mr. R. M. Phipson, architect:—
Newall.....£1,949 16 6
Cornish.....1,639 19 4
Wright.....1,780 0 0

For restoring and beautifying the nave of Fundenigo Church, Norfolk. Mr. R. M. Phipson, architect:—
Grimwood (accepted).....£598 0 0

For rebuilding Cockley Cley Hall, Norfolk, exclusive of bricks and stone, and the materials of the old mansion. Mr. R. M. Phipson, architect. Quantities supplied by Messrs. Widdell & Trollope:—
Smith & Co.....£11,547 0 0
Brown.....10,779 0 0
Cornish.....9,835 2 6
Guggs (accepted).....9,256 0 0

For roads and footways on the Lebanon estate, We Hill, Wandsworth, for Mr. Nickinson. Mr. D. Haylock surveyor:—
Chapell (accepted).....£161 10 0

For villa residence at St. John's Common, Hurstfield point, Sussex, for Miss Norton. Mr. Dallimore, architect:—
Brown (accepted).....£647 6 4

For building villa residence at Kilburn, for Mr. H. Jones. Mr. H. F. Bacon, architect. Quantities supplied by Messrs. Wright & Dresser:—
Colls & Son.....£2,310 0 0
Faiman & Fotheringham.....2,298 0 0
Jackson & Shaw.....2,285 0 0
Turner & Son.....2,132 0 0
Higgs.....2,100 0 0
Clayton & Co.....2,069 0 0
Sharginton & Cole.....1,960 7 7
Ebbis & Sons.....2,687 0 0

For building cottage residence at Matfield, Kent, for Mr. Harrie. Mr. J. Janner, architect:—
Keyes & Head.....£1,375 0 0
Greenwood & Sons.....1,363 0 0
Colls & Sons.....1,335 0 0
Wells.....1,303 7 7
Turner & Son.....1,277 0 0
Ebbis & Sons.....1,265 0 0

For erecting water-power flour-mill and dwelling-house at Chicks Grove, Wilts. Mr. James Soppitt, architect:—
Ploverman.....£1,272 0 0
Clarke & Son.....1,260 0 0
Miles.....1,116 0 0

For additions, &c., to residence, for Mr. W. H. Cutler at Marshull, Dorset. Mr. James Soppitt, architect:—
Parsons.....£988 0 0
Doggrell.....610 0 0
Miles.....588 0 0
Score & Dew.....582 0 0

Amended tenders:—
Score & Dew.....£642 0 0
Miles (accepted).....605 15 0

For repairs, &c., to Ship Inn, Shaftesbury. Mr. James Soppitt, architect:—
Miles.....£586 10 0

For new rectory house and offices, at South Hykeham, Lincoln, for Rev. J. J. Reynolds. Mr. James Soppitt, architect:—
Kirk & Parry.....£2,000 0 0
Close & Goodburne.....1,610 0 0
Singsby.....1,536 0 0
Hobson & Taylor.....1,535 0 0
Ottor & Elsey.....1,470 0 0
Hallam & Wheeler.....1,465 0 0
Hobson & Taylor (amended and accepted).....1,400 0 0

For building two detached residences at Woodford, Essex, for Mr. H. C. Bose. Messrs. Hills & Fletcher, architects:—
Bask.....£1,700 0 0
Bishop.....1,518 0 0
Egan.....1,491 0 0
Alexander.....1,468 0 0
Coleman.....1,384 0 0
Grover (accepted).....1,427 0 0

TO SURVEYORS AND BUILDERS. WANTED, a RE-ENGAGEMENT, by a Young Man, thoroughly acquainted with office duties, drawing, measuring, and estimating works, taking out quantities, &c. Satisfactory references in Town.—Address, W. B. Co. 6, Foley street, W.

TO ARCHITECTS. WANTED, a RE-ENGAGEMENT, by an ASSISTANT, who has had seven years' experience. In a private perspective draughtsman, and is well up in Gothic design and detail.—Address, E. K. Post-office, Kensington Park.

WANTED, by a well-educated Youth, aged 17, a SITUATION in an Architect's, Surveyor's, Engineer's, or Contractor's Office. Has a good knowledge of architectural drawing, speaks French and German.—Address, H. 2, Portland place, Brompton.

TO BUILDERS, ROAD-MAKERS, AND CONTRACTORS. WANTED, by a first-class practical Man, a Cartwrights Taylor, Street Man, Gents Dresser (Wool and Dutch Cloth), or Tailor, to TAKE WORK by the PIECE. Let him call. Good testimonials and references.—Address, JAMES CRITCHLEY, 7, James place, North-street, Poplar.

TO ARCHITECTS AND BUILDING SURVEYORS. WANTED, an ENGAGEMENT, by an ASSISTANT, well up in design, detail, and working drawing. Can make up, and thoroughly understands quantities.—Address, M. C. 12, St. James's-row, Buryley Lane-church.

TO BUILDERS AND CONTRACTORS. WANTED, by a thoroughly practical, general FOREMAN, a RE-ENGAGEMENT, to take the entire charge of a Job (or Shop). Will up in all the branches of the trade and setting out. A good chieftain hand. No objection to town or country. First-class references.—Address, W. 11, Office of 'The Builder.'

TO ARCHITECTS, SURVEYORS, AND BUILDERS. WANTED, by the Advertiser, a SITUATION as JUNIOR ASSISTANT. Is a good draughtsman, and well up in the usual routine of an Office. Four years and a half experience. Good character and unexceptionable references.—Address, G. S. Archer Way, Norfolk-terrace, Brompton, W.

TO MASTER WHEELWRIGHTS. WANTED, by a Young Man, aged 22, a SITUATION as IMPROVER in the above trade. Wants not so much consequence as improvement.—Address, W. B. 47, James-street, Oxford-street, W.

WANTED, by a thoroughly practical PLUMBER, constant EMPLOYMENT, or a Job. Is willing to fill up his time drawing and glazing. If required, Good references.—Address, W. W. 49, Queen-street, Edgware-road.

TO BUILDERS AND CONTRACTORS. WANTED, a RE-ENGAGEMENT, by a practical GENERAL FOREMAN. Car entry and Joiner by trade. Aged 33. Town or country. Good references.—Address, W. W. 2, Edgewood-street, Bayswater, W.

WANTED, by the Advertiser, a RE-ENGAGEMENT as GENERAL FOREMAN, or to take entire charge of a Job. Carpenter and Joiner by trade. Has just finished a large J. B. Unexceptionable references from past or present employers.—Address, A. J. W. 15, Upper Clifton-street, Brompton, E.C.

TO ARCHITECTS. WANTED, by an ASSISTANT, of good London experience, a RE-ENGAGEMENT, who has knowledge of constructive drawing, and is prepared to take practically conversant with perspective, and is fully able to prepare specifications of work. Good testimonials.—Address, G. L. No. 12, Bury-street, Greenwich, S.E.

TO ARCHITECTS, &c. WANTED, a RE-ENGAGEMENT, temporary or otherwise. Is a really good draughtsman and colourist, and can from rough sketches prepare both geometrical and perspective drawings for competition, &c. Good references. Salary moderate.—Address, W. L. 21, Great Russell-street, W.C.

WANTED, an immediate RE-ENGAGEMENT by an efficient GENERAL ASSISTANT. Well up in Gothic and Italian design, detail, perspective, modelling, &c. Highly commensurate testimonials.—Address, TEMPER, St. Thomas's, Fulsam, S.W.

TO CONTRACTORS AND OTHERS. WANTED, by a Young Man, a SITUATION as CLERK, T. MEASURE, or any position of trust.—Address, A. B. 3, Derby-street, Finsbury-street, E.C.

TO IRONMONGERS, BUILDERS, &c. WANTED, by a respectable, steady Man, a SITUATION as GASFITTER and BELLHANGER, &c. Understands hot water work, ranges, &c. Country not objected to.—Address, W. H. 5, Brunswick-terrace, Brompton-street, Brompton, W.

TO BUILDERS, GENTLEMEN, &c. WANTED, by a Carpenter and Joiner, aged 25, a SITUATION in a Builder's Shop, Warehouse, or on an Estate. Wants not so much an object as a constant. Good references.—Address, W. C. 222, Hill-street, Waltham.

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TO ARCHITECTS. WANTED, by the Advertiser (aged 23), TEMPORARY EMPLOYMENT. Has had considerable experience in Gothic architecture, and is well up in competition, perspective, and detail drawings.—Address, 34, Office of 'The Builder.'

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WANTED, a SITUATION as BUILDERS' CLERK. Is a good book-keeper. Well up in measuring up work, &c. Good draughtsman, and has a thorough practical knowledge of the trade. Satisfactory references, and ready to go to any part.—Address, A. B. 7, Milton road, Ricks, Newington.

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AN experienced PLUMBER is in WANT of a SITUATION. Can do painting, glazing, &c.—Address, FLEMING, 32, Raffle-street, Knightsbridge.

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TO ARCHITECTS, &c. A QUICK DRAUGHTSMAN and a superior GENERAL ASSISTANT is at liberty. Good designer, perspective draughtsman, and fair colourist, and thoroughly conversant with the routine of a London office.—Address, ARCHITECT, Post-office, Pall-mall-street, S.W.

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The Builder.

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Adam Kraft and his School.
1490—1507.

HERE are few visitors to Nuremberg who do not gaze wonderingly and admiringly, in the church of St. Lawrence, on the Tabernacle, or Sacraments' House, a pile of flowery stone-work that runs up to the gabled vault of the choir, a height of more than 60 ft., and then bends down gracefully, if deceptively, as if there checked by the roof. They admire also the three sculptured figures at the base, representing the sculptor and his two assistants, and mostly learn that the former was called Adam Kraft. Other works from the same cunning hand they meet with in the town, notably the great tomb outside the church of St. Sebald;

so that there are few of the Mediaeval artists whose names are more widely known than that of Kraft. Still the extent of his work is little recognised by the large majority, and Professor Wanderer has done a good deed in bringing together a collection of his sculptures with descriptive letterpress in German, French, and English.* The volume includes sixty engravings on wood to a large scale, and if it do not substantiate the right of Master Adam to be considered a worthy compeer of that great genius, Albert Dürer, as the author would have it, it advances his long-recognised claim to be considered a great craftsman. In estimating the merits of Kraft, the period at which he worked, when love for and skill in the severer style of pointed architecture were passing away, and the style of Renaissance was about to take its place, should always be considered. The present work, the author says, "is intended to fulfil an obligation which the partiality of the followers of modern Gothic, in their exclusive pursuit of a pure style, has, hitherto, caused to be omitted." The materials for an account of the life of Adam Kraft here presented are very slight, and, to some extent, contradictory. Thus, in the sketch of him left in the first half of the sixteenth century by Johannes Neudörffer, a writing-master of Nuremberg, it is asserted that in 1490 he took for his second wife a widow, who, to please him, changed her baptismal name from Magdalen to Eve; whereas, a "spaanbrief" not long ago discovered in the archives of Nuremberg, and dated February 20th, 1510, states that his

widow, Barbara Kraft (not Magdalen nor Eve, and nothing is said of a third marriage) appeared with her late husband's creditors before the Court, and renounced in their favour the house on St. Jacob's Steig which he had bequeathed to her;—an incident that seems to show, moreover, that Kraft's circumstances when he died were not in a very flourishing condition.

Neudörffer says that Kraft was as dexterous with his left hand as with his right, and that he died in the hospital at Schwabach in the year 1507, a statement which is to some extent corroborated by the fact that one of the last works he executed was a handsome Tabernacle for the church there.

The founder of the Tabernacle in the church of St. Lawrence, the finest and best known of Master Adam's works, was one Hans Imhof, who on the 25th of April, 1493, in the presence of two witnesses, Michael Lemlein and Jörg Holzschuher, entered into a contract with Adam Kraft for its execution. This document, which is drawn up with some care in the details, is still in the possession of Imhof's descendants. Amongst other matters it sets forth,—

"That the aforesaid master shall he bound to work at it with his own hands; and to appoint four, or at least three honest and skilful men to work with him therat, and meanwhile they are not to take any other employment. But since the said Master Adam has likewise other works on hand, and may have more, he shall keep for those other workmen, so that the men employed hereafter shall not have to quit the work. Farther, it stipulates that he shall be at liberty to give directions to such workmen for the space of one hour daily, but no longer without permission of the said Hans Imhof."

Kraft engaged to complete the work within three years for the sum of 700 florins (something less than 60l.). In the rash presumption of being able to finish within three years this work, and likewise to undertake others, Kraft, as we shall not be surprised to learn, deceived himself. His receipts, of two of which facsimiles are annexed by Mr. Wanderer, show that between 1493 and 1495 he had already received by instalments the stipulated sum; and, finally, a gratuity of 70 florins, which Imhof thus sets down:—

"Item—On St. Barbara's day, A.D. 1495, I settled accounts with Master Adam: paying him, first, according to his contract, 700 florins; and, secondly, an agreement of 70 florins—total, 770 florins."

Our author goes on to say that the founder did not live to see the accomplishment of his work. "He died 1499, and it was not until 1500 that Adam Kraft first brought his labours to a close."

This is not quite satisfactory. If the work were not finished in 1495, why did Imhof then settle accounts with Kraft, paying him not merely the amount of his contract, but the extra sum agreed on?

Our author seems to misunderstand a portion of this agreement when, speaking afterwards of the probability that Kraft kept a large number of men employed elsewhere, he says, "It was not without some reason that the contract for the Tabernacle so expressly stipulates that he should not employ more than one hour daily in correcting the work of the two chosen men." The stipulation in the contract evidently referred to the workmen employed on other works on hand, not to the two men at work with him on the Tabernacle.

The form and construction of the Tabernacle are fully illustrated and described in the interesting volume now before us. The wreathed pinnacles, curling and twisting almost like a living plant, have been viewed as remarkable pieces of stone-cutting; they led to the popular belief, indeed, that Kraft possessed the secret of softening stone and hardening it again after it was worked. Mr. Wanderer, however, shows

that these each consist of ten and often of more small pieces of stone bored through and connected together by an iron wire, the joints being run with lead.

Some years have passed since we visited Nuremberg;—

"Quaint old town of toil and traffic, quaint old town of art and song,
Memories haunt thy pointed gables, like the rooks that round them throng."

It was in student-days, and it seemed to us then a town of pictures, a romance in stone. There was a queer old "public" near the Town-hall called "Zum Gläsernen Himmel," and there we sat in the seat said to have been the usual place of Adam Kraft, who did not disdain the "wheat beer" for which the place was celebrated. The old house has been pulled down since then; but his Madonna and Child, which formerly adorned it, is set up in the new building that took its place.

A TRIFLE FROM MARGATE.

ALTHOUGH Margate has been very full, and even now is well filled, the inhabitants complain of bad times. The spring was cold, so that the first arrivals were late, and the rough weather lately sent hundreds away to their homes. The season has therefore been short, and hence "the season." Last week, nevertheless, the Jetty, at certain times of the day, was a sight,—so crowded with persons that circulation was difficult. Where all the young girls, in their Noah's-ark dresses and wonderful heels, came from, and where they expect to go to, is a puzzle to the best friends of the sex. On Sunday afternoon, at half-past four, there could not have been fewer than from 3,000 to 4,000 persons on the Jetty and Parade, when suddenly burst a thunder-storm. The sea was enveloped in mist, the lightning flashed, and a flood of rain descended that laid the Parade roadway under water, and made it, as acted on by the wind, a mimic lake. As to the people,—an ant's nest violently agitated affords the best simile. The sand was terrific, and to those who, safely sheltered in the comfortable White Hart, could drily look on, not without interest. Every vehicle, too, was taken up, and in ten minutes not a person was to be seen,—man, woman, child, or nigger. It spoke something, too, for the arrangement of the surface drainage, that so soon as the storm had passed over the roadway was fairly dry again. We cannot say quite as much for other drainage, and the town will do well to take the cesspools seriously in hand. They are now advertising for a new sanitary inspector, and inviting candidates to say for how little money they will perform the duties of that and some other offices combined.

The mayor, who looks like a sensible man in the photographic shops, and his colleagues doubtless know, if they would but remember it at the right time, that cheap things are not always economical. We earnestly invite them not to let the lowness of salary named by any particular candidate blind them to the enormous importance of obtaining a thoroughly competent and suitable man. To maintain the reputation for health of such a place as Margate is of paramount importance; and if one able to do this should offer, and who is, moreover, a man of taste, likely to aid in improving appearances and making the town attractive, an extra 50l. or 100l. a year to secure him would be a profitable investment, they may be assured. If Margate could be refined, so to speak, and the South-Eastern Railway Company taught their duty, there would be an enormous future in store for this place. Its fine air and admitted salubrity, so far as it is not interfered with and counterbalanced by man, to say nothing of other advantages, afford a foundation on which a great town might be built, and, we may venture to say, will be built. When the right man comes, Margate will make a start that will astonish its present stagnant owners and regulators. About the immediate neighbourhood of the Parade there is a mixture of Cremorne and Wapping that wants improving away. On the heights spreading away from the Fort, the aspect is different. A large hotel, the Cliftonville, built by a company, is in full swing, and many new streets have been built. There is a want of life, however, up here, and the need of a presiding mind is evident. It was a good thought to name some of the rows

* Adam Kraft and his School. Being a Collection of his Sculptures still extant in Nuremberg and its Vicinity. By Fr. Wanderer, Painter, and Professor at the Royal School of Art at Nuremberg. London: Williams & Morgate, Henrietta-street.

Ethelbert-road and Ethelbert-place; all historical, traditional, and poetical associations should be carefully preserved at resorts of this kind. The Isle of Thanet is so much a place of mere pleasure that the amount of deep interest that attaches to it, its connexion with the earliest history of the country, is apt to be forgotten. At Ebbs's Fleet, near Pegwell Bay, St. Augustine landed in the sixth century; Hengist and Horsa possibly at the same place. The meeting of St. Augustine and King Ethelbert took place a few miles from Margate (the gate or passage through the cliff, near the mere or streamlet), and it was wise, therefore, to recall the connexion with Saxon times by the names of the new streets.

A good sea-drive would be a valuable addition to the attractions of Margate, and the town ought to look forward and arrange for the formation of one. Some better arrangement is needed with the owners of hired carriages. They refuse to let the drivers go for the hour. They insist on a charge being made for each place visited, which, nine times out of ten, involves a swindle. Moreover, visitors constantly desire a drive without exactly knowing where to go, but are prevented by the present system. An enormous carrying trade is done in the shape of excursions all day to St. Peter's, Broadstairs, Kingsgate, Pegwell Bay, Ramsgate, Richborough, or Minster, and back, and this may make the coachmen careless about accommodating the public in another way. Some of these places afford inducements for a more quiet visit than these excursions admit of, which address themselves only to a part of the community. The view at Kingsgate, which includes Lord Holland's sham Roman villa, ivy covered; Harley's Tower, the tower erected to mark the site of a great battle between the Danes and the Saxons in the beginning of the ninth century; the north Foreland Lighthouse, and other landmarks, all come into sight, and, with the precipitous cliffs and the sea, form a panorama of great beauty.

The cliffs at Margate, by the way, near the Jetty, have been embayed and rounded in a remarkable manner within the last twenty years, and one wedge-shaped piece of the cliff is left standing in a gap alone, and, as seen from near Goodman's photographic studio, produces a remarkable effect.

At Birlington, a ride out from the other side of the town (and on the road several new houses are being carried up), the church, mainly of the thirteenth century, with remains of Norman work, has been soundly restored. Daundellon and Salmeston both afford remains of ancient buildings, worth investigation.

We mentioned as amongst the steps required to put Margate in the proper track for advancement,—the reform of the South-Eastern Railway; and, without now going into the whole question, we will prove the necessity of it, at any rate, in one direction. We recently printed the complaint of an individual traveller on this line, showing a series of annoyances to which he had been subjected in one journey out and home. We have before us the substantiated complaint of another that, coming from Margate on two occasions within the last fortnight, the train had been forty minutes after time, and that all his arrangements were consequently upset. It is obvious, therefore, that these inexcusable irregularities are not exceptional, but constant. It is of no use upbraiding a board any more than a stone. We appeal to Lieut.-Col. Eborall, advertised as General Manager, and ask if this be proper management, or whether it be not the management that snobs, dignists, and drives away! We have no hesitation in saying that similar management in the Board-room and offices, if it be going on, is quite competent to wreck the company, and we advise the shareholders to look to it in time. We reiterate our belief that a great future is in store for Margate if those who are concerned act rightly; but they have a great deal to do to assure it.

State of the Serpentine.—A correspondent writes:—As there is every probability of a great number of men being out of employment during the coming winter, I would beg to suggest that the Serpentine River (Hyde Park), which is in a most filthy condition, be properly cleaned out, levelled, and cemented. There is, I believe, a Government grant for this purpose, so there would be no difficulty in the way. It is well known how dangerous this sheet of water is in summer to bathers and in winter to skaters.

THE BRIDGES OF THE METROPOLIS.

The various bridges recently constructed, and in course of construction, over the river Thames, possess a certain degree of historical importance.

They not only serve to mark the progress which has been made during the last century in engineering and architectural science, but they afford, at the same time, remarkable facilities for a comparison of the relative merits of the several systems and designs embodied in the respective structures.

If civilisation finds its origin in, and is maintained by, the useful arts, rather than springing from the triumphs of warriors and statesmen, there is certainly as yet but little indication of its decay. The New Zealander who is to sketch the ruins of Saint Paul's, at all events is likely to discover a more favourable accommodation than historians have predicted.

Within some few years past, besides the removal of the Suspension Bridge which formerly existed at Hangerford, we have witnessed the disappearance of two of the principal structures which hitherto nited the shores of Surrey and Middlesex, and in each instance they have been supplanted by works of more magnificent, and apparently durable, construction. In one case, that of Blackfriars notably, there are fair indications that the substituted structure may last as long as Saint Paul's itself.

In 1739, the stone bridge which formerly existed at Westminster, and which occupied a portion of the site of the present iron bridge, was commenced from designs by Labaley. This bridge was constructed of Portland stone, at a cost of 490,000*l.* It was 1,220 ft. in length, 40 ft. wide, 25 ft. above high-water mark, and had 15 openings. Its total altitude above high-water mark was 27½ ft., and the centre opening spanned a distance of 100 ft.

The present bridge was begun in 1853, and finished in 1862. It is from the designs of Mr. Thomas Page, who also designed the handsome but inglorious structure which spans our polluted river between the new barracks at Chelsea and Battersea Park. The present Westminster Bridge is, perhaps, the widest bridge in Europe, and certainly yields to none in beauty of design and finish, remembering the circumstances under which it was carried out. The necessity of a favourable gradient at both sides for the accommodation of traffic, of leaving sufficient headway at the same time for the navigation of the river, and of keeping within bounds that would not outrage upon the grandeur that is claimed for the structure of the Houses of Parliament which adjoin it, affected by many complicated restrictions the appearance and durability which otherwise might have been given to the undertaking. It is to be wondered at that with all these difficulties to encounter—and they were not the only difficulties which presented themselves—the bridge shows so many claims to consideration as it undoubtedly possesses. It is 55 ft. wide, 20 ft. above high-water mark, comprises seven openings, and the centre span is 120 ft. wide. It was erected at a cost of 393,000*l.*, and completed, notwithstanding much unforeseen and uncontrollable delay in the progress of the works, within nine years. Old Blackfriars Bridge, of which the last vestiges have scarcely yet disappeared, was commenced in 1710. It was constructed also of Portland stone, like old Westminster, from the designs of Mylne, at a cost of 300,000*l.* This bridge had exhibited marked symptoms of crumbling and decay before steps were finally taken towards its removal. It was the most interesting representation of the possible decay to which such structures may arrive of which we have any modern record. Arch after arch was propped up, as many of our readers may recollect, until at last a serious obstruction was opposed to the ordinary navigation of the river. It was only 995 ft. long, 42 ft. wide, 27½ ft. above high-water mark, and had nine openings, the centre one of which measured 100 ft.

Waterloo Bridge, which Canova, the sculptor, thought to be the finest in Europe, is to all appearance as untouched by time and unharmed and perfect in every way as when first finished, now some fifty years ago. It was begun in 1811, while the first Napoleon was centering all his forces towards the invasion of Russia, and was carried out while history looked down on the dreadful spectacle afforded by the retreat of the Grand Army. This bridge is 1,326 ft. in length, 43 ft. wide, having a headway above high-water mark of 27½ ft., and has, as old Blackfriars Bridge had, nine openings. The centre arch of

Waterloo Bridge is 120 ft. wide. The bridge is constructed of granite, from designs by Rennie. Its erection cost the sum of 937,391*l.*, and only occupied six years.

This bridge, notwithstanding the number of arches upon which it is built and its numerous river piers, from the width of the river at this point, still leaves a total clear water-way of 1,080 ft., an amount which no other metropolitan arch bridge affords.

The next bridge which comes under our consideration is Southwark Bridge, which has only been completed within the past fifty years. This bridge was designed by Rennie, but is accompanied by circumstances which mark it out as one of the most extraordinary contributions towards the science of constructive architecture. It was the first occasion of the introduction of a cast-iron span of such truly gigantic proportions in structures of this character, and, as an experiment boldly testifying to the applicability of cast iron upon a large scale, it paved the way to a new theory and practice of building.

The span of the central arch of Southwark Bridge is equal to that of the roof of the new Midland Railway Station at St. Pancras, and in comparison with the magnitude of this last-named building, the roof of the Moscow Riding-school no longer remains the standard of colossal architecture that it was formerly. It has been surpassed. Southwark Bridge was commenced in 1814, and was successfully carried out and finished in 1819, at a cost of 650,000*l.* The entire length of this bridge is only 700 ft., and the centre opening is spanned by a cast-iron arch of 240 ft., probably the largest single cast-iron span extant.

The present London Bridge was begun as recently as the year 1824. This, like Waterloo Bridge, is constructed of granite. London Bridge was designed by Rennie, occupied seven years in erection, and cost the sum of 2,566,268*l.* This enormous expenditure represents an amount exceeding the aggregate cost of nearly all the other bridges over the Thames.

The total length of London Bridge is 920 ft. It is 45 ft. wide,—not much more than half the width of Westminster Bridge, and has an altitude above high-water mark of 29½ ft. It is composed of five arches only, the central opening measuring 150 ft.

The cost of this structure was provided out of a fund called the Bridge House Estate Fund.

The estates appertaining to this fund—it was stated in evidence which was taken before a select committee appointed in May, 1855, to consider the abolition of tolls on Metropolitan bridges—are held in trust for the maintenance and support of London Bridge. "When the Act for this bridge passed, and the money was to be raised on the credit of the Bridge House Estate, the Government contributed 150,000*l.* out of the Consolidated Fund. The Government also suggested that the bridge should be made 6 ft. wider than it was originally intended to be, which involved a further outlay of 42,000*l.* That amount was also contributed by the Government towards the construction of the bridge out of the Consolidated Fund. The residue of the expense was defrayed by money raised on the credit of the Bridge House Estate, amounting to 431,000*l.*, and the difference was made up out of the surplus rents and profits of the Bridge House Estate. The 431,000*l.* were advanced by the Lords of the Treasury upon terminable annuities for forty years, now partially expired, and ceasing altogether in 1871."

Hammersmith Bridge was opened in 1827, and is remarkable on account of its being the first bridge which was erected upon the suspension principle over the Thames. The platform of the bridge is held up by vertical iron rods, let fall from chains which stretch entirely across the river, and are so adjusted as to support the general structure. The main chains themselves are in the course of their length across the river and two places of support upon stone piers erected in the river way.

There are two of these piers, as is mostly the case in suspension bridges, upon which a superstructure of masonry or iron is carried up to support the chains. In the case of Hammersmith Bridge the superstructure of the towers is of masonry, in the form of an arch, comprising the width of the roadway. These towers support the suspension chains, which disappear at each extremity into anchorages on the margin of the river at each side. The anchorage plates rest against a firm bed of masonry, which constitutes the abutments. The vertical rods descending from the main chains are fixed to cross girders

of the requisite width, upon which the roadway of the bridge is laid.

Apart from the singular novelty of the structure embodied in this undertaking, it is also remarkable as having afforded that particular design of construction upon which the minimum cost of bridge accommodation was reached. The cost of Hammersmith Bridge did not exceed £5,000.—a sum scarcely equal to the cost of a single arch of many of the other bridges.

A bridge upon the same principle as the Hammersmith one was subsequently erected by Brunel at Hungerford, and was not many years since translated bodily to Bristol, where it is now known as the Clifton Suspension Bridge. The old piers of this bridge still do duty in supporting the girder bridge of the Charing-cross Railway, aided by numerous cylinders sunk in the river. The piers themselves are now chiefly remarkable for their singular conclusion at the summit. The Suspension Bridge at Chelsea, which has already been mentioned as having been designed by Mr. Page, is, perhaps, the handsomest form in which this class of structure has ever been embodied. This bridge was finished in 1858. Three years later the Lambeth Suspension Bridge was begun, as designed by Mr. Peter Barlow, and it was erected at a cost scarcely more than half that of its prototype at Hammersmith. The Lambeth Suspension Bridge, however, is something more than a Suspension Bridge, pure and simple, for some very singular modifications of the suspension principle have been here introduced. In place of a succession of bolted or pinned links for the principal supporting chains, we here find a number of iron wire cables or twisted ropes stretching in unbroken continuity entirely across the river. In place of the usual vertical supporting rods, a series of pendent triangular supports have been substituted to take the roadway, and their operation is stiffened by the application of a giant system of strutting along their line of direction. Each tower is supported on two iron cylinders, which are sunk in the bed of the river and built up internally with concrete and masonry. By this means the usual stone piers have been superseded, and their great cost escaped. There is an entire absence of meretricious adornment in this structure, and by some it is apprehended that it is attended by difficulty to discover anything in it that is fairly ornamental. Still, as a bridge which was begun in 1861 and finished in 1862, at a cost of £10,000, apart from the challenge which it holds out to scientific criticism, it possesses many claims to consideration. It is 950 ft. long and 20 ft. wide, having three divisional spans of 300 ft. each, its altitude above high-water mark being but 22 ft. only.

Old Vauxhall Bridge, which seems alike to defy criticism and escape it, is a compound structure of stone and iron. It has no less than seven arches, within a total waterway of 765 ft., whereas Waterloo, with the same number of openings, gives a waterway of 1,080 ft. The span of the centre opening of Vauxhall Bridge is but 100 ft. It was erected from designs by Mr. J. Walker, at a cost of 370,000.

It is very curious to observe the order in which modern bridges have arisen over the Thames between London Bridge and Southwark there the South-Eastern Railway Bridge designed by Mr. Hawkshaw, a substantial and costly-looking iron structure. It is a plain girder bridge, supported on rows of fluted-iron columns, embedded in the river. What little ornamentation has been attempted in this structure is in keeping with the general design, which fairly ranks as one of the most notable achievements of the adaptation of iron to structural purposes.

Looking from the other side of Southwark towards Blackfriars, we find the London, Chatham, and Dover Railway Bridge now in progress, although from that spot it is somewhat remote for critical inspection. Between Blackfriars and Waterloo there is as yet no new structure intervening.

Between Waterloo and Westminster is to be met with the conglomerate or insoluble structural metamorphosis known as the Charing-cross Railway Bridge. From the circumstance that this bridge being largely used by foot passengers, the superior objectivity of the Warren piers as perceived from the river some slight process appears being continually enacted of indiscriminate human sacrifice, which it would well to screen from the outer world.

It is happily but a visual distraction, which could be altogether prevented by clearer marks

of distinction between the footpath and the railway. As it is, it is a utility bridge, and, perhaps, it aims at being nothing more in appearance. Between Westminster Bridge and Vauxhall, Lambeth Bridge is interjected,—not a railway bridge, however, as the three preceding ones alluded to as late as intermediary erections.

Between Vauxhall and the New Chelsea Bridge, which has itself only been erected during the past eleven years, is to be found, perhaps, the widest, and certainly the most unique, railway platform over water in the world. This is formed of the noted bridges of the London, Chatham, and Dover, and London and Brighton lines. Although outwardly these two bridges seem to correspond and closely resemble each other, appearing from their connexion but as one structure, their features and style of construction are altogether dissimilar. The half-width more recently added possesses many novel claims to notice. It is, in the first instance, a genuine and very fine example of wrought-iron riveted girder work. None of the riveting is counter-sunk, and it shows up in harmonious lines of strength admirably along and upon the surface of the work. This is an exception to the practice which is usually observed in analogous cases, and appears to be a very commendable one. Its more special and singular feature, however, in a scientific point of view, is perhaps attributable to the circumstance of its main girders being continuous girders throughout its whole length across the river. It is an *experiment crucis* as to the holdness and freedom with which iron may be skillfully handled.

Some further distance up the river, beyond the old Battersea wooden bridge, but still within the limits of the metropolitan railways, there is also a fine substantial railway-bridge, recently erected in connexion with the Clapham Junction system and the railways encircling London, from Hammersmith at one extremity, to the Thames Tunnel at the other.

The expansion of modern civilization, in one form of national embodiment, at all events, seems clearly exemplified in the multiplication of bridges along the course of the Thames.

No doubt a paramount regard for the unimpeded navigation of the river has long retarded or prevented the erection of suitable means of accommodation over the river below London Bridge. The only attempt ever made in this direction was made under ground. We are at a loss to imagine any explicable reason why in the face of the unbounded extension of the metropolis on all sides, and the extraordinary railway facilities to which we may have recourse, London Bridge should for ever remain the common goal of navigable merchandise and the arbitrary line beyond which people must either cross the river in a balloon or harrow under ground. Owing to the vexatious barrier offered by this structure to the uniform extension of that accommodation which prevails elsewhere, we find that the whole of the eastern and south-eastern districts of the metropolis are totally cut off. From London Bridge to Bow on the one side, and to Blackheath and Greenwich on the other directions of dense and fastly-extending population, no practical means of communication exist,—while, within equal limits on the other side, there may be probably as many as twelve or fifteen bridges. Since the usurpation of the Thames Tunnel by the railway, the only prospect of intercommunication held out to the inhabitants of the opposite shores at about these points is that likely to be afforded by the Tower subway now in course of construction for the accommodation of immense portions of the metropolitan area, where, if anywhere, the population may be seen gravitating in unhealthy numbers and mass around the head-centres of traffic and manufacture.

Should population and traffic tubes be multiplied eastward along the course of the river, they would doubtless effect much towards giving vent to a long-felt want of commercial intercourse across the river; but it is questionable whether their utility would recommend them to unhesitating and general adoption, as in the case of a good substantial undertaking above ground. It all depends upon the question as to how much longer London Bridge is to be tolerated as the commercial extremity of the metropolis; that being once satisfactorily determined, we may speedily have half a dozen bridges further down the river, uniting the very busy and very populous localities of Bermondsey and Whitechapel, Rotherhithe and Shadwell, Poplar and Deptford, Greenwich and the Isle of Dogs, and all those circumjacent districts which have parted years since with their suburban reputation. Some few years ago, a design for a high-level railway

bridge below London Bridge was projected upon novel principles, which afforded ample room and verge enough for the passage of the highest masted vessels, and of which structure no portion whatever would have been within river limits. Should high-level bridges be opposed in any way to those interests which congregate round Old London Bridge, it is fair time to take into consideration whether London Bridge itself might not, with many advantages, date its claims to attention from some more favourable situation. In that case a more convenient class of structure might be substituted than such as should necessarily leave so great an amount of headway beneath them as the present mode of traffic would demand.

HOUSE-BUILDING: CHISWICK.

The continuous and prodigious growth of London manifests itself in a constantly widening circle round its centre. One open space after another disappears, and green fields and gardens in all directions are speedily assuming the neutral tint characteristic of building plots. In one quarter that may be called suburban, say in the East of London, rows of cottages are run up; and in other quarters, less remote from the centre of the metropolis, great blocks are built of improved dwellings for the working classes. In another locality, say New Cross, or Peckham, newly laid-out streets or roads are being quickly lined with ranges of houses for the occupation of persons of a higher status in society than the conventional working-man,—the tenants who can or do, pay from 28l. or 30l. to 50l. a year. In other localities again, "terraces" and "places" are laid out, and rows of houses erected, of a larger size and more pretentious character, for which still higher rent is required. And yet, again, there are other localities in which single and semi-detached villas are provided, which rank next to mansions, concerning which last-mentioned class we have not, at present, anything to say.

While there has been an increase in the number of new houses provided in the metropolis from year to year, there has been little or no improvement in the style of the majority, materials, or workmanship. To this remark exception should perhaps be taken in favour of the improved dwellings for the working classes here and there, in which a beginning has, at least, been made in the march of improvement. For the rest, from the detached and semi-detached villas downwards, there has been little or no improvement. It is in but few instances that these new erections are put up with a view to either permanent possession or occupation: like Peter Pindar's razors, they are made—to sell. An ordinary mode of proceeding is, for the speculator to run up the houses at as cheap a rate as possible, to get them tenanted, and to sell before time has been allowed for the tenants to find out fully the wretched and comfortless character of the brand new houses into which they have entered. In a good many instances, indeed, the first tenants are induced soon after entering to purchase their houses, by the help of a building society or otherwise. In time—and it does not take a long time—they discover what's what. They cannot drive in a hook to hold, in the brick joints without, for a bird's cage, nor fix a brass-headed nail to hang up a picture within. Very soon locks, latches, window catches, and other ironmongery fittings, low-priced but not cheap, which never performed well, are universally unfit to serve their purposes. All the woodwork shrinks to an amazing extent; doors hang and windows rattle; there are chasms everywhere and fierce draughts through them, and the house becomes a place unfit for a human being either to be born, to live, or to die in.

Among our favourite suburban building localities a new one has recently sprung into popularity. We refer to "Strand-on-the-Green," in the parish of Chiswick. The favour with which this locality is now regarded may be attributed to several causes, and amongst them to the fact that the Prince of Wales has taken a lease of the delightful seat of the Duke of Devonshire, Chiswick House, immediately adjacent. The locality has, besides, its own great and independent charms in the number, variety, stature, and exceeding beauty of its forest trees, and the profusion and luxuriance of its gardens, orchards, and shrubberies; in the ever-attractive Kew Gardens hard by; in the stately river flowing past; in a word, in the greenness, fertility, and salubrity of that portion of the Thames valley.

As compared with building districts in the higher regions to the north of London, such as Kensal Green and Highgate, Strand-on-the-Green is at a disadvantage, that may, however, be estimated lightly—namely, the provision of cellar accommodation, which, from the comparatively narrow margin between the natural ground-level and high water in the Thames is impracticable. One "Gothic" mansion in the district, with a river frontage and two peaked round towers, suffers from being cellared, and at high tides has sometimes 3 ft. or 4 ft. of water standing in the bottom, which, of course, saturates the greater portion of the house, and keeps it in a damp condition for an indefinite time after each flood.

Some good houses are in process of erection, or have been recently finished, at the "Strand-on-the-Green;" amongst others a pair of semi-detached villas in the Swiss chalet style. They are lofty and roomy, and apparently substantially built, but are hard and angular in outline. Some of the others in process of erection show the old vices of construction in fall bloom and vigour.

One new house has been recently erected in the locality for Mr. W. T. Wells, of Regent-street, and is fast approaching completion, which is in contrast with all this. Mr. John McEwen, the designer of the house in question, has certainly set a good example to other builders, and taken a step in the right direction. Thames Bank House, to which we are referring, has its principal front to the river, from which it is separated by a gently-sloping lawn and carriage-drive, about 60 yards wide in all. It is divided into five bays, including three gables,—one in the centre, and one at each end, rather higher than the central gable. All the external angles of the house and the chimney-stacks have stone quoins, and the several parts appropriate cornices and copes. A good view of the house is presented to the river on the angle from both up and down stream. The entrance to the hall, which will be laid with Minton's tiles, is on the ground floor of the centre gable, the door having one chamber window above, and over that, in the pediment, a stone shield projected. There is not any pretension to purity of style or elaborateness of decoration. It is noticeable as a piece of substantial work.

We look for a change in matters generally that will make buildings be what they seem, that will prolong the life of houses sufficiently to cluster such associations round them, and to make such comforts in them possible, as to entitle them to the designation of homes.

FROM PARIS.

The group of figures representing Dance, in front of the new Paris Opera,* has been cleansed of the ink-stains produced by a bottle being dashed against the naked Bacchante. We all recollect the mutilation of the allegorical figure of the city of Lille, in the Place de la Concorde, by a maniacal workman, because the figure resembled his mother. He was punished, not severely enough, by the law, but the disappointment of the man must have pained him when he saw how the monument had been completely restored.

The new commission appointed to represent France in the collective labours of the International Congress of Weights and Measures, call upon all governments anxious to adopt the metric system, to delegate *anoms* who will aid in carrying out the work, and to provide standard copies of the platinum prototype under the surveillance of the Superintendent of the Director-general of the Archives of the Empire, to serve for the verification of the real equivalents between the French metric system and those of other countries.

We have already mentioned that the statues of Acis and Galatea, at the Luxembourg, were defaced by colouring matter, about three months ago. The same gentleman (calling himself Esquires) who cleaned up—as only a practical chemist could do—the Opera-group, has succeeded at the Luxembourg. The Acis and Galatea, at the Luxembourg are due to the chisel of M. Otin.

It is said that successful experiments have been made with an American stone-cutting machine, worked by steam, giving a result of an economy of one-eighth of that required to do the same amount of work by the old system of

manual labour. We have been long acquainted with M. Gay's machine, and have seen it at work in the quarries near Paris. There is a great difference between stone-sawing or stone-cutting, and quarrying by steam. In the two first we have only to place the block to be dressed under the wheel, or in face of it, so that the stone shall not shake. The operation of quarrying requires another system, by which M. Gay, of 5, Rue Jean-Jacques-Rousseau, cuts the stone into square blocks, leaving the sides of the drift perfectly smooth—fit for setting. We must say that a result of 40 square metres cut into handy blocks of any dimension, instead of 5 to 7 metres per day, by ordinary quarrying and blasting, is the proof of a certain intellectual and ingenious progress on the part of M. Gay which has attracted the attention of the highest authorities of the Mining School. Cutting into a face of limestone to a depth, horizontally, of 2 ft., with the clean seams about 2 in. wide, and a scouring stream to take off the dust, the machine seems to be to us the best as yet tried at large quarries in the open air or in pits. There is not an atom of waste to signify, or chips; so that future labour of dressing being much saved, the economy is great.

THE LATE MR. E. BUCKTON LAMB, ARCHITECT.

We refer with very considerable regret to the decease of Mr. E. B. Lamb, who died suddenly at his residence, No. 3, Hinde-street, Manchester-square, on the 30th ult., in his sixty-fourth year. He was the son of Mr. James Lamb, who held an important Government appointment, and who was an amateur artist of talent, and an occasional exhibitor at the Royal Academy. It was from his father that Mr. E. B. Lamb first imbibed his taste for art, and he was articled to the late Mr. Cottingham, architect, with whom he duly served his time. One of the first buildings superintended by him was the church of St. Philip, Lloyd-square, Clerkenwell, in the early days of the Gothic revival. Since that period he has erected other churches to the number of between thirty and forty in various parts of the country, of which the most noteworthy are at Healy, Thirkleby, and Aldwark, all in Yorkshire; West Hartlepool, Egham, Gospel Oak-fields, Kentish-town, Addiscombe, &c. He was also extensively employed in remodelling and adding to country mansions; and amongst works of this description may be mentioned Great Brickhill Manor, Hingehuden Manor, and Wakefield Lodge, all in the county of Bucks; Holt Hall, Norfolk; Thorburn Hall, Suffolk; Mopleton, Yorkshire; Montreal, Kent; and many others. Illustrations of several of his buildings will be found in our volumes. In addition to works of this class he carried on an extensive and varied general practice. Mr. E. B. Lamb published several works on architecture, and was an early worker with the late Mr. Loudon. Mr. Lamb was an enthusiast in his profession, and took a great interest in all matters calculated to advance and improve the public taste in matters architectural.

On some future occasion we may speak more fully of Mr. Lamb and his works. He was by no means an architect of the pattern-book school, but constantly endeavoured, even at the expense sometimes of beauty, to exhibit originality. He was a Fellow of the Institute of Architects.

THE CHADWICK MEMORIAL COMPETITION, BOLTON.

The sub-committee appointed to obtain designs and estimates for the monument proposed to be erected to Dr. and Mrs. Chadwick, of Southport, formerly of this town, reported at a recent meeting that they had obtained models from Mr. W. Calder Marshall, R.A., the cost to be 1,400l.; Mr. Jos. Darham, 1,050l.; Mr. Birch, 850l.; Mr. E. G. Papworth, 1,200l.; Mr. E. E. Gellowski, 1,050l.; and Mr. J. Birnie Philip, large model, with pedestal of fine axed granite, 2,200l.; small model, with granite pedestal, 1,600l.; or if denuded of its bronze figures, 1,200l. If stone be substituted for granite Mr. Philip would accept the following prices:—Large model, 2,000l.; second model, 1,450l.; with the base devoid of figures, 1,050l. Mr. Gellowski had also since written, that in case no alto-relievs be desired on the sides of the pedestal, his price would be, for statue not less than 8 ft. 4 in. in height, with pedestal in

granite or stone, 840l.; with two alto-relievs, 160l. extra; and with three alto-relievs, 210l. extra. The town-clerk stated, that in addition to the above, Mr. Mathew Noble, Mr. John Bell, and Mr. Woolner were also invited to send in competitive designs, but declined.

In answer to questions, the town clerk said the sum named to the sculptors was 1,000l., and they were requested to make the statue of such a size as would be consistent with that of Crompton, behind which it was proposed to be placed. The dimensions of the Crompton memorial were sent to all the artists.

Mr. Hall asked how much money the committee had in hand, because that might determine to some extent the selection to be made.

The Mayor said if they spent about 1,000 guineas, they might take it for granted that they had 500l. at least to raise yet.

At a subsequent meeting of the general committee, the models submitted by Mr. Birch and Mr. Gellowski obtained the preference, and on a division, there voted for the model of Mr. Birch, 15; for that of Mr. Gellowski, 6. It was then resolved that the commission for the execution of the statue be entrusted to Mr. Birch. At the suggestion of Mr. Taylor, it was resolved that a medallion portrait of Mrs. Chadwick, or a design commemorative of her works of charity and benevolence, should be incorporated with the statue.

CONCERNING CERTAIN CORNISH TOWNS.

ONE would think, after so much showing-up as Truro and Falmouth have had, that the sewerage in those towns would have undergone some improvement.

Not a bit of it. I have, in a run into Cornwall, just visited those towns, and anything more loathsome than their state cannot well be conceived.

I would sincerely caution all intending tourists to avoid those two towns; or, if they will not, so far take my advice then simply to be content with a walk through the principal street of each town. The stenches,—the fearful, intensely wild, compressed essences of stinks,—they will meet with in the other streets are sickening for me only to contemplate.

Contemplate! I have been out of Cornwall just five days, yet those stenches I fancy I now have half-way down my throat. Fancy every, any, foul, loathsome, nauseating, noxious smell you can, and in either Truro or Falmouth you shall have its equal. Is it any wonder? In Truro the sewers are of common dry stonework, rectangular in section, and various in size. They are for the most part about 18 in. wide by 2 ft. or 3 ft. high, covered with large flat stones as they come from the quarry. If their edges do not meet, why they put some smaller stones upon top; no mortar or cement is used in their manufacture. Where the wisdom of the commissioners has so dictated, there is on the side of the road, or in the *trotoir*, nearly always under a window, a cesspool 3 ft. or 4 ft. square, made of dry stone work, and covered with a cast-iron slab; at the upper end, on a level with the gutter, the road-water runs into this, an untrapped opening. This untrapped opening is by the people living near taken advantage of: they throw into it their slops, garbage, and nightsoil.

Fish have been plentiful in Cornwall this year: fish bones and fish offal lie in every opening, mixed with human excreta, soapuds, and so forth. One of the cesspools I saw in Campfield-hill, so nauseously foul, that I fairly retched; and that in Mitobell-hill had such an effect upon a friend that it acted as Epsom Salts upon him, and he lay on a sofa taking brandy in the evening: it was close under a window. The one in Campfield-hill was placed on the other side of the road to the cottages: the road is from 10 ft. to 11 ft. wide. As I looked in astonishment, I heard one poor wan-looking middle-aged woman say to another—"Ah! it's too bad: that there place stinks so, it do, one can hardly live here, and it's no use to say nothing."

In Ryder-street, Union-street, Fairmants-street, Cardew-street, are these cesspools to be found, and all in the same state. The gutters in these streets, and, generally speaking, throughout the town, are paved with quartz, locally called *spar*, pebbles of irregular shape; of course the paving is badly jointed, so in this way the garbage and liquid refuse that the inhabitants throw into them are as much as possible retained on the surface, and the spreading of noxious exhalations expedited. Some of the streets are

* See p. 681, ante.

paved in the same outlandish manner, and this in a county famed for its beautiful granite!

I question if either commissioners or surveyor ever heard of granite paving-stones. By the bye, the surveyor has 60% per annum, I believe, but am not sure, paid fortnightly, and he is not allowed to do anything else. If these cesspools are bad undisturbed, how much worse do they become when the man comes round "to clean 'em out a bit when the weather is nice and dry." The operator has a shovel made like a spoon, only not so much dished: with a handle or shaft to it, I should say, from 6 ft. to 7 ft. in length, he raises the cast-iron cover, at once exposing the bluish-black, putrid, bubbling, semi-liquid mass; sinking his shovel into it, and using the long handle as a lever, he brings up shovelful after shovelful of the horrible stuff, and lays it, spreading itself like something animate at the side of the reservoirs of poison, "out of the way of the road you know, sir," where it remains until it is fetched, which may be this afternoon or to-morrow morning; perhaps to-morrow morning, seeing there is but one scavenger's cart in this town of 11,300 inhabitants. No regular system of sewerage is there in the town; they do not even see that the new drain empties itself properly into the river that runs through the town. If they meet with an existing drain, of whatever size it may be, "why they make 'em join, o' course: stans to raise the drain empty himself somewhere." The cesspools are in untrapped communication with the sewer: the matter in the cesspool cannot get beyond a certain height in it, for a hole in one of the sides of the pit takes it off into the sewer. The sewers are all supposed to empty themselves into the river. The river is a piece of mud, several feet thick, nearly two miles in length, and of a width for the upper half of its length (that closest to the town) of from 100 to 300 yards, through which meanders a narrow channel, which is every year getting narrower and shallower.

In Falmouth the same sort of sewerage exists. In describing that of Truro I have described that of Falmouth, though of the two Falmouth is the worst, if worst there can be.

In Falmouth the surveyor has, I believe, 12 a week, paid fortnightly. There the drains empty themselves into the sea. On landing from the steambath on the jetty in Market-strand, I could at once testify that some drains empty themselves into the sea; even the pebbles on the little beach are bluish black from the sewage matter pouring over them. But even a blind tourist could discover the proximity of sewage matter. In a boat going along the shore, you see drain after drain, high up the wall, pouring its foul contents into the lovely sea; you see block after block of rank, ill-looking houses, and you see privies and ash-pits overhanging, or bordering the sea, the stain from the matter coming from them all down the sea-wall.

Falmouth in one respect is ahead of Truro, for it has waterworks. The reservoir is about four or five miles from the town; the fishing in it is strictly preserved, for it is rented by some gentlemen who keep boats on it.

I did not go into Cornwall to get cholera, or fever, or even to get sick on foul smells; I had quite enough of it in Truro and Falmouth, so I did not go on to Penzance: therefore I know nothing of its state other than I heard a lady complain of the dust and the absence of anything remotely resembling a water-cart, save one day when she saw on the Esplanade an empty one pass by.

This is the way Cornwall seeks to have a healthy population, empty workhouses, low rates; and this is the way she encourages tourists to visit her lovely coasts.

And—will you believe it?—though some splendid water can be found in the neighbourhood, yet influential people in Truro have again and again opposed its being brought into the town; and now that, after repeated attempts, an Act for the creation of waterworks has been passed in the last session, grave doubts are entertained if a company can be formed to do the work.

No Truro people prefer having their water from the wells that are sunk in different parts of the town, having water that is full of organic remains of diluted sewage; and, as if that was not enough, to have a fine lot of zymotic diseases in stock, they must allow conduits full of poisonous gases to distribute their contents throughout every street in the town.

Falmouth will not have a proper system of sewerage, for the present system did when they were children, and why not now?

Truro believes itself a marvel of cleanness,

and is inclined, in solemn council assembled, to speak slightly of people suggesting any alterations. Perseverance is generally rewarded; and so, if in Truro and Falmouth they have not had fever nearly all the year round, they ought to have it.

Pro.

THE PICK AND THE SHOVEL AT WORK AT CHATHAM.

To those who entertain the conviction that "the noblest study for mankind is man," it follows, with some degree of logical sequence, that the worthiest title by which architecture can claim the respect of the philosopher is its rank as a branch of ethnology.

To those who are habitually accustomed to regard the art, the science, and the practice, of the builder, as a special, and by no means secondary, branch of the finer and more subtle crafts which it is given to the human intelligence to perfect, such a view as the above may seem, at the first glance, utterly inadmissible. And yet, on further reflection, it will not prove altogether strange to our readers. The more our attention is directed from the practice, to the history, of architecture, the more distinctly does the mind become impressed with the mode in which the important function of reflecting, and recording, the phases of social life, is fulfilled by the creations of the builder. Of how many nations and races, of whom no other relics remain, have we the unnam'd and crumbling walls, or the carefully constructed, and long hidden, sepulchres? The art of the potter, himself an early servant, or brother, of the builder; the art of the founder, exercised on implements that appear to have served alike the purposes of the warrior, the hunter, and the timber hewer; the yet earlier and ruder toil, for it can scarcely with propriety be termed art, of those who chipped knives and arrow-heads out of flints, or scraped bone into the predecessors of what we call needles; these alone have left some faint and few relics of human life that are more ancient (possibly, for even that is not certain) than the ruins of prehistoric buildings. Thus the steadiest, if not absolutely the longest, ray that is thrown back into the unmeasured night, which preceded our present early dawn of civilization, is lent by the lantern of architectural research. Those who will not allow architecture to be called a branch of ethnology, must yet admit that some of the most important data of the later quasi science are due to the ancient teutonic art.

Nor is the relation confined to the province of historic architecture,—of antiquity and archaeology. It is no less apparent in the practical, striving, busy life of the day. To how many of the most cultivated workmen—workers with the intelligence, or with the fancy, no less than with the skilful hand—is not the architect called on to ally himself? In the mathematical science of construction: in knowledge of the strength and qualities of materials; in the operations of the quarry, the ravine, the kiln, the forest, and the timber-yard, the architect stands on common ground with the engineer. In decorative art, he is linked with the painter, the sculptor, the smith, the moulder, and founder of metal: his occupation is not foreign to that of any apt student in the wide field of artistic design. In regarding the surroundings of his creations, he must seek the aid, if he do not himself possess both the taste and the experience, of the landscape gardener, the horticulturist, or even the cultivator on a wider scale.

No less close is the link which binds the architect to the soldier, especially to those corps, the élite of all armies of the world, to which the opposed and complementary functions of the arts of construction and of destruction are especially committed,—the *gens* of foreign armies, the Royal Engineers and Royal Artillery of our own. So close, indeed, is the similarity between the education of the Royal Engineer officers of the day, and that of the civil engineer, the architect, and the surveyor, that the officers of that illustrious corps are looked to, by the Government of this country, to discharge many of those functions which we may be pardoned for considering to come rather within the province of the civilian, who has been specially trained to their discharge. Thus not only one special function of the mechanical engineer,—the construction of ordnance,—is discharged as a military duty, but the formation and maintenance of the great constructive works of our arsenals and dockyards, the Ordnance Survey, and minute

mapping of the entire kingdom, and even the purely architectural work required for the accommodation of the Department of Science and Art at South Kensington, are all committed to Royal Engineers. We must not be understood as wishing to express an opinion, at this moment, as to the greater or less advisability of this course; we are only concerned to point out the close and intimate relationship existing between the architecture of peace and the engineering of war.

We have before referred to the influence of the progress of the art of war, on the public, and, in a minor degree, on the private, edifices of a country. It is evident that by far the greater part of historic architecture reflects the exact state of the relation between the offence and the defence at the date of erection. The clustering towers of Mediæval Italy came down before the face of the rude falcon, or saker, or whatever was the name of the clumsy engine that was the predecessor of the rifled ordnance of the day. It was not necessary to command them all. The subjugation of one stubborn noble chieftain, such as the one of whom Carlyle tells us in his "Life of Frederick the Great," by the hoarse and unaccustomed eloquence of one gun, such as was then thought heavy, sapped the very foundations of the keeps of that chieftain's peers. When towers and turrets were known to be undefensible, they ceased to be built. And thus it has come to pass that, within less than 500 years, that form of seignorial dwelling which was, in some parts of Europe at least, so common as to be universal, attracts, by its relics in Ireland, such curious speculation at the present day. Bel, Apollo, Priapus, ugly forms of Indian, of Phœnician, or of African worship, are all appealed to, or ransacked in order to explain the very simple fact that, when times were rough, the arm of law feeble, and cannon unknown, gentlemen built towers to live in, because they were safe with a double safety. They afforded their owners a wide and reassuring look-out, so as to give a tolerable safeguard against surprise, and they were so difficult of access as to be able to resist anything but a blockade.

It is not only, therefore, for the reason that we have habitually kept open a limited space in our columns for matters of vital social interest, although not directly and immediately connected with either the science, the art, or the trade, of the Builder, but from the fact of the intimate relation of military engineering to architecture proper, that we have, from time to time, called the attention of our readers to the rapidly alternating phases occupied, during the last few years, by the arts of attack and of defence.

On one point of military order alone, the Builder has been led more than once to insist, from the profound conviction of its vital importance to the defence of the future. First, and almost, if not altogether, alone, among the science publications of the day, we have pointed out the indispensable necessity of rendering each soldier of our small but admirable army, an engineer, or, if the term is better liked, a sapper. Familiarity with the employment of labour, intimate knowledge of the difference between the speed and facility with which a taught and an untaught pickman can make a hole in the ground, some personal acquaintance with science, and circumstances of war on the Continent, and a careful study of the current incidents of both the German and the American wars, have led us again and again to insist on the importance of the spademan a weapon no less essential to the soldier than the bayonet. It is with great satisfaction that we now see, for the first time, that the efforts of the advocates of common sense have not been altogether lost in this important matter. We are abandoning our time-honoured English method of learning nothing without the sanction of a drubbing. We are actually thinking it desirable to turn practical attention to the best method of providing sudden shelter for our troops, without having had of a campaign, of a division, or even by the loss of a lesson for the thinking it desirable of a man. "The Pick and Shovel for Troops" has appeared among the broadsides by which our daily contemporaries strive to attract the notice of those casual purchasers who are fain to look for amusement in their columns when London is out of town.

The French, we are told, have for some time recognised the primary importance of the view we have so strenuously urged. In 1867 were issued, "Observations sur l'Instruction sommaire pour les Combats," in which it is distinctly stated that the use of arms of precision (and still more, of arms of repetition) has trans-

ferred the advantage from the attack to the defence, in the case of troops advancing over open ground. The distance of three or four hundred yards is enough to expose an advancing corps to an annihilating fire. Distance, within such limits as to constitute actual military pressure on the field, is no protection. Courage, pluck, discipline, all that distinguishes an army from a mob, are utterly valueless in the face of a sustained fire; so that the enemy do not run short of ammunition, and the period of exposure extends over more than a few minutes. In any case, the French strategists urge, an advancing body of men would arrive too much weakened to contend with success against an enemy prepared to receive them, and who had themselves been protected from fire.

Again, in a paper called "Instruction sur les Franobes d'Abris," rules are laid down for the rapid construction of trenches for the shelter of the troops forming them from fire. Before the death of Marshal Niel (a great loss to the French army), a conference of officers was held under the presidency of that distinguished administrator, in which the necessity of acconing infantry to protect themselves by *impomph* field works was fully admitted and insisted on. Napoleon, himself an engineer (as proved by his noble works of national intercommunication, no less than by the great development given in his tactics to the artillery), especially condemned the reluctance shown by officers and soldiers to using the pick and shovel. If, with the artillery of his day, Napoleon held that field fortification should be improved, and that the art of the military engineer was in arrears of that of the officer of infantry or of cavalry, what would have been his views, and what his dispositions, if he had been a grim witness of the strife between Armstrong and Whitworth.

In the American war the country was furrowed with trenches, and turned into a perfect rabbit-warren of rifle-pits. General Grant, no less than his antagonist, made more use of the spade than had ever been the case in the previous history of war. An extract from an American work is quoted in the French report to which we have referred, to the effect that a Federal brigadier, having had to change his position twice in less than an hour, left behind him two lines of nearly completed entrenchment.

After having received, in the Royal Military Academy at Woolwich, the only systematic education which, in this country, can be in any way compared to that given in the seats of the highest Continental culture, the newly-commissioned officers of the Royal Engineers are now sent to pass a certain course of practical study, at the School of Military Engineering at Chatham.

Experiments have for some time been going on at this establishment, as to the method of providing instant shelter for troops, regard being had both to the minimum section available for use in a field, parapet, and ditch, and to the maximum amount of labour that might fairly be expected from the individual soldier, duly trained and directed. The section arrived at is that formed by the excavation of a trench 4 ft. wide, and 15 in. deep, the erection being thrown into a mound, of course on the side exposed to fire. An untrained party is said to have executed such a trench in less than half an hour. Of course much must depend on the nature of the soil. Military drill has the great advantage of acconing the sappers to work more closely to one another than is the wont of our navvies and miners. A linear yard of trench is allowed to each man in common trench work, and only 2 ft. in flying sap.

A more serious experiment is reported as having been made last week, under the immediate inspection of the general officer commanding the Chatham district. The 27th Inniskillens, the Royal Marines, and the 1st and 2nd Depot Battalions, furnished a total force of rather more than 1,000 men, who were employed, distributed into three reliefs, in the formation of a redoubt under pressure as to time. The length of the face of the work is stated at a little under 140 ft., and the work, with all its requisite defensive details, was completed in eighteen hours. The ground was somewhat unfavourable over a portion of the line selected, being hard, compact gravel. But the officers threw themselves on the resisting element, not horsed, but pick in hand, and rough and smooth were overcome, guns mounted, and trenching instruments removed, before the time fixed for the visit of the inspecting officers.

We have witnessed with the utmost satisfaction this step in the right direction. The method

adopted is not identical with that to which we endeavoured to direct (the attention of the service; but, on the other hand, it is thoroughly and entirely military, and appears to have been eminently successful. We entertain no doubt as to the advantages of our own suggestion, but it is possible to hold to that conviction, without in any way underrating the result actually attained. The essential thing is that the infantry soldier should, as a matter of course, become accustomed to the use of trenching tools; the pick and shovel drill, if officers like to call it so, should be as familiar to him as rifle and bayonet drill. As to the best method of doing this, especially considering the small size of our army, we are willing to speak with great deference to the practical experience of the staff. So long as the *non possumus* was opposed to the plain prevision of common sense, we held it right to speak in an unflattering tone. The Papal excommunication and the speaking of actual written communications from the highest military authorities) is now withdrawn. The order from the Horse Guards is "Experiment." To the result of that experiment, boldly and energetically carried out, we can only wish God-speed.

It will be remembered that the financial element was not excluded from our calculations. That under the energy and spur of emulation, officers and men may freely work, to show what they can do, has now been happily proved. But human nature is not absolutely changed, even if some of its weaknesses be eradicated, by military drill. It must be remembered that, as far as the present private soldiers of our army are concerned, they are under contract with the public. It would be an undue strain upon that contract to insist upon the performance, under its terms, of the work of the sapper, in addition to that of the rifleman. Nor must the rightful interest of the officers be neglected. Uniforms are extremely expensive. We can speak, from a very vivid experience, of the influence of hard civil work on the augmentation of the tailor's bill. For the infantry officer, this influence will be as important as it will be unwelcome. To maintain that spirit of hearty satisfaction which is essential to the wellbeing of an army in time of peace, those considerations must be borne in mind. Even if officers and men, from sheer patriotism, *esprit de corps*, or any other motive of noble emulation, will freely give to Old England an amount of muscular labour which is "not in the bones" do not let us expect to mulet them also in pocket. The House of Commons, not always wishing to loose the paras-strings of which it is a somewhat capricious guardian, must be applied to in support of the new educational movement, unless, as we had the honour to suggest, that movement can be made self-supporting. That such can be the case we have no more doubt than we have of the necessity of the change. Marshal Niel and H.R.H. the Duke of Cambridge have come over to this opinion as to the latter part of the question. We anticipate, sooner or later, a similar conversion as to the former fact. In a question which, after all, is a matter of engineering, we have no doubt of the value of engineering experience. That the experiment now reported from Chatham is successful we rejoice to believe; but success, to be success, must be permanent.

We trust, therefore, that amid all the satisfaction which must be so justly entertained by those who have advanced thus far in the course of teaching the soldier to protect himself, there will be room for a whisper to be heard from the source whence the first alarm on the subject proceeded. The *Builder* rejoices in the fraternisation of the soldier. He desires it to be durable. To insure durability he wishes to see it based on those sound principles of fair play, common sense, and respect for the most powerful motives that ordinarily actuate mankind, which may be left out of sight on a spurt, but can never be safely neglected in the long run. Let every soldier be an hearty connoisseur, with the least possible delay, not at his own cost, and not at the cost of the tax-payer. If this can be done without such arrangements as shall tend to make the British army in some sort a self-supporting institution, well and good. But, in any case, no one of the above-named requisites can be neglected without great disadvantage.

Royal Manchester Institution.—The Exhibition of modern paintings and works of art here will be opened to the public on Monday, the 13th inst.

BOLTON SEWERAGE: PROPOSED INTERCEPTING WORK.

For a long period much agitation has been going on in Bolton on the subject of the outfall of the sewage. We are at last glad to find there is a probability of the work being carried out under the pressure of the powers possessed by the Home Secretary, as Mr. Lawson has just decided between the rival plans suggested by the engineer, and the Sanitary Sub-Committee. Bolton, it should be understood, contains a population of 70,000 inhabitants; the area of the borough is 1,840 acres, one half of which is drained. The river Croal, running through the town, takes 720 acres; the river Torge, 122 acres; and the Jenny Bech, 73 acres; and the portion in dispute was the outfall drainage of the area falling towards the river Croal. The total quantity of the sewage of Bolton is 1,725,780 gallons, 7-8ths of which flow into the river Croal. The bed of the river Croal, we should remark, is pitched, for the distance it passes through the town. According to the engineer's report (February 4, 1867), it appears that all the sewers are so constructed that the sewage can be intercepted at any period. The proposed outfall sewers have been so designed as to intercept all the sewage of the town, and to carry it outside the borough a distance of one mile and three-quarters (measured along the river course), from the Market House.

From the proposed point of exit it is intended to make a sewer, 5 ft. by 3 ft. 9 in. of uniform shape, along the right bank of the river to the sewer discharging at Rosehill; from Rosehill a sewer of reduced size, 4 ft. by 3 ft. to the new sewer at Church Wharf; from thence one of 3 ft. 9 in. by 2 ft. 9 in. to Water-street; from thence a circular sewer of 3 ft. diameter to Great Bridge; from thence a circular sewer of 2 ft. 6 in. diameter to Gilroy-lane, and terminating with a sewer of 2 ft. diameter at Pike's-lane, the total length being 3 miles 270 yards.

At Pike's-lane he proposes to form a flushing tank, with sluices, &c., complete, to flush out the whole length when necessary, and also at this point to erect a chimney-shaft and furnace for the ventilation of the sewers, as it is the highest point.

It is also intended at all convenient points along the course of the outfall to construct storm overflows to deliver excessive rainfalls into the river and these overflows are to be trapped.

Manholes are to be placed at frequent intervals, and junctions left at such places as may serve for the drainage of the land and houses, when built upon. The estimated cost of the proposed works is 13,684l.

The general inclination of the sewers varies from 1 in 43 to 1 in 325, except in one instance, which is 1 in 12.

No scheme is at present recommended for the ultimate disposal of the sewage, as, in consequence of the great sacrifice attending experiments in many places, and the failures that have occurred, the engineer has been deterred from doing so; but he has watched for a long period the progress of sewage utilisation works in other places, a list of which he gives. At Leicester, Exeter, Uxbridge, Ely, and Clifton, deodorisation has proved a failure. At Cheltenham and Coventry a system of filtration has proved only partially successful. At Hitchin and Blackburn, precipitation has proved a failure at the former, and at the latter place it has only been recently adopted. At Croydon, Rugby, Edinburgh, Tavistock, Harrow, Crediton, Fasey, Clipstone, Bannry, Watford, and Carlisle, irrigation has been tolerably successful; but at Croydon, systems of precipitation, filtration, and deodorisation had been previously tried, but each had proved a failure.

Upwards of fifty patents for dealing with town sewage had been taken out, and there is no instance on record of any one having been successfully applied. At Croydon, it is stated that until recently the disposal of the sewage cost 3,000l. a year, but at the present time a profit of about 300l. is made by it. There are 350 acres of land irrigated by the Croydon sewage, and the profit realised is said to be 1l. per acre.

The report was submitted to the sanitary committee, and one member, the mouthpiece of that body, opposed the plan, and suggested a crude and undigested scheme, as will afterwards appear, of their own, as more economical.

From Great Bridge they proposed to take up the pitching of the river bed, and reduce it in

* This system is said by some to produce the foot and mouth disease now prevalent amongst cattle.

width from 6 ft. wide by 19 in. deep, to 4 ft. wide by 15 in. deep, and to lay an iron pipe of 16 in. diameter in the line of the river underneath the invert. This iron pipe, of 16 in. diameter, was to take the sewages of twenty drains, between Great Bridge and Water-street, the sectional area of the sewage being stated to be 45 square inches, the sectional area of the pipe being estimated at 256 square inches. From Water-street to Bridge-street, to take the sewage of eleven additional sewers, computed at 69 square inches, they proposed a 20-in. pipe, of 400 square inches area, to take the united quantities of the above sewer, calculated at 114 square inches of sectional area.

From Bridge-street to the weir at the wharf they propose to lay down a 24-in. pipe, the sectional area of which is 576 square inches, to convey the sewage from the thirty additional sewers which discharge into the river between these points, the flow of sewage from which they estimate to be 84 square inches, and which, added to the former quantities, gives a sectional area of 198 square inches. From the wharf to Messrs. Marsden's Bleach-works, they proposed to lay down a pipe of 30 in. diameter, the sectional area of which is stated to be 900 square inches, to convey the sewage from six sewers, of 176 square inches area, making the total quantity of sewage 374 square inches. In other words, as they say, to provide an outfall sewer of 900 square inches, to take the whole of the sewage, which is estimated at 374 square inches. The large pipe is to be cast in 6-ft. lengths, in two pieces horizontally, and secured by flanges and bolts in the centre. To connect the present large street sewer with the intercepting pipe, they propose to use pot-pipes of just sufficient size to take the ordinary drainages, and at these points to have (*vaque*) storm overflows, to take the rainfall into the river.

They also provided for a system of ventilation, approved of by Government engineers (?) of 4-in. pipes affixed to, and carried up above, the roofs of the houses; and a plan of flushing by means of slide valves fixed to the pipes.

They state that the estimated cost of these works is 4,966*l.*, or say 5,000*l.* The size and weights of the pipes are as follows:—

Diameter.	Cwt.	Cwt. Qr.	Lb.
16 in.	1,088	or 2	2 20 per yard.
20 in.	881	„ 2	1 13 „
24 in.	2,318	„ 4	0 0 „
30 in.	5,093	„ 5	0 0 „
Branch pipes, &c.,	99	—	—

Total weight... 10,080 required for the pipe sewer.

We may in this place point out the errors in the calculation in the later report, as must be self-evident to the veriest tyro in the profession. First as to the area of the pipes,—

Instead of a	Pipe.	Sq. In.	Sq. In.
.....	16 in. = 256	should be	201.06
Ditto	20 in. = 400	„	314.16
Ditto	24 in. = 576	„	432.39
Ditto	30 in. = 900	„	706.85

In estimating the quantity of sewage, the question of the velocity of flow appears to have been altogether omitted,—a very important element in estimating the amount of a discharge in these days of hydraulic engineering.

And with reference to the weight of iron and the estimate, we must add 50 per cent. to the former, and about 75 per cent. to the latter, to be nearer the truth, which would very much augment the totals of weight and price.

The report above mentioned, was reviewed by the engineer (March 11, 1867), its errors of calculations as to quantities of sewage and acres of pipes pointed out, also the estimate of cost; and it was not until the inhabitants of the district affected by it took up the case, and petitioned the Home Secretary for the purpose of putting the Local Government Act on "Pollution of Rivers" in force; and that Mr. Arnold Taylor was sent down, and the result of his inquiry was to approve of the scheme of the engineer, and to condemn that of the committee in unmistakable terms, and his recommendation was pressed on them by Mr. J. Taylor, of the "Local Government Act Office."

To evade this, they proposed another *economical* scheme, viz., "a double line of iron pipes, one on each side of the pitched invert of the River Croyal, and this was referred to the Home Secretary, who objected to it, and referred them to the original plan of the engineer, and gave them notice under the Act that if they did not proceed with the works, he should take the necessary steps to do so; but he was recently requested to postpone it, in order to enable them to consult another engineer to decide these knotty

questions, and Mr. Lawson was instructed to make the necessary investigation.

Mr. Lawson, in his report, points out the merits and defects of both plans; and one question, he says, is to settle the point as to the time the overflow shall come into action, and the sewage be allowed to escape into the river Croyal.

Mr. Lawson thinks that neither plan on that head will have full effect, that the sewage after the first rush of water from heavy rain contains a great amount of filthy deposit, and that ten times the amount of the ordinary sewage is required to effect a perfect clearance, say ten times 1,500,000 gallons, equal to 15,000,000 gallons. If it is intended that the river Croyal shall be purified, the engineer's scheme is ample, and that of the committee somewhat small, and both plans would fail as the overflows are arranged, and the committee's plan is besides impracticable. He is of opinion that substantially the plan of the engineer is the best, as affording facilities for regulating the flow, and better calculated for future requirements. He then proposes reduction in the sizes of the smaller sewers to 3 ft. 6 in. by 2 ft. 6 in., 3 ft. by 2 ft. 6 in., 27 in. diameter, and 24 in. diameter, and overflows to be so fixed as to discharge the flood water above mentioned, and so constructed as to be capable of adjustment. He then incidentally recommends depositing tanks to relieve the sewage of a portion of its solid matter. He also points out the errors of the calculations of the sub-committee, both as to the area of the pipes and the sewage flows, the latter arrived at without reference to its velocity. Thus, it appears after two years and a half, or more, of discussion and agitation, the plan of the engineer is substantially to be carried out, after a small reduction in the sizes of the sewers.

ERWIN VON STEINBACH AND HIS WORKS.*

CHRONICLE and legend have inseparably associated with the name of Steinbach that of his daughter Sabine in the production of one of the noblest monuments of Gothic art in Europe. That much of the more delicate and elaborately executed sculpture is due to her chisel there appears to be little doubt, and her personal beauty is also a feature in the traditions which have made her name that of the chief heroine of Medieval art. A complete romance has, in fact, been embroidered upon the canvas supplied by her story, the main features of which have possibly their foundation in truth. As an example of the kind of material which the art-career of Sabine, as told by tradition, has furnished to the novelist, the following half-legendary anecdote may be cited. The story is thus told; Bernard Sunden, a young Silesian sculptor of average promise, who was engaged, like many others, in carrying out the designs of Erwin, became deeply imbued with an enthusiastic admiration of the beauty and artistic talents of Sabine, who was, however, too closely wedded to her art to listen to declarations that might in any way distract her attention from it, or retard the progress of the work, in which she was aiding to raise a monument to the glory of her father, by forwarding the completion of his great design. There was also, as usual, a rival, one Polydore of Bologna, a young French sculptor, from the plains of Picardy, in whose ardent nature the charms of Sabine had developed a similar but far more violent passion than that which had stirred the breast of the more passive Silesian, who found consolation in the genial though quiet routine of his professional pursuits. It soon, however, became evident to the watchful and jealous eye of Polydore, that while Sabine did not allow her attention to be diverted for a moment from the ardent pursuit of the art to which she had devoted all her energies, she yet seemed to favour the pretensions of Bernard by allowing him to assist her occasionally in the works on which she was engaged. Matters stood thus at the time that she was near completing some conspicuous figures and elaborate enrichments above one of the principal portals. In this special work Bernard had been allowed to assist, and the last finishing touches having been given just as daylight began to fail, the protective hoarding was removed after dark, in order that the newly-finished portion of the work might be seen as a pleasant surprise by the public spectators. This state of things soon got wind,—the evening's gossip spread it far and wide; and when the

following morning arrived, and many hastened to the place to see the newly-exposed work, great was the surprise and consternation experienced on finding the whole of the figures and ornaments mutilated and disfigured, beyond, as it seemed, the possibility of repair. Some considered the act that of the incarnate fiend himself, who, it was averred, had more than once sought to interrupt and retard the building of the temple; but others shrewdly attributed the work of destruction to Polydore, whose ill-concealed rage and jealousy since Sabine had accepted the aid of Bernard, seemed to know no bounds; and moreover he did not appear at his usual post that day, nor on several succeeding days. But then comes the miraculous part of the story. It was said that Sabine had had a vision in the night, in which she was promised celestial aid in the restoration of the mutilated work, and that in the morning she had discovered a beautifully drawn out plan for the repair of the work, upon her little table in the window niche of her bedroom. However this may be, say the relations of the tradition, the mutilated work was found partially restored on the morning following the vision, according to the design furnished to Sabine, and each night still further progress was made. Many were induced to believe, such was the beauty of the restored portions, that they were the work of angels, who had wrought under cover of the darkness; and it was asserted in corroboration, that the blows of a mallet, as though striking upon a sculptor's chisel, had been heard in the dead of the night, when every other sound was stilled. These reports and surmises appeared to be borne out by the rapid and continuous progress of the restorations themselves, accounts of which spread far and wide, till it was evident that another night's operations of the supposed celestial sculptors would complete the work, with even more perfect beauty than it had originally possessed, though even then considered the masterwork of Sabine. At this juncture it was said that Polydore had been again seen in Strasbourg, and Bernard, who believed that the Bolognese sculptor had more to do with the mutilation than the foul fiend, determined that night to set himself to watch the work, notwithstanding many pious scruples on the score of interfering with the work of the angels, and also some dread of the devil, who, in spite of his suspicion regarding Polydore, he still thought might possibly be at the bottom of the work of destruction, and perhaps ready to recommence it after the miraculous restoration. His scruples and fears being, however, both overcome, he proceeded to the scene of his nocturnal watch, where, contrary to expectations and fears, nothing occurred to vary the monotony and stillness of the darkness till nearly midnight, when he thought he distinguished, coming from the sculpture of Sabine's portal, slight sounds like those of a chisel struck gently by a mallet against stone or marble; but the sound was very faint, and he persuaded himself it was only fancy, the more especially as he had not the amount of courage requisite for approaching the spot more closely. He had, however, placed himself at the precise spot at which a human enemy was most likely to make his way to the part of the scaffolding in question—and this point he thought it his duty to guard,—though he was not prepared to contend with an enemy of more mysterious nature. But this was not the only point of possible approach, and he just then clearly distinguished the creaking of a plank on the scaffold itself, leading to the stage in front of the miraculously restored wall. Almost immediately after, his eyes having become sufficiently accustomed to the darkness to distinguish dimly the forms of objects in favourable positions, he discerned a dark form, the outline of which was rendered tolerably distinct against the lighter colour of the new stonework. The form appeared to be unmistakably that of Polydore, and it glided along the scaffolding towards the point he was so anxiously watching, and where he had heard the sound. Then came another slight blow, like that of a mallet, and a fragment fell upon the stage below, and immediately after a white object appeared gliding round the projection of a buttress. The dark figure turned towards the new apparition, and started back upon the narrow scaffold as though in sudden terror. Then came a sound like that of a heavy mass falling to the ground, followed by what seemed like a sigh, or a groan. Bernard, whose gaze had been riveted upon the white form that glided out of the shade of the buttress, soon perceived that it was not that of an angel, as he

* See p. 679, ante.

bad at first supposed, but simply a slight graceful human figure, and in an instant he was on the planks of the stage above; for he knew every ladder and every intricacy of the scaffolding, and was just in time to catch the falling figure of the somnambulist, Sabine, who had been pursuing her dream work, and was in the act of returning, when the noise of the fall which had just taken place had suddenly roused her from her trance, and but for Bernard's timely arrival she would have fallen to the ground. The simple explanation was that the destruction of her work had preyed upon her mind in dreams, under the influence of which she had glided safely, night after night, to the scene of the devastations, and bad, in her sleep, effected those restorations which the peculiar spirit of the times had so readily attributed to supernatural intervention. Sabine's impression, that she had been favoured with a divine vision, combined with the excitement of her religious enthusiasm, may have induced both the acts of simple somnambulism, and also her nocturnal labours at the injured sculpture; and this explanation has been very successfully suggested and expressed by M. Grasse, in the well-conceived statue before alluded to; in which she is made to hold a prayer-book in one hand, while with the other she grasps a mallet and chisel, which she presses to her breast, as though she felt that the instruments were imbued with a miraculous power, by which their action would be guided, rather than by the skill of her own hand. This story, whether wholly or only partly true, has taken a strong hold upon the literary and artistic men of Germany; and, as previously stated, a German novel-writer has made Erwin and the progress of his great work the subject of a graceful and very graphically treated fiction,—in which, of course, Sabine occupies a prominent place. There are many such legends, partly true and partly legendary, associated with the erection of the great ecclesiastical edifices of the Middle Ages, showing us that architecture is very far from being without its romance.

The great artist-mason, with his sons and danghter, continued the work together till the beginning of the fourteenth century, by which time the fame of Erwin and the renown of his cathedral had spread to other parts of Germany. In Strasbourg he was styled *gubernator fabricæ ecclesiæ argentinus*, and he was also more familiarly styled *hüttenherr* and *werkmeister*; generally considered to express "engineer" and "principal architect." One of the consequences of the successfully carrying forward of so vast a work at Strasbourg led to the nomination of that city as the seat of the principal Masonic guild or lodge of the Free Society of Masons, and it may be that his title of *hüttenherr* had reference to his being elected master in chief of the Germanic lodges, as the German common term for a lodge was *hütte*, the Strasbourg lodge becoming the *haupt-hütte*. Another consequence of the widely extended repute of Erwin of Steinbach was, that the aid of his fertile invention in design and skill in construction was called for in various quarters; the principal works which he designed or executed beyond the walls of Strasbourg being the graceful church of Thann and great part of the cathedral of Freyburg, including its elaborate spire.

Thann.—Thann is a beautifully-situated little town nestled close to one of the narrow valleys of the Vosges Mountains, and, with its elegant Gothic church, forms such an exquisite picture, with its ancient houses and mountain background, that a painter in transferring the scene to canvas would scarcely deem it necessary to either heighten or subdue a single feature. At the first aspect of the beautiful spire of Thann the student is at once satisfied that the traditions and records which attribute the erection of the church to the architect of the great work at Strasbourg are no myth, for the whole structure is plainly enough stamped with the true spirit of Erwinian design. The elegant steepled tower is at the southern angle of the east end of the building, and is furnished, like the tower of Strasbourg, with external winding stairs, cased in a spiral shell of open-work, all the way to the top of the lofty tower, from which rises the elegant steeple, supported at its springing by the slenderest and most fanciful of flying buttresses; the steeple itself being perforated with open-work, light and beautiful as a richly-traceried window of delicately intricate design. The whole composition is, indeed, unmistakably from the same hand as the tower and steeple of Strasbourg, of which the perforated staircase turrets at the angles form so

remarkable a feature. The south portal is a marvellously-beautiful example of lofty and elegant proportion, wrought out with the richest conceivable details; the capitals of the slender detached columns forming corbels for small statues, remarkable for their graceful execution; and above which are delicately perforated canopies, surmounted by pinnacles, as light and slender as lacework. The double western portal is also quite a masterpiece, and altogether exceptional in regard to its elaborate and minute enrichments; while the exquisite touches of sculpture encrusted upon and about the buttresses are of very remarkable elegance and most ingeniously devised in regard to appropriateness of attitude in reference to situation. In short, the western facade is a perfect jewel of elaborate art,—the amount of finely-designed patterns, of minute perforated work and lacy canopies, being perfectly astonishing. Part of this work appears to exhibit manipulative touches of a later period than that of Erwin; but the main features and the distribution and proportion of the general elevation, as well as all the principal enrichments, are indubitably due to his fertile and graceful invention.

The interior is by no means so remarkable as the exterior; but its exquisite lateral chapels, with their elaborate and interesting stone altars, should, nevertheless, be carefully examined; especially one of the fourteenth century in the chapel of the Virgin, which is a masterpiece of its class; its intricate tracery, and delicate pinnacles and tabernacle work, being of the most highly-wrought kind. Another obapel, also, contains a stone altar marvellously rich in florid decoration, the deep panels being entirely filled with richly wrought interlacings of foliage; one having vine branches with large bunches of grapes, another fig branches and figs, and the others different foliage and fruits, equally rich in design and treatment. There is also another very splendid altar in the southern aisle, which, however, has been so elaborately restored, that it has acquired somewhat the stamp of the modern Gothic of the Munich school, and lost much of the charm of the original manipulation. The groining of the ceiling of the south aisle differs from that of the rest of the church, and is very distinct and characteristic in its style.

How much of the work of this elegant structure may have been executed in Erwin's own time it is difficult to say. But it is known that the works were proceeding during the time that his son and successor, Jahn, was still directing the works at Strasbourg, though much of the work was evidently executed at a later period, as proved by a passage in a local chronicle, which states that the building of the church was still going on in the year 1431, when the wine produced along all the eastern slopes of the Vosges was so abundant that during a drought which occurred in the autumn of that year it was used instead of water to prepare the mortar used in carrying on the building of the church. Nevertheless, it is stated in the chronicle in question that the building was from the design of Erwin, of Steinbach.

Freyburg.—The same chronicle also states that Erwin was likewise the architect of the cathedral of Freyburg, of which there is also sufficient evidence of other kinds to leave little or no doubt upon the subject. The cathedral of Freyburg is a much more important building as to scale than that of Thann; but the style of the spire resembles the one at Thann more than that of the Strasbourg edifice, which last, however, it nearly rivals in height. The portal of the cathedral is fine in form, but not greatly enriched with sculpture, the abundant smooth surfaces appearing to have been provided expressly for polychrome treatment by painting, as was more the custom in this part of Germany than in Alsace; and the columns and moldings are accordingly painted in the usual Medieval style, with geometric or slightly foliated patterns. The first porch leads to an inner one, or "Paradise," as it is termed; the walls of which are enriched with arcade work up to a certain height, and then corbels rise between the arches, starting from immediately above the columns, and supporting a series of statues which are surmounted by elaborate canopies, the general effect being rich and picturesque. The main interior is not comparable in any way to that of Strasbourg, but is yet very good, and certainly attractive in its general aspect; and there is a particular statue, against a massive group of columns, which produces a remarkably picturesque effect, on account of a delicate spiral

canopy rising to a great height above it, rich with the most profusely elaborate decorations. It should be observed that in examining the numerous statues with which the interior is enriched, none can fail to detect, not only the same banding as in the sculpture of Strasbourg, but also the same faces as those of the "wise and foolish virgins" previously described, and must feel convinced that the cunning hands of Erwin and his danghter Sabine have been at work upon them, and that Sabine's own face and figure are faithfully reproduced in more than one of the statues of female saints in the cathedral of Freyburg. The pulpit is a very remarkable work, but appears of somewhat later date than the productions of Erwin, though the design itself may be his; for it bears a strong likeness to that of Strasbourg, which, though executed by Hammerer, and with certain additions said to have been suggested by the great preacher Koyersperger, is yet known to have been originally designed by Erwin. The ceiling of the choir appears to have been completed in 1410. The three eastern altars at the termination of the nave and aisles are of very rich tabernacle work, which might belong to the end of the fifteenth or beginning of the sixteenth century; but, then, in the profusion of decorative features, and in the intricacy of the decorations themselves, Erwin was so much in advance of his contemporaries that for fully a century afterwards his followers had enough to do to work up to the point he had previously reached, without dreaming of going beyond; and this may account for some of the work, even of his own hand, being attributed to a more recent period; for his original genius developed a daring advance of style, which was not only accepted by his contemporaries, but followed by his successors. It will not be without interest, while describing this interior, to call attention to the work of a modern emulator of the decorative style of Erwin, namely, the throne of the archbishop,—a rich composition of tabernacle work entirely carved in sycamore wood, or box, which has assumed a most beautiful golden tone, of almost metallic effect. The work is most delicate and intricate, and the carver stipulated, before parting with the result of his labour, that it should never be either gilt or painted; and, not content with promises, he had a dead drawn up to that effect, which was willingly signed by the venerable archbishop, now above 90 years of age. The artist's family possess the Dead, regularly drawn up on parchment, and signed by the archbishop, both for himself and his successors. The idea was probably suggested to the modern carver by the three altars which are entirely gilt, so that the spectator cannot guess whether they are of wood or stone—or even gilt iron, which they might very well be taken for, on account of the delicate slenderness of their features, did we not know that Erwin treated stone, even in external decorations, with such excessive slenderness and attenuation of the more delicate features, that the proportions are positively more like ornaments wrought in metal than carved in stone.

The windows of the choir are fine in general form and proportion, but the tracery does not seem to present the Erwin *cachet*. In fact, the windows are of various dates in this structure; some of those of the original Romanesque character remaining, and also some of the Early Lancet period, which are by no means good specimens of the style. The famous windows with the painted glass presented by the different trade guilds of the city in the thirteenth, fourteenth, and fifteenth centuries, form a very interesting series; they are large, and their tracery simple, and they seem to belong to the close of the thirteenth century. The paintings they contain are each enriched, as a main feature, by the armorial bearings of the respective guilds; the hootmakers' shield having a yellow field, representing gold, and bearing in the centre a black loose boot turned over at the top with red. The shield of the brick and tile makers bears an object which may be called a brick or tile; that of the smiths a hammer and pincers; that of the tailors a pair of open scissors; the bakers, an unmixtable loaf; and the weavers, a shuttle. The window of the Vinedressers' Company is perhaps the richest in its general pictorial subjects; but all are very interesting monuments of local art, and all more or less good. The windows above these are undeniably the work of Erwin, and their forms are stamped with his peculiar elegance of proportion and design.

But it is the exterior, perhaps, that exhibits the Erwin style more conspicuously. The grand

and at the same time elegantly perforated spire, in the style of that of Thann, rises from a lofty tower, the upper or second story of which is of the most delicate design, highly enriched with a profusion of the tall and slender panel, niche, and open-window work, for which the style of Erwin is so well known. It is probable that Erwin's work, in the tower, commences with the second story, as a marked change of style takes place at that point. Two lateral towers near the entrances of the present transept are parts (still perfect) of the original Romanesque structure, but both are crowned with two upper stories of Erwin's work. The whole of the choir was probably an addition to the ancient Romanesque edifice, and the greater part of it, containing all the more decorative portions of it, are from the hand of the great mason of Strassburg. The buttresses of that portion of the building, with their connecting gallery work, are extremely rich in ornamentation, which is exquisitely varied in its detail; and the profusion of richly-canopied niches, with their appropriate statues, is most remarkable. There is, especially, an equestrian statue surmounted by a delicately-enriched canopy, in the style of the equestrian statues of Clovis and Dagobert at Strassburg, which at once attracts attention. In short, the beauties wrought out at Freyburg are almost as remarkable as those of the more famous cathedral at Strassburg, and are just as indubitably the work of Erwin of Steinbach.

The works, or at all events the preparation of the designs, had been going on simultaneously with those of the master-work of the great sculptor-architect, whose unceasing industry was busily plied in his atelier close to the cathedral at Strassburg during twenty-eight years, where he died in 1304, after having established a more brilliant and widespread reputation as a successful and unrivalled architect than had been achieved by any of his predecessors in Germany.

Erwin's tomb may be seen close to the cathedral, in a little court attached to the chapel of St. John the Baptist, the epitaph giving him the titles of Hüttenberg and Werkmeister previously referred to. It is intended to remove it eventually to a conspicuous place in the interior of the cathedral itself, as near as possible beneath his sculptured portrait, which appears to look down from an upper gallery. In the mean time another memorial has been erected in memory of the great artist-mason at Steinbach, his native village, among the vineyard-clothed hills on the borders of the Black Forest. The village itself, which was visited by the writer of this notice, possesses no remarkable features, no interesting old houses, and especially not one that could with any show of probability be pointed out as the birthplace of Erwin. Moreover, there was not in the place a suitable site for a statue. But on a neighbouring hill, at the highest point of a finely undulating vineyard, is a spot from whence the distant spire of Strassburg may be seen or imagined, and on that spot a statue has been placed, which appears to look intently towards the marvellous work which the man it is intended to honour conceived and planned with such consummate skill. The attitude of the statue is well designed, and as well executed. It is, indeed, a worthy tribute to the memory of a great artist.

The fame of Erwin and his work continued to spread even after his death, and his son Jahn was with universal acclaim appointed to carry on the great work at Strassburg towards completion; Sabine appearing to have been appointed, conjointly with her brother, to direct and carry forward the execution of the decorative portions of the building. Jahn continued the work with vigour for even a longer period than his father—viz., for five-and-thirty years, from 1304 to 1339, when he died; and doubtless very great progress had been made at the time of his death.

His sister Sabine, according to the legendary accounts of Erwin and his family, became the wife of Bernard of Sunden, and eventually settled with him in the North German provinces, where they produced many works of note, especially a great portion of the chevet at Magdeburg, in the decorating of which they reproduced several of the groups and figures which they had worked upon together at Strassburg; the style of the sculptors in question appearing to render the tradition probable.

Wykin, the younger son of Erwin, also became celebrated as an architect, and built the collegiate church of Hassenloh, in the duchy of Baden, where he died, and where a tomb was erected to his memory, which is still in perfect preservation.

After the death of Jahn, Hültz, of Cologne, one of the most rising architects of the day, was called upon to continue the great work at Strassburg; but he only lived ten years after his appointment, yet, in that time, as the tradition goes, supported by contemporary records, he completed the exquisite steeple according to Erwin's design, and raised the repute of the cathedral and its original architect to its highest pitch, inasmuch that Strassburg was finally acknowledged as the seat of the chief Masonic Lodge of Germany. After Hültz several other architects succeeded each other, but at last Josse Dörtzinger, of Worms, was appointed to carry on the works, and his competency soon approved itself by the continued rapid progress of the building, the influence of which on architectural art throughout Germany became more and more apparent, and it was under his leadership that in 1452 the various lodges of Germany handed themselves together in one association, the chief of the Strassburg Lodge, Dörtzinger, being appointed its permanent head, to be succeeded by his descendants. Representatives of all the lodges met at Ratishon on the 25th of April, 1459, to draw up formal articles of association, the various secrets and signs and other forms being agreed upon at that meeting.

Dörtzinger appears to have died in the year 1486, after carrying forward Erwin's vast design for 36 years, the work having then lasted with little intermission, for 147 years after the death of the younger Erwin. Hammerer and Larechut succeeded Dörtzinger as architects of the cathedral from 1486 to 1495, and then came Conrad Waght, who in 1498 obtained a ratification of the Masonic articles of association, confirming them in the possession of considerable judicial powers in the settlement of all disputes in matters appertaining to building transactions,—privileges which were subsequently subscribed by Charles V., and which remained in force for more than two centuries.

In concluding these remarks on the great mason-architect Erwin and his family, and on the progress and contemporary celebrity of his greatest work, it may not be without interest to recall the fact that in 1481 the Duke of Milan, wishing to complete the noble cathedral of that city, a work not inferior in celebrity to that of Strassburg itself, wrote on the 27th of June, 1481, to the chief magistrates of Strassburg, asking from them, on the faith of their own celebrated temple, an accomplished mason capable of completing the great rival cathedral of Milan; and from its peculiar style, so distinct from any other great Gothic edifice in Italy, it appears probable that one or more architects responded to the invitation, and that those German artists had a leading share in imparting to it those forms of the Germanic Gothic which peculiarly distinguish it.

HILDESHEIM.

In addition to the works of art already described,* the choir of the cathedral at Hildesheim contains a superb set of stalls of fourteenth century work; the canopies and ends are beautifully carved; the stalls themselves are forty-two in number. The centre space of the choir is filled with two large cantors' desks and two lateral desks. Although this arrangement is probably not older than the seventeenth century, it is uncommonly picturesque, and, as far as we know, peculiar to this cathedral. The "sanctuary" is separated from the choir by three steps. In the centre of the sanctuary is the high altar, with a silver frontal, tabernacle and candlesticks; they are unfortunately of a very wretched design. On either side of the altar are doorways leading to the apse, which is screened off from the choir and sanctuary by an immense Italian retables. Over these two doors are brackets supporting two most superb Early Romanesque shrines: one contains the bones of St. Bernard, and the other those of St. Godehard, or Gotthard; they are both of silver gilt, set with precious stones, and are about 8 ft. long. The sides of St. Godehard's shrine are ornamented with an arcade of round arches supported upon little columns. Each of these arches contains the statue of a saint worked in high relief.

On the altar is a fine fourteenth-century bust of St. Catherine, in silver; on the credence-table is a copy of the Gospels made by St. Bernard in the eleventh century; and on the left of the high altar is a "Madonna and Child" of the tenth century. It is carved in black wood,

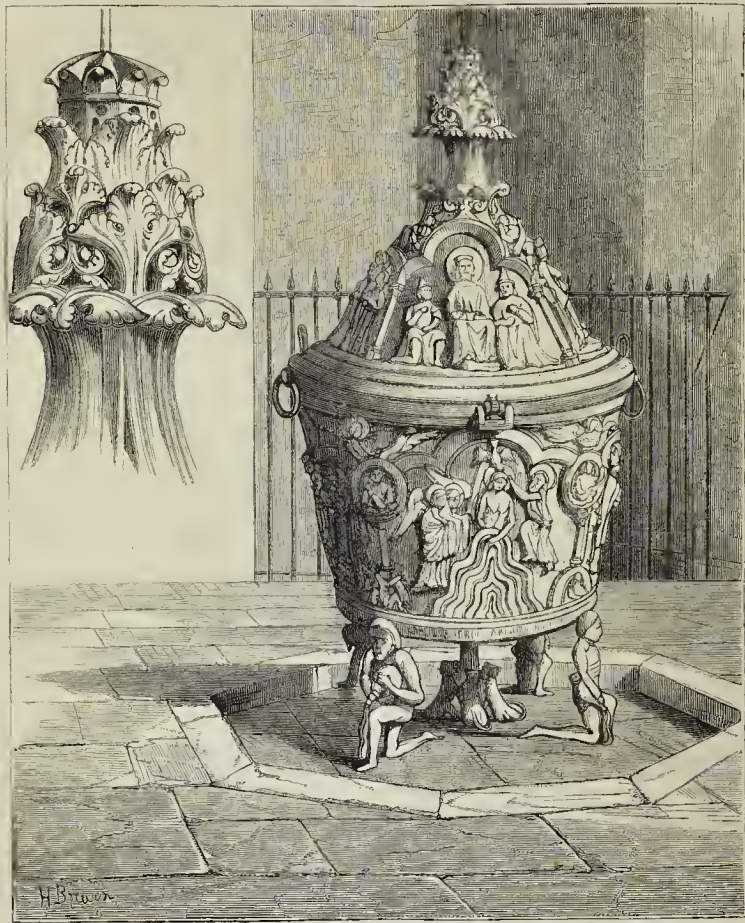
with the faces and hands covered with plates of gold. Two horrible enry wigs disguise this remarkable work of art.

The space at the back of the high altar forms a kind of treasury, full of most superb works of Medieval art; amongst others, the following are perhaps the most remarkable:—The chalice of St. Bernard, ornamented with ancient classical cameos, on one of which are the three Graces; a magnificent chalice of the thirteenth century, with pattern to match; a fourteenth-century pastoral staff, still used by the bishop; and many other articles of church plate. The cloisters enclose three sides of a square, to the east of the cathedral, the fourth side being formed by the apse and eastern sides of the transepts. These cloisters are of early Romanesque work, and are arranged in two stories, the lower composed of large single arches, and the upper of narrow arches, arranged in sets of three, separated by slender columns. In the centre of the cloister square is a beautiful little spidal chapel of the fourteenth century, and leading out of the south wall is a Romanesque chapel, divided into four equal aisles by low columns and round arches. This chapel contains several very early monuments, and in it are deposited the remains of the superb incised pavement which once adorned the choir of the cathedral. Under the choir is a crypt of very early Romanesque work, on one of the altars of which is a fine ivory crucifix of the twelfth century, and fixed to the altar-rail is a singular bronze lion of the same date. The sacristy leads out of the south transept; it is, like all German sacristies, of very large size, and contains an altar dedicated to St. Thomas à Becket. Above the large porch called the New Paradise, is a large room divided into three aisles by lofty columns; it is a kind of treasury or museum, and is full of most interesting works of ancient art. Amongst other curiosities are the silver bust containing the head of St. Oswald, and a silver model of the original central tower of the cathedral. This tower, which is replaced by the present ugly dome, stood over the junction of the nave and transept; judging from this singular model, it was probably of wood covered with copper or lead. Returning into the body of the cathedral, we must notice the singular and beautiful bronze font represented in our engraving. We gave a description of this font in the *Builder*, when speaking of the font at Würzburg Cathedral: so it will be unnecessary to describe it again.

We must now leave the cathedral, and say a few words about some of the other churches in the town. The abbey churches of St. Godehard and St. Michael are most interesting Romanesque buildings. They have originally both possessed apses to the east and west, but the eastern apse of St. Michael's Church was destroyed many years ago, and the altar is now placed in the western apse. St. Michael's Church is one of the few churches which retain their ancient flat boarded ceiling with the oak leaf decoration, very similar to the work lately executed at Ely Cathedral by Messrs. Le Strange and Gambier Parry. There are some fine stalls, two old altars, a bronze font of fifteenth-century work, a fine thirteenth-century side screen to the choir, and some very interesting old paintings by an early Flemish painter. St. Godehard's Church is the noblest church in the town, and has been excellently restored. In the choir is a modern corona, copied from those at the cathedral, and an incised pavement, a restoration of the one which originally adorned the choir of the cathedral. This pavement is formed of a hard white composition, and figures, birds, beasts, foliage, and inscriptions are incised on it with lines cut in and filled with black and red mastic. The ancient roof exists, but is placed across the south transept. The western apse of this church does not contain an altar, as is usual in the double Basilica churches in Germany, but is divided into two stories, the lower of which forms a baptistery, to which there is a descent of several steps. The upper story opens into the church by a large arch, and is used as an organ-loft. There is a well-designed modern altar.

The remaining churches in Hildesheim are interesting buildings, but our space will not allow of our entering into any detailed description of them. St. Cross's is a large modernised Romanesque church; St. Andrew's, a lofty and very striking fifteenth-century building; St. Lambert's and St. Paul's are late Third Pointed; and St. Moritz's very Early Romanesque, with a later chancel: the whole building is terribly modernised.

* See p. 698, ante.



ANCIENT METAL FONT, HILDESHEIM CATHEDRAL.

THE NEW NORTH BRIDGE, HALIFAX, YORKSHIRE.

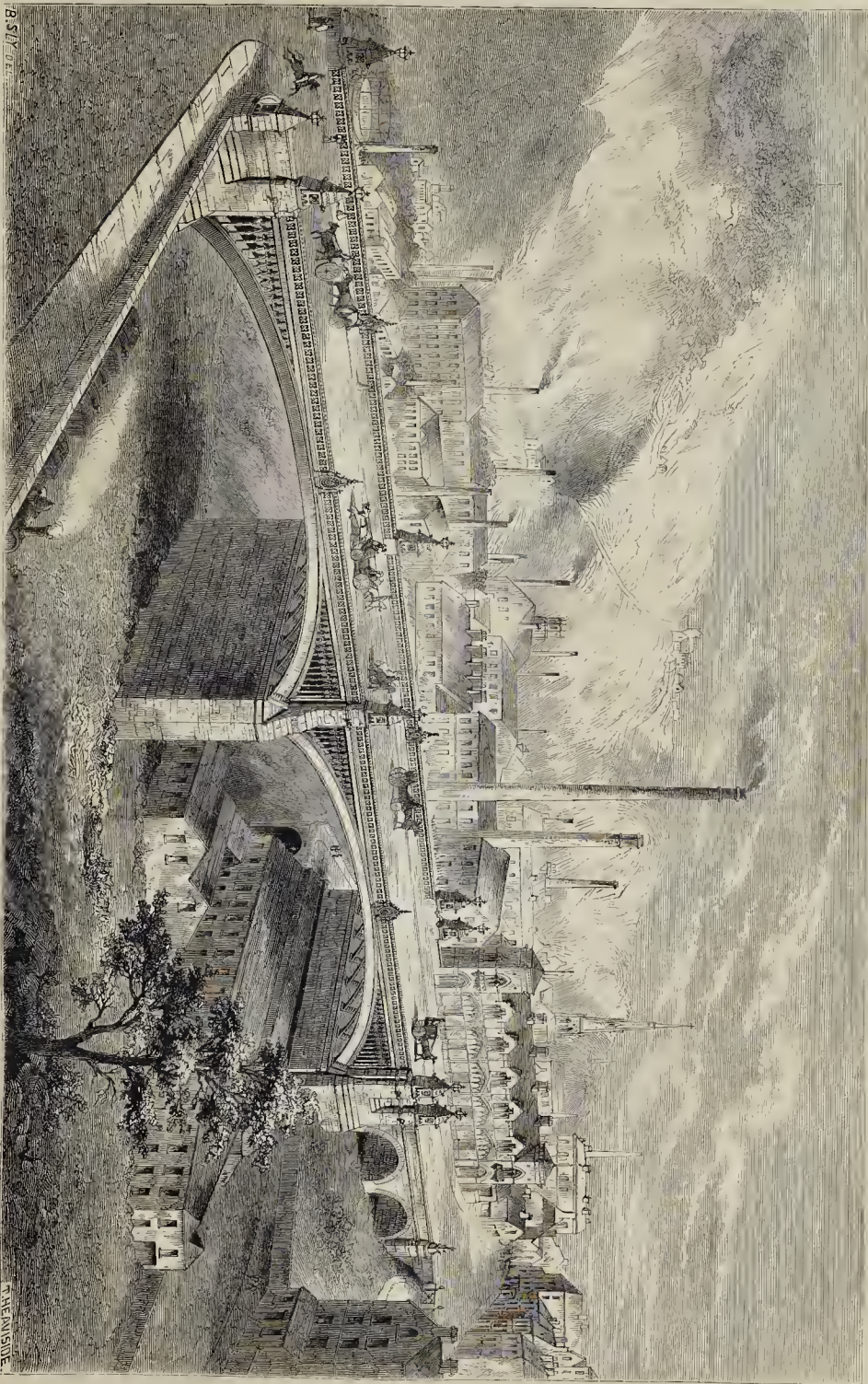
HALIFAX has made wonderful progress within the last few years, and many changes and improvements have been required to meet the altered circumstances. Amongst other things the old North Bridge has been found insufficient for the requirements of the present age, and a new structure is being erected in its place. The population of the town of Halifax in the year 1764 numbered about 6,500, and there were then, according to an authenticated return, 1272 inhabited houses. The present population of the town is about 57,000, with 11,000 inhabited houses, and the rateable value of the borough is 180,000*l.*—so considerably has the town grown in numbers, wealth, and prosperity. The first stone of the new bridge was laid on the 14th day of April last, by Mr. John Dysen Hutchinson, mayor of the borough. We now give a view of it as it will appear when completed.

The old bridge, which is of six arches, carrying a roadway 27 ft. wide, at a height of about 56 ft. above the level of the stream at the bottom of the valley, served its original purpose, and was useful in avoiding the steep and winding road formerly in use only by packhorses. Of late years, however, as we have said, the old bridge has been found totally inadequate to the requirements of the town, and the corporation, taking up the question with energy, determined upon having a new erection of increased proportions. Various schemes from time to time were suggested, and eventually Mr. John Fraser, civil

engineer, of Leeds, was consulted. Ultimately a design for an iron bridge of two spans, 160 ft. each, and with a clear width between the parapets available for traffic of 60 ft., prepared by Mr. Fraser, was adopted. In designing a bridge of two spans, the engineer had several objects in view, one being to span over the station ground on the north side of the valley, now in course of construction, and also to clear some valuable property on the south side. Moreover, in a sanitary point of view, a light iron bridge of two spans resting on one pier is far preferable to a stone bridge with six arches resting upon five piers, as had been determined upon at one time, as forming a much less obstruction to the proper current of air so necessary for the ventilation of a steep and narrow valley. The new bridge has been designed in the Gothic style of architecture. The elevation shows two flat elliptical arches of 160 ft. span with a rise of only 16 ft. The outside ribs, which are of cast iron, are 4 ft. deep at centre, and 5 ft. 3 in. deep at the springing, and carry open trussed spandrels at the haunches crowned by a cornice and a partly open quatrefoil and battlemented parapet with a central feature comprising a shield for the corporation arms, with foliage on each side on a diapered background and terminated at the top with a lamp. The inside ribs, six in number, are placed at a distance of 8 ft. 7 in. apart. The centre part, for a space of 52 ft., is composed of wrought-iron plates, the remaining parts of the ribs being of cast iron. The transverse bracing connecting the wrought-iron part is composed of

wrought-iron bars, but that connecting the cast-iron part is of cast iron. These ribs carry open cast-iron spandrels; upon the top flange of these are placed the cast-iron road-plates, the road being formed by layers of asphaltic concrete, upon which the paving is laid. The total weight of the cast-iron work is 1,200 tons, and of the wrought-iron work 150 tons. The iron, made by the West Yorkshire Iron and Coal Company, has been selected after some experiments. The masonry of the abutments on each side of the valley and of the central pier will be finished by five spire-like terminations, which will rise 15 ft. above the parapet on each side of the bridge, and will carry large octagonal lamps to be supplied with gas for lighting the roadway. As a portion of the new bridge will stand upon the site of the old one, it is intended to build one half of the new bridge, and then to turn the traffic from the existing structure on to the new half. The present bridge will then be pulled down and the remaining half completed. The roadway of the new bridge, when completed, will be 11 ft. above the level of the old one; by this means a gradient almost level will be obtained from Cross Hills to the opposite side of the valley, at the junction of the Haley Hill and New Bank roads.

Mr. Archibald Neill, of Bradford, has undertaken the construction of the bridge and of a new road called Bridge-lane diversion, rendered necessary by the increased width of the approaches, for the sum of 21,000*l.* The ironwork is being furnished by Messrs. Joseph Cliff & Co., also of Bradford.



THE NEW NORTH BRIDGE, HALIFAX, YORKSHIRE.—MR. JOHN FRASER, ENGINEER.

The history of the United States of America is a story of growth and change. It begins with the first settlers who came to the continent in search of a new life. They found a land of vast potential, but also one of many challenges. The early years were marked by struggle and hardship, as the settlers fought to establish a new society in a remote and often hostile environment. Over time, the colonies grew and developed, and the people began to assert their independence from British rule. The American Revolution was a pivotal moment in the nation's history, leading to the birth of a new and free nation. The years following the Revolution were a time of rapid growth and expansion, as the United States spread across the continent. The nation's economy flourished, and its political system became a model for other countries. The American dream of a better life for all became a reality for many. The United States emerged as a world power, and its influence was felt across the globe. The nation's history is a testament to the power of the human spirit and the ability to overcome adversity. It is a story of hope and possibility, and a reminder of the importance of freedom and democracy.

PENS.

As the Ponds of our last little paper had no reference either to shillings or to pennyweights, so these Pens in the present have as little as possible to do with their usual and familiar accompaniments, ink and paper. We speak not of that great gosequill sceptre of rule which shares with the sword this broad world's sovereignty,—nor of that hybrid between both, the Magnum Bonum, or Gillett's No plus ultra,—but of a certain generation of smaller ponds, otherwise pens, wherein to be atrinhabitable no small amount of cruelty from man towards his humblest servants. Let it be the happy province of the *Builder* to advocate humanities even to the lowest, and to reform architecture even in respect of such unconsidered dwellings as many poor beasts and birds are compelled to live and die in.

We have in our mind's eye some certain matters in modern farming which appear to us pre-eminently cruel to the animals, and cannot be otherwise than conducive to disease in the meat they generate: as, the solitary confinement system of fowl-houses, where the poor creatures have not room to turn nor the chance of ridding themselves of parasites, but, with only heads and tails exposed, fatten in unwholesome misery; and, still worse, as those pits into which a bullock is lowered and is fed therein week after week without air or exercise until he gradually reaches the level on the mass of manure he has been making, and finishes his dreary and pestilential existence by crawling for his first walk into the fresh field, an unwieldy mass for the shambles; and, more familiarly, as the very common case of the close, hot, filthy pigstye, or your dog-kennel in the sun, where poor Juno mournfully clanks her perpetual chain, while all things round are free; or your lark, thrush, bullfinch, or canary, cribbed, caged, and confined in the smallest possible cages, and hug out in the hot sun.

Do let us, in these happier days of enlightened kindness, give more consideration to all the poor dumb creatures round us. A kind heart and a modicum of common sense would cure more evils than we have time or space to enumerate. Larger, cleaner, better-shaded styes and kennels, with more frequent healthy "outings" for their prisoners; fowls fed in the open and not stewed-up in pens; cattle fattened in wholesome stalls and strawyards, not on subterranean dungheaps; with plenty of Nature's great free gifts, air and water, always accessible, and as much exercise and liberty and enjoyment of life to bird or beast as can reasonably be conceded. Depend upon it, such humanities are also economics.

MARTIN F. TUPPER.

IMPROVEMENTS IN CAST STEEL.

In an able address before Section G of the British Association, at Exeter, Mr. C. W. Siemens, F.R.S., thus spoke on this important subject. A great revolution of our constructive art has been prepared by the production, in large quantities and at moderate cost, of a material of more than twice the strength of iron, which, instead of being fibrous, has its full strength in every direction, and which can be modulated to every degree of ductility, approaching the hardness of the diamond on the one hand, and the proverbial toughness of leather on the other. To call this material cast steel seems to attribute to it brittleness and uncertainty of temper, which, however, are by no means its necessary characteristics. This new material, as prepared for constructive purposes, may indeed be both hard and tough, as is illustrated by the hard steel rope that has so materially contributed to the practical success of steam ploughing. Machinery-steel has gradually come into use since about 1850, when Krupp, of Essen, commenced to supply large ingots that were shaped into railway tyres, axles, cannon, &c., by melting steel in halls containing hundreds of melting crucibles. The Bessemer process, in dispensing with the process of puddling, and in utilising the carbon contained in the pig iron to effect the fusion of the final metal, has given a vast extension to the application of cast steel for railway bars, &c. This process is limited, however, in its application to superior brands of pig iron, containing much carbon and no sulphur or phosphorus, which latter impurities are so destructive to the quality of steel. The puddling process has still, unless the process of decarboxisation by Mr. Heaton takes its place, to be resorted to,

and to purify these inferior pig irons, which constitute the bulk of our productions, and the puddled iron cannot be brought to the condition of cast steel, except through the process of fusion. This fusion is accomplished successfully in masses of from three to five tons on the open bed of a regenerative gas furnace at the Landore Siemens Steel Works, and at other places. At the same works cast steel is also produced, to a limited extent as yet, from iron ore, which, being operated upon in large masses, is reduced to the metallic state and liquified by the aid of a certain proportion of pig metal. The regenerative gas furnace, the application of which to glass houses, forges, &c., has made considerable progress, is unquestionably well suited for these operations, because it combines an intensity of heat, limited only by the point of fusion of the most refractory material, with extreme mildness of draught and chemical neutrality of flame. These and other processes of recent origin tend toward the production, at a comparatively cheap rate, of a very high class material, that must shortly supersede iron for almost all structural purposes. As yet engineers hesitate, and very properly so, to construct their bridges, their vessels, and their rolling stock of the material produced by these processes, because no exhaustive experiments have been published as yet fixing the limit to which they may safely be loaded, in extension, in compression, and in torsion, and because no sufficient information has been obtained regarding the tests by which their quality can best be ascertained. This great want is in a fair way of being supplied by the experimental researches that have been carried on for some time at her Majesty's dockyard at Woolwich, under a committee appointed for that purpose by the Institution of Civil Engineers. I have also pleasure to announce an elaborate report, by Mr. Fairbairn, on this subject. In the meantime excellent service has been rendered by Mr. Kirkaldy in giving us, in a perfectly reliable manner, the resisting power and ductility of any sample of material which we wish to submit to his tests. The results of Mr. Whitworth's experiments tending to render the hammer and the rolls obsolete by forging cast steel, while in a semi-fluid state, into strong iron moulds by hydraulic pressure, are looked upon with great interest. But assuming that the new building material has been reduced to the utmost degree of uniformity and cheapness, and that its limits of strength are fully ascertained, there remains still the task for the civil and mechanical engineer to prepare designs suitable for the development of its peculiar qualities. If, in constructing a girder, for example, a design were to be adopted that had been worked out for iron, and if all the scantlings were simply reduced in the inverse proportion of the absolute and relative strength of the new material as compared with iron, such a girder would assuredly collapse when the test weight was applied, for the simple reason that the reduced sectional area of each part in proportion to its length would be insufficient to give stiffness. You might as well almost take a design for a wooden structure, and carry it out in iron by simply reducing the section of each part. The advantages of using the stronger material become most apparent if applied, for instance, to large bridges where the principal strain upon each part is produced by the weight of the structure itself; for supposing that the new material can be safely weighted to double the bearing strain of iron, and that the weight of the structure were reduced by one-half accordingly, there would still remain a large excess of available strength in consequence of the reduced total weight, and this would justify a further reduction of the amount of the material employed. In constructing works in foreign parts the reduced cost of carriage furnishes also a powerful argument in favour of the stronger material, although its first cost per ton might largely exceed that of iron.

The Visitors to the South Kensington Museum.—The number of visitors to the Museum proper last week was 17,437; more than 5,000 above the average of corresponding week in former years, and this has been the case for several weeks past. Considering the emptiness of London, this is the more noticeable. It affords a very conclusive answer to those who assert that the situation of the Museum puts it out of the reach of any but the well-to-do and upper classes of society, the vast majority of whom are at this time seeking health and change anywhere but in London.

THE WALLACE MEMORIAL MONUMENT, STIRLING.

This monument on the Abbey Craig, near Stirling, is now all but complete, and is to be handed over in a few days to the Town Council of Stirling, who have agreed to receive it in trust. Some 12,000*l.*, we are told, have been spent on it. It has been determined that no public proceedings shall take place on the occasion, which we regret, if only because they would have been made the occasion for a pleasant day by a number of persons. The friends of a Rev. Dr. in London have been setting up rather extraordinary claims on his behalf as originator, while different things are said by others equally acquainted with the history of the affair. We do not find it desirable, however, to go into the question. Whether personal matters of this kind have had anything to do with the determination arrived at we scarcely know.

A view of the monument, which was designed by Mr. J. T. Roched, architect, will be found in our volume for 1860.* It is 220 ft. high, and 36 ft. square at the base, and enjoys a fine position.

A CHANNEL RAILWAY.

The exceeding importance which is attached by many persons to the idea of a continuous railway across the Channel may be judged of by the numerous projects which have from time to time attracted the attention of the public, and which involve some of the most remarkable schemes of modern engineering. To minds unaccustomed to follow the progress of science in the present day, it would at first sight appear to be an impossibility to connect by a continuous line of railway the opposite sides of a sea nearly twenty miles apart; but we have seen three cables stretched across the Atlantic; we find one railway ascending the hitherto almost inaccessible heights of the Alps, and another penetrating through them; and we are about to witness the realisation of what has long been considered by able engineers an impracticable dream, viz., the opening of the Suez Canal.

To span the Straits of Dover is not more contrary to experience than any of these realised projects, and the numerous plans for effecting this object sufficiently attest that if it could be done it would yield to none in importance and value. It would afford a line of railway over which the traffic of the world with Britain would pass.

Such a railway must be made either by means of a bridge above or a tunnel below the water; and supposing both to be practicable, there can be no doubt that most people would rather pass over it by a bridge than under it through a tunnel thirty miles long; but objectionable as such a journey would be, the desire for a connecting railway is so great that it would probably be made through a tunnel if no better means of accomplishing it could be discovered.

We are led to make these reflections by a report which has recently been made by Capt. Tyler to the Board of Trade, which throws some light upon this very subject. A deputation had previously waited on Mr. Bright, and represented to him that the French Government were desirous of having the co-operation of the English Government in determining on the best course to adopt for effecting a railway communication between the two countries. We are glad to see that Capt. Tyler does not hesitate to recommend that the whole matter should be referred for the consideration of the French Government with a view to the appointment of an international commission for the purpose of dealing authoritatively with the important interests involved, and satisfactorily deciding the general question.

It appears from Capt. Tyler's report, that of the various projects which have been proposed, "those which have of late made the most progress are the bridge scheme of M. Bontel, and the tunnel scheme presented under the chairmanship of Lord R. Grosvenor." The British Government has been at great pains to ascertain their practicability, for it has referred the latter to three commissions of inquiry, and "the Council General of Mines, to whom the question was last referred, concluded that in the present state of things they would not form any estimate either of the probable duration of the works or their cost."

Of M. Bontel's bridge, Capt. Tyler reports that an association has been formed for making

* Vol. xviii., p. 67.

experiments. Two small bridges have been built on his system, and arrangements made for a third, in two spans of half a mile each; and that the engineer visited the works, on a site which has been granted by the French Government, and is stated to have expressed himself favourably with regard to the project. The bridge is intended to cross from Dover to Blanc-nez, near Calais, and is advocated as (1) being less costly than a tunnel, (2) occupying less time in construction, (3) giving no trouble in ventilation, and (4) avoiding the danger of sudden inundations. It is contemplated that the bridge can be completed in three years, and that the pending experiments give reason to expect that the estimate of 8,000,000*l.* will not be exceeded.

Capt. Tyler states, and truly, that there is nowhere a sea-service of equal importance which is so much in want of improvement, and we shall look with great interest for the result of the pending experiments in Paris which are being made by the direction of the French Government in reference to M. Bontel's bridge. Anyhow, the evils attending the existing modes of communication should be removed.

We are informed on good authority that the pending experiments in Paris are considered, so far as they have progressed, to be satisfactory.

BELLS AND CARILLONS, OR CONTINENTAL CHIMES.

Our great musical historian, Dr. Charles Burney, in his interesting work, "The present State of Music in Germany, the Netherlands, &c.," London, 1773, speaking of his visit to Courtray, says,—

"It was in this town that I first perceived the passion for *carillons*, or chimes, which is so prevalent throughout the Netherlands. I happened to arrive at eleven o'clock, and half an hour after the chimes played a great number of cheerful tunes, in different keys, which awakened my curiosity for the species of music so much, that, when I came to Ghent, I determined to inform myself, in a particular manner, concerning the *carillon* science. For this purpose I mounted the town belfry, from whence I had a full view, not only of the city of Ghent, but could examine the mechanism of the chimes, as far as they are played by clock-work, and likewise see the *carillonner* bells, as those of the harpsichord and organ do with strings and pipes. The great convenience of this kind of music is, that it entertains the inhabitants of a whole town without giving them the trouble of going to any particular spot to hear it."

So far so good. The respected author then goes on to say,—

"But the want of something to stop the vibration of each bell, at the pleasure of the player, like the valves of an organ, is an intolerable defect to a cultivated ear; for by the notes of one passage perpetually running into another, everything is rendered so inarticulate and confused, as to occasion a very disagreeable jargon."

Now, having myself examined the bells and mechanism—*cylindres et claviers*—of the most celebrated *carillons* in Europe, and repeatedly listened to their music at various distances, I beg to assert most distinctly that the statement made by the learned doctor in the last paragraph is false. I deny that "everything is rendered inarticulate and confused," or disagreeable. On this point I speak the more plainly, because almost every Englishman who has written a line about *carillons* since 1773, has followed Burney's dictum, and told us that the great defect is the want of a damper to each bell. Several examples relating to Boston and other chimes have been contributed to public journals since Christmas last.

Perhaps the following observations may suggest what led the Doctor to entertain and publish the notion just mentioned:—

Every musician worthy of the name knows that instruments strung with wire "which have nothing to stop the sounding-strings, make an intolerable jangle to one that stands near," as I may add, bells do to one that is in the *bell-chamber*, and hears the continuing sound of dissonant tones. Such an instrument of the wire-string kind is the dulcimer. But the piano-forte has a simple contrivance—a damper—for stopping the vibrations of the strings when the fingers are lifted from the keys.

If, then, instead of going to a spot at some convenient distance from the tower, as he ought to have done, with a view to "inform himself in a particular manner" concerning *carillon* music, Dr. Burney stood in the *bell-chamber* during a performance, the effect must indeed have been intolerable to a cultivated ear.

I maintain, however, that musical bells suspended in a tower, require no damper whatever; for, when their sounds have issued from

the openings in the sides of the building, they spread themselves in the air, and ultimately reach the auditor with precision in subdued and pleasing tones. Even rapid passages in *carillon* music, if properly harmonized so as not to weaken or confuse the melody, and executed by, or upon, a good instrument, produce an admirable effect.

It would be well if the vibrations of many noisy and discordant things called bells were completely stopped. But to say that musical tower bells require dampers in order to produce the desired effect is truly absurd. It is equal to any of the "moonshine" on bells in general with which we have been favoured during the last fourteen years. THOMAS WALESBY.

MATHEW DE RENZY, KNIGHT: A QUENRY.

As a pendant to the sketch of Richard Castles, architect, which appeared in the *Builder* a few weeks ago, the following waif of another forgotten German worthy may be of some little interest. The annexed epitaph is copied from a monument in the churchyard of Athlone, Ireland:—

"This monument was erected for the Right Worshipful Mathew de Renzy, knight, who died on the 29th August, 1631, being of the age of 57 years. Born at Cullen, in Germany, and descended from the family and renowned warrior George Castriol, *alias* Sanderberg, who in the Christian wars fought 23 battles with great conquest and honour against the Great Turk. He was a great traveller and general linguist, and kept correspondence with most nations in many weighty affairs, and in 3 years gave great perfection to the nation by composing a grammar, dictionary, and chronicle in the Irish tongue; in accounts most expert, and exceeding all others for his great aplausus. This work was accomplished by Mathew de Renzy, his son, August 29, 1635."

Do any of our Celtic archæologists or philologists know anything of the above works? Are they still extant? The above epitaph is another proof that the Celt is not a little indebted in past time, as at present, for the preservation of his mother tongue, to the intellects of the German "vaterland." G.E.

THE PATENT LAW QUESTION.

MR. C. W. SIEMENS, in his address as chairman of sections of the British Association at Exeter, thus dealt with the Patent Law question:—

"A patent is, according to modern views, a contract between the commonwealth and an individual who has discovered a method peculiar to himself of accomplishing a result of general utility. The State, being interested to secure the information and to induce the inventor to put his discovery into execution, grants him the exclusive right of practising it, or of authorizing others to do so, for a limited number of years, in consideration of his making a full and sufficient description of the same. Underneath this simple and equitable theory of the patent system is very imperfectly carried out, and is beset with various objectionable practices which render a patent sometimes an impediment to rather than a furtherance of applied science, and sometimes involve the author of an invention in endless legal contentions and disaster instead of procuring for him the intended reward. These evils are so great and palpable that many persons, including men of undoubted sincerity and sound judgment on most subjects, advocate the entire abolition of the Patent Law. They argue that the desire to publish the results of our mental labour sufficient to ensure to the commonwealth the possession of all new discoveries or inventions, and that justice might be done to meritorious inventors by giving them national rewards. This argument may hold good, as regards a scientific discovery, where the labour bestowed is purely mental, and carries with it the pleasurable excitement peculiar to the exercise and advancement of science on the part of the devotee; but a practical invention has to be regarded as the result of a first conception, elaborated by experiments and their application to existing processes in the face of practical difficulties, of prejudice, and of various objections, involving also great expenditure of time and money, which no man can well afford to give away; nor can men of merit be expected to advocate their cause before the national tribunal, unless they are offered only very narrow and imperfect views of the ultimate importance of a new invention would be taken, not to speak of the favoritism to which the doors would be thrown open. Practical men would undoubtedly prefer the scope to exercise their inventive in secret where that is possible, or to desist from following up their ideas to the point of their practical realization. If we review the progress of the technical arts of our time we may trace innumerable practical inventions, almost without exception, to the Patent Office. In cases where the inventor of a machine or process happened to belong to a nation without an efficient patent law, we find that he readily transferred the scene of his activity to the country offering him the greatest encouragement, there to sell the ranks of intelligent workers. Whether we look upon the power appliances that furnish the shapeless masses of iron and steel into railway wheels or axles, or into the more delicate parts of machinery; whether we look upon the complex machinery in our cotton factories, our print works and paper mills, or in a Birmingham manufactory where steel pens, buttons, pins, buckles, screws, pencil-cases, and other objects of general utility are produced by carefully-elaborated machinery, at an extremely low cost; or whether we look upon our agricultural machinery, by which England is enabled to compete without protection against the Russian or Danubian agriculturist, with cheap labour and cheap

land to back him, in nearly all cases we find that the machine has been designed and elaborated in its details by a patentee who did not rest satisfied till he had persuaded the manufacturers to adopt the same, and had removed all their real or imaginary objections to the innovation. We also find that the knowledge of its construction reaches the public directly or indirectly through the Patent Office, thus enlarging the basis for further inventive progress. The greatest illustration of the beneficial working of the patent laws was supplied, in my opinion, by James Watt, when, just 100 years ago, he patented his invention of a hot-working cylinder and separate steam-engine condenser. After years of contest against those adverse circumstances that beset every important invention, and with falling health and scanty means, was only upheld in his struggle by the deep conviction of the ultimate triumph of his cause. This conviction gave him confidence to enlist the co-operation of a second party, after the first had failed him, and of asking for an extension of his declining patent. Without this opportunity Watt could not have succeeded in maturing his invention; he would, in all probability, have relapsed into the mere instrument-maker, with broken health and broken heart, and the introduction of the steam-engine would not only have been retarded for a generation or two, but its final progress would have been based probably upon the coarser conceptions of Papin, Savory, and Newcomen. It is a hopeful circumstance that during the next session of Parliament the whole question of the patent laws is likely to be inquired into by a special committee, who, it is to be hoped, will act decidedly in the general interest, without being influenced by special claims. They will have it in their power to reorganize the Patent Office an educational institution of the highest order."

BRADFORD TOWN-HALL COMPETITION: CAUTION.

Sir,—We think it is necessary on behalf of the profession generally, and of the competitors in particular, to call attention to what we consider not only a flagrant breach of good faith, but also of the instructions issued by the Town Council to the architects competing for the design of the new town-hall. These instructions contain a clause providing, as far as possible, that the authors of designs shall not be known, and to that end a motto "is to be affixed to each drawing, and to the inside only of the envelope in which they are sent; the author's name is only to be written inside a sealed envelope, which will be opened after the award is made."

On the 9th September the lot was the last day on which designs would be received, and you may judge of our astonishment, on passing through the streets in the evening, to see quite a procession of men carrying some large drawings in their arms, and some in their hands, of architects well known in this town, from their offices to a warehouse in Bridge-street, being, in fact, the same warehouse in which were exhibited the recent designs for the covered market, and which is in no way alluded to in the "instructions." These drawings were carried openly, and without cover of any kind, and were received as openly by the officials as if they were designs submitted by the "anonymous." These drawings are to be addressed to the mayor, and the mayor's rooms are in quite another part of the town, with the municipal offices. The result of this proceeding is, that the names of the authors of this design are known to the officials, and to every one who saw them.

The question also arises, how did the authors get their instructions to take their drawings to the warehouse alluded to, which, as we have since learnt, to be used for exhibiting the designs?

We think the competitors would be justified in asking that a design delivered in such a manner should be excluded from the competition, as having broken one of its principal conditions. W.

THE ROMAN WALL: HADRIAN *versus* SEVERUS.

M. LUCAS writes:—

"Permettez-moi, en vous remerciant à nouveau de la bienveillance attention accordée à mes œuvres dans votre établissement, de vous adresser quelques réflexions sur le projet que j'ai fait de l'appréciation de l'Empereur Archéologue Adrien, 'without quoting any authority,' que tout mon travail a pour base la Nouvelle Biographie Universelle de Didot citée à la première page, et, pour ce qui concerne la grande muraille d'Angleterre, Spartian, que je cite souvent, dit, &c., 'Britanniam petit; in qua murum per octingenta milia passuum ducit; qui barbaros Romanosque dividet.'"

"Veuillez agréer, Monsieur et très-honoré collègue, mes respectueux remerciements."

Without wishing to seem to imply blame by repeating the observation, we think it right to inform M. Lucas that the writer to whom he referred, *Ælius Spartianus*, is quoted as an authority by those who set up Severus as its author. The partisans of Hadrian have to explain away the statement of Spartian in his life of Severus,—"Britanniam quod maximum ejus imperii decus est, muro per transversam insulam ducto, utrimque ad finem oceanii munitur; unde etiam Britannici nomen accipit,"—before they can accept as conclusive the passage in his life of Hadrian to which M. Lucas alludes,—"Britanniam petit; in qua nulla corruvit, murumque per octingenta milia passuum primus ducit, qui barbaros Romanosque dividit." And not only is the authority of Spartian in this matter,—capable of being quoted by both sides, but all his work is esteemed of its value in Smith's "Dictionary" in correct. Speaking of MSS. of Spartian's "Historia Augustana Scriptores Sex," the writer of the article Capitolinus says,— "No trustworthy conclusion can be drawn from

the styles of the different portions, for the lives do not exhibit the well-digested result of careful and extensive research, but are in many instances evidently made up of scraps derived from different sources, and possessing different degrees of merit, loosely tacked together, and often jumbled into a rough mass destitute of form and symmetry. Hence we find numerous repetitions of frivolous details, a strange mixture of what is grave and valuable with the most puerile and worthless rubbish, and a multitude of irreconcilable and contradictory statements, freely admitted without remark or explanation.

We should have rejoiced if M. Lucas had happily lighted upon some new testimony that could have been cast into the scale in favour of Hadrian. Those who second the claims of Severus quote successively, after Spartian, Aurelius Victor, Eutropius, Cassiodorus, and Paulus Diaconus. One of the latest, if not the last, antiquary who has taken up the cudgels in favour of Severus, is Mr. Robert Bell, Nook, Irthington, whose work, "The Roman Wall: an Attempt to substantiate the Claims of Severus to the Authorship of the Roman Wall," was answered by Dr. Bruce, the champion of Hadrian, in a paper first read to the Society of Antiquaries, Newcastle-upon-Tyne, 1852, and subsequently published, entitled "Hadrian, the Builder of the Roman Wall."

SQUABBLES IN BANBURY.

A VISITOR to Banbury who had looked in at the last vestry meeting would have seen a new version of "Banbury cross." The vicar and others wanted to improve the chancel of the parish church, and Mr. Blomfiel has submitted designs for it, which include a flight of seven steps up to the communion-table, to which and other points in them a number of the ratepayers object. The following conditions were sent to the architect:—

- 1. That this meeting approves of the plans now submitted for altering the chancel of the parish church subject to the following conditions,—
- 2. That there is to be no elevation of the communion-table by means of steps.
- 3. That the communion-table is to be of wood, and moveable, and without any super-altar; (and that communion table is to be as at present.)
- 4. The screen as shown is to be omitted or removed to the western extremity of the chancel.
- 5. That no decoration shall be made without consultation with the churchwardens and parishioners.
- 6. And that the plans and specifications shall be submitted to the churchwardens, and he approved by them before any alterations be commenced.
- 7. That the parish vestry is not to be appropriated for the choir, or for any other purpose than a parish vestry."

At the meeting in question the architect's reply was read, containing these passages:—

"I may as well say at once that it would be quite impossible for me to proceed with the work in accordance with some of these resolutions. I may particularly specify Nos. 1, 2, and 4. To say nothing of my own reputation as a church architect, I should naturally suffer when a church architect is not in accordance with the work was done and the blunder apparent, I am sure such a plan would never receive the approval of the bishop, nor should I like to ask it. No. 3, I need scarcely say, is a matter of course. It would be illegal otherwise. The question of a super-altar is one in which I should always be guided by the wish of my employers.

No. 4, there would be no difficulty about.

Nos. 5, 6, and 7 I have no objection to; but Nos. 1, 2, and 4 so completely upset any possibility of a proper or even decent arrangement of choir and chancel, that if insisted on I must decline to have anything more to do with it."

This led to a considerable display of feeling on both sides, and ultimately the meeting was adjourned for three weeks to allow it to cool and consider.

One ratepayer, wishing to answer those who asked the use of the steps leading to the chancel, said,— "For the same reason that in a theatre the stage is always raised above the people, or they would not be able to see," which led one of the most moderate of the objectors to remark that,— "A gentleman near the vicar had made a singularly happy illustration when he talked about a theatre, for where these restorations of churches took place, performances had followed as a necessary consequence. Almost as natural as any sequence in the world in these churches the practices— or rather a bad imitation of them— of the Church of Rome immediately followed. (They had no objection to the church being made as beautiful as they pleased, provided its Protestant character was preserved."

A very little yielding on both sides will, we have no doubt, bring about a satisfactory result. Unless brought about by some structural necessity, the great body of the English laity object to see the communion-table exalted to the extent there contemplated.

THE BUILDERS OF STRASBOURG CATHEDRAL.

Sir,—In common fairness to our Christian forefathers, such a passage as that quoted by Mr. Alfred Strong, with reference to Strasbourg Cathedral (p. 711, ante), should not be allowed to pass unnoted. The inference that you are not allowed to draw, is, that the correspondent, by his italics, appears to draw, is, that the priests called on the people to steal in order to get money for the building. Now, any one acquainted with the very worst states of Medieval Christianity will feel sure, at once recognize that this is simply preposterous. The carefully concealed "old author" must either carelessly or maliciously have altered the text of the apse. It will be patent to every one that a very slight modification of the sentence as it stands would convey the meaning that, any one in possession of goods which he knew to be stolen, but which he had no means of now restoring to the rightful owners, would be at liberty to offer them for sacred uses. Such advertisements were, I believe, not uncommon in those days. J. A. S.

THE POPULATION OF LONDON.

It is not easy to form a conception of the enormous aggregation of human beings which constitutes the London of the present, without some standard of comparison.

It may be furnished by the consideration that it is sufficient of itself to supply a very large colony with cities, towns, and hamlets, as follows:—

	Population.	Population.
1 Capital city, of.....	25,000	250,000
2 Large cities, of.....	100,000	2,000,000
10 Smaller cities, of.....	50,000	500,000
20 Large towns, of.....	25,000	500,000
30 Smaller ditto, of.....	15,000	450,000
40 Ditto, of.....	10,000	400,000
50 Ditto, of.....	5,000	250,000
100 Villages, of.....	1,000	100,000
200 Ditto, of.....	500	100,000
400 Ditto, of.....	250	100,000
1,000 Ditto, of.....	100	100,000
1,000 Hamlets, of.....	60	50,000
2,833		3,000,000

Two thousand eight hundred and fifty-three cities, towns, and villages, with an average population of over a thousand, with a surplus of several thousands over the three millions for a sprinkling of detached houses.

THE NEW POPLAR WORKHOUSE: THE ALLEGED BREACH OF CONTRACT.

At the meeting of the Poplar Union Board of Guardians, held on the 3rd inst., Mr. J. Barringer presiding, the Board's clerk announced that in accordance with a resolution passed at the special meeting,* he had written to the builders of the new workhouse, stating that the Board's attention had been called to the fact that the materials being used in the erection were not in accordance with the specification, and requesting an explanation. He had received the following reply:—

Sir,—We are in receipt of yours of the 31st ult., written at the request of your Board, informing us that it had come to their knowledge that "some of the material used in the construction of the new workhouse implements are not in accordance with the description given in the specification;" and in reply beg to state that the only material objected to by your architect as not being in accordance with the description on the contract and specification, consists of a large-load of bricks, and the timber details that have been removed from the premises. With reference to the bricks, we supplied better stocks, in our opinion, than the specification required, and the large of bricks referred to was sent to us by the same manufacturer whose bricks are now being used (and were selected by your architect as being the best of the various samples sent in for his approval), and immediately one of our firm saw them upon the ground (before the receipt of the written notice to remove them), he ordered them to be carted away, and a letter sent to the party forwarding them to us, asking them for an immediate explanation why bricks of such a character had been delivered. The reply was to the effect that they were not of his make, but had been sent on from an adjoining maker's field, to keep up the regular supply, in consequence of an accident to his barge, which had sunk just as it was ready for leaving.

Respecting the timber, we admit that the specification describes "best Danish." We had your architect's permission to use deals for the joints of the pavilion, and we quite agree with him, and are prepared to maintain, that the deals which were sent for this purpose are infinitely superior to any Danish timber which is imported. The timber in the roofs of the workshops and relief-offices was objected to by your architect, and has been removed by us, not because we thought it inferior, but to show our desire to meet the wishes of your architect and the Board.

We must also direct your attention to the fact that in every case we enter into contracts for the supply of the material to be delivered to your works to the satisfaction of your architect, and according to the specification. It cannot, therefore, be of any interest to us to use material of an inferior description.

We must beg that you will inform your Board that we have no desire to depart from the conditions of the specification. At the same time, however, we expect the architect to put a fair and reasonable interpretation upon its clauses.

In conclusion, we cannot help remarking that the course taken by your Committee and the Board in receiving the architect's statements made, especially those of the Clerk of the Works (many of which are now proved to be totally

* See p. 711, ante.

with out foundation, and the others capable of explanation), without giving us an opportunity of contradicting them until they had been published, is a course which we very much regret, and one that is unjust and calculated to do us a considerable amount of injury.

HILL, KEDDIELL, & WALDRAM.

The Chairman said this letter was a very satisfactory one, and he would now suggest that no further proceedings be taken in the matter.

Mr. Blott said he was very far from satisfied. Messrs. Hill, Keddell, & Waldram did not acknowledge by their letter that they were wrong, except in the matter of the large-load of bricks; and they said they removed the timber not because of its inferior quality, but because the architect desired it.

The Chairman considered that the builders had answered the imputations in a satisfactory manner, and he did hope that affairs would now go on smoothly again. He would be very sorry to show other than a conciliatory spirit over this question.

After a lengthy discussion, a general agreement was made that the matter should now be allowed to drop, and that the Clerk should merely acknowledge receipt of the builders' communication.

THE NEW OFFICES FOR THE POPLAR DISTRICT BOARD OF WORKS.—STOP-PAGE OF THE WORKS.

At the meeting of the above Board, held on Tuesday evening last, at the Office, in East-India-Dock road, Mr. Edward Coleman presiding, a letter was read from Messrs. Baker & Constable, of Blenheim Works, Hornsey-road, the builders of the Board's new offices, intimating that in consequence of certain circumstances it would be impossible for them to go on with the building, therefore the works had been stopped.

It appears that the architects (Messrs. Hills & Fletcher and Messrs. Barton) recently objected to the use of some material, principally timber. The builders felt aggrieved on account of the material being condemned, and did not have it removed. Since then Messrs. Baker & Constable have applied to the architects for a certificate of payment of a portion of the contract sum (7,300l.), which they (the architects) were unwilling to grant until the whole of the material condemned as defective had been removed. Thereupon the builders refused to proceed with the works, and for the past few days nothing has been done.

In the event of Messrs. Baker & Constable being unable to establish their grounds of refusing to proceed with the works, it will be a matter to them of 5d. per day, after a certain date of November, as the contract contains a clause to that effect.

AGRICULTURAL PROGRESS.

Harvest Carting by Steam.—A new use has been made of steam power on the farms of Messrs. Howard, at Bedford. A steam ploughing-engine, which is also used for traction purposes, is now employed in drawing wagon-trains of corn. Many farmers who use steam power for cultivating the land, have thought that if the dormant power in the engine could be used during harvest to facilitate operations in fine weather, they would be able to reduce their stand of horse, amounting from 20l. to 25l. a horse per annum, besides their first cost. It has now been proved satisfactorily that not only the breaking up of the land, but the seeding or drilling can be done most expeditiously and economically by steam. In utilizing its power at harvest, a missing link has, so to speak, been found, so that on a large farm the few horses kept can be used as an auxiliary to steam, instead of employing a greater number with steam as an auxiliary, as is now the general practice.

Harvesting Crops independently of Weather.—In a letter to the Times, Mr. R. Neilson, a tenant of the Earl of Derby, says on this subject:—

"My experience will be found to have anticipated to some extent the recent trials on this subject on a farm of under 300 acres, which I have held for some years as a tenant of the Earl of Derby. During the wet autumn of 1863 my friend and brother magistrate for this county, Mr. Gosage, of the well-known chemical and soap manufactory at Widnes, in this neighbourhood, paid me a visit to explain and impress upon me some ideas he had long entertained as to harvesting crops so as to be independent of weather. Mr. Gosage's notions were, that if corn (however wet it might be) were placed in ricks in such manner that a current of dry or heated air could be forced through it, the superfluous moisture would be speedily driven off and the corn become thoroughly cured. He proposed to do this by means of a centrifugal fan driven by horse or steam power; and if the latter were employed, to use the gases which were produced by combustion of fuel under the boiler to yield heated air to be applied to accelerate the drying."

Mr. Neilson then details his experiments based on Mr. Gosage's idea, and adds:—

"I commenced these operations by the advice of my friend Mr. Gosage, in 1863, and have continually pursued them since that period. I consider that I have now so thoroughly proved the practicability and advantage of these operations, that I can recommend their universal

adoption by my brother agriculturists, in the full conviction that, by these means, we can render ourselves, to a great extent, independent of weather in harvesting our crops."

Danger in Stackyards.—A suggestion has been made, in a letter to the newspapers, by Messrs. Charles & H. White, that corn should always be stacked in the fields in which it is grown. When ricks are placed, as they generally now are, close to each other in a rick-yard, whenever a fire occurs, either through accident or malice, great destruction of property is the result. By stacking the corn in the fields where it is grown a great saving would be effected. With reference to the firing of stacks by the overheating of hay, Messrs. Merryweather & Sons, of the London Fire Engine Works, recommend the use of a "Patent Rick Ventilator," manufactured by Messrs. R. Garratt & Sons, of Snuffolk. The ventilator consists of a perforated tube, which is passed into the centre of the stack. A perpendicular funnel is attached to the outlet, and by this means a current of air is caused from the centre of the rick to the open air, all superfluous heat being thereby removed.

Pannification.—A method has been discovered of making bread without grinding the corn, and a patent has been taken out for the process. It is said that whereas in the process of making bread from flour there is much waste, so that 100 pounds of grain yield only 112 pounds of bread, according to the new process 100 pounds of grain will produce 115 or 150 pounds of bread. The new bread is not only increased in quantity, but is also said to be of better quality. According to the old process much of the gluten was decomposed and lost in the heat of grinding. It is preserved when grinding is unnecessary, and the new mode of fermentation contributes greatly to the whiteness of the bread. The new method of bread-making is called "pannification."

Progress in Australia.—At the meeting of the Agricultural Society of New South Wales, in May last, the first prize, class 205, for a portable steam-engine suitable to agricultural requirements, was awarded to P. N. Russell & Co., Sydney, for a 12-horse power portable steam-engine of Clayton & Shuttleworth, with enlarged fire-box for burning wood, and otherwise adapted for agricultural purposes.

OUTBREAK OF FEVER AT SCOTHERNE VILLAGE, LINCOLN.

At a recent meeting of the Lincoln Board of Guardians, the sanitary state of Scotherne was alluded to, and a terrible state of things was revealed. The subject was introduced by Mr. Mantle, who said that he had requested Mr. Martin to accompany him to the village, and they, with Mr. Grimes and the Rev. E. M. Barry, made an inspection of the place. What they saw he should never forget. The village was full of fever cases, and no wonder. The beck was dried up, and the wells were filled with sewage matter. They went to one pump and found the water emitted an unbearable stench. He (Mr. Mantle) asked a woman if she drank the water from the well, and she replied that she did, but that it stank a bit; and there could be no doubt about that, for the well was full of "pure" sewage matter. They went to another house, occupied by a widow with five children, the head of the family having died of fever last year. This family were now on the books of the union. The house was built on a declivity; the pigsty, privy vault, and cesspool were quite full; and, after a shower of rain, the contents were washed up to and past the door. The family were in an emaciated state, and one of the children was suffering from fever. After inspecting that part of the village, they proceeded to the house of a man named Harrison, who, with his wife, were laid up with fever, and who were both buried in one grave on Sunday last, leaving five children to be supported by the union. On the Wednesday the unfortunate couple were in the last stage of fever, and the villagers had such a dread of the disease, that none of them would enter the house, and the clergyman and the relieving officer had to administer the medicine themselves. Harrison was the best workman in the parish. The cost to the union had already been 12l., and at the lowest computation a cost of 600l. would fall upon the union in maintaining the children, and probably they might remain paupers for life. This amount would have been sufficient to thoroughly drain the parish. Mr. Marshall's foreman had since been stricken down with fever, and there were many other cases in the

village. Mr. Mantle concluded by moving that the guardians put in full force the power vested in them by the Nuisances Removal Act, and that a committee be appointed to take action in all sanitary matters outside the city. They ought to thoroughly cleanse and drain every village in which fever existed. Fever had existed at Scotherne for two years, and he had noticed that his horse would never drink water at the place unless the beck was running. Mr. Mantle then read a special report, drawn up by Dr. G. M. Lowe, of Lincoln; and after some discussion, several guardians were appointed as a local authority to visit Scotherne and Ingham, and do what was necessary.

CHURCH RESTORATION IN ESSEX.

We have of late noted the progress of a good many restorations in the eastern counties, and particularly in Essex. It is proposed to make a complete internal restoration of Hornchurch old church. For the work proposed the sum of 2,000l. is required, and subscriptions are being now received. The restoration of High Easter Church has cost 2,300l. At Margreting a contract for 630l. has been entered into, that sum having been already raised, but to complete the restoration 200l. more are yet needed. The ancient church of the parish of White Colne is about to undergo a thorough renovation, external and internal, towards the expense of which 400l. have been subscribed. Fryerning Church is in a dilapidated state, and has been out of use. In addition to what has been contributed towards the restoration of the fabric to its original character, some 200l. are still solicited. At Broomfield the church was re-opened a few weeks ago, after having undergone extensive alterations and improvements. With the exception of the ancient tower and part of the south wall, the whole fabric has been rebuilt. A sum of between 300l. and 400l. is yet required to make the interior correspond with the exterior. All Saints', Springfield, has recently undergone extensive repair, and been supplied with a new organ. In addition to these the parish church of Barling has been restored and the churchyard increased in size at a cost of about 700l.; while in June last a new north aisle was added to Southend Church, but the demand for summer accommodation is so great that the erection of a free south aisle is now in hand, to be completed by November. The restoration of St. Mary's Church, Chelmsford, has been in hand some time. Gifts have lately been made in the shape of a font and memorial window. After works extending over nine or ten months have been done, the church of All Saints, Snton, has been re-opened and re-dedicated. It is contemplated to make extensive alterations and improvements in church accommodation at Prittlewell, and also at Walton-on-the-Naze, which is very rapidly rising into repute as a sea-side resort. It is desired to erect another church at Walthamstow to meet the spiritual wants of the large and increasing population there. At Writtle the work of re-seating the church and making other improvements has been prosecuted; and at Bishop Stortford and other places on the borders of the county similar efforts have been and are still being put forth.

THE NEW READING GRAMMAR SCHOOL.

Subscriptions are being solicited for the erection of the projected new grammar-school for Reading. The site of the school is on the Redlands estate, and the land will cost 4,000l. It contains ten acres. Mr. Alfred Waterhouse, of London, is the architect, and the entire block of buildings, as designed, consists of two masters' houses, one at either end; a large common hall or schoolroom in the centre; and between it and them the various apartments for school purposes and for the use of the boys. The central common hall will be on the first-floor, and approached by a circular turret staircase; its dimensions are 82 ft. by 26 ft. Below it are lavatories, hat and coat rooms, &c., and a covered cloister, leading on either hand to the rooms, for school purposes. The accommodation on either side of the central common hall is a repetition of that on the other. It will suffice, therefore, to describe one of these wings. The master's house on the ground-floor contains a drawing-room, 18 ft. by 15 ft.; dining-room, 19 ft. by 15 ft.; study, butler's pantry and serving-room (these communicate with the boys' common dining-hall), kitchen, scullery, &c. On the first-floor are four bedrooms, two dressing-

rooms, bath-rooms, &c., and on the second-floor two bedrooms. The boys' room in each wing consists of,—on the ground-floor, the dining-hall, 30 ft. by 23 ft.; study, 22 ft. by 17 ft.; four separate class-rooms, all connected together by a corridor. On the first-floor, approached by a staircase between the study and class-rooms, are the dormitories, thirty in number, each about 9 ft. by 7 ft., opening out of a corridor, which communicates directly with the first floor of the master's house. On this floor also are the bath-room and linen store-rooms. Above the dormitories is a story devoted to hospital purposes, containing two sick-rooms, a day-room, a nurse's kitchen, which obviates the need of communicating with the floor below. It is proposed to place the building which would have a total frontage of 400 ft., at the upper end of the site, so as to have as much space in front for play-ground, cricket-ground, &c., as possible, and leave room for future master's residence in the lower portion of the ground. The building has been planned in a straight line, rather than in a quadrangular form, in order to receive the maximum amount of sun and air. Each boy will have his own bed-room, and each room its own window. It is proposed that the building should be erected of red brick and with tiles. The entire cost, as stated by Mr. H. J. Simonds, will be 25,000l., and the subscriptions may be paid by three yearly instalments. Subscriptions are received at the three Reading banks.

VENTILATION OF DWELLING HOUSES.

SIR,—Not knowing your correspondent who has brought this principle (see p. 704) under your notice, and not very clearly as you state, allow me to say, for your information, that the plan of constructing one shaft instead of one from each room has been in use for over five years, and answers very well; and that the further improvement of introducing the ventilation to each room in connexion with the single smoke-flue, as stated by your correspondent, has been in use over two years, and gives general satisfaction to the tenants and owner of the property. He kindly consents to show any friend I may introduce to see the houses. W. H. KELSY.

HIGH RENTS AND LOW AGENTS.

May the owner of numerous houses and shops in the suburbs address a few lines to you (leaving others to renew the subject) on his sad, unprofitable experience of false rents and advertising house-agents? Diablic trouble, I at one period largely employed this class of men. They induced and persuaded me to increase the rents fully 30 per cent., studying, as I foolishly thought, my interest,—a woeful mistake. My houses were always changing tenants; some were one and two quarters empty; from others the inmates "shot the moon." Every new tenant wanted expensive repairs, causing me nothing but diminished income and dilapidations.

Let me explain why agents create this mischief. The higher the rent the greater their charges; the oftener empty the better, as they obtain 1l. for the agreement, their commission, and a profit from the builder who is employed. Now I am wiser and more just. Letting myself, at rents which tenants can afford to pay, I secure a regular income, and freedom from the above annoyances.

WM. PERCY TRUEMAN.

SOCIAL SCIENCE CONGRESS, BRISTOL.

The arrangements for the forthcoming annual congress of the Social Science Association, to be held in Bristol, from the 29th inst. to the 6th of October, are progressing satisfactorily. Sir Stafford Northcote, bart., M.P., will preside over the whole association, and deliver his inaugural address on the first evening of the meeting. Mr. G. W. Hastings takes the presidency of the Jurisprudence Department, in which arrangements are being made for a thorough discussion of the questions of the relations between England and her colonies, charitable endowments, and the occupation and ownership of land. The Rev. Charles Kingsley, lately appointed a canon of Chester, takes that of the Education Department, where the subject of education, whether of the upper, middle, or lower classes of society, will be discussed. J. A. Symonds, M.D., of Bristol, will take the Health Department, where the special ques-

tions for discussion are,—1. Can Government beneficially further interfere to limit the spread of infectious diseases? 2. What legislative measures might be proposed to deal with cases of uncontrollable drunkenness? 3. Should the Contagious Diseases Act be extended to the civil population? The Economy Department will be presided over by Mr. Stephen Cave, M.P., and will specially discuss,—1. Is it desirable that state aid should be given to emigration, and, if so, in what form? 2. In what respects may the administration of the poor law be improved? 3. How may the condition of the agricultural labourer be improved? The congress will be opened by a sermon to be preached by the Lord Bishop of Gloucester and Bristol. During the sitting there will be a conference of ladies interested in educational, sanitary, and other social subjects, under the able superintendence of Miss Mary Carpenter. A working men's meeting is being organised, and *soirées* are to take place. There will be excursions to Cheddar, Tintern Abbey, and the training-ship at the mouth of the river.

THE SOUTH SHIELDS' TOWNHALL COMPETITION.

In our report on the designs sent in for the above, we expressed an opinion that the one under the motto of "I Work to Win" was the one most likely to take the first premium. Since those remarks were written, the town council have made their final selection, which, after considerable discussion, resulted in the first premium of 50*l.* being adjudged to "I Work to Win," and the second of 25*l.* to the design "Well considered."

The following are the authors of the six sets of plans originally selected by the committee for the consideration and final jurisdiction of the council:—"I Work to Win," Mr. John Johnstone, Newcastle-on-Tyne; "Well considered," Mr. John Johnson, 35, Moorgate-street, London; "Phoenix," Messrs. Potts & Son, Sunderland; "Always Ready," Mr. J. T. Meredith, Kidderminster; "Northumbrian," Mr. J. W. Bailey, Leeds; and "Nota Bene," Mr. C. J. Adams, Stockton-on-Tees.

NEW BUILDINGS IN BELGIUM.

The new church of St. Antoine, at Louvain, is rapidly approaching completion. It is a large and striking edifice, and consists of a nave of six bays, western tower, aisles, north and south transepts, and a deep apsidal choir. The total length is about 220 ft.; the width of nave and aisles internally about 70 ft.; height to the vaulting about the same, and the width of transepts about 110 ft. The church is built of brick, with simple stone dressings. The west front, however, is entirely of stone, and is the least satisfactory portion of the whole design. The tower is at present only carried up to a few feet above the ridge of the nave roof. The interior is vaulted throughout, the vaulting columns and arches being executed in rough moulded brick, which is to be covered with a very thin coating of plaster; the capitals, bases, triforium, arcade, and more ornamental portions of the work being carved in stone. Although there is plenty of ancient authority for this kind of construction, yet it seems to us hardly satisfactory; and one would think that first working the arches in moulded brick, and then again in plaster, would be little less costly than stone. All the details of the church are excellent, except portions of the west front, which seem to us to be later in character and less satisfactory than the rest of the church. Mr. Lavalle is the architect.

A new church has been opened some months ago at Ostend; it consists of a nave and aisles, all vaulted, a deep chancel, and a western tower and spire over a porch. The spire is of slate, and has four tall slated pinnacles at the angles; it is the best portion of the design. The porch below the tower is very shabby, and looks internally more like a scullery than the entrance to a church. The high altar is well carved in oak, and there are a set of rich canopied stalls in the chancel. There is a great deal of stained glass of doubtful merit.

The new church at Laeken, near Brussels, has been opened, though far from finished. Although this is one of the largest and most costly Gothic churches of modern times, the general effect is not satisfactory. The three towers crowded together at the west end want boldness; the

whole front is cut up with perpendicular lines, and the huge extinguisher roof crowning the lady chapel at the east end, surmounted with an immense acorn, bears no resemblance to any kind of Gothic architecture that we have ever seen. We are sorry to have to speak in this way of a building erected with such noble intentions, but our duty as critics compels us to call attention to these defects in a building of such magnitude and pretension as the new church at Laeken.

CHURCH, BRIDLINGTON QUAY.

Sir,—Not having seen your last week's number, I am not aware that you mentioned the result of the select competition for the new church at Bridlington Quay, proposed to be erected on the Beaconsfield estate.* I now beg to send you an abstract of the protest three of the competitors have forwarded to the committee.

On the grounds of unfairness in choosing a design that was not the best or in accordance with the instructions, but said to have been carried by the votes of relatives of its author, who were on the committee.

That a sixth competitor was admitted, and his design put to the vote; by which they broke their agreement with the five they invited, in accordance with the resolution passed at one of their meetings, in which the five architects were named; and as the placing of this nameless individual's design, "Con Amore," in competition, was quite irregular, and contrary to their own resolutions, as well as damaging to the chance of the others, they required the matter to be re-opened, and professional assistance called in to decide on the merits of the designs,—or that they should be fully remunerated for their time and trouble in preparing plans, &c., as instructed.

J. B. & W. ATRINSON.
ALFRED CROUCH.

RAILWAY MATTERS.

New Works at Liverpool.—The extensive new works on the London and North-Western Railway in this locality, and which include the construction of an additional double line of railway from Edge-hill to Huyton, Prescott, and St. Helen's, in order to afford increased accommodation to the over-crowded local traffic, are proceeding with rapidity; and the new railway, as it may be called, between Liverpool, Huyton, Prescott, and St. Helen's, is expected to be ready for opening in the course of a few months. The new double line commences near the company's large engine depot at Wavertree, from which point the existing line is in course of being widened to double its present extent, the excavation through Olive Mount being exceedingly heavy. Nearly the whole of the excavation on the south side through the Mount has been completed, 140,000 cubic yards of stone having already been taken out; and we may state that 14,000 cubic yards of this stone have been removed in large blocks or squares and conveyed to Garston, where it will be used for the walls of the new docks which the company are immediately about to construct there. All the bridges across the railway from Wavertree, through Olive Mount, have also been taken down and widened to nearly double their former extent, and an additional new bridge has also been constructed. Amongst the more important works which the company have in progress between Liverpool and Huyton is the reconstruction of the several stations at Broad Green, Roby, and Huyton, in order to extinguish the objectionable and dangerous level crossings at each of those stations. Extensions of great magnitude have recently taken place at the Edge-hill station, which now occupies an area of 95 acres.

The first half of the vast road at the Lime-street station has just been completed. Messrs. Thompson, the contractors, have entered upon the contract for the other or western half, whilst the company's monster hotel facing Lime-street is being covered in.

The Three-penny Fares.—Mr. Brandon has brought his scheme for the wholesale reduction of fares before the British Association, in a paper titled "Some Statistics of Railways in their relation to the Public." Mr. Brandon showed that the returns made for railway investments had not been such as might have been expected from capital laid out, and that the public had every reason to complain of the present railway system.

He suggested that it could only be accomplished by uniting all the railways under one general management, to form them into a separate branch of the public service. Mr. Brandon contended that a passenger should be enabled to travel one journey, of any distance, in a given direction, for a sum little more than nominal. In 1868, 310,150,915 passengers travelled on the railways, paying an average fare of 11*d.* to 11*½d.* Six times the number of passengers could be carried for a very small (if any) additional expense; and if a universal fare of 3*d.* was charged for any distance for each person, at a very moderate computation, six times the present number would travel, and would produce 23,261,318*l.*, being 8,536,510*l.* in excess of the receipts of 1868 from passengers only. But he would fix the fares for any distance at the following rates: first-class, 1*s.*; second, 6*d.*; third, 3*d.*; and for such first-class passengers as would pay 10*l.* and 5*l.* annually in addition for such distinction, should travel in carriages provided exclusively for them. In conclusion, he showed that the scheme would have a beneficial effect on the labour markets, by enabling a workman to remove at once to the district where his skill is in demand, and would thus tend to equalize the value of labour in the country.

ACCIDENTS.

By the fall of a builder's scaffolding at the gasworks, City-road, Manchester, some seven or eight men have been severely injured. The city corporation are constructing at these works a large circular pit, which is about 200 ft. in circumference. The boundary-wall of the pit, which is of brick, is in course of erection, and has already been raised to a height of about 26 ft. The circular scaffold for the workmen which surrounds this wall appears to be of a somewhat slender structure, supported by a horizontal beam embedded in the brickwork and an upright plank, which apparently had no means of support apart from its own equilibrium. About 20 ft. gave way, and eight or ten men who were working on the scaffold were precipitated a depth of 26 ft. The scaffold was repaired soon after the accident, and work resumed. The fall had not been caused by any breakage, but simply from the slipping of the upright plank, which had lost its balance.

A new chimney is now in course of erection at Shrewsbury, on Mr. Cook's premises, at the bottom of Barker-street. The shaft, which, when completed, will be 120 ft. high, has been raised nearly 80 ft., and lately a man had been working at the top, and was descending, with his feet upon some weights, which were attached by a chain and hook to the rope, when the hook broke, and he fell a distance of about 50 ft. The chimney is so narrow internally, that the man did not turn over, and he fell, consequently, upon his feet with fearful force. He now lies in a sad state, his spine, it is feared, being injured, as well as the lower part of his body. At the end of the rope, which is a strong one, a chain is attached with some weights, and when a workman wishes to ascend or descend this chain should be removed, and a stronger one, which is provided for the purpose, put in its place. The workman, however, neglected to do this, and attempted to descend by placing his feet upon the weights and holding on by the rope, when the hook broke.

FROM SCOTLAND.

Edinburgh.—George Watson's Hospital has been sold to the Royal Infirmary for 43,000*l.*, on condition that the necessary consent of the subscribers to the building fund of the Infirmary be obtained, and also an Act of Parliament got for granting sufficient powers to accept the offer. This resolution of the Governors of the Hospital is subject to the special approval of the Merchant Company.—The extensive area of ground belonging to Mr. William Cunningham Glen, of London, barrister, and his sisters, adjoining Lauriston Park-street, has been feued to Messrs. Shore & Crawford, builders, who have commenced operations for the construction of two streets, running north and south, in which will be erected houses of a respectable class, similar to those in Lauriston Park—the north frontage of the ground opposite Portland-place being to be occupied with handsome shops having flats of dwelling-houses above. The plans of the new buildings have been prepared by Mr. R. T.

* See p. 711, ante.—Ed.

Shiells, architect, and revised by Mr. D. M'Gibbon.—The nursery ground on the east side of Leith Walk, which has recently been recovered from Messrs. Dicksons & Co. by the Governors of George Heriot's Hospital, was exposed for public sale in the Council Chambers, Mr. Murray being the auctioneer. The front space was divided into four fens. The first of these, that to the south, measuring 55 ft. in breadth, was put up at 12s. per foot, and after a little competition was knocked down at 14s. Lots 2 and 3, measuring each between 60 and 70 ft., were sold at 12s. per foot. Lot No. 4, also measuring between 60 ft. and 70 ft., was put up at 12s. per foot, and sold at 15s. Lots 1, 2, and 3 of the back fens, measuring, one of them a third, and the other two each half an acre, were sold at the value of 100l. per acre, with 2l. additional on the actual price of the smaller lot. The whole of the lots were knocked down to one purchaser, Mr. Wilson, contractor, Granton. Other seven lots to the east, which had also been marked off for sale, were not disposed of.

Glasgow.—A meeting of members of the City Improvement Trust, with factors and others having charge of property recently acquired by the trustees, was lately held in the Council-hall, with a view to adopting measures to mitigate the evils of overcrowding and uncleanness in the densely populated parts of the city. In the course of the proceedings reference was made to the unusual increase in the number of fever cases at this season of the year; and the opinion was generally expressed that, as the Improvement Trustees were now proprietors of property in the lowest portions of the city in which nearly 12,000 families found accommodation, they were in a position to grapple with the matter with a firm and vigorous hand—to prevent overcrowding, and almost to enforce cleanliness. It was resolved that a notice should be issued to the tenants, and inserted in a prominent place in their rent-books, containing various special intimations as to expulsion for overcrowding, uncleanness, &c.

Greenock.—A meeting of the Greenock Water Trust was recently held to consider the state of the water supply. The Provost stated that there were 5 ft. of water in Loch Thom, and 16 ft. in the compensation dam—equal to 13,000,000 cubic feet, or 81,000,000 gallons. The supply to the mills, refineries, and public works along the line of falls, had been stopped; and the present water in store, with the compensation water saved from Cartburn and the shortened interval of domestic supply, was estimated to be equal to thirty-one days' domestic supply as at present. Of the works along the line of falls, two only had been granted a supply for machinery.

Alyth.—A meeting of the promoters of new water-works has been held. The principal object of the meeting was to hear the report of the surveyor, Mr. James Lamond, as to the probable cost of the entire undertaking. His estimate for forming a reservoir at Fyall—the place from which it is proposed to take the water—laying a 4-inch metal pipe from there to the north side of the town, a distance of about 3,000 yards, forming a small reservoir there, and distributing pipes through all the streets of the towns where there are no pipes laid, besides erecting twenty additional fountains, would amount to 1,061l.; but with glazed clay pipes of the same diameter the whole distance, there would be a saving of 300l. The meeting was unanimous as to the desirability of immediate action by framing and signing a requisition to the Parochial Board as the local authority. It was shown that the rateable rental of the town was 3,000l., and that 6d. per l. would pay stock and interest of 1,100l. in twenty-five years: so that ample provision remains to meet all outlay.

CHURCH-BUILDING NEWS.

Chellington.—The church of Chellington has been re-opened for public worship. It had only been partially repaired for many years past, and had fallen into such a dilapidated state that it was pronounced no longer safe to use it. It required a new roof, floor, and seats throughout the whole building. The arch at the west end of the nave, and several windows and arches blocked up and disfigured, were to be restored. A hell, cracked how long no one knew, was to be recast, and other works required attention; and these works have been begun and in a great measure brought to completion.

Tisbury (Herefordshire).—The re-opening of this

church took place on the 3rd instant. The new church, which replaces one erected a century ago, consists of nave, north aisle, with arcade of four bays, south porch, chancel, organ chamber, and vestry; the old tower is retained. The walls are built of Penrhos stone, Bath stone being used for the dressings. The arcade shafts are hewn Pennant. The fittings throughout are of oak, and the accommodation provided is for about 220 persons. The church is warmed by underground stoves. The windows, with the exception of the two on the south side of the chancel, which are filled with stained glass by Messrs. Baillie, are glazed with cathedral tinted glass by Messrs. Done & Davies, of Shrewsbury. The encanitic tile floors are from Godwin, of Lugwardine. The style of the church is Early Decorated; and the work has been carried out by Messrs. Lewis & Day, of Hereford, under the direction of the architect, Mr. E. Haycock, jun., of Shrewsbury.

Wettenhall.—The chapel-of-ease here is to be rebuilt on an enlarged scale, and, as a parish church, dedicated to St. David. It is also proposed soon to commence the erection of schools, and eventually a rectory-house. The edifice will be built on the site of the old chapel-of-ease, on the road from Over to Bumbury, and about nine miles to the north-west of Crewe. As the funds are limited (the cost, allowing for the old materials, will be about 700l.), it was determined to construct the edifice of brick and other inexpensive materials. The style is a simple type of thirteenth-century architecture. In shape the church will be cruciform, the total dimensions from east to west being 67 ft. 5 in., and in the body of the church 26 ft. 9 in. wide, and from north to south walls of transepts 36 ft. 5 in. and by 14 ft. 4 in. wide. The entrance is by a south porch. The minister's vestry is in the arm of the south transept. At the side of the nave coupled windows alternate with buttresses. Triple windows are placed in the gable walls of the chancel transepts and west end. The west end gable is surmounted by a bell-turret, and other gables by ornamental stone and iron crosses. White Kelsall stone is to be sparingly used; the roof is to be of open timber-work varnished. All the sittings—180—will be free and unappropriated, and will be made of Savannah pitch pine, which has been supplied to the builder at a nominal price by a tradesman of Winsford. The architect is Mr. James Redford, of Manchester, and the contractor Mr. P. Hodgkinson, of Sandbach. A fête has been held at Calveley Hall, Earl Grosvenor's seat, in aid of the funds.

Long Eaton.—The parish church of Long Eaton has been re-opened, after having undergone considerable enlargement and improvement. For many years past the old church was felt to be inconvenient; and as the population of the parish increased it became totally unsuited to its requirements. It would only seat 252, and those in pews of the most unseemly description. Accordingly, about four years ago, the vicar, the Rev. Mr. Atkinson, determined upon making an effort to enlarge and restore the edifice, and a subscription was started. Many of the parishioners coming forward to assist, instructions were given to Mr. Street to prepare plans for the enlargement of the church. Mr. Street soon submitted his designs, which met with general approval, and the work of restoration was commenced; Mr. Hunt, of Long Eaton, being the contractor. The old church has been made to form the south aisle, and to this has been added a north aisle, a nave, and a chancel, the architecture of which corresponds to that of the old building. All of it is built of stone. The old pews have, of course, been swept away, and plain open seats erected in their stead. A new pulpit of carved stone, by Mr. Earr, of London, has been procured, and two stained windows have been placed in the chancel. One of these represents Christ in the manger, and also in the Temple; and it has been given by the teachers and children of the Sunday school. The other represents Christ's baptism by St. John, and His disputation with the doctors in the Temple; it has been contributed by the children and teachers attending the night school. They are the work of Messrs. Ward & Hughes, of London. The vicar has been at the expense of another painted window, manufactured by Messrs. Hardman, of Birmingham, which is placed in the south aisle. The cost of the whole improvements will be about 3,000l.; and towards this sum 2,200l. have been raised. The church will now accommodate about 600.

London.—The foundation-stone of a proposed

new and enlarged church to Longdon Church has been laid. Mr. Griffiths is the builder, by whom the work of renovation has been undertaken. The funds at the disposal of the vicar being inadequate, it is proposed to do no more at present than to render the body of the church more suitable for the performance of Divine service by rebuilding the chancel, with the addition of an organ recess and vestry, opening and affording space for additional sittings in the old tower. The tower is the only remains of the old church, which, being somewhat dilapidated, was pulled down, and the present edifice was erected. It is proposed to substitute open sittings, to remove the pulpit to a proper position, to remove an obnoxious gallery, and erect a church portal on the southern side. It is hoped that ere long funds may be forthcoming for casing the present brick and stucco structure of the body of the church with the grey sandstone obtainable on the spot. It is also proposed to convert the Grecian windows into a more Ecclesiastical style.

Barnard Castle.—The foundation stone of a Free Christian Church has been laid in Newgate, Barnard Castle. For more than a quarter of a century a Free Christian Church has existed in Barnard Castle. The members have assembled in a building in the Broadgates, but the situation being somewhat obscure and out of the way, it had long been felt to be desirable that a commodious place of worship should be built by the community in a more central and public situation, and the site for the building was purchased in Newgate. The church will be Gothic in style, and will be built from designs by Mr. Harrison, of Manchester. It will contain 150 open sittings, but no gallery. A school will also be attached to the church, and by the removal of two screens 100 more sittings in this school can be added to the church at any time. The estimated cost of the building is 1,000l., of which 900l. have been subscribed. Mr. Donaldson has contracted to do the stonework, Mr. Carter the joinery, and Mr. J. Jackson the plumbing work.

Books Received.

"On certain Economical Improvements in obtaining Motive Power." By Richard Eaton. This is a reprint of a paper read by Mr. Eaton before the Mechanical Science section of the British Association at Exeter. It relates to an invention of a Mr. Warsop, of Nottingham, which is held to be of great importance. Patents for "obtaining motive power" are not seldom schemes of perpetual motion; but with such schemes this has nothing to do. It relates to what is called "Warsop's Aero-Steam-Engine," in which compressed air is introduced by means of the air-pump into steam-boilers, for the purpose of aiding in the production of power and the economization of fuel. Professor Tyndall is said to have volunteered to investigate the scientific bearings of the results, as personally observed in Nottingham, by Lord Richard Grosvenor, who is an amateur engineer, and by others.—"Twickenham Drainage: Report on a Proposed System for the Drainage and Disposal of the Sewage." By Henry M. Ramsay, Surveyor to the Twickenham Local Board.—"Twickenham Local Board: Report on the Drainage and Disposal of the Sewage." By the Local Drainage Committee.—These reports recommend that the plan for the drainage of the parish should comprise the town and all outlying districts, as shown in the surveyor's plan. The committee recommend the board to adopt irrigation as the system for dealing with the sewage; and advise 100 acres to be purchased, although they consider that 60 acres, as stated in the surveyor's report, would suffice, according to a report from Banbury, which has 120 acres for a population of 11,000. The committee are of opinion that the parish drainage will thus become not only self-supporting, but a source of pecuniary profit.—"Natural Philosophy." By John Tyndall. London: Cassell, Petter, & Galpin.—We need not say anything in recommendation of Professor Tyndall on Natural Philosophy, which in this case is intended for boys.—Other two of Messrs. Cassell's little books for children, which happen to be within reach of us, are "Æsop's Fables" in words of one syllable, by Mary Godolphin; and "Evenings at Home," in words of one syllable, by Uncle John, author of "The Children's Album."—Whatever we may think of the peculiar English which authors are

constrained to write where no two or three-syllabled word is allowable, the ingenuity with which these books are written is surprising; they are fair specimens of good sound Anglo-Saxon, too; all the more, it may be, that they are free from long Latin and other importations.—“The Civil Service Book-keeping: Book-keeping no Mystery: its Principles popularly explained, and the Theory of Double Entry analysed.” By an Experienced Book-keeper. Lockwood & Co. This treatise on book-keeping is intended for the use of young men commencing business, examination candidates, and students generally. We have no doubt it has been prepared by “an experienced book-keeper,” who appears to have belonged to Her Majesty’s Civil Service.

Miscellaneous.

Mortuary House, Marylebone.—Dr Whitmore says in his last monthly report:—By an order of the vestry, the mortuary-house, situated in the Paddington-street Burial Ground—and which has been ready for the reception of the dead for the last six months—will be opened for public inspection for the next five or six weeks. It is to be hoped that the poorer classes in particular will take the opportunity of visiting it, in order that they may judge for themselves of its extreme fitness for the purpose for which it has been erected. It is a thing of common occurrence that bodies are kept unburied for eight or ten days, owing to the inability of surviving friends or relatives to find the money to pay for the interment. In such cases it most frequently happens that the bereaved family have had one room in which to live, sleep, and perform every domestic office; here, then, in the midst of them lies the decaying mass of mortality, poisoning the atmosphere they breathe, and endangering their health and even their very lives. Surely, both on the score of personal safety, as well as from a feeling of respect and reverence for the mortal remains of those whom in life they loved, the poor will see the desirability of making use of this fitting manseum, as a temporary receptacle for the bodies of their deceased children or relatives, to which they will have daily access, and for the use of which no fee or charge whatever is required.

A Mission of Inquiry.—Mr. Conolly, artisan, has been deputed to go to the United States in order to report upon the condition of labour in that country, and has hidden farewell to the South London Lodge of the Operative Masons’ Society. An address was presented to him, and in reply he said he was not undertaking the mission with any view to his personal advantage. His object would be to find out the hours of labour in every branch of trade, as well as the amount of wages. He should further inquire whether workpeople lived in boarding-houses or houses of their own. He should endeavour to ascertain whether, with their dollars in America, people were better off than with their shillings in England. He should make inquiries, too, with regard to education, the system of which in America was said to be one of the best in the world for the youth of the working classes. His object would be to find out whether, under that system, the lads became more skillful artisans, better citizens, or more worthy heads of families. He would particularly inquire into the working of Abraham Lincoln’s Act, whereby, it was said, any steady man was enabled to acquire 150 acres of land after residing upon it for five years. He would ascertain in what respect the trade-unions as there existing differed from trade-unions at home. One member of the Government (Mr. W. E. Forster) had sent him \$1, as well as an introduction to Mr. Adams, the late American Minister to this country.

Driving Piles by Gunpowder.—An improved pile-driving machine has been invented by a Mr. Shaw, and is manufactured at Philadelphia by a new company. Hand and steam are superseded in this invention by gunpowder, which, by its explosion, excited by the fall of a hammer on a small quantity of fulminate, in cartridges fed into a cylinder, causes a recoil of the cylinder, which forces the pile into the ground. The cartridges can be thrown in at the rate of 50 per minute, and the hammer is thus kept going without a lever. The charges of powder are said to be only one-third of an ounce each. The hammer is one of 675 lb. weight: it is thrown 8 ft., and exerts a force on the head of the pile equal to a dead weight of 300,000 lb.

[New House, Sink, Yard, and Ventilating Trap.—Mr. James Mansergh has lately designed a trap with a special view of keeping sewer gas out of dwelling-houses. The waste from a sink-stone, &c., is discharged into the trap out of sight. The vertical socket for receiving the waste-pipe is buried in with the trap, so as to form with it one piece of stoneware. The upper part of this socket is tapered to take in any size of pipe; the lower part extends an inch or so below the tip of the opening into the gully forming a water-trap. Over the gully is an open grating for the ingress of surface water; the plate forming one side of this gully is carried down below the bottom of outlet to drain, forming a second water-trap entirely independent of the first. Behind this trapping plate, and in free communication with the drain, is a socket, to which may be connected a ventilating pipe of any size up to 4 in. diameter. By this ventilator, which is to be carried up above windows and away from chimneys, the house-drain is relieved of pressure, and the gas has therefore no tendency to struggle through had joints or traps into the space under lower floor. On the waste-pipe from the sink, there is a junction into which the wastes from baths and lavatories, and especially the overflows from cisterns, are to be taken, thus cutting off these from becoming direct lines for the ventilation of drains into the upper parts of houses.

Covering Walls with Glass for Protection of Fruit Trees.—In a paper read at the Manchester Congress, July 22, 1863, it was said: Where there are walls with a southern aspect in gardens, a covering of glass will be found the cheapest and most certain way of securing crops of the finer fruits, such as peaches, nectarines, and apricots. When the new kitchen garden was planned at Welbeck, a range of south wall nearly 800 ft. long was covered with glass on a novel principle. All the framework is of iron, and the roof made on the ridge-and-furrow mode, and glazed with strong plate glass, cast on purpose to suit the curve in the roof. The openings for top ventilation are made in the back wall, and every alternate light in front is opened and shut by machinery worked from the inside. The height of the back wall inside is 13 ft. in the front 7 ft. 6 in., and the inside width 7 ft. 4 in. This structure is heated by hot-water pipes, and these were found very useful this spring, for good crops of peaches and nectarines have been secured, as well as plenty of cherries, plums, and pears grown in pots. Fire-heat is only used at the time they are blooming, or in the autumn, to ripen the wood, as the object of this structure is to get a succession of peaches and nectarines after the hot-house ones are over.

Magnetic Disturbance of Watches.—An American watchmaker has made the curious chance discovery that the balance-wheel in nearly every watch is, if made of steel, converted into a magnet. By what process in the manufacture it has become one it might be difficult to say; but whether the wheel be indeed a magnet or not may be easily discovered by fixing it upon a small piece of cork, letting it float in still water, and seeing if it always turns in one direction. The fact of the magnetic character of the wheel will account for many irregularities in watches which have hitherto been inexplicable. A key, an iron brace-buckle, or the steel blade of a knife near or in the same pocket as the watch, may exert a disturbing influence. But even if there should be no piece of steel in or near the pocket, the magnet will necessarily tend towards the north, and so far interfere with the calculations of the watchmaker in a very delicate piece of mechanism. Gold-balanced watches must thus be far preferable to steel-balanced ones.

Wrought-iron Chimney at Creusot.—A new wrought-iron chimney has been recently erected at the Creusot Ironworks. The Engineer gives particulars of it. It is 137 ft. high and 6 ft. 7 in. in diameter. At the bottom the diameter is increased to 10 ft. by a curved base which is fastened by vertical bolts to masonry work. The thickness of the sheet iron is $\frac{3}{8}$ in. at the top, and $\frac{1}{2}$ in. at the bottom. There is an inside iron ladder. The weight of this chimney is 40 tons; it has been riveted horizontally and lifted afterwards with a crane. Another, 275 ft. high, will soon be erected, but by a different system; it will be riveted vertically, with an inside scaffolding. These chimneys are built for an extension of the Creusot Works, especially intended for steel-making.

Telegraphic Progress.—Mr. Verley, the electrician, is at Brest for the purpose of remedying a fault in the French cable of a point about 1,000 miles from the French coast. Mr. Verley, without raising the cable, hopes to be able by some manipulation of electricity to produce at the precise spot of the fault an effect similar to electrotyping on the surface of the conducting wire, and by this means prevent the escape to earth of any portion of the electric current. Sir William Thomson notifies that a plan for electric testing at sea has recently occurred to him as available with Mr. Verley’s form of cable, which will give a security against faults not attainable with any form of cable having metal in its outer covering. According to this plan a fault existing in the coiled part of the cable on board ship, and merely producing an addition to the general leakage scarcely recognizable as due to an incipient fault, will make a sudden and decisive indication after it passes out of the tank, and before it reaches the stern pulley. The alarm will thus be given at the right time to stop the egress of the cable, and cut out the fault with a minimum of risk and delay.

The Workshops Act.—Mr. Redgrave, one of the inspectors of factories, in the half-yearly report just issued, says:—“I am very sanguine that this Act will eventually be a success. I found this opinion upon the expressed willingness of employers to accept it as legislation in a wise direction, upon their readiness to observe its provisions, and upon the entire absence of quibbling or misrepresentations to escape the restrictions. Granted that in some respects it might be improved, yet in its main features, in the restriction of the labour of females and young persons, it has already entirely changed the features and aspects of some trades; and in the necessity it imposes upon children to attend school it has already in a great number of trades prevented the improper employment of infants, and is preparing the way for a general observance of school attendance. A very slight pressure of the local authorities would make this Act as well observed, and as popular as the Factory Act itself. But the educational effect of the Act is by no means satisfactory. Manufacturers will not employ school children—half-timers—in their establishments.

Opening of the Southern Embankment of the Thames.—The second portion of the Thames Embankment on the south side, namely, that which commences at Lambeth Bridge and terminates at the end of the Poteries, is now so far completed that the public have been permitted to walk along it instead of, as formerly, proceeding through the dirty thoroughfare which runs parallel with it. Nearly the whole of the Embankment is now paved, and as soon as the roadway is finished it is understood that the Metropolitan Board will permit its instant use for traffic. The first portion of this Embankment, it will be remembered, was opened about twelve months since from Westminster Bridge to Lambeth Bridge. The extensive demolition of houses in the Poteries has considerably improved its appearance.

The International Horticultural Exhibition at Hamburg.—This exhibition has been opened. The buildings stand on a site between Hamburg and Altona. The boathouse in which the principal productions are exhibited is adorned with a figure of Fame, a copy of the work of Paul Delarocche in the School of Fine Arts in Paris. The walls are decorated with flags of all nations, surmounting names of naturalists and horticulturists. The exotic plants in the park give something of a tropical character. Competent authorities are engaged in arranging the flowers as they arrive, so as to suit the architectural details of the building.

Descendants of the Nearly Extinct British Barbarians.—Some savages in the parish of St. Hilary, according to the *Cornish Telegraph*, have wilfully destroyed Trewhella Cross. The matter is to be brought before the Penzance Natural History and Antiquarian Society, with a view to their prosecution in a criminal court.

The New Theatre, Croydon.—Several alterations and improvements have been made in this theatre during the recess. The stage has been lengthened 22 ft., and a separate approach added to the stalls. The gallery floor has been sheathed and felted, which will deaden the treading of feet overhead. The theatre has been taken on a lease by Mr. Clarence Holt.

Santiago-de-Chili International Exhibition.—Last year the Chilean Government advertised an agricultural exhibition, in which some large prizes were to be distributed to the successful competitors. A grand prize of a gold medal and 800 dollars, or 160*l.*, was offered for the best collection of agricultural machinery; and another of a gold medal and 500 dollars, or 100*l.*, for the best steam-thrashing machinery. Many other gold medals and prizes of smaller value were offered. English firms have carried off the lion's share of the prizes. Messrs. Hansomes, Sims, & Head, for their thrashing-machine, got the first prize; and gold medal; Messrs. Clayton & Shuttleworth the second gold medal. Special prizes were also gained by Messrs. Howard. American manufacturers came in second for the chief prize.

The Smoke Nuisance at Newcastle-upon-Tyne.—The committee appointed at the meeting held in the Guildhall, Newcastle, has had a conference at the council chamber, under the presidency of the Mayor. Considerable discussion arose as to the steps to be taken. The most perfect unanimity, however, prevailed as to the desirability of acting in such a way as not to embarrass unnecessarily the important manufacturing and mining interests of the neighbourhood. There is said to be a general feeling among owners of works, collieries, &c., that the time has come for doing something towards suppressing the nuisance. A sub-committee was appointed to inquire into all the plans proposed or in operation for the prevention of smoke and noxious vapours, and to report to the general committee at their next meeting.

School of Art for Burslem and Tunstall. A meeting has been held in the Lecture Hall of the Wedgwood Institute, Burslem, in furtherance of the opening, at the Institute, early in October, of a school of Art and Science for Burslem and Tunstall, and to appoint a master for the school. A committee of eleven gentlemen in each of the towns named was appointed. Mr. Hope, a manufacturer, said he trusted the committee now appointed would prove to be an active one. He remembered a former school of art at Burslem, which decayed, he feared, partly from lack of activity on the part of the committee. Now they had such a noble building for their purpose they were doubly bound to activity. Burslem and Tunstall ought not to be one whit behind Stoke and Hanley in artistic skill. The members of the new committee present proceeded to make choice of a master, and Mr. Theaker was elected.

The Building Trade in Paris.—The Paris correspondent of the *Telegraph* says:—

"One of the largest branches of Parisian industry, that of house building, is threatened with a strike on the part of the workmen, who seem to be in a great state of agitation and discontent, especially the masons and stonecutters. I must tell you that the number of contracts for this department is limited to three or four great firms, the most important of which has just lowered the men's pay considerably. Where they gave 3*fr.* 50*c.* before the 1st of September, they pay only 3*fr.* 75*c.* now. In 1868 and 1869, at the height of the building fever, the wage was 4*fr.* 25*c.* Now that the furor is fast declining, and that most of the anticipated speculations are realised, contractors no longer think it worth their while to pay the workmen at the same rate. But the remaining works of Paris will certainly come to a 'stand still,' if the discontented corporations carry out their plans, which are not only to strike, but to emigrate, as they find there is now no chance whatever of their gaining nearly as much as they did formerly."

Proposed Alterations of Liverpool Town-hall.—The town council have agreed to a recommendation of the finance committee, to adopt a general plan submitted, showing alterations of the Town-hall for the accommodation of the mayor, and the enlargement of the council-room, at a cost not exceeding 3,000*l.*; but have added to their resolution that the appropriation of the several rooms, and the details of the plans, and also of the fittings and furniture, be postponed for further consideration.

The English Congregational Church, Swansea.—We are asked to say with reference to the notice of this building in our last issue, that the interior is not in one open span as stated, but is divided by iron columns into "nave and aisles." Further, the gas-fittings were manufactured by Dovey, of Manchester, though supplied by the local gas-fitter, Mr. Holmes.

French Prizes for Architecture.—M. Duc, the architect who lately obtained the Emperor's prize of 100,000*fr.*, has paid 40,000*fr.* into the treasury of the French Institute to found an annual prize for the encouragement of architecture.

Leavesden, Woodside.—Mr. Mann, the contractor for building the St. Pancras Parochial Schools, has protested against Messrs. Killingback & Rudley entering on the ground for the purpose of carrying out the drainage works; but the guardians, acting under legal advice, are determined to proceed with the works. Mr. Mann did not send in a tender for the drainage works, but forwarded a schedule of prices, through the architects, which the guardians could not accept, as they had invited tenders for a fixed sum.

Removing Incrustation in Steam Boilers. A mixture called halogium, says *The Penny Mechanic*, is sold and used in Germany for preventing the formation of incrustations in steam-boilers. The mixture consists of 65 per cent. of sal ammoniac, 17 per cent. of chloride of barium, and 18 per cent. of catechu, and is said to answer its purposes very well. Chlorine, which exists in the sal ammoniac, as well as in the chloride of barium, is a halogen, which seems to account for the name halogium.

Proposed New Hospital at Royston.—It has been determined to erect at Royston a small hospital, for the treatment of the poor who cannot properly be attended to at their own homes. It is intended that the hospital shall be partially self-supporting. Lord Dacre has given a site for the hospital and its garden. Mr. E. Nash has undertaken to provide the architectural plans for the building, which will be constructed with a due regard to sanitary arrangements, as recommended by Captain Galton, R.E.

TENDERS.

For rebuilding house and premises, No. 87, London-road, Southwark, for Mr. J. R. W. Rells, Mr. R. J. Dickens, architect. Quantities supplied by Mr. C. B. Midland:—
Canning & Mullins 4710 0 0
Kent 655 0 0
Falkner 647 0 0
Cooper & Cullum 845 0 0
Linfild & Son (accepted) 597 0 0

For five houses and shops to be erected in Long-lane, West Smithfield, Mr. L. H. Isaacs, architect. Quantities supplied by Mr. L. C. Riddett:—
Simpson & Son 48,200 0 0
Patman & Fotheringham 6,082 0 0
Macey 5,495 0 0
Mansfield, Frick, & Co. 5,475 0 0
Holland & Hannen 4,940 0 0
Browne & Robinson 5,369 0 0
Phillips 5,195 0 0

For rebuilding house and premises, No. 343, Walworth-road, and alterations, &c., No. 345, ditto, for Mr. J. E. W. Rells, Mr. R. J. Dickens, architect. Quantities supplied by Mr. C. B. Midland:—
Canning & Mullins 4940 0 0
Kent 333 0 0
Falkner 314 0 0
Linfild & Son 298 0 0
Cooper & Cullum (accepted) 298 0 0

For the erection of six cottages at Kingston, for Mr. H. Nash, Mr. J. S. Ellis, architect:—
Wells (accepted) 41,530 0 0

For erecting two shops in forecourt of house, High-road, Upper Footing, Mr. Herbert Taylor, architect:—
Potter 4770 0 0
Fid 885 0 0
Kilby 677 0 0

For new post-office, Bank-street, Ashford, for Mr. J. E. Munns, post-master, Mr. King, architect:—
Steady, Joy, & Steady 2845 0 0
Clifford 839 0 0
Dryland 789 0 0
Frybaird 778 17 10
Fowler 769 0 0
Hamett 749 0 0
Petters (accepted) 722 12 0

For alterations to Bramerton Hall, Norfolk, Mr. R. M. Phipson, architect:—
Hawes (accepted) 42,410 0 0

For restoring the nave and aisles of Fressingfield Church, Suffolk, Mr. R. M. Phipson, architect:—
Grimwood (accepted) 6822 0 0

For new Congregational Chapel, Romel-road, Bermondsey, Messrs. Lander & Bedells, architects:—
Little 3,379 0 0
Axford 3,835 0 0
Simpson 4,800 0 0
Browne & Robinson 4,795 0 0
Dove, Brothers 4,745 0 0
Grover 4,575 0 0
Mann 4,375 0 0
Manley & Rogers 4,347 0 0
Hart 4,310 0 0
Rider 4,270 0 0
Renshaw 4,205 0 0
Kant 4,275 0 0
Coleman 4,231 0 0
Hill & Sons 4,165 0 0
Wells 4,180 0 0

For enhancing Offton Church, Suffolk, Mr. R. M. Phipson, architect:—
Smith 4297 4 0
Cornish 195 0 0
Tooley (accepted) 180 0 0

For rebuilding 59 and 60, Wilson-street, Finsbury, Mr. Hammon, architect:—
Brass 4,743 0 0
Grover 1,663 0 0
Ennor 1,600 0 0
S. Saby 1,483 0 0
C. Saby 1,293 0 0
Preedy & Son 1,251 0 0

For dwelling house and shop, in North-road, Brighton, for Mr. J. Sayers, Mr. Dallimore, architect:—
Childs & Simmonds (accepted) 4733 0 0

For sewers in Sloane-square, for the Vestry of the Parish of St. Luke, Chelsea, Mr. Pattison, surveyor:—
Bloomfield 259 0 0
Morris 210 0 0
Lacy 207 0 0
Sayers 195 17 0
Wignore 187 0 0
Neave 178 0 0
Whittick (accepted) 178 0 0

For rebuilding warehouse, Nos. 4, 5, and 6, Maiden-head-court, and 19, Nicholl-square, E.C., for Messrs. Salomon, Mr. B. Talbot, architect:—
Brass 4,182 0 0
Turner & Sons 3,974 0 0
Henshaw 3,788 0 0
Pritchard 3,747 0 0
A. E. Robinson 3,737 0 0
Browne & Robinson 3,676 0 0
Perry 3,547 0 0
Craib & Vaughan 3,638 0 0
J. Pritchard 3,342 0 0

For sewerage works connected with the utilisation of the sewage, for the Borough of Cheltenham, Mr. D. J. Humphris, Borough Surveyor. Quantities furnished to contractors by Mr. J. Simmonds. Pipes supplied to the Commissioners by Messrs. Gibbs & Canning:—
Hall & Price 4,770 0 0
Moore 4,120 0 0
Dierden 4,812 0 0
Ford 4,180 0 0
Feywick & Mantle 3,293 10 0
Field 3,392 11 4
Abell & Co. (accepted) 3,300 0 0
Coker (exclusive of compensation) 2,999 0 0

TO CORRESPONDENTS.

C. R. M.—J. R.—M. & F.—M. S.—W. B.—H. K. & W.—Pro.—Mr. M.—Mr. F.—B.—W. H. K.—E. D.—J. D.—W. P. T.—J. V.—J. G.—A.—W. C.—F. C.—J. F.—J. R.—Messrs. F.—J. D.—W. H. R.—H. W. L.—G. G.—H. C.—F. H.—Mr. H.—M. J.—W. H. C.—C. & V.—H. K. & W.—E. H. T.—J. I. (if the collector acted as the agent of the trustee, the trustee is liable. Take advice).—Messrs. H. & Co. (arrived too late)—H. S. (next week).

We are compelled to decline pointing out books and giving addresses.
All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rest, of course, with the authors.

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THE TREATMENT OF SEWAGE.
By JOHN HARRIS.
A Pamphlet for Municipal Authorities, and those interested in the Cultivation of Food.
London: H. WIPPELL, MARSHALL & CO.,
Leamington: H. WIPPELL, Victoria Library.

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London: LONGMANS, GREEN, & Co. Patent Stationers.

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The Builder.

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Titian's Country.

ALMY evenings, gilded gondolas gliding on shining waters, with reflections of brilliant hues in the rippled shadows, matches of love-songs floating in the air, garden banquets, with witty, sparkling converse, within sight and sound of such accessories, and a general impression of artistic luxury and sumptuousness, if not of voluptuousness, come into the mind at the first mention of Titian's country. To the general public the home of this great painter was Venice; and its palaces and lapping waters are the first objects thought of when his name is

spoken. The letter of Il Priscianese, doubtless, accounts for much of this association of idea. The description given in it of the evening he spent with Titian in his pleasant garden, when Aretino, Il Sansovino, and Nardi were present at the supper, and his mention of the situation of the painter's house, as being within sight of the island of Murano, and of the fact that as soon as the sun went down, and the tables were set in the garden, that part of the sea within view was filled "with a thousand little gondolas adorned with beautiful women, and resounded with divers harmonies,—the music of voices and instruments," till midnight, have made us a little word-picture that is difficult to dismiss. But if we would know more of Titian's life than this one evening, or the series of similar garden feasts to which the notes of Aretino also bear testimony, we must dismiss it. Titian was no sybarite whose rest a rose-leaf would have disturbed; no opionore; no voluptuary; but a hardy mountaineer, "canny" rather than otherwise, hardworking, and indefatigable. Although for forty-nine years he occupied the house and grounds in which he gave these famous supper parties, he rarely failed in the summer time to visit the mountain district in which he was bred and born. This was Cadore, a town on the Piave, about eighty-six miles distant from Venice, in the heart of the Alpine region. On fine days in the early dawn, his native mountains could be described in the horizon from his studio windows, ever reminding him of their majesty, and ever urging him back to their beauty. No wonder, then, that after he had passed the great age of our score and ten he still wended his way to their feet, charmed as at first, and strengthened with the bracing mountain air to climb their steep sides. Thither, after an interval of three centuries, he has recently been followed by an admirer, who has, as literally and exactly as may be, sought out his footsteps, rested on the route where he rested, gazed at the scenes he surveyed

from the successive stages of his journey, searched out the pictures he saw in churches in or near the way, and traced some that he painted with his own hand to the country churches for which he designed them. We allude to a task just completed and described by Mr. Josiah Gilbert, whose familiarity with the Dolomite Mountains in the same part of the world enabled him to accomplish more than an uninitiated person was likely to have undertaken.* Some thirty years ago the Abbate Cadorin identified the Casa Grande, the large house with a studio extending over the extent of its upper floor, in which Titian lived for so many years, but which, up to that time, was not known to have been his residence. It is on the north side of Venice, rarely visited by strangers, and is now so blocked in with modern dwellings probably built upon the garden, as to appear like one side of a narrow court. It is subdivided into a row of houses, at the top of which, however, still runs the bold cornice of Titian's time, showing it was formerly one handsome residence. The Abbate ascertained that Titian had a mortgage upon the house, and that it finally became his, and passed at his death, with his other property, into the hands of his spendthrift son Pomponio. And now Mr. Gilbert has thrown as much light upon his birth-place in the little mountain republic, and shown how it was that mountains and forests were so much upon his canvas. He has done more, too, for Titian. The trumpeted blot upon his fame left by the imputation that many of the lovely faces he painted and made more lovely still, were those of his mistresses, Mr. Gilbert has laboured to remove. He believes that the famous "Violante" introduced in a picture for the Duke of Ferrara, which he spoke of as "the object dearest to him on earth," was his fond wife; and that another portrait of a beautiful woman sitting by his side was that of his dear daughter; and that probably the other paintings described as mistresses of Titian's were merely so called in default of names forgotten.

Walking in his garden, as we have said, Titian, when there was no opal haze rising off the sea or along the plain, could see the range of hills that sheltered his native place; nay, more, he could identify the Antelao, the chief guardian of Cadore. There is a picture of his, a shepherd playing on a pipe, in which Mr. Ruskin has identified this view as a background. And his great picture, the "Peter Martyr," so unfortunately destroyed in the burning of the hall in the ducal palace, portrayed a nearer range, through an opening in which the Antelao is seen, the hills of Ceneda. His famous "Battle of Cadore" afforded a legitimate field for their portraiture; and accordingly we find his native hills again depicted. Mr. Gilbert gives both a fac-simile of Mr. Ruskin's sketch of the Cadore mountains, and a view of the Alpine scene that was in the painter's mind when he sketched the outlines for his battle-piece. A more valuable illustration than either of these, we may as well add here, is a fac-simile of Titian's original design for the piece that was to celebrate the prowess of the Cadorini, a drawing that passed through the collections of Sir Thomas Lawrence, Esdaile, the engraver Rota, and the late Dr. Wellesley, at the sale of whose effects it was purchased by Mr. Gilbert. There are numerous illustrations of the mountain scenery etched by the author; several woodcuts, and a photograph of Fontana's rare engraving of the "Battle of Cadore."

We can assure our readers they would enjoy setting out for Cadore in Mr. Gilbert's company. He starts from Venice, so travelling northwards. He tarries first at Treviso, a stage of eighteen miles, where there is one of Titian's choicest works on the "Annunciation" in the Duomo,

and where doubtless the great painter often scrutinised the works of his rivals, Giorgione and Pordenone. Thence he passes on to Conegliano, whence the road leads through a plain that is covered with vines, mulberries, and Indian corn, to Ceneda. Here is the range of hills seen from the studio window of the Casa Grande, an abrupt, grassy, serrated ridge, rising behind the town, one point crowned with a pilgrimage chapel. And here, too, Titian possessed property, including a villa, earned by his industry; for the inhabitants of a village close by agreed to transport stone for it, and find the manual labour, as the price of a picture for their church, also to supply him with corn and wine at a fixed price for eight years. Mr. Gilbert, of course, sought out the picture in the poor village, and found it in a "forlorn-looking little church," at the end of a long acacia-hedged lane, at the edge of a hare knoll. It is a Madonna, with two detached figures of apostles, all very much perished, and with some of the great master's work, doubtless, coarsely painted over. The view from this mountain village, looking down upon the vast plain between it and Venice, and catching glimpses of the inextricable city itself, just as glimpses of the hills are caught at Venice, is thus pictorially described by the author:—

"An expiring thunderstorm was moaning along the terraces of Alpine hills, rising into mist and blackness on the north; but, under a ragged canopy of cloud, the distant Julian Alps stood out in opal clearness, and a flood of golden light was poured over the plain, which spread boundless beneath the eye, east and west, and south, a sea of verdure, whose purple distance might have been the sea itself, as the shining campaniles, dotting it all over, might have been the sails of innumerable ships. One of the most distant due south was pointed out as that of St. Mark's. Thus arrayed in glory, and with all the advantage of vivid contrast, the prospect was one of the most captivating that can be imagined. . . . Fortunately Titian to possess a resort like this, which no Venice garden could rival in attraction, and that associated in one view almost all the elements of the highest landscape beauty. . . . Here beneath your feet the fortunes of the world have ebbed and flowed for ages. Now it was Roman armies passing to Eastern conquests; now barbarian hordes pressing westward into Italy; now German, now French invaders contending for the mastery."

Near Ceneda is Serravalle, the residence of Titian's married daughter Lavinia,—another charm that drew his feet to the spot; and the longer the stay amidst mountain influences, the more, we may be sure, his soul drank in a sense of their splendours. One of his favourite effects was a representation of ranges of low hills beneath a cloudy sky, but the peaks of the hills relieved against a sunset or twilight, just as he saw them, night after night, in this neighbourhood. His mixtures of woodland and plain, of sweeping lines of hills broken by a jutting rock, or sinking into soft vales, Mr. Gilbert also ascribes to his impressions from Ceneda. The Duke of Devonshire's picture, "St. John in the Wilderness," gives an expanse of country, with white mountain crags in the distance, which he considers is a reminiscence of Ceneda; and a picture in the Royal collection at Buckingham Palace, in which mountains, clouds, light, and rain are marvelously treated, contains, he concludes, another recollection of views from this part of his journey. At Serravalle there is another picture by the master,—a splendid specimen and in good preservation, representing the Virgin and Child in glory surrounded by Angels, who fade into a golden haze above; and on each side of this hang a picture by his contemporary Pordenone. Leaving Serravalle, which is in a mountain gorge, and protected by a turreted wall climbing the steep hills around, a gloomy Lago Morto varies the scene, a haunted place where every one who ventures upon the water is supposed to meet with certain death; and then comes a great wood, ninety miles in circuit, overhanging the road on the summit of precipices, further on, with cbamois, roehuck, wolves, and bears roaming on it, and believed to possess stalactite caves and hollows, and a great central cup-formed meadow seven miles in circuit.

This forest Mr. Gilbert penetrated, and describes very cleverly. When he had climbed and

* "Cadore; or Titian's Country." By Josiah Gilbert. London: Longmans, Green, & Co. 1869.

climbed, and threaded glade after glade of beeches, and then climbed again from spur to spur, and wound in and out among the beeches, he actually arrived at the vast central meadow, then speckled with herds feeding, where on a knoll stood a building composed of church, inn, and Government office, for the management of the timber. The reason he undertook this investigation was an impression that the wood must have furnished Titian with some of the inspiration with which he treated woodland scenes. And before reaching Cadore he makes another detour to the Val di Mel, a lovely country, that had also an influence upon the landscapes of Titian. A number of sketches accompany the description, some of the scenery, and others of drawings in which it is introduced by Titian. "Other painters," says Mr. Gilbert, "had dealt in mountain shapes of delicate blue reposing in pure ether, and for clouds scattered a few woolly patches in the void above. Titian, a mountain man, and better taught, brought the vapours down among the hills, gave them involution and coherence, wrapped them round his mountain peaks, or piled them into vast competing bulks far into the sky." He regarded the great mountains as friends, not enemies, his commentator continues, looking at them, not as a Lowlander shrinking from their awfulness, but as a mountaineer welcoming their terror. At last after many detours undertaken for love of the great master, and with a view to realise the influences that worked in his mind, and see every fragment of work that he has left, Mr. Gilbert arrives at Cadore. Seen in the distance, this is a small white town on the side of a hill, with hills in every direction around it. On approaching nearer, a modern looking church and an old brown tower are leading features rising out of the white houses. In the town is a little piazza with a central fountain, where, "go when we will," says the explorer, "we shall find women washing at the fountain of 'limpid sweet water,' or sitting among piles of peaches and pears; one or two country carts, a few idlers with cigars in their mouths, several idlers without, and scores of ragged boys." On the south side of the piazza is the brown tower mentioned above, an appendage of the town-hall, in which is a large and somewhat tawdry painting representing Titian standing by a pedestal, in which are placed his palette and brushes. The house, too, in which he was born, now an osteria, is in good preservation. It is a small cottage in a lane, winding down the castle hill, and must have been the first one Titian came to after his three days' journey from Venice. The fresco he is said to have executed when only eleven years old, with the juice of flowers, is still to be seen. It is on the wall of a house Mr. Gilbert thinks must have belonged to his grandfather, which wall was once an external one, but owing to additions is now an internal one. A sketch of it is given. It represents a Madonna with the child standing on her knee, and a youth kneeling by her side in adoration. The background and drapery have suffered, but not from wanton destruction; the Cadorian in this and every other respect apparently delighting to honour their celebrated townsman, and preserve every vestige of his genius. In the strong room of the church they have preserved several letters in his handwriting relating to loans he was able to make the little community in the days of his prosperity; and in the church are specimens of his art. The groined ceiling he painted in arabesque, in a chamber in his cousin's house, has, however, been so unfortunately restored as to be no longer worth seeing. Titian's family, the Vecelli, appear to have first settled in Cadore, in 1320, in the person of Guocello, who came there in the capacity of administrator for its feudal lords, the Counts of Camino; and to have speedily risen to importance, their names figuring repeatedly in the annals. They seem to have acquired some property, for the house in which the painter was born was given to his father by his grandfather during his lifetime, and probably on the occasion of his son's marriage. Titian's elder brother, Francesco, lived in it, and carried on the timber trade of the place in it, till his death in 1560, when it became the property of the painter, then in his eighty-third year. Mr. Gilbert gives many interesting facts about Titian's household, both here and in the Casa Grande; but his chief effort consists in refuting the statement of the artist's contemporaries that he only excelled in portraits, and proving that he was not only the first painter that threw feeling into landscape, and so created a new branch of art, but that all

his inspirations were due to the magic of his mountain home. Mr. Gilbert's book is a very pleasant addition to the literature of art. No one may plume himself upon knowing all that is to be known about Titian and his masterpieces, his household in Venice, and his first home in Cadore, until he has read it.

SUB-AQUATIC TUNNELS.

THE anticipated success of a well-designed, though cheap and simple, tubular driftway under the bed of the Thames, has attracted a considerable share of public attention to the subject of subterranean, or sub-aquatic, communication. The idea of a tunnel, indeed, has been rendered so familiar to the inhabitants and to the visitors of London by the convenient service of the Metropolitan Railway, that persons who are devoid of the slightest idea of the difficulties with which the engineer has to contend, from the moment when he bids farewell to open daylight, come to speak of a tunnel as a very ordinary piece of work, and gravely discuss the feasibility of a structure of this nature, of the modest length of 30 miles, and at a level dipping some hundreds of feet beneath the bottom of the Straits of Dover.

Mr. Barlow's success, we trust, is now beyond doubt. Of the 1,320 ft. demanded for his driftway, he has already safely constructed upwards of 1,000 ft., and the tube, advancing from a shaft on the northern bank of the Thames, has been pushed beyond low-water mark on the opposite shore. In his letter published a few days since, Mr. Barlow asserts that the very moderate estimate of 16,000*l.* for the entire work will not be exceeded. Should this prove to be actually the case, there can be little doubt of further demand on the skill of so economical an engineer. But the reason for which it occurs to us that it is most important that the public should not be misinformed as to the actual risks and difficulties against which the engineer of a tunnel has to provide, is as follows.

In all normal times of engineering activity a marked and novel success, especially if it be a financial success, is apt to force a heavy aftercrop of more or less similar schemes. In these cases it too often follows that the modest anxiety and patient forethought which have led to the first triumph are altogether discarded by those who rush to follow in the same path. B was tunnelled under the Thames; therefore C and D will fight for authority to tunnel under the Mersey, and E and F to tunnel under the Channel. Talk of the latter project as wild, and its supporters will point with triumph to the little *cut* by the Tower.

Tunnelling, indeed, is not an invention of the present day nor of the present century. That great engineering people, to the influence of whose institutions we owe so much of the very framework of modern civilization, wrought tunnels which endure to the present day. Two thousand two hundred and sixty-four years ago, the miners of Furius Camillus drove the famous *Emissarium* through a part of Mount Alba, and tapped the swelling waters of the lake of that name. Etruscan science, on this occasion, directed Roman energy. But the *tufa* of Italy, a material which behaves under the pick of the miner in a mode very similar to the English chalk, is bored and drilled with shafts, and *adits*, and lofty tunnels, in all directions. The gallery of Posillipo is familiar to every visitor of Naples. The cruciform system of galleries and caverns known by the name of the Grotto of the Sibyl, dates from a remote antiquity. Whether it were from an observance of hydraulic laws, from want of a trustworthy material for pipes, or from the conviction that the steady unchecked action caused by gravitation was best suited for the permanence and purity of a water-supply, we need not now pause to inquire. But certainly a knowledge of the engineering works of ancient Italy might have taught the English predecessors of Brunel more than they ever knew about tunnelling.

The school for tunnelling in England has been, of course, underground. In our mines, especially in our coal mines, the problem of constructing subterranean galleries has long been solved. In certain districts, such, for instance, as that of the Peak, in Derbyshire, vast natural caverns open out in the living rock, glittering, when lighted up by the miner's torch, with sparkling stalactites, accessible, in places, only by narrow and low-roofed passages; and at times traversed, or occupied, by rivers, which

long barrow from the light of day. In one Derbyshire cavern a river precipitates itself down an unfathomable abyss, and what becomes of the water is unknown.

But with all our practice as to mining, and all our acquaintance with natural subterranean galleries, the progress of the tunnel engineer was slow in this country, until the exigencies of the line selected by Stephenson for the London and Birmingham Railway led to the simultaneous construction of four wide and lofty tunnels, of dimensions before rarely attempted. It is true that the method of piercing the barrier that divided valley from valley had been pointed out, no less than the main directions of the best line of communication had been indicated, by Telford. The Grand Junction Canal was the pioneer and guide of the London and Birmingham Railway. But the canal tunnels were reduced to the minimum cross section. They admitted a canal boat, with the depth of water requisite to float it, and no more. In the earlier tunnels the boats were propelled—or, we might say, coaxed through—by the barbarous and painful expedient of the boatman's lying on his back and pressing his feet alternately against the roof of the tunnel.

In the case of the Thames and Medway Canal, a tunnel of larger dimensions was cut, through the chalk, at Rochester. A narrow tow-path was formed, in this instance, by the side of the water-way. In that tunnel, of some 2,000 yards long, the chalk in some places gave way, and lofty caverns diversified the usual elliptical section of the arch, which, in only a few places, was protected by brickwork. When the Gravesend and Rochester Railway was laid through this tunnel, the Government Inspector, Lieut.-Gen. Sir C. Pasley, satisfied himself of the solidity of the chalk roof by the military expedient of firing at it from a mortar. He only used, however, wooden plugs.

The Kilsby tunnel was the scene of a most protracted, and for a long time a precarious, struggle of Robert Stephenson, with the great enemy of the tunnel miner—water. So long and so continuous was the influx, and so far were the methods at first employed from being adequate to keep it under, that the abandonment of the works was at one time all but resolved upon. A quicksand fall of water had been tapped by the tunnel, and, till this was emptied, satisfactory progress was impossible. Notwithstanding the increased command of steam and of mechanical power which the last thirty-five years have placed at the command of the engineer, the experienced man will yet even now look grave at the prospect of tunnelling through a hill that is likely to be wet, unless he can allow of the tapping of the springs, and the bleeding of the internal lake, by gravitation.

In his contest with the water at Kilsby, Robert Stephenson could indeed avail himself to some extent of the experience gained by Sir Mark Brunel and his assistants in their long struggle with the Thames. But the Thames Tunnel was unlike any other work. It was long considered, deservedly, and is still ranked by foreigners, as one of the wonders of the world. Skill, patience, energy, enough to have reared a monument of the loftiest dimensions, were buried in that horrible mine. Engineer after engineer was knocked up by labour, by damp, and by the ill effects of the deposit of the London sewage in the bed of the river. But the Thames Tunnel was a work *per se*,—a marine, or rather river, work, under most unfavourable circumstances, rather than a tunnel proper. The normal idea of the latter work is that of boring through the earth. The material may vary; props, and struts, and polling boards may be more or less constantly required; water may pour in, and necessitate constant pumping; but these are the accidents of the case (and very unpleasant accidents they are). They are not essential or constant obstacles to the boring through of a rocky or chalky barrier. Earth, or rock, is the natural bed of the ordinary tunnel. But Sir Mark drove through shifting mud. The square platform which grew together, brick by brick, as his many-partitioned shield was driven forward, was often within but a few feet of the bed of the Thames. It is even probable that, had the problem been affronted in the first instance, the engineer would rather have preferred to construct a double brick arch, working from one end, through nothing but water, than to deal with the ever-varying difficulties of mud, and silt, and clay, and wholesale impour of the tide.

Indeed, Mr. Barlow claims for his well-considered and simple shield, the merit that it would

be so adjusted as to drive a tube ahead through water. It is far from being impossible that such a procedure should be carried out.

In the case, however, of the actual subway, the chief point to note is, that a wise provision has been exercised in fixing the level of the work so deep in the London clay that not a drop of water has entered the drift-way. That necessary for the purposes of the work has been sent down the shaft. In fact, though no engineer would have felt justified in making the experiment, there is little doubt that the simple expedient of mining through the clay at the same level, "polling" the drift-way, and following the miners by a gang of bricklayers, who should have turned a brick and a half ring round the aperture, would have met with uninterrupted success. The one thing necessary in a case where, as in this instance, no faults occurred in the clay, would have been to keep up such a rapid rate of progress that the arch should always have been keyed in before the clay began to "creep." How certain, and how formidable, that creeping action is, Mr. Stephenson had ample proof in the Primrose-hill Tunnel. Under the influence of the successful experience of the Watford Tunnel, driven for the most part through solid chalk, the originally designed invert of the Primrose-hill Tunnel was countermanded. But the clay betook itself to fill up the hole drilled through its bowels; and the invert had to be put in, in very much of a scramble, after all.

Men familiar with this description of work looked with a sort of amused surprise at the recoloured statements which from time to time appear in the public journals as to a "Channel Tunnel." They do not say that such a work is impossible. They do not even care to form a distinct opinion on that head. But they are very well contented with the applicability of the proverb, "*Le jeu ne vaut pas la chandelle.*"

A heter communication with France is no doubt both extremely desirable and perfectly feasible. Our present mode of transit, onomoxious as it is to the majority of ourselves, islanders as we are, and still more miserably and terrifically onomoxious (to judge from their countenances on deck) to most of our Continental neighbours, is hardly up to the requirements of the day. A safe, speedy, regular transit, free from donk, from risk, and, above all, free from the fear of that horrible *mal de mer*, is what the English public have the right to expect of the profession of civil engineers, and what that profession will place at the command of the public, on the one sole necessary condition of being furnished with funds. These funds must be large, for the waves of the Channel are rough and tempestuous. But to speak of the same requisite as one which would be adequate to the construction of a submarine tunnel, 30 miles long and 250 ft. (some say yards) below the level of the *Manche*, is, to our mind, nothing better than grave trifling with an important practical subject.

It is curious to see how the non-professional imagination has not only run to lower, but to seed, about this question of crossing the Channel. The most remarkable feature in the case, moreover, is, that hardly any scheme is so absurd as not to find solemn-visaged propounders and open-mouthed admirers. It is evident that the material on which Law counted as the basis of his imaginary wealth is still to be found in rich abundance within our shores. It is only necessary to dig. *Les badauds ne passeront jamais.* Neither railway kings, with their royal mode of making things pleasant, nor colossal contractors, with their lines to develop traffic; nor financial companies, with their periodical crashes; nor Brighton directors, with their eight millions laid out so as to earn an annual loss, exclusive of the perished and annihilated interest; nor Chatham and Dover magnates, with their discounts of all per cent, have had more than a temporarily enlightening influence. We are told of scientific French evidence in favour of a grand Channel tunnel. By way of making a few preliminary inquiries, the Chancellor of the Exchequer is to be asked for the trifling sum of a couple of millions on account. The French Emperor, it is added, looks favourably on the scheme, and has given a conditional promise of as much more. All right; we rejoice to hear it. We have only one point on which to insist. Let us get the French Emperor's money down *first*. Then it will be time enough to inquire about our own instalment.

It is proposed, as caution is always desirable in engineering matters, that a drift-way should just be run under the Channel in the first instance, to prepare the way for the tunnel. The sugges-

tion is at once economical, prudent, and practical. Let us suppose a drift-way to be run, some 6 ft. or 6 ft. high and wide. Is it to be timbered—or arched—or lined with iron? As the meeting from the two ends would be a thing forbidden by the calculus of probabilities, it will have to be worked from one extremity. As we get on—say beyond the twentieth mile, how will the miners be sent in to their daily work?—how supplied with air, or with materials?—how will the excavated chalk be sent back to land?

Galleries in chalk are infected, as miners are well aware, with choke-damp. What would be the quantity of choke-damp that would exude from 280,000 superficial yards of chalk surface (when the drift-way had advanced *only* twenty miles), and how would it be withdrawn?

Water infiltrates through chalk. A very small head of water will cause infiltration for a considerable distance. Where hands of flint occur they act like layers of sponge. All the wells in Strood, within a considerable distance of the Thames and Medway Canal, were rendered salt by infiltration through the chalk, when the brackish water of the Medway was admitted into the canal; and the company had to pay, and did pay, heavy damages in consequence. What would be the infiltration through the grey chalk due to the pressure of the water of the Channel? What would be the difference between the exudation from the 280,000 yards of surface at high tide and at low tide? How would the water, on the most modest estimate of its rate of infiltration (which, by the bye, would increase *de die in diem*), be removed? A few of these practical questions must be answered before we can undertake to speak, with any idea of serious investigation, as to the prospects of the Channel Tunnel.

But we are not limited to one scheme. Their name is legion. One amateur proposes the formation of an embankment across the Channel, the top to be some 30 ft. below low-water mark. Rails are to be laid on this embankment (which is kept down for the benefit of navigation), and long-legged carriages, of novel structure, are to run backwards and forwards over the submarine railway. We should like to let the laying of the permanent way to the projector.

Another gentleman proposes a floating tubular tunnel. It is to be moored at certain distances by chains. The process of anchoring and straining the chains at the bottom of the Channel would be highly interesting. Supposing—not to make two bites of a cherry—the tube complete, moored, and at work. What a grand idea to think that the whole service of the Continent, and the lives of all who happened to be at any time in a structure that recalls the legend of Mahomed's coffin, would be at the mercy of a heggary gun-boat, or a mischievous torpedo!

In fact, we warn our friends, when called on for subscriptions for a Channel bridge, or tunnel, or hybrid between the two, to button up their pockets, and wait. The limits of the service of the engineer are, no doubt, rather financial than physical. The limits of speculative imagination appear to be equally removed from the barriers of prudence and from those of experience.

Returning for a moment to the Tower subway, we would mention that the work has been carried forward by the advance of a tubular wrought-iron shield, about 8 ft. in diameter, which is so constructed as to form a close head in case of need. As this shield is pushed forward by screws, the excavators opening out the ground for a few feet in advance, the permanent tube of the subway is fitted into place behind it, being cast in 18-in. lengths, each consisting of four segments; three of which are of equal size, and the fourth is a mere key-plate, 14 in. or 15 in. wide. Length by length these narrow plates are bolted on the face of the tube, being protected, until firmly fixed, by the shield. The introduction of the narrow wedge-piece has proved a great facility in fitting together the segments of the tube.

The internal diameter of the completed tube is 7 ft. A narrow railway will be laid through-out, and the passengers, being lowered down the shaft by a vertical hoist, will be carried through the subway in an omnibus specially constructed for the purpose, propelled partly by gravity and partly by haulage by a stationary engine. A curious feature in the actual construction of the tunnel is the filling up of the small space, excavated outside of the tube, with blue lias grout. A hole is left in each plate, and through this the grout is driven by a large syringe until the aperture is completely full. The mixture dries so rapidly that it is unnecessary to plug up

the holes on the removal of the nozzle of the squirt. How far that irresistible oxidation of the iron (by absorption from the grout), of which we have recently seen such a striking instance in the tomb of King Henry VII., will proceed, remains to be seen. It seems almost a penny-wise-and-pound-foolish proceeding not to have enamelled, galvanised, or otherwise protected, the inaccessible exterior of the tube from a very formidable danger which there is no means of detecting until it is too late. Mechanically considered, the injection of the grout is admirable. Chemically regarded, we fear that the same cannot be said.

We avail ourselves of the opportunity to call the attention of all managers of tunnels, mines, and similar works, to the immense facility afforded to the work by the use of the electric telegraph. A constant and instantaneous communication is kept up by the wires between the engine-driver and the face of the work. Lowering and raising of materials, and admission of air by the fan blast, are thus precisely directed by the foreman on the work itself. The sense of confidence that would be inspired in any case of danger by the possession of this mode of communication would be beyond all price.

NOTES UPON SOME OF THE DUTCH TOWNS.

ENGLISH travellers passing from Rotterdam to Belgium or Northern Germany generally perform the journey as rapidly as possible, and scarcely ever think of stopping for a single hour on the way. In fact, most people imagine that there is little to be seen, and that the sooner this long and monotonous day's travelling is over the better. Even those who delight in antiquity and are interested in archaeology usually content themselves with the idea that the flat plains of Holland contain nothing to interest them, and that the best thing to be done is to get on as quickly as possible to Bruges or Cologne. Now we do not for a moment mean to imply that the architecture of Holland is so fine as that of Belgium or Northern Germany, or that the Medieval buildings existing there are so grand or in such a perfect condition as those in the two last-named countries; yet we think that the student of architecture would find a few days well spent in examining some of the ancient towns between Rotterdam and the German frontier. We will point out a few places at which we think those who take an interest in Medieval art might find things to interest them.

The third station from Rotterdam is Gouda. The principal church here is well worthy of a visit. It was commenced in the year 1155, but was nearly rebuilt after the fire, which took place in the year 1552. The dimensions of this church are extraordinary; its length is over 300 ft., and the height to the top of the wooden barrel vaulting of the nave is over 140 ft. The architecture is, of course, very poor, but what is most worthy of notice is the wonderful amount of stained glass which this church contains. There are nearly sixty windows entirely filled with stained glass, varying in date from 1553 to 1603. The earlier windows contain religious subjects, but those which date after the year 1572-9 (at which period the Protestant religion became established in this part of Holland) are filled with allegorical subjects, and are inferior, both in design and execution, to the earlier windows. Of course, the style of all these windows is Renaissance, and many of them were the works of the brothers Crabeth. It is worthy of note that one of these windows was given by Queen Mary of England, and contains a very good portrait of that queen and her husband.

After again travelling for about two hours by the railway, one's attention is attracted by a tower of noble elevation and a lofty detached choir, the whole surrounded with a belt of fine trees, with here and there an old church tower-crooping up. This is Utrecht, one of the proudest of the prime of all Holland, and one of the most important bishoprics in all Europe; at later times celebrated for the "Synod," which decided the established religion of Holland, and even now an important and flourishing town, with 60,000 inhabitants.

Utrecht contains three cathedrals and twenty-three churches. Of the cathedrals, one belongs to the Calvinists, one to the Roman Catholics, and one to the Jansenists. Of the churches, ten belong to the Calvinists, seven to the Roman Catholics, four to the Jansenists, one to the

Lutherans, and one to the Remonstrants, or Arminians.

The cathedral (Calvinist) is the relic of what was once a most glorious church. All that now remains are the choir and aisles, transepts, and the great western tower. The nave and aisles were allowed to fall into disuse, and after many years of neglect, were destroyed by a thunderstorm at the end of the seventeenth century. When perfect, this church was over 400 ft. in length, and was probably the largest church in the "Low Countries." The great western tower is 70 ft. square at the base, and rises to the height of 350 ft. For two-thirds of the height it is of brick, and very plain, but the upper portion consists of a beautiful open lantern octagon on plan, and entirely of stone. In each face of this lantern is a large unglazed three-light window. This lantern is crowned with a pyramidal slate cap; it probably originally terminated with an open-work stone spire. This tower was erected between the years 1321 and 1352. The space originally occupied by the vast nave and aisles is now an unenclosed square. The transepts are of great size and magnificence, with large windows at the ends. Both the transepts and choir bear a strong resemblance to Cologne. The height to the vaulting of the choir is rather over 100 ft. The great apse is surrounded by seven apsidal chapels. The choir was erected between the years 1298 and 1329. The transepts are probably 40 or 50 years later, the detail of every portion of the building is rich, but not overdone with ornament; the tracery of the windows is remarkably elegant. The interior of this superb church has been frightfully ill-treated; the only portions now used are the transepts, and they are formed into a conventicle, which bears a stronger resemblance to a lecture theatre than a Christian place of worship. This portion of the building is divided off from the choir by a wooden "hoarding" nearly 60 ft. high. The choir itself is entirely bare and empty; but even with these disadvantages its noble arches and graceful columns at once attract observation. The vaulting is simple but very good, and the row of chapels surrounding the apse have a most charming effect even in their present neglected and degraded condition. A fine fifteenth-century monument of black marble is pointed out as the tomb of St. Boniface, but there is not the least reason for this supposition. There is also a good Cinquecento monument to Bishop Egmout, who died in 1549. On the south side are the remains of the cloisters. They are very rich, and rather wild late Geometric work. Some feeble attempts at restoration have been made outside the choir of this cathedral, but they are not to be commended, and have done rather more harm than good.

The churches of St. Peter and St. Gertrude contain crypts and other remains of the Romanesque period, but so spoiled by the barbarous treatment of the last three hundred years, that they are of little value to archaeologists. St. James, St. John, and St. Nicholas and St. Mary, have been large and striking fifteenth-century churches built of brick; but they have been denuded of every kind of ornament which they once possessed; even the tracery of the windows and the capitals of the columns have been cut away as savouring of "idolatry" and "superstition." The interiors of these churches are covered with whitewash. In startling contrast to these is the Church of St. Catherine, formerly belonging to the Carmelites, but now the Roman Catholic metropolitan cathedral. This church was erected in the fourteenth century, and is a fine building, consisting of a nave and aisles, of five bays, transepts, and a very spacious choir without aisles. Over the junction of the nave and transepts is a *flèche* of metal-work. The whole church is vaulted in stone, and is lofty and well proportioned. It has lately undergone a very judicious and costly restoration, and, what strikes one as most remarkable in Holland, is the fact that every portion of the interior is decorated with colour and gilding, but the whole has been so skilfully done that the effect, though brilliant, is not gaudy. The walls and columns are painted of a parchment tint and have "masonry patterns" traced upon them in dark red lines. Half-way up the nave columns, which are cylindrical, is a kind of conventional arcade or band of flat niches. These are at present left white, but will, we suppose, be eventually filled with subjects or single figures. The spandrels of the nave arches have large angles, with their wings extended, holding emblems, &c. The chancel is simply and quietly treated, and the

vaulting is pale blue, with very rich borders and powderings. All the windows of the nave are glazed with mosaic patterns in pale colours. The choir stalls and sedilia are most elaborately carved in oak, and are of remarkably good design. The same may also be said of the bishop's throne and the pulpit: the latter has a canopy reaching to the roof of the church. The side altars, though not bad, are not so satisfactory. The high altar is temporary, as is also the glazing of the choir windows. We were unable to find out who was the architect to this very remarkable work of restoration, but from the care and knowledge displayed, we think we cannot be wrong in attributing it to Mr. Cuyppers. It is proposed to add a new west front, flanked with towers, surmounted with spires, to this church. The foundations for this work have been laid some time since. One of our illustrations represents the panelling of the west door.* The great singularity is that the framing of the door is external. Although this is by no means uncommon in Italy, it is hardly ever to be met with north of the Alps in Mediaeval work.

The other churches in Utrecht possess nothing remarkable or worthy of notice. There are several good examples of ancient domestic architecture, particularly one large house near the cathedral, and a building now used as a charity school.

Arnhem possesses two fine churches. The great Calvinist church is an immense building, chiefly of brick, with a lofty square tower at the west end, a spacious nave and aisles, transepts, choir, and aisles, and an apse with the aisle continued round it. The south porch is a good specimen of late fourteenth-century work, with some good canopy work. The choir is cut off from the nave by a metal screen, and is disused. The whole church is vaulted apparently in wood, but every portion of the interior is covered so thickly with whitewash that it is difficult to say for certain what is the material used in any part of the building.

The church of St. Walburg (Roman Catholic) is rather a remarkable building. The west front, flanked by two square towers crowned with slate spires, is exceedingly plain Romanesque work. There is a short nave of three bays, transepts, and a chancel of three bays, with an apse. The whole of this portion of the church is good, but plain fourteenth-century work. The whole church is vaulted in stone. The interior is fitted with modern Gothic altars of poor design, and the pulpit which formed such a conspicuous object in the Dutch court of the Great Exhibition of 1851 is to be seen here. It is from a design by Mr. Gnyppers, but very inferior to his later works. Some of the windows are being filled with stained glass. A large Roman Catholic church has just been built near the railway station. The exterior is unsatisfactory, and the spire is what we should call "Brunnagem," the interior is rather striking. The whole church is vaulted in stone, and the walls are lined with the same material. All the windows are of stained glass. The church is, in fact, rather a costly than a successful example of Modern Gothic architecture.

Our space will not allow us to enter into any account of Zutphen or Nimeguen, though both these places are well worthy of a visit.

The other example of panelling given in our illustration is from the door of an old house at Münster, in Westphalia. It is highly probable that this kind of door, with the framing external, was not uncommon in Holland and Westphalia during the Middle Ages; very few examples, however, are to be met with. From the fact that this sort of door is found in Lombardy, and not in either Belgium, France, or South Germany, it is most probable that the Dutch took the idea from the Lombards, who probably borrowed it from the East.

Competition in the English and Belgian Iron Trades.—Recently, some iron girders, rolled and riveted, were required in the construction of a mansion between Leeds and Bradford, and tenders as to the price at which they could be furnished, in accordance with a specification, were sought from a number of ironfounders in both England and Belgium. The highest tender received was from a Bradford ironfounder, and was 120*l.* and the lowest, which included the delivery of the girders on the spot, was from a Belgian ironfounder, and was 63*l.* The latter was accepted.

* See p. 746.

THE SEWAGE QUESTION.

Consideration of the Subject by the British Association.—At the late meeting of the British Association, at Exeter, the subject of town refuse was in several ways brought prominently forward; and in the chemical and mechanical sections the various methods of dealing with sewage refuse were so fully discussed that it is evident this subject is now felt by the Association, especially one of the most urgent importance, especially in reference to the well-being of town populations. At the previous meeting, Mr. Grantham had moved for the appointment of a committee to inquire into the treatment and utilization of sewage, and the preliminary report of this committee was brought forward in the chemical section by Dr. Paul. A series of questions had been sent to the various local sewer authorities throughout the kingdom, and replies had already been received from upwards of 100 towns, most of which have adopted the water-carriage system, either wholly or partially. A few of these towns are not sewered at all; in many the sewerage appears to be only partial, and frequently it is very defective. In fifteen cases where the water-carriage system has been adopted the sewage is applied as manure in irrigating land. The results obtained in those cases vary considerably according to local condition, so far as relates to the expenditure and return; but in most instances, while the application of sewage for irrigation is said to have been attended with marked improvement in the state of the neighbouring rivers and watercourses, there does not appear to be any evidence of prejudicial effects from the irrigation on the sanitary condition of the localities. In regard to the treatment of town sewage with the twofold object of preventing pollution of rivers, and of extracting from it material of value as manure, it appears that, so far as the committee has been informed, the various plans tried for the purpose have been only partially successful. Mechanically suspended material is generally separated both by filtration and by those methods which comprise the use of some precipitating agent; in the latter case there is sometimes also a partial extraction of the substance held in solution; but this is always so partial by any method yet tried, that the effluent water still retains much of the organic substance that chiefly causes the pollution of rivers, and much of the materials that are of value as manure. The results said to have been obtained in this way are generally described as satisfactory, so far as the appearance of the river is concerned. It would appear, as regards liquid town sewage, that the only course to be adopted at those places where the water-carriage system of removing town refuse is established, is the application of the sewage to land by irrigation. For the settlement of the mode in which that is to be effected, a number of questions require to be considered as to the influence of local conditions in regard to the cost and possible return. As yet the committee has not sufficient information to report on this subject, and it will be the object of their future labours to collect the information. The report says as to—

"Treatment of Liquid Sewage."

At fifteen of the places which are sewered wholly or partially, the liquid sewage is subjected to treatment either by allowing it to remain for a time in settling tanks from which the deposit is occasionally removed, as at Burton-on-Trent, Birmingham, Epsom, Farnham, and Andover, or by filtering, as at Uxbridge and Baling.

In eight instances deodorising materials are added, such as lime and carbolic acid, as at Carlisle and Harrow. Lime alone is used at Leicester; lime and chloride of lime at Luton; perchloride of iron at Cheltenham; perchloride of iron and lime at Northampton; ferruginous chloride with sulphuric acid at Stroud; and at Leamington the lime treatment has lately been superseded by the method proposed by Messrs. Sillar & Wignier.

By this treatment the sewage is clarified, and a deposit is separated, which is sold as manure.

In regard to the effects thus produced, it is stated that at Leicester the sewage runs off as pure as ordinary rain water; at Baling it is said to be free from smell, colourless, and harmless to vegetable or animal life; at Stroud and Luton the effect is stated to be satisfactory; at Harrow the nuisance is said to be somewhat mitigated; and at Aberystwyth the stench is said to be abated by this treatment of the sewage.

At Bury St. Edmund's, upward filtration through charcoal and gypsum has been abandoned in favour of costly irrigation. At Banbury, treatment of the sewage has failed. At Hereford, where it was proposed to be adopted in the parliamentary places, it has not been tried, on the score of expense. At Tunbridge it is about to be tried; and at Hastings and Cambridge experiments are being made.

The cost of treatment amounts, at Leicester, for a population of 7,500, to 300*l.*, and the cost of the plant for the purpose was 3,000*l.* At Luton, with a population of 18,000, the annual cost is 500*l.*; at Cheltenham, with a population of 34,000, it is 350*l.*; at Uxbridge, with 7,000 population, it is 200*l.*; and at Alton, with 3,300 population, it is 45*l.*

The solid deposit obtained by treating liquid sewage is sold at prices varying from 6d. to 2s. 6d. per ton. At Leicester as much as 5,000 tons are produced. At Luton the deposit is mixed with night-soil, at Banbury with street-sweepings, and at Stratford it is made the basis of a manure that is sold at 7l. 10s. per ton."

The committee sought to obtain information from foreign countries as to the practices adopted there; and, through the liberal assistance of the Home Secretary, Mr. Bruce, a number of official reports had been obtained from various foreign Governments. From these documents it appeared that, as a rule, the use of waterclosets is but rare, both on the Continent and in America. The complete sewerage of towns as a means of removing excreta refuse is even still more unfrequent. The general practice is to use either the old form of privy and pit, or some improved modification of it. In some towns, still more objectionable methods are adopted—as, for instance, in Berlin, with a population of about 600,000, where 50,000 night-stools are said to be in daily use. Hamburg is the only town on the Continent where the water-carriage system is carried out to any great extent. At other places portable reservoirs are used, and these are periodically removed and emptied outside the town. At some places the householders pay for the removal of the refuse; at others, they sell it to neighbouring farmers. Where the town authorities carry out the plans for disposing of town refuse, a profit is sometimes derived from the sale of it. At Groningen, for instance, the yearly profit amounts to 1,600l.; at Antwerp, to 2,700l.; and at Ostend, to 700l. At other places the return only just covers the cost of removal, and at some places the expenditure is much greater than the return, as in the case of Stockholm, where the difference amounts to more than 2,000l. a year.

Mr. Stanford read a paper in the Chemical Section, in which he endeavoured to show that the water-carriage system as at present carried out could not be regarded as perfect. He strongly advocated a particular form of dry-closet system, in which the use of earth, as in Monie's closets, was superseded by the [certainly impracticably expensive] use of ocherous, so as to produce a mixture that could either be used as manure, or charred so as to yield a fresh supply of charcoal for future use. The earth system for towns is infeasible enough, but this improvement on that system would be far worse.

In the Mechanical Section a paper was read by Mr. Barry, advocating the treatment of liquid town sewage with some precipitating material, as practised at Leamington, and opposing the use of sewage for irrigation, on the grounds of expense and detriment to the public health. A long discussion took place, in which the facts already mentioned were referred to by the several speakers; and the president, Admiral Belcher, somewhat surprised the meeting by the statement that he was the originator of the Thames Sewage Scheme, by which the outlet should be extended through Essex, and the sewage delivered by the river Crouch into the German Ocean. The interest excited by this subject was still further evinced by the re-appointment of Mr. Grantham's committee, together with the addition of Mr. W. Hope, of Barking, and by the grant of 50l. for the prosecution of the inquiry.

Sewage Irrigation at Banbury.—The sewage of Banbury formerly polluted the Cherwell, but certain parties complained of the nuisance, and a decree of the Vice-Chancellor ordered its discontinuance. The Board of Health subsequently rented a farm of 137 acres, about a mile from the town, on the Northampton side of the Cherwell, over which they have since continued to pump the liquid, the quantity being 300,000 gallons in the twenty-four hours, which is the refuse of 11,000 inhabitants. The solid matter is detained in tanks, mixed with the sweepings of the streets, and with ashes, and disposed of to canal boatmen, who sell it to the farmers. The rent of the farm is 616l. 10s. Thirty-five acres were laid down with Italian rye-grass, which is now in its third year. During 1868 the sales of produce realised upwards of 1,300l. Up to the present time for this year the amount received has been 912l. 15s. 10d. This sum includes successive cuttings of rye-grass, mowing grass, laternath, and cabbages. There is now growing on this sewage farm a crop of mangolds (16 acres), the like of which is rarely to be met with. A great many of the roots are 24 in. in circumference, and it is impossible to guess what size they will attain before the end of the season. Good experience, *pro* and *con*, is being gained with other crops; and the irrigation scheme at Banbury

has, so far, proved a success. The liquid, after passing over the land, enters the Cherwell some distance below the town. No nuisance is complained of, and fish may be seen sporting in the river close to the outfall of the effluent water from the farm. It is calculated that the receipts from the farm this year will exceed those of last year.

The Bradford Sewage.—Mr. Angus Holden, son of Mr. Isaac Holden, late M.P. for Knareborough, has been endeavouring to establish the practicability of purifying the dark and feculent streams of Bradford, and of utilizing the matter removed from it for a beneficial end. A piece of ground in the immediate proximity of the main outfall of the sewerage of the corporation having been placed by that body at the service of Mr. Holden, he has erected his works there. The experiment is watched with deep interest by neighbouring corporations, and particularly by those of Bradford and Halifax, both of which have already been involved in litigation, the first on account of the alleged pollution of the Aire, and the second for fouling the waters of the Hefle. The results are said to be so far as a week or two's proceedings can show, quite satisfactory. The process used is described as being a combined chemical and mechanical process, of French invention, whereby the sewage water is deprived of its impure and fœtid matter, which is retained for some useful purpose, while the apparently pure water from which it has been removed is sent forward on its natural course. The Bradford corporation is under legal obligation to deal with the question practically before the 11th of January, 1872.

The Liverpool Sewage Utilisation Company.—This company, in which the Liverpool Corporation are largely interested as shareholders, have just commenced operations on the first portion of their works, which have been constructed between Sandhills (at the north end of the town) and Ince Blundell. The company themselves have taken about fifty acres of land at Ince Blundell for the purpose of making experiments and testing the merits of the project. It has already been ascertained that the engine at Sandhills is sufficiently powerful to admit of the sewage being pumped up from the well at the station, passed through the pipes, and distributed over the land at Ince Blundell within from twenty minutes to half an hour. Branch pipes have been laid down to a farm at Ince Blundell, and they are also about to be laid down upon other farms in the neighbourhood.

The Sewage Question at Leamington.—Sewage deodorisation at Leamington has recently entered on a new phase, and the patent process adopted for the dejection of the sewage and the conversion of the solid residuum into "native guano" has already attracted the attention of the governing bodies of many towns. The Leamington sewage works are situated on the western side of the town, close to the viaducts by which the London and North-Western Railway crosses the Leam, and about half a mile from the Avenue Station. The works, which were originally constructed for the lime system of deodorisation were, early in April last, transferred from the Leamington Local Board to the "Native Guano Company," which has been formed to work the A. B. C. process, patented by Messrs. Sillar & Wigner, of London. The rainfall is only partially separated from the sewage by surface drains. The effluent water is said to be perfectly free from smell when discharged into the river, even when the works are seen under unfavourable circumstances; but some samples, on being kept in a closely stoppered bottle, according to the *Mark Lane Express*, have a smell which is strongly suggestive of the nature of the source from which the water has been obtained. On the other hand, other samples, under precisely similar circumstances, were perfectly bright, and free from even the slightest smell.

The Castle Caverns, Guildford.—The Castle caverns are still closed. The *Surrey Standard* thinks it is a little strange that a party of archaeologists who took the train at Guildford the other day in quest of objects of interest in the neighbourhood, neither halted at Rack's Close, nor, during the day, in their papers or speeches, made the slightest allusion to the excavations. It would be satisfactory, doubtless, adds our contemporary, to know the date of the formation of the caverns: that they are distinct from the castle, and that they had an origin independent of it, is pretty certain.

ARCHÆOLOGICAL EXCURSIONS.

The Somerset Archaeological Society.—This society held its annual meeting this year at the ancient little town of Axbridge, making excursions to the villages and various objects of interest in the neighbourhood. The country comprised within this year's programme is one of the most beautiful districts of Somersetshire, and offers a wide field of research to the archaeologist. The programme this season was of the usual character, comprising a museum, the reading of papers with discussion, and excursions. The general meeting was held in the town-hall, the president for the year, Mr. W. Long, in the chair. The Rev. W. A. Jones, the hon. sec., read the report; and, after some official business, the president read an able address, on the meetings of the society; the Mendip country and the explorations therein, the traces of prehistoric man; megalithic remains; and the traces of Roman occupation; and suggested further explorations. While treating of megalithic remains, he spoke of the stone circles and avenues, as well as barrows:—

"With respect to the stone circles and avenues at Stanton Drew (he said), I would merely submit to your consideration, whether we may not reasonably assign their origin to Phœnician influence reaching these shores through the energetic maritime people, the Veneti, who extended a portion of the coasts of Armorica (France) were still carrying on a brisk trade with Britain in the time of Cæsar; and in whose district were the remarkable stone structures of Kennec and its neighbourhood. The traces of the Belgic occupation of this district are to be seen in the camps, barrows, circles, hut circles, trackways, and cattle enclosures which abound on the Mendip and neighbouring hills. Their extreme western boundary, the Wansdyke, may be very distinctly seen in many places between the Bathampton Camp above Bath, and Meesknoll above Keynsham, but from this point, in its supposed course either to Porchester or to the Clifton Camp, Mr. Scarth and I have sought for it in vain. It is probable that, although the use of bronze, both in the East and on the continent of Europe had prevailed for a considerable previous period, the Belgic race was the first which introduced the bronze age into Britain. Even in the time of Cæsar, bronze was an imported article ("Ere utantur importato," B. G., v. 12); and it is not likely that the Phœnicians, if they found it to their advantage to have settlements on these coasts, would allow the native population to possess any weapons of a more formidable character than their sling stones and arrow-heads of flint. Of the Belgic race, which drove westward, and reduced to slavery, the previous and long-headed occupants of this district, Dr. Thurnam, the great authority on the craniology of our early British races, says: "The brachycephalous people or roundheads, who buried in the round barrows were more civilised than the dolichocephal (or long-headed) race; and may be inferred to have brought with them the more common use of iron knowledge of bronze. The exploration of their tombs, shows that hurrying the dead was with them the prevailing and fashionable, though not the exclusive, mode of burial; and the appearances are consistent with what we are told of the Gauls (their supposed conquerors) by Cæsar and Pomponius Mela. From the same source, or the appearance in the tombs, we should infer that they had advanced from the nomadic, hunting, and pastoral condition, to a more settled agricultural stage of culture; and that if they had not altogether abandoned the more barbarous customs of their ancestors, and in particular that of human sacrifices (which all history tells us, was at one time, everywhere prevalent) they had at least restricted them within narrow limits." These British brachycephaly of the bronze period," Dr. Thurnam adds, "are to be regarded as descended through the Belgic Gauls, from the great brachycephalous stock of central and north-eastern Europe and Asia, in all the countries of which,—France, Switzerland, south Germany, Bohemia, Poland, Russia, and England,—the broad and short cranial type is still the prevailing one." (Paper on the ancient British Barrows of Wiltshire and the adjoining counties, read at the opening of the Blackmore Museum, September, 1867.)

The Barrows upon the Mendip range, and which may be seen in clusters near Masebury Castle at Priddy, near the Castle of Comfort Inn, and on Blackdown, are not nearly so numerous or of such varied form, as those which are to be found on the Wiltshire downs around Abury and Stonehenge. They were the burial places of the more distinguished occupants of these hill tops during this Belgic period. The greater number of them were opened about fifty years ago by the Rev. John Skinner, rector of Comerton, near Bath. His manuscript account of their examination is in the Library of the Bath Literary Institution, but it has been printed in *extenso* by the Rev. Mr. Scarth in the 16th volume of the Proceedings of the Archaeological Institute. The interments were all in circles of the Belgic or bronze period, cremation having been practised in every case; and the few articles discovered with the burnt ashes consisted of bronze spear-heads, some amber beads, and some coarse clay cups. There appears to have been a considerable Belgic mining settlement at Charterhouse, which, from the articles discovered in it, must have been subsequently occupied by the British, who here worked the mines for their Roman master.

I take this opportunity of commending to the attention of Somerset archaeologists a remarkable and extensive collection of hut circles, which seems to have been hitherto unnoticed by them. It is on the slope of the northern harrier of Cleve Combe. Some of these circles are in the wood on the crest of the Combe, but the greater number are in the open space adjoining. In some instances the stone which has been dug out in forming them has been used on the surface to wall them round, so as to provide the occupants with a better protection against the weather than their walled covering could afford. One cannot traverse this ground without wishing to examine some of these circles with pick and shovel."

After the address was delivered and thanks voted for it, the Rev. W. Hunt, of Conglesbury, read a paper on the Monuments of the Borough

of Uxbridge, and Mr. C. Pooley one on the Remains of an Old Cross found at West Harptree. In the afternoon the members visited the parish churches of Axbridge, Cheddar, and Rodney Stoke. At a *conversazione* in the evening, papers were also read, and on the following two days excursions were made to various places of interest in the district.

The Wiltshire Archaeological and Natural History Society.—The sixteenth annual meeting of this Society commenced at the New Hall, Chippenham. The president (Sir J. Awdry) occupied the chair, supported by a numerous body of the leading families of Chippenham and neighbourhood. The secretary (the Rev. A. C. Smith) read the report, and after the appointment of officers for the ensuing year, Sir J. Awdry delivered the inaugural address, in which he said that any one who read the first chapter of Genesis must be of opinion—be he Darwinian or not—that creation was a progressive thing, and that Scripture and geology both told them that man was the final work of his Creator. Whatever were found among the pyramids of Egypt, or in the rubbish heaps on the Danish coast, were historical chronicles, if they were anything, that man existed there. He combated the idea that it was impossible to believe anything except there was a contemporary narrative. They, on the other hand, possessed trustworthy monuments, arising, as it were, out of the swamps of the ocean, to confirm them in what many persons believed to be only a supposition. Such things were as historical as they could possibly be, but still it behoved them to be careful. The business of the meeting, he said, would include a paper on the pit dwellings near Salisbury. In the Blackmore Museum were a large number of curiosities obtained from the Wiltshire clay. Wiltshire possessed Stonehenge, which was so vast a work that it excited the admiration of all who viewed it, and he asked whether those things were not historical in regard to the works of man. After alluding to the geographical position of Wiltshire, the president particularly noticed the church at Bradford, and the many conflicting opinions concerning the building. He said it was evidently a piece of workmanship prior to the arrival of the Romans, while some persons put it down as a work coinciding with that of the eighth century. The Rev. Canon Jackson read a paper, announced as "A few Odds and Ends about the Town and Neighbourhood of Chippenham." The Rev. J. J. Daniel followed with a long paper on the town of Chippenham, during the great rebellion. At the conclusion of the meeting, the Rev. Mr. Barnwell drew attention to the church at Bradford, of which we have before now spoken, and suggested that the society should take the initiative and assist in preserving such an ancient edifice. He said the building had been visited by various architects, all of whom were unable to fix any date to the church. After inspecting the church the members met at the Angel Hotel, and dined together under the presidency of Sir John Awdry. At half-past seven a *conversazione* took place in the school-room, when papers were read by Mr. C. H. Talbot on "The Existing Structure of Lacock Abbey;" Mr. W. Cunningham, on "Iron Ore and Iron Working;" and Mr. Goldney, M.P., on "Corsham." A temporary museum was opened in the room at the new hall, the articles for exhibition being lent by the members and friends of the Association. Next day the proceedings commenced by the party assembling at the New Hall, Chippenham, whence they proceeded on a visit to Lacock Abbey, where the company inspected the antiquities of the Abbey Church, &c., and then started for Corsham Court. From Corsham they returned, about 50 or 60 in number, to Castle Combe, where they were entertained at luncheon, provided by Mr. Lowndes. The church was visited; and then the whole party climbed the steep hills with which Castle Combe is environed, and drove on to Grittleton. Here Sir John Neeld entertained them with tea and coffee, and other refreshments; and then the pictures and statues and other works of art were examined by the large number of visitors who spread themselves over the suites of rooms and galleries. The gardens, and of course the church, were visited; and then the archaeologists drove back through Kingston St. Michael to Chippenham, where the meeting was announced to commence at 8 p.m.; and arrangements had been made for the delivery of a paper by Mr. E. T. Stevens, on the "Ancient Pit Dwellings in Salisbury;" a paper by the Rev. E. C. Awdry, on "Monumental

Brasses in some of the Churches near Chippenham;" a paper by the Rev. W. H. Jones, F.S.A., on "Some Names of English Occupiers in the time of Edward the Confessor, still preserved in those of Wiltshire Persons or Places;" a paper by Mr. H. A. Merewether, on "The Head Gear of the Ancients." Next day (Thursday), the excursion took the following route, viz.: Chippenham, by Langley Buller Church to Draycot, by Sutton Bengier and Christian Malford to Clack, Bradenstoke Abbey (where the Society were invited to luncheon by Mr. Goldney), by Foxham, Cadnam Manor House, and the Tythertons, to Chippenham.

NEW BOROUGH LUNATIC ASYLUM, IPSWICH.

This new establishment, though not finished, has assumed its outward form. The site is at Felixstow, and consists of two fields and a plantation, forming part of the Rose Hill farm, lying between the Foxall and Felixstow roads, and containing rather more than fifty acres. The situation is high and healthy, and the distance from the town convenient. The committee appointed the town surveyor, Mr. W. P. Ribbans, as the architect.

Mr. Ribbans accepted an offer of the Commissioners in Lunacy to allow him to examine plans they had approved of other asylums which had recently been erected, but he was informed that the Commissioners did not consider they had yet got an asylum which could be put forward as a model; and Mr. Ribbans, it is said, did not find the plans he saw of any great use to him. He prepared plans of a building calculated to accommodate about 130 patients, and these were sent to the Lunacy Commissioners for their approval. The Commissioners suggested some alterations, the principal being in the arrangement of the infirmary, which the architect had proposed to build two stories high, whilst the Commissioners suggested that it should be enlarged, and should be entirely on the ground floor. These alterations were made, increasing the estimate of the cost from 13,500l. to 16,500l. The altered plans were approved by the Commissioners, and tenders advertised for, the result being that that of Mr. Edward Gibbons, in 18,950l., was accepted at the end of April, 1868. Mr. E. Catchpole was appointed clerk of the works, he having acted in a similar capacity during the erection of the town-hall, and the work was at once commenced, and has now so far progressed as to be externally nearly completed, though it will be several months (the contract gives till next June) before the building will be entirely out of the contractor's hands.

The entrance to the asylum is from the Foxhall-road, from which the building is recessed about 120 yards, but the principal front is that which faces to the south, and is seen from the recessed and the Felixstow-road. The asylum, says the *Suffolk Chronicle*, in describing it, is a larger building than we should have thought would have been required; and from the nature of the arrangement of the asylum proper—a three-storied building, the main part only one room in width—it appears even larger than it really is. The length of the south front is 395 ft. of the high building, and then on either side is a low one-storied building—the infirmaries—extending 64 ft. further, so that the total length of the building is 526 ft. The material used in its construction is red brick, with white brick dressings, and here and there—as at the main entrance, and the bow-windows on either side—further relief is given by white stone; the roofs are slated, and the sky-line of the centre block is broken by an iron cresting. The centre of the south front is formed by the dining-hall and the chapel above it. These rooms are lighted by larger windows than the dormitories and corridors on either side; and the dormitories beyond the general line of front; they project beyond, and at each end of the high part of the building the day-rooms—large, bright, and pleasant rooms, built in the form of bays—are brought forward; and above these the towers, containing the ventilating-shafts, upon which a judicious amount of ornament has been bestowed, are seen. The windows in the first two floors have semicircular heads of white brick, and in the upper floor elliptical.

The arrangements, dimensions of the rooms, &c., are exactly similar on each side of the house. On the ground floor a corridor, 12 ft. wide, runs the whole length of the wing; it is lighted by windows looking southward, and from

it open nine rooms, each intended for a patient, and each 7 ft. 2 in. by 9 ft., besides attendants' rooms of rather larger dimensions, one of which is at the end of the corridor and next a dormitory, 18 ft. by 22 ft., in which several patients will sleep. Opposite the dormitory is the day-room of the patients located on this floor, 32 ft. by 20 ft., a light, cheerful room, with a southern aspect. The corridors will be used by the patients in the day-time as well as the day-rooms. Beyond the day-room on the ground floor is the infirmary, with a similar corridor with three single bedrooms, 11 ft. by 9 ft., and a dormitory, as well as a day-room somewhat smaller than that for ordinary patients.

The first floor is exactly similar in its arrangements to the ground floor, except that it ends with a day-room, the infirmary being only one story high. A few more steps lead to the chapel, a noble room of the same length and breadth as the dining-room, over which it is, and 2 ft. higher, lighted by seven windows, from which there is an extensive view.

Care has been taken that the wall which encloses the airing-grounds should not appear to be high and prison-like, and from the windows of the ground-floor it looks as if one could jump it with ease, but in reality it is a 7-ft. wall, the ground having been excavated close by it, so as to form a gravel walk some 3 ft. below the level of the rest of the garden. The ground slopes towards the east, so that on the female side of the house there will be a terrace, with steps leading to the garden.

The carpenter's and tailor's shops and the laundry are to be connected by covered ways with the main building. The drainage is easily carried off the premises, owing to the natural fall of the land. The gas-fittings and water-piping are being done by Messrs. D. & E. Haggart.

NOTES FROM THE SOUTH OF IRELAND.

The new cathedral to be erected in Cork from a design by Sir John Benson, will be one of large proportions, and will show variety in its treatment. The ridge of both transept and nave will be 80 ft., crossing each other at an equal elevation. The transept will be 114 ft. in length, and from east to west within the walls will be about 237 ft. The transept gable will be of a richly ornamental character; that on the south side will have a porch deeply moulded with a carved tympanum, the triangle over the archway being perforated for effect. Flanked at either side with double aisles, the choir will be seen, those aisles constituting chapels, this part of the building being joined to the transept by a flying buttress. Sacristies below, square, and securely built, will give the air of solidity to the adjoining slighter superstructure. To the west the view will show the south aisle and clearstory, and a tower, which, to the top of the parapet, is 157 ft., but, on completion, with finished spire, will be about 250 ft. A rich confusion of pillars will be presented to the sight on entering the transept door, five altars standing in the centre, others forming the termini of the double aisles, running along and forming part of the choir. In either end of the building will be large traceried windows, and above a long arcade resting on stone columns, around which will be a cluster of parasitical marble pillars, a triforium will rise. Over its arches will be the clearstory window; three stories will be then presented. The fascia of the nave will be open woodwork, suitable for coloured decoration. A groined roof of stone will cover the aisle. The choir beyond the transept will differ from the nave in some particulars, the floor being raised by a series of gradations to give effect to the altar; the triforium is cut off in this part, leaving the main arcade to possess the most height. These provisions are designed for the purpose of enhancing the internal appearance of the cathedral. The structure will partake of the "Marble City" Kilkenny, which boasts of "a fire without smoke, water without mud, and streets paved with marble," have at last resolved on lighting the old historical town with gas. Kilkenny has been long in the dark.

In Waterford a very pretty quarrel is going on between the Harbour Board and the Corporation, as to who has the right to seize the water-bailiff's fees.

The Sligo and Ballaghaderreen Junction Railway works are being proceeded with, and it is hoped it will open up the trade and facilitate the traffic due west.

In Limerick the Corkanree Embankment is nearly finished. The city surveyor is pushing on the works energetically. In a sanitary point the works will be an advantage to the city. It is intended to have its sides planted with ornamental shrubs, making the work at the same time ornamental as well as useful.

An infants' school is in course of erection by a society of the Sisters of Mercy, in Accommodation-road, Carlow.

In Kinsale, in Cork, for ten weeks there has been a dead-lock in the water supply. The streets were torn up during this time in laying down mains, but in the meantime the inhabitants are forced to resort to the surrounding districts to seek water. There has been banging or miscalculation somewhere in sinking the reservoirs.

Measures are about being adopted in Cork to obtain a training-ship and a capitation grant from the Government for the purpose of establishing a Naval Industrial School for Destitute Boys in the harbour.

The inauguration of the Royal Docks will take place on the 28th instant; the Lord-Lieutenant has accepted the invitation to a civic banquet on the occasion.

WATER SUPPLY.

THERE is a population of 30,000 at St. Helier, Jersey, who are dependent on any chance supply of water for ordinary or exceptional use. There are a few pumps and a few wells; but the population generally have to depend entirely on water-brought. *The Jersey Times* says,—

"The long drought of last summer ought, if anything can, to arouse us to the necessity of water storage. Neighbours quarrelled and fought for water, and the police magistrates were frequently engaged in investigating assaults arising out of the joint users of the same pump. The fear was before the eyes of large numbers of the people that the rain supply being exhausted, the wells would fail next, and they might actually go without water—a fate infinitely worse than deprivation of bread."

Even were the well-water more plentiful, it is hard, and otherwise unsuitable for domestic purposes. The only alternative, therefore, is to provide a reservoir for the storage of the water supplied by the mountain streams, and that which descends as rain. To carry out this scheme, a company has been formed, and, since there seem to be no engineering difficulties in the way, and as the want of a supply of water is beyond all doubt, there is every prospect, if the works are carried out, not only that a great public good will be done, but that a fair dividend will be paid to the shareholders. St. Helier is overlooked on several sides by hills, and among them it is suggested to construct a large reservoir from which the water will descend by its own gravity to all parts of the town. The company (a limited liability), is already incorporated, and of the 5,000 shares, at 10*l.* each, which it is proposed to issue, 2,000, it is stated, have been taken up, leaving 3,000 to be disposed of. The directors feel confident that a dividend of 10 per cent. per annum may be relied on. A contract has been entered into with Messrs. C. W. Harrison, G. Redgrave, and R. Robson, of London, for the completion of the works for 48,000*l.*

The water supply of Dover engages the attention of a committee to whom the question has been specially delegated. Experiment has disclosed the low levels to be the seat of an enormous waste complained of. Efforts should be made to discover the cause of waste in some systematic manner.

THE TRADES MOVEMENT.

London Carpenters and Strikers of Blackburn Joiners.—A representative meeting of the carpenters and joiners of London has been held. Mr. George Potter in the chair, to consider the propriety of lending pecuniary assistance to the joiners of Blackburn and Darwin in their existing strike for a reduction in the hours of labour. Mr. Sternale, a delegate from Blackburn, explained the origin of the strike, which arose out of a demand of the joiners to reduce the hours of labour from 54 to 49. The men declined to arbitrate the question, because the hours they asked for had been granted to other trades. The General Union of Carpenters had already spent 1,200*l.* on the strike. It was unanimously resolved:—

"That in the opinion of this meeting the short-time movement is the necessity of the day, and that its adoption will tend to the intellectual, physical, and moral improvement of the working classes; that this meeting,

therefore, views with satisfaction the efforts of the Blackburn joiners to reduce their hours of labour, and tenders them its warmest sympathy in their struggle."

A committee was appointed to receive the subscriptions of the London carpenters, and forward the same to Blackburn weekly. This strike, however, is now said to be nearly settled by a compromise.

Masons' Strike at Sheffield.—A meeting between master builders and operatives, to endeavour to settle the strike, has been held in order that representatives from each body might discuss the questions at issue. The mayor presided. After some little dissonance upon the rules in question, the mayor proposed that the matter should be postponed till January, when the questions then in dispute should be decided by arbitration, the masters meanwhile to withdraw the notices they had given, and open their workshops to the men. This proposition was eventually agreed to, subject to the approval of the general body of masters and men.

Fruits of a Strike.—The secretary of the Operative Spinners' Association at Preston has issued a statement to the members. The contract entered into between the association and the members out of employment will expire in four weeks, by which time the society will have expended, since February last, over 6,000*l.* The association has now discovered that "those who most advocated resistance were the very first to desert the men they advised to leave their work."

Strike at Dundalk.—There is a strike of the masons and bricklayers employed in the construction of the Dundalk and Greenore Railway. They ask an increase of wages from 2*s.* to 2*s.* 6*d.* a week, accompanied by a decrease of the hours of labour. A strike of the labourers employed on the same works occurred recently, but ended in a return to work on the old terms.

Strike at Stettin.—In Stettin, where a short time ago the corn-carriers left their work demanding a rise of wages, and where the cabinet-makers are still on strike, the carpenters, to the number of about 700, turned out on the 30th August.

SEWAGE UTILIZATION AND THE ESSEX SCHEME.

At the recent meeting of the British Association at Exeter, apropos of the grants for various purposes, Sir William Tite, with reference to the 50*l.* granted to Mr. Grantham for the treatment of the utilization of sewage, said he thought that there was a large company in existence under the superintendence of Mr. Hope, and that they were doing all that was possible in the inquiry, without the necessity of the Association spending money in following it out. He did not deny the importance of the question, but simply wished an explanation of why the 50*l.* were granted to Mr. Grantham, when the question was in the hands of a powerful company, with large means, and who were doing their best to show the advantage of the utilization of the sewage.

Professor Rankine said it was well known that the company was a large, powerful, and interesting one; but he wished to ask whether the company was established for inquiry into every conceivable way of treating sewage, or only to carry out a particular plan.

Sir William Tite said he believed it was for both. The scheme of the company was that, at the outfall of the sewage on the Essex side, a large channel should be cut down to the Maplin sands. It was said, and probably in truth, that if the sewage was poured over these sands, and the sands inclosed, a large and valuable tract of land would be recovered. The question was, was it true that sewage water possessed that fertilizing quality? That, of necessity, was the nature of the company; they had taken a farm, and were doing their best in every possible way to show that the utilization of sewage was an advantageous process. That being so, why should they take it up at the expense of the British Association?

Mr. Vignoles said it was the feeling in Section G that, however useful might be the efforts of the company, a more scientific and independent inquiry by the Association would be more satisfactory.

Dr. Farr said the Chemical Section at Norwich considered it very important that this committee should be appointed. The question of sewage utilization was of vital interest, both in an economical point of view, and as regards the public health; and they thought it very desirable that a scientific committee should investigate the sub-

ject, entirely unembarrassed, as Mr. Hope might perhaps be, by the pecuniary or other concerns of the company, or such considerations as might arise in the Metropolitan Board, of which Sir W. Tite was so distinguished a member. The committee took the question up in a purely scientific point of view, and 50*l.* could not be better employed.

Sir W. Tite said, after the explanation, he withdrew his objection.

We take this opportunity of drawing the attention of our readers to the voluminous and excellent reports of the proceedings of the Association given in *Scientific Opinion*, from which we here quote. These reports are far more complete than any others we have seen.

RAILWAY MATTERS.

THE promoters of a system of "Universal Penny Railways" have matured, and now submit for public consideration, a scheme by which, as they believe, the so-called "impossibility" of penny railways may be overcome. The basis of the plan is, of course, the assumption of all the railways by the State. By a number of economical changes in the management of the traffic, —for example, by doing away with tickets in the case of third-class passengers, who constitute two-thirds of the entire bulk of travellers by railways, and by the institution of "stop stations," the projectors of the scheme expect to produce results of the most startling character. In the "People's Class" passengers will be conveyed from London to Holyhead for 1*s.* 6*d.*; from London to Edinburgh for 1*s.* 11*d.* At a "stop station" the traveller will leave the train, and if he desires to go further will go through an "on room," and pay a toll of 1*d.* to the next station. By the disuse of tickets, &c., the promoters hope to save an enormous sum.

An embankment on the Oxford and Wolverhampton Railway, at Dudley, has been partially destroyed by a singular accident. The line is constructed over a bed of coal, which in one case comes to the surface. Owing to some cause the coal has ignited, and is still smouldering and the accumulation of water on the line is greater than can be carried off by the ordinary channels.

WORKING-CLASS DWELLINGS.

The Artisans and Labourers' Dwellings Act.—It appears that some of the metropolitan vestries are undecided as to the course of procedure they should adopt under Mr. Torrens's Act. At a recent meeting of St. Luke's vestry, the medical officer reported, under the Act, that certain huts or shanties in Wood's place, Chequer-alley, were unfit for human habitation; and the vestry clerk remarked that the vestry was empowered to shut the premises and keep them closed until they were put in a proper state of repair. Thereupon it was pointed out by several vestrymen that if they carried out the provisions of the Act they must employ several additional officers; and that if they put the premises into a proper state of repair, an expensive machinery would have to be put in force. The clerk, however, explained that if the vestry failed to carry out the provisions of the Act, the Home Secretary would cause them to be carried into effect, and charge the expenditure to the vestry; and Mr. Adams remarked that, if, after the receipt of the medical officer's report, an outbreak of fever occurred in the neighbourhood, the vestry would most certainly be held responsible to a great extent. Some of the vestrymen were in favour of proceeding under the Nuisances Removal Act; and Mr. Daniel suggested that the matter should be allowed to stand over for a month, and that meanwhile each member of the vestry should be furnished with a copy of the Act, so as to become master of its clauses. After a long discussion, the matter was referred to the sanitary committee, and copies of the Act were ordered for the vestrymen. In the meantime, the huts or shanties in Wood's place, Chequer-alley, remain "unfit for human habitation."

The London Labourers' Dwellings Society (Limited).—The report of the directors stated that they had completed the purchase of twenty-three leasehold houses in Watson's place, Kingsland-road, for 5,020*l.* The whole of the property had been put into thorough repair, which necessitated the temporary removal of most of the tenants in succession, and only the most respectable were allowed to return. The new block of buildings at Vauxhall was ready for occupation

in May, and out of eighteen tenements sixteen had been occupied. They consisted of two rooms, each with a scullery in common to each three tenements, and the rent ranged from 4s. 9d. to 5s. 6d. per week. The directors continued to allow one week's rent in the half-year to all those weekly tenants who paid quite regularly, and who also kept their houses in good order. Upon the whole, the directors were quite satisfied with the practical working of the plan. The total net rents had amounted to 982*l.*, and the net profit to 88*l.*, which was sufficient to pay the usual dividend of 5 per cent. per annum, free of income-tax. The benevolent fund was 500*l.*, invested in shares of the society, and the annual dividends were applied to support charitable and useful institutions in the localities. It appeared there were twelve distinct properties, containing 292 tenements, purchased for 29,276*l.*; solicitor, 446*l.*; repairs, 2,46*l.*; buildings, 9,300*l.*; interest on cost, 300*l.*; surveyor, 129*l.*; sundries, 62*l.*—total, 41,930*l.*

THE NEW OFFICES FOR THE POPLAR DISTRICT BOARD OF WORKS.

SIR,—In reply to the *ex parte* statement contained in your last impression in reference to the stoppage of these works, we beg to inform you that it is entirely incorrect, likely to mislead the public, and seriously to injure the contractors.

All the timber and other materials hitherto supplied on the ground have been approved by the architects to the Board of Works, and (contrary in our opinion to the contract between our clients Messrs. Baker & Constable and the Poplar Board of Works) Messrs. Hill & Fletcher and Messrs. Harston, the architects to the Board, have refused them a certificate for a portion of the contract sum due to them for work done and materials supplied until the whole of the timber required for the completion of these works is put upon the ground; and, as we deem this course to be utterly illegal, we trust to your sense of justice to insert this letter in the next number of your journal.—We remain, &c.

NOON & DAVIES (Solicitors).

JOSIAH MASON'S ORPHANAGE AND ALMSHOUSES.

THE reading public have been lately informed far and wide of a magnificent act of thoughtful charity on the part of Mr. Josiah Mason, of Birmingham, an act involving the appropriation of as large a sum of money as that devoted by Mr. Peabody to the improvement (more or less) of the condition of the poor of London; that this was determined on and commenced two years before the American philanthropist announced his first donation; that the two donors were born within a few days of each other, commenced life in the humblest manner, and were the builders of their own great fortunes. It seems that as far back as 1858 Mr. Mason established in the village of Erdington, about four miles from Birmingham, an Orphanage for the reception of 30, and afterwards of 50 children, and this institution he maintained entirely at his own cost. Desiring to engage in some large work of charity, he resolved, in the first place, to extend the Orphanage on its original site. By degrees, however, this plan was expanded, and Mr. Mason determined to erect a new Orphanage in another part of Erdington, for the reception of 300 children, two-thirds of these being girls, and one-third boys.

The new building in Bell-lane, Erdington, of which we now give a view, was commenced in 1860. Owing, however, to the endowment consisting of land, it was necessary that, in order to validate the gift, the donor should live twelve months after the deed had been registered, and, therefore, no public announcement was made in reference to the charity. The statutory period expired in July; and then, without ceremony, Mr. Mason handed his magnificent gift of 260,000*l.* to the appointed trustees, thus divesting himself of all control over the property, and devoting it formally to public uses.

The trust consists at present of seven gentlemen, residents in or near Birmingham. At the death of Mr. Mason the number of trustees is to be raised to fourteen, of whom one-half are to be always elected by the town council of Birmingham, either from its own body or from other persons. It is provided that the trustees shall always be laymen and Protestants, and any of them making default in either condition thereby becomes excluded from the trust. The property in the endowment and the general management of the estates and the institution are devolved by the deed immediately upon the trustees, but during his life Mr. Mason retains the right of acting as a member of the managing body, and of taking the general oversight of the charity, which is to be called "Josiah Mason's Orphanage and Alms-houses."

The endowments of the Orphanage, as we understand, consist of about 1,032 acres of freehold land. Of this about 220 acres, almost all of it valuable building land (and including Mr. Mason's own house and grounds), are in the village of Erdington; and the rest is in the parishes of Northfield, Bickenhill, Feckenham, Sutton Coldfield, and other places in the counties of Warwick and Worcester. About two acres and a half consist of building land in the heart of the town of Birmingham, mostly covered with buildings, and of increasing value. One of these properties, recently erected, is let at 1,500*l.* a year, and it is stated the total rental of the Orphanage estates cannot be much less than 10,000*l.* a year even now. In a very few years this amount will probably be doubled by the increasing value of the endowments, and in view of this contingency the trustees are directed to apply any surplus funds, when these are sufficient, to the erection of other orphanages, in accordance with the general scope of the trust deed.

A few of the clauses of the trust deed will show our readers the plan of education and religious instruction to be followed in the Orphanage:—

"The children who are admitted into the Orphanage shall be lodged, clothed, fed, maintained, educated, and brought up gratuitously, at the exclusive cost of the Orphanage income.

"Proper arrangements shall be made by the trustees for the instruction of the children, and having due regard to their respective ages and capacities in reading, writing, spelling, English grammar, arithmetic, geography, and history, and such other subjects of general and useful knowledge as may be, from time to time, directed or authorised by the trustees, subject to the condition which the said Josiah Mason doth hereby declare to be fundamental, that no instruction in any language or grammar other than in the English language and English grammar shall be given to the children in the said Orphanage.

"And it is hereby declared to be the express wish and direction of the founder, that all the children shall be brought up in habits of industry, and that, as far as practicable, the girls be instructed in sewing, baking, cooking, washing, mangling, and in all ordinary household and domestic duties, and in other useful knowledge, with a view to their being fitted to become useful members of society in those positions in life to which it may please God to call them, and which He may give them talents worthily to fulfil.

"And, under the deep conviction that the fear of Almighty God is the beginning of all true wisdom, the said Josiah Mason doth hereby declare it to be his special desire and direction that the children shall be carefully instructed in the knowledge of the Holy Scriptures, and taught to love, reverence, and obey the doctrines and precepts therein graciously revealed, and, through the Divine blessing upon the labours of those engaged in their instruction, the words of the Apostle may be addressed with truth to every child who shall have been brought up in the Orphanage: 'From a child thou hast known the Holy Scriptures, which are able to make thee wise unto salvation through faith which is in Christ Jesus;' provided always that all the religious instruction given in the Orphanage shall be confined to the Holy Scriptures in the authorized English version, and to the truths therein contained, and that no catechisms, formularies, or articles of faith, whether of the United Church of England and Ireland, as by law established, or of any other body of professing Christians, shall be taught to the children.

"The trustees shall make such provision as they shall, from time to time, think fit for the assembling of the children for divine worship in the institution, having regard, as far as practicable, to the earnest desire of the founder, that the children may be trained up as simple and sincere followers of the Lord Jesus Christ, without reference to sectarian distinctions and prejudices; and it is hereby declared that the trustees shall, out of the income of the Orphanage, expend such sum as shall from time to time be, in their judgment, necessary to provide for each orphan, on leaving the asylum, a sufficient outfit in clothes, in the discretion of the said trustees, together with a Bible, and the said trustees may also pay such sum as an apprentice fee as they may, in their discretion, think fit."

The almshouses in the village of Erdington are intended for the reception of forty-six female inmates; twenty only have been admitted during

the past ten years; the building which formerly served as an orphanage is now being converted to accommodate the twenty-six additional aged women. These almshouses and the new Orphanage are at some distance apart, and form distinct institutions, the latter standing in its own grounds of thirteen acres in extent. The aged women are received at the discretion of the founder. The admission of children to the Orphanage is controlled by one condition only, "that every child shall be under the age of nine and the legitimate child of poor parents both then dead." There is no other condition whatever, neither of position, country, nor religious persuasion. The children remain in the Orphanage, if boys until they are fourteen, or if special permission a twelvemonth longer; and if girls, until they are eighteen years of age. Provision is also made for girls willing to enter service at the Orphanage "with the *bona fide* intention of becoming teachers, nurses, or assistants, either in the Orphanage or in other like institution."

The view we give of the Orphanage shows on the left the south-west front, and on the right the south-east front. The building was designed by Mr. J. R. Botham, architect, but, through circumstances, was not carried out by him, as we understand, to completion. It is of brick, with stone dressing, and in style may be called Lombardic. The three towers which give it character (two only appear in the view) are made to assist in the ventilation of the establishment, and receive the smoke from all the fireplaces.

On the ground-floor, at the end of the south-west front (left wing), is the library, 36 ft. by 30 ft. 6 in., at the back of which is the chapel, 50 ft. by 30 ft. 6 in.; between the two projecting wings of this front are six private rooms for officers, each 20 ft. by 14 ft. 6 in., and the infants' nursery, 30 ft. by 20 ft.; at the angle of the building (right wing) is the infants' schoolroom, 36 ft. by 30 ft. 6 in. Along the south-east front are two storerooms, each 23 ft. by 18 ft.; the officers' dining-room, 23 ft. by 18 ft.; and the dining-hall, 70 ft. by 23 ft. Behind these are the kitchen, 61 ft. 9 in. by 30 ft.; and the laundry, 52 ft. by 30 ft.; together with the stores, pantries, and servants' offices.

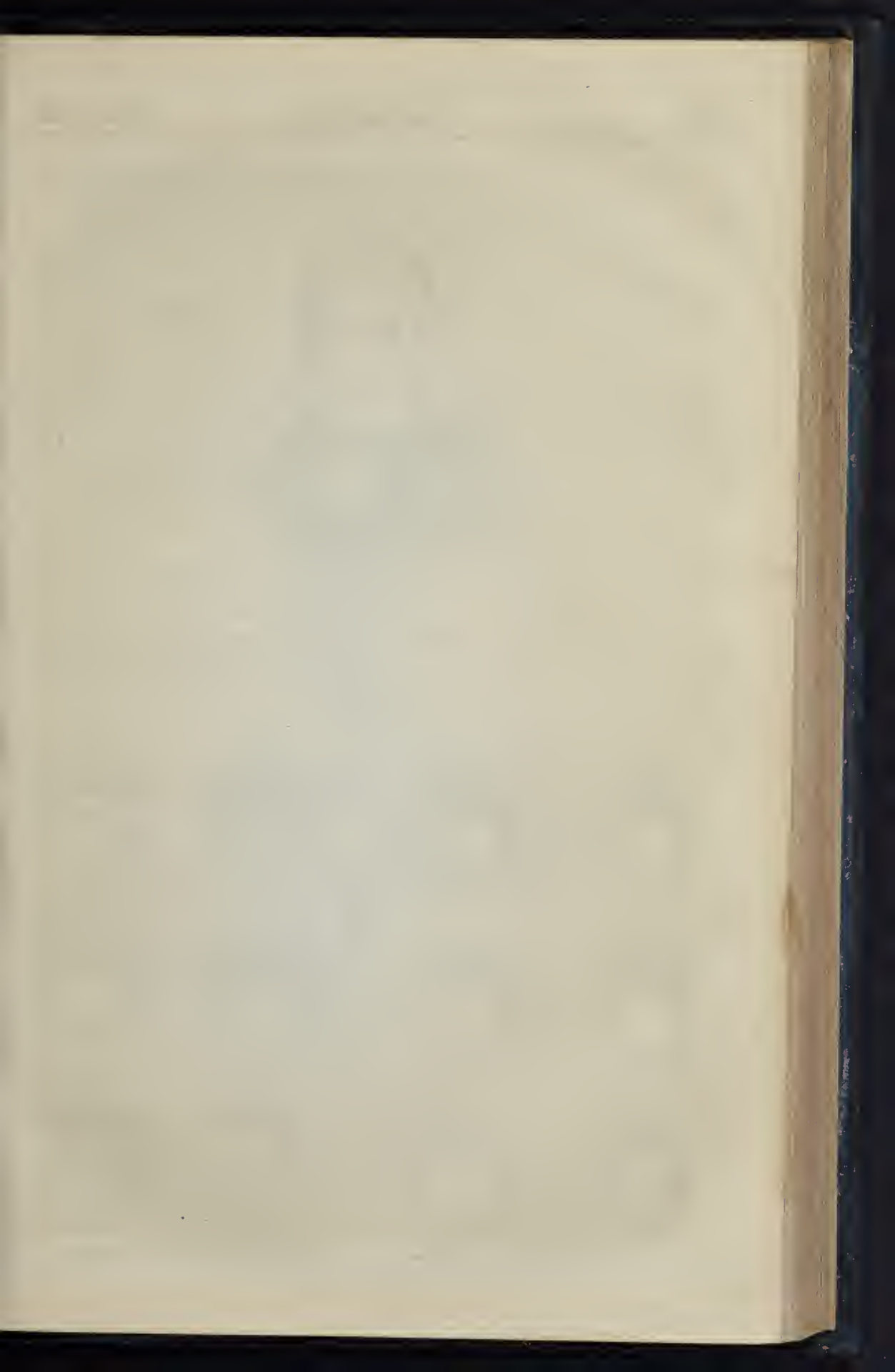
On the one-pair floor, over the library, is the infirmary, 46 ft. by 30 ft. 6 in.; eight bedrooms, each 14 ft. 6 in. by 13 ft. 6 in., over private rooms; girls' sewing-room, 36 ft. by 30 ft. 6 in., over infants' schoolroom; three class-rooms, each 23 ft. by 18 ft., over stores and officers' dining-room; and schoolroom over dining-hall, 70 ft. by 23 ft. Over the kitchen are two lavatories, each 56 ft. by 14 ft. 6 in.; and above the laundry is a large storeroom, 52 ft. by 30 ft. Over some of the offices at the back is a girls' playground, 38 ft. by 16 ft.

The two-pair floor is occupied by the dormitories.

The basement under the whole of the south-east front is appropriated to a covered playground.

In the various accounts published, the cost of the building is given as 60,000*l.* We are enabled, however, to say that this can scarcely be correct unless indeed there was much unwise expenditure; as, according to a carefully prepared estimate made by an experienced surveyor, it would not have exceeded 33,200*l.*, including fence walls and gates, had the work been executed by a builder in the usual way. Mr. Mason, it should be mentioned, was his own builder.

The career of the admirable founder of this great charity has already been sketched in several journals. We must content ourselves with a very brief allusion to a few points of it. How unfurnished he was at starting with the good things of this life, is shown by the statement that he commenced it by selling rolls and cakes about the streets. Working his way, we find him in 1823 (when he was twenty-eight), engaged in the manufacture of split key-rings in Birmingham, and commencing the foundation of his present large fortune. All the world knows Perry's pens and Elkington's electro-plating, but until this orphanage was talked of only a very few persons were aware that these titles might be with equal justice Mason's pens and Mason's electro-plating; in the one case his ingenuity and skill, and in the other his spirit of enterprise and his capital having placed these matters where they are. Join to these undertakings some successful copper works at Pembley, and it will be unnecessary to look for other sources of his wealth, part of which he is now spending with a noble motive.

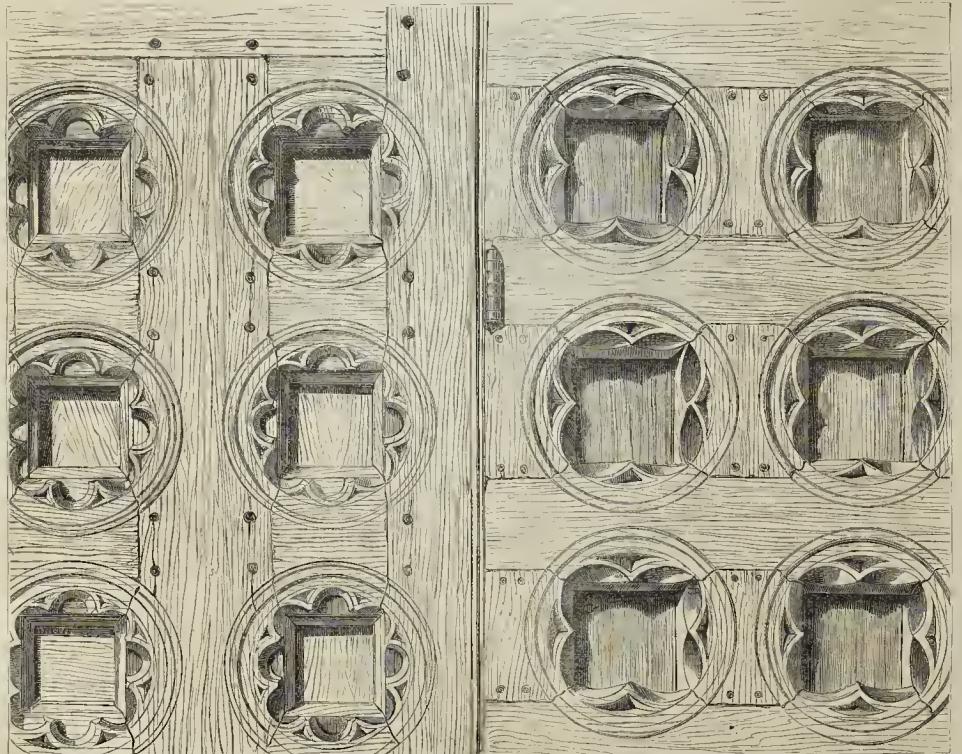




MR. JAMES PENNETHORNE.

Architect of the New Buildings for the London University, Burlington Gardens.

CARVED DOORS.



Portion of Door of a House at Münster, Westphalia.

Portion of the West Door of St. Catherine's Church, Utrecht.



MR. MASON'S ORPHANAGE, IN EDDINGTON, NEAR BIRMINGHAM — DESIGNED BY MR. BOTHAM, ARCHITECT.

WORTHING SEA-DEFENCES COMPETITION.

SIR,—To show the fair way in which the competitors in this affair have been treated, I beg to forward you the following extracts from the local press.

In the *Brighton Daily News* of September 13 appears the following:—

"Among the schemes which involve the least expenditure, is one proposed by the Board's surveyor, Mr. Johnson, which is very simple, but, we think, would prove effective if carried out. He suggests the erection of twenty-four groynes, and a breastwork 1,300 ft. in length. . . . Mr. Johnson was, we believe, engaged in the construction of the sea defences at West Worthing. . . . The Board will hold a meeting this evening, when a motion will be made respecting the plans; but we are not able to state whether one of them will be decided on at this meeting."

In the next day's impression of the same journal appears the following:—

"A meeting of the Local Board was held in the Town-hall last evening, when the plan for the sea defences of the Lancing-road was decided on. Mr. Patching said they had met together to decide upon a very important question. . . . He proposed that the Board adopt the plan bearing the motto, 'Resisto Oceanus.' . . . Mr. Smith said by some means it had been made known who were the owners of some of the plans which had been submitted. He regretted this, as it was a secret matter, but he did not believe it was mentioned by any member of the Board. It should be mentioned that the plan selected proposes the erection of twenty-four groynes and 1,300 ft. of breastwork."

Is it just, I ask, after such a flagrant breach of the usual rules in competition, to thus award the premium, and trifle with the valuable time of professional men? R. S.

SIR,—Would you kindly insert in your next issue, that the plans selected by the Worthing Local Board and their consulting engineer for the above works, was that hearing the motto, "Resisto Oceanus," Mr. C. W. Johnson, Town Surveyor, Worthing; and the plan under the motto, "Desideratum," Mr. R. Blaker, Builder, Worthing, was the second best. C. W. JOHNSON, Town Surveyor.

COTTAGE HOSPITALS.

A COTTAGE HOSPITAL is about to be established in Ashford, Kent, at the cost of Sir Edward Hoare, bart., and other influential residents, to provide for the treatment of the poor, during illness, as nearly as possible with the surroundings of their own cottage home, but with better sanitary appliances, more skilful nursing, and more liberal diets than can be obtained by them under ordinary circumstances. Some cottages and other property in Ashford have been taken for the purpose, and plans prepared by Mr. Thomas Henry Watson, of London, for the necessary alterations to carry out the above objects. The alterations proposed are not considerable. Mr. Watson reported that it is desirable in such works to keep constantly in mind the importance of not destroying the "cottage style" of the building, and of maintaining the homely feeling of the poor when treated in small rooms, instead of in the large wards of county or metropolitan hospitals. Good ventilation and supervision, together with separation of the sexes, are indispensable. The works are to be carried out under the direction of Mr. Wm. King, of Ashford, as local superintendent.

A WORKMAN ON THE TRADE-UNION CONGRESS.

SIR,—It is said, and with some truth, that this is an age of congresses; and, no doubt, all the evils which affect society would be eradicated if the resolutions passed at the meetings could be carried out. I read with some interest the report in the *Builder* on the late Trade-union Congress; and as I dissent from the canons of trade-unionism, and believe that heterodoxy in relation to that question is the best course, I wish, sir, with your permission, to give in the columns of the *Builder* my reasons, and to state the other side of this great social question.

The Trade-union Congress is unlike all others, inasmuch as the delegates did not meet to consider what was best for society, but how they could make the public serve the ends they had in view. It appears trade-unionists live in a world of their own, the creation of which is not for the benefit of the community, but only to protect their privileges, and to get more wages for less labour. I am not going to state that no honour is due to the delegates for their exposition of trade-union wants, and what they

intend to do; but it must be remembered they represented the aggregated wisdom of the whole body of trade-unionists. Mr. Potter, in his introductory paper, for once deviated from the usual course, and got but small praise for his pains; and in treating politic and impolitic questions he told some truths relating to the misexpenditure of earnings by the working classes. That part of the social question has been treated on often before. The author of "Lives of the Engineers," in the *Quarterly Review* for July, 1860, showed what could be done by the working classes if they would understand wise spending as well as great earnings. Teetotalers, for the last thirty years, have told the public that the expenditure of wages by the working classes in intoxicating drinks was the cause of untold misery. It led to short work, had pay, ill health, and pauperism, and, in short, was the cause of almost all the evils which afflict society; and they also add this proviso, which science and experience prove,—that man is best without intoxicating drinks, as they supply no physical want, and no place is found for them in the human organisation. We teach and practise teetotalism, not for the purpose of winning strikes, but to win humanity into better and wiser paths. The question of arbitration is an important one, and touches a practical one, which may in time be successfully carried out. It seems that but few are aware that arbitration was tried some time prior to its re-introduction by Mr. Mandella, and I think it would have been well to have inquired into its partial success and collapse. In the "British Almanac and Companion" for 1857, an article appeared giving "A History of Arbitration in Trade Disputes;" and I find so early as 1854 a conference was held under the auspices of the Society of Arts; and as far back as 1829 the lace-makers of Nottingham established a sort of court of arbitration to lessen certain evils then existing. It further gives the results of hours of arbitration, in connexion with 16 other trades, some of which were successful for a time, and then failed for want of a compulsory law to keep the machinery in motion. The "Conseils de Prud'hommes" in France appear to be unsuited to trade disputes in this country, as they only deal with minor cases, which are personal to the employer and single workmen; while in this country arbitration seems to be established to settle disputes in which hundreds or thousands are concerned. I think an amalgamation of the two systems is wanted in England, which must be made compulsory; as, without a law to enforce arbitration, it will, after the novelty has worn off, fail when it is most wanted. Some doubts have been expressed about the working of a compulsory law, as it is said the law cannot, in a free country, force workmen or employers to accept an adverse decision. And herein lies the difficulty of arbitration. I think employers would, as a rule, accept the conditions of the board, as their interests are materially affected by a strike, and some method might be found to deal with those who would not accept the ruling of the board. And as to the workmen, the law should be framed so as to protect employers in respect to their obtaining other workmen, by making it criminal to obstruct or molest them, by picketing or otherwise, in obtaining workmen willing to work on the terms agreed to by the board.

The repeal of the combination laws was demanded by the congress, or, at least, that "part which prevents a number of workmen coercing or intimidating a smaller number from following their usual employment." The delegates also demand that trade organisations of working men should be placed in the same position as other legal associations. The question resolves itself into, What are legal associations? In most cases they are easily defensible;—a trading or manufacturing company which fulfils the conditions imposed by the legislature; or a number of men engaged in a co-operative business, and carrying it on without interfering with the action of others, is a legal association. But if three out of four were to unite, and determine the fourth should in all respects conform to the rules and regulations of the others, and, by molestation, try to force it into compliance, they would no longer be legal, and the public would not recognise them as such. Trade-unionists demand that the law shall legalise their right to work, or refuse to work, with certain persons. One speaker gave an illustration of who one class of these certain persons were; i.e., if a man took 5s. a day when the market value was 6s., and they said they had as great a right to refuse to work

with him as he had to take that payment. If it happens a man is an inferior hand, or has some other misfortune, or no employer would give him work at full wages, trade-unionists would turn him into the world to starve, because he was not gifted with the same powers as they possessed. Such law, if passed, would be an outrage on humanity, and ought to be condemned by all who claim to belong to civilised society. It does seem that legal trade-unions are to be different from all legal associations, and will have nothing in sympathy with the progress of the age. A barbarous people might, perhaps, pass such laws as the trade-unionists demand, and savages might be found to put them into effect; but for a number of men to ask, in this the nineteenth century, for retrogression and despotism, is adding one more to the curiosities of civilization.

In another letter I will examine other favourite dogmas of trade-unionists, to show they are bad in theory, and an agitation for them to be put in practice would do great injury to the working classes; and that there is something more than the profits of capital which regulate the rate of wages. JACK PLANE.

ARCHITECTS' ACTIONS.

BECK v. STEWART.

THIS was an action brought in the Queen's Bench by Mr. George Beck, an architect, of Hastings, against the Rev. Halley Stewart, a Dissenting minister of the same place, to recover 143l. 17s. 3d. under the following circumstances:—

The defendant paid 15l. 15s. into court. This action was referred from the last assizes at Maidstone to Mr. John Phillips, of Mire-court, Temple, by consent of both parties. The reference took place on Monday, the 31st ult.

The inquiry was a protracted one, and lasted from 11 a.m. to 8 p.m. Several witnesses were examined pro and con, and among them the plaintiff and defendant. The case was shortly as follows:—In the year 1838 defendant came to plaintiff, and having stated he had some money at his command, instructed him to look out some properties in Hastings which might be converted into a ladies' seminary. Plaintiff accordingly did so, and viewed and inquired into several properties likely to be had for the purpose. This lasted until the middle of 1838, and that scheme was abandoned. Soon after defendant purchased some land on the Clive Vale estate, Hastings, and instructed plaintiff to prepare plans, &c., for about twenty-four labourers' dwellings, to be built in flats; this was done. Specifications prepared, quantities taken, notices for tenders for the works issued, and tenders received; and in consequence, as defendant alleged, that the amount exceeded his resources, the buildings were abandoned. Defendant asked for his bill, which was tendered, amounting to 1897l. 12s. 3d., and defendant paid him 75 guineas which he considered was all he was entitled to; and the ground of his defence was, that the plaintiff undertook that each dwelling should not exceed in amount the sum 300l. Plaintiff, on the other hand, proved to the complete satisfaction of the arbitrator in the suit that no such stipulation was made, and on Saturday, the 1st, the arbitrator published his award, which was in favour of the plaintiff, Mr. Beck, for the full amount claimed, and also the costs of the cause and the reference.

NEW WORKS OF THE CHARTERED GAS COMPANY.

THE Society of Engineers paid a visit the other day to the new works of the Chartered Gas Company near Barking, which have been erected for the Company by the Messrs. Aird, from the designs of the Company's engineer, Mr. Evans, at the cost of about 600,000l. According to the official account of the visit, the cylinders to carry the pier are now being sunk. The method employed is one well known. It consists in excavating the ground from the interior, and allowing the consecutive sections to sink by their own gravity. If necessary, they can be weighted, should any obstacle obstruct their descent, and should they get fast, the aid of a driver is called in to ascertain the cause. Being 6 ft. in diameter, these cylinders offer great facilities for carrying on the sinking operations. The separate lengths are 13 ft. in thickness, with flanges on the inside, through which they are bolted together. As it is necessary to carry them down about 10 ft. into the hard gravel, they are sunk some 30 ft. below the Ordnance datum, and their total height is not far less than 60 ft. The superstructure will consist of wrought-iron girders fixed on the cylinders, and the pier will form a direct communication between the river and the retort-houses. It projects at right angles from the river wall, and after continuing in this direction for about 400 ft., it turns suddenly "up stream" for nearly double that distance. The coal will be raised by steam or hydraulic power from the barges into tracks on the pier, which will run

from it along a viaduct, which forms, in fact, a continuation of this pier into the retort-houses. The river wall extends 1,000 ft. of the 1,500 ft. frontage belonging to the Company. It is built of brick, coped with stone, and protected in the usual manner by fender piles, which are bolted right through the wall in a secure and substantial manner. The gas having been made will pass into gas-holders, which have a diameter of 180 ft., and the nited contents of the four will amount to 4,000,000 cubic feet. To supply these reservoirs, the retort-houses, which are also four in number, will contain 1,080 retorts, each of which is 20 ft. in length, and capable of being charged at both extremities. The main pipes are 4 ft. and 3 ft. in diameter respectively, and the operation of laying them was inspected by the party. They were conveyed to the spot, over a light railway, which has been laid down on a road which will eventually connect the gasworks with a point on the Barking-road. In consequence of the isolated nature of the locality, it was necessary to construct this road in order to effect inland intercommunication.

EXETER HALL, STRAND.

The large room at Exeter Hall and the approaches to it have been painted and decorated with more force than finesse. The covered ceiling is divided by bands of yellow and whio wreaths of red and green, upon a greenish blue ground, into geometrical forms, amongst which the numerous ventilators play a prominent part. The walls are of a sort of fawn colour, with pilasters of light green, and all the enrichments—which are Greek in style—have been painted in bright colours; the whole being supported by a dado prilled in vermilion and black. The large organ is painted and gilded in patterns that suggest Egypt.

The forms into which the ceiling is divided are somewhat large and coarse, and the pattern is awkwardly broken in the centre. The side walls, too, are a little gloomy. What the effect will be when the room is lighted up with gas we have not yet had the opportunity of seeing. The work has been carefully done by Messrs. Harland & Fisher, under the direction of Mr. A. W. Maberly, architect.

"SPARE THE TREES."

As large tracts of land are continually being let on building leases in the neighbourhood of the metropolis, and as the Finchley-road estate, long preserved from being built upon, will now, I suppose, be gradually covered with houses, allow me to ask your powerful aid in drawing the attention of builders to the ruinous mistake they so often make in cutting down all the trees on their ground. In a large field close to my residence there was a fine row of lime-trees fronting the main road. The field was let for building. Every one of these trees was immediately cut down, besides three or four fine old elm-trees along the side road. Large houses were run up, and a set of wretched little stuccoed arches, by way of entrance-gates, were built where the trees had previously stood. The houses do not let, and the builders are in the *Gazette*. Had the houses been rather smaller, placed further back from the road, and protected from it by the said trees, they would have been most attractive residences for gentlemen worried with the day spent among noise and glare, worned of people and interminable brick and mortar in the great city. But if those gentlemen can find something more countrified within reasonable distance, we may be sure they will not take houses with nothing to look upon but a brick wall, stucco arches, and the houses on the opposite side of the way. When will builders understand that men who come away from business in London want, of all things, to look on trees and grass, to be free from the sights and sounds that would have been pressing on them all day long?

It would seem as if, to some extent, builders are already aware of this fact, from their often planting little eaplings in front of their houses when finished. But this only makes their suicidal policy of cutting down well-grown trees (which no money and only many years can replace) the more painfully absurd. In the case just referred to, a few little things have been stuck into the ground, but they will give no real refreshment or shelter to the eyes for many years. The foreman's mind, at least, was enlightened on the subject one day, but too late, when a gentleman came to look at the houses,

and said, pointing to some trees yet undemolished on the further side of the field, "Ah! if they were only near those trees I would take one of them," little thinking how many had been destroyed close by.

GAS.

The present price of gas per thousand cubic feet is, in Leeds, 3s. 6d.; Bury, 3s. 4d.; Salford, 3s. 4d.; Manchester, 3s. 2d.; Ashton, 3s. 2d.; Sbeffield, 3s. 3d.; Liverpool United, 3s.; Dudley, 3s.; Stockport, 3s.; Carlisle, 3s.; Birmmgham, 3s.; Derby, 2s. 11d.; Warrington, 2s. 9d.; Plymouth, 2s. 9d.; Cardiff, 2s. 9d.; Birmingham and Staffordshire, 2s. 6d.; Newcastle-on-Tyne, 2s. 6d.; and Walsall, 2s. 4d. Not only have the Manchester people the advantage of cheap gas, but what is more, and what the Londoners with their higher-priced gas have not, the Manchester gas consumers have gas that is good as well as cheap; and still more than all, the Manchester gas yields to the corporation, who provide it, and of course to the people, handsome profits, which have been laid out in reducing local taxation, and carrying out city improvements.

LINSEED OIL.

SIR,—Can any of your readers inform me of some easy way of testing linseed oil? It is important to the trade, as I believe it to be largely adulterated with resin oil or other material; preventing the work from drying hard. I am, &c., E. L. D.

*A considerable amount of information on the subject of the too general adulteration of linseed oil will be found in an earlier volume of the *Builder*.

"SOUTH-EASTERN RAILWAY MANAGEMENT, OR OTHERWISE."

SIR,—As you have already entered a protest on the above subject, will you allow me to state that I yesterday sent a clerk, to meet a clergyman, a client, who was leaving town by the 4 p.m. train from Charing Cross Station. The business was, of course, urgent. The clerk arrived in reasonable time, but was informed that he could not on any account be allowed to pass the barrier, although he stated the circumstances and the urgency of the case, and pointed out the gentleman at the further end of the platform. After many minutes wasted in solicitation on the part of my clerk, and stern denial on the part of the official, that dignitary deigned to state that my assistant must obtain a porter, who could inform my client that he was required. Of course, some time was consumed in finding this clergyman in corridors; and, of course, also by that time my client had taken his seat in one of the carriages, and Mercury had to inquire for him at each compartment, my client having eventually to walk from the further end of the platform to the barrier, as the train was starting. As it was, I believe, he did regain his carriage, or at all events went by that train; but had the business taken two instead of one minute to transact, it is obvious that he would have been seriously inconvenienced.

ARCHITECT.

MANCHESTER ARCHITECTS.

SIR,—For several months past the following advertisements have been inserted in the *Manchester Guardian*:

No. 1.—Plans, specifications, &c., by an Architect, upon exceedingly reasonable terms. Preliminary sketch designs gratis.

No. 2.—An Architect is open to make plans, &c., for Buildings at his own Office on advantageous terms. On Saturday last there was also the following advertisement:

No. 3.—Plans by an Architect 15 per cent. A clerk of mine who had been a book-keeper in a builder's office, and who had come to mine to copy specifications, I found practising on his own account, calling himself an architect, copying my plans, &c. On finding that out I immediately discharged him. I then asked a friend to answer the above advertisements in order to ascertain whether any other of my assistants were doing the same, when he received three replies, of which the enclosed are copies. What will the so-called profession come to? AN ARCHITECT.

THE SOUTH SHIELDS' TOWNHALL COMPETITION.

SIR,—I think it is due to the competitors that they should know the way the above competition has been conducted; therefore I extract from the *Newcastle Chronicle* the following intelligence:

"Mr. Ald. James said he would, if the council was willing, read Mr. Hall's report about the plan of 'I Work to Win.' Mr. Young jumped up and protested against reading of the report, as unfair to the other competitors. It was understood that no one should know who the architects were who were competing, yet he understood that one of the architects had sent circulars to the members of the council, and the letters contained his initials and the post mark. When he voted for 'I Work to Win,' he knew for whom he was voting. Such a proceeding was very unfair to the other competitors. Mr. Stanton asked if it was generally known by the council who this man was who signed the initials 'J. D.' so plainly."

Mr. Young said it was Johnston. Mr. Stanton said, if the name of the man was generally known, he would propose that his plan be knocked out of the competition.

Several cried, 'No, no.' The name is only surmised; but Mr. Young persisted in shouting, 'Johnston; his name is Johnston.'

After further discussion the vote was taken, when the first premium was given to 'I Work to Win,' the plan 'Well considered' being declared the winner of the second prize.

The envelopes bearing the mottoes of the winning plans were then opened, and it was found the winner of the first prize was Mr. J. Johnston, architect, Clayton-street, Newcastle.

Mr. Young: I told you so."

I wish to ask the architectural profession in general, and Mr. Johnston in particular, if it be considered decent for a professional man to take unfair advantage of other competitors by sending circulars to members of the town council so as to obtain votes for a design submitted.

HONESTY.

VENNOR CEMETERY COMPETITION.

SIR,—The Vennor Burial Board must thoroughly believe the proverb which tells us that "a corporation has no soul to be saved or body to be kicked," otherwise they would have a wholesome dread of an attack of that disease which a coroner's jury declared to have been the cause of death of an old miser, who suddenly dropped dead after giving a beggar a farthing,—viz., "enlargement of the heart."

This liberal Board offer the magnificent premium of 20l. for plans, specifications, and estimates for laying out and erecting burial-ground, and building a house for the aged and two chapels. But, stop a moment: the Board are not so liberal as they appear to be; for, on reading the advertisement carefully, you will observe that the Board offer the premium, not for the best set of plans, estimates, &c., nor even for that one which the Board in its wisdom may consider the best, but "for the plans which may be adopted. The Board have only to decline to employ a plan, and they will then have very cheaply sucked the brains of all those who may be so innocent as to respond to their invitation. Nothing is said about employing the successful (?) competitor to superintend the buildings on the usual terms, and for a very good reason, which is this, I am told:—The Burial Board, some time ago, looked out for the work a young man, who calls himself a civil engineer, and has appointed him surveyor to the Board. It appears, therefore, their surveyor having had no experience in architecture, that the Board are desirous of getting, at little or no cost, an idea to set him to work. Will the Board offer their 20l. in the *Builder*, and the local newspapers a whole week before advertising in the *Builder*, which is the recognised organ for such announcements? VENNOR, SAT. SAT.

BRIDGE AT LEEDS: COMPETITION.

SIR,—Allow me to draw your attention to an advertisement which has lately appeared in the newspapers of a competition for a bridge at Leeds, and which appears to me to be worthy of special notice. The premium offered for the best design is 100 guineas, and that for the next best is 50 guineas. The remarkable part of the advertisement is, that competitors are told that before they can be furnished with the block plan and conditions to enable them to compete, they must pay out guineas to Mr. C. A. Curwood, the town-clerk of Leeds. Thus if 150 competitors (no unusual number in these days) apply, they will, between them, pay the two premiums; and, as the corporation guard themselves from undertaking to employ the recipient of the first premium in the execution of the work, the competition resolves itself into a sweepstakes, where the entrance-money is one guinea, and the first and second prizes 100 guineas and 50 guineas respectively.

It appears to me that the competitors might as well invest a guinea in a good sweepstake on next year's Derby as spend it in guineas in acquiring the plans and particulars of this competition. In the former case their guinea would have an equally good chance of being returned with 50 more guineas, and they would save themselves the trouble and expense of preparing the competition designs. If the guinea were demanded as caution-money, it should be returned to those who send in designs; but, as the case now stands, it is an ingenious device for making the competitors pay all or part of the premiums, and it does credit even to a Yorkshireman's acuteness. C. E.

THE "SENTINEL AT WINDSOR."

SIR,—The anecdote of the "Sentinel at Windsor" being saved by a clock being verified to have struck "thirteen"—which is doubtless true—was considerably older in date than the existence of the present "St. Paul's" clock, or bell, and, I believe, occurred about the time of James I., or a little later; and the bell which he heard was the great one in the old tower of St. Stephen's, Palace-yard (seen in view by Hollar, &c.); which being nearer the water, and at a different aspect of the river, was, perhaps, more audible at Windsor. At any rate, that was the bell. J. D. P.

MARGATE.

SIR,—Amongst minor matters that require attention, some improvement might surely be made in the reception given to those who arrive by the "husbands' boat," which is simply disgraceful, to say the least. Jaded, and perhaps ill, after an unaccustomed roll on the sea, the passenger no sooner finds himself on the top of the steps of the Jetty than he is compelled to "run the gamut" of a long lane of hooting and yelling beings, more like savages than civilized friends, who treat him as though he had committed some horrible crime, and eadly try the nerves of a sensitive man. B.

American Institute of Architects.—We have before us reports of papers read before the New York Chapter of the American Institute of Architects, and will give some account of them on another occasion.

FROM SCOTLAND.

St. John's Episcopal Church, Forres.—This church has been reopened for divine service by the Bishop of Moray and Ross, Primate of the Scottish Episcopal Church. The building consists of a nave, with transepts and circular chancel, and is arranged after the style of the Basilica. The interior has been entirely renovated, and the whole apse richly diapered in colour with devices about the altar and on the part forming the reredos. The three apse windows are by Barnett, of Newcastle. They are memorial windows, placed respectively by Captain and Mrs. Dunbar, of Seapark, Lady Gordon-Cumming, and Mr. John Grant, of Glenmoriston. A circular window at the west end of the church is also of stained glass, and is contributed by members of the congregation. The altar, and the whole of the apse in which it stands, the pulpit, reading-desk, pews, &c., have been renewed at the cost of Mrs. Dunbar, of Seapark, and her son, Mr. J. A. D. Dunbar, jun., of Seapark, after designs by Mr. Ross, of Inverness.

Consecration of St. Paul's Episcopal Church, Strathnairn.—This church was opened on Tuesday last, and consecrated by the Bishop of Moray and Ross. The building has been erected from funds left for that purpose by the late Mr. Macgillivray, of Danraglassa. It was designed by Mr. Alexander Ross, architect, and is of the early English Gothic style, built of granite, with freestone dressings. It consists of a nave with apsidal termination, and heltry at the west gable. The interior woodwork is of red pine, with open timber roof. The stained glass windows are four in number, by A. & W. O'Connor, of London, and are placed by Mr. Sutherland Walker, of Aberarder. The rose window in the west gable is in memory of the late Archdeacon Mackenzie, the centre representing the Sermon on the Mount, the quatrefoil surrounding containing illustrations of the Beatitudes. The other three windows in the apse represent the conversion of St. Paul, the Crucifixion, and the Good Samaritan. The church is seated for 150.

CHURCH-BUILDING NEWS.

Hammer-smith.—A new church is to be erected in Masborough-road, Brook-green, Hammer-smith. The district to be assigned to it has sprung up during the last few years, and contains a large extent of building ground, which is being rapidly covered with houses. The population is upwards of 4,000, of which at least 3,000 are of the working classes. The cost will be about 6,000*l.* The new church will be dedicated to St. Matthew.

Disley.—The church here has just been reopened, after refitting and alterations, carried out under the direction of Messrs. Medland & Henry Taylor, architects, Manchester. It is situated on the brow of a hill overlooking the Buxton railway. It has a tower, and a wooden-panelled ceiling to the nave. The interior was pewed up in an unsightly and uncomfortable fashion. The chancel had no fittings, except the table and iron rail, and had a flat white-washed ceiling, with a small parlour-like plaster cornice all round. Mr. Legh, M.P., of Lyme Hall, provided a sum for the first work that was undertaken, and there have been some special gifts for the altar-rail by a number of the communicants, and for the pulpit by Mr. Scott, and also general subscriptions liberal in amount. The chancel has been laid with encaustic tiling, and furnished with brass altar-rails and carved oak stalls. The plaster ceiling and "parlour" cornice have given place to a panelled ceiling of pitch pine. On the north side of the sanctuary there is a niche, used as credence and piscina, the stone arch over it being carved into a fleur-de-lis, with reference to the dedication of the church to St. Mary. The chancel window-sill is so near the floor that there is no room for a reredos; but all the space round the east window has been decorated in coloured devices with legends and emblems, at intervals. The pulpit is mainly of white Caen stone, carved and tracered all over. Red stone is used for the cornice, and for panels, &c., to show by relief the patterns wrought in the white stone. There are alabaster shafts at each angle. The heads of the four evangelists are carved in the cornice. The stairs wind round, so that the preacher enters the pulpit direct from the vestry. All the old pews in the nave and aisles have been removed, new floors have been put in, the decayed timber removed, ventilation underneath provided, and new open benches of pitch pine have been put in through-

out on the ground floor. The gallery has yet to be made comfortable, and, if possible, more church-like. The baptistery has been raised off at the north-west corner of the north aisle, and the old font removed there.

Silloth.—The chief stone of a new church, according to the *Carlisle Journal*, has been laid at Silloth. An accumulation of blocks of granite lying between Esk-street and Caldew-street, and fronting the promenade which intervenes between Criffell-street and the sea, forms the materials with which the new church is to be built. The edifice will be Early Decorated, and comprise a nave of five bays, with north and south aisles; an apsidal chancel, with two small transepts, that on the south side forming an organ-chamber and vestry, with cellar underneath for the heating apparatus. The church does not stand due east and west, but presents its longest front to the sea, the principal entrance being under the contemplated tower, which will stand at the corner towards the sea first reached from the station; a second entrance being provided in the transept for the benefit of visitors from Skinburness; and a third entrance on the opposite side adjoining the vestry, and facing the town of Silloth. The aisle windows are trefoil-headed; the clearstory and windows of the so-called west front, facing Esk-street, have crispings of an early date, and are all to be worked out in the white Tollerite stone, with which all the external dressed stone of the building is to be carried out; while the walls themselves are faced with the granite now on the site. This will make Silloth Church to differ in appearance from all the others in the diocese. The interior of the church will be lined with white brick, relieved with bands of red brick, introduced to mark the most prominent architectural features. The church is about 50 ft. from the floor to the apex of the roof. It is not contemplated at present to build the tower and spire. The tower will be about 20 ft. square, with buttresses at each corner, and will be of three stages in height, with moulded and recessed doorway on the first stage, and heltry windows on the upper story. The centre stage is to be furnished with a clock with gabled cover in itself. The tower is to be surmounted with a slender spire, to be covered either with slate or shingle banded with lead, rising in all to a height of about 130 ft. to 140 ft. The church provides 503 sittings, and is from the designs, made some four or five years ago, of Mr. Charles Ferguson, of the firm of Cory & Ferguson, of Carlisle, architects, under whose superintendence the work will be carried out. The concrete foundations are rapidly being put in.

Exeter.—The new hospital chapel, which has at the cost of Mr. Arthur Kempe, been erected for the use of the inmates of the Devon and Exeter Hospital, has been formally opened. Mr. Hayward, the architect of the Albert Museum, prepared the plans. It is built of brickwork, in uniformity with the hospital. The exterior is plain and simple, though of a sufficiently ecclesiastical character to proclaim its use. The chapel stands at the north end of the hospital, and is approached by a covered passage. It will seat about 150 persons. It is 64½ ft. in length, and 23 ft. wide, and has an apsidal eastern end. For the interior side of the walls cream-colour bricks have been used, the arches and other parts of the work being relieved by red bricks. The ceiling is polygonal, and is divided by wooden ribs into panels, which are now plain surfaces of plaster work, but which are intended to be ornamented with colour and appropriate devices. The ribs of the ceiling spring from marble shafts, which have carved pendants and caps. The chapel is lighted by a large window of three lights at the western end, by nine lancet openings in the sides, and by four circular windows in the apsidal end. All the windows are filled with thick rolled white glass, relieved by holders of pale green. The walls adjoining the seats are lined with oak boarding, as high as the string course at the bottom of the windows, and the seats themselves are of the same material, space being allowed for the infirm and crippled. The eastern end of the chapel is raised two steps above the general level. Here the walls are covered as high as the string course under the windows with tiles arranged in plain and ornamental bands. Immediately over the altar-table a cross of alabaster is inserted in the tiling. The whole of the floor, except in the seats, where boarding is used, is laid with Maw & Co.'s tiles, plain red and black in the passages, and mixed with encaustic at the eastern end. The building will be heated by

warm-water pipes under the floor, supplied from the apparatus in the hospital, and is ventilated by openings in the roof, as well as by casements in the windows. The exterior of the chapel shows no attempt at embellishment. At the western end rises a bell turret, which has a square pyramidal roof resting on four pillars of Bishop's Lydeard stone, having carved capitals of Bath stone. On the north side is a vestry for the use of the chaplain. The high brick wall, which formerly inclosed the ground now occupied by the chapel, is replaced on the Southern-hay side with a light iron railing, and granite piers. Messrs. Moass & Sons are the builders. The carving has been done by Mr. Hems, who did the carving at the Albert Museum. The entire cost of the structure will be about 2,000*l.*

Bridgend.—St. Catherine's Church, Pontypridd, has been opened for divine service. The edifice is the first church of which Pontypridd can boast. The town has, during the last twenty years, advanced as much as any other town in South Wales, and the fact is testified by there being many Dissenting chapels, hut up to the present time the members of the Church have had to attend divine service in a narrow low room, uncomfortable to all. St. Catherine's Church, from want of necessary funds, has been in course of erection nearly four years. The architect was Mr. Norton.

Howden.—The ancient collegiate church at Howden, which has been for some time undergoing a renovation, has been re-opened for divine service. The thick covering of whitewash and dirt which hid the masonry has been removed from the arches in the nave and the clearstory. The proportions of the structure are now more clearly defined, and the removal of the organ to the north corner of the transept and the consequent opening out of two windows in the south aisle, has added to the architectural effect of the interior. Of the bells, three have been recast. The total amount expended in the restoration of the church is about 800*l.*

Newcastle-upon-Tyne.—A meeting has been held in the vestry of St. Nicholas's Church, to consider the plans and site for the proposed Archbishop Longley's memorial church, in the new parish of St. Philip's, Arthur's-hill, Newcastle. The Archdeacon of Northumberland was in the chair. The Rev. S. Shepherd, jun., hon. sec. to the committee, and incumbent of the new parish, said they had already received subscriptions and promises amounting to 1,000*l.* Several friends had also intimated their intention of subscribing. Mr. Boyd, one of the committee, stated that they had applied to Mr. Redmayne, architect, of Manchester, for plans, and he had sent them those produced. If the church were completed in accordance with the plans, it would be capable of accommodating 650 persons. The rough estimate of the cost was about 5,000*l.*, including the full height of the tower, and excepting one of the aisles. According to the plans, the full height of the tower would be 175 ft., the cost of which would be 1,300*l.*; but if it were raised to 40 ft., the cost would be 600*l.* It was finally resolved that the plans should be provisionally accepted, subject to the approval of the archdeacon and bishop, and to any alterations which the committee might afterwards propose; and "that the secretary be authorised to treat with Mr. Walters, agent for Mr. Darnell, for his site, subject to the approval of the bishop."

DISSENTING CHURCH-BUILDING NEWS.

St. Laurence (Ramsgate).—A small mission chapel is now in course of erection in the Denmark-road, for the Primitive Methodists. Mr. John R. Collett is the architect, and Mr. W. Osborn the contractor.

Plymouth.—The new Presbyterian Church at Eldad, the foundation-stone of which was laid in August of last year, has been opened for divine service. It has been erected to take the place of an iron building, which was opened in 1862, and which provided accommodation for about 650 persons, with school premises in the basement for 400 children, but owing to the accommodation of the iron church proving inadequate to meet the wants of a growing congregation, it was resolved that a large stone church should be erected on the same site, and the new church will provide accommodation for nearly 1,200 persons, while the schools and class-rooms in the basement will accommodate 700 children. The new church is 80 ft. long by 50 ft. wide, and is 40 ft. high from floor to ceiling. The design is an adaptation of the Italian style of architect-

ture. The walls are built of limestone obtained from Pomphlete. The entrance doorways and window openings are framed of Portland stone and the cornices, capitals, and other moulded work are executed in Portland cement. The ceiling is pannelled with gilt mouldings, and the church is lighted by means of sunlights, with ornamental work surrounding them. These are attached to the ceilings, and there are also brackets under the galleries. The galleries form three sides of the church, and the fronts are ornamented. The pulpit is constructed of pitch pine end deal; the seats are also of deal, and all the woodwork is stained and varnished. The entrance lobby will be paved with Maw's tiles. The works have been carried out by Mr. Walter Lettbridge, of Plymouth, from the designs and under the immediate superintendence of Mr. J. L. Hodge, of Plymouth. The carving of the stone capitals of the window mullions was executed by Mr. Hems, of Exmouth, and the gas-fittings were supplied by Messrs. Monk & Westlake.

Lynton.—The foundation-stone of the new Wesleyan Methodist chapel to be built at Lynton has been laid. The site is in the Front-street, and the south façade is to be in the Front-street, and the chapel will extend backwards to Middle-street. A central entrance into a large lobby, with doors on each side, leads respectively to the staircases of the galleries and the ground-floor; the pulpit is at the further end, the minister's vestry behind, and over this is a gallery for the organ and choir. The style adopted for the building is the Renaissance, and the stone selected for use is the Prudham. The central part is advanced slightly to obtain a subordination of parts. The circular-headed entrance-door forms a prominent feature of the front, with carved caps, spandrels, &c., and other mouldings. On each side of the door are two windows divided by pilasters; these light the lower part of the staircase lobbies. The lower part is divided from the upper by a cornice, on which rests the pedestal of the upper order. There are to be six columns or pilasters, with windows, in each division. The columns, having carved caps, support the cornice, extending across the entire front end round the ends of the building. The centre projecting part is to be terminated by a pediment. The entire width of the front is 52 ft., the internal width 46 ft., 4 in., and the extreme length of the inside is 74 ft. The sides of the chapel are partially concealed by adjacent buildings. The front of the galleries is supported by rows of metal columns, which divide the pews on the ground-floor into three groups; in the side galleries there are three, and at the south end eight pews. The roof is high pitched and open, carved brackets from the roof beams resting upon stone corbels in the wall. Consideration has been given to heating and ventilation. Accommodation has been provided for 720 adults. The contract for the execution of the whole of the works has been let to Mr. Thomas Robson, builder, South Shields. The cost of the building will be about 3,000l. The architect is Mr. F. R. N. Haswell, of North Shields.

Ipswich.—The Congregational chapel, the memorial stone of which was recently laid, will occupy a site in the centre of a part of the town, St. Clement's district, where a church was much needed. Messrs. Cattermole & Eade were the architects employed to prepare plans for the new chapel. Part of the site is described in the deeds as a place on which a chapel stood. Coins were found of Elizabeth's reign. The ground presented considerable difficulties, owing to the irregularity of its form, and the rapid rise of the ground from the Front to the Back Hamlet. The architects have planned a chapel which will give accommodation for about 450 people, besides a school-room calculated to hold 150 children, and class-rooms. The principal front of the chapel will be that facing the Front Hamlet, and will consist of a gable of red brick with white brick dressings, of no pretensions to architectural beauty. Owing to the rise in the ground, the chapel floor will be some 9 ft. 6 in. above the level of the street, flights of steps leading from the two doors, one on each side, to the entrance-lobby of the chapel. The basement will be used for class-rooms, lighted by rectangular windows. Above these are three plain pointed windows, and then a window with five lancet lights. The edifice will be 60 ft. long by 39 ft. in width, and the height to the ceiling line in the roof will be 32 ft., the height of the walls being 22 ft. At the back of the chapel there will be a minister's vestry, and a vestry for the deacons, and behind the school-room

separate yards for the boys and girls. Mr. W. G. Cunbold is the builder, the amount of the contract being 1,237l.

Luddenden.—A new Congregational choral hall has been erected at Booth. Mr. Ralph Nicholson, of London, supplied the plans, while resident at Halifax in 1868. The new building, which is in the Lombardic style, is erected close to the old one, on an elevated site, a little above the Luddenden stream. It is 100 ft. long, 40 ft. wide, and about 40 ft. from floor to ceiling. The principal front, facing south, is flanked at each end by towers, and in the centre of the gable is a large circular window filled in with seven plain circles. On each side of the chapel are double rows of windows, the upper row consisting of five two-light windows, with a circular light over each. The interior of the church has, on three sides, galleries sweeping round the south end in a half circle, the fronts having ornamental iron panels, backed with scarlet cloth. The seats are all open, and are constructed of red deal, which will be stained. In the bottom of the chapel the aisles will be laid with Mosaic tiles, by Messrs. Hargreaves, of Manchester. The organ recess is at the north end. It is a circular one, being supported by two clusters of three iron pillars, and two single ones. The old organ will be removed into it, and there is also room for the choir. Underneath this is a minister's vestry, with a smaller vestry for the deacons. Behind the organ recess is a half circular lobby leading from the north-east staircase. The entrance to the gallery is on the north-west side, on a level with the chapel yard; there being also a staircase on the north-east side, and one from the front entrance. The pulpit is a temporary structure, which will be replaced by one in keeping with the style of the chapel. The roof is a partly open one, and the chapel will be lighted by two sun-lights, about 8 ft. from the top, in addition to pendants on the walls, which are to be painted in imitation of stone work. The accommodation will be ample for about 700 people, allowing 20 in. for each person. The scholars will be seated at the south end of the gallery, opposite the organ and pulpit. As it is intended to convert the old chapel into a school, a wide passage of communication has been constructed between it and the new building. The windows are all filled in with tinted cathedral glass, and the building is warmed by an apparatus, supplied by Mr. Thornton, of Huddersfield. The moulding round the windows is made to form an architrave. The works, though not yet complete, are so far advanced as to allow of the church being opened for divine service. The new edifice is surrounded by grounds laid out in rockeries, flower-beds, &c. The new and old chapels with minister's residence, chapel-keeper's house, &c., are all now within one boundary wall, and there are several approaches to the grounds from the roads both above and below the buildings. The builders are Messrs. King & Pickles, of Halifax; joiner, Mr. Fox, of Sowerby Bridge; painter, Mr. Binns, of King Cross; and plumbers, Messrs. Firth & Sons, of Halifax.

STAINED GLASS.

Sunderland.—The windows in the north transept of the New Church, Stockton-road, have recently been filled with stained glass. The centre window contains a representation of our Lord dispensing the Last Supper, and the two side windows are illustrative of the Agony in the Garden. Above is a rose window, traceried principally with three cinquefoils, which are filled with devotional angels. Texts and ornamentation are introduced throughout. The windows are erected by Mr. Samuel Alcock, Ashmore, to the memory of his son, William Charles Alcock, who was unfortunately drowned in the Mediterranean. The artists were Messrs. James Ballantine & Son, of Edinburgh.

St. John the Evangelist's, Leeds.—A stained glass window, by Messrs. Ward & Hughes, of London, has been placed in the south-east of the chancel of this church as a tribute to the late vicar, the Rev. Edward Monro, M.A. Rich and poor have contributed to the window, and the Sunday-school children contributed 20l. From this circumstance it is usually called the children's window and is placed close to their seats in the chancel aisle. The design is similar to one in Sidmouth Church, executed by Messrs. Ward & Hughes, by command of the Queen, in memory of her father, the late Duke of Kent. The principal group embraces the greater portion of the two centre compartments, and represents

our Lord as saying, "Suffer the little children to come unto me, and forbid them not. And He took them up in His arms, put His hands upon them, and blessed them." The two side lights and lower compartments of centre lights represent the acts of mercy, as follows:—Feeding the hungry; giving water to the thirsty; receiving the stranger; clothing the naked; visiting the sick; aiding the prisoner; teaching the young; caring for the orphans. At the base of the window is a large block of polished Connemara marble, on which is placed a brass, with the inscription.

PROVINCIAL NEWS.

Grimsby.—A private meeting of the corporation was recently held in reference to the scheme for a bridge over the railway and old docks. Mr. Sacré, civil engineer of the Manchester, Sheffield, and Lincolnshire Company, coming to Grimsby on other business, attended the council meeting by prior arrangement. Reporters were refused admission. Both the proposed bridges, however, were considered, and Mr. Sacré expressed himself desirous of meeting the wishes of the council as far as possible in the matter of economising the cost of the bridges. He undertook to draw the best plans he could with that view, and submit them at an early day to the council, and intimated that he would not charge the corporation anything for his professional services.

Ripon.—The almshouses of St. Anne, otherwise called Maison-de-Dien Hospital, supposed to have been erected in the time of Edward VI., having become dilapidated, and the late Mr. H. Greenwood and his sister, of West Lodge, Ripon, having left a sum of money to be laid out in rebuilding the almshouses, the foundation-stone has been laid by Miss Greenwood. Messrs. Parkens & Sons, of Leeds, are the architects; and Mr. J. Thackway, of Ripon, the builder. The style of the new building is Domestic Gothic.

Macclesfield.—The works connected with the building of the new county asylum in Macclesfield, which have been in progress about eighteen months, may be said to be approaching towards the half of their completion. The extensive ground-plan is nearly covered with the several sections of the buildings, and about two-thirds of the main building, as well as the governor's house, are covered in. The recreation hall, which will form one of the chief features of the centre block, is now being roofed, and three out of the four large day-rooms,—two in each wing of the building, are also covered in, likewise the intervening corridors, dormitories, &c. The offices, store-rooms, cooking, washing, and other departments are situated in the centre block, and have ready communication with the male and female portions in the right and left wings of the building, each of which will be complete in itself, having separate infirmaries, fever wards, &c. The clock tower, standing about 90 ft. high, will be supplied with dial plates, 8 ft. in diameter, and will be seen from a considerable distance. The town's water has been conveyed to the spot, but the pressure is much below what is desirable: provision, however, for the storage of water is being made by the erection of several water towers. The governor's residence occupies a central position, and, like every other part of the institution,—being on a high level—will command charming views of the surrounding country. A chapel is being erected on the ground for the accommodation of the patients. Excepting this edifice, which is of stone, the whole of the buildings are of red brick, varied by the introduction of black and white blocks of Staffordshire ware. The whole of the brick used in the construction has been made on the spot from several beds of clay found on the site. The architect is Mr. Griffiths, of Stafford, and the contractor, Mr. Lovatt, of Wolverhampton. Between 400 and 500 workmen are employed on the works, the great majority of whom, together with the extensive building plant, steam engines, horses, carts, &c., have been brought by the contractor from his works at Wolverhampton and other places.

The Wolf Rock Lighthouse Door.—The brass door made for the Wolf Rock Lighthouse weighs 13 cwt., and cost 170l. Where it will be fixed, a door, of solid oak, 4 in. thick, was shivered into fragments by the sea, and one 4-in. thick, strengthened by bars of iron 4 in. square, is *locum tenens* till the brass one be put up.

PATENTS CONNECTED WITH BUILDING.

BRICK-KILNS.—*G. & J. Wilson.* Dated November 11th, 1868.—The inventors make a number of openings about half way up the kiln, through the external walls thereof, for the admission of cold air into the bags at or about the centre of the kiln, whereby they obtain greater control over the heat and prevent the formation of smoke. Three perforated quarries, or fire-brick lumps or slabs, are employed, placed one behind the other, and standing over the inner arch of the fire-hole. These perforated quarries further assist in preventing smoke, and serve to keep the fire to the bottom of the kiln. Extending straight down from the center perforated quarry or brick above referred to is the regulator hole or passage, which communicates with a perforated hot and cold air chamber immediately above the fire-hole. This regulator hole and chamber are for facilitating the supply of fuel to the fire-hole, and for admitting hot and cold air thereto. The front of the fire-hole is perforated with numerous holes leading into various parts of the fire-hole, and supplying air thereto for keeping up a uniform and active combustion.

CLOSETS AND URINALS.—*N. Voies.* Dated 18th January, 1869.—This consists of a mechanical arrangement for operating the pan valve of water-closets, and for regulating the supply of water thereto by the simple opening and closing of the closet door. The arrangement consists of sliding rods or bars connected to the door, and by an arm to the valve lever, so that when the door is opened the rods and arm cause the valve lever to rise or move, whereby the pan valve is lowered, and the valve for admitting water to the basin is opened; and again, when the door is closed, the valve lever is lowered or returned, and the reverse action takes place. The valve lever may be weighted so as to return the parts to their normal position, and close the door when pressure is removed from the door; but as the weight for this purpose would have to be heavy, it is preferred to fit a strong spring to the door, so as to keep the same closed when not pushed or pulled open.

HORSE NAILS.—*J. W. Price.* Dated January 18th, 1869.—This consists in providing a machine employed in this manufacture with a special furnace through which the nail-rod is passed continuously before arriving at the anvil or anvils; also in an automatic feed motion for propelling the nail-rod, and in the employment of such machines of two distinct anvils and hammers, one of which anvils is stationary and the other moveable. One of these anvils has formed on its face a die representing a nail on its side, and the other a die representing a nail on its flat, or those dies may be formed on the faces of the hammers of the respective anvils, or partly in the hammer and partly in the anvil in each case.

BURNING BRICKS.—*A communication.—John H. Johnson.* Dated 18th January, 1869.—The essential feature of this invention consists in so constructing a brick kiln that the products of combustion from fires contained in furnaces at one end of the kiln are caused to forcibly permeate the mass of bricks by the action of jets of steam or other equivalent exhausting device situate at the opposite end of the kiln, and *vice versa*, the products of combustion being caused to pass through the mass from one end to the other of the kiln, first in one direction and then in the opposite direction, thereby heating the bricks uniformly throughout; jets of steam are also directed into the combustion chambers and over the fuel of those fireplaces which are in action for the time being, as well as into their corresponding ash-pits.

FLOORING CRAMP.—*W. & J. Paine.* Dated 19th January, 1869.—This improved floor-dog is composed of a metal plate, having a boss pierced with a slightly inclined screw-tapped hole, through which passes a screw, the head of which is perforated to receive the end of a lever, and the opposite end socketed in a foot plate. The metal plate traversed by the screw also carries two gripping levers bolted loosely on its underside, the plate being pierced with several holes, so that the pivoting of the grippers may be shifted at pleasure.

WATER CLOSETS.—*J. Steel, N.B.* Dated 13th January, 1869.—A space is enclosed by walls outside of the staircase, and is carried up the entire height of the building or nearly so. This space is partially boarded over and a closet with a seat is constructed at each flat, but the several closets are arranged so that the space

below each seat is perfectly clear down to the bottom. Thus if the space or shaft enclosed by the walls were continued with the same width up to the top, which could be done if preferred, then the top closet would occupy the whole horizontal area, the next below it would occupy that area diminished by a shaft from the seat above, and the lower ones would occupy spaces diminished by the other shafts corresponding to the number of shafts above.

WINDOW BLINDS.—*W. P. Wright.*—Dated 15th January, 1869.—This consists first in making blind-rollers in two parts, that is to say, using a strip of wood of a semicircular or other convenient form with a semicircular or other shaped groove on the flat sides, and by cutting off strips so formed in suitable lengths, using two of such pieces or lengths for a roller, and securing them together by glue or other means; the internal groove will be continuous and uniform from end to end, with an open joint sufficiently apart to allow the fabric or material of the blind to pass between in the following manner:—A broad hem is formed on the top of the blind, into which a strip of wood or other suitable material may be inserted, sliding the same with the blind into the groove of the roller from end to end, an opening being formed in the single flanged metal end for allowing the blind proper to pass in, and securing such end by screwing in the ordinary way, and the other metal end has a sunken groove, or double flanges, which metal end it is preferred to put together in parts, produced partly by casting, drawing, and pressing, and fixed together with press tools, to which a single elevating blind-cord is connected and wound around the same by the drawing down of the blind, the metal ends having projecting centres in the ordinary way working in brackets formed on the window frame.

Books Received.

The New Bankruptcy Act, 1869; together with the Act for the Abolition of Imprisonment for Debt. By T. T. Weightman, B.A., Barrister-at-Law. London: Routledge & Sons.

THE whole law of debtor and creditor is so interfered with by the new Bankruptcy Act, and the Act for the Abolition of Imprisonment for Debt, that it becomes necessary for all persons to make themselves acquainted with these statutes. The author of the little book before us, Mr. Weightman, has arranged the sections of the new Act under their different headings, and endeavoured to place the new law before the general reader in a simple manner. His *résumé* of the new Act may be usefully quoted:—

"Let us see what are the general provisions of the new Act, 32 & 33 Vict. c. 71, which comes into operation on the 1st of January, 1870, and which repeats the whole of the existing law of bankruptcy. The court has hitherto consisted of commissioners in London and the country, with a number of officers, registrars, official assignees, inspectors, and others, who had the government of bankruptcy proceedings. In their stead the new Act substitutes a London court, with one chief judge, and gives in the country districts the bankruptcy jurisdiction to the county courts.

Creditors elect their own officer, called a trustee, and choose further a committee of inspection to superintend the proceedings. By these provisions there will be a better opportunity for the creditors to realize the assets, and prevent any improper dealing with the property of the bankrupt.

A petition for adjudication might be presented by the debtor himself, according to the Act of 1861; but that provision is now repealed, and under the new Act a petition can only be presented by some creditor or creditors. The trustee is to collect the assets. When the bankrupt has paid 10s. in the pound, he will be entitled to his discharge; and he will further be entitled to his discharge if the creditors pass a resolution that his misfortune was involuntarily incurred. Where no discharge is granted, the bankrupt is to be un molested for three years; but at the expiration of that time any portion of his property, on application of creditors, may be sequestered. This latter provision of the new Act was also an enactment of the old Insolvent Debtors Act, but never applied to bankrupts, an omission productive of much evil and abuse. All imprisonment for debt is to be abolished, provision for which is made by a separate Act, 'The Debtors Act,' 32 & 33 Vict. c. 62; but in certain cases imprisonment is made the punishment, where any fraud has been committed in contracting a debt. Under the existing law, county court judges have the power of imprisoning debtors who have the means and refuse to pay their creditors. This is to be extended to the superior courts, in cases where the debt is above 50*l.*"

Both the Acts come into operation on the 1st of January next. Mr. Weightman's book will be found useful.

VARIORUM.

Mr. J. N. Reddick's "Report on the Results of an Inquiry into the Causes of the Turbidity of the Water supplied by the Southwark and

Vauxhall, and Lambeth Water Companies" has already properly received attention in many quarters. We will look to it another time.—"Modern Workshop Practice," by John G. Winton, Engineer (Strahan & Co., Ludgate-hill), applies to the manufacture of marine, land, and locomotive engines, floating docks, dredging machines, bridges, and cranes. For 3s. it gives a very large amount of useful and suggestive information.—Alnwick Castle is the subject for Mr. S. C. Hall's "Stately Homes of England" in the current number of the *Art Journal*. It is very fully illustrated. The *Journal* agrees with us in condemning the position of the Peabody statue behind the Royal Exchange.

Miscellaneous.

The Naples Waterworks.—The plan for the execution of the Naples Waterworks, which is now before the Municipal Council of that city, is supported by Baron Erlanger, who has made financial arrangements in Paris, amounting to about one million and a half sterling, for carrying out the entire matter at once. The preliminary deposit, 200,000 francs of the caution money (40,000*l.*), was paid by him on the 24th ult. The plan of the engineer and concessionnaire, Mr. E. Pettis, adopted by Baron Erlanger, is to conduct the spring waters of the basin of Sereno, which are of the greatest purity, to Naples, a city of 600,000 inhabitants, from a distance of about twenty miles. The whole system is high pressure and a constant service of an unlimited supply in the loftiest houses, an inestimable advantage in a hot climate. It is understood Messrs. Laschi, of Vicenza and Varona, are the contractors for a considerable portion of the works. Messrs. Coathape & Co., 88, Cornhill, are the English agents.

The Pollution of the River Aire.—The following resolutions, amongst others, were adopted at a recent meeting of the proprietors of the estates on the banks of the river Aire below Leeds:—

"That the pollution of the river Aire, below Leeds, occasioned by the discharge of offensive matter from the sewerage works of the Leeds Corporation, has recently increased so rapidly, and has now become so serious, that the health of the inhabitants throughout the valley is seriously affected, and during the summer months it is unsafe to reside on its banks; and that the water itself has become so impure as to become totally unfit for cattle, and destructive to fish." "That by the provisions of the 23rd section of the 'Towns Improvement Clauses Act, 1847,' incorporated with the 'Leeds Improvement Amendment Act, 1848,' under which the corporation obtained Parliamentary power to convey their sewerage into the river Aire, the corporation are under express obligation to take care that their works shall in no case create a nuisance." "That Messrs. Dibb, Atkinson, and Brewster be requested, on behalf of the proprietors present and represented at this meeting, to apprise the corporation of the proceedings in contemplation, and that the corporation be requested to state, within one month, whether they are prepared to give a satisfactory assurance that measures will be forthwith adopted for effectually abating the existing nuisance; and further, that no additional drainage works shall be connected with the existing sewers until such measures have been carried into effect."

Megalithic Monuments.—At the Exeter meeting of savants, Mr. A. L. Lewis read a paper on this subject. He pointed out the practically unbroken chain of megalithic monuments extending from India to Great Britain, and asked who were their builders? Such an identity of plan as could not be accidental, extending through an unbroken chain of communication, and the existence of common practices and superstitions, and other traces of affinity throughout that chain, led to the conclusion that there must at least have been a great common influence at work throughout this area, though possibly not an absolute community of race. They were probably constructed under Celtic influences, at least in Europe and Africa. The consideration of a number of facts, he urged, induced the belief that the single upright stones (menhirs) were used as memorial pillars, the circles and alignments primarily as places of sacrifice, and the dolmens, or table stones, of which there are two well-marked varieties, as places of sepulture on the one hand, and places of sacrifice or memorial on the other.

Flowers and Fruit for Sick and Poor.—Leiston, in the United States, has a well-organized system for the distribution of flowers to the sick, the idea of which, according to the *New York Times*, was suggested by a little girl, and inquiries are now being made in the city of New York whether a similar arrangement cannot be made to secure the distribution of fruit among the poorer classes.

The International Statistical Congress.—The seventh meeting of this congress was held this year at the Hague. The previous meetings were held successively at Brussels, in 1853; Paris, in 1855; Vienna, in 1857; London, in 1860, under the presidency of Prince Albert; at Berlin, in 1863; and at Florence in 1867. The British delegates and fellows of the Statistical Society present were Lord Houghton, W. Newmarch, F.R.S. (the president), Dr. W. Farr, F.R.S., J. F. Hamrick, R. Valpy, P. L. Simmonds, S. Brown, W. T. Thomson, E. Chadwick, C.B., W. Donnelly, C.B., J. Heywood, &c. The other foreign representatives numbered more than 100, exclusive of the Dutch. The countries which have sent delegates to the congress are the United States, Austria, Baden, Bavaria, Belgium, Denmark, Spain, France, Great Britain, Greece, Hamburg, Hesse, Hungary, Italy, Mecklenburg, Norway, Prussia, Roumania, Russia, Saxony, Servia, Sweden, Switzerland, and Württemberg. The general assembly was divided into the following five sections:—1. Theory of statistics and application of statistical facts; 2. Statistics of justice, civil and commercial; 3. Finance; 4. Fisheries and commerce; 5. Statistics of the European Transatlantic possessions. Rooms were placed at the disposal of each of these sections in the Parliament House. On Sunday, the 5th inst., a public dinner was given to about 100 guests in the great room of the Zoological and Botanical Society, M. Quetelet, presiding, supported by the ministers of the Interior and of Finance. On Monday, the 6th, the king received the delegates officially, at a special audience, at ten o'clock, and afterwards they visited the queen, at the palace in the wood. On Monday evening there was a special musical *fête* in the Zoological Gardens, which were brilliantly illuminated. On subsequent days there were other receptions, dinners, *fêtes*, &c. The palaces, picture-galleries, museums, libraries, hospitals, and other public buildings were thrown open free to members of the congress.

Opening of New Dock at Birkenhead.—The Morpeth Branch Dock, which has been constructed on the site of the old Morpeth or Woodside Basin, has been opened. The original Morpeth Dock was entered by an opening in the north-west corner of the Woodside Basin, which was simply a large open space that dried at low water, and was principally useful for vessels to beach on, being fitted with a large gridiron alongside the west quay. Soon after Mr. Fosbery Lyster took engineering charge of the dock estate, he found that this basin was rapidly silting up, and that the necessity of constantly dredging the approach to the Morpeth Dock quite overbalded any advantage derived from the sheltered aspect of the entrance. He accordingly proposed to the Dock Board that in addition to enlarging the Morpeth Dock itself, a new entrance should be made, consisting of a passage 85 ft. wide, running from the dock in a southerly direction, and opening directly upon the river, having four pairs of gates, and including a locking chamber 398 ft. in length,—the south-western quay traversing the site of the old Morpeth Basin in a slanting direction to its river face at the south-east corner. The portion of the basin thus enclosed he suggested should be made into a branch dock of triangular form, having an opening from the Morpeth Dock at its old entrance of 85 ft. width. The work was in progress about two years, and has been recently completed. The depth of the new branch dock is about 3 ft. below the level of the sill at the entrance, and, with a 20 ft. 4 in. tide, there is a depth of 34 ft. 6 in. water in the dock.

London General Omnibus Company.—The extraordinary (half-yearly) general meeting of shareholders has been held. It appeared from the report that the gross receipts of the company during the half year ended 30th June last amounted to 270,925*l.* 16*s.* 8*d.*, and that during the corresponding half-year of 1868 the gross receipts amounted to 251,780*l.* 1*s.* 6*d.*, showing a decrease of 18,354*l.* 17*s.* 10*d.* The total expenses during the half-year ended 30th June last were 252,455*l.* 12*s.* 2*d.*, and the expenses in the corresponding period of 1868 were 277,722*l.* 12*s.* 3*d.*, showing a decrease of 25,267*l.* 0*s.* 1*d.*; balance remaining from previous half-year, 686*l.* 12*s.* 7*d.*; profit on the working account, 18,470*l.* 4*s.* 6*d.* The directors proposed to declare a dividend of 2*s.* 6*d.* per share, or 6*½* per cent. per annum, free of income-tax, amounting to 18,708*l.* 11*s.* 2*d.* The report and accounts were adopted, and the dividend was declared.

The Earthquake-proof Dwellings of the Japanese.—The frequency of earthquakes in Japan is a reason for nearly all the habitations of man there being built of wood; and by long experience Japanese builders have arrived at certain modes of building by which the great danger of a house coming down upon the inmates is in many cases obviated. They seem, says Mr. Dickson, in his book on Japan, to depend upon the roof for weight; and the piles upon which this heavy roof rests are not fixed firmly into the ground, but some of them are fixed slightly into a square framework of wood, laid on stone, while the others stand simply each upon the surface of a large, round, hard, water-rolled stone, which has been firmly imbedded in broken-down sandstone. By this means the snap of a sudden shock is avoided, and some slight motion is allowed. Whatever be the principle upon which these houses are erected, it is wonderful to see buildings which seem to be put up in a shape the most ready to topple over upon the least motion, withstand the shocks of earthquakes for ages. There are pagodas in many parts of the country of seven and even nine stories high. At Kamakura is a temple with a narrow circular neck, above which the eaves of a square roof project to about 10 ft. on every side, resembling the projection of a Chinaman's hat. It is said to be two hundred years old. The Californians, who want to know how to make earthquake-proof buildings, should make a run across to Japan and study the subject there.

Drowning by Carbonic Acid Gas in Wells.—Two more cases have occurred, in which four persons have been suffocated or drowned in the heavy gas which is so apt to lodge in wells. In one of these cases, at Rochdale, well-sinking was going on: the well had been sunk 24 ft. by 4 ft. 6 in. wide: water had been got, and, after a night's interval, one of the well-sinkers was lowered, without previously testing the air with a light, and almost immediately he fell over as if in a fit. Another slid down to his aid, and of course met with the same fate. Then a rope was tied round a volunteer, who also became stupefied, and had to be drawn up. Wool-hooks were then got, and the two poor fellows were hooked up quite dead. In the other case, a well-fitter was engaged about 16 ft. down a well in altering the piping and must have been overcome by the gas. He fell into the water, and disappeared, while no one was looking on. Another went down in about an hour, but had to be raised to the surface again from the influence of the foul air upon him. A third man then insisted on going down, though warned of the state of the well, and was allowed to do so, even without any rope attached to him. He also, of course, was overcome by the gas; and in fifteen or twenty minutes a young man was lowered, at last with a rope attached, and succeeded in fastening ropes round the two dead bodies, when all were hauled up. Warning and instruction are of no avail. Some people will believe in nothing they cannot see or handle. Well-sinkers and fitters, however, ought to know better.

The "Wand-laus."—To ears polite this German word may be more tolerable than the vulgar cognomen "bug," with which, as wall-louse, it is synonymous. A correspondent, "W. H. C.," the 101st, at least, who has made anxious inquiries of us, one time with another, as to this celebrated and interesting creature, wishes to know how to dispose of him in a wall without injuring the paper. The pyrethrum powders are said to be of use, and as these powders may be blown into crevices, or on to papers, from the puff-balls, we should think they might be blown off again without injury to the paper; but we doubt the possibility of getting them out of a wall without scraping off the paper, and dosing them well with something like chloride of lime. The chloride, however, might be used in their favorite haunts, and the paper on these parts renewed after scraping, at very little expense, if the paper pattern happened to be obtainable. As the wall-louse feeds on the paste of wall papers, could not the paste be well spiced with something that would be good for them, especially if that could be done without necessitating resort to heroic remedies such as corrosive sublimate, arsenic, *et hoc genus omnia*? It is said there are insect powders, such as Keating's of St. Paul's Chantry, which kill insects without being poisonous to animal life generally; but whether such powders would be still effectual when mixed with paste we do not know.

The Question of Public Mortuaries.—At the last meeting of the Clerkenwell vestry, Mr. Franklin referred to the strong remark made by Dr. Hardwicke, the deputy coroner for Central Middlesex, upon the condition of the Clerkenwell mortuary, and suggested that some improvement in the way of ventilation should be made, as its present state was most discredit-able. Mr. Croucher "hoped the ratepayers' money would not be foisted away in altering the building." Mr. Thompson thought the erection of the mortuary was one of the most proper works undertaken by the vestry. Mr. Hopkins "hoped the vestry would let the matter drop; and, as to improving the ventilation, he hoped nothing of the kind would be done, as a storm of indignation would be raised over their heads if the ventilation were improved." Mr. E. D. Johnson was astounded at the observations of Mr. Hopkins, and he agreed with Dr. Hardwicke that the public mortuaries should be kept in a fit and proper condition. Mr. Brooke should be glad to vote such a sum as would place the building in such a state as to induce the poor to take the dead bodies of their relatives there until they were buried. Mr. Gillingwater suggested that a disinfectant should be used in the mortuary. After some further discussion, a resolution, moved by Mr. Hopkins, and seconded by Mr. Croucher, to the effect that no further outlay should be made upon the mortuary, was put and lost, and the matter was referred to the sanitary committee to report upon.

Miss Coutts's Market and the Tradesmen.—A meeting of the tradesmen of Hackney-road and neighbourhood has been held, for the purpose of considering the great detriment to trade in the vicinity, occasioned by the destruction of a large number of houses in the erection of Miss Burdett Coutts's Columbia-market. The demolition, it was stated, had resulted in the removal of a large number of people from the locality, and the tradesmen had consequently sustained a serious loss. The chairman said that 91 houses had been removed to make room for the market and the model dwellings, but in consequence of some misunderstanding in the purchase of one of the houses, affairs had remained *in statu quo*, and the ground was unoccupied. Resolutions appropriate to the occasion, and to the opinion of the tradesmen present, were passed, including a memorial to Miss Coutts. Mr. Mortlock, in moving a resolution, which was passed, that a deputation be sent to the vestries of St. Leonard, Shoreditch, and St. Matthew, Bethnal Green, said he thought the market was entirely out of place in the east of London, and was better suited to the west. Passers-by inquired whether it was a cathedral. He thought Miss Coutts was not aware of the fact that 400 families had been driven away, and that distress had been caused by the ground remaining un-occupied.

Does Brain Work shorten Life?—An American paper, treating on this subject, says,— "In the Massachusetts report for 1867, it is stated that in twenty-five years nearly, the deaths of 3,663 professional men had been reported, with an average of 50.5 years, and 9,856 merchants, financiers, agents, &c., with an average age of 48.4 years. The average of those who died in some of the most important professions and occupations was as follows:—

	Years.	Years.	
Bankers	517	Judges and Justices	68.4
Bank Officers	54.8	Lawyers	60.1
Merchants	50.6	Physicians	60.0
Booksellers	50.5	Professors	60.9
Clergymen	57.8	Public Officers	64.5

Many more are injured by excessive indulgences of the bodily passions and appetites than by excessive indulgence in literary labour. Tobacco and alcohol produce far more softening of the brain and disease of the heart among students in this country than close application to their studies. The leading public men of all countries, notwithstanding their severe mental labour and the excitement of their anxious life, reach old age. In fact, the brain men, independent of dissipation, seem to outlast ordinary men.

The Velarium.—The fresco lately discovered in Pompeii, and now in the Bourbon Museum at Naples, is said to show that the Velarium was not, in all cases at any rate, a covering for the whole area of the amphitheatre, to protect from sun or rain, but merely a curtain or awning for the upper galleries. Stairs are represented, leading up to the boxes set apart for the gladiators. Some remains of these stairs may still be traced in the ruins.

Whitworth Scholarships.—The following is a list of the successful candidates, with their ages, occupations, and the number of marks they obtained, who have been reported to the Science and Art Department as entitled to the ten Whitworth scholarships of 100*l.* a year each:—William H. Greenwood, aged 23, engineer, student at the Mechanics' Institution, Manchester, 143 marks; Thomas A. Hearson, aged 23, engineer student, Royal School of Naval Architecture, 137 marks; John Hopkinson, B.Sc., aged 19, student at Cambridge University, 134 marks; Thomas S. Elgood, aged 24, mechanical engineer, Leicester, and Owens College, Manchester, 127 marks; George A. Greenbill, aged 21, student at Christ's Hospital School, and Cambridge University, 116 marks; John R. Brittle, aged 23, engineer, student at Sir Walter St. John's School, Battersea, 113 marks; Thomas W. Phillips, aged 23, student at British School, Millwall, and Royal College of Science, Dublin, 100 marks; Richard Bennett, aged 21, engineer, student at the Royal School of Naval Architecture, 98 marks; Robert B. Buckley, aged 21, engineer, student at Merchant Taylors' School, 97 marks; Charles E. Leeds, aged 23, B.A. (Oxon), student at Oxford University, 96 marks.

Tramway Branchlets to Railways.—The prospectus of the Tram-Railway Company of Great Britain, with a capital of 500,000*l.*, in five series of 100,000*l.* in shares of 10*l.* each, has been issued. The company, which proposes to purchase the patent of Mr. Thomas Page, G.E., and Mr. Haworth, is started for the purpose of bringing, by properly constructed tramways or road-rails, into direct communication with the existing railway systems, outlying towns and districts, without building costly viaducts, embankments, and bridges, or making tunnels and cuttings. It is stated by the company's engineers that the cost per mile of a tram-railway on the company's systems will average about 2,000*l.*, while the cost per mile of the railways already existing, including purchase of land, &c., has averaged 35,000*l.* The prospectus informs us that "The public highways will not in any way be obstructed, nor the ordinary traffic impeded," and that "an ingenious locomotive, the invention of Mr. Page, will be employed where required, which will ascend steep gradients, make no noise, and, by incorporating with it the leading characteristics of Allen's economic engine, will be worked at a cost of about one-third of an ordinary locomotive."

Self-moving Velocipedes, Cabs, and other Vehicles.—In reference to an announcement in the *Builder* from Paris that a velocipede, or travorsar at least, has been invented in which the weight of the siter on the vehicle is made to act in impelling it, a constant subscriber, who dates from Manchester, and says he is "one who desires a change in the old-fashioned time-worn carts, cabs, omnibuses, &c.," thus writes to us:—"You may say that it is easy for the weight to be placed so as partly to revolve the wheel, but how is the weight to be brought to bear a second time? I say simply by a lever. I believe that the plan of the French velocipede that they are about to patent will be something in this shape; but if it is, I will bet them, for I am making one that is like a young horse that will not stand still except I hold it. I feel quite convinced that this weight as a motive power will revolutionise all kinds of conveyances." We do not quite see it in the light in which our correspondent puts it; but what is of decided importance here is to find that the subject of self-moving vehicles is fermenting in the public brain as it is in that of our correspondent.

Death of Dantan, the French Sculptor. The death of Dantan, the younger, telegraphed from Baden, has caused regret in the artistic world. Jean Pierre Dantan was born in 1800. Like his brother and many other sculptors, Marochetti among the number, Dantan was a pupil of Botic. His comic statues of Count D'Orsay, Lord Brougham, Talleyrand, and a host of notabilities, won him fame and gold. His chisel, however, produced serious works, such as the statue of Adelaide Kemble, the bust of Gristi and one of Rose Cheri.

A Friendly Pitcher.—Mr. Sidney Davey's "Pitcher" machine has been in operation at St. Agnes. It will receive sheaves from six bands at once and deliver to as many more, at a height of 30 ft., or any lesser height. By means of the "pitcher," and other machines, Mr. Davey secured the produce of 125 acres of corn in four days.

The Royal Albert Asylum at Lancaster. A public meeting in aid of this institution has been held at Ulverston, under the presidency of the Duke of Devonshire. The object, according to the chairman, was to raise funds to build and start, free from debt, an institution on the model of Earlswood, which would afford accommodation for 500 inmates, and be capable of easy extension. Considering the wealth of the seven associated counties there ought to be no difficulty in obtaining the 19,000*l.* still needed; and his Grace concluded by forcibly appealing to Ulverston and the North Lonsdale district generally to do its full share of the work in raising the amount. Resolutions expressive of hearty sympathy with the object of the meeting, and appointing an influential local committee, were carried.

South London Music Hall.—The foundation-stone of the new South London Music-hall, in the London-road, Southwark, has been laid by Mr. Stanley Vickers, M.P. The building is being erected by Mr. Edwin Villiers, a caterer for the public in music-hall entertainments. The building is 118 ft. long, 70 ft. wide, and 50 ft. high, interior measurement. The stage, which will be erected on the south side, will be the whole width of the building, and will have beneath it a space of 20 ft. deep, to receive the scenery. The style of the building will be Italian. The pit and stalls will be on the ground floor, the boxes on the first floor, and the gallery above. The hall will be capable of holding between 3,000 and 4,000 persons comfortably, but on a pressure as many as 5,000 persons can be accommodated. The orchestra will be 30 ft. wide, and will hold forty performers. The internal decorations are not yet decided upon. The outer walls have been nearly completed.

The New Telegraph Act.—Under the new Telegraph Act, passed on the 9th ult., arrangements are being made by the Postmaster-General with the various telegraph companies, and in a short time it is expected the telegraphs will be in the hands of the Government. By the Act of last year, the sum of 5,715,048*l.* 8s. 11d. was authorised to be paid to the companies mentioned. The chief object now sought is to give authority to the Treasury to raise funds which will be required to enable the Postmaster-General to carry into effect the arrangements he is making. The Treasury may raise sums not exceeding 7,000,000*l.* for the purposes of the Act, either by terminable annuities, or by the creation of Exchequer Bills or Bonds, and the moneys raised are to be placed at the disposal of the Postmaster-General under certain regulations. The accounts, &c., are to be laid before Parliament. Messages are to be deemed "post letters," and the present and last year's Act to be considered as "Post-office Laws."

Free Libraries in Berkshire.—A public meeting in furtherance of a proposed free library in Wallingford, in response to the Hon. Anthon Herbert's offer of pecuniary assistance, has been held in the town-hall. Mr. Edward Wells, the president of the Wallingford Mechanics' Institution, occupied the chair. Mr. W. Blake Atkinson, the hon. secretary to the provisional committee, gave a statement of the steps that had been taken in the matter, from which it appeared that 177*l.* had been subscribed by inhabitants of the town and neighbourhood. Resolutions were then passed expressive of hearty approval of the undertaking, and recommending that the proposed free library should be incorporated with the mechanics' institution. The general feeling expressed was that a building should be erected; and further promises of substantial support were made. It is stated that Wallingford has been the first town to lay claim to one of Mr. Herbert's gifts of 150*l.*, having been the first to fulfil the required conditions.

Opening of the Corporation Baths, Sheffield.—These baths have been formally opened by the Mayor. The building possesses no architectural points whatever, being merely a red brick building of a very ordinary character. Mr. S. F. Holmes, the borough surveyor, having but a limited estimate to work upon, set aside architectural features to make the inside as spacious and comfortable as possible. The swimming-bath is large and well lighted. The water which will be used in the baths will be applied to the flushing of the defective sewers in the adjoining streets. For this purpose drainage pipes have been laid from the baths to the sewers.

A Canal from Calais to Calcutta.—Sir Arthur Cotton has proposed to the Indian Government a scheme for a canal from Calcutta to Calais, *via* the Caucasus. He points out that a great deal of work has already been done, there being already a canal from Hurdwar to Cawpore, and one from Calcutta to Oolyabarrah, besides numerous portions in Europe, while the Black Sea might be made use of in fine weather, and until the work was finished. The summit level of 13,453*ft.* would be reached by a series of locks, worked by steam machinery; an abundant supply of water would be obtained there by an annuit across the source of the Euphrates; the surplus, after filling the canal, to be applied to irrigating the Khadir of the Caucasus, whence alone, he says, an abundant revenue might be obtained. Sir Arthur calculates that by means of this complete inland water communication, goods and passengers could be conveyed from India to Manchester at one-ninth of the cost of the present route, at an average speed of 2*½* miles per hour; and, in face of these facts, he protests against the public revenue being squandered upon railways.

A New Use of Photography.—The important problem of measuring distances and constructing plans and maps by means of photography has at length been solved, says the *North German Correspondent*. Since the art of photography has been sufficiently improved to permit the apparatus to be easily moved from place to place, and to produce pictures which are correct in a perspective point of view, the Berlin photographer, Mr. Meydenbauer, has paid great attention to the subject. At length he succeeded in convincing the Prussian Government of the correctness of his theories, and was commissioned to survey a fortification. In six months he had succeeded in obtaining 800 plates, and he met with no great difficulty in completing a photogrammetric instrument of such simplicity that a workman quite unacquainted with the art was able to draw up a special plan of a fortress on the scale of 1 to 2,500 after a few short instructions. The photographic camera can therefore in future be employed for a number of important purposes.

Enamelled Glass Mosaic Work.—Some specimens of enamelled glass mosaic work have recently been placed in the arcade of Ereter College, Oxford, immediately below the apse windows of the college chapel. The work was executed in Venice, by the Salviati firm, and placed in its present position by Luigi Verona and another Italian artificer, of London. The arcade stretches round the five sides of the chancel, each side containing three arches. Dr. Ridding, head-master of Winchester College, gave 300*l.* towards the work, the remainder of the cost being defrayed by several donations given at various times, supplemented by a vote from the college authorities. The altar steps, also just added, are of red Devonshire marble, and are the gift of one of the fellows of the college.

House-moving in Boston U.S.—In the work of straightening and widening some of the very crooked streets of Boston, it became necessary to move a building known as "Hotel Pelham." This building is of freestone, 96*ft.* high, and weighs, it is estimated, 10,000 tons. It was moved 14*ft.* in three days, by means of rollers and screws, a portion of the side-work being also moved with it. No crack was made in the building, and nothing in it was at all disturbed. The fastest rate accomplished was 2 in. in four minutes. A large bank building adjoining the hotel was used to brace the screws against. A great number of these screws, 21 in. long, were employed. 25,000 dollars were paid to the contractor for moving the hotel.

Salisbury Cathedral.—The proposal to restore the choir of Salisbury Cathedral, at a cost of some 15,000*l.*, as a memorial of the late Bishop Hamilton, has been adopted throughout the diocese, and already upwards of 6,000*l.* have been subscribed towards the object. Mr. G. G. Scott has made a personal survey of the choir, and is preparing plans for the restoration.

Lead-encased Block-tin Water-pipe.—A tin pipe, covered with lead, was a desideratum for water and other liquids, and for gas, but especially for water. A pipe, which seems to be of American invention, has been patented by a Mr. Haines, in this country, to meet the desideratum. It is highly spoken of by Professor Silliman, and may not be so worthless an invention as some tin-lined lead pipes we have seen.

Aberystwyth.—A memorial stone of a new English Baptist chapel in Aberystwyth has been laid by Mr. E. M. Richards, M.P. for the county. The site is on the west side of Alfred-place. The plan is a parallelogram, 56 ft. by 33 ft. inside measurement. The ground floor and a gallery on one end will seat about 450 persons, and there are schoolrooms and vestries underneath. The back and side elevations are to a great extent hidden by other buildings, and are consequently plain, but the principal façade to Albert-place will present an elevation carried out with Rbanon stone dressings and local stone worked square random. The ceiling will be of a wagon-head shape, cut up into ribs and panels with a large quantity of detail. All the pews are to be of pine, stained and varnished. The minister's platform will be of pitch pine, French polished. The contract has been let to Messrs. L. & J. Evans, local builders, for 1,560l. The architect is Mr. R. Owens, of Liverpool.

Saltley.—The inscription-stone of the Saltley Training College Schools has been laid. The buildings will occupy part of a plot of ground, 2½ acres in extent, recently added to the college, at a cost of 1,000l. They are designed by Messrs. Paull & Robinson, of Manchester, and are being erected by Messrs. Parnell & Son, of Rugby. They will consist of three principal schools, besides class-rooms, and will be especially adapted for giving to the students of the college practical instruction in the art of teaching. It is estimated that the cost of the schools (exclusive of the site) will be 2,500l. Towards meeting the expense of the purchase of the land and the erection of the schools there have been promised or received about 2,400l.

Some Effects of Combustion.—It is asserted that one hour after the gas of London is lighted the air is deoxidised as much as if 500,000 people had been added to its population. During the combustion of oil, tallow, gas, &c., water is produced as well as carbonic acid: in cold weather we see it condensed on the windows. By the burning of gas twenty-four hours in London more water, it is estimated, is produced than would supply an emigrant-ship on a voyage from England to Australia.

New Blackfriars Bridge.—The report now is that the new bridge at Blackfriars will be opened to the public on Michaelmas-day, but we should think this very unlikely. At any rate, there can be no ceremonial of any consequence if it be so. The course of the traffic over the temporary bridge has been changed at the two ends so as to admit of the formation of the approaches to the new bridge.

Removal of the Sabloniere Hotel.—Often threatened, the building materials of this hotel in Leicester-square have at last been sold, and the clearance of the site for the purposes of projected improvements will shortly be effected. Hogarth came to live in 1733 in what is now the northern half of the hotel. If he were alive now he would make a telling picture of the present disreputable condition of the enclosure.

The Seat of H. H. Prince Duleep Singh.—The mansion, Elydon Hall, Norfolk, is in course of rebuilding, from the design of Mr. John Norton, the builders being Messrs. Cubitt, of Gray's-inn-road. The west wing is the first instalment. The present house was erected by Admiral Keppel, first Earl Albemarle, but in size is inadequate for the uses of the present owner.

TENDERS.

For the erection of St. Luke's National Schools (boys and girls), Preston. Messrs. Myres, Vevers, & Myres, architects:—	
Cowell & Clayton.....	£1,917 0 0
Cooper & Puhls.....	1,712 3 6
Exton, Brothers.....	1,655 0 0
Bamber.....	1,630 0 0
Aiston (accepted).....	1,628 0 0
For rebuilding No. 3, Little Warner-street, Clerkenwell. Mr. W. P. Griffith, architect:—	
Lidstone & Son.....	£378 12 0
Bamford.....	349 0 0
Martin.....	329 10 0
Wagstaff & Son.....	288 0 0
For new house and farm buildings, on the Redstone Estate, near Brackley, Northamptonshire, for the Warden and Fellows of Merton College, Oxford. Messrs. Lavender & Son, architects:—	
Hawkins.....	£2,590 7 8
Hedges & Son.....	2,610 16 8
J. & T. Davis.....	2,400 0 0
Munday.....	2,288 18 0
Haddon.....	2,185 0 0
Claridge.....	2,016 0 0

For the erection of large hall and offices for the Hammer-smith Town-hall Company. Mr. H. Saxon Snell, architect.	
Quantities supplied:—	
Pollard.....	£2,397 0 0
Taylor, Pitts, & Co.....	2,360 0 0
Cowland.....	2,060 0 0
Henshaw.....	1,867 0 0
Blackmore & Morley.....	1,850 0 0
Manley & Rogers.....	1,670 0 0
Snowdon.....	1,615 0 0
Nutt & Co.....	1,800 0 0
Nightingale.....	1,864 0 0
Crabbs & Vaughan.....	1,862 0 0
Rankin.....	1,850 0 0
Capps & Ritso.....	1,765 0 0

For alterations and additions to house and outbuildings at Stoke Prior Mills, near Bromsgrove, Worcestershire, for Mr. W. H. Wall, Mr. W. Seckham Witherington, architect:—

First Design.	
House.	Outbuildings.
Lovatt.....	£1,300 0 0
Wood.....	1,159 12 0

Second Design.	
House and Outbuildings.	
Wood.....	£232 4 6
Shilcock.....	694 1 6

For the erection of a dwelling-house, with offices and stabling, at Priory Park, Roehampton. Mr. F. Warburton Stead, architect:—	
Hill, Keddell, & Waldram.....	£1,686 0 0
Gannon.....	1,648 0 0
Gascoyne.....	1,610 0 0
Wacombe.....	1,658 0 0
Adamson.....	1,600 0 0
Elbs & Sons.....	1,398 0 0

Accepted for alterations to Bancroft House, Hitchin, Herts, for Mr. C. W. Wislhere. Mr. J. Shilcock, architect:—

Bricklayer's and Plasterer's Work.	
Warren.....	£160 0 0
Carpenter, Joiner, and Painter's Work.	
French.....	£143 5 0

For new school and class rooms, for the Trustees of the Independent Chapel, Hitchin. Mr. J. Shilcock, architect:—	
Jeeves (accepted).....	£1,020 0 0
Butterfield.....	1,000 0 0

For building three small houses, at Hitchin, for the Trustees of the Two Brewers' Benefit Society. Mr. J. Shilcock, architect:—	
Anderson.....	£451 7 0
Stapleton.....	440 0 0
Ansell.....	405 0 0
F. Jeeves.....	400 0 0
G. Jeeves.....	398 0 0
Joyner.....	398 17 6
Butterfield (accepted).....	387 15 2

For villa residence, at Alesager, for Mr. John Keen. Mr. Geo. B. Ford, architect, Burston:—	
Lea.....	£1,761 17 0
Ellis.....	1,647 0 0
Hodkinson.....	1,613 6 3
Wood (accepted).....	1,514 0 0

For cottages at Spring Bank, near Tunstall. Mr. Geo. B. Ford, architect:—	
Cartier & Sons.....	£692 0 0
Hammerly.....	650 0 0
Sambrook (accepted).....	6 0 0

For a pair of cottages on Feag Hays Estate, near Tunstall. Mr. Geo. B. Ford, architect:—	
Sorag.....	£213 0 0
Rowley & Whittingham (accepted).....	210 0 0

For schoolmaster's house, at Crewe. Mr. Geo. B. Ford, architect:—	
Ellaon.....	£220 0 0
Wood.....	210 0 0

For erecting show-rooms and offices, in the Grosvenor-road, Pimlico, for Mr. B. Fabricotti. Mr. F. G. Widdows, architect:—	
Rider & Son.....	£4,107 0 0
Pritchard.....	4,084 0 0
Troploe & Sons.....	4,067 0 0
Finch.....	3,958 0 0
Conder.....	3,968 0 0
Ennor.....	3,954 0 0
Newman & Mann.....	3,676 0 0

For two residences, in the Woodford-road, Sharnbrook, for Mr. B. Rowbotham. Mr. F. G. Widdows, architect:—	
Hunt & Ellington.....	£2,280 0 0

For additional farm buildings, Burchell Chesham, for Mr. T. Hampidge. Mr. F. G. Widdows, architect:—	
Cleesum.....	£413 0 0

For new wing, at Royal St. Ann's Society's School, Brixton-hill. Mr. J. Wimble, architect:—	
Jones.....	£1,491 15 0
Candler.....	1,480 0 0
Smith.....	1,415 0 0
Bartlett.....	1,370 0 0
Taylor.....	1,359 0 0
Ramsay.....	1,331 0 0
Andrew.....	1,290 0 0
Colls & Sons.....	1,245 0 0
McLucahn.....	1,160 0 0

For the erection of ten dwelling-houses (containing 100 suites of rooms, each suite consisting of living room, scullery, two bedrooms, and W.C.), in Lisle-street, Finsbury, for Mr. E. Foster. Mr. John S. Ellis, architect. Quantities not supplied:—	
Dove, Brothers.....	£11,655 0 0
Maxwell.....	13,000 0 0
Bates (accepted).....	11,000 0 0

For new rectory, Hutton, Somersetshire. Mr. Hans F. Price, architect:—	
Shorney.....	£2,050 0 0
Escott & Co.....	1,925 0 0
Harvey.....	1,763 13 0
Perry.....	1,710 0 0
Hartree.....	1,700 0 0
Hawkins & Sons.....	1,673 0 0
Bunsell.....	1,512 10 0
Dale.....	1,348 0 0
Corrill (accepted).....	1,265 0 0
Tucker.....	1,151 5 0

For additions and alterations to the Clock House, at Potter's Bar, Middlesex, for Messrs. Haddock. Quantities furnished by Mr. Shrubsole:—	
Warne & Co.....	£1,380 0 0
Leach.....	1,340 0 0
Walton.....	1,199 0 0
Cooke & Green.....	1,149 0 0
Crabbs & Vaughan.....	1,077 0 0
Till.....	997 0 0
Knight.....	997 0 0
Scrivener & Stephens.....	968 0 0
Turner.....	867 0 0
Shirley & Horne.....	838 0 0

For a block of buildings containing dwellings for sixty-five families, in addition to four large shops, to be erected on the Marquis of Westminster's Estate, Ebury square, Pimlico, for the Improved Industrial Dwellings Company, limited. Messrs. Beck & Lee, architects. Quantities furnished by Messrs. Weich & Atkinson:—	
Ash & Horner.....	£14,369 0 0
Hill, Keddell, & Waldram.....	13,236 0 0
Brass.....	13,230 0 0
F. Anson.....	14,120 0 0
Jackoe & Sharratt.....	14,110 0 0
Conder.....	13,805 0 0
Henshaw.....	13,795 0 0
Myers & Sons.....	13,578 0 0
Perry & Co.....	13,273 0 0
Allen & Son (accepted).....	12,327 0 0

For erection of two houses, in the Lewes-road, Brighton, for Mr. H. Lester. Messrs. Gouly & Gibbons, architects:—	
Lockyer (accepted).....	£998 0 0

For a new billiard-room, at the Clarence Hotel, St. Andrew's, for Mr. W. Finch. Mr. Cutler, architect. Quantities supplied by Mr. Shrubsole:—	
Danstan.....	£288 0 0
Davis.....	860 0 0
Pitcher.....	810 0 0
Webb.....	790 0 0
Warne.....	700 0 0
Cooke & Green.....	700 0 0
Till.....	651 0 0
Smith.....	630 0 0
Crabbs & Vaughan.....	650 0 0
Cubitt.....	649 0 0
Chisholm.....	630 0 0
Blease.....	593 0 0
Shirley & Horne.....	580 0 0
Blackmore & Morley.....	575 0 0
Stons & Co.....	570 0 0
Turner.....	528 0 0

For reseating and general repairs to Clerkenwell Parish Church. Mr. Bashill, architect. Quantities by Mr. T. M. Rickman:—		
Oak.....	Pitch Pine.....	Deal.....
Conder.....	£1,493.....	£1,175.....
Colls & Sons.....	1,433.....	1,252.....
King & Sons.....	1,363.....	1,097.....
Knight.....	1,357.....	1,255.....
Dove, Brothers*.....	1,180.....	1,029.....

* Accepted.
Poplar and Stepney Sick Asylum.—[List previously given.] Accepted tender:—
 Mann..... £29,932 0 0

TO CORRESPONDENTS.

W. M. M. (It has often been asserted that electricity would be the best motive power for aerial navigation. W. M. M. only resorts to the same long) — W. C. T. (thank) — E. B. (shall be looked up) — H. H. (we cannot enter into private disputes. The affair seems altogether exceptional) — E. F. J. (After the time is not so much used in London as it might be if proper means were adopted to render its qualities known) — F. N. C. — C. W. J. — E. S. — J. W. B. — G. R. F. — L. & Son. — F. G. W. — G. & G. — J. — E. — R. — A. — H. — W. — R. — E. — J. — R. C. — W. S. — W. — A. — R. — F. — N. — C. — H. — L. — D. — N. — & D. — A. — J. — F. — M. — Messrs. P. — G. — W. — E. — H. — J. — S. — R. — L. — T. — H. — W. — E. — A. — & G. — H. — J. — N. — G. — R. — H. — G. — E. & Son. — J. A. W. — B. — C. — H. I. We are compelled to decline publishing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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The Builder.

VOL. XXVII.—No. 1390.



Technical Education in France.

WE are not about at this moment to enter into any of the numerous ingenious arguments that have been put forth, both for and against the introduction of an extended system of technical instruction amongst our working men. Our present purpose is merely to show what is the extent and the nature of the instruction which the working man of France may get, if he has the mind to seek it. The great French Exhibition of 1867 told us how sharp was the competition of Continental manufacturers with this country. We saw there the wonderful steel-castings of Krupp, and of the Bochum Company in Rhenish Prussia. We found Borsig, of Berlin, sending to Paris his two-thousandth engine of better make than any from French and Belgian factories. Subsequently we heard that M. Schneider, of the Great Creusot works in France, had made a score of engines for our Great Eastern Railway, built from drawings and specifications sent to his workshop from this country. The cry has arisen, and is getting louder and louder still, that the foreigner should be shut out, or at any rate restricted in some way or other, from coming into competition with ourselves, to our manifest detriment. But is such a thing possible at the present time? Can we ever prevent our capitalists from buying in the cheapest market, be that market home or Continental? Whether or not the immense strides made by Continental manufacturers are due to superior education we do not intend here to inquire. This, much, however, we may affirm, that the Continental educational system is preferable to our no-system and rule-of-thumb way of going about the business in hand. And certainly, if a workman has within his breast the high, the laudable desire to excel in his calling, and to improve his condition, we say, without hesitation, that technical education will prove his best and truest friend.

As respects technical education, workmen are constantly being told of the superior advantages enjoyed by the Continental; but hitherto we have not been very fully informed as to the details of the foreign system of teaching. Some information in this direction derived from official sources, will not be out of place.

The Imperial Conservatory of Arts and Trades, or, as it is styled in French, the "Conservatoire des Arts et Métiers" is the oldest establishment for affording technical instruction in France. It owes its origin to a mechanical genius, Vaucanson, who, during his lifetime, was apparently fritter-

ing away his talents in contriving complicated pieces of automata, which nevertheless formed the delight of those who had an opportunity of seeing these triumphs of mechanical skill.

Vaucanson constructed, among other things, an automaton flute-player, which executed several airs in a charming way; and a duck which waddled in the water, arranged its plumage, picked up its food, and apparently digested it; together with other ingenious imitations of the natural habits of the bird.

These, however, were but the playthings of a great man, and Vaucanson, while he lived, did much that was of service to his country, and at his death bequeathed his valuable collection of looms and other machines to the Government, for the free use of artisans, native and foreign. The Government accepted the gift, and placed the collection in a building which was open to all. The collection was enlarged, and just as the great French Revolution burst over France, the institution had become an important aid to the mechanic. During the early tempestuous days of the revolution, the Conservatory was at first neglected, and then shut up. But the period of its vicissitudes was short, and in a very little time the institution resumed its teaching. In 1796 a drawing-school was established. This was an era in the records of technical instruction in France, for until this time no establishment for the teaching of drawing applied to industry, and based upon descriptive geometry, was to be found in the country. From this school, as the Government report assures us, proceeded a number of pupils, who, in various ways became useful to their country, as well as several eminent manufacturers.

In 1810 the Continental blockade, devised by Napoleon to strike a death-blow at English manufacturing industry, was in full operation, and the importation of English cotton goods was almost entirely prevented. This condition of affairs gave rise to the establishment of a spinning-school at the Conservatory. Looms were set up, and a sufficient number of workmen were trained to give an impulse to the weaving trade of France. This school did not long continue in operation; the weavers found employment in private manufactories, after which the establishment was closed as being of a character foreign to the general nature of the Conservatory.

With the exception of this temporary educational workshop, and the elementary drawing-school, the only object of the Conservatory down to this date was the formation of a collection of machines, looms, and apparatus employed in the industrial arts. Its scope was much widened in consequence of a decree of 1819. Prior to this, the Conservatory merely offered to industry a mute museum, from which the manufacturer or artisan might doubtless derive useful instruction; but this instruction was unaccompanied by the teaching of the principles which should form its foundation.

In December of the latter year an important step was taken. There was established a public and gratuitous course of instruction on the application of the sciences to the industrial arts. Here, indeed, was an immense stride, the consequences of which are everywhere to be witnessed in France at the present day. A decree of 1829 added fresh popularity to the Conservatory by the inauguration of a course of physics as applied to the arts. In 1836 three more additions were made. These were,—a course of cultivation, a course of mechanics and buildings applied to agriculture, and a course of agricultural chemistry. There were now seven courses in full operation. But these were still insufficient for the increasing development of industry, as well as for the general demand for more scientific instruction. In prompt obedience to this demand an enlightened French ministry decreed five new public and gratuitous courses. They

were,—a course of mechanics applied to industry a course of descriptive geometry, a course of law as applied to industry, a course of chemistry applied to the arts, and a course of agriculture, to which the previously existing course of cultivation was added as a second course. Thus the number of courses was raised to ten. In 1843, a course of ceramics was opened by M. Ebelman, director of the Sèvres Government porcelain manufactory; but at his death the lectures were discontinued. Many improvements were also suggested at this period, but were delayed in consequence of the political condition of France during 1848 and subsequently. The foundation of new courses recommenced in the year 1852 with the establishment, at the instance of the Paris Chamber of Commerce, of a course of spinning and weaving, and a course of dyeing, printing, and dressing of tissues. In the same year a course of zoology applied to agriculture and industry was opened. A course of civil architecture was founded in 1854. At this period, the number of gratuitous public courses in the applied sciences had reached the number of fourteen. But the augmented advantages of the Conservatory were not restricted to oral teaching; the collection of models and machines was enlarged, classified, and in every way improved. Since 1849, a catalogue had been in existence; but now every object exhibited was accompanied by a card explanatory of its use. Projected in 1849, and at the present time in full operation, is a gallery for experiments, and for machines in motion. This department has an important office to perform. It is used for trying, either at the demand of the different ministries, or of private manufacturers, any new machines or apparatus presented for examination. These experiments have been received with great satisfaction, and reports of them have been published by the Conservatory. The experiments are made gratuitously. The Conservatory also undertakes the verification of the standard weights and measures required by those foreign Governments which have adopted the French metrical system.

The collections of models are estimated to be worth 1,300,000 francs, or 52,000*l.* of our money. The library contains 18,000 works on the sciences and industrial arts. In the gallery of drawings there are upwards of 7,000 designs of the newest and most useful machines, to scale, and with dimensions given. There is likewise a collection of expired patents. As early as the Exhibition of 1851, the industrial artists of France were, according to their own confession, alarmed at the strenuous efforts England was beginning to make to dispute with them the empire of taste. From this feeling arose the demand made by the industrial interest for increased facilities in art-teaching. The director of the Conservatory addressed a memorial upon the subject to the Emperor. There are two characteristic paragraphs in this memorial, dated 1854, which we will translate. They show that our indifference to what is going on upon the Continent respecting the teaching of science and art, is not shared by the foreigner, who, as a matter of fact, has been closely watching all our efforts at improvement in technical instruction. The first paragraph says,—“The Universal Exhibition of London has proved to England the superiority of France in the arts dependent on form, taste, and colour. Instead of disputing the fact, the English have set to work at once, with their immense resources and habitual energy, to found museums and drawing-schools all over the country. The Queen and private individuals have stripped their galleries to enrich the museums of practical art with the finest specimens of Sèvres porcelain, bronzes, sculptures, &c.”

The second paragraph is still more characteristically French:—“It would seem as if the English were bent on operating on the human species in the way they have upon races of

animals, so as to transform a nation of traders and artisans into a nation of men of taste. How far the Anglo-Saxon race is susceptible of this transformation is a philosophical question beyond my province; but one thing is certain—namely, that a few years hence England will have made immense progress in the arts of design."

To return to the Conservatory. According to the yearly reports addressed to the Minister of Agriculture, Commerce, and Public Works, the number of persons attending the public courses of the Conservatory is constantly increasing. In six months it has reached 180,000 persons. The great amphitheatre of the institution will accommodate 700 persons; the smaller one 300 persons; and both are found too small.

When the courses were first started, Sunday was the day which the public appeared to prefer. Gradually, however, the week-day evenings came into favour.

The teaching so freely given at the Conservatory is exclusively devoted to science applied to industry. The audience is for the most part composed of foremen, workmen who have already received some instruction, and apprentices. There are also a few foreign professors, and many persons who take an interest in the progress of technology. As we have seen, these public courses are gratuitous, and are open to both natives and foreigners. The teaching of this institution is so constantly kept on a level with all the improvements continually being made in France, England, and elsewhere, that the courses are attended by a great number of young foreigners whose intention it is to become professors.

The special influences which this institution brings to bear upon the progress of science applied to industry, may be thus summarised:—The collection of models, machines, and products; lectures on science relating to industry, and upon industrial arts; a gallery of drawings which the public are permitted to copy; and an elementary school. The sum at present voted for its maintenance is 285,500 francs a year.

The Conservatory of Arts and Trades is situated in the Rue Saint Martin, and the visitor to Paris may go over it on any Sunday or Thursday free; on other days he would have to pay a franc.

The Central Imperial School of Arts and Manufactures is a highly esteemed and most important educational establishment, and has been already described at some length in our pages.* By its means many pupils who cannot avail themselves of the opportunities offered by the great Polytechnic School, are enabled to obtain a most complete and practical education.

For the purpose of comparison, we will give a short sketch of the Polytechnic School. It was founded in the year 3 of the Convention (1791), for the instruction of young men in mathematics and drawing for the artillery and engineer corps. None but candidates who can pass a very severe examination in mathematics are admitted. Its effort has always been to educate, above all things, good engineers; and some of the most celebrated military and civil engineers have been bred within its walls. Still, the time required by this school (seven years), including the preparatory and complementary studies, is much too long for candidates who are anxious to commence their practical and money-earning career as soon as possible. The difficult preliminary examination also excludes a great number of candidates. Again, more than half the pupils of the Polytechnic School choose the military service, whilst the greater portion of the other half abandon the civil service to follow scientific pursuits. This is why the admirable Polytechnic School has never been able to satisfy the ever-increasing demands of industry.

The Central School, therefore, fills up a manifest deficiency in the French system of technical instruction. It was founded in 1829 by the celebrated chemist Dumas, assisted by three other gentlemen, without any aid from the Government; but, after some years of success, it first of all passed into the hands of a proprietor, and was then transferred to the State. In the Central School have been educated a considerable number of able engineers, who have taken high rank as constructors of railways, &c. Many directors, managers, and other functionaries of important industrial establishments, civil engineers, mechanical engineers, architects, &c., have emanated from this school.

The Central School is very popular, even with

persons of narrow means, though what in France is held to be a high charge (500 francs, 32*l.*, a year) is demanded from pupils. The Government and several of the departments have founded scholarships in favour of the sons of parents in very humble circumstances, and in some cases money for board and lodging has been added. The sons of rich parents pay for their education, as they naturally ought; whilst the doors of the school are also open for the sons of artisans who have given proof of the talents necessary to profit by the instruction.

At the central school the pupils are compelled, whatever may be the careers they intend to follow, to attend all the courses, and to pass very strict and frequent examinations. During the first year the instruction is purely theoretical. In the second and third years theory and practice are blended. The teaching is not confined to unaided oral instruction; for laboratory experiments, and mineralogical and geological excursions are made use of to complete what the lectures of the professors have commenced. As we have stated, there are frequent compulsory examinations during the courses and at their close, in addition to which there are searching examinations at the termination of each year's studies. The effect of this system is to keep the pupils always up to their work. Discipline is also strictly maintained.

The Central School is quite international and cosmopolitan in its character; pupils of all nations are admitted on the same footing as natives of France. Not a county in Europe is without a representative, and at one time or another pupils have come here from every part of the civilised globe.

There can be no better way of showing what this institution imparts to its scholars than the quoting in full the programme of the three years' studies.

First Year.—Analysis and general mechanics, sixty lessons; general physics, sixty lessons; inorganic and organic chemistry, sixty lessons; theoretical and applied kinematics, twenty-four lessons; construction of machines, twenty lessons; hygienic and applied natural history, twenty lessons; mineralogy and geology, thirty lessons; architecture, ten lessons; industrial drawing, twenty lessons.

Second Year.—Applied mechanics, sixty lessons; strength of materials employed in machines and constructions, twenty-four lessons; construction and mounting of machines, sixty lessons; analytical and industrial chemistry, forty lessons; metallurgy, twenty lessons; civil constructions, sixty lessons; industrial physics, forty-five lessons; industrial and commercial legislation—ceramics, eight lessons; dyeing, twelve lessons; glass-making and mining, twenty lessons.

Third Year.—Applied mechanics, sixty lessons; construction and erection of machines, fifty-five lessons; analytical chemistry, twenty lessons; industrial and agricultural chemistry, general metallurgy, and metallurgy of iron, sixty lessons; mining, twenty lessons; public works, sixty lessons; steam-engines, thirty-five lessons; railways, forty lessons; naval constructions, twenty-five lessons.

In addition to the above the following practical exercises and studies are required:—

First Year.—Various chemical manipulations; exercises in general physics, stereotomy, and taking of plans; architectural and topographical designs, and working drawings; problems in the infinitesimal calculus, general mechanics, and general physics. During the vacation, after the first year's studies, the pupils are expected to make plans of buildings and machines; also to write an essay on the resistance of materials.

Second Year.—A practical essay on the flow of gases, with the aid of an anemometer and a ventilator; each pupil to draw up a paper on the subject. Construction with bricks according to given plans of various kinds of chimneys, a baker's oven, a lime-kiln, a hot-air stove, &c. Each pupil to make a survey, and draw a plan of a watercourse, and measure the volume of water in a stream; a paper to be sent in on the details of these operations. Practical exercises in a factory on the construction of machines. Twenty-seven manipulations in analyzing and assaying. Drawings and projects of machines and buildings. During the vacation after the second year, the pupils to visit manufactories, &c., and to hand to the director, on resuming their studies, a diary, giving a summary account of the studies made and the factories visited; an album containing notes and sketches made on the spot; fair copies of the most remarkable

objects contained in the album, and a paper on questions in applied mechanics.

Third Year.—Projects in two series: the first on the more important subjects in all the courses; the second on subjects connected with machines, buildings, metallurgy, and chemistry.

Such is the profound and comprehensive course of technical education carried out at the Central School. After the Exhibition of 1861, this institution was proposed as an excellent model for the great industrial school which Prince Albert thought of founding in this country. Under the auspices of the prince, a report was drawn up, in which it was alleged that it was indispensable, in order to maintain English industry at the proper height, that an establishment upon this model should be set up in this country. Unfortunately the prince's project has not yet been realised.

The subject will need another paper.

THE PROPOSED CHANNEL DRIFTWAY AND OUR COMMENTATORS.

A LETTER bearing the not very distinctive signature "Engineer," printed in the *Times* of the 20th inst., in reply to observations in these pages, affords, what most disinterested and impartial persons will probably consider to be very weighty testimony in favour of those views as to the doubtful, or at least fabulously costly, project of a tunnel underneath the Straits of Dover, which we intimated, rather than enforced, in our last number.

Let us say at once that in using the term disinterested, we make not the slightest allusion to the possible pecuniary interest of any man, scientific or otherwise, in the scheme. Let professional schemes, once for all, be subjected to the fair course of professional criticism without any approach to an imputation, on either side, of unworthy motives. But there is nothing more likely to bias and swerve the judgment, especially when it is not matured by an adequate amount of experience, than that kind of party spirit which almost invariably springs up on the proposal of any great scheme of a nature altogether novel. That engineer would be almost more than man—he certainly would be no ordinary man—who, when asked if he would undertake the direction of some colossal enterprise, should calmly reply, "All things are within the reach of money; but this which you propose can only be attained by a disproportionate and unjustifiable outlay of money." Thus, let a man, let us say of eminence, be once consulted on a brilliant project, however wild; let some degree of preliminary work be attempted, some degree of preliminary expense incurred, and eager advocacy is sure to be forthcoming. Nor is such advocacy to be regarded, by any impartial judge, in any other light than that under which we criticize the opening speeches of those able men, who in gowns of silk and of stuff, have learned so much of the language of the civil engineer in the committee-rooms of the Houses of Parliament.

In the present instance the advocacy of "Engineer" is peculiarly *maladroït*. Bearing in mind that the one great engineering difficulty is that of expense, it is certainly rather an Irish mode of procedure to propose to halve the difficulty by doubling the cost. "A certain—or rather a very uncertain—amount of the stifling gas known as choke-damp exudes from the surface of freshly-cut chalk. A known amount of the same irrespirable vapour is produced in the lungs of workmen, and by the combustion necessary for illumination. For the greater facility of dealing with this snub enemy, "Engineer" proposes to double its quantity—to double the superficial area of damp chalk, to double the number of workmen, to double the combustion, to double the expense: in a word, "to construct two parallel drift-ways." If the problem had been how to ventilate of the utmost possible expense, the suggestion of this plan would have been the proper answer.

It should also be observed that this part of the scheme as it now stands, is irreconcilable with the purpose of "proving the possibility of making the tunnel below 20 per cent. of the necessary capital is expended." Without having before us the plans and sections (if the scheme has advanced so far as the construction of plans and sections), it is impossible to speak with certitude as to the proportionate cost of the drift-way and the tunnel respectively. But every one who has any practical experience in such matters knows that the cost is by no means pro-

* See p. 409, ante.

portioned to the areas, or to the cubic quantities of the larger and smaller bores. A driftway, though costing less per linear yard than a tunnel, costs far more per cubic yard. It is more than questionable whether a driftway of any description could be run under the Straits of Dover for one-fifth of the cost of a tunnel of an area adequate to allow of the passage of a locomotive. It is certain that a pair of parallel driftways could not be constructed for so small a proportion. Some discrepancy in the results of the studies of "the most eminent engineers . . . for many years" here requires explanation.

It is also unfavourable to the upshot of those studies that "Engineer" speaks of the commencement of the driftway in the tone,—or at all events illustrated by the analogy,—of a six months' tour. The projector has not made up his mind whether to use a great coat or an umbrella to keep out the tide. Whether his two parallel driftways shall be timbered, or bricked, or iron-lined, is to be as it pleases Providence. Each costly material "will doubtless be employed in its proper place." There is a great convenience in this easy mode of leaving the morrow to take thought for the things of itself. Into the cost per foot cube, or per hundred-weight, of timber framework and polling, of temporary brick arching, or of bolted and calked iron-lining (all of which has to be removed before the tunnel itself can be constructed), fixed in place, at 250 ft. depth below the centre of the English Channel, it is, on this view of the case, unnecessary to inquire.

A different, but scarcely a more practical, style of argument is applied to meet the difficulty of the great length of headway which it is proposed to run from one end. The actual length of tunnel proposed by "Engineer" and his friends is not stated. The account on which our remarks were principally founded spoke of a total length of sub-aquatic tunnel of thirty miles. "Little over twenty," is the estimate of "Engineer." Accepting this recommendation (as really one of no great practical importance to the matter in its present state), we are told that because a full-sized tunnel, twelve miles long, run from each end, under the Alps, will meet accurately somewhere,—that is, because the engineers of the Mont Cenis tunnel feel perfectly "sure that the two ends will meet,"—therefore the meeting of driftways running for "over twenty miles" under the Channel is "reduced almost to a matter of certainty." We are grateful for the concession "almost." To those who know by long practice the hourly difficulties attendant on the charge of both the centre line and the levels of a troublesome tunnel, the encouragement drawn from the expectation that the hopes of the French and Italian engineers, who are working under circumstances of an entirely different character in Mont Cenis, will be fulfilled, fails to be absolutely reassuring.

Again, as to the water. There is, we are told, "every reason to believe that the tunnel will be a comparatively dry one." Of three universal reasons two only are hinted at; one is, that because coal workings, under the same strata of the coal measures, are, in a particular instance, "comparatively dry," therefore chalk workings will be so. The other is, that because, above the level of the sea, no "considerable amount of water has been found in the lower chalk," therefore, under the hydrostatic pressure of the entire depth of the Channel, the same happy state of things will be found to exist. It must be observed, moreover, that, in the absence of definite borings, the very nature of the material through which the experimental driftway is to be run, whether upper chalk, lower chalk, chalk with flints, or half a dozen other materials, is, to say the least, only matter of geological inference, or, in other words, of scientific guess-work.

Not more conclusive is the comfort to be derived from the experience of the Kilsby Tunnel, "if an immense quantity of water were met with." In fact that experience points rather in the opposite direction. It was by the exhaustion of the sandhilled filled with water which was encountered in that mile of work,—subterranean indeed, but far above the level of the sea,—that progress in the works was rendered feasible. In that case, and in similar instances, had the engineer run an adit through the deep cutting at each end of the tunnel to the face of the work, the cost would have been enormously lightened, at the price of a delay in the actual commencement of the tunnel. The tunnel and the enticings once complete, the water could not again accumulate. Under the Channel the reverse would

be the case. The reservoir of superabundant water is absolutely inexhaustible. If entrance were once obtained, in any considerable volume, no pumping machinery in the world would make any permanent impression upon the flood. Every drop of water that percolated into driftway or into tunnel, would clear the way for a larger drop to follow. Every hocketful of water that was pumped out would increase the infiltration from above. And above is the ocean!

If then "semi-professional journals," among which we have not the false modesty to rank the *Builder*, "have suggested to the public that there are insurmountable difficulties of the most obvious character, which have been overlooked, with reference to this scheme," we can only join them in the regret that the skill of "some of the most eminent engineers" who "have carefully studied the subject for years," has not been illumined by a little more practical wisdom. The more closely the certain difficulties that oppose the prosecution of such a scheme—to say not a word of contingencies—are studied, the more obvious and formidable do they become. The more widespread, and the more accurate, our experience of actual tunnel work (and it will be clear to all practical men that it is in virtue of such experience, that we speak), the more hazy, visionary, and indefensible does the project of a subterranean communication with the Continent appear, on mature consideration. That there exist neither commercial, financial, nor political reasons to justify such an attempt, is our dearest opinion. Of the physical possibility of liberate opinion. Of the physical possibility of the undertaking we have not spoken, nor have we at all exhausted the question of its certain cost, and attendant dangers. But no one can, in the present state of our geological and engineering science, actually demonstrate that the execution of the scheme lies within the power of man, or that, even if the amount of money estimated were raised, a sub-aquatic gallery to France could be attempted with more success than a tunnel through the volcanic bowels of Etna, or a railway to the moon.

NEW STEPPING-STONES.

Two little hooks, purporting to be stepping-stones to architectural design and building construction, have just appeared, which are likely to be useful, so far as they go, to the rising generation. The one we shall speak of first is a catechism (of the Pinnock class), such as might be conveniently used in schools. It is called a "Stepping-stone to Architecture." It is certain that if some general idea of architecture were to be given in schools our young people would be provided with an inexhaustible source of pleasure. All our ancient remains would be looked at in a different light to that in which they are but too often now regarded. Instead of associating such sites only with the scene of picnics, or matches of one sort or another, such as are now kindled only at the sight of classic shores. The different amount of interest felt for a building by a person who has some knowledge of architecture, and one to whom all details are a confused mystery, is so considerable as to be alone a sufficient reason for instructing youth with a fair understanding of the subject. A superb piece of architecture creates in the mind of those who can appreciate it exactly that exquisite kind of intellectual rapture that the cadences of a consummate poem impart, or that is wafted into the mind with the sound of matchless music.

A series of papers in our pages on the subject, addressed to ladies, some years ago, and afterwards gathered together as a little hook, were not without a certain amount of good effect, as we have reason to know.

Both student and building cannot be otherwise than benefited by an early knowledge of architecture, and we earnestly recommend its study in schools. The mere familiarity with the masterpieces chosen as illustrations would be a gain. And because early impressions are often nearly indelible, a conscientious endeavour should be made to render them exactly correct. Mr. Mitchell has evidently taken great pains to make his stepping-stones trustworthy, and but few blemishes can be found

* "The Stepping-stone to Architecture." By T. Mitchell. London: Longmans, Green, & Co. "The Elements of Building Construction and Architectural Drawing." By Ellis A. Davidson. London and New York: Cassell, Peter, & Galpin. "A History in Ruins: a Handbook of Architecture for the Unlearned." By Geo. Godwin. Now out of print.

upon them; but still there are on his stones what we may, perhaps, call two or three patches of wet lichens that, to the unwary foot, might lead to disaster. In reply to his question, "Of what materials is it most probable that the earliest buildings were constructed?" he makes his wistful scholar reply, "It is most probable that the earliest materials used were rushes, reeds, and the branches of trees tied together, plastered with mud and thatched with leaves. The ancient Britons constructed most of their dwellings of wickerwork." Did they? From the very numerous remains on our wolds and hills of ancient British dwellings built of stone, we might conclude that was the material most frequently used in their construction. Again, the querist is anything but clear about the distinctive details of Saxon architecture. The so-called triangular arch is not mentioned, though the flat-headed and shoulder-beaded so-called arches of later times are given; nor is anything said of the halluastre columns that are so distinctively pre-Norman. And, unfortunately, the illustration of an arch given as Saxon is a Norman. Once more, the illustration of the Doric order should be described as not purely Greek, but Roman. Still, the general merit of Mr. Mitchell's book is considerable, and it is very cheap. There are twenty-four engravings in it reprinted from Gwilt's "Encyclopaedia of Architecture," and forty-nine woodcuts.

The second stepping-stone is a link in a series of technical manuals. It is furnished with a hundred and thirty-three illustrations drawn on wood by the author,—consequently is a work of rather more pretension than the catechism just noticed. Moreover, it is adapted for the use of youth rather than children. Mr. Davidson states his aim is to give a general knowledge of the principles of building construction, and at the same time to afford elementary practice in architectural drawing. To this end he wisely advises students to read each section of his work carefully with frequent reference to the cuts, and attention to the lettering; and then to draw the illustrations to a larger scale and letter them, taking care to give, underneath the drawing, a description, or abstract, of the principles upon which the construction is based. This plan will enable them to remember what they study; and should they feel that what they have acquired is slipping out of their memories, they will have but to glance at their own drawing to revive their acquisitions. He asks, on the part of the artisan, whether the ability to understand and apply the principles of building construction will bring him wages, and answers— "we quote his words—'Yes, it will; for we may fearlessly assert that never in the whole history of labour has there been a period when the workman has been deemed more worthy of his hire, or when greater efforts have been made, firstly to teach the artisan, and then to show appreciation of his work, than the present.'" So far so well.

After explaining the drawings required for building purposes, Mr. Davidson treats of the various departments in building construction, beginning with natural and artificial foundations, and going through the various kinds of masonry, brickwork, woodwork, roofs, floors, joinery, and fire-proof construction. And besides this varied information, he gives a special chapter concerning drawings for masons, another relating to drawings for bricklayers, and a third devoted to drawings for carpenters and joiners. This is an admirable arrangement, and one advised, by the best minds, as more suitable for our schools of scholars one sort of drawing, irrespective of the different trades in which they may be engaged, or about to be employed. As considerable licence is taken in the application of tints to trade drawings, the author gives a list of those chiefly in use among architects to express various building materials:—

Materials.	Colour.
Brickwork to be executed (in plans and sections)	Crimson lake.
Brickwork in elevations	Crimson lake mixed with burnt sienna or Venetian red.
The lighter woods, such as fir	Raw sienna.
Oak or teak	Vandyke brown.
Granite	Pale Indian ink.
Stone generally	Yellow ochre or pale sepia.
Concrete works	Sepia with darker markings.
Wrought iron	Indigo.
Cast iron	Panque's grey or neutral tint.
Steel	Pale indigo tinged with lake.
Lead	Gamboge or Roman ochre.
Brass	Pale Indian ink tinged with indigo.
Clay or earth	Burnt umber.
Slate	Indigo and lake.

The drawings for masons are an example of planking, brick footings, and stone piers, as adopted in the circular vaulting at the London Docks; a bridge to cross a road; and a stone staircase; all worked out in every detail of their construction carefully. The drawings for carpenters show the various kinds of joints in timber, including the French scarf, "Trait de Jupiter," in which the key is placed at right angles to the slanting line of the scarf instead of parallel to the line of the beam; trusses, tenons; complete roofs; trimming; double and framed flooring; and a trussed partition for supporting floors, leaving a space for folding doors in the centre. Those for joiners show the construction of the woodwork for finishing the interiors of houses. In the matter of fire-proof construction, Mr. Davidson gives a notion of both the French and English methods in outline, reserving a more complete examination of them to a future manual. The French plan differs from our iron-gird system, our readers will remember, by using timber quarterings. The account given in the late Mr. Hoeking's neglected book is quoted:—

"The framed structure being complete, strong oak batten laths, from 2 in. to 3 in. wide, are nailed up to the quarterings horizontally, at 4 in., 6 in., or even 8 in. apart, according to the character of the work, throughout the whole height of the enclosure and partition; and the spaces between the quarterings and battens are built up with rough stone rubble, which the laths prevent falling out till the next process has been effected. This is to apply a strong mortar, which in Paris is mainly composed of plaster of Paris, which is there of excellent quality, laid on from both sides at the same time and pressed through from the opposite sides, so that the mortar meets and incorporates, imbedding the stone rubble by filling up the interstices and with so much body on the surface as to cover up and imbed also the timber and the laths, in such manner, indeed, as to render the concrete of stone and plaster, when thoroughly set, an independent body, and giving strength to, rather than receiving support from, the timber. The ceilings are constructed on a somewhat similar system."

We hope the day is not far distant when every workman in Great Britain will be able to make a working drawing, as well as understand that which is placed in his hands for execution. Both the little works we have here noticed may play a certain part in advancing matters towards this issue.

FALSENESS IN TRADE.

So that it seems to be, never mind what it is. Such is the maxim of thousands in this God-fearing country and wonderfully intellectual age. So that a house will just stand, a printed cotton just wash, or a soldier's coat hold together till it is appropriated; so that the inferior stuff at the end of a piece of cloth cannot be discovered till it is opened, and the untempered worthlessness of the axes and picks will not be known till the bales are broken in the backwoods by eager workers dependent on sound tools, it is all right: trade has been done, profit has been made. Never mind the loss, the disappointment, the sorrow inflicted on others: profit has been made. The falseness and sham, the want of truth on the part of workmen in matters connected with their trade, are little less than appalling. You can be certain of nothing. You may buy pens that will not write, pencils with which you cannot mark, milk innocent of the cow, beer that is poisonous, looks that will not last a week, manure that has no pretence to a fertilizing quality, and seeds that could not grow in it even if it had. These last are amongst the worst kinds of deceptions,—deceptions that cannot be discovered till it is too late to supply a remedy, and the user's hopes for the year are blasted. Nearly the last Act of the past session of Parliament was one to prevent the adulteration of seeds, declaring that the practice of adulterating seeds, in fraud of her Majesty's subjects and to the great detriment of agriculture, required to be repressed by more effectual laws than those in force. To "kill seeds" means to destroy by artificial means the vitality or germinating power; and to "eye seeds" is to give to seeds by colouring the appearance of seeds of another kind. The penalty is £l. for the first offence and 50l. afterwards, with publication of the offender's name at his expense in newspapers. We would have had the punishment heavier. For such scoundrels we have no consideration, no mercy; nor can we see any valid reason why the Act should not have come into operation at once, instead of being postponed, as we believe it is, till the beginning of next year. Surely it is not to enable these honest traders, disappointers of men's hopes, to get rid of adulterated stocks on hand?

The tendency of the world to listen to specious promises, to be beguiled by apparent cheapness, to

"Give to dust that is a little gilt,
More laud than gilt o'er-dusted."

encourages the vice to which we are pointing, but does not in the least excuse it.

We remember hearing of contractors, during one of the recent wars, who sent out to our soldiers boots so made and of such materials that they became saturated with the first shower, and endured no time. The commonest feelings of humanity, apart from thought of gratitude, prompt indignation, and should have prevented such an infamous proceeding. The indignation it excites within us has no bounds. We say with Emilia, and with our whole heart,—

"O Heaven! that such companions thou'dst unfold,
And put in every honest hand a whip
To lash the rascals naked through the world."

Even this baseness is paralleled, if it be not exceeded, by those who manufacture life-boys of materials incapable of floating. Hard as it may be to believe, there is good evidence to prove that many of the life-boys sold at seamen's shop-shops, instead of being stuffed with solid cork-wood, as they should be, are filled with rushes, straw, or cocco-fibre, which being tied up in canvas will float for a little time, but are gradually saturated, and sink,—destroying what they should have saved. We have talked of whipping, but with the manufacturers of these painted lies, with these murderers for money, we would adopt a shorter course: we would unhesitatingly hang them.

VICTORIA-STREET AND THE ABBEY.

As compared with any other portion of the metropolis, the hallowed precincts of the ancient Abbey exhibit a melancholy account of ecclesiastical management. The whole district as far as Vincent-square is Church property, and in it we find more wretched dilapidated tenements,—we cannot call them houses,—than in Stepney or Rotherhithe. Within these precincts there are over thirty narrow courts, having an average of eight hovels with six rooms in each; every room tenanted by at least four human beings, and paying weekly rents. By day, if any one venture on an inspection, the whole is revolting to the sight; by night, after nine o'clock, it is horrible.

So far as Victoria-street has been completed, the improvements have kept pace with modern taste and requirements, and now that the Picnic end of this fine thoroughfare has been opened out to Grosvenor-place a more direct route to the Houses of Parliament and the Abbey has been secured for the inhabitants of the West-end.

From Hyde Park Corner to the Victoria Hotel buildings of superior description have been ranged along the line, generally in an efflorescent French style, and the contrast becomes flagrant when a comparison is made with the adjacent church slums, which occupy a no less valuable position, in close proximity with the glorious Abbey and the Houses of Parliament. Is it that Churchmen are wholly wrapped up in what concerns futurity, and therefore take less interest in merely mundane affairs?

The squalid condition of all the surroundings of the Abbey induced us before to suggest for the improvement of that important though neglected district that a continuation of Victoria-street should be made in a direct line from Stratton Ground, opposite Christ Church, to Victoria Tower.

At this point the street diverges in a slight angle, in a radius that would, if continued, strike in upon the Westminster Bridge: the continuation recommended, forming an elongated delta, would cut Abingdon-street in the centre, and issue in the broad space 50 ft. southward of the tower, being about 500 yards long, and opening out from the planted grounds of Christ Church, it would strike in upon Great College-street, passing clear of the good buildings in Dean's Yard, and would require only a few feet (say half the roadway) to be cut off the Dean's garden: thus securing for the Dean and Chapter site for the erection of suitable canons' houses, in lieu of those old red deformities which at present defile the venerable old cloisters, and which wholly blind and screen off the Abbey.

The work of restoration now in progress will be wholly lost as to external view, unless the old shapeless masses of brick hovels are cleared

away from the south side. Some space with the standing trees should be left open, both for street effect and for the aspect of the Abbey, and then this thoroughfare would not only be one of the noblest of the far West, but it would open out resources of building profit.

At the present moment there are but two unappropriated building plots on this line, which has lain so many years in hideous fallow: one is at the end of Stratton ground, and it is yet open for the practicalisation of this thoroughfare,—we cannot call it a boulevard, being only 60 ft. wide; the continuation might, however, be enlarged 10 ft. more, and with effect.

The new street would keep clear of Old Pye-street, allinating nearly with it; and in cutting across at right angles Duck-lane, New Pye-street, St. Ann's-street, Great Smith-street, and Bowling-street, would in a range of about 1,000 ft. strike in upon Great College-street, clear of the College School, necessitating the clearance of some of the filthiest lairs in Westminster.

The fine ranges of chambers extending to Dean's-yard would branch off at an angle of forty degrees, and the intervening space now occupied by dens called Union-court, Cottage-gardens, New-square, and two or three other nameless courts, together with a dozen decrepit houses in the traverse streets, would make room for fabrics of a more respectable, profitable, and durable character.

By the practicalisation of this new street, the Houses of Parliament would be approached in the distance of a quarter of a mile less than by the present issue into Great George-street; for there is a considerable deviation northward from Dean's-yard to be added to the return south from that point to Abingdon-street.

The most telling improvements of the metropolis are its bridges, quays, and grand causeways, and the present year will add much to the value and beauty of our city by the opening of Holborn, of Blackfriars, and of the Embankment. By the formation of a fine thoroughfare as here recommended, our old Abbey and the Houses of Parliament would be better developed, whilst a central, valuable, and vicinal district might be redeemed from waste for the convenience and intercourse of the whole population.

When it is considered that the fashionable quarter surrounding Eaton-square, and called Belgravia, is a mile farther westward from the centre; that its range is no higher above high water than these purlieus of the Abbey; and that all the noble mansions built there command the highest rate of rent and purchase, there can be no doubt but that clearances about the Abbey, extending in width even from St. James's Park to Vincent-square, would produce a good return financially, whilst the adaptation of the space to modern constructions would effect the redemption of a district now a disgrace to the metropolis.

REPORT ON SOUTH OF LONDON WATER SUPPLY.

The Report of Mr. J. N. Radcliffe to the Medical Officer of the Privy Council on the results of an inquiry into the causes of the turbidity of the water supplied by the Southwark and Vauxhall, and the Lambeth, Water Companies, has been issued in a printed form.

In the outset the Reporter says:—

"Professor Frankland, in his Reports to the Registrar-General on the waters supplied by the Metropolitan Water Companies in the years 1867 and 1868, makes the following statements:—Of 1867 he writes,—

"Only on one occasion during the whole year have I obtained a transparent sample of water from the Southwark company's mains." Of 1868: "On several occasions the water of the Lambeth, Southwark, and Chelsea companies was in such a muddy condition as to render it totally unfit for domestic use. In February last the Lambeth company's water was so turbid, that brightly illuminated objects could not be seen through a stratum of it 12 in. deep. On account of the great amount of sewage which commingles with the river waters supplied to London, their efficient filtration before delivery is of the utmost importance. . . . The Southwark company's water is almost invariably sent out in an imperfectly filtered condition. Only on one occasion in the entire year did I obtain a sample of clear water from this company's mains, and the same was the case in 1867."

Referring to an instance of exceptional contamination of the Southwark company's water during the months of August, September, and October, 1868, Professor Frankland remarks:—

"I directed the attention of the company's engineers to the abnormal conditions of the water, pointing out that the admission of a certain proportion of tidal water of the

Thames at Battersea, where the company's reservoirs are situated close to the river, would cause the excess of impurities which I had observed."

The following table shows the number of occasions, out of a total of twenty-four monthly observations, on which, according to the reports of Professor Frankland to the Registrar-General, the different Metropolitan Water Companies delivered turbid water from their mains during 1867 and 1868:—

Name of Company and Source of Supply.	Number of Occasions when Clear and Transparent.		Number of Occasions when Slightly Turbid.		Number of Occasions when Turbid.		Number of Occasions when Very Turbid.		
	1867.	1868.	Total.	1867.	1868.	Total.	1867.	1868.	Total.
Thames —									
Chelsea	9	7	16	3	2	5	0	1	1
West Middlesex	11	12	23	1	0	1	0	0	0
Southwark	1	1	2	0	0	0	0	0	0
Grand Junction	8	9	17	1	2	3	5	4	9
Lambeth	9	6	15	3	1	4	0	2	2
Other Sources —									
New River	12	10	22	0	2	2	0	0	0
East London	10	3	13	2	8	10	0	1	1
Kent	0	8	8	2	3	5	2	1	3

The Report then goes on to give evidence of the turbidity of the water of the Southwark and Lambeth companies at various times in course of the present year; and also as to the causes of that turbidity, and what had been done to obviate it. The great and rapid increase of demands upon the Southwark company's supplies,—an increase said to have overpassed, for the time being, all measures to meet it satisfactorily,—is referred to.

The Report states that

"The Southwark company has for some time been taking measures to overtake the increasing requirements of its district, and to remedy the insufficient provision for subsidence and filtration described. They have constructed extensive additional works at Hampton, which it is believed will be in full operation before the close of the present month (July); and they are making an important addition to the works at Battersea. The new works at Hampton are adjacent to the old works, and are supplied with water for the same intake. They consist of (a), a subsidence reservoir, having an area of 3½ acres, and capable of containing 10,000,000 to 15,000,000 gallons, according to the height of the river; and of (b), three filter-beds, having a joint area of 3 acres, and estimated to be capable of filtering, when in full action, 420,000 gallons per hour. In connexion with these works two engines are being built, and are now well-nigh completed, having a total horse-power of 450. The new work in progress at Battersea consists of a subsidence reservoir having an area of 2½ acres, and a capacity of 24,000,000 gallons.

It is proposed, when the new works at Hampton are brought into operation, to devote them entirely to the supply of that portion of the Southwark company's district which lies westward of Vauxhall Bridge; the operation of the works at Battersea being limited to the district east of that point. It is estimated that from 35 to 40 per cent. of the entire supply of the company will be distributed from Hampton.

When the additions now in progress are completed and brought into operation, the Southwark company will have placed its works fairly on a level with its present requirements; but if the demand upon its supply continues to increase at the rate of the past two years, the margin of safety, even for the near future, appears to me to be too scanty. It must, also, however, be stated, that the company has recently bought land at Battersea with a view to a further extension of their works when needed."

The general summary of the Report, with suggestions, is as follows:—

"In bringing this Report to a conclusion, I would state:—

I. As to the Turbidity of the Southwark and Vauxhall Company's Water.

(a) In respect of Causation.—(1) That it is dependent upon the deficiency of provision for subsidence; (2) the insufficiency of the area of filtering surface; (3) and, in certain instances, upon one or other of the following causes; (a) the admission of tidal water from the Thames into the reservoirs at Battersea, either by direct inflow, by breakage, or by leakage; or (b) upon the admission of unfiltered water from the subsidence reservoirs into the pump-wells.

(b) In respect of Remedy.—(1) That the company has already taken measures which will remedy for the present (a) the defective provision for subsidence and the insufficiency of the filtering area; (2) but it should be required also, in order to obviate the cause of turbidity, that the works at Battersea with the tidal portion of the Thames, by means of the old conduit leading to Battersea Resch, and the direct communication of the subsidence reservoirs with the pump-wells, should be entirely cut off. Any contingencies that might arise, which would apparently, at the moment, justify the company, as a matter of expediency, in continuing the legality of the aforesaid conduits, taking water into their reservoirs through the conduit communicating with the tidal water of the Thames, or in permitting unfiltered water to pass directly from the subsidence reservoirs into the engine-wells for distribution, can be provided for in other and more legitimate modes.

II. As to the Turbidity of the Lambeth Company's Water.

(a) In respect of Causation.—(1) That the source of impurities is objectionable; and (2) that the provision for subsidence, and (3) filtration, is insufficient.

(b) As to Remedy.—(1) That the intake of the company

should be removed above Moulsey Lock; and (2) that additional provision should be made for subsidence and filtration.

The removal of the intake above Moulsey Lock would not interfere with the present works at Long Ditton, and would let once do away with the cause of difficulty in the way of effectual filtration, which arises from the exceptional turbidity of the river at the present intake of the Lambeth Company's supply. The same remarks and suggestions apply to the Chelsea Company, it must be noted, in constructing two additional filter-beds at Seething Wells, having a joint area of two acres.

POSITION AND PAY OF ENGINEERS IN INDIA.

A PROPER understanding of the position of the Public Works and other Departments in India, and the right management of them, being of great consequence to a large number of our readers, we have on numerous occasions allowed representatives of the various branches to state their own views and grievances, and have advocated such reforms as seemed necessary. Continuing in this course, we give insertion to the following as representing the views of a considerable body of public servants.

Though in India the two things, position and pay, go very much together, yet one can be treated separately from the other, and position can be considered apart from pay. The subject as affecting civil engineers in that country is very important, and to understand the bearings of the question it is necessary to go back some years, and depict the state of Indian official society when there were no civil engineers. There were to be met with then five grand divisions of covenanted civil servants, officers, medical men, and chaplains of the army; a very small body of white brought up on the hills, chiefly sons of officers, and known as "country born," half castes, and natives. The Covenanted Civil Service was, as every one knows, the best. It was entirely filled by nominated youths from England, trained at Haileybury, had a monopoly of civil appointments, and extraordinarily good salaries. Originally these covenanted civilians were the East India Company's mercantile assistants, and under the name of writers, junior and senior, merchants drew poor stipends, and boarded in the forts and factories, as if they were the clerks of a business house. In fact, no firms could in these days bring out subordinate agents on anything like the terms to fill the most minor situation.

They were, however, allowed to trade on their own account, and on the Company getting territorial away, they were sent into the districts to collect the revenues, and rule the subject people. Salaries remaining what they were, the Company's civilians exercised their authority as much as possible for their own advantage, levied protective duties on merchandise passing through their provinces, thus favoured their own ventures, and made enormous profits. Lord Clive saw that this easy state of affairs was ruinous to the interests of the Company, and an immoral method of Government, and that, though salaries were extremely low, the revenues were being absorbed at a fearful rate, and the servants of the Company were so but nominally, and taking things with a high hand. He therefore enormously raised the table of salaries, and strictly prohibited clandestine adventure and private trading. To ensure this result, the salaries had of course to be fixed so as to allow of civil servants living as they had been accustomed to do, and till recently it was very difficult to spend more than two thousand rupees a month in domestic establishments. To the very last of the Company, civil appointments were called writerships, but the consequence of increasing the salaries was to impart a tone which has made the covenanted service one of the most upright bodies in the world. The possession of a majority at the consultable and heritable in all the places of authority in the regulation provinces of three presidencies gave the civilians an exaggerated power, one that could be exerted for the advocacy of their own views, and the furtherance of the interests of their order. It was not to be supposed that such advantageous conditions would not make them entertain a very good opinion of themselves, and from the court of directors downwards there was a general acquiescence in their elevation, and a conviction that they were qualified for any appointment, provided it was well enough paid. Where there was a good thing going, or one that could be set a-going, there would be a covenanted civilian he found at the head of it. And if a particular person was suited to a particular place or office, and belonged to the Civil Service, the salary had to be amplified to the dimensions of his expectations. In point of rank, the civilians hardly needed any special graduation, as their published drawings would sufficiently indicate how they stood; but there was in India grown up with the remodelled Civil Service a very numerous army, most of whose offices were very moderately, not to say poorly, paid, but which had colonels and generals with emoluments almost rivalling the common run of civilians, and military rank, decorations, and glitter to add lustre to these. It was necessary

III. I have stated in an earlier portion of this report that no measures are adopted by the Southwark and Lambeth Companies, nor by the other Water Companies obtaining their supplies from the Thames, to ascertain upon the provision of the law as to the thorough filtration of the water delivered by them is properly carried out. The law (Metropolis Water Act, 1852, sect. 4) requires that the water supplied shall be effectually filtered; but it does not direct that any steps shall be taken to ascertain whether effectual filtration is accomplished. It is obvious that if the action of the filter-beds upon the water transmitted through them be not subjected to regular observation from day to day, filtration becomes little more than a hap-hazard process.

It is greatly to be desired that the different Thames Water Companies should keep a register, open when required to the inspection of any properly authorised public officer.

It is desirable, also, that the other Metropolitan Water Companies should keep a like register, modified in accordance with the nature of their source or sources of supply. It is further desirable that the state of filtration of the water delivered by the different Metropolitan Water Companies, as indicated by transparency or turbidity, should be subjected to more frequent investigation by some public authority than at present.

IV. The remarkable differences existing in the provision for filtration by the different Thames water companies, and, indeed, among the Metropolitan water companies generally; the absence of any common consent among the engineers of the companies as to what are the conditions of efficiency, as indicated by these differences; and the too frequent inadequacy of the filtration of the water of all the companies (except that of the West Middlesex), suggest the necessity of an official investigation of the subject, with a view to determine some common rule of guidance.

V. Professor Frankland's references to living organisms in the sediment deposited by the water supplied by the Southwark and Lambeth companies suggested a comparative microscopical examination of the companies' water at different points from the source in its passage through the works. I collected samples for this purpose and forwarded them to Dr. J. Burdon Sanderson, F.R.S. I append Dr. Sanderson's extremely suggestive report.

P.S.—After this Report was written, the Report of the Royal Commission on Water Supply appeared. The suggestion of the Commission that all the Metropolitan water companies should be superseded by a municipal authority appears to provide in another way for the kind of supervision contemplated in Section III. of my recommendations. J. N. K.

Dr. Sanderson's Report states that in each of the waters derived directly from the Thames he found an abundant deposit, which presented all the characters of the deposits described by Dr. Hassall in his paper on the "Microscopical Characters of the London Waters" published in 1851. It consists partly of formless granular matter, shells of diatomacea and other organic debris held together by a gelatinous-looking transparent substance, partly of living plants and animals, and partly of shreds of vegetable tissue and fragments of grit.

It appears to him to be of greater importance that time should be devoted to the investigation of the extremely minute and elementary structures which he describes as "rod-like bodies and microspores," than to the enumeration and description of the higher forms, e.g., ciliated infusoria, diatomacea, and desmidea, &c., with respect to which he holds that their only significance lies in their affording evidence of defective filtration. As regards monads, and more particularly as regards the actively moving microspores and rods, he remarks, they probably afford proof that chemical decomposition is in progress, and that the water containing them is in such a state as to be improper for consumption.

The Dresden Theatre.—The Court Theatre, Dresden, has gone the way of all theatres,—it was destroyed by fire on the 21st inst.

to introduce some relative order, and the table of Indian precedence was framed. The civilians were divided off into classes according to length of service. On first coming out they ranked with subalterns, after four years' service as captains, after eight years' residency as majors, and after twelve years as lieutenant-colonels, and so it went on. In framing the table they had taken good care of themselves, as it took an ensign from fifteen to twenty years to become captain, and he often retired from the army on a pension without getting over the rank of major. Moreover, salary was not taken into account, and a civilian with a good round income need have cared very little about what class he was in.

The writers on appointment in England had to undergo a smart pass examination, chiefly in classics, and then spent two years at Haileybury College, where there were the facilities for studying law, Indian languages, and political economy. Once in the college, it would require great indolence not to be able to get out of it. The military services were entered in two ways. For the cavalry and infantry services cadetships, as they were called, were given direct,—that is, the cadet immediately on passing a test examination to show he had received what is termed a military education, went out to his regiment in India. Certain cadetships were called Addiscombe appointments, and no one could go out to India under this form of nomination without spending two sessions at the Company's military seminary. There those who qualified received engineer and artillery commissions, and those who did not, or for whom there were no vacancies in these branches of the service, went out in the infantry, counting the time spent under instruction as *bonâ fide* Indian service for pension. Taking the case of two brothers, one nominated to Addiscombe and one to Haileybury, and looking at their position after, let us say, twelve years, the one would be a subaltern of artillery, on 250 rupees a month, and the other, with the relative rank of Lieutenant-Colonel, an acting collector on 2,000 rupees a month. There was nothing to account for this difference of position except the original nomination.

The cadet might have changed places with the civilian, according to the caprices or accident of patronage. Such overwhelming differences in prospects could not but produce a strong jealousy between the services, and a practical belief in the minds of the civilians who had the giving of appointments in India, that a post intended to be filled by a military man, or for which an officer of the army was eligible, should be much lower paid than if it was a civilian that was to occupy it. Thus a military paymastership was worth half what a civil paymastership was. The feeling had sometimes a ludicrous manifestation. The wife of a civilian at Calcutta, narrating, so the story goes, who formed the party at a certain entertainment, said So-and-so were present, and So-and-so, and a lot of trash from the fort, meaning officers and their wives from Fort William. Such vulgarity of sentiment, it need hardly be said, cannot well have been general among the civil servants; but their immense distance from their contemporaries in salary cannot have failed to impart a certain claim to superiority in spite of themselves, and which at times would be apparent; but, in truth, the civil servant became in some ways superior to the mere regimental officer. From entry into the service his expenses had been of a much more varied kind, and his attention had been devoted to mental exercises, such as learning the Indian languages, observing the working of political economy, practising the law, adjusting taxation, or secretarial duties; while the subaltern was from day to day drilling his men, attending station committees, and dining at mess in the evening, for the most part physical occupations. The military life suited those who were not fond of study, contented with moderate allowances, and aimed at the reward of a soldier. There were also other things to be mentioned further on, which somewhat melted down the silver barrier between the Services. No power could be expected to pay its army upon the liberal scale of the Indian Civil Services; still less when there were thousands of Indian officers to hundreds of civilians. Besides, Parliament had fixed limits to the covenanted Civil Services. The Court of Directors availed themselves of no similar bounds existing to the extension of the army; and though their regiments were not over-officered, and promotion was excessively slow, still the number of native regiments was almost always on the increase till they matured in Bengal. After that event,

those curious to see what reductions have been made can consult a local Army List belonging to each period, and may observe in India itself what further curtailment is desirable. Having a large native army gave the opportunity of getting away cadetships by wholesale. Coincident with the augmentation of the army was the extension of the Company's territorial sway; and for the many civil duties of Government in these increased domains there was no organisation except an inexpansive covenanted Civil Service educated as magistrates and private gentlemen. Accordingly, where civil engineers and architects were wanted, the corps of military engineers were distributed, supplemented by chance selections from the cavalry and infantry of those who expressed a wish to act in these capacities, or who were considered to have a taste for drawing. If a chaplain was wanted, an army chaplain was supplied. All doctors were military surgeons; and in districts where the benefits of English rule had to be conferred officers were taken as commissioners and assistant commissioners on passing an examination in a native language, and performed generally very fairly the duties of collector and magistrate, or sessions judge. It became the practice for a considerable number of officers to be permanently absent from their regiments in time of peace, liable to recall to take the field with them. There was thus an unlimited opening for a virtual increase of the Civil Service; and it had this advantage, for the Directors were prudent legislators, that they could obtain almost equally efficient service on lower terms. It has always been the custom to remunerate military staff appointments, such as those of adjutant-general and quartermaster-general, with their deputies and assistants, aide-de-camp, and the like, by salaries in addition to the pay of military rank. So that a major and adjutant-general would get a little less than a colonel and adjutant-general, and lieutenant and aide-de-camp less than a captain and aide-de-camp. This was the principle of the army. It kept a value to military rank; was the custom of every civilised country in dealing with the staff of armies; and was for the East-India Company a very cheap method. They could say to a young officer, "It is very true your staff salary and pay combined are small compared with the emoluments of your contemporaries in the covenanted Civil Service, but wait till you are a colonel, and you will receive all the benefit of your elevation." The principle was applied to all the services in connexion with the army, the commissariat, stud, &c.; and as public works were then administered by the Military Board, which also directed the foregoing civil branches of the army, all engineer officers received staff salaries on much the same scale as the commissariat, and, in addition, the military pay of rank. But the Civil Service owned no such law. Certain consolidated salaries were fixed for each class of appointment, and those in them got the full rate of remuneration, irrespective of their age or standing. Latterly the same privilege was extended to military officers holding office in the non-regulation provinces, but the Public Works Department remained on the old footing. The covenanted Civil Service had a fixed pension of 600*l.* a year granted to each member on completing a limited service; and, in order that the inducement to retire might be sufficient, Government deducted regularly 4 per cent. of each civilian's salary, and gave an annuity to make up the pension to 1,000*l.* a year. No civil servant could remain more than thirty-five years in India. The army had also pensions much according to length of service, and varying from, for twenty-two years, 191*l.* up to 450*l.* for thirty-two years; and for those able to stay on for an average period of forty years there were off-reckonings, bringing up the pension to 1,000*l.* a year. Any officer obtaining the position of full colonel could reside permanently in Europe without retiring from the service. The East-India Company were provident, and knew the circumstances of Eastern service. The Civil Service had a Widow and Orphans' Fund, to which they paid in subscriptions as a condition of appointment, and from it the widow of each civilian got 300*l.* a year. The army in each presidency had also a military fund, to which all cadets had to bind themselves to belong on their arrival in the country, and which they could not resign without severing their connexion with Government. Subscriptions to the fund were—for a single ensign in India, 13*s.* a month; on leave in England, 5*s.* a month. For a married ensign, 1*l.* a month in India, and 8*s.* 8*d.* in

England. A colonel paid, unmarried, 4*l.* 13*s.* a month, or, married, 7*l.* a month in India; and 1*l.* 7*s.* 6*d.* and 2*l.* 1*s.* 3*d.* in England respectively. The ensign paid a donation to the fund on entrance of 33*l.*, and additional donations on attaining higher rank, the colonel's being 60*l.* On marriage an ensign paid 66*l.*, and a colonel 440*l.* The return for those payments was that bachelors who fell sick got their passage paid when it was not paid by Government, and, if subalterns, an income allowance in England; but the fund was mainly instituted for family purposes. It paid a widow's passage home with her children, gave her a pension of from 81*l.* a year for an ensign's widow up to 235*l.* a year for a colonel's. Besides this, children received from 20*l.* to 40*l.* each, and girls the latter sum till marriage or death. An officer wishing to bring out his family could obtain a loan of the needful sum. So that such an institution as the military fund was invaluable.

The medical services had also funds of their own, which, in addition to widows' pensions, gave annuities to prevent retired members having to go into practice again. The noteworthy feature about all these funds was that they were Government institutions, which the East India Company warmly supported. Every person in their employment was required to belong to them. The subscriptions and donations were levied by the State paymasters, and the money was deposited at high interest in the public treasury. The country-born population was a trifling fraction in the white community of India. Many of them received cadetships for which they were examined in India, and joined their regiments on exactly the same terms as those who came out from England. During the construction of the Ganges Canal, several educated at the Roorkee College were taken on as engineers, but in a subordinate capacity and with no assured position, and their prospects were very unsatisfactory. The fact is that no greater injustice can be done to a boy of pure European blood than to attempt to bring him up either on the plains or hills of India. The constitution is rendered sapless. Instead of a rosy colour and full development, there is a pallor with only a slight hectic flush to show the purity of origin. The face looks pinched and old. The association with natives continues, and a life only is not conducive to moral health; and a life in a country like India, where society is totally different from that of Europe, and abnormally constituted, is not calculated to give any breadth of view or real knowledge of the world. Such a person's ideas must be contracted, and they must be quite out of sympathy with the ordinary run of British gentlemen. This great difference in breeding is one of the chief causes of the gulf so often noticed and deplored between natives and Europeans, and neither in their case nor that of individuals country born can education bridge it over. A person brought up in the country can be told at once by a peculiar vacancy of expression, and if that does not reveal it a few moments' conversation does. A young lady of this class once, on being told a sumptuous banquet had been given on some public occasion in England, remarked, "Of course, everything on the table was hermetically sealed," being unable to conceive any luxury procurable out of a tin case, such as they are invariably only to be found in India. But as the second generation of pure Europeans is, according to the report of the Colonisation and Settlement Commission, unknown in India, the country-born class is a very small one, and not self-increasing. It seems, however, to have furnished the first civil engineers engaged on terms not very flattering to the profession, and is interesting in that respect, and as illustrating the subject in hand.

The next subdivision of society in India is the "Half Castes," a rather numerous, and, as may be supposed, varied body. The term is that usually employed to designate a mixed race in all parts of the world, but it is strongly objected to by the class in question, as being an epithet of reproach, and oscillating by turns between the entitlings of "Eurasian" and "East Indian," have adopted the latter. They, however, consider it very hard that there should be any special nomenclature for them, and are much afflicted with false pride. The term "half caste," or its equivalent, is seldom or never applied to any but those East Indians who have never been out of the country; such of them as may have received an English education take their place with any other European; and there are many in all branches of the service who have not found

their descent a barrier to their advancement or reception into society. Of such we are not speaking, nor are we of a few who, though strictly East Indians, have risen as merchants or otherwise, to wealth and local repute. But the great body of half-castes were, from the very fact of their being brought up in India, excluded from the advantages a pure European would possess through his knowledge of men and manners alone. They generally intermarried with persons of colour, and by degrees the tendency was for them to become darker and darker, till at last they could hardly be distinguished from natives. From their knowledge of the vernacular tongues from childhood, they could not but have an intimate acquaintance with native ways and modes of thought, and so close a connexion could not fail in resulting in their horrowing much that was non-European. For various reasons they would not engage in manual labour or any pursuit that required much physical exertion. The more successful and best educated turned to Government service, and were employed as clerks; the only thing they were fit for. Others became assistants in the Presidency town shops, or apothecaries, headles, pew-openers, and held those little offices which are filled in England by poor deserving people. But the summit of their ambition was to be a clerk, and it was a vocation into which they all pressed. A few made very fair overseers in the Public Works Department, but had neither the ambition nor the energy to rise higher. In aspirations and bent of mind they could have nothing in common with British gentlemen; their manners were not those of polished European society; their training had been acquired solely in India, and theirs was a constitutional inertness, the effects of climate of which the Englishman would not be very tolerant. But in the sphere which they selected, East Indians, by their respectability and docile demeanour, gained approbation, and they professed Catholicism. The natives were more at home than any of the other classes, and had a natural and complete development. The climate told even on their frame and activity, and caste determined their walk in life, but no scheme of government could be worked in India without their assisting largely. The higher castes, as the Brahmins, will not stoop to severe manual labour, but consider any kind of official employment highly honourable, and will begin on very small salaries, and sometimes on no salary at all, working their way up in the grades of clerks to higher posts. Every other description of Government work was done by some caste of natives. Their habits are very simple, the man of wealth dressing and feeding little better than the lower classes. So that their personal expenses are very few, and they can afford to accept moderate pay, and would only hoard or waste in marriages and indiscriminate charity an excessive remuneration. Before the expansion of education in late years the stock of knowledge with which a candidate began his official career was mostly confined to the three Rs, and he worked away side by side with his relatives at rote forms and judicial processes, till he attained a technical proficiency, and they left vacant places. The vernacular languages of India have no literature, and very few natives indeed have any acquaintance with the celebrated Sanscrit classics, and they rarely read English books except as a school task; so in the public offices there were no natives of really liberal education who could be introduced into society and associate on equal terms with European civilians and officers of the army. Among so numerous a body as the natives in the offices of Government there could not fail to be clever intellects; but these had quite a different forming from the European mode, and were exercised on the practical routine of life of their countrymen, and the details of revenue collection and law-court decrees. The great bulk of the native officials received not more than 15*l.* a month even as head clerks of offices, subordinate and the actual collectors of revenues from the land, or junior magistrates. But their intimate knowledge of the ways of the people,—a thing that the oldest European servant of Government finds it impossible to fathom,—enabled them to materially increase their incomes, and no appeal against assessment or suit at law could be properly presented to the covenanted collector or judge without a regular fee being given to all those members of the office from the doorkeeper upwards with whom the client had to deal. Over this practice the European officers could have no check, as the advice of natives was essential to

the conduct of business, and the increase of salaries, in a country where moral notions were so loose, would not necessarily abolish the evil, though it might and has diminished it.

In the Public Works Department the qualifications for an ordinary clerkship, and such skill as could be picked up from watching masons and labourers, would not lead very high. Much of the duty was out-of-door exercise, involving travelling from day to day, and though the expenditure of the department was considerable, a tangible result had to be produced, and a rigorous account system would disclose or suggest the taking place of wholesale embezzlement. Besides, the offices of public works were for design and audit, and little frequented by the mass of the population; so that there was scarcely any opportunity of adding to the Government salary. In consequence the more talented natives betook themselves to other departments, and the Public Works Department had to make the most of their inferior castes, and such Brahmins as could not get in elsewhere. There has always been this inferiority in the raw material of the Public Works Department to contend against, and it is a thing likely to continue, as the causes are ingrained in the disposition of the people. There were thus, several years ago, in India, the civil servants appointed and sent out from England. The military, medical, and clerical services, supplied directly or indirectly from the same source, all of them Europeans, and socially British gentlemen, wielding the supreme power, and occupying the positions of mark and most emolument. They contained within their bodies all heads of departments and the prime authority in military and civil matters. They constituted also the European society of India. One with another, they had a rank given them in this society by patent. They had either covenants or privileges which meant that they could not be dismissed during good behaviour without compensation, and the welfare and good name of their families was carefully guarded by means of insurance funds, for which Government was responsible. The ordinary functions could, of course, be carried on by a cheaper agency, and as a matter of obvious necessity the natives and those allied to them were employed in all petty and subordinate capacities in immense numbers. All classes were mixed up together, and employed in situations indifferently as their abilities pointed. The half-caste head clerk might have an office of natives under him, or a native might preside over a roomful of East Indians and natives, or a motley assemblage. The whole of this ancillary class were civilians engaged in strictly civil duties. They were persons gazetted to the posts they held, with a large share of the practical administration divided in minute distribution amongst them, and were virtually civil servants as much as a clerk in Somerset House or a tide-waiter. But they were in nationality, bringing up, acquirements, notions, demeanour, and social organisation totally distinct from the civil servants sent out from England, and incapable, in their own view or any one else's, of being confounded with them. They did not require sick leave or furlough to Europe, or to retire at an early period of life, or premiums for studying the native languages and the like. But being members of the Civil Service they could call themselves civil servants. It was found there was one distinguishing feature. The Haileybury civilians signed certain documents styled covenants at the East India House before coming out. Natives and others appointed in India signed no covenant. So at once a suitable appellation was discovered, and they were popularly said to belong to the uncovenanted Civil Service. Thus "uncovenanted" for years in India was taken to mean no European education, birth in the country, a humble social position, or a native one for which there is no European equivalent, and incapacity for rising beyond an income on which a gentleman could hardly subsist. An uncovenanted service of this nature required no provident funds. Natives are polygamists, and hold much of their family property common, and the principle of caste ensures them against dire calamity. Half-castes, though more in need of some sort of insurance than natives, can, from the nature of the climate and their social system, which takes a good deal after the natives, suffer little domestic misery. Government accordingly promulgated an entirely different set of leave and pension rules for uncovenanted servants to those in force for their European officers. Read side by side they appear to go to the extremes of harshness

and liberality. The sick leave of the covenanted civilian was to count as service; that of the uncovenanted was to be deducted. Where one had three years' furlough the other could only have one, and so on. But when the circumstances of the two parties were had regard to, the rules were fair enough as applied to each respectively. One of the first disturbances of the Indian fabric took place by the introduction of individuals who were neither in the army nor covenanted civilians into scientific appointments. Prominent instances were gentlemen entertained as civil engineers. It would have been thought that as they had satisfied the Home authorities as to their qualifications, and had the same requirements, they would as to leave, furlough, and pensions, have been treated like other civil servants sent out from England. But no special clauses were inserted in their covenants to render their condition as nearly allied to that of uncovenanted civil servants as it could be made. Of course, the nominees unacquainted with Indian society would not immediately perceive the indignity to which they were subjecting their profession by signing such a covenant, which moreover was so incomplete as to leave sundry matters unsettled. On going out to India, and there presenting themselves, the Government ordered that in all respects not provided for in their covenants, civil engineers should not be, as might be supposed, under the generous rules of the covenanted service, but under those of the uncovenanted, specially framed to suit persons who were not gentlemen in the English sense of the term, and had never been out of India. This attitude and action of the Government shows an aim all through, and a desire to place civil engineers on a lower footing than they were entitled to, and which could not be done without abstracting from the local dignity of the engineering profession. Further, the names of civil engineers' grades were entirely left out of the table of precedence, and they take no rank with other covenanted officers. Such civil engineers as happened to enter the Government service in India from the railways or colleges were naturally put under the full operation of the uncovenanted service rules, and had no covenant at all, and thence it comes that there are three varieties of engineers in that country—the Military, the Covenanted, and the Uncovenanted,—according to its leave and pension rules. If there were any satisfactory pretexes for treating civil engineers, professors of the State colleges, headmasters of the educational department, others in the geological survey, and in posts which this advancing civilization of India calls into existence, as half-castes and underbred native clerks, there would be less inducement for complaint. The Government says, "Fair for one, fair for all. We now acknowledge neither race, nor caste, nor creed, in our services, and we wish to make it as homogeneous as possible, and many offices Europeans now are brought to fill we hope in course of time natives will be fit for; and we wish to have no more exclusive services and special rules founded on physiological differences between Englishmen and Asiatics. So long as we have our own old institutions of the Covenanted Civil Service and the Army, we intend to maintain their privileges. But your professions stand upon a much lower platform, and are not so influential, and we do not see it advisable to give them to you." The ratiocinating of jealous Anglo-Indian civilians who direct the Indian Government can scarcely hold ground in Great Britain, which owes so much to engineers, and some effectual redress may be looked for when it becomes understood what uncovenanted really means.

A. E. I. O.

Glue which will unite Polished Steel.—

The following is a Turkish receipt for a cement used to fasten diamonds and other precious stones to metallic surfaces, and which is said to be capable of strongly uniting surfaces of polished steel, even when exposed to moisture. It is as follows:—Dissolve five or six hits of gum mastic, each the size of a large pea, in as much spirit of wine as will suffice to render it liquid. In another vessel dissolve in brandy as much isinglass, previously softened in water, as will make a two-ounce phial of strong glue, adding two small hits of gum ammoniac, which must be rubbed until dissolved. Then mix the whole with heat. Keep in a phial closely stopped. When it is to be used set the phial in boiling water.—*The Stationer.*

GUTTER CHILDREN AND DRUNKEN PARENTS.

THE benevolent scheme of Miss Rye and others for the exportation of neglected female children to America forms the subject of a burlesque and sarcastic brochure from the pen and pencil of good George Cruikshank, the champion of the total abstinence movement. He depicts Miss Rye as the driver of a dirt-cart, into which her assistants in the emigration movement are sweeping and shovelling the poor little "female" vermin, by wholesale, off the street, before the Angel public-house. "My own opinion of this matter," says Mr. Cruikshank, may be seen in the sketch at the head of this paper, for the proposition appears to me like sweeping up the little girls, as so much mud out of our gutters, and pitching them into a mud-cart, to be "shipped aboard of a ship," like so much guano, or like so many cuttle, for a foreign market. And if such a transportation of innocent children, of that tender age, either girls or boys, should take place, it will not only be a degradation and a disgrace to this nation, but also a disgrace to the Christian world; for I consider such a proceeding would be contrary to the laws of nature, and also Christian civilisation. . . . Has 'Glorious Old England' come at last to such a state as this!!!! . . . The cause of nearly if not all this misery, crime, lunacy, neglect, and desertion of our 'Gutter Children,' and disorganisation, is, because the Christians and the Jews use intoxicating liquors as a beverage. It has been stated over and over again, by many of the leading men of the day, that 'Drunkenness is the curse of the country;' but this is a very great mistake. Drunkenness is a terrible thing, no doubt, but it is the drink, the intoxicating liquor, that is the curse of this country, and of many others. Most persons take these intoxicating liquors with a relish, and in many cases for many years, without any apparent harm or injury; but they, nevertheless, produce disease, and shorten life, except in a few solitary cases, and are the cause of all sorts of evils, from small offences up to the most diabolical deeds." He proposes, as an aid to its suppression, the formation of a "society for the prevention of cruelty to human beings and of the murder of children."

It is in all probability the cursed drink, he remarks, that has shortened the lives of the parents of these gutter children; and in cases of neglect or desertion, the drink has been the cause of the father and mother losing all paternal feeling, and unnaturally leaving their offspring, without caring what becomes of them. "And I must impress upon my readers the fact," he adds, "that there is not one neglected or deserted child amongst the millions of teetotallers, even of the most humble classes; and should there unfortunately be any orphans, they are also taken care of, and properly trained. . . . Let us try to support these neglected children in their native land. And let every woman ask each other if she is a member of the Society for the Prevention of Cruelty to Human Beings, and for the Prevention of the Murder of Children."

We may here add on to Mr. Cruikshank's brochure brief notice of a pamphlet titled "An Inquiry into the Causes of the Present Long-continued Depression in the Cotton Trade, with Suggestions for its Improvement." By a Cotton Manufacturer. (Manchester: Heywood.) This, like the preceding, has the excellent object of reducing the dreadful evil of intemperance in view, but it is also a little Quixotic. The author argues indirectly that if the three hundred and odd millions sterling expended within the last three years in drink had been expended in the purchase of cotton and other manufactured goods, the building of houses, and so on, how much better it would have been both for trade and for the morals of the people; and no doubt it would. It is strange, he thinks, that men of intelligence cannot see this. We should rather think they can and do, although they may differ as to the best or most practical, and speediest and most effectual way of remedying the admittedly enormous evil. Dreadful as the effects of drink are, we are persuaded that a vast proportion of the "nine-tenths of all crime brought before the magistrates" attributed to drink are more particularly ascribable to the admirable and infuriating adulterations of the drink, to give intoxicating effects without the alcoholic intoxicant. "Toxicology" means the science of poisons, and brewers and distillers, as well as other drink-sellers, are highly skilled in this science. Are not they responsible for much of the crime which drink produces? The writer

of this has a painful recollection of the loathsome prevalence of drunkenness in certain Scottish towns previously to the last quarter of a century, and for nearly a quarter of a century in all, but it never was accompanied by anything like the fearful crime with which it is now continually associated; and this difference he is convinced is attributable mainly to the increased skill and rascality displayed in the adulteration of all sorts of alcoholic liquors.

The total suppression of liquor traffic is simply out of the question; but we should not regret to see it so heavily taxed that the drinking of it in relatively large quantities in any shape by the masses of the people would be rendered totally—though not quite tea-totally—impracticable, from sheer want of means.

A puzzling problem has just been put before the Home Secretary by Mr. Darrab, a resident of Manchester. Mr. Darrab, it seems, is acquainted with a drunkard who suffers from frequent attacks of *delirium tremens*, during the existence of which he is obliged to be placed in a lunatic asylum. His wife is willing to pay for his retention in safe custody, but the officials declare that they have no power to detain this confirmed drunkard after recovering from the rabid symptoms of the disease. Mr. Darrab asks the Home Secretary, "What can be done to protect the wife and save the man from his own folly?" Mr. Bruce replies as follows:—

"The Government has announced its intention of introducing a measure for the better regulation of the trade in intoxicating liquors, which it may be hoped will have some effect in diminishing drunkenness and its attendant evils. The method, however, of dealing with persons in the condition of the man described in your letter is one of great difficulty, and Mr. Bruce is not at present prepared to recommend any change in the law with respect to such cases."

The Americans have taken the subject of the disposal of drunkards in hand, and are erecting homes for drunkards, or "Inebriate Homes" as they call them. A site comprising fifteen acres of land, in a pleasant locality, having a fine view of Statue Island and New Jersey, has just been set apart for the erection of what, on such a scale, is a novel institution—an Inebriate Home for King's County, New York. A charter has been obtained for the home, and about 30,000l. have been appropriated for the purchase of land and the erection of the buildings. An Act of the Legislature of New York has also been passed, granting it about 1,500l. a year from the excise licence fees and from fines levied in King's County for violation of the excise laws.

EXETER HALL.

SIR.—In the notice published in your last week's issue upon this work, it is said that it has been executed "with more force than fluency;" also that the forms into which the ceiling of the Great Hall is divided, are somewhat large and coarse together with other remarks upon the treatment generally, to which we hope you will give us an opportunity of replying.

That a considerable amount of force is necessary in the arrangement coloured described in a building of this chief uses requires the aid of artificial light, we think you will allow; and whether the force employed in this case is more than sufficient, we submit, cannot be positively decided until the building has been exhibited. We have had great experience in such work, and our fears have only been those of an opposite result, through being obliged to consider the hall is occasionally used by daylight. The forms into which the ceiling is divided are large, it is true, but the size of the ceiling itself, with the huge ventilators, placed at irregular intervals (which irregularly causes the break in the line you remark), and the necessity that existed of making these an important part of the design, quite prevented any more intricate arrangement, even should such have been thought desirable; and the coarseness of which you complain, is a matter of colouring only, which, as we have said, has not yet been tested. The walls of the building have been kept somewhat neutral in tone (but, at the same time, a colour that reflects light well), for the sake of emphasising the pilasters in order to carry out the bright colouring of the ceiling down to that of the dado. That the pattern on the large organ should "suggest Egypt" is unfortunate, as with the exception of the Ionic-like arrangement, which was adopted for the sake of effect, upon the large central pipes, there is nothing Egyptian in its character.

Mr. Maberly having placed the entire work in our hands, we trust that on his account, as well as on our own, you will think proper to insert this explanation.

HARLAND & FISHER.

THE ROCK OF CASHEL.

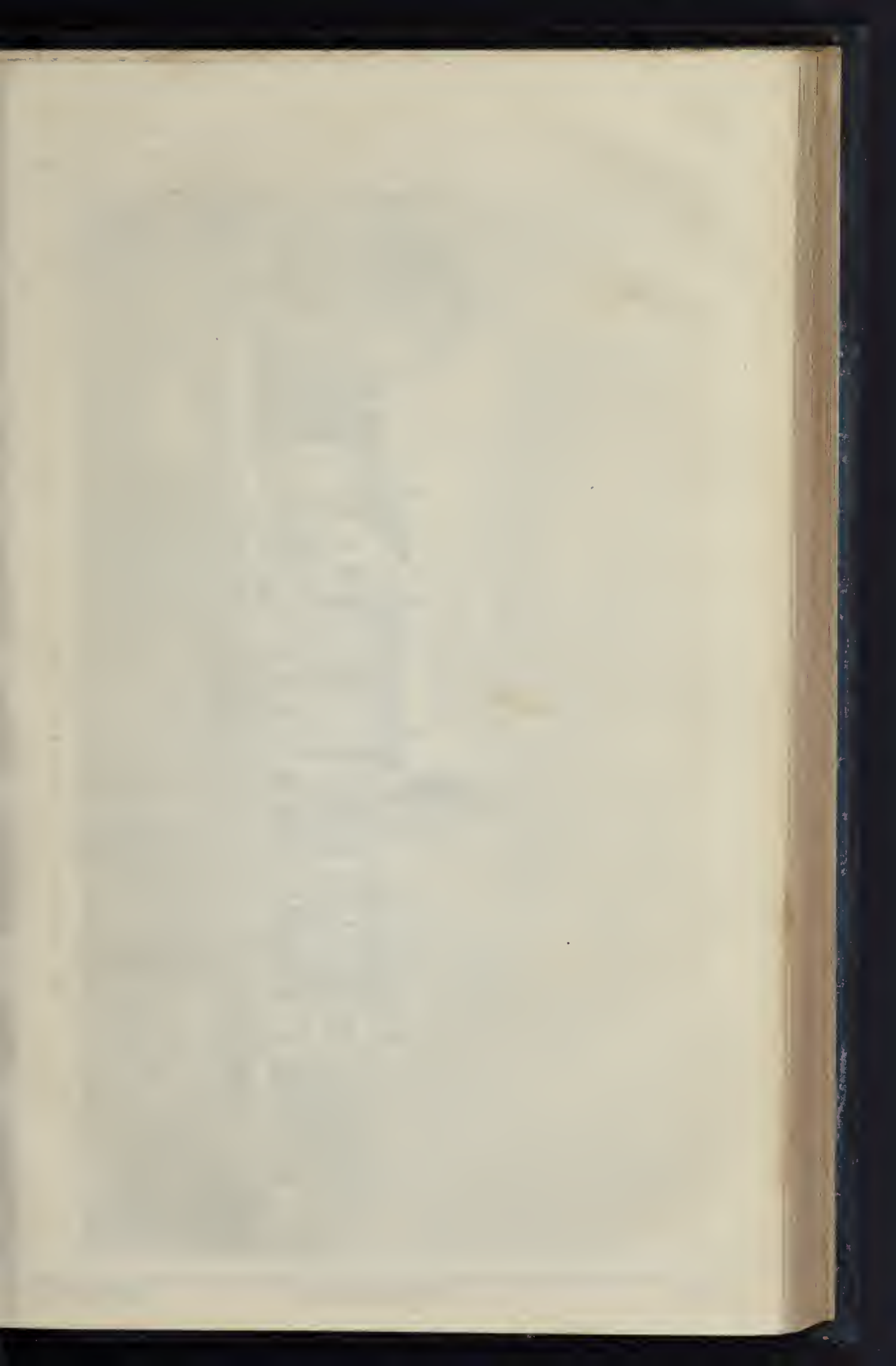
THERE are perhaps but few of those in any degree acquainted with the history of Ireland who have not at some time heard of, if perchance they may not have actually seen, the remarkable structure which is known as the "Rock of Cashel." The district in which it is situated formed at one time the metropolis of the kingdom of Munster, when Ireland—somewhat like England during the Saxon heptarchy—was divided into several kingdoms. The original territorial divisions of the sister country are

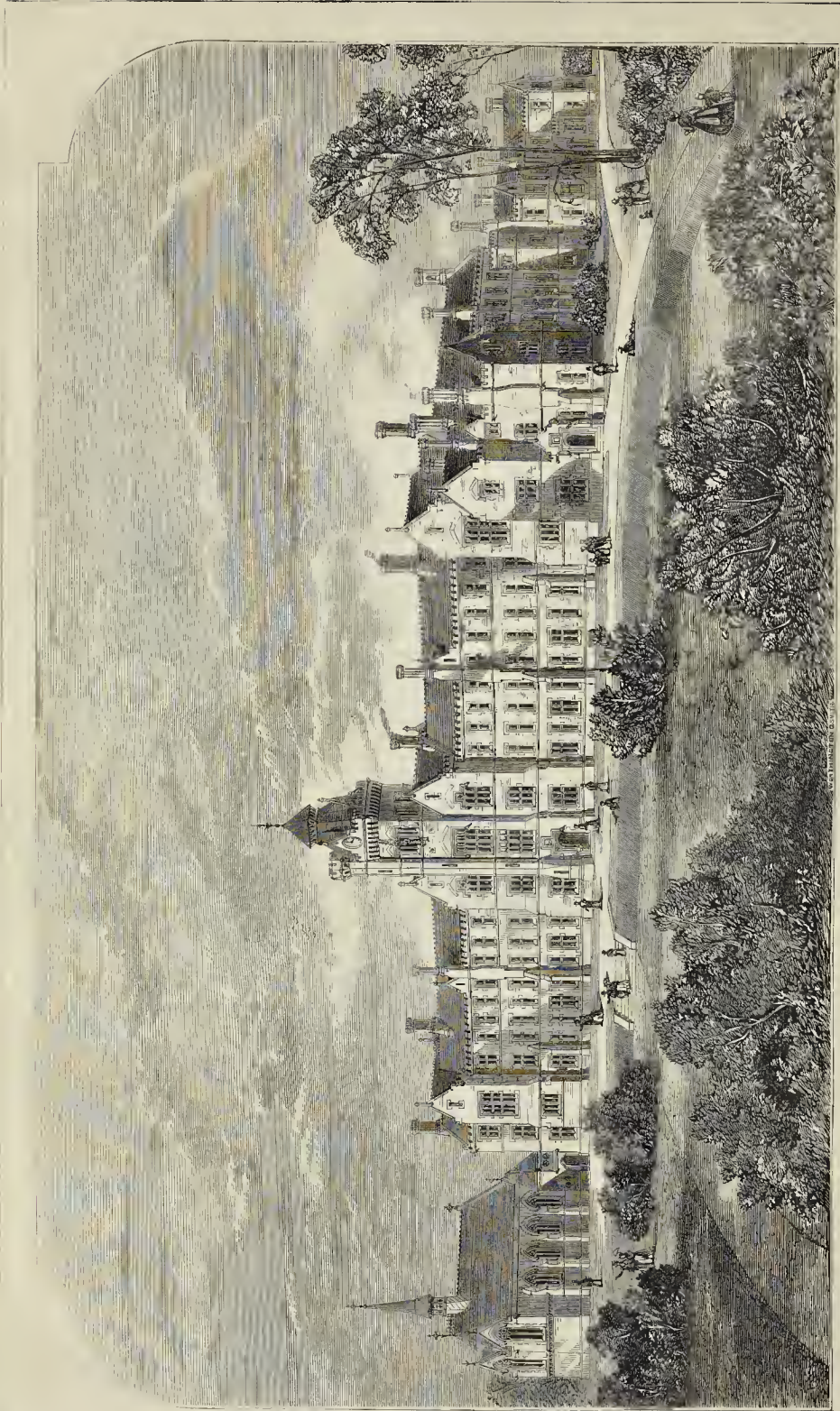
still in a great measure recognisable in the provinces of Ulster, Munster, Leinster, and Connaught, all of which provinces are in some way distinctly remarkable. It is in what was in ancient times the chief city of Munster that the Rock of Cashel is located. It may be remembered that a recent visit was made to this spot by His Royal Highness Prince Arthur, with the especial object of inspecting the architectural ruins which have rendered the place so celebrated. Upon a rock which is called after a name which the Prince himself hears, and by which he will be alone known in Ireland, Saint Patrick's Rock, the remains of chief interest are to be discovered. From the warmth of the reception which was accorded to the youthful Prince in Cashel, it formed, as was well known, one of the most pleasing incidents of his journey through the country; and His Royal Highness, judging from the remarks which he made upon the occasion, was apparently far from displeased at the way in which his metamorphosis into an Irishman was actually accomplished. The building, or series of buildings, more accurately speaking, which were inspected on the occasion of the Prince's visit, are commonly designated by a title which altogether fails in conveying an adequate or intelligible construction. It is not simply the Rock of Cashel that is intended to be described. Were it possible that the memory could embrace a period anterior to the erection of the venerable pile of buildings thus entitled, the Rock of Cashel itself, upon which they are founded, would still possess some claims to attention. This rock is an irregular elevation of the surface of the land in a locality where a dwarf mountain of this kind would perhaps be least expected, and from its isolation alone it would probably attract notice as an onerous freak of nature. It is in reality a bold upheaving by subterranean pressure of the stratified limestone of the district, as described by Archdeacon Cotton, sloping down gently at some parts towards the surrounding level, while at other points it is precipitous, straggling, and steep, and clearly exposes to view the strata of which the hill is constituted.

It presents the appearance of a prodigious natural mound, which may have been discovered to have been composed of material adapted to building purposes—which it undoubtedly is—and of which no inconsiderable portion came to be quarried and removed from the locality. So far is the rock disassociated from the general features of the neighbourhood, that its existence is attributed altogether to a legendary source.

There is in the northern part of the county Tipperary a range of mountains out of which, at one particular spot, a large gap may plainly be distinguished from the summit of the rock. This huge indent is geographically known as the "Devil's Bite" or "Bite." Tradition runs to the effect that Saint Patrick, the titular saint of Cashel, so nearly annihilated Satan's influence throughout these parts, that in sheer discomfiture his enemy began to prey upon the mountains. Being observed in attempting so orthodox a piece of devilry as this, Saint Patrick gave chase to Satan, who, in order to facilitate his escape by flight, let fall that considerable morsel which constitutes the Royal Rock.

It might perhaps, says Archdeacon Cotton, be thought rather unfortunate for the credit of this story that the mountain from which this bite was fished is not composed of similar material: a circumstance which, in the Archdeacon's view, seems calculated to invalidate the hypothesis. Upon this rock, on the more level portions at its highest elevation, are the remains of various buildings in a more or less perfect state of preservation. They afford evidence of having been erected at different periods, but in order of erection appear to have been nited and blended together in one common structure, until in the mass they have acquired features of considerable attraction and interest, and indeed of magnitude. As in the case of many other ancient historical structures, much difference of opinion prevails amongst those who claim to speak with authority upon such subjects with regard to the comparative antiquity of the assemblage of buildings upon the rock. Much diversity of opinion exists also as to the actual character of the architecture exhibited by them. We should premise that the pile of buildings is composed of a round tower, differing but little from numerous similar structures which abound in Ireland, of a chapel known as Cormac's Chapel, and of a large cathedral building, with which the other structures are incorporated.





THE BEDFORDSHIRE MIDDLE-CLASS SCHOOL, BEDFORD.—MR. F. PECK, ARCHITECT.

THE ANSTICE MEMORIAL INSTITUTE AND WORKMEN'S CLUB, MADELEY.

This building has been completed as a memorial of the late Mr. John Anstice, a public man much esteemed in the locality. The building has been erected by Messrs. Nevett & Sons, builders, Ironbridge, after a design by Mr. Johnson, of London, whose design was approved of out of upwards of fifty sent in for competition. The exterior is faced with pressed red brick, the eap, strings, cornices, and other architectural portions being executed in white local stone. In the centre of the facade, and forming one of its principal features, is the entrance porch, which is built entirely of stone. The windows of the ground floor are coupled, the division being a stone pier, with moulded cap carrying the architrave and lintel. At the level of the first floor a deep string-course is placed, which is continued round the building. At each end of the facade a portion is slightly projected, forming in appearance wings. The seven first-floor windows are of large size, semicircular-headed, the arches being of stone springing from piers with moulded caps. The building is crowned with a cornice of bold proportions. The roof is covered with slates. The principal entrance is under the porch with vestibule, beyond which is the entrance-hall, 25 ft. long, with the stairs to lecture-hall at one end. The floors of the entrance-hall and porch are laid with encaustic tiles, the gift of Mr. G. Maw. Adjoining the entrance-hall are the men's and youths' othn-rooms, smoking, reading, and librarian's rooms, lavatories, &c. A corridor leads to the hall-keeper's apartments, to the general kitchen, scullery, stores, larder, pantries, &c. On the first floor, at the landing of the principal stairs, are ladies' retiring and committal rooms. Adjoining is the large lecture-hall, 40 ft. wide, and 70 ft. long, with raised platform at one end and gallery at the other. The inside face of the walls is of white pressed bricks, relieved by a few red bricks in bands and arches. The ceiling is boarded and divided into rays, by moulded wood ribs with ornamental pendants. At the intersection, the ceiling is flat in the centre, with very large cones at the sides, this form being considered best for sound. The warming is by hot-water pipes fixed behind the projecting skirting with iron gratings on the top, the furnace being in the basement. The lighting is by star harness fixed to the pendants on the ceiling. Ventilation is provided for by a number of small openings communicating with the external ventilators. The whole of the internal woodwork is stained oak-colour and varnished.

OUR BUILDING STONES.

PERMIT me through your valuable journal to express still further my thoughts on building stones. In your number of January 23, I gave a general outline of various stones, noticing their causes of decay, &c., and hope that many of your readers who visited the buildings mentioned, where they can have ocular evidence, and thus be enabled to judge of the truthfulness of my remarks in your journal of the above date.

There have been a great number of letters published lately on this subject, and some of the writers have given us their experience of six months' labour, such time being too short for any gentleman to be able to gather the information which is essential for any inexperienced man to know before he gives his opinion.

First, we will commence with Portland stone, it being most extensively used in London, and as there are so many various descriptions, we will merely mention three.

1. Some of your readers may not be aware that there is a class of brown Portland which possesses all the elements of decay, and will decay in whatever atmosphere it is placed. This brown Portland is of a sandy nature, each particle being placed loosely together. When the face of such stone is rubbed you are enabled to see each particle separated from the others, and some of this stone is of a hard nature; but all practical men, who have been in the trade more years than some have months, can detect this stone wherever it may be, and without applying a magnifying glass or subjecting it to a chemical analysis.

2. There is another kind of Portland stone, having a cream colour, or lighter than the one just mentioned. The grain of this stone is close, and appears cemented together by a liquid; it is softer than the brown stone before mentioned.

This kind of stone when rubbed on the face looks almost like marble, it being so fine. It will resist the weather and stand in whatever atmosphere it may be placed.

3. The white Portland, or so-called "best bed." The first bed of this kind which I will mention runs thin, and the texture is of a silny nature, much resembling soap. It is very fine in the grain, and those who are not acquainted with the quality of the stone admire it for its fineness, but there are very few elements in it but what will decay. Another bed which I will mention as belonging to this "best bed" runs 3 ft. or 4 ft. thick, and is of a harder nature than the thin bed just referred to. This is also a white stone, but possesses more of the qualities of the cream-coloured stone. This stone I have seen used very extensively, and it stands the weather well; at the same time it requires great care in its selection for outside work.

Best Stone.—A number of opinions have been recently expressed upon this stone, but none of the writers have stated anything in relation to the various beds. Allow me to say just a word or two. The thin beds of Corsham ground stones, Fareleigh Down, and a number of other stones, are generally of an inferior quality, as you will often observe an inch or two on each side of the bed which is of a red, soft, sandy nature. These thin beds will not stand the effects of the weather so well as the high beds, for the bigger the beds are the better the stones generally is. It is cheaper for the contractor to buy the high beds; it may, perhaps, cost more in price, but he is saved in a great measure from those soft outside portions referred to, and also from waste.

Darley Dale is of a brown colour, the grain finely cemented together, and extremely hard; for instance, after it has been removed from the quarry for some six months, it is almost as hard to work as granite. The best quality of this stone sparkles like silver; it will stand the weather well, for several works have been constructed in London with this stone, and are now in excellent preservation.

There are a great number of Grit stones which I could mention that will stand our atmosphere, such as Hawley Park, Gazeby, and many others from the neighbourhood of Halifax, all of which can be used with safety.

A limestone which is obtained from the north of England is a very good building stone, and is worked in a similar manner to granite, with small picks and axes. One or two churches were erected from this stone in Preston some thirty years since, and are still in good preservation. It is quite essential that all building stones, of whatever description, should be fixed on their bed or joint bedded, as we have seen the ill effects produced by stones being fixed otherwise. I have not gone into the various ingredients of which these stones are composed, but merely mention those that will and those that will not decay. In conclusion, I hope the time is not far distant when we shall see granite introduced in London for bases, plinths, columns, &c. The light-colored granite when left from the axe would match well with our Portland stone, and the expense of this granite is not so much in contrast with other stones as might be expected.

WILLIAM CROSS,
Manager of the Prince Consort Memorial,
Hyde Park.

TELEGRAPHIC PROGRESS.

ALTHOUGH the telegraphs are not formally to become the property of the Government until the 1st of January next, an arrangement has been come to between the Postmaster-General and the companies, that the system should pass under the control of the Government staff next month, in order that the latter may have practical experience of the working before their own responsibility commences. The present scale of charges will, however, be maintained, and the receipts will be paid over to the companies every week.

On and after the 1st of January, the instruments of the various companies will be collected at the principal Money-order Office in Cannon-street, which will be the telegraphic head-quarters. The present office in the Exchange will be retained as a receiving-office, and the messages will be transmitted thence to Cannon-street by the pneumatic tube. Branches will be established at all, or nearly all, the money-order offices in town, and the messages from these branches will be sent by wires to

Cannon-street, where they will be checked, and despatched to their destination. The present staff will, for the most part, be retained in the service of the Government. Individuals who are not required will be pensioned, if they have been five years in receipt of quarterly salaries, or seven years on weekly wages, from the companies. With regard to the messages, the Government will start with a uniform rate of 1s. for messages of twenty words (exclusive of the addresses) to any place in the United Kingdom. A considerable increase of business is expected. Reduction of rates, extension of business, and increased efficiency will be kept in view as objects to be attained whenever practicable.

A man who owes a bill in London, says a New York paper, can now pay it in four hours by simply going to Wall-street and purchasing a document known as a "cable transfer," a device born of the great Atlantic telegraph enterprise, whereby the equivalent of the money which he gives in New York will be immediately delivered to his creditors in London.

The *Times* anticipates a grand development of speculative rascality during the next few years in telegraphy. "The public," he says, "will be invited from time to time to construct some specific line at a heavy cost, on glowing representations from the experts in these matters as to probable results, and so soon as the required subscriptions shall have been paid they will find some rival line projected by the very same parties, who will then in the 'rapid progress of electrical science' have discovered that the new one can be laid in a much more speedy and efficient manner at 20 or 30 per cent. less expense."

The messages by the French cable the week before last were 478, yielding 1,088*l.* In the previous week they were 448, yielding 1,040*l.*

THE PRUDHOE CONVALESCENT HOME.

THE Prudhoe Memorial Convalescent Home at Whitley, in Northumberland, has been inaugurated by the Dowager Duchess of Northumberland, in the presence of the Duke and of Earl Percy, Lord Algermon Percy, Sir William Armstrong, the Mayor of Newcastle, and a numerous assemblage besides. The institution has been erected as a monument to the memory of Algermon Percy, fourth Duke of Northumberland, K.G., and is situated on Whitley Links. It is conveniently placed for sea-bathing purposes, and commands an extensive prospect of the surrounding country, with a fine sea-view. The foundation-stone was laid with much ceremony, on the 14th of June, 1857, by the Hon. Henry George Lord Warkworth (now Earl Percy). It is intended as a place of resort for invalids from all parts of Northumberland and Durham. It will be an auxiliary to the Newcastle Infirmary, of which the Duke was a chief supporter.

The building is designed partly on the pavilion plan. It consists of a central block containing the "administrative," or house department, with a central corridor, running at right angles with this, out of which the various rooms project, both back and front, with open spaces between for ventilation and for light and sunshine. The front of the building faces the sea, and the whole of the apartments have a sea-view. The length of the frontage is 230 ft., and the various offices extend to a depth of 190 ft. backwards. The structure is built entirely of stone, and the style of architecture adopted is Gothic, of a simple and plain character, adapted to the purposes of the building, except the central portion, in which some architectural embellishment is displayed, in recognition of the magnificence of the late Duke of Northumberland. The line of frontage towards the road is enclosed by ornamental iron railing, in the centre portion of which is the entrance to the gateway, with gatekeeper's lodge, partially recessed in a segmental curve. The building, which is raised several feet above the level of the roadway, is approached by means of an elevated terrace with steps in the centre, and by inclined roadways on each side. On reaching the building, the vestibule, which is open, is approached by several steps. This entrance consists of a triple arch supported on polished red granite columns, with encaustic tile flooring and stone walls in particular. On either side are the porter's and matron's sitting-rooms; behind is the surgeons' room, and adjoining are the grand hall and stone staircase. The grand corridor, 8 ft. wide, intersects at this point,

and on the one side are the day-rooms and dormitories for the men, and on the other the same for the women. Behind the hall are salt-water and fresh-water baths for both sexes, and beyond these is the dining-hall, approached on either side by the respective occupants. The kitchen and cooking department, with several out-offices, including wash-houses, laundry, pantries, &c., are in the extreme rear. Accommodation is provided for between fifty and sixty patients, but the building is designed to accommodate ultimately 100 inmates. The latrines are so arranged that they cannot affect the atmosphere of the house—being separated from the day-rooms and dormitories, and ventilated on the "through and through" principle. The dormitories are also arranged on this plan, each bed being placed against the wall, with a window on each side of it, and also with corresponding windows exactly opposite, for purposes of light and air. The whole structure is fire-proof, the several staircases being of stone, and the corridors arched and covered with encaustic tiles. The floors are of pitch-pine, and are polished, and the walls are coated with Parian cement, which can be washed when required. The ventilation and warming are in harmony with the new principles adopted throughout the construction of the building, everything being as natural as possible under the circumstances. That portion of the building which the architect has selected to express more especially the memorial character of the structure is the centre block, and here he has thrown the whole of the ornament and the architectural expression. There is a central tower, about the middle of which is proposed to be erected on a projecting pedestal and under a carved canopy, a statue of the late duke.

Mr. Thomas Oliver is the architect under whose superintendence, with the assistance of Mr. John Adams as clerk of the works, the building has been carried out. Mr. Joseph Keyll was the contractor for the whole of the works, and Messrs. Walker & Emley undertook the engineering department. The total cost has been about 20,000l.

SOMERSET ARCHAEOLOGICAL SOCIETY.

ALTHOUGH we briefly noticed the trip of this society to Cheddar and Rodney Stoke on the first day of their meeting, the excursions did not really commence until Wednesday. The first halt was made at the village of Rowberrow, which lies in a secluded hollow of the Mendips, and is the centre of the mining district. Of the parish church Mr. Parker gave some account. Having heard that the old mansion of Langford Court was worth a visit, some of the party went there for the purpose of noticing the principal features of the house, over which they were shown by Mr. T. B. Collings. After leaving Langford Court the Ancient British Camp of Dolbury was visited. The ascent was a trying one, especially to the stouter members of the party. Passing through the grounds of Mendip Lodge the next place reached was Burrington Church, which was described by Mr. Freeman. They then proceeded to explore Barrington Combe. On reaching the cavern known as Aveline's Hole, as many of the company as could descended into it, and Mr. Boyd Dawkins gave a brief account of it. A short cut across the fields led to a Roman Amphitheatre, the plan of which was pointed out by the Rev. Prebendary Scarr. A few yards further on the President called attention to some hut circles as indicative of former occupation. The party then dropped down to Charterhouse, where they partook of luncheon in the schoolroom.

While the horses were resting and their drivers dining, a party set off across the fields on a visit to the works of the Mendip Mining Company, who find it more profitable to work up the slag on the surface, which was cast aside by the Romans as useless, than to dig up the ore from the bowels of the earth. It was stated that this slag contained about 25 per cent. of lead. A visit to Cox's stalactite cavern closed the day's proceedings, and the party returned to Axbridge about eight o'clock.

Wincobme was the first place visited by the archaeologists on Thursday. Though not so numerous as on the previous day, the party filled several conveyances. Leaving Wincobme, and journeying for four or five miles under the shadow of the Mendips, the next stoppage was made at Loxton, a small village romantically situated under Crook's Peak. Here was seen a curious

little church quite different in character from those larger, later, and finer churches which the archaeologists had been visiting.

Christian, a small parish, situated in the gap between Crook's Peak and Bleadon Hill, only a few minutes' ride from Loxton, was the place next visited. The inspection of the church being completed, the journey was continued to Banwell Caves. The explorers then proceeded to Banwell, and on arriving at the village, they found the business nearly at an end. Sir Stafford Carey read a paper on "Year Books," and Mr. W. A. Sandford was to have read one on "The Rodentia of Somersetshire Caves," but time pressing, it was taken as read, and the company agreed to visit Banwell Church. Mr. Freeman was again the guide. The concluding meeting was held in the schoolroom, Banwell, where luncheon had been provided by the liberality of gentlemen in the neighbourhood.

SOCIAL SCIENCE CONGRESS, BRISTOL.

THE Congress in Bristol promises to be satisfactory. The order of proceedings stands thus: On Wednesday, 29th September, there will be, at 3 p.m., special service at the Cathedral; sermon by the Right Rev. the Lord Bishop of Gloucester and Bristol; and, in the evening, the inaugural address by the President, Sir Stafford H. Northcote, bart., M.P., in the Victoria Rooms. On Thursday, at 10 a.m., address by Mr. G. W. Hastings, president of the department of Jurisprudence and Amendment of the Law, in the Victoria Rooms. At 11 a.m. the departments will meet in their respective rooms; and at 8 p.m. the Mayor will hold a reception at the Colston Hall. On Friday, at 10 a.m., address by the Rev. Canon Kingsley, president of the Education Department, in the Victoria Rooms. At 11 a.m., the departments will meet; and, at 8 p.m., working men's meeting in the Colston Hall, Sir Stafford H. Northcote in the chair. On Saturday, at 10 a.m., address by the Right Hon. Stephen Cave, M.P., president of the Economy and Trade Department; at 11 a.m., the departments will meet; excursions to Cheddar, and to the Bristol training-ship at mouth of the Avon. On Monday, 4th October, at 10 a.m., address by Dr. John A. Symonds, president of the Health Department; at 11 a.m., the departments will meet; and, at 8 p.m., soirée at the Victoria Rooms; address by Miss Carpenter, on Female Education in India. On Tuesday and Wednesday there will be meetings, and on Thursday an excursion to Chepstow Castle and Tintern Abbey. The ladies' conference will be commenced on Wednesday, September 29th.

THE TRADES MOVEMENT.

THE masons at Sheffield have, at a meeting presided over by the mayor, for the purpose of bringing about an amicable settlement of the dispute between masters and men in the building trade, deliberatively adopted a resolution in which they decline to submit the question to arbitration. They alleged as a reason that by so doing they should isolate themselves from the 290 lodges forming their National Association, by none of which has arbitration ever been adopted.

The operative stonemasons' strike at Manchester having lasted about twenty-two weeks, and there being no prospect of an immediate settlement, the masons made the following overture to the employers:—"That we, the operative masons of Manchester, Salford, and Hulme, do hereby agree to accept 30s. and 48½ hours per week." The reply of the masters was:—"That no men be engaged hut on the terms that have been adopted during the last few months." The men, it is said, are determined to make no more concessions, and will not submit to the hour system and arbitration.

At the adjourned meeting of the London carpenters, in support of the Blackburn joiners, on strike for the nine hours, it was resolved—

"That this meeting bears with satisfaction that a conference has taken place between the employers and workmen of Blackburn, with the object of settling the existing dispute, and is of opinion the offer made by the men is one that should be accepted by the employers; and that we continue our pecuniary support to the Blackburn men until the strike is settled."

The Blackburn strike has now terminated on the masters' terms,—hour work in place of nine hours' day work.

In the course of the discussion of the London carpenters, the necessity of inaugurating a

nine-hours movement in London was strongly advocated. It was stated that, while hundreds of joiners were walking idly about the streets, several firms were working their men twelve and thirteen hours per day. It was also stated that at Messrs. Trollope's firm the men for some time past had been working from six o'clock in the morning until eight at night, and that last week an order had been issued that they were to go on working until nine o'clock. Some of the men who remonstrated against these long hours had been discharged in consequence.

The twenty-first anniversary dinner of the Paddington Operative Bricklayers' Society has been held at the King Alfred, Lisson-grove; Mr. George Howell in the chair. The chief business of the evening was to receive from Mr. Howell, who had been delegated by the trade to attend the recent trade congress at Birmingham, a report upon the proceedings as affecting the labour question. Referring to the question of shortening the hours of labour, he stated that the prevailing opinion expressed at the congress was in favour of an eight-hour day's work. Although the congress had decided in favour of the limitation of apprenticeships, he did not agree with that decision. It was a principle which never could be enforced in their own (bricklayers') trade, and if enforced, it would have the effect of driving young lads into trades which were already overstocked. As to the protection of trades-union funds, the Government had passed a temporary measure which would effect that object, and it was not likely that Government would recede from the position they had taken up. The congress had unanimously condemned the combination laws. Co-operation and industrial partnerships had been approved of by the congress, and he looked upon the scheme as likely to be one which would solve the labour problem by giving men a direct interest in their own labour. Arbitration had been warmly approved of by the congress.

SEWAGE MATTERS.

Sewage Culture at Aldershot.—The Aldershot sewage farm contains 130 acres, 77 of which have been under irrigation, some of it for several years. When the sewage was first applied there was no vegetable soil, properly so called, on the common. The surface consisted of reddish and yellow Bagshot sand, with layers, more or less dense, of iron-sand, locally termed "pan" which required to be broken up before the ground could be prepared for crop. This ground contained 95 per cent. of silica, 3 per cent. of protoxide of iron, and a trace of vegetable matter. The surface, to a depth of 4 in. to 6 in. was in many places nearly as hard as concrete. Perhaps the very worst possible soil has in this experiment been brought under successful irrigation and culture. It is remarked, in the report of the Army Medical Department, that all the elements of the question have been dealt with, and the result has been that the offensive harrack and South camp latrines have been abolished, the station drained, all the refuse water rendered innocuous by irrigation, and the fertilizing matter removed out of it and applied to the production of food on ground which had previously yielded nothing in the form of useful vegetable produce. Mr. Blackburn, the lessee of the Aldershot Farm, has given some interesting information regarding the method of cultivation adopted. The whole sewage of the South Camp and barracks was not turned on to the farm until 1856, scarcely three years ago, and the following have been the results, as regards produce raised per annum on each acre:—Potatoes, 4 to 5 tons; swedes, 12 tons; mangolds, 13 tons; garden turnips, 300 bushels; cabbages, 16,000 plants. There is, besides, a large area under Italian ryegrass cultivation, which is cut five or six times a year for cows, and four times a year for horses. The lowest cutting averages six tons per acre, the highest fourteen tons per acre. The maximum produce is forty tons of ryegrass per acre per annum. As the culture advances, the number of articles is increased. The usual cropping of the farm is as follows:—Potatoes, 23 acres; Italian ryegrass for food, 29 acres; Italian ryegrass for hay, 15½ acres; green crops, 6½ acres; total, 77 acres. This absorbs the whole summer sewage of the camp and barracks. The crops to be raised this year will be Italian ryegrass, potatoes, mangolds, swedes, turnips, cabbages, tares, onions, carrots, and haricot beans. There has been no smell from the farm; the earth

deodorizes the sewage as soon as it touches it. There are no complaints of nuisance from the irrigated land, nor of injury to health. All the plants grown are healthy-looking and wholesome for consumption. At first there was some prejudice against the produce, but that has been entirely removed.

Sewage Utilisation and Reconstruction of Sewers at Liverpool.—The Liverpool Sewage Utilisation Company has commenced operations on a small farm at Ince Blundell, and the directors speak hopefully of the project. The undertaking, however, would appear to have been beset with difficulties. In the first place, the negotiations with Major Blundell for land at Blundell-sands fell through, and it became necessary to carry the pipes three miles further than was originally contemplated. This, of course, was attended with increased expense; and to make matters worse, several of the warmest friends of the scheme were unable, owing to the commercial pressure, to give the monetary support which they had promised. Then the Earl of Derby and Lord Selous insisted upon a deposit of £1,000, in hard cash as a guarantee against any damage that may arise to their property from the undertaking; and the result is that the company finds itself in a deficiency of about 3,500. The affair is practically at a standstill for want of funds, and an appeal to the shareholders and the public is to be made.—The reconstruction of the sewers in Nesham Park, which, on examination, were found to be defective, has been completed. Some months ago the West Derby Local Board, in whose district Nesham Park is situated, and who ultimately will have charge of the whole of the sewers in the park, refused to incur the responsibility of taking them over until they had been examined, and their construction certified as perfect. This refusal resulted in the borough engineer being requested to make a careful inspection; and on this being done it was discovered that in many places the levels of the sewers had been miscalculated; and it was also found that at several points the brick-work had fallen in, and that the sewers had literally collapsed. A considerable portion of the main sewers running through the park was thus condemned and taken up. The sewers are now, on an average, 11 ft. in depth, being about 4 ft. deeper than those which were condemned as ineffective. As the contractor alleges that the original sewers were executed under the superintendence of the corporate surveying officials at the town-hall, it is, we believe, a matter of uncertainty on whom the cost will fall.

Leamington.—An agreement has been arranged between the Earl of Warwick and the Leamington Local Board for the latter to pump the town sewage upon his lordship's estate for thirty years, for 450*l.* a year. The rise is over 100 ft., and the distance about two miles. It is estimated that the necessary works will cost the Board 12,000*l.*, and that the annual expenses will be 700*l.* The Earl will take all responsibility as to injunctions. The A B C process of Messrs. Siller & Wigner is in operation at Leamington for this year.

The New Sewage Works at Halifax.—In reply to remarks made by Mr. Bristolow, before the Master of the Rolls, that the contractors for these works were unable to find the necessary sureties, the *Halifax Guardian* has been requested by Messrs. Dovenor & Helm to state that they were not unable to find sureties, but that they declined to enter into the severe bond imposed upon them by the Vice-Chancellor's chief clerk.

The Drainage of Brighton.—Mr. Hawkshaw, the engineer called in by the town council to advise it on the point of carrying the sewage to a distance from the town, has made his report. Three "practicable modes" of doing the work are considered by Mr. Hawkshaw; namely, 1st, by an extension of the present system of deep-sea drainage, the cost of which would be about 66,500*l.*; 2nd, by an intercepting sewer to the westward, to which there are such "insuperable difficulties" that Mr. Hawkshaw cannot advise its adoption; and 3rd, by an intercepting sewer to the eastward, which Mr. Hawkshaw recommends as "the most perfect and efficient" plan. The cost of this latter plan Mr. Hawkshaw estimates at 80,000*l.* It would include both the Cliftonville and the Brunswick-square districts. Mr. Hawkshaw concurs with Mr. Hawksley and Dr. Letheby that sewage delivered into the ocean from 1,500 to 2,000 ft. from the shore is not likely to be productive of disease or objectionable to health; nor, he adds, "do I believe that any smell arising therefrom can be detected by persons on the shore." But, he says, its

discharge is plainly visible from the road facing the sea; to those who go out in boats, and who chance to come near the point of discharge, the effluvia is unpleasantly evident; and "those who bathe from boats cannot escape occasionally finding themselves floating in a bath of what must necessarily be far from agreeable." The mouth of the sewer, however, Mr. Hawkshaw points out, might be taken more than double its present distance out to sea—to 4,000 ft.; and he shows how the discoloration of the sea by storm-water might be dealt with in this way. The expense would be 66,500*l.* According to Mr. Hawkshaw, the most perfect plan is to construct an intercepting sewer from Cliftonville to Portobello (four miles eastward of the Brighton boundary),—a distance of seven miles and 160 yards,—with a fall of 3 ft. per mile, and with, at intervals, ventilating shafts,—"which," adds Mr. Hawkshaw, "could be so arranged as to be unobjectionable."

THE STUDY OF ARCHITECTURE ABROAD.

M. PILLET, an architect in Paris, formerly of the *Ponts et Chaussées*, announces that he is about to open a preparatory *atelier* for such as desire to enter the "Ecole des Beaux Arts," and where complete instruction will be given. The studies are to be organised so that the students may not only acquire the knowledge necessary for admission, but be enabled to go at once to the second class, and be so practised in drawing as to have no occasion to take further lessons in it. He points out in his announcement that in existing *ateliers* the candidates for admission to the school only obtain instruction in architecture, and are obliged to have recourse to other professors for mathematics, descriptive geometry, history, drawing, and water-colour painting, which expensives studies being pursued separately, and without general control, do not always produce such a result as could be desired. If it be remembered, however, continues M. Pillet, how important these branches of instruction are, not simply to enable the student to pass the examination for admission, but for definitive education in architecture, the advantage of pursuing them under one direction will be obvious.

Architectural students in this country, and those who have the management of them, may learn something from this announcement if they consider it properly; and it is with that object in view that we refer to it. They may see something of what is necessary if English students would keep abreast with the architects of the future abroad, and fit themselves to aid in advancing the artistic character of their country.

RETROSPECTIVE EXPOSITION AT BEAUVAIS.

BEAUVAIS, famous in old times as the see of one of the six spiritual peers of France, has inscribed its name on the records of the present year as the scene of what is called a Retrospective Exposition. The term, when once explained, is not to be condemned. The exhibition itself has been one of more than mere local interest; and the idea, hinted by the title, of illustrating the history of the past, down to our own time, rather than of endeavouring to whet the edge of the manufacturing rivalry of the day, is one worthy of very full development.

Two gentlemen of local distinction, the Baron de Selliers, of the Château de Mello, and M. Delabarthe, of Beauvais, appear to have been the principal instigators of, and contributors to, this interesting exhibition. The objects displayed were divided, chronologically, into two categories, that of those anterior to the eighteenth century, and that of those of the eighteenth and nineteenth centuries. Two saloons, adjoining the great hall of the Industrial Exposition, were occupied by the articles contributed. Objects of stone and of bronze, Gallo-Roman and Merovingian relics, coins, medals, enamels, portraits, works in iron and in earthenware, old MSS., chests, and furniture, formed the contents of the ancient division.

Ancient arms, contributed by M. Barraud, are described as being those of a race of men who lived as far back as the Glacial era! What, ever doubt may be thrown on this determination of date, we come nearer to historic times in regarding the next relic, a magnificent Gaulish sword, of bronze, the alloy being of the same proportions that are found in early Grecian

weapons. In a leaden sarcophagus, together with some jewels and ornaments of female attire, was found an ivory bas relief of Bacchus, surrounded by fauns. A similar plaque is said to have been found near Rheims. A Roman *pilum*, of a form altogether unusual, with a quadrangular point more than 2 ft. long, is another relic of early Roman date. Later, but still telling of the victories of Rome (if with the keys rather than with the sword), is the copper-gilt cover of a reliquary, and a diptych, of German work, dated in 1495. Mention must also be made of two portraits, in *Limoges* enamel, one of King Francis I., and one of his queen, Claude of France, bearing the signature L. Limousin. A sketch of a *chasse*, designed in 1459, for the cathedral of Noyon, by Gravat, a bourgeois of Amiens, and a fifteenth-century manuscript of the customs of Normandy, are also among the chief objects of interest in this portion of the collection; which further contains a fine piece of tapestry work, representing the vision of Constantine, which was commenced by the orders of the famous Fouquet, intendant of finances, and completed at the *Gobelins* manufactory, by the order of Louis XIV.

The division adopted, being according to date, and not according to the character of the object, is such as to render unnecessary a summary of the jewels, stiffs, *jaquettes*, and other articles exhibited in the second, or modern saloon.

"ORNAMENTAL PYROGRAPHIC WOODWORK."

BURNED patterns on woodwork are of old date, and some few years ago an establishment was opened for supplying them on a large scale, of which our readers were told at the time. Some fresh works have now been opened in Glasshouse-street. In the ordinary samples, the designs are burnt into veneers of sycamore or maple, and are supplied wholesale to builders, cabinet-makers, and others, ready for laying in the ordinary manner; but, if preferred, the designs can be applied to the solid work, to impart greater durability. By the use of wood so ornamented all necessity for painting is, of course, avoided. It is inexpensive and worth looking to.

HOUSE BUILDING AT CHISWICK.

Sir,—In an article in your issue of Sept. 11th, under the head of "House Building at Chiswick," mention is made of "One Gothic mansion in the district, with a river frontage, and two peaked round towers," stating that it suffers from "being cellared, and at high tides has some 3 ft. or 4 ft. of water standing in the bottom, which, of course, saturates the greater portion of the house, and keeps it in a damp condition for an indefinite time after each flood."

As there is but one house in the district to which the first part of this statement can allude, one that I erected about twelve years ago for J. Pullman, esq., I beg to give an unqualified denial to the second part, viz., that it suffers from being cellared, &c.

The house is built as substantially as possible, none of the estate being more, if indeed so, solidly constructed; and when I tell you that Messrs. Holland & Hannen were the contractors who carried out the collapse in question under my personal superintendence, I think it will be sufficient guarantee that the work was well done. Since reading the article from which I have quoted, I have seen the proprietor who has inhabited the house since its erection, and he will fully endorse my statement. Your insertion of this letter will greatly oblige

RABEAL BRANDON.

LOW RENTS.

Sir,—I have just seen the letter of Mr. W. S. Truman in your esteemed publication of the 11th inst. He is a bold man. May his liberality and example be followed not only by owners of house property, but also by those who supply our daily bread and other necessities, and you may be assured we shall hear less of strikes and discontent; and the public-house and crowded lodging will be superseded by a respectable home for every man.

ONE OF THE BEES.

WELLS AND MINES.

Sir,—Having so frequently read of accidents and deaths occurring in wells and mines for want of some speedy means of rescue for the sufferers, it has occurred to me that some sort of "safety-cradle" or frame-work of either iron or basket-work might be so constructed as to be kept constantly at hand at the bottom of wells or of the shafts in mines, and so secured by an extra length of chain or rope as not to interfere with the ordinary work of the workmen, but ready to be brought up with its human freight when necessary by a little extra working of it. Thus, if in repairing a well a workman were overcome by the unhealthy inhalation of deleterious gas, he would fall into the very receptacle ready for his rescue, instead of into the jaws of death—as the foul vapours at the bottom or deep water might prove; and if even not drawn up in time to prevent so serious a catastrophe, no other life need be risked to bring him up. When for use at the bottom of a shaft,—for instance, where ready accommodation might be required for many people,—the cradle might be made in tiers or stages, and formed so as to collapse (like the

head of a shaft) when not required, and the chains or ropes might be of sufficient length to admit of its being allowed to stand aside when not required, so as not to interfere with the ordinary means of egress; and a bell being at hand to communicate the alarm to a watcher above-ground, a little extra work would soon bring a few more at least up to bank than could be rescued in the ordinary manner without unnecessary delay.

M. A. H.

AN IMPRACTICABLE CONTRACT.

An arbitration case, between Messrs. Cutler and the Radhill Gas Company, has just been decided by Mr. T. G. Barlow, gas engineer, as arbitrator. Messrs. Cutler, in October, 1868, entered into an agreement with the Radhill Gas Company to construct on the company's premises a cast-iron tank and gas-holder. The contractors also agreed to construct the foundation; but on making the excavation they discovered that the subsoil was boggy and totally incapable of bearing the weight of the structure it would have to support. They reported this fact to the company, and requested them to provide another site for the gasholder. The company at first refused to do this, but on Messrs. Cutler stating their inability to carry out the contract on that site with credit to themselves, some negotiations ensued between the parties, which resulted in the abandonment of the contract, so far as the foundation was concerned, the contractors allowing a certain sum from the original contract price. The company then, failing to procure another site, decided upon making a foundation on the boggy site themselves. For this purpose they employed the very man who had been engaged by Messrs. Cutler as sub-contractor for the foundation, and at last a resting-place was made for the tank and gasholder. The Messrs. Cutler then commenced building; but they discovered that as the structure increased in weight, the foundation began to subside unequally. This subsidence caused a very unequal strain to be exerted upon the side of the tank, which was constructed of plates of iron bolted together, the unequal strain causing the plates to fracture. The fractured plates were taken out and fresh ones substituted for them; but the contractors discovered that the subsidence caused the tank to be out of the perpendicular, and also out of the circular. They state that they did all in their power to remedy these defects by cutting the plates to a different shape, and by altering the joints; but they found their efforts were of no avail, and therefore applied to the company for payment of the work done. The company refused to make this payment, on the ground that the works had not been done in a proper manner, and that it was absolutely impossible for the gasholder to work in the tank as constructed by the contractors; whereupon the latter contended that as the badness of their work had been caused by the subsidence of the foundation constructed by the company, they were not liable to make their work good, and they gave notice of their intention to refer the matter to arbitration. Four days were employed in hearing evidence and speeches on both sides; and the arbitrator has decided that the Messrs. Cutler shall be paid the amount of their claim, less only a few deductions for the goods supplied by them, to the company without written authority for them to do so. The latter part of the award condemns each party to pay their own costs, which, in all probability, amount to between 400*l.* and 500*l.*

THE PUBLIC CLOCK THAT STRUCK THIRTEEN AT MIDNIGHT.

Most people have heard something about the tradition, that a soldier, whilst on guard at Windsor Castle, during the reign of William III., declared that he heard the clock of St. Paul's Cathedral strike thirteen at midnight.

Here is the original story — not generally known — which I take from *The Public Advertiser* of Friday, June 22, 1770, now before me: —

“Mr. John Hatfield, who died last Monday at his house in Glasshouse-yard, Aldersgate, aged 102, was a soldier in the reign of William and Mary, and the person who was tried and condemned by a court-martial for falling asleep on his duty upon the Terrace at Windsor. He absolutely denied the charge against him, and solemnly declared that he heard St. Paul's clock strike thirteen, the truth of which was much doubted by the Court, because of the great distance. But, whilst he was under sentence of death, affidavit was made by several persons that the clock actually did strike thirteen instead of twelve; whereupon he received his Majesty's pardon. The above his friends caused to be engraved on his plate, to satisfy the world of the truth of a story which had been much doubted, though he had often confirmed it to many gentlemen, and, a few days before his death, told it to several of his neighbours. He enjoyed his sight and memory to the day of his death.”

But, as I stated in the *Builder* of December 14, 1867 — when I gave my first account of the Great Bell — the sentinel must have spoken of the clock that struck upon “Great Tom at Westminster,” for St. Paul's Cathedral had not then any public clock.

Your esteemed correspondent, “J. D. P.,” having reopened the subject in your last number, I have thus attempted once more to set the question at rest. THOMAS WALESBY.

Chemical Professorship at Anderson's University, Glasgow. — Mr. James Young, well known in connexion with the paraffine industry, has presented 10,000 guineas to Anderson's University, for the purpose of founding a chair of technical chemistry, and establishing bursaries, scholarships, &c. The *Society of Arts' Journal* says Mr. W. H. Perkin, F.R.S., who, it will be remembered, delivered a course of Cantor lectures before the members of the Society of Arts during the last session, has been appointed the first professor.

NATIONAL EDUCATION LEAGUE.

A GENERAL meeting of the members of the National Education League is to be held at the Exchange Assembly-rooms, Birmingham, on Tuesday and Wednesday, the 12th and 13th of October. On Tuesday, after the election of officers, and the report of the Provisional Committee has been read, the following motion will be submitted to the meeting: — “Resolved, that a Bill, embodying the principles of the League, be prepared for introduction into Parliament early next Session.” In the afternoon papers will be read and discussions taken on the best system for National Schools, based upon local rates and Government grants. In the evening there will be a *soirée* in the Town-hall, given by the Mayor of Birmingham. On Wednesday papers will be read and discussed on Compulsory Attendance, and on the best means of enforcing it; and on Unsectarian and Free Schools. In the evening a public meeting will be held in the Town-hall; the Mayor in the chair. Mr. F. Adams, 47, Ann-street, Birmingham, is the secretary.

The object of the League is the establishment of a system which shall secure the education of every child in England and Wales. The means proposed are —

1. Local authorities shall be compelled by law to see that sufficient school accommodation is provided for every child in their district.
2. The cost of founding and maintaining such schools as may be required shall be provided out of local rates supplemented by Government grants.
3. All schools aided by local rates shall be under the management of local authorities and subject to Government inspection.
4. All schools aided by local rates shall be unsectarian.
5. To all schools aided by local rates admission shall be free.
6. School accommodation being provided, the State or the local authorities shall have power to compel the attendance of children of suitable age not otherwise receiving education.”

NEW ZEALAND.

The *Illustrated Australian News*, of Melbourne, gives a view and some particulars as to Princes-street, Dunedin. This street is the main thoroughfare of Dunedin, skirting the bay at the foot of the hills, on which the larger portion of the town is situated. The ground occupied by Princes-street has been levelled within the last few years, and now presents a very different appearance from what it did eight years ago, before the influx of a Victorian population. At that time it ran over two outlying spurs of the main range and crossed two swamps, one at the foot of Rattray-street, and the other further east, where the Octagon is now built. The view given is from the top of Jetty-street, and the first building on the right is the Provincial Chambers. The Provincial Government invited competitive designs for the Provincial buildings, and about eight sets of drawings were submitted. Those prepared by Messrs. Mason & Clayton were selected. The building is nearly square, having about 150 ft. frontage to both Princes and Water streets. The approach to the Provincial offices is from Princes-street. The offices surround a large central hall, which is approached from the main entrance in Princes-street; it is about 80 ft. by 40 ft., and both stories are lighted by a lantern from the top. This hall accommodates the public on the plan of a large bank, where easy access to each department may be had. The frontage to Bond-street has three stories on the ground floor, having two magistrates' courts, each 40 ft. by 25 ft., with the necessary offices conveniently arranged. Over these courts the Provincial Council Hall is situated (80 ft. by 34 ft. and 24 ft. high) fitted up for Mr. Speaker, members, reporters, and the public, with polished cedar.

The building is Italian, being faced with red pressed bricks, with Oamaru stone dressings. Next is the post-office. This building was commenced at the time when the demand for postal accommodation was very great, consequent upon the discovery of gold. Now that the great rushes are over it is found too large for postal purposes, and an arrangement has been entered into between the General and Provincial Governments by which the former hand the building over to the latter, on the condition that the Provincial Government provide funds sufficient to erect a smaller building suited to the requirements of post-office, telegraph, and registrar's departments. The principal front is towards Princes-street, about 150 ft., having a deeply recessed arcade on each side of a large central tower abutting at each end on wings, which were

intended to have been offices for money orders, savings-bank, and private letter-boxes. The sorting-room, 60 ft. by 40 ft., is in the centre of the building, and off it are rooms for the letter carriers, inland and foreign despatch, delivery and receiving of letters; the sorting-room being lighted from the roof. The upper floor, which extends completely round the sorting-room, was planned to accommodate the chief postmaster, chief clerk, auditor, &c., but is now appropriated to the museum and municipal corporation offices. The building is faced with Oamaru stone, and otherwise built of brick. It is Italian in design, of rather an ornate character. The lower story is composite, with rusticated pilasters between dwarf Doric columns, supporting moulded arches, with enriched spandrels and richly carved frieze and cornice over. The upper story is Corinthian, the entablature, with the usual dentils and modillions, being supported by full columns, coupled with relieved windows between each pair of columns. The building was designed and carried out under the superintendence of Messrs. Mason & Clayton, at a total cost of about 28,000*l.* Beyond is the Bank of New Zealand. The spire in the central distance is the monument erected to the memory of Captain Cargill, the pioneer of the settlement built in the centre of the Octagon.

THE NEW STREET FROM BLACKFRIARS BRIDGE TO THE MANSION HOUSE.

SIR. — This street is only partly open. On the 9th of April last, the Metropolitan Board of Works let the contract for paving, sewerage, sub-way, &c., the Mansion House end of the street, a portion 450 yards in length, to Messrs. J. Mowlem & Co., for the sum of 19,750*l.*, and these gentlemen will probably finish their work during the ensuing month, October.

The Blackfriars Bridge end of the street (Blackfriars Bridge to near Cannon-street) must be at least a year before it is opened. Very little structural work has been done at this end.

The contract for the portion of the low-level sewer from New Earl-street to the Tower, about 1,480 yards in length, was let on May 14th, to Mr. Webster for 67,500*l.* This is the work which may be seen going on in New Earl-street, and in Cannon-street. The time to be occupied in this contract I have not heard.

The contract for that portion of the Northern Embankment which reaches eastward from the Temple Gardens, was let in May, 1868, to Mr. Webster, for 126,500*l.* It was commenced on June 30, 1868, and was to have been finished by June 30, 1869, that is, in twelve months from commencement, but some delay to the contractor was caused first by the whole land necessary not being placed at his disposal; and, secondly, by his dam breaking in. The progress up to June 1st this year was 48,490*l.*, of which the sum of 7,490*l.* was for progress during the month of May. The average progress, according to contract, was to have been 10,000*l.* a month. On the 24th of September the Board will meet again, and on the 1st of October we shall have another report of progress.

JASPER.

MONUMENTAL.

The equestrian statue of the Queen, for Liverpool, now being completed by Mr. Thornycroft, is not likely to be placed in its position in front of St. George's Hall during the present majority. It will probably be about the Christmas or New Year holidays ere it is ready to be publicly unveiled.

A marble cenotaph, to the memory of the late distinguished astronomer, the Earl of Rosse, has just been erected in the church at Parsonstown, Ireland.

A new reredos, the gift of Lady Mildred and Mr. Beresford Hope, in memory of a daughter, and as a thank-offering for the recovery from a dangerous illness of another daughter, has been erected in Kildonnan Church. It was carved by Mr. Redfern, under the general architectural superintendence of Mr. Slater, and was erected by the authority of a faculty from the Archbishop of Canterbury. The material is Painswick stone, relieved with colour and gilding. The shape is that of an oblong panel of the same length as the altar, and of such a height as not to interfere with the east window. The centre is occupied with the Crucifixion, angels appearing in attendance on our Lord.

The Humboldt centenary was celebrated throughout America. Some alarm seems to

have been excited lest the statue of the great traveller, which had been cast in Germany, should not arrive in time to be duly inaugurated. We learn, however, that it reached New York some days before the celebration.

THICK TRACING-PAPER.

Sir,—I require to make a number of tracings on thick tracing-paper, and shall be glad if any of your subscribers will inform me if there is any method by which the tracing-paper can be made more transparent, so that the ink lines can be plainly seen through the paper.

SUBSCRIBER.

* A recipe for making thick paper transparent was quoted in our pages a few weeks ago.

DISFIGURING ADVERTISEMENTS.

Do you not think that the advertising portion of the community should be required to confine the exhibition of its talent within reasonable limits, and not be permitted to disfigure such portions of the metropolis as have been beautified at great public expense?

Not content with the innumerable spaces and contrivances already under their control, the advertisers must bedaub with their announcements every new piece of foot pavement, and completely spoil the appearance of new and well-finished work. The Thames Embankment is already disfigured in this way. The new street from the Mansion-house to Blackfriars has been in like manner visited by advertising transgressors; and, unless prevented, we shall be having the new Blackfriars Bridge and the Holborn Viaduct tattooed with fantastic advertising designs, much to the annoyance of every lover of order.

Why spend thousands of pounds upon stone carving and decorative ironwork, and then allow the effects to be counteracted by such unsightly additions as I have referred to? F. W. M.

Another correspondent writing on the want in the metropolis, still insufficiently met, of "stopping places" and the disfigurement of those there, says:—

"I should like to draw the attention of the several vestries of London to a very effectual remedy adopted by that of St. Marylebone to prevent the places I have been writing about being made so unsightly by quack medical advertisements. I do not know the precise Act of Parliament quoted, but it is to this effect:—By a certain Act of Parliament named, any one disfiguring any lamp-post, or erection, or building in the parish, renders himself liable to a penalty not exceeding, &c., or an alternative imprisonment."

CHURCH-BUILDING NEWS.

Shute (Devon).—The church at Shute has been reopened, after considerable works of restoration. The central tower has had a new roof, parapets, and gargoyles; and a new roof of red deal to the north aisle. The arched ceilings have been improved by ribs and bosses. The church has been reset with red deal. A new entry has been erected at the end of the north transept. The south transept arch has been raised and restored. Tracery and appropriate glass have been supplied to the west and east transept windows. The east window is in stained glass by Messrs. Powell. There are new pulpits and reredos, of Caen stone, in the Ogwell marble shafts by Messrs. Mitchell & Son. Minton's tiles are laid in the chancel.

The contractors were Messrs. Langford & Co. The stone carving was executed by Messrs. Hens; the wood carving by Mr. Lindell & Mr. Harding, Exeter. The architect was Mr. Edward Ashworth, of Exeter.

Blackton.—The new church of St. James's, Blackton, near Wakefield, has been consecrated to the Bishop of Ripon. The foundation-stone of the new church was laid in 1867. Built in the Second Pointed style of architecture, the church contains nave, north aisle, chancel, south aisle, and south porch. It is seated to accommodate 450 persons, and the pews, which will free, are of heavy pitch pine. Externally the church is built of stone, and the inside walls are of pressed bricks, which, with the open-roofed roof and complete absence of ornamental masonry, give the building a very plain unpretentious appearance. At the east end there is a stained-glass window, the gift of the patron of the late Lady Matilda Lister Kaye, Lady Grange, and the workmanship of Mr.

Bagaley, of Newcastle-on-Tyne. The subjects of the first light are the Nativity, and Christ blessing little children; second light—Christ being made known in the breaking of Bread; centre light—the Crucifixion; fourth light—the Burial of Christ, and His Commission to His Apostles, the Resurrection, and the Martyrdom of St. James, to whom the church has been dedicated. In the tracery are represented the Ascension, and the Kingdom of Glory with the Angels. The nave is separated from the north aisle by four pointed arches of red brick, springing from circular stone pillars, with moulded capitals. The chancel is divided from the nave, with which it corresponds in width, by an arch of similar construction. On the west side of the church is a four-light tracery window, of plain glass, with stone mullions. At this end of the church a bell-turret has been erected, but there is no nearer approach to a tower, the church being exteriorly as plain as it appears inside. In the chancel aisle, which is separated from the church by a red-brick arch, is placed the organ which belonged to the old church. The building is entered by a porch at its south-west corner, with moulded doorway, and faced internally with white brick. The stone font, which is placed opposite the entrance, has likewise been removed from the old church. The chancel is paved with encaustic tiles, which are further carried up to the Communion-table. The church is built from the designs of Mr. W. H. Crossland, of Leeds and London, and is built on land bequeathed for the purpose by the late Rev. H. Torre, rector of Thornhill, who has also furnished the burial-ground adjoining. The cost of erection will be about 2,600l.; of this amount 2,000l. have already been subscribed.

Carlton.—The church of Carlton, Saxmundham, has been restored. The restoration just finished has been entirely confined to the interior of the building, which has undergone a complete transformation. Formerly the nave was filled with high pews, the chancel was on the same level as the nave, and the carved oak pulpit was stuck upon a kind of platform in the south-east corner of the nave. Now the floor of the nave has been re-laid, the passage paved, and in the place of the old pews are stained deal benches with carved poppy-heads, the oak panelling round the walls being allowed to remain. The vestry under the tower has been re-arranged and improved, and the pulpit removed from the south to the north side of the nave, and placed upon a base designed by Mr. T. Thurlow, of Saxmundham (by whom the restoration of the chancel has been carried out, and who has had the general superintendence of the whole), and where necessary it has been retouched. The chancel arch remains as it was before, but the floor of the chancel has been raised a step above that of the nave, and a plain stone screen put up with new reading-desk and lectern. The carved oak benches in the chancel have been repaired and re-arranged by Mr. Thurlow, and its floor is now paved with Staffordshire tiles, the space within the communion-rails being paved with Minton's encaustic tiles. Mr. Carter, of Saxmundham, has carried out the carpenter's work. The restoration of the chancel has been at the expense of the rector, the cost of that of the nave being defrayed by subscriptions.

Longhope.—The spire and tower of the parish church having been for some time past in a dangerous and dilapidated condition, it has been determined to take down the spire and part of the tower, and to rebuild the latter in a more substantial manner. The tower will have pinnacles at the angles, and the bells, so long silent, will be rehung and made available for ringing. The contract has been let to Mr. Organ, of Mitheldean, builder; and the work will be carried on under the direction and superintendence of Mr. Alfred W. Maberly, of Gloucester, architect.

Winsthill, near Burton.—St. Mark's Church, Winsthill, near Burton-upon-Trent, has been consecrated. Mr. Holmes was the architect. The church is in the Geometrical Early Decorated style of architecture, and comprises nave, 72 ft. long by 24 ft. wide within the columns; north and south aisle, each 12 ft. wide—the tower occupying the west end bay of the south aisle; the chancel, 30 ft. long by 21 ft. wide, and a vestry and organ-chamber on the north side of the chancel. On the north, an arcading of four bays, and one on the south of three bays, connect the aisles with the body of the church. The arches are of Hollington stone, with red Mansfield stone voussoirs, and have an inner

ring of Bath stone, chamfered. They are supported by square shafts, diagonal in plan to the line of arcading, with a red Mansfield stone column on each face, and connected together with richly-carved caps and moulded strings and bases. Alabaster is employed in the ornamentation of these columns. The entrances to the church are situated west and south, the latter occupying the lower stage of the tower, and the former entering through a porch, with stone roof and ceiling. The doorways are relieved by red Mansfield stone shafts, with moulded bases and carved caps, and the arches are moulded. The height from the floor to the ridge of the nave roof is 52 ft., and from the floor to the top of the wall-plate 22 ft. The nave and aisle roofs are open-timbered, and plastered between the rafters; that of the nave is carried by framed principals, with king-posts and tie-beams moulded and carved, and supported on stone corbels. The chancel roof is carried by framed principals with curved trusses, supported by Devonshire marble corbelled shafts, with carved caps and corbels. This roof is boarded on the under side of the rafters, the upper portion taking the form of the cross-braces of the principals. The tower is 45 ft. high, and the spire 75 ft. to the top of the cap-stone, the total height to the top of the nave being 150 ft. The tower contains a peal of six bells, from the foundry of Mr. John Taylor, of Loughborough. The bell-framing, which is of oak, is carried by stone corbels built into the tower walls. The diameter of the tower bell across the mouth is 47 in. The walls of the building are of brick, plastered internally, and faced externally with Hollington stone, the external dressings are moulded and carved work being of picked Hollington stone, rubbed. The internal dressings are of Bath stone. Red Mansfield stone has been used in the bands and voussoirs of the arches. The roofs are covered with tiles of two colours, arranged in patterns, and having an ornamented ridge cresting. The interior of the chancel is lined with Bath stone. The opening to the chancel is 20 ft. wide between the piers, and the height from the floor of the nave to the apex of the arch is 32 ft. Four Devonshire marble shafts, with moulded bases and carved hands and caps, support the arch, the inner rim of which is of Derbyshire alabaster. The building is lighted by a wheel-window at the west end, and by several three-light windows with traceried heads in the aisles. The chancel is lighted by two single-light windows on the south side, and one on the north side, and a beautiful seven-light east window, the latter being filled with stained glass, representing various incidents in the life of the Saviour. It will seat about 550 persons. The reredos (of Caen stone) extends across the whole width of the chancel, and consists of an arcading of seven divisions, the centre being considerably larger than the others. The arches, which are moulded and cusped, are carried by dwarf alabaster shafts, with moulded bases and carved caps. Over the arches are gables with carved crockets and finials, the space forming the tympanum being filled in with sunk tracery. In the spandrel spaces between each gable are figures of angels, supported by carved corbels, and covered by carved canopies; the seven compartments are filled in with polished white marble, that in the centre having the sacred monogram in brass, whilst the other compartments contain the Commandments, Belief, and Lord's Prayer, and selected text. The lower part of the reredos has the surface carved in diaper. The nave and aisle benches are of deal, stained and varnished. The chancel stalls are worked in oak, having open-framed arcaded fronts, the spandrels of trefoil heads, and other portions being carved. The chancel floor is laid with Minton's encaustic tiles, while the aisles and passages in the nave are laid with Hopton Wood stone. The church is warmed by means of hot water. At the entrance to the churchyard are folding gates to the carriage-road, with foot-gates on either side hung to stone piers. The gates are framed and cross-traced with oak, and fitted in with ornamental metal work. This, and the metal work in the chancel and pulpits, was the work of Messrs. C. Smith & Son, of Birmingham. The stone work has been executed by Mr. William Clarke, of Burton-upon-Trent, and the joiner's work by Mr. George Lilley, of Ashby-de-la-Zouch; the carving throughout has been cut by Mr. Thompson, of Nottingham.

Bungay.—The alterations and improvements in the interior of St. Mary's Church being sufficiently completed, a special opening has

taken place. Among the improvements in the church we may notice the erection of a stone reredos, consisting of traceried base, Gothic arches with carved spandrels and surmounted with carved cresting; an oak altar-table, carved; new oak altar-rails on metal standards, &c. Within the altar-rails the floor is laid with Minton's encaustic tiles. The reredos was executed by Mr. Henry Narsey, and the altar-table and reading-desk by Mr. J. D. Botwright, both of this town.

SCHOOL-BUILDING NEWS.

Percy (Tynemouth).—The foundation-stone of new schools for the parish of Percy, in the township of Tynemouth, has been laid by his Grace the Duke of Northumberland, who has also given the site. The schools are intended for the accommodation of 129 boys and 96 girls; a house containing five rooms being also provided for the schoolmaster. The cost of the building will be 1,050*l.*, exclusive of the value of a large quantity of materials which have been supplied by the neighbouring proprietors. The building will be erected from the designs of Messrs. Green & Gibson, architects, Newcastle-on-Tyne.

Kidderminster.—New Wesleyan schools have been erected and opened here. Mr. Bland, of Birmingham, prepared the plans, and the building has been erected by Mr. Hodgkiss, of Wolverley, the cost being about 1,150*l.*, exclusive of fittings. The new schools consist of one large room, another room for infants, and four classrooms.

Books Received.

Architectural and Decorative Designs, for the Use of those engaged in Architecture, Sculpture, Working in Metals, &c. Drawn by Enrico Salandri. Incorporated with "Page's Decorator." London: Atchley & Co. 1869.

We have here sixty-five quarto plates of parts of buildings, ornaments, and details well drawn and neatly engraved, for a price little more than nominal, —12s. 6d. They are, for the most part, from works of the Renaissance period, not a few Rococo, and the plates have done duty before; nevertheless we venture to say there are few persons engaged in designing who would not find the volume a good investment.

Miscellaneous.

The Carlisle Memorial.—A column in memory of the late Earl of Carlisle, erected on the summit of Balmer-hill, Castle Howard, Yorkshire, was last week opened to view. The design by Mr. F. P. Cookerell was selected, our readers may remember, in competition. The work has been executed by Mr. Bailey, of York, under the honorary clerkship of Mr. John Clieck, of Whitwell, the agent for the Lechnere estates. The monument bears a surrounding inscription, as follows:—"In memory of George Wm. Frederick VIIIth Earl of Carlisle, Viscount Morpeth, K.G." Upon the Castle Howard face of the pedestal is the inscription, "He to whom this monument was raised, A.D. MDCCCLXIX., in private life was loved by all who knew him. By his public conduct he won the respect of his country, and left the bright example of a true patriot and earnest Christian." On the York face is the following:—"He to whom this monument was raised by public subscription, during XII. years represented in the House of Commons firstly Yorkshire, secondly the West Riding, and during VIII. years was Viceroy of Ireland." The cost is estimated at over 2,000*l.* The monument is visible to the whole vale of York, the greater part of the vale of Derwent, the West Riding hills, the Yorkshire wolds, and a large part of the North Riding.

Government Educational Inquiry in Manchester.—In preparation for the bill for the improvement of the education of the people, which is to be submitted next session to Parliament, the Government is making an inquiry into the present supply and quality of such education within the municipal boroughs of Manchester and Liverpool. The commissioner, Mr. D. R. Fearon, who is appointed to conduct the inquiry in these two boroughs, will commence his operations in Manchester about the 20th of November, and in the meantime receive information or suggestions from persons interested in the subject.

Railway Progress in Russia.—The table of Russian railway statistics for 1870 has just issued from the press. The railways already in operation make up an aggregate of 5,490 English miles, all of which, with the exception of the Moscow, Tearskoe-Celo, Riga, Danaburg, and Warsaw-Vienna lines, have been constructed within the last eight years. The lines to be opened in 1870 are the Kharkov-Taganrog, 350 miles; the St. Petersburg-Viborg, 240 miles; the Moscow-Smolensk, 260 miles; the Ribinsk-Bologoe, 172 miles; the Lazovo-Sevastopol, 214 miles; and the Ostashkovo-Torjokovsk, 214 miles. To be opened in 1871, the Poti-Tiflis, 190 miles; the Kharkov-Kremenchug, 165 miles; the Voronej-Grushkev, 353 miles; the Liban, 196 miles; the Ivanovo-Kineshansk, 248 miles; and the Skopinak-Risjak, 29 miles. To be opened in 1872, the Baltic-Port and St. Petersburg, 254 miles; the Tambov-Saratov, 225 miles; and the Borisoglebsk-Tsaritzin, 232 miles; the whole forming a total of 3,335 miles of railway to be completed and set in operation within the next three years. The programme of the "outer list" contains the lines surveyed during the past year, and now about to be commenced. These reach the enormous aggregate of 10,000 English miles, and run thus:—Southern and Western lines:—1. From Smolensk to Brest-Litovsk; 2. From Rostov (on the Don) to the central Caucasus; 3. From Livna to Orel. Eastern lines:—1. From Tiflis (the chief town of the Caucasus) to Baku, on the Caspian Sea; 2. From Nijni-Novgorod (via Kazan) to Ekaterinburg, the frontier town of Siberia; 3. From Morshansk (via Penza and Samara-super-Volga) to Orenburg, the frontier town of Tartary. Northern lines:—1. From Yaroslavl or Ribinsk to Vologda; 2. From Viatka (a town about 300 miles to the north-east of Nijni-Novgorod) to Archangelsk.

The Artisans' and Labourers' Dwellings Act.—Two of the parochial bodies of the metropolis have at last begun to act up to the spirit and letter of Mr. Torrens's Act. At a recent meeting of the Hackney District Board of Works, Mr. Runtz moved that the houses in Lawrence-buildings, West Hackney, numbered 1 to 6, and 8 to 11 inclusive, be closed. He remarked that the Board had tried every means of bringing the premises into a habitable condition, but without effect. Fever, he said, was continually in the place, and to close up the houses was the only practical remedy to be adopted. Mr. Beck said he had known the place for the last twenty-five years as a hot-bed of disease. Mr. Gowland hoped this case might act as a caution to other landlords as to the state of repair in which they kept their houses. The motion was carried, as was also another for the demolition of a number of cottages in Sanford-lane, West Hackney. At the last meeting of the vestry of St. George the Martyr, Southwark, it was decided that the necessary proceedings should be taken in the case of certain houses in Little Surrey-street, which had been reported by the medical officer as unfit for human habitation and dangerous to health.

To Render Timber Incombustible.—In the *Neues Jahrbuch für Pharmacie*, Herr Reinach states that, having been requested to report to a fire insurance company about the best means of preventing timber bursting into flame, he experimented with various salts, and at last came to the conclusion, as the result of his experiments, that impregnating timber with a concentrated solution of rock-salt is as good, if not better, a preservative against its bursting into flame as water-glass (silicate of soda), while the price of the former salt is, of course, only a mere trifle; moreover, rock-salt thus applied to timber is a preservative against dry rot and noxious insects. The author recommends the use of salt water, that is to say, a solution of rock-salt of moderate strength for the use of fire-engines during a fire as by far more effective than water; but in order that the salt should not injure the working parts of the engines, they will immediately afterwards have to be played with fresh water again.

Architecture, University College.—We desire to draw attention to the commencement of the annual course of lectures at University College by Professor Hayer Lewis. The first lecture will be given on Tuesday, October 5th. There will be thirty lectures on architecture as a fine art, and thirty on construction. Students will do well to avail themselves of the means of obtaining information thus afforded. The lectures are delivered in the evening.

Experiment for Supplying a City with Hot Air.—Experiments, it seems, are being made by a gentleman who has worked for many years in the United States armory, for supplying a city with heated air. He proposes to force air rapidly through a coil or series of iron pipes heated in a furnace, and then to a greater length of pipe outside, made of fire-clay, which is claimed to be about the best non-conductor that can be had. The first trial will be a pump of 8 in. diameter and 8 in. stroke, and the clay pipes, now being made in New York, will be 300 ft. in length and of a 4 in. bore, with a thermometer at each end, which will indicate 60 degrees. The projector expects to heat the air in the iron pipe to that temperature and force it to the further end with little loss. If the pipes are laid in the streets it will be necessary to have them enclosed in a brick arch, lined with mortar made of fire-clay. It is contended, if the thing works according to the expectation of the projector, that but a small portion of the coal now used will be necessary for all heating and cooking purposes.

A Sanitary Inspector Wanted.—Any one walking through the pleasant green fields between Highgate and Fortis-green will have his nostrils assailed by the most abominable odour, arising from an open ditch, passing beneath the high road and Great Northern Railway, and winding towards Finchley. On tracing this open drain to its source, we found it in a field through which a public footpath runs at the back of Hampstead-lane, and close to a crescent of new and, at present, unoccupied villas, in which the odour was distinctly perceptible. Here the open mouth of a large earthenware drain empties its contents, which are said to be only the overflow of some large cesspools receiving the drainage of the houses on the north-west side of Highgate. However this may be, it is certain that the new houses in the crescent, at the back of the playing fields of the Cholmeley School, have lately been drained into this open ditch, and that its stench is abominable. The drains of many of the houses of Fortis-green also run into this ditch, and no attempt has been made to cover it in.—*Lancet*.

Grange-over-Sands, North Lancashire. The Blawith Estate, advertised in our present issue for sale on the 14th of October, is in a peculiarly beautiful, though not very well known part of the country. Grange overlooks Morecambe Bay, and, knowing the site well, we quit a Grange with a contemporary, who says:—"Excursionists in want of a new pleasure,—they who have done Europe, and are shy of Ireland, no caring to be shot by the merest mistake in the south, or stoned for being too blue, or too orange or too green, in the north,—will do well to take tickets for Grange, and explore the magnificent district. Beauty of nature, interest of history, quaintness of social life, and many other pleasant things, combine to make the place attractive. The estate includes a good mansion, and a very productive farm. An hotel has been built, and the railway station adjoins the grounds, and gives ready communication with Furness Abbey, Lake Coniston, and Barrow."

Nicknames of Italian Painters.—Ado Stahr, in his "Winter in Rome" (*Ein Winter in Rom*, von Ado Stahr und Fauny Lewald, Berlin, 1869), writes:—

"Together with Guercino's name I remember that too, it is a nickname, Guercino meaning 'the little squint' his original family name was Barberi. Such like *toponi* which, originally given by boon companions, stuck the artist, and took the place of the true name of the same, are many in the history of Italian art, and they at the same time characteristic as regards the social form of that time. Thus the painter Robusti was, and is still called 'Tintoretto' (the little dyer); Barbarelli we know almost only as 'Giorgione' (his George); Conradi 'Ghirlandajo' (the garland-maker); Ribera as 'the little Spaniard' (Spagnolello); Andrea Vanucci is much better known by his nickname Andrea del Sarto (Tello Andrea), his father being a tailor. Which name is behind Luca della Robbia ('Madder-Luke'), and Massacio ('Dirt-Thomas'), I cannot call to mind just now."

Kenilworth Castle.—A considerable portion of the ruins of this once magnificent pile having shown signs of falling, Earl Clarendon, the owner, is now repairing and strengthening the great hall, Leicester's buildings, and parts of the external walls on either side. His lordship also restoring some of the doorways, windows and fireplaces. In the course of the repairs excavations have been made, and underground apartments, cells, and passages revealed which had been hid for centuries. The great hall, 90 ft. by 45 ft., still retains several of its Gothic windows, and some of the towers yet rise 70 ft. high.

Royal Military College, Sandhurst.—A memorial window to the late gentleman cadet George Ayscough Booth, son of the vicar of Clondown, Bath, has recently been erected in the east end of the College Chapel. The stonework, of the fifteenth century, was designed by Mr. Backeridge, of London. It is a cusped four-light window with tracery. The two side-light windows bear a series of subjects in stained glass, commemoratively displaying, under the form of allegory, the virtues of Bravery, Piety, Brotherly Love, and Resignation; while the Redemption, Resurrection, Ascension, and Judgment are embraced in the centre compartments. Faith, Hope and Charity, Humility, Forgiving Spirit, and Repentance are also allegorically displayed in the tracery, and two ascending angels bearing texts, complete the figurative arrangement. The entire work is finished by a canopy-work surmounting each group. The window was executed by Messrs. R. B. Edmundson & Son, Manchester.

A Mushroom Town.—The headlong manner in which things are done at the West is shown by the progress of the town of Duluth, upon the projected route of the Northern Pacific Railroad, and which metropolis is now fully three months old. Within the period which has elapsed since its birth, 75 houses have been built, plank sidewalks laid down, a large hotel commenced, which will be completed in September, and two churches are under way. Four months ago the land upon which Duluth is to be built was worth from 1 dol. 25 c. to 2 dol. 50 c. per acre; now town lots in the city are worth 1,000 dol. each. From about five persons—the population of Duluth on the 1st of April—the residents of the town have swelled to 1,500.—*Philadelphia Commercial.*

Leith School of Art.—At a meeting held in the Council Chambers, Leith,—the Provost in the chair,—it was resolved to establish in Leith a School of Art, in connexion with the Government Department of Science and Art, for giving instruction in freehand, geometrical, mechanical, and architectural drawing, designing for manufactures, modelling, and painting. Over 500 had been already subscribed, and some further sums promised, to meet the expenses incurred in commencing the school. An influential local committee was formed, with the Provost as chairman, and Mr. Robert L. Bain, late artist-master at Inverness, was appointed master of the school.

An "Unsuitable" Tombstone.—At a recent meeting of the Wednesday Local Board, attention was called to a tombstone to the memory of a man named Mincher, lately erected at the cemetery, with Watts's verse inscribed upon it:—

"Whatever brawl disturb the street,
There should be peace at home;
Where sisters dwell, and brothers meet,
Quarrels should never come."

The verse was held to be unsuitable. The clerk said the verse was attached without the knowledge of the Board, and it could be removed. The chairman was not inclined to order the absolute removal of the stone, but merely to point out the objectionable verse to the friends, and to them to alter it. The widow's defence was that at the deceased often repeated the verse. The suggestion of the chairman was adopted, and it was resolved that in future all inscriptions should be submitted to the Board.

Breaking of a Bridge in Prussia.—At Königsberg, during a *fitte* in honour of the King and Crown Prince of Prussia, the Princess of Wales, and other royal personages present at Königsberg, a wooden bridge which was illuminated seems to have caught fire, and a panic seized the people who were on it witnessing fireworks which were going on; the railing of the bridge gave way, and some hundred persons were precipitated into the Schloss teich or lake below. Forty-three corpses had been recovered from recent accounts. The *fitte* was brought to a sudden close.

A Railway Bridge on Fire.—Early on Monday morning, Cotton railway bridge, about three miles from Preston, was discovered to be on fire on the up-line side of the bridge. The fire on that line was at once stopped, and the trains were made to extinguish the fire, which fortunately were successful, and preparations were made to renew the burnt part of the bridge with fresh timber. The bridge is a wooden one, and it is supposed the fire was caused by lighted cinders falling from an engine in passing over.

Will of an Italian Architect.—Signor Poletti has left his whole fortune, now found to amount to 400,000 francs, to his native place, Modena. The syndic of that city, however, has just been apprised that the executor will not part with the property until Modena is placed in a position of independence, and that, in default of this—that is, the restoration of the old duchy of Modena—the bequest will be diverted to the city of Rome.

Park-lane: a Large Offer.—At the meeting of the Metropolitan Board of Works this Friday, a letter from Mr. Dunster is to be read, stating that one of his clients is willing, on the Board obtaining a repeal of the Act for opening up Hamilton-place, and obtaining an Act for the widening of Park-lane, to contribute the sum of 50,000, towards such improvement.

Velasquez.—We hear that in one of the public libraries of Spain several letters and receipts in Velasquez's own handwriting have been found. One was a receipt for 1,100 reales, or nearly eleven pounds sterling, for his famous picture of "The Drunkards." Prices have changed.

The Builders' Benevolent Institution.—The annual dinner in aid of the funds of this charity is fixed to take place on Thursday, the 28th of October. Mr. J. M. Macey is the president for the year, and the list of stewards is now being made up.

Discovery in Rome.—In digging for the foundations of a large palace to be constructed for a savings-bank on the Piazza Sciarra in the Corso the workmen, it is said, lately discovered the basement of the triumphal arch erected by the Senate to the Emperor Claudius.

Dumfries.—The foundation-stone of a new infirmary for Dumfriesshire and New Galloway has been laid, with Masonic honours, by Mr. Landerdale Maitland, Provincial Grand Master for Dumfries. The building is expected to cost about 13,000.

The Gale.—During the recent high winds an old beech tree, nearly 4 ft. in diameter, was suddenly blown down at Croydon. The tree was borne by the gale across St. Peter's-road on to the roof of a house, which it greatly damaged.

Blackfriars Bridge.—This bridge was commenced in the year 1760, not 1710, as, by a typographical slip, was stated in a recent notice of Metropolitan bridges in our pages.

Eton College.—A new music-hall is being erected in connexion with Eton College. A residence is also being built for Doctor Hayne, the professor of music.

TENDERS.

For stabling at Holloway, for the London General Omnibus Company (Limited). Mr. A. G. Church, general manager. Mr. Scerry, architect. Quantities supplied:—

Fawcett	.....	£14,355 0 0
Fletcher & Coughley	.....	14,181 0 0
Williams & Sons	.....	13,879 0 0
Sanders	.....	13,500 0 0
Pearson	.....	12,980 0 0
Clemence	.....	12,887 0 0
Carter & Sons	.....	12,751 0 0
Kelly, Brothers	.....	12,734 0 0
Blackmore & Morley	.....	12,690 0 0
Roberts & Co.	.....	12,580 0 0
Lewis & Co.	.....	12,498 19 8
Turner, W. T.	.....	12,497 0 0
King & Sons	.....	12,483 12 10
Conder	.....	12,432 0 0
Parker	.....	12,440 0 0
Ford	.....	12,399 0 0
Goodman	.....	12,310 0 0
McLachlan	.....	12,246 0 0
Brown	.....	12,200 0 0
King & Sons	.....	12,170 0 0
Coker	.....	12,050 0 0
Henshaw	.....	11,993 0 0
Stoner	.....	11,879 0 0
Hill, Kettle, & Wadham	.....	11,855 0 0
Merritt & Ashby	.....	11,665 0 0
Manley & Rogers	.....	11,620 0 0
Taverner	.....	11,494 16 0
Scriven & White	.....	11,418 0 0
Higgs	.....	11,283 0 0
Thomas & Son	.....	11,747 0 0
Crabb & Vaughan	.....	11,745 0 0
Edson & Chapman	.....	11,690 0 0
Wynbip	.....	11,590 0 0
Crookett	.....	11,500 0 0
Tarver, J. F.	.....	11,475 0 0
Perry	.....	11,447 0 0
Cooke & Green	.....	11,247 0 0
Till	.....	11,187 0 0
Hughesdon	.....	11,160 0 0
Tripp & Co.	.....	10,575 0 0
Snodball	.....	10,338 0 0
Logmead & Way (accepted)	.....	10,305 0 0

For alterations to residence, Talk-o'-Hill, for Mr. Thos. Sherratt. Mr. G. B. Ford, architect. Burslem:—
Fryer (accepted)..... £310 0 0

For alterations to the Wesleyan Chapel, Burslem. Mr. G. B. Ford, architect:—

Blackhurst	.....	£300 0 0
Woolrich	.....	300 0 0
Bridley & Critchlow	.....	243 10 0
Glazing and Painting	.....	105 0 0
Langley	.....	94 0 0
Sambrook	.....	94 0 0

For alteration of front and new workshops at rear of 25, Soho-square, for Messrs. G. & I. Allen. Mr. Ward, architect:—

Leing	.....	£335 0 0
They	.....	278 0 0
Manley & Rogers	.....	243 0 0
Belham	.....	239 0 0
Slade	.....	183 0 0

For rebuilding No. 83, Watling-street, and making sundry alterations and additions to warehouse, for Messrs. Crocker, Sons, & Turner. Mr. Herbert Ford, architect:—

Pritchard	.....	£3,403 0 0
Browne & Robinson	.....	3,317 0 0
Henshaw	.....	2,928 0 0
Ashby & Horner	.....	2,465 0 0
Conder	.....	2,389 0 0
Lawrence & Sons	.....	2,239 0 0
Brass	.....	2,183 0 0
Myers & Sons	.....	2,096 0 0
Moultrie	.....	2,083 0 0

For enlarging men's receiving ward, and building bake-house, at the Faversham Union. Mr. B. Atkins, architect:—

Whiting	.....	£540 0 0
Bourne	.....	504 16 0
Sirabsole	.....	497 0 0
Ridgill	.....	478 10 0
Austen	.....	473 0 0
Judges (accepted)	.....	469 0 0

For alterations, additions, and repairs, at Nos. 52 & 53, Shann-street, Chelsea, for Mr. Elton. Mr. Sidney Godwin, architect:—

Grover	.....	£175 0 0
Fletcher & Coughley	.....	423 0 0
Bowman	.....	417 0 0
Jones	.....	304 10 0
Robinson	.....	387 0 0

For County Court of Kent, at Gravesend. Mr. T. C. Sorby, architect. Quantities supplied by Mr. J. Scott:—

Chappell	.....	£5,248 0 0
Cobham	.....	5,009 0 0
Patman & Co.	.....	7,998 0 0
Browne & Robinson	.....	7,589 0 0
Nixon & Son	.....	7,548 0 0
Pink & Mitchell	.....	7,470 0 0
Lilleystone	.....	7,450 0 0
Macey	.....	7,594 0 0
Lacey Brothers	.....	7,373 0 0
Higgs	.....	7,147 0 0
Blake	.....	7,400 0 0
Hill & Sons	.....	7,330 0 0

For the erection of a County Court-house at Barnsley. Mr. T. C. Sorby, architect. Quantities supplied by Mr. J. Scott:—

Oak Joinery	.....	£4,400 0 0
Lalham & Son	.....	43,140 0 0
Neil	.....	8,910 0 0
Hinchiff & Son	.....	8,449 0 0
Tomlinson	.....	7,934 0 0
Ridgill	.....	7,087 0 0
Neil & Sons	.....	7,806 0 0
Robinson & Son	.....	7,323 0 0
Shafte & Barry	.....	7,387 0 0
Bealstead	.....	7,280 0 0
Boothman & Broomhead	.....	7,028 0 0
Nicholson & Son	.....	6,993 0 0
Taylor & Son	.....	6,516 0 0

For additions to The Willows, Mitcham. Mr. Joseph Gibson, architect:—

Cooper & Cullum	.....	£388 0 0
McLachlan	.....	311 0 0
Carter & Son (accepted)	.....	409 0 0
Taylor	.....	493 10 0

For building two dwelling-houses, Church-street, Blackfriars-road, for Mr. Isaacs. Mr. E. L. Blackburn, architect. Quantities supplied by Mr. Strubsole:—

Merritt & Ashby	.....	£1,471 0 0
Taylor & Pitts	.....	1,430 0 0
Warne	.....	1,375 0 0
Crabb & Vaughan	.....	1,370 0 0
Gore	.....	1,355 0 0
W. Smith	.....	1,278 0 0
Nightingale	.....	1,267 0 0
Pitcher	.....	1,253 0 0
Sodon	.....	1,225 0 0
Cooke & Green	.....	1,217 0 0
Brown & Sons	.....	1,210 0 0
Till	.....	1,209 0 0
Harvey	.....	1,187 0 0
A. Smith	.....	1,179 0 0
Hutchinson	.....	1,150 0 0
Shirley & Horne	.....	1,110 0 0
Stone	.....	1,109 0 0
Cohen	.....	1,100 0 0
Turner	.....	1,085 0 0
Brown	.....	1,047 0 0

For the erection of four houses at Acton, Middlesex, for Mr. J. Barnes. Mr. J. Figg, architect. Quantities by Mr. Strubsole and Messrs. Blagden:—

Bell	.....	£1,450 0 0
Crabb & Vaughan	.....	1,435 0 0
Kelly Brothers	.....	1,373 0 0
Blackmore & Morley	.....	1,365 0 0
Warner	.....	1,350 0 0
Till	.....	1,300 0 0
Tutler	.....	1,275 0 0
Rowles	.....	1,250 0 0
Knight	.....	1,221 0 0
Cawdron	.....	897 0 0

For alterations to the Clock-house at Potter's Bar, the list of tenders for which was published last week:—
Shirley & Horne (accepted)..... £388 0 0

For the erection of a Presbyterian church at Camberwell. Mr. S. C. Capes, architect. Quantities supplied by Mr. Lansdown:—

Thompson	£5,100 0 0
Nightingale	4,985 0 0
Newman & Mann	4,841 0 0
Dove Brothers	4,865 0 0
Webb & Sons	4,853 0 0
Scribner & White	4,626 0 0
Colls & Son	4,587 0 0
Sawyer	4,555 0 0
Conger & Cullum	4,664 0 0
Jackson & Shaw	4,524 0 0
Wells	4,195 0 0

For pulling down and rebuilding Bloomsbury Hall, Berks, for Mr. P. Holloway. Mr. J. Dale, architect. Quantities supplied by Mr. Bennett:—

Revel	£11,995 0 0
Nightingale	11,473 0 0
Harris & Edwards	11,399 0 0
Till	11,200 0 0
Longmire & Burge	11,135 0 0
Cowland	10,980 0 0
Twitfrees	10,516 0 0
Underwood	10,382 0 0
Elliot	9,870 0 0
Parsons	9,799 0 0
Woodbridge	9,571 0 0
Gibson Brothers	9,442 0 0
Pyshers	9,355 0 0
Roberts & Co.	9,302 0 0
Collins	9,273 0 0
Carter & Ross	9,249 0 0
Nutt & Co.	9,136 0 0
Peace Brothers	9,083 0 0
Mesher	8,960 0 0
Baxter	8,795 0 0

For Lilley's Mansion, Wexden, near Aylesbury, for Mr. H. Casanova. Mr. G. Dreyer, architect:—

Trolope	£11,642 0 0
Holland	11,547 0 0
Halden	11,159 0 0
Sewell	10,888 0 0
Darley	10,528 0 0
Mjers	10,373 0 0

TO CORRESPONDENTS.
A. B. the question of lamp waxes has been discussed on several occasions in our pages. Very little that is satisfactory has resulted. — H. (Hills) — Yarnmouth 61000. — Kensington News, two are by no means sure that the application to the prop and fact is sound. — T. E. C. (nothing to be recommended with certainty). — P. W. B. (next week). — W. W. — F. — O. — J. — F. — W. — M. — H. — R. — W. — C. — R. L. — B. — W. — S. — E. — J. — H. — S. — Mr. O. — H. — L. — R. — J. — H. — S. — A. — D. — W. — E. — G. — T. — O. — K. — J. — L. — B. — Surveyor. — H. — G. — H. — L. — C. — H. — T. — C. — S. — J. — B. — G. — R. — F. — M. — P. — W. — G. — S. — J. — W. — W. — Mr. H. — B. — R. — A. — D. — T. — R. — M. — The Lord of the Manor. — E. — H. — France. — S. — M. — H. — L. — J. — C. — J. — W. — S. — We are compelled to decline perusing old books and giving address. All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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Advertisements cannot be received for the current week's issue later than THREE o'clock, p.m., on THURSDAY.

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(Signed) J. M. DRAGO,
Treasurer of the National Government.
JOSE TOMAS ROJO,
JUAN M. ALVAREZ,
A true copy.—A. M. BELL."

A large assortment of these Safes may be inspected, and lists of prices obtained, at CHUBB & SON'S, 57, St. Paul's Churchyard, London; 68, Cross-street, Manchester; 28, Lord-street, Liverpool; and Horseley-fields, Wolverhampton.

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The Builder.

VOL. XXVII.—No. 1391.

Concrete Buildings.



SOME time ago we alluded to the erection of a large and lofty warehouse wholly of concrete, in Great Guildford-street, Southwark. We have recently visited it, and find it standing remarkably well. It was built by the owner, Mr. H. Goodwin, Mr. E. T'Anson being the architect. Mr. Goodwin, who is laying himself out to execute other buildings in this material, gives us some particulars of the work, which we use usefully printed:—

At your request I will as briefly as possible give you an account of the concrete warehouse in Great Guildford-street, built by me. In the place, the concrete is composed of one part best Portland cement to seven parts of mal consisting of clean Thames gravel, crushed and clinkers from furnaces, crushed bricks, shippings, oyster-shells, pottery, hard core dust-yards, and any other hard and incom-ible material I could get. After waiting six months for the Metropolitan Board of Works to consider whether or not Portland concrete was applicable to building purposes, I at last got consent to proceed with the work. We built upon an average day about 12 in. all round the walls, being in with sand and cement at every fresh of concrete. We also put in hoop-iron at each floor. We could have built 18 in. away, which is the depth of the apparatus, but considered 12 in. quite fast enough for a build- to high; though at other smaller jobs I have built 3 ft. per day. The building is 70 ft. 0 in. high, and 60 ft. high. It consists of basement five floors, each floor supported by twelve columns. The roof is of concrete 3 in. thick, between tes-iron 3 ft. 6 in. apart, covered with asphalt. The thickness of walls is to brick rule; those 70 ft., two floors 27 in., two 22 in., and two floors 18 in.; the 50-ft. are, two floors 22 in., and four floors 18 in. The cost of the walls, considering I had a great deal of the material for nothing, is under 6l. per rod; or, take the whole of the building as a cube, the cost was about 1000 per foot. It is very strongly built, and stands as one of the warehouse class can be. It is now loaded with goods, every floor and has never shown the slightest crack or movement. It is harder than most kinds of concrete used for building purposes, and is of one mass from beginning to end. While in the course of construction I was honoured by visits from many members of Parliament, most of the members of the building profession, and many gentlemen, who took great interest in this experiment and experiment in building, as well as in myself. Thanks for your good remarks in the Builder at that time.

With Mr. Tall's patent apparatus (with which it was built) a perfect surface is obtained without, it requires only a thin coat of plaster and sand to finish the walls perfectly straight and true. I quite agree with Mr. T'Anson

in his opinion "that the success of such work depends on the entire honesty of the man who does it."

I have learnt so much of concrete with this and other contracts I have taken since, that I find the greatest care must be used in choosing the material. I have made specimens of all kinds. Many persons, and amongst them builders, think if they have gravel, by adding the cement they have all that is required to make concrete. So much depends upon the gravel, that if it is not the right sort the work will cost as much as brickwork, and then never be sound. Every bit of loamy matter and dirt must be washed out thoroughly; then you must replace with clean sharp sand, about one-fourth.

Those who wish to build of concrete should only do so where the material is on the spot or very near. Clean river ballast, with a good proportion of sand, is as good a thing as we can have for Portland cement concrete. If some crushed slag or furnace clinkers can be mixed, so much the better; it is also lighter, which is a good thing in wall construction. Burnt clay is also a very good material, provided it is well burnt. Great care should be taken to sift with a fine sieve all crushed material; for, let it be what it may, dust, loamy matter, or fine sand, if it is finer than the cement itself it will dilute and kill it. I have made specimens of concrete with gravel that have become as hard as the best stock brick, and I have made others, with the same proportion of cement, that you may crush and crumble in your hands. There is much gravel in some parts of Surrey, all small round stones free from leam, but containing a very fine sharp sand. Many would think it good for concrete; but use it, and take whatever care you please, the concrete will be little better than if you had only mixed it with water; the reason is, the sand being finer than the cement, kills it.

The concrete chapel I have just completed at Snarebrook, in Essex, is built of the refuse of the brick-fields, mixed with sharp sand got from a good depth, there being a sewer in course of construction close by. The concrete is composed of one part cement to seven parts of material. The prime cost of the walls, including the working the apparatus, was 7l. per rod. Many of the statements that have appeared in print upon concrete are not correct. It has to be borne in mind a yard of concrete mixed dry, when wetted and put into the apparatus, falls considerably short of a yard,—at least 15 per cent. Neither does the cement make bulk, but disappears in measure, as does the water. If lumps of stone can be got, or brick burrs, or old bricks, to pack into the wall, it makes better work and cheaper. The more the cement can be displaced the better for the work and the less the cost. Great care should be taken the cement is not too fresh, or it will cause the work to crack. It should be at least a month old before using.

The concrete villa at Addiscombe-road, Croydon, is now completed and occupied; it gives great satisfaction, and, it is said, will be the only house the rain will not penetrate in that neighbourhood. The lower floors are all of concrete, and perfectly smooth and warm; there is no channel for a mouse or any creeping thing in that house, unless it take up its abode with the family. I forgot to remark, the porch in front of the chapel at Snarebrook is built of white brick, by desire: the whole of the other work to the walls around, some 130 ft. long, 5 ft. high, 6 in. thick, without a pier, are all of concrete. Some of the walls near by are 12 ft. high, and 9 in. thick.

In the course of these particulars, Mr. Goodwin makes an observation on which we may usefully enlarge. He says:—"It has to be borne in mind a yard of concrete mixed dry, when wetted and put into the apparatus, falls con-

siderably short of a yard,—at least 15 per cent. Neither does the cement make bulk, but disappears in measuring, as does the water." In the prize Essay on Concrete, by the Conductor of this journal, published in the first volume of the Transactions of the Institute of British Architects, this loss of bulk in making is pointed out, and experiments are referred to which show a diminution in those particular cases of about one-fifth.

In the year 1857 Mr., now Professor, Lewis read a paper at the Institute of Architects with the view of showing that this asserted loss did not take place. The writer says:—

"The general idea with respect to this material is—1st, that there is a sensible loss in bulk of the ballast, independently of that of the lime; and, 2nd, that the materials, on being mixed together, expand considerably. So much is this idea prevalent, that a respectable builder—one, I am sure, quite above stating anything that he did not believe to be true—required, in calculating the price of the concrete, that I should allow him one-seventh more ballast than the concrete cubed to, he depending on the published statements of the loss of ballast being thus great. It was this demand that first led me to experiment. The following trials were all made in the same manner, and, with one exception, I was present at the whole process from beginning to end. Several of the committees of the Architectural Publication Society also attended at the trials. A wooden box was made, holding exactly one cubic yard. This was filled with a fair sample of the ordinary Thames ballast, and such as is used for concrete in London. To this was added ground Medway grey stone lime, in the proportion of one of lime to six of ballast. The whole was then turned out and mixed together in the ordinary way, the cubic yard taking about forty gallons of water. The whole bulk would thus stand as follows:—

Ballast	27 feet cubic.
Lime.....	10½ do.
Water	5 do.
Total	37½ do.

The concrete, thus mixed, was thrown into the box from the level of the ground, so that the lower part would have a fall of about 4 ft., and the upper part of 1 ft. The experiment was also made of throwing it in from a platform, 10 ft. above the ground. In each case the result was the same, viz., the whole mass, made into concrete, occupied precisely the same space as the dry ballast, viz., one cubic yard, all the bulk of the lime and water, being about two-fifths of that of the ballast, being lost, but none of the ballast itself. The surface was carefully levelled, and thin boards tacked over, so as to ascertain if there were any expansion in the setting, but none could be perceived."

We needed no inquiry to assure ourselves that as a rule, whatever might have occurred on the occasion described by Mr. Lewis, the original statement as to a loss in bulk was correct. In order, however, to obtain the experience of others on the point, we made numerous fresh inquiries, and found the answers so unanimous in confirming our views, that it seemed unnecessary to notice the contradiction. The statement, however, that there is no loss in bulk of the ballast having been adopted in consequence in more than one book of reference, and loss having accrued to individuals in several cases through faith in it, it is desirable that the truth should be established.

The Messrs. Lucas wrote:—
"We have the pleasure to forward you, as promised, the following particulars of experiments made with concrete. They were made at the new Italian Opera House, Covent Garden.

A deal measure, 3 ft. by 3 ft. and 3 ft. deep, carefully made for the purpose, was placed upon a wood floor, and filled with ballast thrown in from a shovel, and made quite level on the top. The ballast was then taken out and mixed in the usual manner (upon the wood floor), with three bushels of ground stone lime, and thrown again with shovels into the measure whilst hot; the concrete, when first put in, exactly filling the measure, as did the ballast before being mixed with the lime.

A deal measure was used in order to ascertain if any expansion took place, but as it retained its shape, none occurred horizontally, nor did any appear vertically.

The experiments were made with 'gravel taken from the excavations, well screened, and with unscreened Thames ballast,' the same quantity of lime being used to each, and the operation performed alike in both cases. When set, the concrete formed with the screened gravel, had diminished in height about 1½ in., or

1.24th, and that formed of Thames ballast unscreened, about 2½ in., or 1.16th. We think, however, that had the concrete been thrown in from a stage, the subsidence would have been greater, most probably 1.12th, and should not think it safe in making an estimate to calculate the subsidence, as less than 1.12th."

Mr. Edward Druce, the resident engineer at the Dover pier works:—

"I have found that with the materials such as we have, 22 parts of the materials when mixed together and measured dry make about 17½ parts of liquid concrete."

Mr. Plucknett (W. Chitt & Co.) said:—

"We have found from actual experiment that 5,722 cubic yards of Thames ballast made 4,891 cubic yards of concrete. It was thrown from a height of 10 ft. This quantity of concrete consumed 544 yards of ground stone lime."

The result of some experiments made by Mr. Buckwell at his Phoenix Stone Works, East Greenwich, was, that "a cubic yard of cement concrete contained 34 cubic feet of ballast and 5 cubic feet of cement."

Mr. G. Robertson, the resident engineer at Leith Docks, wrote more fully, and thus:—

"When the ballast was moderately dry, 12 cubic yards of ballast and 2 cubic yards of fresh ground lias lime made 11 cubic yards of concrete mixed and deposited, the waste from the dry materials being then 22 per cent."

But, if the ballast was very dry, the same quantity might only make 10 cubic yards, and *vice versa*. The first quantity is the average, however, of thousands of yards, and may be depended upon as accurate in practice, with the above proportion of lime."

A cubic yard of concrete requires on the average 38 gallons of water of mixture, of which 8 gallons are required chemically to form hydrate of lime, and 30 gallons remain free in the concrete.

The expansion in setting varied from an extreme of 1.30th in hot summer weather to 1.48th in winter during cold weather. This is the expansion for a cubic foot enclosed in a box; on the large scale it is not so great, as the weight of a mass above aids in keeping it down. With lias lime, which slakes slowly, there is expansion going on for perhaps a month. More particulars about the lias lime will be found in a paper I read before the Institution of Civil Engineers in 1858."

The use of concrete will probably extend, and it is of importance that all the circumstances attending it should be rightly understood.

ARCHITECTURAL DECORATION IN THE EIGHTEENTH AND FIRST CENTURIES.

An accurate and minute representation of the details of the domestic architecture of a given period seems to bring before the imagination, with striking force and startling reality, the very tone and movement of the social life of the people. The glimpse into daily habit, in the Augustan times, which is afforded by a visit to the unveiled *atria* of Pompeii has more power in stimulating the imagination to realise the Roman life, during the decadence of the first Christian century, than the whole library of classical literature. We look, indeed, to pictures for the same class of information, but it is not often that we find faithful pictorial records of manners far removed from those of our own time. We are apt to think the clustering wigs, the ponderous garments, and the stage-ethnical attitudes represented by portraits and statues of the eighteenth century exaggerated and unnatural. We do injustice to the artists. They did but represent what they actually beheld, and reflected the pseudo-classical charlatanism which was the fashion of the hour. Yet we fail to realise the truthfulness of the powdered effigies. The graphic portrayal speaks in a more dead language to our sympathy than do the records, the letters, the memoirs of the persons portrayed. The intellectual, political, passionate life of the day more closely resembled our own than did the dress, the country, or the general appearance of the men and women. The former seems to appeal more directly to our common human nature than does the latter. But, if we can, as it were, peep into a room, one, five, nineteen, centuries old, from which it might be thought that the occupants had only just stepped out, we come face to face with the life of the period in a very striking and instructive manner.

Such a treat for the student of the morals,

and the art of the eighteenth century is now offered to the visitors to the South Kensington Museum. What the Crystal Palace, in its palmy days, effected by way of reproduction of Roman, of Moorish, or of Medieval architecture, is excelled by this representation—it is a reality, not an imitation—of the hodoir of a lady of the Court of Paris in the days of Louis Seize.

This piece of decorative architecture, painted on panel, has been erected in a corner of the eastern arcade of the south-eastern court of the Art Museum. The legend attaching to its history, as stated by the officers of the Museum, is as follows:—M. Serilly, one of the paymasters of the army of Louis XVI., who lived in the old Rue St. Louis, in the Marais (now the Rue de Turone), married one of the favourite maids of honour of Queen Marie Antoinette. During a temporary absence of M. Serilly from Paris, his wife, with the assistance of the Queen, caused this hodoir to be fitted up, as a surprise to him on his return.

From the Serilly family the house passed to M. St. Anbin, by whom, through M. Achille Juvinat (the well-known antiquary and writer on tapestry and similar subjects), it was sold to M. Recapps, and so came into the possession of the Museum.

We are thus invited to enter the actual apartment which, eighty years ago, was finished with all the graceful taste of the period, for the delight of the chosen darlings of wealth and of courtly favour. The lesson which it offers is as intelligible as it is impressive. The luxury of Imperial Rome had been transplanted to the banks of the Seine. The erotic legend of a poetic mythology, illustrated by the ablest artists of Europe, was represented on the walls. The worship of pleasure, if, as became the climate, in a guise somewhat less unveiled than in a *veneream* at Pompeii, yet no less distinctly and exclusively followed out, is brought home not only to the imagination, but to the senses. The little apartment (13 ft. square, 14 ft. 6 in. high to the level of the top of the projecting cornice, and 16 ft. to the centre of the coved ceiling) has two sides occupied each by a window, one by the fireplace, and one by a door. The great proportionate height, while it diminishes the apparent size, and somewhat lessens the English notion of the comfort or *snugginess* of the apartment, is well calculated to promote the feeling of enjoyment, a fact of which those who have passed from the occupation of lofty rooms to that of apartments with lower ceilings are made very practically aware. The panelling is of a delicate white, tastefully painted, and inlaid with gilt mouldings and arabesques. In the centre of the ceiling is represented Jupiter,—not a very noble figure, by the way,—resting by his Eagle. Large bronze shells occupy each corner of the coved roof, the lower part of the decoration of which is hidden by the bold projection of a rich cornice. Below this, a scroll pattern, traced in gold and flowers, runs round the room. Scutcheons, or shield-shaped ornaments, range below; and under these, again, are painted circular medallions, with a row of oblong medallions beneath. Under these last are inlaid metal figures, in low relief, bearing vessels on the head. A band of scroll pattern, in gold and flowers, as in the upper part of the decoration, follows; and the base is occupied by Cupids supporting vases.

In four lunettes under the cornice are the largest and most highly painted figures that ornament the apartment:—Vulcan, girt with a leopard-skin, and armed with a ponderous hammer—not the swarthy god of the industrial forge, but the emblem of skill made the slave of luxury; Pomona, with a *cornucopia* laden with fruit, telling of that horticulture which waited only on the service of the *château*; Juno, imperious and scornful, half asleep beside her characteristic peacock; and a stern river god, the only figure who seems to have preserved somewhat of his natural vigour, uneffeminated by the enchantments of the scene. Geres and Bacchus, Vulcan and Vesta, appear in medallions on the ceiling.

The grey Italian marble slab of the chimney-piece, with its ornamental figures, is upheld by two finely-carved, bearded, terminal figures,—works, not of a mere decorator, but of a sculptor. The interior, or lining of the fire-place (in which silver dogs no doubt held the fuel), is the only part of the room which reminds us of later progress in the application of fine art to the service of architectural luxury; the embossed cast-iron back and sides being inferior in sharpness of execution to the work we should now

produce. Even this inferiority, however, is a point of keeping, when we consider the purpose which this old ironwork is applied.

In the panels on either side of the window the east of the room, and in the corresponding decorations of the door which is opposite, the painter seems to have given rein to the warm luxuriance of his fancy. In the former, delicately tinted Venus, girt with but the slightest apology for a *cestus*, stands caressing dove on her bosom, while its mate flutters above her head, and beneath the feet of the golden are painted a dove and a goat. *Vis-à-vis* to the Queen of Beauty advances Mars, no longer the God of Battle. A dove broods on the summit of his helmet; and he holds out a wreath of flowers in his hand. Above him a cock corresponds to the dove of Venus; and below, a fox, peering out as if for grapes, reminds one of the famous fall of *Æsop*. The pendant panels by the doorway are painted with figures of Diana and Endymion, and with hunting dogs and groups of game.

It is true that there is yet much wanting to the reproduction of the full effect of this elegant apartment. It is still far from finished. Very much, in all French rooms, depends on the effect of the hangings, the *parqueterie*, and the furniture, all which have yet to be supplied. That antique and correct taste, at the result of which, in producing true luxury of furniture contrast to mere display, the *Memoirs* of d'Abraham give such an instructive glance could alone be intrusted the appropriate furnishing of such a hodoir. It is true that in the immediate vicinity there are to be seen rare and choice specimens of the articles of luxury of the period,—inlaid and painted tables, embroidered chairs, painted and gilded china; but it is impossible to look at the restored apartment without feeling that, in order to do it full justice, the architect who designed should also have furnished it. It is so harmonious, all is so utterly Pagan (with one glimpse of the sterner redeeming feature of the Pagan life), that the step back into ball reared for the æsthetic education a delight, not of a choice and dainty *noblesse*, but of the teeming population of the largest city of the nineteenth century, seems a practical anachronism. It has been, indeed, a deluge that has intervened between the Paris of which we have here a specimen, and the Paris of London of to-day!

The value to the architect or the decorator of such a specimen of the fine art of a luxurious period, applied to domestic architecture, is very considerable. A lesson of more serious import may be drawn from a study of the scene we have attempted to describe. With the revival of learning, and of that taste of classical literature which yet illustrates the memory of the period of Leo X., commenced an attempt, on the part of those who directed the course of fashion, to re-establish some of the worst evils of decaying Roman civilisation. With classic taste was introduced the fashion of classic morals, or rather of that laxity in certain respects which was so fatal to the over-worn civilisation, first of Italy, and later of Gaul. It is a stern retribution hefted those who renounced in a great part, only its darker vices. Women and women thought only to repeat the story of Lucretia, or to imitate the luxury of senators or of the emperors of tottering Rome, those who were ground to the very dust, support a heartless idleness in which they had no share, went yet a step further back. They drank yet deeper at the fountain of classical history. They learned how the pride of Tarquinius sharpened the sword of Brutus. They recalled the great word which was older than empire among the Romans. From the mock classic drapery of the court of Louis XVI. emerged a giant spectre of the Republic. The people were taught to look backwards with admiration. They did so, at last, with a vengeance!

It is highly instructive to compare the revived pagan taste of the period to which we have referred with those actual relics of Roman times which are yet continually being brought to light in Campania. But the courts, and frescoes, and mosaics of Pompeii are, if not familiar, yet least, as to their representation and description, readily accessible to our readers. The literature of the subject is ample. It is more suitable for our purpose to refer to the latest progress of discovery, and to compare with the lady's hodoir of the decrepit French monarchy, the proportions and adornment of the imposing Italian villa which is even now in course of exploration at Palermo.

In sinking holes for the fixing of some of

which are used for the displays of the fireworks in which the Southern Italians take so avid a delight, in the month of December, in the Piazza Vittoria, at Palermo—opposite the archiepiscopal palace—some remains of ancient buildings were brought to light. Professor Cavaliere, and a committee interested in the promotion of the fine arts and discovery of antiquities in Sicily, directed attention to the subject, and were rewarded by the discovery of the foundations of a large edifice, some 100 ft. in length, at a depth of about 4 ft. below the level of the soil. A porch, or vestibule, with two carved door-jambs, on which it appeared that hinges had turned, gave entrance into a hall, nearly 80 ft. long, entirely paved with mosaic work. A doorway, graced by two Corinthian columns, led thence into a long gallery, also floored with mosaic, which again opens into a square apartment, leading into other chambers.

An external gallery, the floor of which is 6 in. higher than that of the rooms included, runs round part of the house; the whole of which had not been uncovered at the time when the description was taken.

In one of these apartments Orpheus, dressed as a shepherd, with a lyre and an iron instrument in his hand, is represented in mosaic of a very correct style; and is admirable in attitude and expression. The work, however, is nowhere equal to that of the great hall, which, for beauty of design and freedom of execution, is said to be one of the finest specimens of Classic art that has yet been discovered. In the vestibule is represented a life-size nude figure, which is in a good state of preservation. The floor of the hall itself is divided into five longitudinal and thirteen transverse compartments, adorned with geometrically-drawn polygons, stars, and frets. A large medallion in the centre is supported by four nude figures. Half-clothed females, wearing diadems, are in other compartments, one seated in a flying griffin, one on a sea-monster, one on a horse with the tail of a dolphin, and one on an eagle. A superb head of Neptune, armed with his trident, is a pendant to one of a radiant Apollo. Two horned heads, one representing a youth, and one bearded, Ieda and Jupiter, and a faun chasing a nymph, form the principal subjects of this superb composition.

Three compartments have been injured, and barbarously restored. The head of the female on the sea-monster is wanting, but, notwithstanding these imperfections, the grandeur and beauty of this splendid mosaic are such as to have produced an extraordinary impression on all those competent to judge of such works, by whom it has been seen. The complete uncovering, and accurate delineation, of the entire ground plan of this important villa will be awaited with mutual interest.

In the comparison thus afforded between the decorative art of classic, and of pseudo classic times, we cannot fail to be struck with the greater power of the earlier people. Where the light taste of the Parisian courtier adorned, with a decoration as perishable as it was elegant, the walls of a single apartment,—a floor which, it may be, had a shop below and a garret above,—the Roman designed in stone, and produced pictures which even the earthquake could not obliterate. In fact, it is to the most terrible forces with which we are acquainted, the fury of warlike storm, or the energy of elemental disturbances, that we owe, almost exclusively, the relics of ancient decorative architecture. The ashes of Vesuvius have preserved the frescos and mosaics of Pompeii, which look, at the moment of their discovery, as fresh as when they were buried in that black and blinding snow. Violence and fire have thrown those monuments over the ruins of the palaces of the Assyrian kings, from beneath which their injured sculptures are now disinterred. In cases where cities never cease to be inhabited none but the most massive architectural features can escape the transformation due to repair. It is only where the destruction has been overwhelming that what has been preserved has been preserved unchanged.

But the painted panels of the Lomis XVI. Palaces would have become entirely obliterated by such an overthrow as has preserved the noble mosaics of Palermo. Climate, no doubt, goes for much, and the distinctive action which the sun exercises on wood has taught the Italian Builder to make use, whenever it is practicable, of stone or of cement. But however we can account for it, the difference remains. If we compare the work of the two periods of decadence, of the corrupt Roman life which was

swept away by the sword of the Goths, and of the corrupt French life which, if but for a moment, was swept away by the Terror and the guillotine, we find the former to be that of men who wrought for all time; the latter, that of men who wrought but for the moment.

Another, and a not unimportant difference, may be traced between the art of the empire and that of the *ancien régime*, between the decorators by oil and the decorators by mosaic. It is that of the superior truth that distinguishes the earlier. Representations of Jupiter and Mars, of Venus and Diana, in the halls of the most Christian king or of his courtiers, were nothing but a sham. In those of the Roman senator they indicated a reality. Without supposing that the Roman gentleman of the time of Cicero or his readers were altogether possessed with faith in a mythology such as is to be found in the pages of Lempriere, there is yet no room to doubt that their forms of thought and modes of speech referred at least as distinctly to the immortal gods of Rome as do those of the Italian of the present day to St. Joseph or St. Jannarius,—to the Madonna or to St. Anne. As in the painted or modelled nook that is to be found in almost every Italian court or garden,—where a daily offering of flowers, or a half-hunt taper, represents the homage paid, in former days, to the Lares, or to Pomona,—there is an indication of the presence of an actual power or force, for good or for evil, ever operative on the popular mind,—so was it with the representation of gods and heroes in the times of our earlier paganism. Nor did the worshipper invoke their aid in mockery. In many aspects of what we now call morality, especially in all that regards the relation of the sexes, the code of Roman manners was far looser than that of Romish prescription. But the manners were not at variance with the code. The emperor had no lurking scruple that he ought to absent himself from the sacrifices because of his devotion to any Roman Madame de Montespan. For a monarch to live in the open disregard of the laws of a religion in defence of which he devastated whole provinces because their inhabitants would not kneel at his altars, was an anomaly unknown even to those who earned the terrible title of foes to the human race. And accordingly, much and repeatedly as Rome suffered from her captors, never was she wetted by her own children with so fierce a baptism of blood as the St. Bartholomew, or its *contre-coup*, the Revolution. The gods of Rome, faintly painted on the walls of salons of Paris, told of an unreality in the morals of the day, which was to meet with a very stern rebuke. Viewed in this light is there not much that we ourselves may lay to heart, in the reflections suggested by a visit to the boudoir of Madame de Serilly?

SOCIAL SCIENCE CONGRESS IN BRISTOL.

AFTER a meeting of the Council of the Association on Wednesday morning, the Bishop of Bristol preached a sermon in the cathedral, which was well attended. In the evening, Sir Stafford Northcote, bart., M.P., as president of the Congress, delivered the opening address in the Victoria-rooms, in the course of which he commented on the various subjects in the programme. We confine ourselves to what the speaker said on sanitary matters, and a portion of his remarks on the education of the labourer:—

Sanitary Questions.

I hope that in what I have been saying I have not led you for a moment to suppose that I undervalue the immense power for good which resides in the State, and which can only be exercised by the State; or that I am of opinion that what the State now does for the advancement of important social objects is anything like sufficient. On the contrary, I believe that there never was a time when State assistance, of the right kind, was more needed for the advancement of these objects than at present. The State is, or ought to be, in the possession of much more perfect information than any private body; its command of the machinery of administration is greater in almost every department of life; and it holds a position of independence and authority, which gives it advantages to which no private individual or corporation can make any pretensions. It is, therefore, most reasonable that in examining social questions we should give great prominence to the inquiry, how far the State can properly

and usefully interfere to promote social improvements. This inquiry we very naturally make in connexion with the third of the great departments of this Association,—the Department of Health. Public health, as has well been said, is public wealth; and it is a description of wealth, which, it is to be feared, we do not husband so well as we ought to do. Now, no amount of individual care, or of individual skill, can do what is wanted in this matter. Combined action is necessary to secure to the great masses of our population the first conditions of a sound sanitary state, to check the propagation of infectious disorders, to prevent overcrowding in dwelling-houses, to provide an adequate supply of pure and wholesome water, and otherwise to bring all the forces of civilisation into play in order to counteract the evils which civilisation brings in its train. For these are not inconsiderable.

It is not quite without reason that the ancients feigned that the introduction of the arts of life by Prometheus was followed by the introduction of a host of new and unknown diseases, especially when they added that mankind had by their own carelessness forfeited the gift of perpetual youth with which the gods had, in the first instance, crowned the measure of their blessings. The progress of population, consequent upon the increase of wealth, and the ever-encreasing exigencies of competition, tend very obviously and directly to the introduction of new dangers to health and to life. But the antidote accompanies the poison, if only we have the skill and the sense to use it; and it seems to be a legitimate function of the State to take care that, while private enterprise is basting after the acquisition of wealth, and is applying all the resources of science to its production, recourse should also be had to science for the protection against the evils which the wasteful, because selfish, spirit of private enterprise might otherwise engender. It is much to be regretted that we have not as yet a thoroughly well-organised department of the Government charged with the duty of superintending our sanitary system.

There is, I am convinced, abundance of work for a Minister of Health, and I believe that such an officer would be able amply to justify the expense which the department would occasion by the services he would render. We must remember that there is the broadest distinction between Government interference with private enterprise and Government support of private enterprise; and we must not confound the creation of public offices for the promotion of important objects with the absorption of all dealings with regard to those objects by the State. The time is probably at hand when three new Ministries must be created: a Ministry of Health, a Ministry of Education, and perhaps (though on this point I speak with diffidence) a Ministry of Justice. The present day, however, is the day of Royal Commissions; that of Ministries is yet to come. More than one such commission is now inquiring into questions affecting the public health. The most important is that presided over by Sir Charles Adderley, which is considering the consolidation of our very complicated sanitary laws, and the completion of our system of sanitary organisation. Those who are in the habit of paying attention to the connexion between the growth of national habits and the growth of national language, will not have failed to notice the recent introduction among us of the phrase State medicine, a phrase absolutely new to many of us, and perhaps still imperfectly understood by the general public. Let me, by way of giving an idea of what it is, quote the list of subjects which, as a committee of the General Medical Council inform us, have been suggested as proper for the examination of candidates desiring to take out a diploma in State medicine, and to enter the Public Medical Civil Service. They are: forensic medicine, toxicology, morbid anatomy, psychological medicine, laws of evidence, preventive medicine, vital and sanitary statistics, medical topography, and certain portions of engineering science and practice. State medicine, in short, as a member of the committee well expresses it, consists in the application of medical knowledge and skill to the benefit of communities, which is obviously a very different thing from their application to the benefit of individuals in private or curative medicine. We are all of us aware that medical men are continually being called on to perform public duties which lie wholly beyond the range of their private practice. They are called on to give evidence in courts of justice as to the nature of injuries, the causes of deaths, the sanity or insanity of in-

dividuals, the presence or absence of poisons, the wholesomeness or unwholesomeness of articles of food, of water, of the vapours occasioned by particular kinds of manufacture, and so on. They are or may be called on to act as coroners, as inspectors of the sanitary condition of workhouses, of prisons, of ships, of barracks, and of various public buildings. Their advice is required in relation to the purification of rivers, the drainage of towns, the regulation of burials, the repression of contagious and infectious diseases both among men and among animals, quarantine, vaccination, and numerous cognate questions. In fact, it is difficult to assign a limit to the demands which the State might with advantage make upon the time and intelligence of a well-organised Medical Civil Service. These remarks naturally suggest two reflections. In the first place, we seem to want a body of men able to withdraw themselves without inconvenience from the engrossing demands of private practice, and to devote themselves to the especial study of the public questions which require medical attention. To a certain extent, of course, it is desirable that all medical men should study those questions; and upon some of them it is necessary that they should be prepared to give opinions as cases arise. But the physical powers, even of medical men, are limited; and it is impossible that a doctor in large private practice, with all the anxieties which such practice necessarily entails upon him, should give to questions of a public character the time and consideration which their importance demands. In the second place, when we have got our Medical Civil Service, how are we to turn it to the best account? This is undoubtedly a question of great difficulty, and one which must lead us into other fields of inquiry, for it connects itself very directly with the whole question of local organisation, and of the relations between the central and the municipal authorities of the country. If we are to have an organised medical staff spread over the face of the land, some kind of local organisation will be required for it; the machinery cannot be wholly worked from London. The solution of this problem will, I hope, be materially assisted by the labours of the Royal Commission now sitting under the presidency of Sir C. Adderley; and should it be solved satisfactorily, the result may be important in more ways than one; for a good system of local organisation for one purpose will greatly facilitate the establishment of a good system for other purposes. Few greater advantages could be conferred on England than a well-considered framework of local self-government, charged with the administration of most of those matters of which this Association takes cognisance,—of justice, of health, of education, of charitable trusts, and so forth,—subject to due control by the supreme central power.

I should have been glad, had the time permitted, to make some remarks upon the sanitary questions which have been raised in British India, and upon the measures which have been taken for the improvement of the public health there. But I should be tempted into too wide a field; and though I am well aware of the great interest which the members of this Association feel in all that relates to the social condition of our Eastern Empire, and of the personal labours there of one whose name I need not mention in the present assembly, for I am sure it is in all our hearts, I must exclude India altogether from the field of my observations.

The Agricultural Labourer.

I pass on, then, to the fourth head of your labours,—the department of Economy and Trade. And here I find that you propose for special discussion the questions of the administration of the Poor-law, of assisted emigration, and of the condition of the agricultural labourer. . . . Now for the improvement of the agricultural labourer you want two things—you want to raise the standard by which he measures himself, to teach him to aim on behalf of his children, if not on his own behalf, at something higher than he has hitherto been content with; and to place within his reach the education and training necessary to enable him to reach that standard if fair play be given him. That is one thing which you want; the other is that he should have fair play; that his work should be paid for in such a manner as to make it his interest to do his best; that he should be encouraged to form habits of diligence and of independence, and should be made to feel that his destiny in life is to a great extent

under his own control. You want, in fact, to operate upon the individual, and to make him work out his own improvement. This is a task not only distinct from that which the advocates of artificial systems for the wholesale elevation of the labouring class propose to themselves, but one which in practice will often be found antagonistic to them. Those who are interesting themselves in the improvement of the condition of the labourer may, I think, be divided into two schools. The one is animated by the spirit of the trade-union, the other by the spirit of piece-work. The one would work through the class, the other through the individual. I take my side with the believers in piece-work. Not that I dispute or doubt the reasonableness of such an organisation of labour as is sufficient to protect the individual labourer against the possible exactions of the capitalist; if trade-unions or labour-unions could be confined to that object, they would be deserving of respect and of sympathy. But when they go further and demand of their own members that they should limit their individual exertions so as not to produce more or to earn more than their fellows, they introduce a principle at once unjust and dangerous. There is no saying what injury they may not thus inflict upon their neighbours; there is no saying even what injury they may not inflict upon their country, by restricting the development of its industry, and possibly driving out of it branches of business essential to its prosperity. The theory of co-operation is indeed a beautiful one; but it seems better suited to the republic of Plato than to the atmosphere of this work-a-day world. It will, no doubt, commend itself to those who abhor what they call privileges, who prefer equality to liberty, and who look to the State to exercise the evils of the inequality which nature has unhappily inflicted on the human race. This is the theory which finds its latest expressions in the proposal of one of the societies represented at the late National Labour Congress at Philadelphia, "that when an employer refused to make an advance in wages or a reduction in the hours of labour, the State should employ such workmen." I presume that in such case the workmen would both fix the amount of wages they would like to receive, and name the amount of work they would like to do in return, leaving the taxpayers to make up the difference between the two sides of the account. It is a theory which may well find advocates; but to many of us—I hope to the majority of us—individual freedom and fair competition are the very breath of our nostrils, and long may it be ere we are deprived of them. What I have said of the artificial system of trade-unions applies, I think, at least in a degree, to the artificial system of assisted emigration directed to the diminution of the supply of labour. I do not believe that in this country there is a real surplusage of labour. Population advances very much less rapidly than does the accumulation of capital; and were it not for the very rapid increase of machinery our labour supply would now be extremely deficient. It might very easily happen that by the injudicious encouragement of wholesale emigration we might drain the country of its strength and drive away employment to other lands, just as we might do by an injudicious attempt to force up the rate of wages beyond the natural level. England holds a very high position in the industrial world, but it is one which rests upon a somewhat narrow basis; it is one which it would be comparatively easy for her to lose, but exceedingly difficult, if not impossible for her, if she once lost it, to regain. I look, then, for the improvement of the condition of our labourers generally, and of that of the agricultural labourers among them, to the free play of individual competition under favourable circumstances, rather than to any artificial remedy. But do those favourable circumstances exist? Has the agricultural labourer really fair play. Has he the opportunity for raising himself? Has he the inducements to exert himself? I fear we cannot give a wholly satisfactory answer to these questions. I cannot doubt that the system of the Poor-law, taken as a whole, has exercised and still exercises a deadening influence upon our labourers, or that it tends greatly to neutralise the wholesome spirit of competition and self-reliance which it is so important to arouse. It is a system which could not be summarily set aside without serious hardship and injustice; but it is a system from which it should be our endeavour as far as possible to teach our labourers to emancipate themselves. Nor is such emancipation visionary. The machinery of

the law must of course be retained; there will always be plenty of cases of unavoidable snuff to be relieved by it. But if the labourer be trained in his youth to recognise the duty of laying his provision for his old age,—if he be early taught prudence, and foresight, and self-denial, and at the same time the means be provided him investing his savings with perfect security which he has now great difficulty in doing, great step might be taken in advance; and his employers be brought to see the wisdom so regulating his wages as to enable him to do additional labour to earn additional remuneration, and so encourage him to increased industry, the heavy weight of pauperism would no longer oppress the energies of our people, but to a very great extent be shaken off.

Earl Ducie, the Dean of Bristol, and the Mayor of Bristol also took part in the proceedings.

PARIS.

The grille of the Palais de Justice, which dates from the last century, is about to be restored and rebuilt. The principal gateway, the only one in *reposé* iron-work,—the Gate of Honour,—far from being in the same state of ornamentation as it was when first put up, besides wanting the entablature and the globe crown and fleur-de-lis. All the royal insignia were removed in 1793; the accompanying attributes were also removed; but the L L remain, they signify, as it is said, *Law and Liberty*, it is curious that the letters, placed back to back, that the two significations march in opposite directions. One thing is certain, viz. that the rusted grille should have been restored, from state in which we saw it a few days ago, with the rest of the building was being renewed. The repairs of the iron will cost 400l.

The rear face of the church of St. Vincent Paul is about to receive a monumental annex in the form of a rotunda, with crypt, in order to increase the accommodation; it will be a construction similar to that of Notre Dame Lorette, on the side facing the Breda quarter, of much larger proportions.

For a long time past the immense building the *Magasins réuniés*, in the Place du Château d'Eau, has been shut up, owing to the failure of the company. Various rumours have gone forth with regard to the future destiny of the pile; a hotel, a monster restaurant, a post-office, all have been hinted in turn. The company who own it propose now, it is said, to found a permanent and universal exhibition, to be called the Galleries of the Château d'Eau. By plan, to which most of the manufacturing firms have adhered, the consumers will be able to purchase necessary objects of household use directly from the manufacturer, and economise for himself the profits of the retailer, which are often in England, enormous.

M. Say, the great refiner, of the Boulevard de la Gare, had given orders to M. Saint-J Drn, successor of M. Mlnot, to sink an artesian well in his vast establishment in the Place d'Italie. It was attended with complete success the trepan reached, at a depth of 1,844 ft., a column of water which rose up in a column, with temperature of 82°, furnishing 1,540 gallons a minute. With tubing, the water will rise 60 ft. or 100 ft. above the ground. The operation only required four years, the total expense not having exceeded 12,000l. Two other artesian wells, as we have before stated, are being bored for the municipality of Paris: one at Lachapelle Saint-Denis, near the road-point, under orders of M. Degoussé; the other at the summit of the Butte-aux-Cailles, at the southern extremity of Paris, the works being confided to M. Saint-Just-Drn, who bored the well for St. Sny.

The black wooden tower which formerly stood over the Passy well no longer exists: a shaft about 4 ft. high stands in the middle of a natural fountain-basin. Through a hole in the rock, 1 1/2 in diameter, gushes forth the streaming torrent into the basin. There is no engine, nor building, nor sign of one near, so that the phenomenon is studied in all their wonderful aspects. The height of the jet is not great, as the diameter of the bottom of the well is less than that of the top; but the quantity astonishes any one who has never seen an artesian well exposed. As the temperature, on a cold day the steam may be seen at a considerable distance.

The French Transatlantic Cable is working well. The number of messages for the week end of the 4th of September was 448, producing 1,000

The works of the new Opera-house have made a regular spurt lately; the inside work is well in hand. It is said that superior orders have been given to the contractors to have the theatre ready by the 15th of August, 1870. Scaffolding are being erected for hoisting the bronze Pegasus, now exhibited in front of the Palais des Champs-Élysées, the work of M. Ondry, of Autenil; it will be placed on the summit of the theatre. A splendid *tampadaire* of vast dimensions is being put in place; so, after all, the opera will be ready before the Hôtel-Dieu; at least, so it seems. Carpeaux's group has been cleaned, as we stated; but a letter has been addressed to the Paris papers intimating that a few persons have sworn to destroy the work if it be not removed.

AN ARCHITECTURAL COMPETITION ONE HUNDRED YEARS AGO, WITH SOME NOTICE OF THE ARCHITECTS.

SOME account of an architectural competition one hundred years ago, with a list of the architects' names, supplemented by a few notes relative to the life and subsequent career of a few of these, cannot but be interesting to the readers of the *Builder*. The list is that of the architects, English and Irish, who sent in their several plans for the building of the Royal Exchange, Dublin, in the February of the year 1769:—

1. William Ivory, Norwich.
2. James Gandon, † London.
3. Stephen Riou, Canterbury.
4. T. M. T., Dublin.
5. John and Samuel Hope, Liverpool.
6. J. Jenkins, London.
7. — Everard, London.
8. Timothy Lightoler, Chester.
9. Robert Mack, Dublin.
10. N. J., Dublin.
11. Thomas Rawlins, Norwich.
12. W., Ireland.
13. J. Jours, London.
14. John Fellow, Southwark.
15. J. T., London.
16. James Workman, Cavau.
17. Mr. Ivory, two designs, Dublin.
18. —
19. Messrs. Myers & Sproule, Dublin.
20. —
21. William Barbor, two designs, Dublin.
22. Præter Laudem Nullins Avarus, Hibernicus et Amator Patriæ.
23. Architectos Bino B.
24. —
25. —
26. Oliver Grace, two designs, Dublin.
27. Hibernicus et Amator Patriæ.
28. Francis Sandys, Dublin.
29. —
30. J. C., Dublin.
31. —
32. Thomas Jarat, three designs, Dublin.
33. —
34. J. W. L., † London.
35. Peter de la Roche, London.
36. F. S., London.
37. Thomas Cooley, † London.
38. R. Edwin, London.
39. Edward Stevens, London.
40. Thomas Cranston, London.
41. William Donn, † London.
42. James Lovel, London.
43. Thomas Wiggins, London.
44. O. B., London.
45. O. A., London.
46. Thomas Sandby, † London.
47. George Richardson, London.
48. William Blackburn, London.
49. John Whiscard, London.
50. Anthony Chearnly, London.
51. Richard Louch, London.
52. Arthur Blackhall, London.
53. †, London.
54. William Elgby Naylor, two designs, London.
55. William Newton, London.
56. John Byrne, Dublin.
57. Roland Omer, Dublin.
58. Michael Priestly, Londonderry.
59. Edward Johnston, Londonderry.
60. Vitrings, Dublin.
61. William Beauford, Dublin.
62. Lodge, No. 158., Dublin.

In the above list those marked † were considered the best designs by the Trustees. It will be seen by a reference to the list, that London contested stonily with Dublin for the prize, and succeeded in winning it. Thomas Cooley was adjudged the first premium of 100l.; James Gandon received 60l., and Thomas Sandby, 40l. In looking down the list, we incidentally find a few names whom the pall of oblivion has not hidden; and by a little painstaking ruminating in the neglected corner of our architectural history, we are enabled to restore and fix two or three more whom the mists of a century were fast hiding from our sight.

Of Thomas Cooley and his *chef d'œuvre*, the Royal Exchange, of Dublin, we gave some particulars a short time since.* James Gandon, soon after the competition, passed over to Dublin, became a resident, and rose to fame.

In fact, he became the first architect, *par excellence*, as we remarked before. Gandon, although he failed to obtain the first prize for his design in the competition under notice, yet shortly afterwards distanced all competitors. In the Dublin Custom House, the Four Courts, and the Corinthian portico to the Irish House of Lords (now the Bank of Ireland), James Gandon's architectural services may be seen. Gandon designed several works in the capital, and throughout Ireland; he became the associate of the most eminent public men in Ireland and England; was elected member of the Royal Irish Academy; and during his professional career in Ireland he contributed some articles to the foremost publications on the rise and progress of architecture in Ireland. Gandon was a hoosem friend of Captain Grose, the famous antiquary, and though dying many years subsequent to him, he was buried with him in the same grave in the village churchyard of Drumcondra, near Dublin. The Mr. Ivory who exhibited the two designs 17 and 18 was a native of Cork, and, like Thomas Cooley, was originally a carpenter. He was a skillful workman, and for some time followed gun-stock making for the chief gun-maker for the Ordnance in Dublin. Ivory imbibed a taste for architecture, and by close study and a determination to succeed, made a rapid progress in the knowledge necessary to the pursuit of the profession. He learned drawing under a master named Bell Mires, but he soon eclipsed his tutor, and was shortly afterwards appointed drawing-master in the Dublin Society School of Art. Ivory became also a surveyor to the Revenue buildings, and he held this office to the time of his death, which took place in 1786, in the fifty-fourth year of his age. Ivory's designs for the Royal Exchange, though they missed the premium, were rewarded with a piece of plate, along with some others. The exhibition of the designs for the Royal Exchange led to the improvement of Ivory's style of drawing. The Blue-Coat Hospital, Dublin, and the Bridge of Lismore were among his public works. It is said he furnished designs for the Courts of Law and for Newgate. Newcomen's Bank, in the Irish capital, was also designed by Ivory, along with several private dwellings throughout the country. Ivory was much given to redundant ornamentation and embellishment, as may still be seen on his works, and this, in the opinion of some detractors from the external appearance of more than one of his successful buildings. Whether William Ivory, of Norwich, whose design is marked J, was any relation of the Dublin architect, we know not at this lapse of time. The latter's Christian name was Thomas.

The name of Peter de la Roche, the inventor of a new "Sixth Order of Architecture," appears at 33 in the list. Some account of this notable personage will be found in the standard architectural works of this century. William Beauford, M.A., No. 60, was the principal of a classical academy in Cork, as late as the close of the last century. He was very ingenious in mathematical problems, and was the writer of some papers "On the Theory of Walls for Roofed Buildings." He compiled tables also for showing the thickness of cut stone on a brick wall at the top, for the support of all the different angular roofs commonly used in Ireland—of Gothic and common pitch, or of pediment, or whether covered with pantiles, slates, or lead. Some of Beauford's mathematical and scientific theories were published in the "Anthologia Hibernica," 1795-6.

William Beauford was also author of an interesting paper on "The Theory of Columns." His problems were comprised in the following:—To find the strength of an insulated column of any of the five regular orders. Second.—Having the power of any force necessary to throw down a column when applied at the top, and acting perpendicular to the axis of the column, to find the power of the same force when applied down the side, and parallel to the axis. Third.—To find the strength of a column having part of its diameter sunk into the wall. Fourth.—Having the contents of a buttress necessary to support a wall, to find how many columns and pilasters shall be equal in power to the buttress.

He calculated a table which expressed the strength of the columns, and their parts, and also diminished pilasters, the strength of their respective circumscribing cylinders and parallelepipeds, being equal to unity.

In concluding his paper on "The Theory of Columns," Beauford remarks, "Such an inquiry, however, may be of service to architects in

enabling them to place their ornaments with judgment both in respect to taste and utility, and not entirely to depend on the caprice of fashion."

The academy over which Beauford presided in Cork, was a commercial and military one. He was previously (1793) at the head of one, or somewhat similarly engaged, in the town of Athy, county Kildare. Strictly speaking, although Beauford sent in a design for the Royal Exchange, he was not, so far as we understand, a practising or professional architect. His mathematical writings, however, were most useful and valuable, and he was proved in the field in the interest of architecture and the building art at a time when the strength of materials received little attention either from builders or their workmen, and when a piece of wood or iron, or any other material, was more judged by its size and weight for obtaining the desired end, than the principles of judicious application, and consequent economy.

Of Edward Johnston, No. 58, of Londonderry, at this moment we know nothing. There was a William Johnston of Armagh, who lived about that time, or a little later; but the only architect of eminence of that name whom we know of belonging to the sister kingdom was Francis Johnston, the founder of the Royal Hibernian Academy, and architect of many public works in Ireland. Whether he descended from either of the other two Johnstons aforementioned, we are not at present able to say. There were other architects of repute in England and Ireland in 1769, but they do not figure in the list unless some of the *noms de plume* hide their names.

Perhaps some of the many readers of the *Builder* will be able to identify other names among this rare and interesting catalogue which we publish to-day, and furnish whatever "waif and stray" they can in making our knowledge more perfect of those architects who played a not unimportant part in our architectural competitions of ONE HUNDRED YEARS AGO.

C. C. H.

THE SANITARY STATE OF TRURO AND FALMOUTH.

THE remarks in our pages "Concerning certain Cornish Towns" (p. 720, *ante*) have produced considerable stir in those towns, and have brought us a dozen letters, some confirming, others denying their correctness. At a special meeting of the Truro Improvement Commissioners, the mayor called the letter in our pages "unfounded and unjust," and then individual commissioners proceeded to point out how much improvement was needed in the town, and how many nuisances were permitted to exist. We have no desire to injure or annoy any person; our object is the general good, and we advise the authorities to take our observations in good part, and to set themselves to remedy the existing defects. We have submitted to the writer of the comments "Concerning certain Cornish Towns," the various letters we have received, especially one signed "An Improvement Commissioner," which has also been printed in the *West Briton*, and we subjoin a part of his reply:—

Truro is a tramp in a dirty condition: he is to be cleaned by a Commission: they stand by as they see his hands and his face washed; the fellow's neck and ears are not touched; his hair is a tangled mat; his body is left in the state it was; yet these Commissioners all the man clean. Clean! ay, a marvel of cleanness, for as the soap is shining on the fellow's face, they exclaim, "By George, you wouldn't know him, would you?"

Now I, "Pro," declare loudly, he is not clean, and that men like "Improvement Commissioner" by their obstinacy and ignorance, have done more to retard the progress of sanitary measures than any number of those who, like at Falmouth, say regarding their own tramp, "Yes, he is dirty, but soap costs money, and we ought not to pay for all of it; there are those two parishes adjoining that ought to help us." Men like "Improvement Commissioner" have done more to keep preventible diseases in stock in England than any other class of men; and they have done more to retard improvement.

I affirm the sewerage of Truro is bad. Years ago, when the cholera raged fearfully in the town, the Improvement Commissioners got afraid, and they made a great many sewers, and I believe the most part of the sewerage may date from that time. They were all built rectangular in section, of common dry stonework, covered with large flat stones (called coverers), as they came from the quarry; the ground was excavated, and

* See p. 419, *ante*.

the walls of these sewers were built on the rock: no invert or arch was turned.

These drains, of course, in time fell in from the superincumbent weight of earth, and from the decomposition of the stone used in their make; and it was that the walls, having to be repaired, were repaired with brick, but neither invert nor arch was turned; the walls still rest on the rock, and are still covered in with flagstones! These are the drains the "Improvement Commissioner" says have been "constructed of brick."

As for the assertion that there are "seven or eight miles of public drains carried to the utmost limits of the town;" seven or eight hundred, if they were hadly made, would not show the sewerage in a better light.

But if it is true that there are seven or eight miles of public drains, and also true that no "less than 20,000 ft." of glazed pipes have been lately used in drains, I would point out that not much less than four miles, or more than half of all the drains in the town, have been either made or repaired by means of glazed pipes alone; and then there is the unmade length of new brick sewers to be added; say, not to be too extravagant with "Improvement Commissioner's" statement, one mile more, or, on the whole, 5-7ths or 5-8ths of the whole of the town sewerage have been recently repaired or made—an assertion which is just one of those wild ones "Improvement Commissioner" might be expected to make, and manifestly untrue to all who know Truro. If a statement be provided, showing where and when these pipes were used, I will thoroughly investigate the matter. I earnestly ask for such statement.

The cesspits were made, as the sewers, of common dry stonework, having a wood cover, set in a wood frame; the openings in and out were untrapped. They, too, have begun to fall in, and some of them have been repaired in the same way as the drains, the stone decomposing under the influence of the sewage matter; and brick walls are built, leaving the bottom on the rock, and, instead of a wooden, a cast-iron cover provided, set in granite. Such a one is the one I particularly spoke of in Mitchell-hill,—please observe I name places,—though I understood it was through possessing a cast-iron cover, built of dry stone walls.

My friend was visiting a poor sick woman living a few yards from this cesspit, and the stench was so bad that it caused a slight attack of diarrhoea.

Now Mitchell-hill is not in "the outskirts of the town," neither is Fairmante-street, Carelew-street, Charles-street, Union-street, Pydar-street, Goodwives'-lane.

"There are now but a few more untrapped cesspits." Are there? I am glad to hear so much work has been done in the last three weeks. But should cesspits exist at all? And moreover, should excreta and garbage be permitted to lie in their openings, poisoning all the air around? My statements relative to the mode of cleansing these cesspits remain unchallenged, and also my statement as to the foul smells caused by their cleaning out. If they will have cesspits, why not use disinfectants? If it were pure "road detritus," would it smell? and would it be black or putrid? or has Truro a peculiar strong-smelling "road detritus"?

I was told of the stench-traps that had been inserted, but I was wishful to avoid mention of them, for I felt I might be misunderstood, sewerage being in such an infantile condition in Truro. Let me now point out that the sewers being badly made, trapping all their openings will aggravate the evil, and the houses in the streets will be invaded by noxious smells. Truro may so far be thankful that all the openings into its sewers are not trapped, nor anything like it; in one street I noticed some openings were trapped, but a cess-pit in the middle of the length of the street was untrapped, and a cess-pit at the lower end of the street was untrapped. Thorough trapping is good if the sewers are good, but then the gases generated in sewers are so powerful and penetrating that even if the sewers are good, care must then be taken to ventilate them. That I am again correct in another item is obvious from the "Improvement Commissioner's" letter.—"About 100 large cast-iron traps have been laid over the many inlets to the common sewers." Bearing in mind that there are "seven or eight miles of public sewers carried in every direction, &c." a stranger can readily judge how thoroughly the sewers in Truro are trapped.

Again, by inference, I am correct. "Im-

provement Commissioner" can see no good in waterworks if they have wells; for was it not found that the "worst specimen of their water three years ago had considerable advantages (sic) over a sample from a neighbouring waterworks"? Some few years ago water taken from three or four wells was tested, and it was found full of impurity; the well in the High Cross, and that by some inn—I forget the name, but I think it was the Dolphin—was found particularly bad. I am told, too, that the pumps are continually under repair. Now, by *under repair* is meant the absolute stoppage of water supply to a particular district for an indefinite number of not hours only, but days, and the supply of dirty water for a time longer.

Because a "neighbouring waterworks" (Query, Was that the Falmouth Waterworks?) has a bad sample of water, is that any reason why Truro should be supplied for the most part with water that is not tasteless?

I am aware that in two or three of the main streets are granite gutters, along which flows water, and I am indeed glad to see it there; but "Improvement Commissioner" goes too far in praise of it. It comes from the leats, on which, just before the water enters King-street, is a public privy, the matter from it falling into the water; higher up are another privy, a dye-house, and a wool-stapler's. I am not sure, but I believe Castle-street and another street connect on drain into it. The back of the street leading to the railway station drains into a branch of it that goes under River-street, and nearly if not all, the houses bordering the leats have privies disgorging their contents into it. I saw that from the public walk called the Leats. But if properly kept, those streams are beyond value; if they were well kept, I should not have seen *excreta* rolling down the gutter in Duke-street, and a housemaid emptying her slop-pail into it near King-street. Why, however, should those streets I have named as particularly bad have open guttering? Good guttering is wanted there; at least, as much as in the main streets: it was that of which I spoke.

I was not told there were in every direction in the lower parts of the town brick-built tanks holding many hundred gallons (is hundred a misprint for thousands?). May I ask where they are, and their exact cubical contents? And if they are only in the lower parts of the town, may I ask, of what service they are to the higher portions of the town for either flushing or in case of fire? And have the upper portions of the town anything in the world to depend on in case of fire, but the pumps so sparsely scattered about? And what flushes the sewerage in the higher portions of the town? I mean that portion the more respectably inhabited, as well as that particularly occupied by workmen. What have those streets I have named to depend on for flushing or in case of fire?

I wrote of the pitching of the streets, not the pavement: it is in a state only to be recommended by coach-builders.

If Truro has a low death-rate, of which I am not aware, it may be ascribed to the position of the town in and on the sides of a valley, a position that man with all his inanity cannot entirely spoil. If the present health of the town is good, it must be ascribed to God's mercy, not to the efforts put forth by the authorities of the town.

As to Falmouth,—is it true, or is it not, that Falmouth was recently, on the solicitation of some of the inhabitants, visited by a Government inspector (I believe, Mr. Rawlinson)? Is it true that, in consequence of his representations, Mr. Bush was employed to give plans for the drainage of the district? And is it true that, while the town authorities were haggling with the parish authorities of Falmouth and Budeock, Mr. Bush died? and but little more has been said of the matter since, except to grumble at Mr. Bush's bill? Pro.

Utilisation of Blast-Furnace Slag.—The following method is now adopted in several iron-works in Belgium:—The slag is allowed to run direct from the furnace, into pits about 8 ft. or 9 ft. in diameter at the top, with sides sloping inwards towards the centre, where they are about 3 ft. deep. The mass is left for eight or nine days to cool, when a hard, compact, crystalline stone is obtained, which is quarried and used for building purposes, but chiefly for paving-stones. They appear to wear exceedingly well, being quite equal to the grits and sandstones already so much used.

POUNDS.

Sir,—As you have given space to Mr. Tepper's lament over impounded cattle, it may be as well to comfort your readers by the information that pounds are fast going out of use and being removed. As owner of a manor and a pound, I took some trouble lately to find out why cattle never were impounded now as they used to be in my father's day. I found, that in consequence of Highway Acts passed since his time, the police took it on themselves to manage straying cattle, and did not allow my "parish Pinder" to interfere. The pound has had no inmates for at least a dozen years, and therefore I shall *certainly not* erect a comfortable cat-hed-shed therein. What a pity so much amiable sentiment should have come into the world too late. Even when pounds were in their glory cattle rarely remained many hours unclaimed.

A LORD OF THE MANOR.

*** The following letter from the *Bedford Times* (to give no other proofs), shows that "A Lord of the Manor" is but ill-informed on the subject of which he writes:—

"In your last issue I saw a paragraph from the *Builder*, in which Mr. Martin F. Tupper appeals on behalf of the unfortunate animals that are so often starved in pounds for want of forage and water. A few days ago I saw a curious illustration reported from Newport Pagnell. The writer says:—"It is a small stone-walled enclosure, the bottom well lined with bricks and glass, the upper part of the wall studded with broken glass bottles deeply embedded in mortar. Three horses were confined in this place of torture; two were speedily liberated from their cruel bondage; the other, a very valuable horse, was allowed to remain, and was constantly plunging and jaccrating its chest against the glass, disfiguring and maiming itself for life, while the inquisitor, policeman, stood guarding his poor captive. If this be the kindness shown to dumb animals by our vigilant police, surely the tender mercies of the wicked are cruel."*

ALNWICK CASTLE: ITS MILITARY ARCHITECTURE.

The castle of Alnwick stands upon a moderate eminence on the south bank of, and about 150 yards distant from, the river Alne, which was thus its immediate defence against the Scot. It is in distance about five miles from, and about 200 ft. above, the sea at Alnmouth. Towards the east and south the castle is cut off from the town of Alnwick by a deep ravine or combe, once the bed of the Bow Burn. This has been trimmed and scarped by art, and its upper part towards the town has been nearly obliterated by modern front of the castle, and separated from it by upfilling.

To the west is a nearly level platform in a ditch, wholly artificial, and in part filled up and covered by the stables and other similar buildings. This ditch was formerly produced along the south front, and communicated with the Bow Burn ravine. A bank of earth of modern date conceals the town from the castle on this the south-western quarter.

The walls of Alnwick town were embattled, and probably built under a licence to Henry Percy in 1434, when he constructed the Bond Gate, now standing. It is uncertain whether the town wall was independent of the castle, as at Okeston, or abutted against its outer wall, as at Carlisle. The main entrance to the castle and its principal postern were both outside the town. The former was approached from it by a town gate, the position of which is remembered, and its name preserved, in the way called "Narrow Gate." The castle postern opens towards the river. The Lion gateway in the south wall, leading to the town and the railway station, is altogether a modern structure, but may represent a by-gate communicating with the town.

In plan the castle is irregular, and many-sided, but on the whole it approaches to a right-angled triangle, the clock-tower being the right angle; the west and south sides, terminating, the one in the Abbot's Tower, and the other in the Eastern or Ravine Tower, are 125 yards and 213 yards long; and the side towards the river, and contained between these two towers, is 226 yards. The area within the walls is nearly 3 acres; that included by the ditch is reputed at nearly 7 acres.

There is no single keep-tower. The keep is in plan an irregular polygon, set round with clustered towers, and containing a central court. This is placed nearly in the middle of the general inclosure, with which it was connected at three points: one, on the south, by a hoist and lofty gallery replacing an original curtain, and which

projects 35 yards from the keep to a gate-house, which divides the eastern and western wards, and is known as the Middle Gate. The other annexions, on the north side, are two curtain walls, of which one reached from the keep 33 yards to the Falconer's Tower, now rebuilt and shifted, and had upon it the Armoner's Tower, now destroyed; and the other was a curtain, now removed, which extended 20 yards from the keep to the Postern Tower.

By these arrangements the area was subdivided into an outer or western, an inner or eastern ward, and a central open keep. There remained, however, on the north front a three-sided space, bounded by the keep and the two curtains, and flanked by the Falconer's and Postern towers. This space, open towards the river, is at present protected on that side by a row of retaining terrace-wall and bastions, of very modern date. A survey of 1567 shows this side open, and no doubt it was so originally; this river, its steep bank, the keep, and the flanking towers and curtains being regarded as a sufficient defence. This disposition is, however, singular and very curious, and looks as though the engineer wished to attract the enemy to this, the strongest and most completely flanked part, by a show of weakness by the absence of an outer *enceinte*. Economy of construction could not have been the motive, for the cross curtains, in length, would go some way towards completing the broken *enceinte*.

It would seem, from existing fragments and traces of foundations, that the lines of the present *enceinte* and keep are those of the old Norman fortress. The outline is governed very much by the disposition of the ground, and the shell keep was the approved Norman way of occupying such a knoll, whether natural, as at Darham, or artificial, as at Windsor, or as here, probably a very slight addition to a natural knoll. A distinct ditch, now filled up, as at Cardiff, encircled the keep, and protected it from its containing wards. Towards the river this ditch seems to have worked out into a steep scarp.

The keep is at this time an open court surrounded by towers. To the south-east, the gatehouse, about 40 ft. deep and 20 ft. wide, has a grand external and internal round-headed Norman arch, of 9 ft. 2 in. span, the vault between being segmental and crossed by plain chamfered ribs. The exterior arch has a double band of hold chevron mouldings within a circle of double-banded work. The inner arch has a single chevron band, and above it a band of which the voussours have alternate patterns of sunk nail-heads and the heraldic "lozenge."

This is the work of Estace de Vesoi, who died 1157, and may be dated 1150, though possibly a part of this "manisissimum castellum" which, according to Mr. Tate, was existing in 1135. This Norman gateway is imbedded within a complete gatehouse of Henry de Percy in 1350, of which the main features are two lofty towers, which, as half octagons, flank the entrance from the eastern ward. Original shields of arms, in the Northumbrian fashion, are carved below the parapets; and upon the merlons, which are looped, are some original figures, as at Bothal and Chestow. The archway is porticulated. The parapets are not unshiculated. The vaulting of the interior of these towers is very good, and they contain in the basement the original dungeons, which are described as vaults 10 ft. square, aired by loops, while below these are oubliettes, 8 ft. by 9 ft., and reached only by trap-doors in the floor above. Over the gateway is the private dining-room.

Entering the court, the open part of which is about twenty-four yards across, on the right, in the wall, is the very curious well. Within a pointed panel are three deep recesses, also pointed, of which the centre contains the mouth of the well, the shaft of which descends in the thickness of the wall. A wooden axle crosses above it, and is fitted, in the lateral niches, with two wheels, set round with pegs, for winding up the water-buckets by hand. Above, within the panel, in a small niche, is a figure of St. James blessing the source. This curious and probably singular well was the work of the first Henry de Percy, in 1312-15; but the figure of the saint is thought to be an insertion of the last century. There is a similar arrangement over the great gate of Goderich Castle, for working the porticulis.

Behind the well is the rear wall of the Great Hall, built by the same Percy, refitted by the first duke, and rebuilt in 1863. The vaults below, with their segmental ribbing, are original, as is part of the rear and north wall and of the

bow, whence the cross curtain ran to the Postern Tower. This is still the state dining-room, 60 ft. by 24 ft., and the vaults fulfil their original destination as ocellars. At this point is placed a cloister supporting a corridor, by which a bye access is given to the suite of state-rooms. This is modern, but is a manifest improvement, and in full keeping with the building. The original entrance to the hall was six open steps from the court.

Next beyond the hall, pointing to the north-east, is a tower, once the kitchen and soullery, but rebuilt for the second time in 1856, and now the drawing-room, 45 ft. by 22 ft. Beyond this, along the north-east front, are the saloon, 42 ft. by 22 ft., and an ante-room, 22 ft. by 22 ft., built 1750-86, but newly fitted up. Next to these, and forming the north-west angle of the keep, is the Prudhoe Tower, the principal tower in the fortress, upon which the flag is hoisted. This contains the library, 55 ft. by 24 ft., and presents two grand bays to the east and west, with a deep re-entrating angle between them. This also is modern.

Next, on the west front, follows the chapel, built in 1856, a rectangular tower of bold projection, one principal floor, and a high-pitched roof. The two angles are cut off, so as to form a polygonal apex. This conventional east end points, however, south-west.

Then, facing to the south-west, follow two half-round towers, rebuilt 1750-86, containing state bedrooms, and connected by a short curtain, within which is a dressing-room. Finally, between these and the gatehouse, completing the circuit of the keep, and projecting due south, is the gallery, having on the first-floor a breadth of one line of five rooms and a corridor, and below, the middle gateway. The rooms are the private apartments of the duke and duchess, and there is a communication with the kitchens. The gateway, which has a porticulis, is of the date of 1309-15, and built into the south curtain, from the outside of which it projects as a mural tower. The gallery replaced a curtain about 1760, and was rebuilt 1856. The battlements of the gatehouse were probably added about 1407-55.

The entrance to the state apartments is in the central court, beneath the arched vestibule, at the north-west corner. From this a grand flight of steps ascends to an interior vestibule, and thence, by a second flight, to the guard-chamber, which opens into the state-rooms. These are all on the first floor, the basement being occupied by servants' rooms.

Although the greater part of the keep has been rebuilt in the last and the present century, it still is composed of the saxon towers of the early Percies, shown in the plan of 1567, and much, especially of the basement, is old; and what is new is arranged with a close general regard to the older, and, indeed, in many parts Norman, plan. The exterior ditch of the keep is partially filled up, and of course the draw-bridge of the inner gate has been removed. A porticulis remains.

Of the general and exterior *enceinte*, the most complete and striking portion is the western gateway, a very fine and unaltered example of a gate and barbican of the Edwardian period, 1312-15, in its simplest form. The barbican, about 55 ft. long by 32 ft. wide, is entered by a large round-headed arch, between a pair of square flanking buttresses, corbelled out above into two turrets, also square. Over the entrance in a sunk panel is a large Percy lion, with their motto, "Espérance." The arch leads into a passage, 55 ft. long by 10 ft. wide, for the first 20 ft. vaulted, but afterwards open to the sky. This lies between very lofty side walls, embatted each way. On the left, a small side-door led to the counterscarp of the ditch; on the right, another door opens into a mural stair ascending to the battlements. In front is the portal of the gatehouse. This barbican crosses the ditch, now filled up. Besides an outer drawbridge, over a loop of the main ditch, it had an inner bridge between its lateral walls, dropping from the gatehouse. This is mentioned in the survey of 1538, and was filled up in 1567. The parapets are without machicolations, and the embrasures have no mouldings. The merlons are not looped, and the figures placed upon them date only from 1750-86. Probably in advance of the ditch of this barbican was a harrier or palisade of timber, and the level space in front, commanded by the walls of both town and castle, is what was usually employed for jousting matches or military duels. The adjacent river was a sufficient security against surprise.

The gatehouse, of which the barbican is the

covering, is a rectangle 40 ft. deep by 45 ft. broad, of slight projecting and bold external projection, and presenting to the field two half octagonal towers. The passage is vaulted, and has the usual defences of a porticulis and gates. The portals are round-headed. There are lateral lodges, entered one from the passage and one from the court.

Entering the court, the curtain on the left, of considerable height, has Norman foundations, 1150, and an Edwardian superstructure, 1350. Outside a strong course marks the base of the parapet, and the embrasures have a decorated moulding carried all round. The wall extends to the Abbot's Tower, but upon it is a small rectangular mural tower, called the Avenor's Tower, 1309-15. The Abbot's Tower, of the same date, caps the north-west angle. It is rectangular, and of three stages, the lowest being vaulted, and ribbed with segmental arches, as in the Constable's Tower, and below the Great Hall. The third stage rises clear of this wall, and is reached by a well stair, which occupies the north-east angle.

From this a short curtain of mixed date, 1150 and 1350, with a low salient, extends to the Falconer's Tower, also rectangular, rebuilt, though not exactly in the old site, in 1856, and from which a modern curtain well runs up to the Prudhoe Tower of the keep. Upon this wall stood the Armoner's Tower, also rectangular, destroyed in 1856, to improve the view from the library. The removal of this and the Falconer's Tower are said to have been the only intentional subtractions made from the original military works of the castle.

Returning to the west gate, the curtain on its right extends, past the west Garst Tower, to the Clock Tower, all rebuilt 1750-86. The latter is circular, with a flat gorge and keel-shaped salient, and caps the south-west angle. Outside the last-named curtain, and reached through it by a gateway, are the stable courts, riding-school, and guest-hall, 135 ft. by 35 ft., by 25 ft. to the spring of the open timber roof, a very noble structure. These buildings are of modern date, 1856.

From the clock-tower the south curtain supports, on its outside, the estate offices. Part of this curtain is 1750-86; part 1309-15. This latter part includes the Auditor's Tower, 1770, of which the square rear projects into the court, and the half-round front outside. Beyond this is a bit of Norman curtain, 1150, against which, on the outside, is built the modern kitchen, and above which a modern corridor communicates between the duke's room and the record-room in the Auditor's Tower. The treatment of this part of the structure by Mr. Salvin deserves especial notice, from the happy combination of the features of the Edwardian age with the appliances of the present day. The kitchen, with much to remind the visitor of Darham and Avignon, is as a whole superior to either, and is, besides, a model of culinary arrangement. These offices, originally within the keep at the east end of the hall, were placed here by the first dukes, but were recast and rebuilt by Duke Algernon.

Formerly there stood in the west ward the exchequer and the stables. The exchequer was a large rectangular building, applied to the north limb of the west gatehouse, and like it embattled. The two ranges of stabling stood a little within and parallel to the curtains next the clock-tower. These buildings, shown in the survey of 1650, were removed probably about 1755.

Traversing the middle gate, in front is the eastern or inner ward, and on the left the inner or gatehouse of the keep. On the right, outside the curtain, is the steward's room, and beyond it the Warder's Tower, mentioned in 1567, but altogether remodelled and rebuilt in 1860 upon a work of 1770. It now contains the lion gateway, leading to the gardens. Below the gatehouse is an ale-cellar, and above, one side of it, attached to the offices, the confectionary.

Beyond the line of the curtain is irregular. About the salient it is Norman, 1150, and a very good example of the rough walling of the age. Upon it is the east garret, 1309-15, and it ends in the Ravine tower, the most eastern work of the castle, and capping an acute angle of the *enceinte*. This is a good-sized round tower, with a well stair at its junction with the curtain. It has been much repaired since its foundation in 1309-15. It is defended by the ravine, whence it derives its name.

From hence the curtain trends to the north-west, being in great part Norman, but repaired

at what is called the "Bloody Gap." Beyond this is a garret bartizan, called *Hotspur's Chair*. It was the gorge of a half-round tower, now removed, but shown in the plan of 1650. Beyond this the curtain is again mixed Norman and Decorated of 1312-15 to the Constable's Tower. This is a strong half-round tower, capping a flattish salient to the north-east. It has an exterior entrance by stairs to each of its three floors. From this a short curtain, 1150, leads to the Postern Tower, 1312-15, rectangular, pierced below by the vaulted and porticullised passage of the postern, and vaulted also on the first floor. This tower is a fine example of a Northumbrian military building of the Decorated period. The arches are round-headed or segmental, and it has in its rear wall a remarkable two-light window, with a transom, and in the head a foliated circle. There is also a very perfect garderobe with external shoot. From this tower, a curtain, now removed, ran upwards to the bow of the hall tower of the keep, and thus completed the defences of this ward. The original postern passage is filled up, or nearly so, with earth, but by the side of the tower a way leads to a terrace walk between the keep and the river, and extending to Falconer's Tower.

The eastern ward contained the castle chapel and the conduit, supplied with water by lead pipes from an exterior spring called *Howling Well*. The chapel, a considerable building, stood detached near the Bloody Gap, and was removed in 1755. The ecclesiastical establishment seems to have been on a respectable scale, and included chantry for the performance of the obits of the family. In this quarter also stood the brew, bake, and slaughter houses, for the use of the garrison.

Alnwick Castle is probably the finest extant example of a Norman castle of this type, having an open keep and a complete *enceinte*; for although most of the present buildings are either of the fourteenth or the nineteenth century, the plan is certainly Norman, and certain detached portions of the construction. It seems also that the keep was never a mere shell, like Cardiff or Arundel, but was always set about with towers and provided with a handsome gatehouse. A remarkable feature is the use of the round-headed and the segmental arch in the Decorated period. This is a local peculiarity, and found in other works of the same age and neighbourhood. The very free use of stone warriors upon the parapets, carried to an absurd extent in the repairs of the last century, is also remarkable. They are seen at Bothal, and in Edwardian works, both at Caermarvon and Chepstow, but by no means so freely distributed as here. They were obviously intended for ornament only, and of all the figures that of the eagle at Caermarvon is the most appropriate. No archer would or could have stood on the crest of the parapet. Most of the later figures were very properly removed by Mr. Salvin.

There is found upon the battlements of both walls and towers, in various parts of the castle, a convenient arrangement for slinging a movable wooden shutter in the embrasures, so as to defend the warders from a Scottish shaft, and from the scarcely less keen edge of the bleak winds of the Border. The shutter hung horizontally, like a port-lid, but from the trunnions, of which one rested in a round hole in one masonry, and the other in a similar hole, terminating in a groove in the other, so that the shutter hung freely, and could be lifted in and out if necessary. The arrangement is precisely that applied to the roller of a round towel. Traces of this arrangement remain in various parts of the castle. A perfect example is seen on the barbacan. It may also be seen on the east wall of *Goderich*.

The officers forming the staff of this castle, as a civil residence, in 1567, were the constable or governor; the porter of the outer gate; the greive, or executive officer, or hallif; the receiver, or auditor; the feodary, who looked up the services and tenures; the steward, learned in the law, who administered justice; the clerk of the courts, who engrossed the rolls and kept the records; and the foreign or outer bailif, who collected the castle-guard and cornage money, and summoned the tenants and suitors. The annual payment to the whole was 53*l.* 18*s.*

Looking to the character of the country, so charged with traces of early military earthworks, and to the strong and well-defined natural position of Alnwick, it seems probable that it was occupied as a camp by some of the tribes who, from a very remote period, made this border their battlefield, and whose defences are

still visible in eleven distinct earthworks within a very short distance of the town. If so, they would necessarily have placed their defences to the north and east, upon the lines of the present castle. The interior eminence would certainly have been their citadel, and the trench, completing their scornity, would most conveniently have been carried along the general direction of the western front, so as to connect the head of the Bow Burn with the Alne, and thus complete the seclusion of the peninsula. Such a site, so defended, was not uncommonly constructed or adopted by the Northmen and Saxons when they became settled, and they would have placed the timber and palisaded mansion of their thane upon the central entrenched knoll.

Probably the Norman Gilbert Tysen, of cloudy memory, who is the reputed pioneer of the Conquest in these wild regions, found and contented himself with some early kind of timber fortress, for the earliest traces of masonry that remain *in situ* or have been extracted from the walls, though Norman, are of late character, and attributable to Eustace Fitzjohn, who married Beatrix, daughter and heir of Ivo de Vesci, who is thought to have married Tysen's daughter. Eustace, called De Vesci, flourished under Henry I. and Stephen, and died in 1157. He was a likely man to have constructed a great castle, being a baron of considerable power, sheriff of Northumberland, and founder of the abbey of Alnwick and, in Yorkshire, of Malton. Also he must have felt the want of a strong place, for, in his days, in 1135, Alnwick Castle was taken by David I., of Scotland, in the interest of the Empress Maud.

Eustace no doubt built, in the first half of the twelfth century, a polygonal clustered keep upon the knoll, gave it the gateway we still see, and placed his residence within. Traces of his walls are said by Mr. Tate to have been discovered when the last rebuilding was being executed. No doubt also he dug or cleared out the moat round the keep. To him also must be attributed the general wall of the *enceinte*, and possibly the ditch outside it; and this would have been strengthened by mural towers, many of which must have stood where their successors are now placed. De Vesci's work is indicated by the stones being mostly square blocks of moderate size, laid in courses, but in beds more or less wavy, as though the mason used neither line nor level. The joints are open. Beyond question De Vesci constructed a castle in keeping with his wealth, and worthy of the chief baron of the Border.

In July, 1174, William the Lion, on his way back from an invasion of Cumberland, found himself, to his surprise, before Alnwick. William, son of Eustace de Vesci, attacked him. He was unhorsed, captured, and sent into England, and beyond sea, to prison. Eustace, son of William, succeeded in 1190, and was visited by King John, 12th February, 1201, and 24th April, 1209, when the king received at the castle the homage of Alexander, king of Scotland. Four years later, May 14th, John, ordered Philip de Ulcote to demolish the castle of Alnwick—a mandate which could scarcely have been obeyed, seeing the king himself was there 28th January, 1213, and 11th January, 1216, no doubt unwelcome visits, for Eustace was a *Magna Charta* baron. He met his death from an arrow before *Barnard Castle* in the last year of King John. Henry III. visited Alnwick 23rd September, 1256, and Edward I. was the guest of John de Vesci there 30th April and 1st May, and 16th and 17th August, 1291, and 16th August and 13th and 18th December, 1292; and again 22nd, 23rd, 24th, 25th, 26th, and 27th September, 1296; and 26th and 29th June, 1298.

The Barons de Vesci became extinct in 1297, by the death of William, seventh Baron, when the castle and harony were acquired, it is said, to the fraudulent exclusion of the natural son, by Antony Beo, the warlike Bishop of Durham, by whom, in 1309, 3 Edward II., they were sold to Henry de Percy, the representative of a warlike family, whose advent forms an important era in the history of the Border. Percy, as the leader of the Northern barons, made Alnwick his residence, and although in possession only for five years, seems to have rebuilt much of the fabric, the rest being completed by his son of the same name.

The Percy Castle, laid out nearly upon the Norman lines, presented very nearly the appearance of the present structure. The authorship of the inner gatehouse is established by the escutcheon of Clifford on its walls, the second Henry de Percy having married a lady of that

house. To the first half of this fourteenth century may be attributed, as has already been pointed out in detail, nearly all the leading features of the castle, as it stood at the incoming of the first Duke. The Percies, though they maintained the reputation of Alnwick as the great Border fortress during nearly four centuries, do not appear to have materially altered the fabric of the two earliest lords. They received here Edward II. in 1311 and 1332, and Edward III. in 1335, but the later earls were much at *Petworth*, and in Yorkshire; and upon the death of the 8th earl, in 1537, and the attainder of his brother, the family ceased to reside at Alnwick, and the castle was neglected. The Percy line ended in Elizabeth, daughter of Jocelyn, the 11th earl, who, 30th May, 1682, married Charles, Duke of Somerset. Of their children, two had issue, Algernon and Catherine, who married Sir Wm. Wyndham, and eventually conveyed to that family the Percy estates at *Petworth*, *Egremont*, and *Leconfield*.

Algernon Seymour, Duke of Somerset, and by creation Earl of Northumberland, left one child, Elizabeth Seymour, who inherited Alnwick, and married Sir Hugh Smithson, created Duke of Northumberland, and ancestor of the present family.

A survey of Alnwick in 1567 shows the decay then to have been very considerable, and as the Seymour lords preferred their paternal residence, Alnwick became almost a ruin. From this it was redeemed by the first Duke, who, under the advice of Adam, restored, and in part rebuilt the keep; and although he fitted up the interior with plaster and frippery, made the exterior sound and good, and, on the whole, in keeping with the character of the place, and with what remained of the ancient buildings.

Matters so remained until the accession of Duke Algernon, better known as Lord Prudhoe, a naval officer, and a good man of business, who had travelled much, and possessed a cultivated taste, and was of a truly noble and magnificent disposition. While foremost in works of public usefulness connected with his estates, county, and profession, and careful to drain his lands, rebuild the cottages of his labourers, restore the local churches, and provide life-boats for his dangerous coast, he, under the sound advice of Mr. Salvin, almost rebuilt the castle, preserving with scrupulous care all that admitted of preservation, and adapting his new work to the period of the first and second Percy, the founders of the later castle. Having thus restored the great fortress of the Border, with strict regard to the rules of military architecture, he proceeded, under the advice of Canina, to fit up the interior in the style of an Italian palace. The contrast afforded is certainly extreme, and the attempt, on so costly a scale, was hardly; but the adaptation of the fittings to the irregular plan of the rooms is so well conceived, the materials employed are so rich, and the execution of the details is so skilful, that it is difficult to regard even so great an incongruity as other than a distinguished success.

Much attention has of late years been paid, and by very competent persons, to the history of this castle. *Grose* gives some particulars, now very valuable; but this and the castles of *Warkworth* and *Prudhoe* have been illustrated by the late Mr. Hartshorne, and are treated of also by him with great success in the Northumberland volume of the *Archeological Institute*. More recently Mr. Tate has handled the subject of Alnwick castle with both skill and accuracy, in his admirable history of the barony of Alnwick, now just completed. In the above sketch free use has, to some extent, been made of the above materials; but the object of the writer has been to treat solely of the fabric of the castle, and that from a military point of view.

REFERENCES.

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|-----------------------------|------------------------------|
| 1. Donjon. | 19. Chapel. |
| 2. Inner Ward. | 20. State Bedroom. |
| 3. Outer Ward. | 21. Entrance. |
| 4. Terrace. | 22. Spur Gallery. |
| 5. Stable Courts. | 23. West Garret. |
| 6. Kitchen. | 24. Abbot's Tower. |
| 7. Estate Offices. | 25. Falconer's Tower. |
| 8. Ravine. | 26. Postern Tower. |
| 9. Ditch. | 27. Constable's Tower. |
| 10. Tower. | 28. Ravine Tower. |
| 11. Inner Gate. | 29. <i>Hotspur's Chair</i> . |
| 12. Middle Gate. | 30. East Garret. |
| 13. Barbican. | 31. Warder's Tower. |
| 14. Hall. | 32. Auditor's Tower. |
| 15. Withdrawing-room. | 33. Clock Tower. |
| 16. Music-room. | 34. Avenue Tower. |
| 17. Ante-room. | 35. Garden. |
| 18. Library. Prudhoe Tower. | |





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SCALE OF FEET

PLAN OF ALNWICK CASTLE.



STREET ARCHITECTURE, BRISTOL: SHOPS IN HIGH STREET.
MESSRS. PONTON & GOUGH, ARCHITECTS.

STREET ARCHITECTURE: BRISTOL.

SHOPS IN HIGH-STREET.

The amount of building that has been done in Bristol and Clifton within the last ten years is very surprising, as well in the shape of banks, insurance offices, hotels, and new shops in the city, as of countless detached and semi-detached residences in its beautiful suburb. Members of the Social Science Association now holding congress there, and whose knowledge of Bristol may be of early date, can scarcely fail to be impressed with the remarkable change apparent. Alterations, too, in the thoroughfares now about to be made, and of which our readers have heard, will still further alter and improve the aspect of the city. As a natural result, one that always follows public improvements, individuals go to work in the same direction, and endeavour to improve their separate holdings. The two shop-fronts in High-street, of which we give a view in our present Number, afford instances of the extent to which the desire to ornament is carried. These were designed by Messrs. Ponton & Gough. The intention of the architects was to show the constructional means used for the support of the building above the shops, and to introduce as little masonry as possible, before the windows of the upper rooms.

The rooms above the shop are about 24 ft. in depth from the façade, and notwithstanding the deep recessing of the glass line, ample light is admitted. The front is of Bath stone, with shafts, bonds, and voussours of red Mansfield and yellow magnesian limestone; sulphur inlay of various colours being introduced between the bonds on the lower story.

The window-heads on the first floor include a series of inscribed heads of ancient healers, which, like the rest of the carving, are very well executed. The parapet, with its range of sitting lions and shields, is the least satisfactory part of the composition.

OXIDATION OF IRON IN BUILDINGS.

The question of the mode in which iron suffers from oxidation, when included in masonry, appears likely to attract fresh attention. It is a subject on which those persons who are familiar with the repairs, or even with the demolition of old buildings, are not altogether without experience. But especial value attaches to the discoveries made on the recent occasion of the examination and repair of the tomb of King Henry VII., in Westminster Abbey, from the fact that both the date of erection, and the subsequent history of the monument, are so distinctly ascertained.

After the cleansing of the statue of the Countess of Richmond, to which so much public attention was directed in last May, the ornaments of the tombs proceeded to examine the central monument of the Abbey, that of King Henry VII. and his queen, standing, as is well known, in the chapel founded by that sovereign, under the protection of a richly-wrought grille.

Not only did the effigies appear to be coated and partially corroded in consequence of long neglect, but the altar-tomb itself gave symptoms of dilapidation and decay. Joints yawned, and cracks menaced, and the general appearance was such as is often produced, in similar structures, by subsidence of the foundations. The effigies were therefore carefully removed, and carried into the Eastern apse, or smaller chapel, where they were cleaned, and that with great science. The altar-tomb itself was reverently taken to pieces, with a view to its replacement in its original integrity. It soon appeared that no subsidence had occurred. On the contrary, the tomb had been built on the finished pavement of the chapel, and the portion of this pavement which had thus been protected from wear was in a condition of great and original splendour, being enriched with a diapered pattern, partly polished, and partly pounced or frosted.

The actual cause of the dilapidation of the tomb then appeared. It was nothing but the oxidation of the only pieces of iron which had been employed by the builders. All the fittings were of copper, with one exception. At each corner of the tomb, as many of our readers will remember, sits a boy angel, in gilded copper. To keep these figures in their place copper bolts were employed, which passed through the upper portion of the ornamental work, and were secured by attachment to four plates of iron, which were built into the tomb itself, under the slab on which the effigies rested. These four

iron plates, notwithstanding their protection, first by the work of the tomb itself, and secondly by the building which sheltered the tomb from the chief vicissitudes of atmospheric temperature, had developed, on either side of each, solid plates of rust, of from three to four times the thickness of the original iron. The slow formation of this oxide had acted as an irresistible wedge, riving the fabric asunder, and threatening in course of time the entire overthrow of this noble monument.

Specimens of these plates of oxide, as well as one of the original iron plates, were exhibited at the meeting of the Royal Archaeological Institute, on the 2nd of July last. The dangerous metal has now been replaced by plates of copper; and the tomb has been restored to its original beauty. But the lesson as to the conduct of iron when included in masonry or in mortar, even under circumstances which might be presumed to be more than ordinarily favourable, is not one of which any prudent architect or engineer will lose sight.

THE POPULATION OF LONDON.

ACCORDING to the census of 1861, the population of London (which was 2,803,034), was nearly equal to all the towns and cities of Great Britain, containing more than 100,000 inhabitants (fifteen in all), as is shown by the following table:—

	Population.
Birmingham	286,076
Bradford	106,218
Bristol	154,093
Leeds	207,165
Liverpool	448,068
Manchester	338,722
Newcastle-on-Tyne	108,108
Salford	102,449
Sheffield	158,472
Stoke-upon-Trent	101,207
Edinburgh	168,121
Glasgow	394,834
Dublin	285,904
Belfast	119,718
Total	3,428,815

The entire population of Scotland was but 3,062,964.

The remark of a celebrated Frenchman was very apt:—" *London n'est plus une ville: c'est une province couverte de maisons*," for it contains as many people as the three largest capitals in Europe together, viz.,—Paris, Constantinople, and St. Petersburg, and more inhabitants than either of the kingdoms of Denmark, Saxony, Hanover, or Norway. J. B. W.

A WORKMAN ON THE TRADE-UNIONS CONGRESS.

SIR,—An unprejudiced reader of the report of the late trade-unions congress could not but notice how entirely the delegates were disinterested from the outside world. They moved and passed resolutions which, if put into practice, would affect the whole community, and yet forgot that the public lived outside their meeting-place, and whose interests were, as a rule, opposed to their conclusions; in fact, the delegates appeared to be in the position of the man who had a memory so bad that he could not leave his home for a short distance without forgetting who he was and where he resided. It is evident that as soon as the delegates separated they would have different interests, as each one represented a different trade; and for the supply of their daily wants they would, as a natural course, buy in the cheapest and best market that which their families required for their daily consumption.

The question of a reduction of the hours of labour received great prominence, and is one of the cherished ideas of the leading unionists. The subject, like many others, looks well on paper. I suppose there are not many workmen who would object to work eight hours per day instead of ten, and therefore to the superficialist and unthinking it is an captivating scheme, more so as the leaders try to persuade the workmen they are doing a charitable action by relieving their fellow workmen's burden and creating employment for them at others' expense. The authors of the papers were not so selfish as some people would suppose, and had no wish to do all the great work by themselves, as they appeal to employers "to abolish the present system of competition, as it is fraught with the most disastrous consequences to society." It seems the congress would fashion society after some plan of their own, and so regulate trade and manufactures as to equally divide what they thought was sufficient

among employers, and limit production so that everybody should have a little of the results of labour; only it must be a very little, as it would entail a little exertion and labour upon the labourers, and under the new plan, that could not be thought of.

In the socialist agitation, the founder of the rational or new system of sociology established Harmony Hall and Harmony Farm. All the approaches to it were laid with rare wisdom. The roads and paths were excellent, and of great beauty. Nevertheless, the delegates who met at Harmony were not harmonious. The result of so much wisdom was defaced, as the delegates could not agree to proportions. And I am afraid, that when the trade-unionist scheme is fully developed, and the scales are evenly balanced, the rank and file will not agree to proportions, as the talkers would, of course, want more than the producers; and, like the national workshops in France, and Harmony Hall in England, the schemes will fall because in theory and on paper they look sweetly pretty, but in practice they are entirely wanting.

It is said there never was a time in the history of this country when trade was more depressed, or employment more slack. And one of the rare gems of the congress was the proposal of the delegates to raise the price of labour 20 per cent., without inquiry as to what its effect would be upon the income of the country. In examining the report of the census for 1861, I find there were 177,969 carpenters and joiners in England and Wales. Professor L. Levi, in his estimate of the income of the working classes, states the average income of the workmen is 22s. 6d. per week. The average income of carpenters and joiners would amount to at least 26s. or 27s. per week. For the sake of enumeration, 5jd. per hour, may be taken as not an excessive estimate, and ten hours per week as the reduction of working time for each man. This would raise the price of joiners' work, 2,004,793l. 5s. per annum. And, further, there are 287,485 mechanics in other branches of the building trade, and, at the same rate of wages as the carpenters receive, it would add for operatives' wages alone 5,528,367l. 11s. for the cost of building in England. The labourers, of whom there are a large number, although not specially stated in the report, would add at least another million; and when employers' profits on the extra capital are accounted for, with the increased cost of material, it would add not far short of nine millions per year to the present cost of building operations. What the building trade had done others would imitate; and a rise of 2s. per week in the rate of remuneration would add 37,200,000l. per annum to the cost of production, and would give the finishing stroke to the prosperity and industry of England.

The trades' delegates seem to have learnt nothing from the experience of the past; they want to take society back to a period when it was the rule to fix and regulate by law the hours of labour and the rate of wages. It is related in the history of industry that guilds and corporations proved the ruin of trades in the corporate towns; "and industry took refuge in the then obscure hamlets of Manchester, Birmingham, Sheffield, and other unprivileged places." The moral of which it would be well for the bulk of workmen to understand; and, I am sure, if they did they would to a man repudiate the false and pernicious blindness of the leaders of trade-unionists. Supposing the reduction of the hours of labour could be carried to a successful issue, and that the moderate computation of 57,000,000l. were added to the yearly cost of production, and trade-unionists met at the Crystal Palace to raise a song of triumph for their victory, their success in the end would prove more lamentable than a defeat, as they could not force the foreigners who buy our goods to receive them at the enhanced price, nor could they force the public of this country to find them employment. Some trades have already found to their cost that there is no royal road to employment. The engineers and ironworkers, for instance, have seen their accumulated fund yearly wasting, in spite of the extra levies and contributions; and they live in hopes that something may turn up to revive a failing trade. The self-made leaders of the working classes at Birmingham complained about the employers wishing to grow rich in a few years. But they ought to have known that in trades which are continually agitated by strikes, and where the employer is not certain for a month at a time that his business will not be disturbed by a strike, he is desirous of making the most profit

in a short time. And if the strike for the reduction of the hours of labour be successful in several towns, it is the inauguration of a general agitation, and will in the end result in the total removal of many industries from this country.

Working men have for a long time been pursuing a suicidal policy, as they have acted as if capital were a patient that would bear continual bleeding, and no wound so deep that it would not heal; and before the patient was recovered, the knife was again in preparation to inflict another sore deeper than the one before. Trade-unionist leaders, with their peculiar political economy, are, it appears, still ignorant of the real cause of the higher remuneration of English artisans. It is not because England possesses more gold than other nations, but that she has hitherto possessed greater powers of production, in the excellence of her machinery and tools, and labour has been more energetic and more skilfully applied than in any other country. The statistical abstract for the United Kingdom shows that this superiority is yearly diminishing, and continual agitation is hastening it on. I intended to review the question of limiting apprentices, but must leave that and other points for another letter.

JACK PLANE.

THE BUILDING TRADE AT SCARBOROUGH.

LIKE many other places which furnish a home for those in pursuit of pleasure and health, Scarborough, there can be no doubt, has been overbuilt, and as a result the building trade is not at the present time in a very flourishing state. There can, however, be no disputing the fact that the builder and the architect have left some good marks of their handy work in times past, as well as at no very distant period. We need only mention the erections at New Scarborough, the Cliffe Hotel, with its 300 bedrooms, thirty private sitting-rooms, together with all the other necessary rooms and conveniences, or point to the bridge, which is 41.4 ft. in length, and 75 ft. in height, to call to remembrance a few of the works which have been completed in the town. At the present time there does not, however, seem to be much doing in the building trade. A few new erections are rising up, amongst which is a structure that has been built on an eminence overlooking the north sands, which will henceforth be known by the name of Cromwell House. The builders have been Mr. Harrison, of Scarborough, and Mr. Grey, of York. The structure, which has a flat roof, is of brick, and has a pleasant appearance. Another erection, similar to the one just named, but not in the same style, is in the course of erection in the same locality.

AMSTERDAM EXHIBITION.

ACCORDING to Mr. P. L. Simmonds, the British Commissioner at Amsterdam, out of 210 British exhibitors 150 have received rewards, including 15 diplomas of honour, 10 gold medals, 36 silver medals, 23 bronze medals, and 12 honourable mentions. Besides these, exhibitors not coming properly within the scope of the Exhibition (owing to their goods being of a different or expensive character, and therefore not strictly suited to the working classes), received 17 diplomas of excellence and 3 extraordinary mentions. The list includes,—

Class I.—Houses and Fittings, &c.

D. Anderson & Sons, Belfast—Roofing felt—Honourable mention.
Engert & Rolf, London—Asphalted roofing felt—Bronze medal.
T. H. Phillips, London—Gas cooking-stove—Bronze medal.
Partridge & Co., Birmingham—Gas brackets—Bronze medal.
Jas. Harding, London—Roofing felt—Silver medal.
Doulton & Co., London—Drain-pipes—Mention extraordinary.
Galliehan & Co., London—Drain-pipes—Mention extraordinary.
W. S. Adams & Co., London—Cooking-stove—Mention extraordinary.
Walker & Slingman, London—Washing boiler—Honourable mention.
C. J. Philp, Birmingham—Chandeliers—Silver medal.
Moule's Patent Earth Closet Co., London—Earth closets—Bronze medal.

J. E. Watson, Newcastle—Plans of workmen's dwellings—Bronze medal.
J. Cliff & Son, Wortley, near Leeds—Drain-pipes—Diplome d'excellence.
Daley & Co., Northampton—Kitchener—Mention extraordinaire.
G. Glover & Co., London—Gasmeters—Diplome d'excellence.
W. Blews & Sons, Birmingham—Gasfittings—Diplome d'excellence.
John Brogden & Sons, Bridgend, Glamorgan—Iron—Gold medal.
Maw & Co., Brossley—Mosaic tiles—Diplome d'excellence.
Society for Improving the Condition of the Labouring Classes, London—Drawings of cottages—Diplome d'honneur.
Central Cottage Improvement Society, London—Drawings of cottages—Diplome d'honneur.

Class VII.—Societies, &c., for Promoting the Well-being of the Working Classes.

Henry Briggs, Son, & Co., Whitwood—Gold medal.
Postmaster-General, London—Diplome d'honneur.
Central Co-operative Society, Rochdale—Diplome d'honneur.
Society of Equitable Pioneers, Rochdale—Diplome d'honneur.
Thomas Twining, Twickenham, London—Diplome d'honneur.
Working Men's Club and Institute, London—Gold medal.
Working Men's College, London—Gold medal.
Working Women's College, London—Gold medal.
Rochdale Co-operative Corn-mills Society—Bronze medal.
J. Bracciant, London—Bronze medal.
Gustav Meinhardt, Birmingham—Bronze medal.

UNITED PRESBYTERIAN CHURCH, DALKEITH.

THIS church was the subject of a limited competition, when the design of Mr. R. Thornton Shiells was chosen by the Committee.

Accommodation is provided for a congregation of 700. There is a gallery at one end of the church opposite the pulpit, and in the rear is placed a session-house and vestry, the former of which serves also as a Sabbath school. The interior is fitted up with deal benches, and has an open timber roof. The pulpit is in the form of a platform of deal stained and varnished, and the whole of the fittings are of a plain and unassuming nature.

The cost of the building, exclusive of the spire (135 ft. in height), is about 3,000*l.*; but it is expected that funds will be forthcoming to complete the design, as the building occupies a prominent site in the town which already possesses two fine spires.

RAILWAY MATTERS.

TRAINS are often placed in situations of danger where the break-power at the command of the guard and driver is insufficient to meet the emergency. It is obvious that the difficulty would be overcome if the break-power could be applied equally to every carriage composing the train. This, Mr. John Clark, of the firm of Messrs. Wilken & Clark, of London, is said to have succeeded in accomplishing. He has invented an apparatus by which a continuous break, self-applied, is attached to every carriage of the train, so that in case of any portion of the train breaking away on an incline, the break is at once brought into operation by the accident alone, and the carriages brought to a standstill. This power is obtained by passing a small chain from the break-van beneath the bottom of the carriages the whole length of the train, and this chain is attached to the breaks. While the train is running the chain is kept tight by the guard. To apply the break throughout the train all that is necessary is to slacken the chain; and the same result follows if an accident should snap the chain at any part, independently of any action on the part of those in charge. When the break is applied no jolt follows, and, unlike most other breaks, the power of this new apparatus increases from the moment it is applied. A train of Midland carriages has been fitted up by the inventor with his apparatus, and an experimental trip was made a few days ago on a heavy portion of the line near Buxton. Amongst other measures resorted to for testing

the value of the invention, the driver was ordered to run down hill at full speed, and, after attaining a speed of 55 miles per hour, he slipped the coupling and left the train uncontrolled by the engine. The snapping of the connecting chain at once applied the break, and we understand with such success that in 27 seconds the train was brought to a standstill after running 330 yards. The maximum power of the break was also tested on a similar descent. The engine set off at full speed, with all steam on, when the break being applied, engine and train were brought to a standstill in 1,000 yards. The trials are said to have given satisfaction to the officials of the company, who were present to watch them. This experimental train has been running between Leeds and Bradford, and is so completely under control that the loss of time by stoppages at stations has been materially lessened. The Leeds Mercury is of opinion that still more satisfactory results would be attained if the break power were placed in the hands of the driver, so that he could time its application with the shutting off of the steam when about to stop.

LONG-LANE, WEST SMITHFIELD.

MORE than 100 silver coins, consisting of crowns, half-crowns, and shillings, of Elizabeth, James I., Charles I., and Charles II., were found in an earthen pot, on Monday last, in excavating for the new houses about to be built for Mr. Hayne, on the north side of this street. The coins were quite black, and had been burnt, probably in the Great Fire of 1666, which consumed the old Griffin Inn, then standing on this spot, portions of whose foundation walls, consisting of the peculiar thin red-bricks in use three and four centuries ago, have been exposed. The pot containing the coins was found amid the ancient foundations referred to. The frontage of the new houses will be set back 12 ft., so as to be in line with the south front of the New Meat Market. Long-lane will thus be widened; the City Corporation having determined, by taking advantage of the rebuilding of the houses, to begin this much called-for improvement.

SCARLET FEVER.

THERE appears to be a complete epidemic of scarlet fever, not only over all the metropolises, but throughout the country. As regards London, it has more especially prevailed in Brompton, Whitechapel, and the Holborn district. In the week ending 25th ult., there were 191 deaths from the fever in the metropolis, which implies a great deal more illness. The Registrar-General says it is "more fatal than ever;" the weekly deaths had been 170, 179, 178, and 191. Doubtless the dryness of great part of the summer, and the consequent deficiency in the natural process of washing away all sorts of filth and decomposing organic matter which rain effects, have tended to cause this fever to spread. It only behaves us, however, all the more strictly to aid nature in such a strain.

The medical officers attached to the various boards of works of the metropolis have, at several meetings which have been recently held, drawn attention to the alarming prevalence and spread of the fever. Particular attention was directed in the Holborn district, to its existence in Eagle-street, Red Lion-street, where several deaths had resulted from it. Mr. Hutchinson, one of the members, said more deaths had occurred in Eagle-street from scarlet and typhus fevers than in any other part of the district. He attributed this fact to the presence of effluvia which came from a slaughter-house in Yorkshire Grey-yard, as on one occasion when he visited the place he found 2 ft. of water and putrid matter, which came from the slaughter-house, extending from a gully into the yard. The smell was most offensive, and likely to breed any fever. The blood from the slaughter-house ran into the gully, instead of directly into the sewer, and it got congealed. He proposed that the occupant of the slaughter-house be forthwith required to drain directly into the sewer. The dunghill, also, which was in the yard, should be cleared away more frequently. The proposition was seconded by Mr. Padman, and Dr. Complin said the houses should be thoroughly washed with lime, and fumigated. Dr. Gibson thought carbolic acid would destroy the infection. Mr. Walker stated that scarlet fever was raging to a fearful extent throughout the metropolis. It behoved them to adopt all requi-

ente steps for the obviation of the spread of the disease as much as possible. Dr. Gibson reported that during the five weeks of the recess seventeen deaths were recorded from scarlet fever. The general mortality had been in excess of the average for the corresponding weeks of the past ten years.

The medical officer for Bermondsey reports eighteen deaths from scarlet fever during the fortnight ending September 11. On being asked in what particular part of the parish the fever prevailed, the medical officer said it was all over the country; and, in reply to other questions, said that nothing could be done by the vestry to prevent its spread. He gave advice to the persons who had families where the disease prevailed. The reason, in his opinion, the fever was so prevalent arose from the fact that parents would not take sufficient care to keep their children away from those who were affected.

EXTENSION OF THE NEWCASTLE WATER WORKS.

The first sod has been cut in connexion with a great new reservoir at Hallington, among the wild hills of South Northumberland, for the Newcastle and Gateshead Water Company. The proposed receptacle is intended to be used for the storing of the clear and pure water which ripples through the water-courses of the district, in order that, in seasons of great drought, the residents along the banks of the Tyne may have a pure reserve for the periods of their necessity. Mr. Bateman, the engineer, was instructed to search for a site for the new undertaking, and, as the company had for long been draining an area of 17,500 acres near Hallington by means of a large open aqueduct, a natural heath in the locality was ultimately chosen as possessing the greatest number of advantages. The reservoir, or the Hallington Lake as it is termed in the Act of Parliament, will cover 160 acres of land, and contain the enormous quantity of 630,000,000 gallons of water. This is 70,000,000 gallons more than the whole of the existing supply combined, and should be sufficient, even if the operations of the company are extended to Tynemouth, to meet all the legitimate requirements of the present and next generation.

The greatest length of ground to be submerged is about a mile and a half, and the only embankment required for confining the water in this space will be three in number. The principal or central embankment—through which the water will be drawn into the existing aqueduct—will constitute the most formidable obstacle in the way of the contractor, Mr. J. B. McGinire, of Manchester; but by means of a puddle trench or wall, and a good water-tight foundation, this experienced gentleman expects to surmount any difficulties that may arise from the marshy character of the land to be worked upon. The puddling wall will be 16 ft. wide at the bottom, tapering to 8 ft. at the surface, and will be supported by the bulk of the soil removed from the interior of the workings; while, as an additional precaution against the angry dashing of the waters in stormy weather, the interior slopes will be faced with an impenetrable coat of rubble pitching. The embankments contain altogether from 200,000 to 300,000 yards of earthwork, and these, as well as the interior, are intended to be ready for use in two years.

THE ENGINEERING TRADES OF MANCHESTER.

The inaugural meeting of the Engineering Employers, Foremen, and Draughtsmen's Society, for the session 1869-70, has been held at the Mechanics' Institution, David-street. Mr. William Mather occupied the chair, and there was a numerous attendance. Mr. J. Nasmyth said the society was formed in 1856. It then numbered forty-five members. Its object was to discuss scientific and practical questions connected with mechanical trades. The members had also to contribute monthly or quarterly subscriptions, which went to form a fund to aid members who, when their active period of life was past, needed such assistance. In 1858 the members had increased to fifty-four, and the society had steadily progressed since. The chairman in the course of his address said the Government had never made the slightest effort to provide institutions for the encouragement of trades, and for increasing the knowledge of

those engaged in them. Everything that had been done was attained through voluntary effort. The time had arrived when they must gravely consider their position. If Englishmen had accomplished so much under great disadvantages, what might they not accomplish by study and education and the aid of scientific knowledge? As an employer, deeply interested in keeping the trade of the country, he had not the slightest fear of the competition of foreign nations. They must regard themselves in the future more as citizens of the world. They ought to rejoice that other nations were advancing, and, instead of feeling discouraged, they should be urged by that circumstance to go on a little faster. He thought, as intelligent men, and enjoying a position in the engineering trade, which was happily free from the disputes that affected some other trades, they might exercise an influence which would bring about a better understanding between the interests of capital and labour. Mr. Hamilton Woods and Mr. R. Rawlinson afterwards addressed the meeting, the latter stating that the society now numbered 140 members, and that the money in hand amounted to 1,100*l*.

THE PUBLIC MORTUARY QUESTION.

The sanitary committee of the Clerkenwell vestry have reported to the vestry with reference to the state of the Clerkenwell mortuary, which has recently attracted much public attention, consequent upon the remarks of the deputy-coroner for Central Middlesex as to the want of ventilation in the building, and therefore danger of injury to the health of those whose business brings them into the place. It was also stated that the bodies of the dead could be plainly seen by the occupants of the houses opposite to the mortuary, and that therefore in front of the entrance a screen should be erected. The committee in their report state that the construction of the mortuary, which was built in 1866, had met the approval of the Government inspector, and that any faults found with it since had arisen from the fact that it was not kept in proper order.

The committee recommended that three air-bricks, with charcoal filters, be placed in the walls at each side of the mortuary; that a screen be put up outside the door; and that the surveyor be instructed to attend to the internal condition of the building.

The vestry has approved the report of the committee, and it is considered that its adoption will prevent the outrages to decency and danger to health heretofore observable at the Clerkenwell mortuary.

NEW BATHING ESTABLISHMENT AT FOLKESTONE.

The desirability of erecting a bathing establishment at Folkestone had been frequently mooted, but nothing was practically effected in the matter until Mr. Gardiner, a local architect, in conjunction with Mr. Harrison, of the firm of Brocksman & Harrison, took it in hand. Mr. Gardiner visited the principal bathing establishments in France prior to preparing the plans which he subsequently submitted, and which were ultimately adopted. It was suggested that a company should be formed, and a capital of 10,000*l*. raised in 100*l*. shares. This suggestion was acted on, and several of the leading residents of Folkestone, with Mr. Gamhrill, the then mayor, at their head, formed themselves into a limited liability company, of which Mr. Gamhrill became chairman. The plans prepared by Mr. Gardiner were approved of, and the contract for the erection of the building was taken by Mr. France for the engineering work, and by Messrs. Holdom & Powell for the building. The shares, with the exception of twenty-five, were at once taken in the locality, and have been paid up in full. The foundation-stone of the building was laid by the mayor, Mr. Gamhrill, in September, 1868, in the presence of a number of gentlemen interested in the prosperity of the town. The visitors on the occasion included Baron M. de Rothschild, M.P.; the Lord Chief Baron (Sir Fitzroy Kelly); Dr. Alderson, president of the College of Physicians; and others. The building is now open to the public. It is in the Italian style, freely treated, and occupies a frontage of 117 ft. by a depth of 48 ft. On the lower tier is a large swimming and plunge bath, and also every description of medicated and "invalid" baths. The first-floor is devoted to a series of

warm and cold baths,—at one side for ladies, and the other for gentlemen. The baths are so constructed that the bather can indulge in sea or fresh water at pleasure. The upper tier has an entrance from the cliff, the house being built on the slope of the hill; and here are situated subscription and assembly rooms, reading, billiard, and refreshment rooms, which are reserved for subscribers to the baths. The assembly-room is frequently used as a hall-room. One of the features of the establishment is a spacious balcony running the entire breadth of the grand saloon, from which an extensive sea view is obtained.

NEW INFIRMARY FOR POPLAR AND STEPNEY.

An order was issued by the Poor Law Board a short time since, combining Poplar and Stepney Unions into a sick asylum district, with a view to the better classification of sick workhouse inmates. At the same time the Poor Law Board notified their intention to sanction the erection of an infirmary for the use and at the joint expense of the two unions.

The scheme was entered into with some spirit by the Guardians of the places concerned, and very soon a site was secured. It is situated at Bromley, Middlesex, adjoining on the Tilbury and Southend Railway. At the last meeting of the Board of Management tenders were opened for the erection, as follows:—

Hunt	£34,308	0	0
Sheffield	34,252	0	0
Kilby	33,755	0	0
Henshaw	33,545	0	0
Emor	33,142	0	0
Pearson	32,749	0	0
Perry & Co.	32,739	0	0
Webb & Son	31,200	0	0
Turner	30,900	0	0
Hill, Keddall, & Walsram	30,745	0	0
Nutt	30,103	0	0
Mann	29,532	0	0

Mr. Mann's tender was unanimously accepted. Messrs. Hareton & Harston, of East India Dock-road, Poplar, are the architects.

ERECTION OF NEW HOUSES: NOTICES TO SURVEYORS.

At a recent meeting of the Camberwell vestry, as reported in the *Clerkenwell News*, the local sewers committee reported that they had requested the inspectors of nuisances to make a weekly report of all new houses in course of erection, with the view of discovering whether proper notice has been given to the surveyor of the same.

Mr. E. D. Rogers said it was unfortunately the fact, that there were builders who forgot, in the midst of their business, to give notice to their surveyor of their intention to erect buildings; and, in consequence, he could not examine them and see that they were properly drained; but this was a matter of such great importance that it should be attended to.

ACCIDENTS.

Salford.—An accident of an alarming nature has occurred in a dwelling-house in Bow-street, off Arlington-street, Adelphi, Salford. The house is one of a kind known as single houses, consisting only of a ground-floor, with a large cellar underneath, and an upper apartment. The ground-floor had sixteen or seventeen persons assembled in it for the purpose of "waking" a dead body. The people had not been long in the house when the floor, which consisted of stone flags, supported by timber couplings, suddenly gave way and fell into the cellar underneath, a distance of at least 7 ft. or 8 ft. The corpse and the people assembled, with the furniture, were precipitated to the bottom of the cellar. A great portion of the furniture was destroyed, but, fortunately, no bodily injuries were sustained. It is stated that the accident occurred in consequence of the joists which supported the floor having been rotten, and many of the floors of the houses in the neighborhood are reported to be in a very dangerous condition from the same cause.

Peterchurch.—A terrific gale of wind recently made great havoc at the parish church of Peterchurch. This old Norman fabric has been under repair since October last, and the double chancel and apse have been restored. About a month ago the work at the nave was begun, and

the south wall having binfold, and being very much out of the perpendicular, it was necessary to take it down and rebuild it (one-half of this wall had been rebuilt), the roof stripped of its tiles being strongly shored up. This roof was a massive one, consisting of twenty-three continuous oaken rafters. The wind swept every one of these from the wall plates, and whirled them into a heap of ruin into the body of the church. Most providentially the accident occurred at a very early hour in the morning, before the men went to their work. The curious old font was encircled by the huge beams, but uninjured, and the new walling and windows also escaped; but the roof of the new heating vault was smashed in, and some scaffolding and ladders broken to pieces. The bishop immediately headed a list of subscriptions for the further restoration of this ancient and interesting church with 20*l.*, an example which it is to be hoped will be followed throughout the county. About 300*l.* more are required to complete the proposed restoration. Mr. R. E. Williams, of Westminster, is the architect, and the builders are Messrs. Lewis & Day, of Hereford.

Newcastle-upon-Tyne.—A frightful accident has happened at the North-Eastern Company's new goods station, in course of erection at the Forth Banks, Newcastle, by which a man was killed on the spot, and another received such injuries that his death ensued within half an hour afterwards. Two glaziers were at work in the station. They were engaged in putting glass into the roof of the building, and for that purpose were on a scaffold close to the roof. While so employed one of the planks composing the scaffold broke, and the unfortunate men were precipitated to the ground—a very considerable distance.

THE CLOCK THAT STRUCK THIRTEEN.

After reading my accustomed weekly periodical, about which I will not say anything, as words would be idle in praise of its excellent papers, I beg again to refer to the "Clock that struck Thirteen at Midnight."

Before the time of the present St. Paul's, and as long ago as the reign of Henry VII., there is on record a well-attested story of a young girl, who, going to confess, was importuned by the monk then on his turn there for the purpose of confession in the building; and, quickly escaping from him up the stairs of the Great Clock Tower, raised the clapper or hammer of the bell of the clock just as it had finished striking twelve, and, by means of the roof, eluded her assailant and got away.

On accusing him as soon as she reached her friends and home, she called attention to the fact of the clock having struck thirteen that time; and on those in the immediate neighborhood of the cathedral being asked if so unusual a thing had been heard, they said it was so.

This proved the story, and the ecclesiastic was degraded.
J. N.

METROPOLITAN BOARD OF WORKS.

PARK-LANE: DANGEROUS STRUCTURES: GAS FROM SEWAGE.

The first weekly meeting of the members of this Board after the summer recess was held on Friday in last week, at the offices, Spring-gardens. Sir John Thwaites, chairman of the Board, presided, and the members present were—Sir W. Tite, M.P., Messrs. Thompson, Collinson, P. Taylor, Savage, Richardson, Hall, Rogers, L. Breton, Runtz, S. Taylor, Biggott, Meaden, Freeman, Phillips, Nicholas, Hows, Fowler, Brooker, Barker, Brushfield, R. Taylor, Dalton, Legg, and Saunders.

Amongst other business which was transacted, the letter, of which we gave notice last week, from Mr. Dunster, stating that a lady, residing in the vicinity of Park-lane, was anxious to preserve Hamilton Gardens from encroachment, and was prepared, on the Board obtaining a repeal of the Act for opening up Hamilton-place, and obtaining an Act for the widening of Park-lane, by the removal of Gloucester House, to contribute the sum of 50,000*l.* towards such improvement, was read to the Board.

It was ordered that the clerk do write to Mr. Dunster, to say that the Board could not accede to the request of his client.

A report was read from the Building Act Committee, recommending that for the present the several district surveyors be requested to carry out the provisions of the Metropolitan Building (Dangerous Structures) Act, 1863, at the same scale of fees as already settled by the Board, and that it be referred to the Building Act Committee to consider and report as to any further arrangements which they may deem necessary for the proper carrying out of the provisions of this Act. Mr. Biggott moved the adoption of the report, and the motion was agreed to.

Sir John Thwaites alluded to a paragraph

which had appeared in several newspapers, to the effect that gas was being manufactured in India from sewage, and leading to the inference that the same results might be obtained from metropolitan sewage. The writer, as Sir John remarked, appeared to have ignored the fact that Indian sewage consisted principally of solid matter, whilst London sewage contained 94 or 95 per cent. of fluid matter, which would render the cost of extraction too heavy to be of any practical utility. At the same time, on the part of the Board, he wished to state that they would give every facility to persons who desired to experiment with a view of arriving at any results not hitherto attained.

CHURCH-BUILDING NEWS.

Walton.—The new parish church here has been consecrated. The church, which has been erected from the designs and plans furnished by Messrs. Paley & Anstis, is built of the red sandstone of the district. The style of the architecture of the new building is English Gothic, some portions of its details modelled upon the old priory at Lanercost, to which the living once belonged. At the north-west end there is a square tower, surmounted by pyramidal slate roof. In the tower is the entrance porch, its arched doorway being modelled upon Lanercost architecture. Passing through the porch (which occupies the whole area of the tower), and entering the body of the church, we find a nave about 45 ft. long by 22 ft. broad, with an aisle, divided from the nave by pointed arches resting upon piers; and at the east end is a large chancel, the entrance to which is spanned by another Gothic arch. The capital of one of the piers is composed of a plain moulding, relieved by a band of "dog-tooth," and the capital of the other is a floral wreath. The chisel marks are left on the piers and the arch-stones. The aisle occupies the breadth of one side of the tower, and has a curved open timber roof. The roof of the rest of the building is also of open woodwork, but there is no varnish or polish upon any of the beams or timbers. The same remark applies to the seats throughout the church. The chancel fittings are of oak, and the sittings in the body of the church are of pitch-pine. There is a six-foil window with three lancet windows beneath it, at the west end; along the south side of the nave there are three single lancet windows, and one couplet with a quatrefoil above it; in the nave there are small lancet windows with inner arches, after the style of Lanercost Priory; and in the east end there is a triplet window filled with stained glass (by Mr. Wales, of Newcastle), and there are also side lights. The windows are all splayed, and the rough-hewn stone is shown, the joints only being chiselled. The walls are plastered. The history of the stained-glass window was this. The site of the old church not being sufficiently large for the new building, and there being no other way of enlarging it except by building over the family vault of the Walton House family, it was arranged that the graves of the Johnsons should be enclosed in the chancel of the new church, with brass tablets to mark them, and the east window was filled with stained glass as a family memorial. The pulpit is of wood, carved; the lectern is plain. The vestry is at the north-east, cut off by a wooden screen; and within the communion rails there are sedilia for the officiating minister. The mason work was done by Messrs. James Ferguson & Sons, of Great Orton; and Mr. Rutherford, of Brampton, did the carpenter's work. The cost has been about 2,000*l.*

Carmarthen.—The new church in Lammastreet, Carmarthen, has been consecrated by the Bishop of St. David's. The church is intended as a chapel of ease to St. David's. The new building was commenced in June, 1867, upon plans drawn up by Mr. R. K. Penson, of Ludlow, architect. The building work was tendered for, and the tender of Mr. D. M. Williams, of Carmarthen, was accepted, the amount of his contract being 3,028*l.*, the total cost 3,600*l.* The ceremony of laying the foundation stone was performed on the 3rd of September, 1867, by the Worshipful Master of the local Masonic Club. The architecture of the church is mixed, the Gothic, however, predominating. It consists of a nave, south aisle, north transept, chancel, and a tower over the chancel. The dimensions are:—nave, 78 ft. by 27 ft. 6 in.; south aisle, 78 ft. by 22 ft. 6 in.; chancel, 41 ft. 6 in. by 25 ft. The height to the top of the wall plate, is 22 ft., and to the ridge of the roof 43 ft. The tower is 34 ft. high, and

has a sharp pointed roof with ornamented iron crest, surmounted by three crosses. The chief material used is hammer-dressed local stone, with facings of Bath stone. The windows, nineteen in number, are filled with cathedral tinted glass. The roof is an open one, laid with ornamental slates, the inside being of pine, stained and varnished. All the fittings of the interior are of stained and varnished pine. The pews are open, without doors. The nave, aisle, and transept are laid with Broseley ornamental tiles, and the chancel with encaustic tiles. The gas-fittings will consist of brass corona round the columns. The number of sittings is 630. The ground around the church is to be laid out and planted; and when the funds permit the temporary wall now enclosing the ground will be dispersed by ornamental railings. The sum required for the whole work is 3,600*l.*, of which 3,000*l.* have been subscribed.

Books Received.

The "Transactions of the Manchester Statistical Society," 1868-69, just now published, include some interesting papers, especially one "On Vagrants and Tramps," by Mr. T. Barwick Baker. Mr. Baker thus sums up his remarks,—

"If, then, I am asked how to make vagrancy cease as a trade, I should say,—1st. Give sufficient food to all who apply; let there be no dirt, no bullying, nothing that can be alleged as a grievance. 2nd. Make it known to the public that such is the case, and beg them not to give. 3rd. Use the ticket system; not as a magical spell, but as a means of relieving from task work those who travel fairly in order, that you may finally enforce a harder task on such as are not travelling straight at their best pace. 4. Urge the transference of vagrants from the Poor Law and workhouse to the police and County rate, so as to get a thoroughly uniform action. 5th. Then build vagrant wards at the police stations, with separate rooms—I should rather prefer the Winesy plans to those at Oswestry, as less expensive. And 6th. When you have made the vagrant wards decent, with sufficient food, punish sharply all beggars."

—The *Illustrated Midland News*, published in Birmingham, has begun very fairly. The difficulty will be to preserve the characteristic on which it is founded, and to prevent it from becoming simply an imitation of the *London Illustrated News*.

Miscellanea.

Minerals and Metals.—There will shortly be published an account of the geological survey of Great Britain and the mineral statistics of the United Kingdom for 1868, which has been prepared by Mr. Robert Hunt, the keeper of the mining records. In a preliminary notice, signed by Sir Roderick Murchison, it is stated that there has been a falling-off in the quantity of coal produced, arising, doubtless, from the long-continued commercial depression, and in regard to the carriage of coal the tonnage has diminished. The production of ores from the British mines does not exhibit any material variation. The following is the quantity of minerals raised in 1868.—Coal, 103,141,157 tons; iron ore, 10,169,231; tin ore, 13,953; copper ore, 157,395; lead ore, 95,236; zinc ore, 12,781; iron pyrites (sulphur ores), 76,484; gold quartz, 1,191; arsenic, 3,300; gossans and ochres, 6,692; wolfram, 9; fluor spar, 60; manganese, 1,700; barytes, 14,235; coprolites, 37,500; salt, 1,513,840; clays, fine and fire, 1,012,479. The total value is 33,837,858*l.* The quantity of metals obtained from the ores enumerated is,—Iron (pig), 4,970,206 tons; tin, 9,300; copper, 9,817; lead, 71,017; zinc, 3,713; silver, 835,542 ounces; gold, 1,012. The money value is 15,736,416*l.*

The Canterbury Water Supply.—A report from Mr. S. C. Homersham, the engineer to the local waterworks, as to the new works at Wincheap, has been printed, together with the report of an analysis of the water by Mr. D. Campbell, analytical chemist to the Brompton Hospital. The water is got from the chalk hills at Wincheap, through a bore hole sunk for the purpose. It is hard when pumped up from the subterranean springs, but, subjected to the lime process of Mr. Clark, of Aberdeen, it becomes soft almost as rain-water, and is perfectly pure and free from organic taint. It is to be conducted through pipes in the ground to covered reservoirs, whence a constant supply will be given to the town without need for cisterns. The works are nearly completed.

Halfpenny Card Postage.—The authorities at the General Post-office have recently had brought under their notice a system of card postage, which has been tried, it is believed successfully, in Germany. At first sight, a penny-postage seems cheap enough, and the trouble of folding up a letter and putting it into an envelope may be looked upon as infinitesimal. But those who conduct large businesses can tell a very different tale. On the other hand, so far from decreasing the receipts from Post-office traffic, it would tend rather to increase them, while diminishing materially the bulk and weight of the mails. The system would be simply this:—Cards would be provided of a standard size by the Post-office, having, in one corner, as an integral part of the card, a triangular stamp. These cards would be sold by the Post-office in packets, just as stamped envelopes are sold now, at the rate of one halfpenny for each stamp. A trifling addition might be made to the charge, to meet the expense of providing the card itself; but probably this would be unnecessary. One side of these cards would be appropriated to the note or writing to be sent, and the other side to the address, and these cards would pass through the post-office and be delivered in the ordinary way.

Albert Park, Middlesbrough.—The fountain which has for some time past been in course of construction in the centre of this park is just completed, and arrangements are being made for its inauguration. It stands on the central plot of ground at the junction of the two main walks. The basin is 90 ft. in circumference, being enclosed in a circle of grey granite, and lined at the bottom in whitewash and cement. The foundation of the fountain is masked by large blocks of freestone, dispersed so as to give a natural effect. The fountain rises in four stages, including the single pinnacle at the top, so that the water will have four distinct falls into and from these intercepting shelves of increasing size into the basin below. These circular shelves are ornamented, especially the lower one, which shows a fringe of lilies resting on the leaves, all painted in imitation of nature. Four cranes and four swans in colours support the two upper shelves respectively. It is questionable whether such ornamentation will stand the weather, coupled with the effect of Tees water conveyed in iron pipes.

The New Workhouse, Westbury-on-Severn.—The guardians of this union, having for some time past found the accommodation afforded by their house wholly inadequate for the increasing population of the various parishes comprised within their district (which includes a portion of the Forest of Dean), lately determined to erect what in fact amounts to an entirely new workhouse. With this view they consulted Mr. Alfred W. Maberly, of Gloucester and London, architect; and his plans having been approved by the Poor-law Board, the contract was let to Messrs. James Coleman & Son, of Chaxhill, builders, who are proceeding rapidly with the work. The new buildings comprise a large dining-hall, with chapel over, ascended by staircases, day-rooms and dormitories for the aged and infirm and able-bodied of both sexes, and for boys and girls, with schoolrooms, lavatories, &c. Attached are work-rooms, wash-houses, laundries, sheds for out-door labour, with all other necessary rooms required in a building of the kind. The old workhouse will be converted into an infirmary, wards for infectious diseases, &c. It is expected that the new house will be ready for occupation during the coming year.

The Wolf Rock Lighthouse and the Storms.—The masonry of the lighthouse being complete, a staff of eight men were placed on the rock to fit up the doors, windows, and lantern. The door, as already noticed in our columns, is of brass, and weighs 13 cwt., yet it opens and shuts with ease, and fits so as to exclude every drop of water: the framework of the windows and of the lantern is proportionately strong and requires to be nicely fitted. On Wednesday, the 8th, the men were all well, and had an ample stock of provisions, enough to withstand a blockade of several weeks. On the 10th and 11th the sea rose, and soon broke clean over this exposed rock, so that the top of the lighthouse had to be severely battered over, and the door and windows closed. The eight men had to make themselves close prisoners. Gales and tremendous seas have since unavailingly assailed the lighthouse.

Fall of a House, Clifton.—On Monday morning last, soon after half-past seven o'clock, an accident of a very alarming character, attended by severe injuries to six workmen, occurred at the Queen's-road, Clifton. A series of dwelling-houses and shops, called the "Royal Promenade," are in course of erection between the piers at present occupied by the Rifle Drill-hall and the Queen's Hotel. The disaster occurred by the sudden collapse and tumbling down of a considerable portion of the side wall of one of the unfinished houses nearest Clifton. The wall was of considerable thickness, and, falling outwards, buried six of the workmen who were on the spot. It is feared that one will not survive, and that probably another case will prove fatal. The workmen at the place assign the accident to two causes. According to some of them the wall had been raised too rapidly, portions being set upon other portions before there had been sufficient time for the parts to dry. Others considered that the mortar used was not sufficiently good.

Inauguration of Statues at St. George's Hall, Liverpool.—A statue of Lord Derby, executed in Carrara marble, by Mr. Theed, of London, has been publicly inaugurated in the large hall of St. George's Hall, Liverpool. The statue has been provided by the Liverpool corporation, at an expense of 1,000*l.*, in consideration of Lord Derby's gift to the town of the Derby Museum, his eminent qualities as a statesman, orator, and scholar, and his connexion with the county. The statue is of the heroic size, and has occupied the artist two years in its execution. It represents Lord Derby in the robes of a Knight of the Garter. On the same occasion there was also inaugurated the statue, in Carrara marble, by Fontana, of Mr. Joseph Mayer, of Liverpool, who is well known in the scientific world, and who recently bequeathed to the town his museum of historical art, valued at 60,000*l.*, and comprising the Fansett collection of Anglo-Saxon antiquities, the Palsky collection of ivory and other gems, and a large variety of Egyptian remains. This statue is also of the heroic size.

Machine-made Bricks.—Until the present time a rule has been in force, owing, we believe, to an understanding between the trade societies of bricklayers and brickmakers, by which none but hand-made bricks were admitted into Manchester. The prohibition also extended to bricks which had been manufactured beyond a certain distance from the city. The existing strike has been the means of inaugurating a new state of things. A company known as the Fairy-lane (Bury New-road) Brick Company has been established for the manufacture of machine-made bricks; and on Tuesday morning the master builders celebrated their triumph in this matter by a demonstration. A hundred carts, laden with bricks from Fairy-lane, and owned by different contractors now engaged upon works in the city, passed in procession to Albert Square, where they halted for a few minutes. They were afterwards taken to the various buildings on which they were to be employed. A considerable proportion of the bricks manufactured by the company will be used in the erection of the new Town-hall.—*Manchester Guardian.*

Opening of the York Institute Art Exhibition and Fancy Fair.—An art exhibition has been opened in the lecture-hall of the York Institute, with the view of popularizing the institute and clearing it from debt, as well as improving the taste of the working classes and the citizens generally. The exhibition, which it is proposed shall remain open for at least one month, comprises, in numerous sections, a collection of paintings by old masters and modern artists, water-colour drawings, engravings, chromolithographs and photographs, busts, statuary, articles of *verre*, literary and historical autographs, ancient costumes and armour, old china and earthenware, coins, metal and leather work, wood carvings and various models, artificial flowers, ornaments, stuffed birds and animals, scientific apparatus, geological specimens, &c.

Presentation.—Some difficult alterations having been completed at Thgmortons-chambers, the successful termination of the work was celebrated by a dinner, on which occasion the architect (Mr. C. N. McIntyre North) was presented by his client with a timepiece, as a mark of approval. The contractors were Messrs. Newman & Mann, of Peter's-hill; and Mr. Waller, of Fish-street-hill.

The Proposed Wet Dock at Whitehaven.—At a special meeting of Whitehaven Town and Harbour Trustees, Mr. Stiven, the harbour engineer, laid before the trustees a plan for the construction of a wet dock in the harbour of Whitehaven. The situation of the proposed dock is thus described in Mr. Stiven's report:—One of the dock walls will run parallel with Tangier-street. The length of this wall will be 570 ft. The wall at the west end of the dock will be 330 ft. long, and intersects the bulwark. The front wall across the north harbour will be 560 ft. in length, and 70 ft. in width. Through this wall, and adjoining the present north wall, will be placed the dock entrance-gate, 50 ft. in width. The wall at the east end of the dock will be 360 ft. long. The area of water space will be nearly four acres and a half. The meeting received the report, and resolved that it be printed and circulated, and that Mr. Stiven prepare an estimate of the cost and the probable time that would be required to carry out his plan.

An Arminian Church in England.—A religious service of a very unusual character was performed at Chorlton-on-Medlock on Friday week—the laying of the foundation stone of the first Arminian Church in England. The officiating priest wore a magnificent blue cope, richly trimmed with gold fringe. The foundation stones, sixteen in number, were blessed on the previous Sunday. Each stone is dedicated to one of the apostles and fathers of the Church, and has its special place assigned according to the Arminian rubric, in the foundations. During the ceremony the priest held in his hand a gold cross, and read from a richly-bound missal the psalms and other prayers arranged for the service. An acolyte carried the stones, which are about 2 in. long, in a bag, each one folded in a white linen cloth, with the saint's name inscribed upon it. Small holes were cut in the foundation to receive the stones, which were deposited at each corner.

Restoration of St. David's Cathedral.—The building committee held a meeting at Carmarthen a few days ago, the Lord Bishop in the chair, when a financial report was read. It appears that, including 10,000*l.* given by the Ecclesiastical Commissioners, about 21,000*l.* are available; and that about 18,000*l.* have been already spent. Mr. Gilbert Scott, the architect, reported upon the works already executed by Messrs. Wood & Sons, and made a rough estimate of what it would cost to repair and restore thoroughly the remaining portion of the interior, the roofs, and external walls—viz., about 11,000*l.* Mr. Scott is to report to a future meeting, and an appeal for further subscriptions is to be made.

Earthquakes in France and Elsewhere.—On September 11th, at 5.5 a.m., a violent shock of earthquake took place at Bagueres-de-Bigorre, spreading in the direction of Bourges, Luz, and Saint Sauveur. The noise was similar to the rolling of distant thunder, and was terminated by an explosion such as would be caused by the falling in of some cavern. At Bagueres several persons thought that their houses were falling down, and got out of bed to rush abroad. At Saint Sauveur, a lady passenger in the diligence between Luz and Bourges felt the ground undulate under her feet at the same time; the earthquake roll was, as usual, like a cart rolling over a paved street. There have also been earthquakes at the Isle of St. Thomas and in South America.

The Baronetries of Mr. Whitworth and Mr. Fairbairn.—It is stated that Mr. Whitworth and Mr. William Fairbairn have accepted the baronetcies which have been offered to them by Mr. Gladstone. Mr. Whitworth's name will, perhaps, be remembered more by the improvements which he has made in the construction of tools than by the rifle which bears his name; and Mr. Fairbairn's discoveries in metallurgy, adding, as they have done, to the material wealth of the country, abundantly entitle him to such honour as the Government has to bestow. Both of the new baronets have risen from the workman's bench.

Working Men's College.—The sixteenth session of this college will commence on Monday, October 25, when the principal, the Rev. F. D. Manrice, M.A., Professor of Moral Philosophy at Cambridge, will deliver the inaugural address. Six new class-rooms are now in course of erection, at an estimated cost of about 2,000*l.*; of this sum about 400*l.* are still required.

Banbury Church Plans.—The adjourned meeting, with the view of applying for a faculty to carry on the plans that had been submitted for a new chancel, was held last week, and as the proposers, very unwisely, as it seems to us, would make no concession whatever as to the seven steps up to the communion-table, the opposition shown continued to be so strong that the vicar and his friends withdrew the plans. All the opposition said was, do without two or three of the steps: surely a small concession to make. Salvation does not depend on such steps as these.

Lamplighting by Electricity.—Mr. Hart, an experienced electrician, has pronounced a scheme for lighting up all the street lamps in Edinburgh at once from an electric battery. The saving of gas alone, without taking the other savings on ladders and lamp-lighters into account, is said to show a figure beyond the expenses of the simple lighting power. The proposal to light lamps by electricity is not a new one, as old volumes of the *Builder* can testify.

Shoreditch New Town-hall.—The ventilating tubes of the sun-burners were placed so near to the woodwork, notwithstanding the provisions of the Building Act, that an accident was feared. The suggestions of several practical men have been taken on the matter, and the vestry resolved to accept the tender of Messrs. Stucle & Co., who undertake to construct additional shafts of ventilation and other improvements for the sum of 46l.

The Female Art Gallery.—A hazard is being got up for the sale of works of art executed by female artists, the proceeds of which will be devoted to the Female Art Gallery, in Great Russell-street, Bloomsbury-square. The hazard is to be opened for five days, and close on Christmas Eve. Those who desire to encourage female art can become subscribers to this gallery.

The Proposed New College at Rotherham.—We are glad (says the *Sheffield Independent*) to be able to announce that a site has at length been obtained for the College, which is intended to supersede the present one at Rotherham. The committee have succeeded in purchasing 5½ acres of land at Moorgate, near the residence of Mr. Jubb.

Preliminary Opening of the Suez Canal. M. de Lesseps, it is reported by telegram, has passed through the whole length of the Suez Canal in fifteen hours, by steamer, the barriers which obstructed the passage of the water into the Bitter Lakes having been removed.

Bequest for Chapels and Schools.—Mrs. Burton, who died recently at Roundhay, near Leeds, has left some large bequests for charitable purposes. The total amount of her benefactions exceeds 30,000l., of which 15,000l. are to be devoted to the erection of Wesleyan chapels and schools in Cumberland and Scotland.

The Expected High Tides.—Consequent on the report of the high tides expected next month large numbers of persons residing in houses on the banks of the Thames are taking measures to prevent the water entering their dwellings.

Great Fire in Bordeaux Harbour.—Between twenty and thirty large vessels have been destroyed by fire in Bordeaux harbour. The fire originated in a lighter loaded with petroleum.

TENDERS.

For building a warehouse, 23, St. Mary Axe, E.C. Mr. H. H. Collins, architect:—
 Abrahams £936 0 0
 Ebbs & Sons 789 0 0
 Sale 794 0 0
 Cohen (accepted) 760 0 0

For building warehouse, 29, St. Mary Axe. Mr. H. H. Collins, architect:—
 Abrahams £343 0 0
 Sale 605 0 0
 Ebbs & Son 602 0 0
 Cohen 511 0 0

For building stables, Stratford-mews, Oxford-street. Mr. H. H. Collins, architect:—
 Ebbs & Son (accepted) £435 0 0

For alterations and additions to stables, Wimpole-street, Cavendish-square. Mr. H. H. Collins, architect:—
 Ebbs & Son £345 0 0
 Cohen 320 0 0
 Sale (accepted) 297 0 0

For building Mortuary Hall, Lodge, and enclosing walls for Hebrew Congregation, Witton, Birmingham. Mr. H. H. Collins, architect. Quantities supplied by Messrs. Bateston & Hart:—
 Webb £3,014 0 0
 Waden & Sons 2,958 0 0
 Matthews 2,890 0 0
 Partridge 2,819 0 0
 Creswell & Sons 2,596 0 0
 Barnley 2,493 0 0

For the erection of a villa residence, in the King's-road, Buckhurst Hill, for Mr. S. P. Willamant. Messrs. Hills & Fletcher, architects:—
 Alexander £735 0 0
 Wiehs & Bangs 739 0 0
 Sheffield 693 0 0
 Stevens 688 0 0
 Egan 650 0 0
 Grover 615 0 0

For a bridge at Ruislip, Middlesex. Mr. G. Eves' architect:—
 White £207 2 0
 Henson 206 10 0
 Cox (accepted) 82 0 0

For erecting show-rooms and offices for the City of London Real Property Company, Limited, at 25, Mincing-lane, City. Mr. Edwin A. B. Crockett, architect:—
 Gammon & Sons £2,890 0 0
 Myers & Son 2,636 0 0
 Clemence 2,300 0 0
 Newman & Nunn 2,335 0 0
 Patman & Fotheringham 2,230 0 0
 Maesy 2,189 0 0
 Abby & Son 1,440 0 0
 Brass 2,014 0 0
 Conder 1,695 0 0

For works at Philip-street, Kingsland. Mr. W. Mundy, architect:—
 F & F. J. Wood £350 0 0
 King & Sons 349 0 0
 Marr 338 0 0
 Blackmore & Morley (accepted) 239 0 0

For works at 337, Goswell-road. Mr. W. Mundy, architect:—
 Peters £163 0 0
 Higgs 147 0 0
 Marr 140 0 0
 Langmaid 139 0 0
 Blackmore & Morley 128 10 0
 Bewles 112 10 0

For works at "Old Blue Last," Curtain-road, Shoreditch, for Messrs. Truman, Hanbury, & Buxton. Mr. W. E. Williams, architect:—
 Anley £220 0 0
 Fairhall & Weekes 750 0 0
 Marr (accepted) 725 0 0

For construction of sewage tank and engine-house, for the Epsom Local Board of Health. Mr. W. Scarlett Trebarne, architect:—
 Colker £290 0 0
 Walton 799 0 0
 Clarke 774 0 0
 Chuter 754 0 0
 Doggett 667 0 0
 Farley 715 0 0
 Paice 700 0 0
 Spearing & Moy 677 0 0
 Crab & Vaughan 667 0 0
 Appleby 657 0 0
 Colker (accepted) 633 10 0

For the erection of St. Luke's Church, Halliwell, Lancashire. Medard & Henry Taylor, architects:—
 Middlehurst £5,200 0 0
 Clark 4,998 0 0
 Ellis & Hinchliffe 4,332 0 0
 Fogant 4,314 0 0
 Robinson & Son (accepted) 4,232 0 0

For new Cattle Market, Melton Mowbray. Mr. R. W. Johnson, architect:—

No. 1 Contract, for Excavators, Roadmakers, and Builders' Work.
 Lee & Alderson £4,250 0 0
 J. & G. Tomlinson 3,790 0 0
 Smart & Co. 3,759 0 0
 Herbert 3,745 0 0
 Fast 3,600 0 0
 Walker & Co. 3,588 0 0
 Thompson 3,585 0 0
 Weaver 3,488 14 6

No. 2 Contract, for Cast and Wrought Ironwork.
 Hill & Smith 1,273 15 0
 Jukes, Colson, & Co. 1,179 0 0
 Law 1,150 0 0
 Ratcliffe & Co. 1,115 0 0
 Gimson 1,107 0 0
 Haywood 1,083 0 0
 Thompson 1,083 0 0
 Sharman 1,063 0 0
 Metcalf 1,043 0 0
 Cooke 885 0 0
 Fast 870 0 0
 Southwell & Co. 865 0 0
 Richards 609 0 0

For new Infirmary and other alterations at Melton Mowbray Union Workhouse. Mr. R. W. Johnson, architect:—
 Weaver & Barnes £2,210 10 0
 Thompson 2,119 0 0
 Huldall & Cane 2,082 0 0
 Osborne Brothers 2,080 0 0
 Shipley 2,059 0 0
 Johnson 2,024 0 0
 Herbert 1,999 10 0
 Neale & Sons 1,849 0 0
 Fast 1,690 0 0

For alteration to factory at Kettering, North Hants. Mr. R. W. Johnson, architect:—
 Sharman £473 0 0
 Margdale 469 0 0
 Wilson 490 0 0
 Hawthorn 407 0 0
 Barlow & Melton 381 0 0

For alterations and additions to Craven Lodge, Melton Mowbray. Mr. R. W. Johnson, architect:—

At House and Offices.
 Neale & Sons £775 0 0
 Herbert 760 0 0
 East 732 10 0

At Stables.
 Herbert 985 0 0
 Neale & Sons 950 0 0
 East 946 0 0

For house in Mansion House-street, Hammersmith, for Mr. C. Bawn. Mr. W. L. Gumme, architect:—
 Sprinks £462 0 0
 Braithwaite 479 0 0
 Coombe 389 0 0
 Chamberlin Brothers (accepted) 359 0 0
 Richardson 348 0 0

For two houses in Regent-street, Bow, for Mr. Hayes. Mr. W. L. Gumme, architect:—
 Sprinks (accepted) £359 0 0

For villa residence at Dresden, for Mr. W. Copstake. Messrs. Scrivener & Son, architects. Quantities supplied:—
 Newbon £758 0 0
 Collis & Hudson 718 0 0
 Harvey (accepted) 709 0 0
 Hedma 682 0 0

For villa, Shelton Hall Estate, Hanley, for Mr. J. Mountford. Messrs. Scrivener & Son, architects. Quantities supplied:—
 Brindley & Critchlow £250 0 0
 Bennett & Cooke 846 0 0
 Woodbridge (accepted) 825 0 0
 Bowden 724 0 0
 Baslow 793 0 0

For shop and premises, Stafford-street, Hanley, for Mr. Boul. Messrs. Scrivener & Son, architects. Quantities supplied:—
 Brindley & Critchlow £280 0 0
 Matthews 559 0 0
 Barlow 586 0 0
 Bowden (accepted) 553 10 0

For limekiln, Hanley, for Mr. J. C. Daniel. Messrs. Scrivener & Son, architects. Quantities supplied:—
 Hedern Brothers £359 0 0

For three cottages, Tinkerslough, for Mr. Frost. Messrs. Scrivener & Son, architects. Quantities supplied:—
 Bryant £384 0 0
 R. Hammersley (accepted) 330 0 0

For sixtars, Queen's Hotel, Hanley. Messrs. Scrivener & Son, architects. Quantities supplied:—
 J. Hemmerley £350 0 0
 R. Hammersley (accepted) 345 0 0

For additions to brewery, Burslem, for Mr. H. Parker. Messrs. Scrivener & Son, architects. Quantities supplied:—
 Walley £745 0 0
 Vachin 715 0 0
 Barlow (accepted) 687 0 0
 Bennett & Cooke 660 0 0

For Ironwork for the above.
 Warner £131 19 6
 Railway Foundry Company 123 13 2
 Hales 118 0 0
 Barker & Coys 117 18 4
 North Staffordshire Engineering Company (accepted) 114 4 11

For villa residence at Erith, Kent. Mr. Herbert Ford, architect. Quantities not supplied:—
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 Crab & Vaughan 2,104 0 0
 Rayner 2,169 0 0
 Cooke & Green 2,074 0 0
 Harrison & Sons 1,990 0 0
 Harrison & Edwards 1,964 0 0
 Ladbetter 1,900 0 0
 Davis 1,899 0 0
 Heare 1,888 0 0
 Vaughan 1,880 0 0
 Blackmore & Morley 1,735 0 0
 Turner 1,730 0 0
 Nield 1,689 0 0
 Biese (accepted) 1,393 0 0

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We are compelled to decline pointing out books and giving addresses.

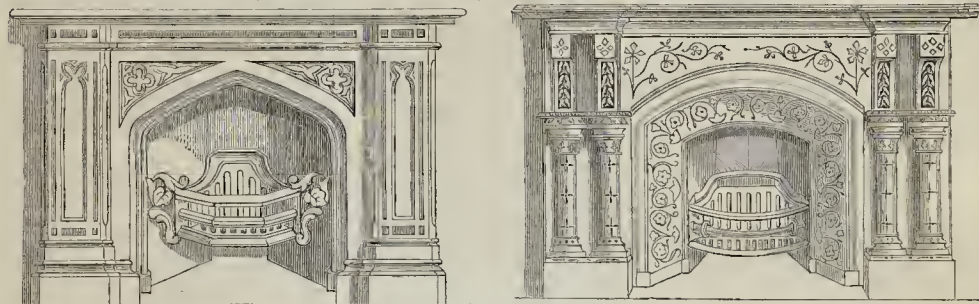
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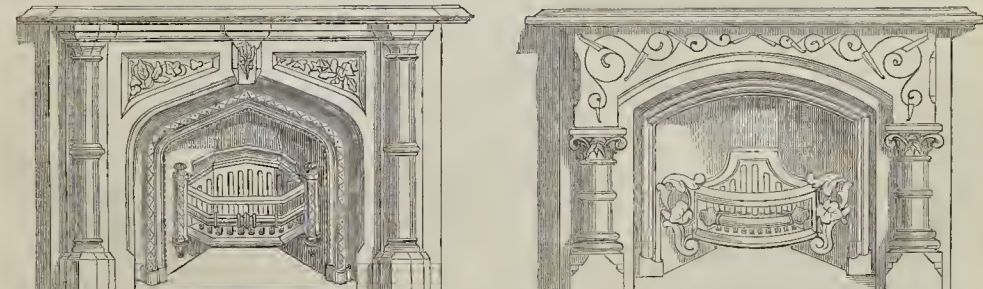
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THE EDINBURGH REVIEW, No. 266, will be published on SATURDAY, the 15th inst. ADVERTISERS intended for insertion cannot be received by the Publishers later than SATURDAY NEXT, OCTOBER 30th. London: LONGMANS & CO. 39, Paternoster-row, E.C.

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VOL. XXVII.—No. 1392.

Social Science in Bristol.

Our last we referred to the opening of the Congress of the Social Science Association in Bristol, and the address of the President, Sir Stafford Northcote. It is now closed, and so far as regards the real object of the Association must be considered as very successful. In a financial point of view it is to be feared there will not be so large a balance for the year's work of the Association as has been the case on some former occasions. The addresses of the Presidents of Departments were very good; many important papers that will influence future legislation have been read, and many valuable observations were communicated in the course of the discus-

prescribed by the supreme authority of the community; how to secure the least evil with the greatest good; how to reconcile the largest liberty of the individual with the least damage to the public need; how, in fact, to adjust the machine of society to the inexorable necessities of its existence,—that was the great problem to be solved by the science of law; and on the correctness of the adjustment, on the wisdom of the solution, depended the weal or woe of every people.

The address delivered by Canon Charles Kingsley, as head of the Education department, was truly admirable, alike in matter and manner. Implying a full discussion of certain moot questions, he bade society remember the broad, ugly, dangerous, disgraceful fact, that there are now—according to the computation of those who ought to know—about one million two hundred and eighty thousand children in this kingdom who ought to be attending some elementary school or other, but who are not; one million two hundred and eighty thousand children growing up in ignorance, in a country which calls itself civilised, but which will be called by a very different epithet some 200 years hence, unless she mend her ways right speedily. Turning then to a subject of equal importance, and one which is exciting increased interest among thoughtful women and men, the better education of girls, he said rightly, something must be done, and done on a large and generous scale, in this direction. While devising plans for educating and civilising the so-called dangerous classes, we must not forget that the most dangerous class of all—far more dangerous than street Arabs or thieves, is composed, alas! of women. And that the causes which keep that class continually recruited are not so much poverty as emptiness of brain and heart. Want of education, whether intellectual or moral, which leaves too many a fair savage, as he termed them (and too many not only of our lowest, but of our lower middle class, are nothing else), with no rational or profitable occupation, no sense of duty or responsibility, no intellectual exercise (if she can read), save the perusal of illicit and exciting novels; and no ideal life, save one which will give fullest scope to vanity, luxury, and passion. They must be taught that there are higher objects in life than finery and amusement; that they are responsible to themselves, to the State, and to God for the precious gift of womanhood. In concluding his address, Mr. Kingsley said he trusted that a system of public education for girls of the middle and upper class would organically develop itself in due time. "Some such organisation must arise, and arise soon. For a people like our own, so rapidly increasing in mere material wealth, and, let me say it, brute prosperity, can only be preserved from ostentatious frivolity and mere tinsel barbarism, by instilling a true and lofty civilisation in its sisters, wives, and mothers of every class. One word more, and I have done. Whatever we do for primary or secondary schools, or for our advanced ancient universities themselves, let us see that our primary education, and still more our advanced education, includes some better teaching of nature and of fact. Let us see that the children of these realms are taught, if not the principles of physical science, at least some of those habits of careful observation and sound induction which alone make physical science—indeed, which alone make health and wealth upon this planet—possible. No one is more deeply convinced than I am of the need of sound religious teaching. But no one is more deeply convinced than I am that even the best religious teaching, especially in these days, will bear but stunted and shrivelled fruit unless accompanied by physical teaching; and thus supported (as all human thought should be), humanized in the minds of teachers and of children alike on a

substructure of truth, reason, and common sense." Remarkable enthusiasm was excited by his observations.

The Right Hon. Stephen Cave, in his address to the Economy and Trade Section, referred thus to

The Position of British Workmen.

"We have seen that the trading industry of England dates chiefly from the immigration of skilled workmen from the Continent, who not only practised their various handicrafts, but taught them to the English. We find that their pupils were apt, and made rapid progress, especially in the southern and eastern counties. Consequently, although the earliest immigrants were welcomed, as conferring benefits in return for shelter, yet when in after years they arrived in larger numbers, flying first from the tyranny of Spain in the Low Countries, and afterwards from France, after the revocation of the Edict of Nantes, they came to be regarded not so much in the light of instructors as of rivals. The English workmen complained that they could not compete with the superior industry or greater frugality of the foreigners; and when we read that these foreigners made soup of ox-tails, which were thrown away, just as the dory was within the memory of man, we cannot wonder that they managed to live well upon what the proud islanders despised. It was said that Massena kept his army before the lines of Torres Vedras seventeen days longer than English troops could have existed, and that during the last year of the siege of Sebastopol, French soldiers made savoury meat of what was flung out as refuse from our hutchers' tents. A story need to be told of a noble Polish exile who lived at wonderfully small cost in London on cats' meat, of the composition and ordinary use of which he was wholly unware. But without going so far as this, there can be no doubt that ignorance, recklessness, and prejudice still cause the waste and refusal of excellent food among our operatives, and necessarily increase their cost of living. To return: great jealousy sprang up against the foreign workmen, resulting frequently in violent outbreaks. We have all heard of the 'evil May-day' in Henry VIII.'s time, and the order in the previous reign that hats should only be made in a city or borough, levelled at the Flemings, who had established a manufactory outside Norwich, which, together with other disabilities, had the natural effect of driving sundry manufactures back to Holland, and ruining the Norfolk capital. I think we have heard of similar rules made by the stonemasons' union about working stones in a quarry. These disputes and jealousies, and tyrannical edicts, at the time of which I speak, chiefly affected different classes and races in the same country. Incessant wars of bigotry and ambition so desolated the Continent that trade continued to flourish in England in spite of every obstacle; and the working of coal, and invention of machinery, together with the markets furnished by our colonies when the Continent was closed by war, completed the commercial prosperity of England. But the restoration of peace to Europe and America has produced its natural consequences. Coal, iron, and copper have been discovered in many districts, and the industry and frugality of the Continental workman, now on his own soil, again forces matter for complaint. The managers of the trade-unions, while loudly denying that their peculiar rules have rendered this competition more formidable, give a practical refutation of their own arguments by their anxiety to extend those rules to foreign countries. Others, again, propose to hound their foreign competitors by the re-imposition of import duties on manufactured articles. But how can it be more just to impose a tax on manufactured goods, for the protection of manufacturers or artisans, on the plea that such articles are made much cheaper abroad, than on corn, for the sake of increasing the profit of the agriculturist and wages of the labourer, on the ground of unfair competition with virgin soils and less uncertain climates?"

"Though I have said that we cannot expect to retain our high commercial position unless we preserve our character for energy and integrity, yet I must be understood to feel much apprehension on this score. Transactions have, no doubt, too often taken place not wholly consistent with the stainless faith of the British merchant; but that this faith still stands high is proved by the fraudulent devices of foreign traders for the purpose of passing off their wares as British manufacture. Foreign goods with false trade-marks



sions that followed. A certain amount of these is preserved by the labours of the press, but much of the information thus orally communicated is altogether thrown away and lost. The public, looking on casually at the proceedings of such a Congress, do not realize the number of earnest and disinterested labourers such a meeting includes, or the extent of their labours. There are men in England who spend half their lives in working for the public good without fee or reward, or any desire for it,—men who are more often sneered at than applauded, and who will be scarcely alluded to when they die, though the nation may be then enjoying advantages resulting from their labours.

Mr. G. W. Hastings, as President of the Jurisprudence and Amendment of the Law Department, made his opening address interesting as well as instructive, no easy matter on such a subject. The practical work of Social Sciences, he said, was to adjust the machinery of society so that it might move in harmony with the great necessities that impelled its progress, with the wants and aspirations of the people; and that adjustment could be effected only by the instrumentality of law. The whole material universe, so far as they could observe, was self-regulated. But when they came to man they found a change—a moral element had supervened, and the free-will, which was the grandest heritage of the race, had opened the flood-gates of evil as well as the infinite possibilities of good. Therefore those manifold evils that grew so persistently with the good fruits of man's companionship had to be repressed, where that was possible, or regulated if they could not be repressed, by the strong arm of the law. The question how best to frame the rules to regulate, repress, and reform

are shipped to England, merely to be sent out again with the clearance of the British Custom-house. And it is said that in Hamburg there is a manufactory fully employed in forging the labels of one great English firm." The right hon. gentleman went on at some length to explain the error, in considering questions of political economy, of generalising from too few instances, remarking on the mistake of those who laid all the blame of the late crisis on the principle of limited liability. He proceeded—"We are entitled to ask whether fewer companies would have been formed under the old law, and whether their collapse was owing to the new system, when we find how few were the instances in which the arrears of calls were paid up, and that in such cases, therefore, it was of no practical consequence whether the liability was limited or not. Surely it is an arbitrary interference with the freedom of action, to say that a man shall not be at liberty to stake as much or as little as he pleases on a commercial venture. Moreover, it has been proved by bitter experience that reputed wealth is a broken reed, and the frequent failure of various banks and other mercantile firms might have shaken the trust of the most confiding in unlimited liability."

The Health Department was under the admirable presidency of Dr. Symonds. We take two paragraphs from his address:—

Health Machinery.

"Dr. Rumsey, with a masterly hand, chalked out lines and parallels for the future extension of sanitary legislation, while Dr. Stewart presented strong statistics and vivid pictures of the good that must accrue to mankind when even the present very imperfect machinery of hygienic improvement has had fair play. But all of these writers afford abundant proof that if we wish to bring out the life and strength of this great people, and to

'Cleanse its foul bosom of that perilous stuff,
That weighs about its heart,'

we must have efficient machinery and a greater number of workers. They must be men accomplished in the sciences that belong to this department, and also men who have had thoroughly practical training. Their occupation must be the care of the public health, and of that only. They must be above the control, and independent of the appointment, of local boards, for there must be neither favour nor fear in their relations with local authorities and with local possessors of property. If they are thought to strain their power, and to encroach too much on public finances, that is, on local rates and taxes, let them be amenable to censure and restraint from the hands of the national administration. It is extremely difficult for locally-appointed inspectors and local boards to do their duty when they have to deal with the dwellings of the poor. They come into conflict with individual interests, often with the interests of persons powerfully influential in the locality. But there are a vast number of subjects that would fall under the care and control of such State officers, who would have no other duties to perform than those which belong to their special office. There would be no struggle between the claims of public work, ill paid, and those of private engagements, which are the main dependence of the officer for subsistence. The interests of the public would not be subject to the fortunate accident of alighting or not on an able and assiduous agent like Mr. Davies, of this city, who has zeal and activity enough to combine successfully both public and private duties. The work of such an officer as we have indicated would comprehend not merely the inspection of the dwellings and lodging-houses of the labouring classes, and streets and thoroughfares, but rivers and watercourses, also workshops, factories, and mines, would come under his survey. Again, he would have to watch the public market-places, the stall of the seller of fruit and vegetables, the shambles of the butcher, the shops of the vendors of possibly adulterated food and adulterated drugs; in fact, all places where refuse may accumulate and noxious products arise, and whence deleterious substances may be disseminated. The registration of births and deaths might or might not fall to his lot, or to that of some other medico-legal functionary; but certainly it would be his duty to watch the progress of sickness in the population, not merely as measured by death-rates. His work, like that of this Association, would be to prevent or reduce the deadly records of the public registrar, and with a view not only to save life, but also to make life happier and more useful.

Suitable Amusements.

"The great misery of the world is not dying, but dragging on a maimed, mutilated existence, in which labour is suffering, and pleasure is a burden and disappointment, a state without spring, and without light or colour, or at best a dull, monotonous *chiaroscuro*, which, if not distressing, is utterly joyless. Yet to vast multitudes life is nothing better, because in the districts inhabited the fountains of life are inadequate, or are adulterated and poisoned. We cannot very much wonder that the artisan, dulled and half stupified by the close air and ill odours of the workshop and the lodging, or by the fumes of the factory, should reel into the cheerful beerhouse or the glittering gin-shop, craving for some temporary relief to his weariness and depression. I need scarcely remark, *en passant*, that one of the most crying wants of the community, with regard to public health, is provision for unobjectionable amusement. In supplying his needs it is not enough to give him oxygen in plenty, and pure water and wholesome food: he has to be entertained as well as fed. Recreation and play are as necessary to mankind as are food and raiment. And if there are not sources of rational and innocuous amusement, then there will inevitably be riot and debauchery. An enlightened and refined community will some day provide for these things. It will not, as of old, be left to self-seeking, ambitious consuls and emperors to corrupt the people with '*panem et circenses*;' but Governments will keep a paternal eye over the sports and amusements, as well as over the health and the toil of the great mass of the community. Here, however, we are encroaching on other departments. But indeed it cannot be otherwise than that the departments should occasionally overlap each other. The mind and the body, the body and the mind; the laws that bind and the laws that loose; the knowledge that strengthens and enlivens; and the economy that provides and husband the resources of life and strength; all of these in their several requirements and operations are perpetually crossing and interpenetrating each other as the unavoidable result of the composition of man's constitution, and of its correlative wants."

Of the proceedings of the various departments we can say but little for want of space. We must confine ourselves to subjects particularly within our province.

Government and the Public Health.

Dr. W. Budd opened the subject put down for discussion, "Can Government further beneficially interfere in the prevention of infectious diseases. He said,—

"He would set out by taking up two leading positions: first, that the vast and multitudinous brood of infectious, or, as he preferred calling them, self-propagating diseases, were the great field of preventive medicine; and more emphatically that those diseases presented prevention with its great opportunity. Alluding to a chart which he had prepared of the deaths from all causes, in London, in the years 1863 and 1866, he showed that in the former deaths from all causes amounted to 69,853, and of this number 10,949 resulted from infectious diseases; and in the latter deaths from all causes amounted to 81,308, and of this number 19,625 resulted from infectious diseases. When the diseases which really were self-propagating were put in their right place, they would be nearly one-third of the total number of deaths; and nearly one-half of the total sickness; but he did not wish them to take that for more than his own opinion, which he dared say many of them would regard as somewhat exaggerated in that matter. The figures showed that of all the legions that made up the great army of death, that of the infectious diseases was at once the most active and the most deadly. They had as yet counted only the slain, and if they multiplied them by some ten or twelve, those who were wounded and amid great pain struggled through, they would have some idea of the loss of human power, and the amount of human misery which those diseases entailed upon them. He believed on the principle *Salus populi suprema lex* the means of destroying infectious diseases was the State medicine. Men would set on the enactments of the State when their herds were endangered; but why were they so slow in putting in force enactments when they themselves were threatened with disease? 16,000 men perished annually by typhoid fever, and no measure had yet been taken to destroy the poison by which that vast mortality was kept up, and thus day by day the dragon's teeth were sown throughout the land, which were to spring up armed men. To that number they must add 147,000 more, which annually passed through the protracted misery of the disease. The action of the Privy Council was excellent as far as it went; but it did not go far enough. What he would urge was, that, first, they should have a thoroughly efficient administrative department of Government presided over by a minister of public health for the superintendence of all sanitary matters, and to enforce the law on all necessary public officers; secondly, a compulsory appointment of medical officers responsible to the central department, and with salaries adequately sufficient to command the undivided services of able men, not only in large towns, but in rural districts; thirdly, the institution of fever hospitals in towns and cottage hospitals in the country; fourthly, the issue of codes of prevention, to be drawn up under the authority of central boards; fifthly, the establishment of depots for disinfectants, &c., in every union; sixthly, instruction in all public schools for the

higher and lower classes of the laws by which infectious diseases spread, and the principles to be acted on to prevent their spreading; and lastly, the institution in all medical schools of special courses of instruction in preventive medicine."

Dr. Trenoh (Liverpool) alluded to the Act of 1866, which he maintained was sufficient for public purposes, without further legislation.

Mr. D. Davies (medical officer of the Bristol Local Board) thought the Act of 1866 might be sufficient if municipal bodies would take advantage of it, and make by-laws; but they would not do so in many instances. He believed they might stamp out typhus in Bristol, but they had it brought there from Liverpool, Manchester, Glasgow, and Ireland. There was one case which was brought from Glasgow by rail, and how many were poisoned on the way no one knew. The case went to the Infirmary, and was sent thence to St. Peter's Hospital. The advantage of a central authority was that country could be brought to bear on the action generally, for with respect to Bristol at present, the only parish of St. George was always full of typhoid fever.

Dr. Pearce denied the advisability of Parliament taking further action in respect to infectious diseases.

Mr. Godwin said they would do more harm in letting the opinion go from this department than there was not any need of Government interference in the matter of health than all the other departments would do good. He would move the following resolution:—"That this meeting is of opinion that not merely can Government beneficially interfere in the prevention of infectious disease and the general promotion of sanitary reform, but that it is imperatively called on, after sufficient inquiry and after the receipt of the report of the Royal Commission, to move at once and effectively, to arrange and simplify existing statutes, to make sanitary legislation compulsory, and to assist in obtaining for the people pure air, pure water, and pure food." A great deal had been done in Bristol; there appeared to be a good Local Board of Health there, and the death-rate was improved; but it was not yet what it might be. He had seen in Bristol some most frightful places, where a good state of health was certainly not possible. Parts near the cathedral might be instanced, and near the gas-works; the Quarry, where men, and women and children were huddled together in small low rooms, without back windows, so that there was no possibility of air, and if any epidemic broke out there such was the state of health that it would carry off large numbers of them.

After long discussion, the motion was carried by a large majority; together with one moved by—

Mr. Michael, "That in order to secure the efficient action of sanitary law, it is desirable that a special department of the public State should be created for the supervision and regulation of the public health."

The Sewage Question.

At another meeting of the department, Mr. J. V. N. Bazalgette read a paper "On the Sewage Evil, its Cause and Effects, with Suggestions for its Remedy." He said pamphlets, blue books, reports, and newspaper correspondence had already accumulated a mass of contending opinions before which local boards and other authorities entrusted with the care of public health stood appalled, and whilst all were unanimous in the opinion that "something must be done," all were equally irresolute as to what particular mode was the best, and seemed waiting for "something to turn up." That irresolution and consequent most injurious delay in disposing of the sewage of towns arose in a great measure from the desire of individuals to stereotype some one particular method as the only efficient means to be adopted in every case, regardless of locality and of the varying conditions which existed in every town. As Dr. Sangrado insisted upon his celebrated specific to the manifest advantage of the undertakers, so the irrigationists, regardless of climate or locality, insisted upon flooding the neighbourhood of all towns with the crude contents of the sewers, as though marvellous crops of a rank herbage were the only desideratum, and the certain immediate precursor of the millennium. There were, doubtless, instances in which irrigation would be found to be not only the most efficient, but, perhaps, even the most economical mode; but from all he had yet seen, he was unwilling to admit any system could be considered advisable which did not commence its operations by deodorising the sewage, and thus retaining many of its most valuable con-

situations which now were wasted by evaporation and exhalation, to the manifest annoyance and injury of the neighbourhood when the operation was carried on, and long before vegetation had been afforded the opportunity of absorbing them as it gradually did, when its powers were allowed to act. It must always, moreover, be borne in mind that irrigation required large tracts of ground which could only be obtained at a distance from towns; that that required costly works to carry the sewage, with annual expense for maintenance; and he might there be allowed to quote the case of Leamington, which, with a population of 17,454, had undertaken at an estimated cost of 12,000*l.*, and entailing an annual expenditure of 700*l.*, irrespective of the interest on the original outlay, to convey their sewage two miles and a half from the town, the only receipt to set off against the expense being 430*l.*, paid by the individual who had the sewage. Referring to the various systems adopted for disposing of town sewage, he said that the one at Stroud was the best that he had seen.

Mr. W. Hoop read a paper "On Town Sewage," in which he urged that funds should be forthcoming to have the best system of sewage for large communities tested, so that the health of the public might not suffer, and the valuable matter now often wasted preserved for agricultural purposes.

Mr. S. Sneade Brown read a paper "On the Ventilation of the Sewers of Clifton." He said Clifton now extended from Clifton-road, Clifton-down, over what were until lately green fields, as far as Fodland and Whiteladies'-road, and was at the present time undergoing a still more rapid extension, and spreading itself over the intervening spaces. Taking 311 ft., the elevation given in the map for the Observatory (so called), the height of the highest part of Upper Clifton, adjoining the Durhadam-down, could not now be less than 300 ft. above the bed of the river, and the upper part of Redland stood still higher. The Clifton sewerage system was distinct from that of Bristol. It comprehended ten branches, uniting in a main sewer which discharged down a steep incline about 240 ft. above the bed of the river into the Avon, at the foot of Clifton-down, where it mixed with the contents of the great Bristol sewer, received from the outfall into the river higher up. The *Journal of Science* for October, 1866, animadverted on the commingling of the tides of sewage in the bed of the Avon so near the town as an engineering mistake, and a breach of hygienic laws. The writer described peculiarities of the sewers at Clifton, and said what he had discovered respecting them induced a reasonable doubt whether the official statement, "that the Clifton sewers do not require ventilation or flushing, as there is no deposit in it and never any accumulation of foul gases," would bear the test of inquiry. He touched on the defective ventilation in the houses about Redland-quarry, and said the sewer air diffused among some of them constituted a grievous blot on the sanitary map of Bristol and its neighbourhood, in spite of a fair supply throughout of drinking-water and the natural advantages of its elevated position. He eulogised the doings of the local board and their officers, Mr. Davies; but he believed that public representations on matters hearing directly on the public health were of essential service to every public body; and that the most dangerous condition for any community to be placed in was to have "peace, peace," cried, when there was no peace.

The *Bristol Times*, discussing the subject since, says,—"No one engaged in the work had any doubt that it would have been much better to take the entire sewage of Bristol and Clifton in a common and capacious culvert, to be carried down along the river side to its mouth; but the cost was the question: and as the plan, so far as it went, was safe, because it could be supplemented and prolonged Channel-ward at any time, the local authorities were content, for the present, to limit the system to a river outlet." We are convinced, however, with the writer, that but the cost ever so considerable, they cannot long defer a further and more finished effort.

For as
 'Heaps of dead
 Will slay their slayers by the pest they spread,'

the sewage discharge does to some extent return by tide and through locks to prejudicially affect the salubrity of at least the ancient city, which, comparatively good as its health is, might be still healthier but for this cause. We must cease to pour the sewage of 170,000 people into

a narrow river. There is no use trying to ignore an inevitable necessity. As it must be done, the present, we should say, is the next most favourable time to do it; since we have allowed a still more favourable time to slip by."

Houses for the Poor.

In the Economy and Trade Department, a paper by Mr. F. Wedmore was read. The writer began by remarking that the problem of how to provide the City poor with healthy homes at moderate rents had been rendered more difficult by the failure of successive experiments. The erection of blocks of buildings in the neighbouring country, and the institution of cheap workmen's trains, had been of little avail, as the disadvantages of living in the country seemed to the poor as great as the advantages. Mr. Peabody's model lodging-houses were too much tenanted by those who, though they might need help, certainly did not need it the most; and this observation applied still more strongly to the "Improved Dwellings" at Notting-hill, in one of which there lived a barrister. It had been thought that by giving to model lodging-houses something of the character of public works, their devotion to the legitimate object would be secured. But Acts of Parliament had done very little. Mr. Torrens's Act, introduced in 1856, was almost a dead letter. There was little use in giving to local authorities—vestries and metropolitan "Boards"—power to spend the ratepayers' money. They would not avail themselves of it. Vestries meet neither the larger view of Imperial Government, nor the feelings (personal and passionate), which were the stimulants to individual work among the poor at London. Some day the State might do much, when people had ceased to fear a "Paternal Government" that boldly took the initiative; but till then Mr. Wedmore saw no remedy but personal supervision, which, it should be remembered, could be indefinitely extended as volunteers increased. Cottages property in London was very remunerative. The writer described the atrocious state of some houses he had visited which were paying 20 per cent.

At the Ladies' Conference, Miss Octavia Hill spoke as to what she had been doing in London for the dwellings of the poor. The efforts made, she said, were directed towards raising the condition of the poor with their dwellings, rather than raise their dwellings for them. The landlords of the poor in London were almost always a low class of people; their power over their tenants was intense, for good or evil, happiness or misery. The great want, therefore, seemed to be that persons of an upper class should become their landlords, and exercise a better influence. She was speaking of this to Mr. Ruskin, and he took the matter up, and gave her money, with which houses in two poor courts in Marylebone, which bore a bad character, had been purchased. Some stables had been pulled down, and a playground made, but otherwise the houses were not altered in the main, and most of the existing tenants were retained; the one condition being, that they must strictly pay their weekly rents. In this she was inexorable, but found, so great is the power of personal influence, that she scarcely ever had any difficulties, though there were now forty families under her. Miss Hill went on to speak of the want of innocent and healthy amusement among the poor, young and old, saying that if those who had money would turn their attention to this, instead of giving indiscriminate alms, they will do good instead of the harm which they now do.

Knowledge of the Laws of Health.

A paper by Dr. Lankester, F.R.S., on "The Teaching of Physiology as a Branch of General Education" was read. He observed that children must be taught to read, and when they read it was quite as easy to teach them to read a book on the structure of their own bodies as it was to read anything else. The Universities should insist upon a physiological examination. If boys were not trained in the rudiments of physiology, surely the girls ought to be. To them as assistants of their mothers in poor men's families, and as nursemaids in the home, a knowledge of the laws of life was essential. If they were ignorant of the structures and functions of a child's body, they made mistakes which were constantly leading to the destruction of infant life. He had no hesitation in expressing his conviction that the large mortality of children under five years of age was not due to vice or

crime, but to ignorance. At least 2,000 children were suffocated annually in bed with their parents or nurses in England and Wales, and not five per cent. of those cases could be traced to vice or crime. The cause of death was the ignorance of the mother or nurse of the necessity of procuring for the children a due supply of fresh air. One of the great causes of the prevalence of preventible diseases and death all over the land was the utter and entire ignorance of the majority of women of the laws which governed health and life. The amount of suffering and wealth that might be saved by a knowledge of the laws of disease was incalculable.

The Workmen's Meeting, always a feature at these congresses, was held in the new Colston Hall, of which we gave a view a short time ago. The meeting included some 3,000 earnest and attentive listeners, and was a fine sight. Concerning what was said there, and other matters, we may find an opportunity to speak. We would simply add here, that Mr. Edwin Peers and other officers of the association exerted themselves, together with some of the members of the local committee, successfully in carrying out the arrangements of the week. Such meetings do not manage themselves.

THE ART LIBRARY AT SOUTH KENSINGTON.

So many are the facilities which are offered to the students of art, of architecture, and of engineering, military, civil, and mechanical, by the various educational collections that are grouped together under the general title of the South Kensington Museum, that a long list of novelties may be frequently described under that comprehensive heading. One branch of this institution, to which we are sure that many persons will be grateful for having their attention directed with some precision, is the Art Library.

It is well to state, in the first instance, that the full advantages which this valuable collection of books and engravings offers to the public are as yet, to no small extent, counteracted by the inadequate accommodation at the disposal of the librarian. Four rooms, squeezed out from the North Court, imperfectly supplied with borrowed light, and confined to an area which, measured on the published ground-plan of the Guide Book, does not exceed four hundred superficial yards, form the present most insufficient lodging of the Art Library, together with the reading-room, which latter only affords an available table space of less than 2 ft. to each person. It is but fair to say that no one can more distinctly perceive, and more perseveringly deprecate, this orphaning parsimony of space than does the learned and courteous librarian himself. "The arrangements for readers," he reported last year, "can scarcely be called accommodation." "Additional room," he again complains in his last report, "is more urgently required than ever." The space which was insufficient for the requirements of readers four years ago, has become wholly inadequate for a number nearly double that of those who attended in 1864 or 1865. "The necessity of having space for the exhibition of the collection of drawings, prints, and photographs, of architecture, ornament, &c., becomes more pressing as the collection increases in extent and value, and the requirements of students seeking aid in the library, not from books only, but from its store of art illustrations, become more varied."

The want of proper accommodation compensated, it is proper to add, as far as is at all practicable, by the intelligence, patience, and courtesy of the librarian and his assistants. Students who have become accustomed to the manipulation of the illegible temporary catalogues of the British Museum, and to the loss of from 20 to 90 minutes incurred during the process of fetching from the shelves any volume of which the would-be reader has succeeded in discovering the press mark, indicating its exact position in the library, experience a pleasant surprise on their first occasion of consulting the Art Library at Kensington.

The readers there do not appear to be considered in the light of intruders, of public enemies, or of ignoramuses, shamefully ignorant of the one criterion of education—knowledge of a MS. catalogue which forms in itself an unindexed library. If the object of research be indicated, the officers of the library take an interest in aiding the pursuit. They seem to have not only a personal acquaintance, but an

intimate friendship, with the authors whose works are on the shelves, and to take positive pleasure in affording such an introduction as the student may be blindly attempting to obtain. On any subject in illustrations of which the Art Library is rich, and the student, wishing to be exhaustive in his search, is not previously acquainted with the literature, more information can be garnered at South Kensington in a day than at Bloomsbury in a week or more. The South Kensington staff, in a word, are not attendants, but assistants.

The total number of volumes and pamphlets in the library is now 25,334, being an increase of 6,267, over that of the preceding year. The total number of drawings and prints is not mentioned in Mr. Soden Smith's report, but 5,133 have been acquired during the past year. 7,878 additional photographs have raised the number of these works of art to 32,273. A copious index to the collection has been printed, which forms, taken with the photographs themselves, an iconographic dictionary of objects relating to art more comprehensive than has been hitherto attempted.

It is calculated that there exist upwards of 30,000 old books of a strictly art character, all of which it is wished to include in the library. Some of these are scarcely attainable from their rarity, but the great majority can be purchased. The acquisition, however, of all important old works becomes daily more difficult; prices are rapidly rising; and the competition of private collectors, and of the agents of public libraries, especially those of the United States, is constantly becoming keener. Sir R. Colt Hoare's "History of Wiltshire," Hasted's "History of Kent," and Bridge's "Northamptonshire," have been among the most valuable purchases of the past year.

Librarians and purchasers of books, no less than literary students, will look forward with great interest to the completion of the "Universal Catalogue of Works on Art," on which the editor of catalogues, Mr. J. H. Pollen, has been engaged since 1867.

The contents of an art library, although far from miscellaneous, will yet be found to rank under very distinct categories. Of these the first may be regarded as that of descriptive technical work, such, for example, as the valuable illustrated manuscript of Cavaliere Cipriano Piccolpassi, written in 1545, entitled, "I tre Libri dell'Arte del Vasajo." Descriptions, such as this unique volume contains, of the processes of foreign or of ancient art manufacturers, are of the highest value and importance to the student, and it is the aim and object of the directors of the art library to acquire every existing work of this description. After MSS. from foreign works, rank translations, such as that made by M. Stanislas Julien from the original Chinese, and published under the title, "Histoire et Fabrication de la Porcelaine Chinoise." Those ancient volumes are supplemented by the literature of the day, as in the case of Bronziart's "Traité des Arts Céramiques," the "Description Méthodique du Musée Céramique de la Manufacture royale de Porcelaine de Sèvres," and the last edition of Joseph Marryat's "History of Pottery and Porcelain, Mediaeval and Modern."

After works of technical description may rank those of illustration, properly so called. Such, for instance, are the numerous and noble folios containing engravings of the principal European galleries and collections, as the Gallery of the Florentine Academy, the "Description du Musée Royal des Antiques du Louvre," by M. Le Comte de Clarac; that of the "Real Museo Borbonico," at Naples; the "Musée des Monuments Français," by Alex. Lenoir; "Il Vaticano descritto ed illustrato," by Pistolesi, and numerous catalogues, handbooks, and descriptions, of various collections.

Works that are incidentally illustrated, and prints and engravings which, if of no great intrinsic excellence, are of value in illustrating the history and progress of graphic art, form again separate portions of the library. The bequest of the Reverend Channcy Hare Townsend to the Art Library included "all books in his library containing engravings." It is evident that if such a wide limit as this be fixed for the contents of the library, its future extension must be so enormous as, to a considerable extent, to interfere with its present most valuable characteristic, that of the instant accessibility of its contents.

A catalogue of "the Library of the Division of Art, at Marlborough House," was printed in 1855. This work, although referring only to some 5,000 volumes, may be regarded as a sort

of programme for the future catalogue of the Art Museum, and in that capacity is worthy of consideration.

The classification of this catalogue is imperfect, the arrangement being partly alphabetical, partly according to subjects, and partly according to the names of authors. The essential principle of all sound cataloguing—the double arrangement of index of subject and index of author—is lost sight of. The volumes included in the library are recounted, under the names of the authors when known, and under the title of the subject when anonymous, in the series which are thus arranged:—A. Alphabets, Writing, &c. B. Anatomy, Physiology, &c. C. Antiquities, Ancient and Mediaeval, D. Architecture, E. Art: 1. General; 2. Practice; 3. Taste, Theory, &c.; 4. History; E. Biography. And so on to Z. Trades. Under the respective heads the same disorder prevails. Thus, "Architecture" is followed by "Art, the Pictorial Gallery of, Useful and Ornamental," "Assisi, San Francesco d'," "Description of the Church of," "Auber, M. l'Abbé, Histoire de la Cathédrale de Poitiers, &c." In a small list of 5,000 volumes it is possible to find what is required, even when thus loosely arranged, by turning over page after page. For a catalogue of a large library, such a system of entry is of little use.

If we take, without farther criticism, the twenty-eight heads into which the Art Library is thus prospectively divided, we shall see that they are such as to admit of a systematic distribution, as the bases of a very available method of classification.

1. Thus, commencing with the literature of the subject, we should group together under the first division the several heads of:—1. Alphabets, Writing, &c.; 2. Biography of Artists; 3. Dictionaries, Glossaries, &c.; 4. Systems of Drawing and Graphical Instruction; 5. Geometry and Perspective; 6. Periodical Literature.

II. Descriptive works would follow in the second division, ranked under the heads:—1. Topography; 2. Antiquities, Archaic and Mediaeval; 3. Monuments; 4. Architecture; 5. Engineering, Building, &c.; 6. Heraldry; and 7. Costume and Habits.

III. Natural history claims a division to itself, including anatomy and physiology, together with descriptive natural history.

IV. Artistic works, strictly so called, rank under the heads of:—1. General Art; 2. Sculpture; 3. Painting; 4. Glass; 5. Decorative Art; and 6. Galleries, Museums, &c.

V. Manufactures, trades, and miscellaneous works complete the distribution of the heads already designated into an orderly and intelligible series. The works catalogued under each head should be arranged in the alphabetical order of the principal subject treated of or set forth in such title. A nominal index, or list arranged in the alphabetical order of the writers' names, should accompany such classified catalogue; the whole contents of the library being ultimately referred to in a general nominal index, which might be reprinted at intervals, say of ten years.

If on the reception of each book its title were immediately copied out and printed on a slip of paper, the subject chosen for insertion in the classified catalogue and the surname of the authors being printed in large black letters, so as to be legible at a glance, a book containing a series of these slips would form the day-book, or credit waste-book, of the library. The arrangement of the slips themselves in the draft catalogues might thus take place, *de die in diem*, with the very smallest amount of labor. Catalogue and index could be carried on at the same time; and no good reason could be given why every work, before it had been seven days in the hands of the librarian, should not be thus recorded in the three distinct entries of register, catalogue, and index. To call a mere nominal index a "catalogue" is a perversion of terms.

In the case of anonymous works, no insertion would be made in the index. Works attributed to any author would be entered under the supposed name; an addition, or note, being printed on the title slip, stating the grounds of the attribution. Works signed by initials would be indexed under the last letter of such initials.

The system of cross references, which is carried to such an intolerable extent in the British Museum catalogue, would be greatly simplified by the use of printed slips. In most cases it would be sufficient to paste a portion of the slip only in that part of the catalogue from which, under the ordinary arrangement, the cross reference is usually made. The words in

the title which are distinguished by capitals, and which may be considered as forming a subsidiary title, are those which would thus appear in the catalogue. Thus, if we take an example at random from the catalogue to which we have referred, we find a title of six lines, commencing, "AUBER, M. l'Abbé. Histoire de la Cathédrale de POITIERS." In the register this title would be inserted in full and designated by a serial number, which would denote the date of its acquisition; it would also be found in full in the index under A, and in the catalogue under P; a single line would be found under C in the list of cathedrals, the black letters being sufficient to lead the reader to turn to P for fuller information.

There is a class of books, now assuming extreme importance, which is not to be found under either of the above heads. We refer to *éditions de luxe*, or illustrated books proper, such as the Bible and the "Idylls of the King," illustrated by Doré. Objects of elegant refinement, rather than of educational art, such works will in time form a library in themselves, and, in the mean time, should be classed in a distinct catalogue.

The means of consulting foreign periodical literature which is afforded by the Art Reading-room at South Kensington are ample and valuable.

French, German, Italian, and Spanish serials lie on the tables, beside English journals. It is highly instructive, if not highly satisfactory, to compare the styles of illustrations adopted by ourselves with those of the Continent. The general superiority of the French artists in this respect can hardly be contested. As far, however, as we can form an opinion, the main element of superiority is to be found in the care given to the actual operation of printing.

The Art Library at Kensington, small, but rapidly increasing in size, and miserably cramped for space, yet offers to the student such facilities as he will find in no other establishment in this country. Hardly any subject of study, in any way connected with art, is unrepresented.

The facility of consulting, at the modest expense of 6d. per week, the rarest and most costly volumes, is as yet far from being realised by the public. It is a matter for great satisfaction that this facility has hitherto been so little abused; a liberal and generous treatment seeming to produce a corresponding return. Such a work as that on the "Antiquities of the Russian Empire," produced under the direction of an Imperial Commission, with 4to text, and six volumes folio of plates,—a present from the Emperor of Russia,—may be cited as one of the treasures of the library. "L'Histoire des Arts Industriels, par Jules Labarte" the great work by Franz Book, containing representations of the regalia of the Holy Roman Empire; the work now in course of publication, under the auspices of the French Government, by M. Prisse d'Avennes, under the title, "Histoire de l'Art Egyptienne, d'après les Monuments les plus recueillis, jusqu'à la Domination Romaine," are productions of the same princely splendour. The privilege of access to such volumes can hardly be too highly rated.

The treasures of high art that lie *perdu* on the shelves of the Art Library are no less precious than the literary stores. Rare old engravings, photographs of the original sketches of the greatest artists, illustrated descriptions of the principal European galleries and museums, supplemented, as they are, by the publications of the Arundel Society, tempt the man of taste to linger within the walls. Nor are original MSS., or original drawings, excluded. Perhaps the chief artistic gem of the library is the Italian note-book of Flaxman, an oblong book, of stout drawing-paper, on which the objects that chiefly attracted the attention of that artist in a tour through the Italian peninsula are drawn with bold, careful, vigorous touch. It is highly noticeable, as illustrative of the peculiar bent of Flaxman's genius, that it is on the relics of Roman antiquity that his attention was mainly fixed, to the exclusion of the no less picturesque, and far more vividly instructive, features of the Italian life of the present day,—a life which, as dependent on an unchanged climate, is an exponent of the habits and customs of ancient Rome, as valuable and instructive as either tombs, or busts, decorated friezes, or crumbling mosaics.

We are by no means certain that the authorities of the South Kensington Museum will be disposed to thank us for directing, so far as our voice can reach, the attention of the public to a portion of their establishment which,

though rich and tempting, is as yet so inadequately housed. But we write in the interest of the public, and with the conviction that it is only requisite that the actual contents and ready accessibility of the Art Library should be known, to produce such an influx of readers as to render delay in the erection of a proper library impossible. We have just heard it stated, in very loud and very unanswerable tones, that it is not the more educated class who criticise, admire, and stay away, that renders any adequate support to those who endeavour at once to please and benefit the public. As the drama finds its chief patron in the multitude, so must an institution like South Kensington, whether we regard the schools and educational collections, the Art Museum, or the Art Library, find its chief supporters and most numerous frequenters, not among those who are satisfied with the present state of their education in matters of taste, of art, or of science, but among those who are eager for instruction. Let those who consider their education finished stay away.

But for those who would reverently regard the wonders of the past, who would watch the footsteps of the great masters of ancient or of Mediaeval art, who would take counsel with the careful writers, and learn from the patient draughtsmen and engravers, of countries and of times more artistic than our own, we have but one word to say. In no spot in the world, be it where it may, will they find so readily accessible, so much to educate, to delight, and to amuse at once the taste and the intelligence as in the Art Library and Museums of South Kensington.

THE CITY HIGHWAYS.

We are glad to see that some suggestions which appeared in our columns in reference to the present condition of the eastern portions of the metropolis are shared in by Mr. Haywood, the engineer to the City Corporation, and are not unlikely to form the basis of important improvements which are now held in contemplation by that body. We made allusion in a late impression to the expediency of an addition to the present number of bridges over the Thames, more effectually uniting the opposite shores of the river below London Bridge, and we observe that the apprehension which we expressed upon the occasion as to the inadequate accommodation which would be likely to be afforded by the construction of subways under the river is more widely entertained than we had supposed. It is acknowledged that superior facilities would be acquired by bridge accommodation and the construction of subsidiary railways towards the relief of the compression of the City traffic.

Mr. Haywood is in accord with us as to the hesitation which would be likely to be declared with reference to the usage of subways, and has proposed the erection of a bridge nearly in the line of direction, which is occupied by the present tunnel from the Tower to Brompton. Those localities unquestionably possess arguable claims in regard to the accommodation which would be extended to them by such a structure; nor do we imagine from the circumstances of the case that in the immediate adoption of this proposal, any consequences of such a character as might, at first sight, appear calculated to ensue need be apprehended with reference to the underground tunnel. Viewing that work for a moment simply as a proprietary work, in the execution of which a large amount of proprietary capital has been already expended, we believe, that it cannot fail to be remunerative. It is obvious that with a capacity restricted within certain limits, as that of the subway professedly is, it could not hold out anything like the amount of accommodation that is demanded between the localities which it joins.

From the preponderance of traffic at these parts, the tunnel is likely to meet with employment up to the fullest extent of which it is capable. Tolls for a few days on London Bridge would defray the total cost of the erection of the subway. So singular, indeed, is this structure in its general features, and the cheapness with which it has been contrived, that the gratification of the novelty which it embodies would almost liquidate the expenditures which has been incurred. We wish to be understood as stating this far from disparagingly. The illustration here afforded by Mr. Barlow as to the possibility of conveying heavy weights from space to space will yet assert important claims to attention, and be wisely adopted. It is the nearest

approach to a material telegram without a battery, advancing in the teeth of pneumatic resistance itself, and the principal objection which may be alleged with reference to it is, perhaps, that it is not a highway. There are numerous circumstances under which its employment would not be exposed to such objections as may now attend it. Many of the suggestions which are embodied in the compendious report as made by Mr. Haywood, and now issued,* from the magnitude of the difficulties with which he has to deal, are necessarily extensive in themselves.

They for the most part intimately concern the welfare and interest of the community at large, and no doubt in some cases are pronounced with the view of eliciting public approval or concurrence, if not with the express object of inviting an attentive criticism. We are induced to recur to the subject of the present commercial limitation of the metropolis, not simply on account of finding our former views so largely shared by the Engineer to the City Corporation with reference to the necessity of the erection of bridges below bridge, subsidiary branches of railway in the eastern portions of the metropolis, and with regard to the minor utility of tubular driftways or tunnels under the river, but from the masterly scope which Mr. Haywood has given to the inquiry.

The variety of means comprised in his recommendations has led to a reconsideration of the impressions which we entertained as to those means which would most effectually, in our view, operate towards the accomplishment of some of the desired objects. The present extent of the city area appears to us an element in the case which has not yet perhaps been sufficiently weighed. The municipal area is but 631 acres, and how far we may be justified in opening up readier means of access to within those constricted lines is a subject which of itself is fairly entitled to some consideration as the case stands. Within these limits it is calculated that nearly one million persons congregate daily. Following, with some timidity, the figures upon which Mr. Haywood proceeds, we are led to the supposition that within thirty or forty years two millions of persons will insist upon finding accommodation within the same area. A communal police, an ingredient which few would regard favourably as a necessary constituent of traffic reform upon which the City Engineer seems somewhat disposed to rely for assistance, might, under the circumstances, discover a wide employment, but not exclusively in that harmless direction which is assigned to them. A comprehensive arrangement we believe would not involve the manifestation on their part of a greater amount of concern for our personal safety than they now display.

We are indisposed to draw largely upon the figures contained in, and suggested by, this report; but inasmuch as we have already alluded to the inequalities which may be perceived in reference to the distribution of the inhabitants over the metropolitan area, we would advert to the results which have been obtained in this direction by Mr. Haywood.

A line continued in a straight course with London Bridge to the extremities of the inhabited areas of London, at both sides, would represent, with regard to the population, a state of things to which many of the difficulties of the present situation may be referred, and which has hitherto engaged but little attention. Mr. Haywood appears to have arrived at the supposition that in a short time the population at either side of such a line would nearly balance, and tends to preponderate eastwards. As we have before remarked, at one side there may be discovered numerous means of intercommunication across the river, while on the other side not a solitary instance of the kind attracts attention, or exists to the sight. We are inclined to regard this circumstance as the chief cause of what is now not only intolerable, but grave and threatening in its growing aspect. Mr. Haywood remarks that "it would be interesting to ascertain the distance needlessly traversed annually by vehicles and pedestrians, owing to the want of a bridge lower down the river than London Bridge, and no calculation yet made upon such subjects would show anything approaching the immense loss of time, loss of labour, and loss of money which the absence of another bridge imposes

* "General Improvement of the City. Report to the Court of Common Council from the Improvement Committee, with Report from W. Haywood, esq., C.E., Engineer to the Commissioners of Sewers, in relation to the Traffic of the City."

upon the traffic and population of the north-east and south-east of London."

It is not, however, in our opinion, one bridge only or two bridges which would substantially effect a relief of all the increasing exigencies of the position, but three or four, or even a greater number, would appear not far from being demanded and desirable. The City alone is not the only precinct of London susceptible of considerable amelioration. The further development of Shore-ditch, in anything like the time extending over the report, represents both a psychological and physical problem. There are many other places which would be embraced and included in a comprehensive rectification of frontiers, to adapt a French expression, of the City and the improvement of its approaches. This task now devolves upon the Corporation, and, if done, could be done once for all.

The numerous railway stations already terminating in localities within or adjacent to the City boundaries, are regarded as being likely to contribute a novel element of mischief. This we do not consider to be a consequence fairly to be apprehended.

The railway branches now entering the City principally facilitate an earlier arrival and later departure to and from the City offices than was formerly practicable; and, in our opinion, add but little to the normal insufficiency of that accommodation which is now experienced. As a means in any degree operating towards the reduction of vehicular traffic, which we are inclined to view as a radical source of the existing confusion, they are comparatively valueless; but they exercise some effect in marking off those periods when foot traffic and vehicular traffic combined reach their maximum points of danger.

Any means which could be devised to diminish the vehicular traffic would operate more successfully than endeavours to accommodate it. The difficulties of the case do not appear in so far a way of being met by providing a further accommodation for the traffic already existing as in getting rid of some portions of it and preventing its access.

The short extract which we have quoted from Mr. Haywood's report with reference to bridges below bridge we think supplies a key to the whole difficulty. The traffic which approaches in converging lines, along both the Eastern inlands from the river towards the nearest accessible bridge, would be subdivided, at points where such traffic pertains, by the erection of more local accommodation than that which London Bridge affords. As a parallel case, let it be supposed that all the bridges west of London Bridge were translated eastwards, and that the traffic now conducted between the two shores were compelled in the direction of London Bridge. The contrast is far from comprising such an exaggeration of the circumstances as might readily be entertained.

As an important feature amongst the improvements recommended for adoption by Mr. Haywood, the establishment of steam-ferry services at points along the river below the Tower would take a principal rank. Those who have witnessed the convenience which is afforded by the steam ferries plying across the Mersey will regard this proposal as possessing many claims to consideration. Ordinary steam-boats, such as those now navigating the Thames, would, however, be inadequate for such a service, and a number of new vessels would necessarily have to be designed and constructed in order to be of any avail in the interchange of produce and merchandise over the river.

While such an amount of maritime traffic as that which is now localised in the direction of London Bridge is continued it would be hazardous to look forward to the successful working of a steam-ferry system, however well contrived. The interception of such traffic at points further below bridge seems to be an essential element in any project to extend or reform the condition of the City.

An alternative proposal is submitted in the construction of bridges with central draw-spans; but here again unquestionable inconveniences would arise in the adoption of a bridge such as is suggested, containing a central moveable opening to admit of the passage of masted vessels. It would convey but little of that accommodation which is expected from bridges in ordinary; nor do we imagine that restrictions or regulations as to its intermittent employment within stated times, for naval and other traffic, would be found to work advantageously. The central span presents insurmountable difficulties.

It would require to be large in proportion to the length of the bridge, and the severance and reunion of the platform would be attended by many vexations and cost. A very fine example of the class of structure herein indicated was, some time since, designed by Mr. Pogo for erection over the river Hooghly, at Calcutta, consisting of four spans of 400 ft. each, and a central draw-span of 80 ft.

It is remarked in Mr. Haywood's report, that the removal of Middle-row, Holborn, in union with the large undertakings in course of completion under the Corporation's auspices, will in no degree sensibly alleviate the existing congestion of the City area, an intimation which we are readily prepared to accept. These improvements have been accompanied by the extension of the terminal stations of some of the main lines of railway into the centre of the metropolis, which would go far towards diminishing any relief which might originally have been expected from these measures. The union of the main lines with the Metropolitan system is not yet complete, and the proximate extension of the Great Eastern Railway, with this object, is daily encroaching upon various properties in the busiest and most capacious parts of the East Central district. An important range of buildings, including the premises forming Miles's Builders' Materials Entrepôt, are now being cleared, with the object of bringing the Great Eastern line into more effectual operation, and numerous habitations are in this direction threatened with removal. These points all tend in favour of an unrestricted and far-reaching scheme on behalf of the City, rather than a mere extension of the existing thoroughfares and the construction of new streets.

The increase of the population within the metropolitan area, based upon calculations which extend over nearly seventy years, gives a population to begin with in the year 1800, a period which many now living will witness of 6,000,000 of inhabitants, or about six times the magnitude of the population as it stood at the commencement of the present century. A more wonderful exposition of the phenomena of human life it would be difficult to submit. Never before assuredly in the history of the world have so many singular features united towards the foundation of such a state and condition of human existence as that represented at the present day.

Nineveh, one of the most notable cities of antiquity, was but 14 miles long, by 8 miles in breadth, inclosed by a wall 100 ft. high, 46 miles round, and thick enough for three chariots abreast. Babylon was 50 miles within its walls, which were 75 ft. thick, and 100 ft. high, and pierced with 100 brazen gates.

The walls of Rome were but 13 miles round, and the city was estimated to have arrived at a maximum population of rather more than four millions of inhabitants. The first census which was taken of Rome occurred 566 years before the birth of Christ, and after an interval had elapsed of nearly four centuries from the presumed date of the foundation of that city, according to the historian Varro. The frequency with which the increase of its population was noted and recorded up to the time of the rebuilding of the Capitol demands the most serious attention of civilised communities. When the Pantheon was erected, under the reign of Augustus, the population is computed to have reached four millions, and it so remained during the lifetime of our Lord, whose birth occurred about this time. The city of London was founded by the Romans in the fiftieth year of the Christian era, Caractacus at that time being taken prisoner to Rome. Since that period we possess access to historical records sufficiently authentic to establish an unbroken and continuous succession of events down to the discovery of yesterday of the Roman pavement in Bucklersbury.

The city of Cordova, under the dominion of the Saracens in Spain, possessed more than 200,000 houses, and more than a million of inhabitants. After sunset, it is said, one might walk through that city in a straight line by the light of the public lamps for a distance of ten miles, while seven hundred years after this time there was not so much as one public lamp in London. The streets were solidly paved, while in Persia, centuries subsequently, whoever stepped over his threshold on a rainy day stepped ankle-deep in mud. "The Spanish Mahometans had brought with them all the luxuries of Asia. Their residences stood forth against the clear blue sky, or were embosomed in woods. They had polished marble balconies

overhanging orange gardens; courts with cascades of water; retiring-rooms vaulted with stained glass, speckled with gold; and the floors and walls were of exquisite mosaics. Here a fountain of quicksilver shot up in glistening spray, the glittering particles falling with a tranquil sound like fairy bells. There were apartments into which cool air was drawn in summer from flower gardens. Clusters of frail marble columns, surprised the beholder with the vast weights they bore. In the boudoirs of the sultanas they were sometimes of verd antique, and encrusted with lapis lazuli. Through pipes of metal water, both warm and cold, to suit the season of the year, ran into baths of marble. In niches where the current of air could be artificially directed, hung dripping alcarazzas. There were whispering galleries for the amusement of the women, labyrinth and marble play-courts for the children; for the master himself grand libraries;" and at this brilliant scene, it is said that barbarian Europe lighted its lamp of civilisation. If such were the case, we must confess that its lamp has yet been scarcely sufficiently well trimmed to discover some of its more important needs. The baths and aqueducts of Rome are still conspicuous by their absence, and the lavatories and marble play-courts of Cordova would be taken to reflect upon the sanity of a Briton. The hurry of life and money-making is so great with many, that a meditation upon the wider and more lasting foundations of life appears impracticable in the main. But we have gutter children and coroners' inquests, and poverty lies quietly down amongst us, to perish upon thresholds of gold. In some points we have omitted to reproduce those common adjuncts of decency by which only an improvement in the manners of a civilised people could be detected.

To revert, however, to the question of the prospective increase of the metropolitan population to the extent and within the time predicted, we have to take objection to the necessity of still further condensing any portion of that population within the prescribed boundaries of the area of the City. If out of the population that is to be one million and a half will find their occupation in the direction of Threadneedle-street, why not at Clapham or Wimbledon, Hampstead or Crayesend? There is as much intercourse, and profitable intercourse, carried on between London and Liverpool, as was formerly possible between London Bridge and Chelsea. There are at this moment nearly 13,000 miles of railway open and in operation in the United Kingdom, finding a common centre within the heart of London. Had Rome possessed such facilities as these, it is possible that some method would have been devised to increase the extent of its commercial centre, at least beyond the dimensions of 631 acres, and might even have taken into consideration the asphyxiating system of bodily refreshment which, as far as the rising generation is concerned, is enacted there. The scheme of the Metropolitan Railway is not only capable of conferring the means of speedier access to and from the City, but would effectually govern new centres of industry and trade. It is now a laocoon struggling with the stream of human life. Viewing the wholesale remodelling of streets and thoroughfares suggested by Mr. Haywood's report, the magnitude of approaching highways asserts some claim to reference.

Foremost amongst these in the southern side must be reckoned the Clapham-road, which, meeting with a slight diversion at the Elephant and Castle at Newington, hursts into architectural fireworks at Clerkenwell-green. The Old Kent-road and Walworth-road unite at a point in advance of London Bridge, and expand inconspicuously immediately they cross over that narrow path, the main direction of the united roads continuing from the other side of the bridge as far as Stoke Newington and Stamford-hill.

The road originating at Blackheath runs continuously until it disappears in the vicinity of Buckingham Palace. When we have named the Wandsworth-road, which itself terminates in the Clapham-road, we have exhausted the cardinal highways of the southern portion of the metropolis. In magnitude they are surpassed by the vast thoroughfares which span the boundaries of London at the Middlesex side. There is one continuous road from Hammer-smith to Stratford with a parallel inside road terminating in Lincoln's-inn-fields by Great Queen-street. From Marylebone to Victoria Park, and Hyde Park to Edgware, would about enumerate the main arteries of Metropolitan Middlesex.

Within the limits thus roughly sketched there are computed to be no less than 500,000 human habitations, affording accommodation to a fixed population of one seventh of the entire inhabitants of the United Kingdom. Nearly one-half of the adult portion of this population at some time daily enter the City, and we are glad at length that some steps have been resolved upon to provide that accommodation which has been so long demanded. This, in our opinion, cannot satisfactorily be arrived at by any means which would encourage further traffic citywards, but by the subdivision of the existing traffic along the course of the Thames eastwards by means of several bridges and the discharge of maritime traffic further down the river.

SHAKESPEARE ILLUSTRATED.

A FEW weeks since we devoted some little space to remarks, descriptive and critical, with reference to the redecoration of the Prince's Theatre, at Manchester. We have now to bestow a passing word on the very carefully and artistically got up representation of the "Winter's Tale," which has been produced at the same theatre, on the model of what was done by the late Mr. Charles Kean at the Princess's Theatre, London. Mr. Calvert, the manager, in the preface to his acting edition of the play, combats the idea that there is anything inimical to the highest exercise of the actor's art in the addition of elaborate scenic illustration. As scenery and costume of some kind are indispensable, to contend that their correctness and effectiveness are a matter of indifference, is to "acknowledge the wrong thing better than the right, and own that to be inappropriate is better than to be appropriate;" and, as a close student of the art of acting, he asserts that "not only is the audience the more impressed by the realism of the *mise en scène*, but that the actors themselves undoubtedly derive an impulse from it." Following out this principle, not only has the play been brought out with the best scenic effects that could be obtained, but the whole of the ornaments, costumes, dances, and other adjuncts have been made subjects of study, and antiquarian authorities consulted in reproducing them. The architecture of the various interior scenes has been designed under the supervision of a professional architect, and the scenes were painted by some of the most accomplished artists in this branch of painting. Particularly good are the second scene, act i., a summer apartment in the Palace of Leontes, and an apartment in the Palace of Polixenes (act iv., scene 3); the latter, which is a "front scene," is an excellent piece of illusory perspective. The only defect we should notice in the architectural portion of the scenery is in the front of the temple at Syracuse (act iii., scene 1), where the columns are too tall and thin in proportion, especially for what must be supposed to be Sicilian Doric.

The hand is a far better one than is found in some of the London theatres, and the whole of the music has been arranged with special reference to the scenes and situations it illustrates, and thus becomes an addition to the total effect, instead of a mere excrescence. Our limits do not permit us to enlarge upon the quality of the acting generally; but we must allude to Mr. Calvert's impersonation of *Leontes* as a carefully studied and artistic effort, especially notable for that careful attention to minutiae which is always the mark of a really finished actor, and which is sometimes neglected and its absence supposed to be atoned for by some noteworthy point in one scene, to which everything else is sacrificed.

The principle before urged in this journal, of bringing true artistic skill to bear upon all the accessories of a theatrical representation, has been carried out here with a degree of care and intelligence which deserves wider recognition than that of a provincial town.

The Armenian Church, Manchester.

A paragraph, on p. 793 in our last issue, gives an account of the erection of an Armenian Church in Manchester; this should be Armenian, if, as we suppose from our correspondent's description, it is the national church of Armenia that is meant. We have Armenian Churches in abundance,—that is, for those who, like the Wesleyans, adopt the doctrines of the Dutch divine, James Arminius, on free grace. Wesley called the magazine he established *The Arminian Magazine* (now the *Wesleyan Methodist Magazine*).

THE DRAINAGE OF BRIGHTON.

The General Purposes Committee has passed, by 7 to 5, a resolution approving of Mr. Hawkshaw's plan for the drainage of Brighton by an intercepting sewer from Cliftonville to Portobello, and recommending the council to give the necessary Parliamentary notices for obtaining an Act in the next session giving the necessary powers. An amendment was proposed:—

"That, as Mr. Hawkshaw agreed with Mr. Hawley and Dr. Letheby that the present system of drainage was not injurious to the health of the inhabitants,—in which they were borne out by the Registrar-General's report,—as the proposed alteration of the system involved an expenditure of not less than 80,000*l.*; and as the council was equally divided in their opinion as to the necessity of such alteration, it was not advisable to give the Parliamentary notices now asked for until the effects of the alteration of the central and western outfalls had been tested, the co-operation of the adjoining districts obtained, and the opinion of the inhabitants of Brighton as to the proposed plan ascertained."

This amendment was negatived by the same division; and the committee's resolution of approval was to be submitted to the town council at their next meeting.

In addition to the report already published, Mr. Hawkshaw has since, in a supplementary note, furnished some details in explanation of his plan. The local *Herald* says, in allusion to these details, "How far these tend to meet the objections that have been raised to a sewer seven miles long, and to the danger of thus creating a nuisance far greater than any we have hitherto endured, we are unable to say. We hear, however, that Mr. Hawkshaw's mode of ventilating this sewer is by gratings at every 200 or 300 yards; and we confess that the prospect of this line of gratings running along the front of our promenades is by no means reassuring. If, instead of discharging the foul air of our sewers into the depths of the sea, we bring them beneath the very noses of our visitors, where is the gain?"

FEN AND MARSHLAND CHURCHES.

On a railway journey from one commercial or manufacturing city to another,—between London and Manchester, for example,—what quiet rural districts are hurried through, what charming shady nooks open out for a moment and then are gone, and how gladly sometimes would the traveller stop, if he could, to admire, to examine, or to rest. But stopping is out of the question, and in spite of his regret and in spite of all attractions, he is carried on perhaps to a more smoky atmosphere than the one from which he began his journey.

The thorough pursuit of any profession, especially of any of those to which this journal is devoted, drives a man along in a fixed track almost as inexorably as a locomotive draws a train. Many things come under his notice and invite his attention, to which he would gladly give careful study and quiet thought, if he could only stop to do it. But each day's practice brings duties which cannot be postponed, though these are not always of the kind which would enchant the fancy or engage the heart. You would occupy your mind with the highest artistic criticism perhaps, when you are obliged to break off the chain of your thoughts to consider the position of a dust-bin or the diameter of a drain! Architects can rarely select the subjects to which they have to give time and thought, still less can they leave out what is unattractive, and only notice what is choice when the selection has been made. But amateurs can do this; and the architectural profession is greatly indebted to them for much intelligent labour and criticism.

A valuable addition to work of this class has just been made by the publication of a book bearing the title which heads this notice, and containing careful and artistic photographs of twenty-six churches in the eastern counties.* These churches have been selected for illustration on account of their architectural rather than for their antiquarian interest: they are not merely old, but intrinsically beautiful. And as each set of photographs is accompanied by a short sketch of the history, alterations, and individuality of the building, a very useful and inter-

esting hook of reference is the result. These descriptive notices, which display research and study as well as a sincere affection for the venerable buildings described, are written for the most part by the clergy of the several churches, headed by the Dean of Chester, who contributes a notice of Wisbech Church, which was the former scene of his labours.

Two volumes of this hook have just been brought out, and a third is promised shortly. It is to be hoped that their publication will be attended with such success as to encourage similar work in other districts. How many beautiful churches are falling into decay, or into the hands of the injudicious restorer, leaving little trace to future time of the feeling of their builders, or of the dignity which time has stamped upon their work.

The photographs are extremely good, the interiors being particularly free from the gloom so often observable in photographs of this kind. The points from which the views are taken are well selected, and both the general effect and the clearness of detail are well preserved. Architects who cannot spare the time or the money to make a tour among the Fen and Marshland Churches, may here obtain a considerable acquaintance with their artistic merits, as well as with their structural peculiarities. The cover is the least satisfactory part of the hook.

INFIRMARY FOR WANTAGE, BERKS.

The guardians of the poor of the Wantage Union, having determined to follow the example of the Boards throughout the country who have provided improved accommodation for the sick poor, have matured a scheme for pulling down certain old buildings at the back of the workhouse, and erecting an entirely new infirmary on the site. The new building will include ordinary and special sick-wards and day-rooms for both sexes, and lying-in ward. Lavatories, bath-rooms, and other conveniences will be provided for all classes, and the building will contain most of the latest improvements of its kind.

More accommodation for the pauper poor has long been needed in this union, which consists of thirty-four parishes, and embraces a large district. The outlay will be about 2,000*l.* Plans have been prepared by Mr. J. P. Spencer, architect, of Wantage; and the Poor-law Board having already approved of them, tenders will be advertised for forthwith.

THE SMOKE NUISANCE.

At Newcastle-upon-Tyne the authorities have resolved to put down the smoke nuisance which is very bad there still. Mr. R. H. Simpson, confectioner, New Bridge-street, has been summoned before the magistrates, at the instance of Mr. Curry, inspector of nuisances, for not abating the nuisance. Mr. Curry stated that on the 24th ult. he had watched defendant's bakehouse chimney for fifteen minutes, and during that time he saw dense black smoke issue from it. Mr. Simpson said he had a smoke-consuming apparatus, but at present it was out of repair. A new one was in course of construction. Fined 40*s.* and costs.

A Civil Engineer, lately on a tour of inspection in the North, says:—"I have examined every class of furnace, and the kind of fuel used, with the various systems of furnace management, but I have seen no furnace, whether in iron, chemical, or any other works, that might not easily be made to consume its own smoke, as required by the Smoke Act. There are in London over twelve thousand furnaces of various classes, in a large number of which nothing but common dust coal is now used. You may take your stand upon London Bridge, or ascend the Monument, from where you can soon for a distance of twelve miles, it would be difficult to trace one smoky chimney. The best of appliances are in use, but they were inefficient for a long period, until the stokers were made to understand that they must give proper attention to their furnaces, or they would be subjected to a fine or a month's imprisonment. If it could be clearly proved by the smoke inspector before a magistrate that the furnace is fitted so that it is capable of consuming its smoke, the prosecution then falls on the stoker for misusage. Mention has been made about 'machine stokers': perhaps there is no place where they have had so true a trial as in London. Jukes's is the only apparatus which may be said to have mastered the difficulty, and before Mr. Jukes died he

proved it to be practicable to apply self-feeding apparatus to certain furnaces; but the difficulty in keeping these machines in order, to say nothing of the first cost, operated against them, so that few of them are now in use. A machine stoker means augmentation of boiler power, boilers of a suitable form for their application, a large annual outlay for repairs, also spare apparatus if it is desired to keep daily in operation, and then, without proper care and attention, they will make as much smoke as any common furnace. It is a common thing for those employing them in London to be fined for smoke. Newcastle, like London, will not get quit of smoke if the stokers are not made to answer for mismanagement and neglect. As for the Tyne, no river can equal it for smoke, and it is a disgrace which could easily be prevented, as on the Thames; but if the law is not enforced, this will continue. We want no committees in London to search for the best mode of consuming smoke. A few sharp smoke inspectors, who will show no favour nor affection to any one, keeping a good look-out for the offenders, would soon cause Newcastle to be as free from smoke as London is."

COMPENSATIONS.

The Metropolitan Board of Works, in their report this year, give an account of the claims made and the compensation actually paid for property taken for metropolitan improvements. The claims settled up to the end of March last in respect of property required for the Southern Embankment amounted to 998,861*l.*, and they were settled for 629,519*l.*, or two-thirds of the sums asked. The chief abatement was in the claims, not for freehold property, but for lesser interests. In fifty-nine freeholds and copyholds the claims were 336,024*l.*, and the settlements 264,574*l.*; seventy-eight leaseholds, claims 584,145*l.*, settlements, 355,265*l.*; thirty-three yearly tenants, claims, 18,650*l.*; settlements, 9,638*l.* For the new street from the Mansion House to Blackfriars, up to the end of March, claims amounting to 2,604,290*l.* were settled for 1,984,711*l.*; and here again the leaseholders had to abate most largely. Claims were made for 1,305,616*l.* for 170 freeholds, and the settlements were for 1,143,867*l.*; the claims for 264 leaseholds were for 1,259,317*l.*, and the settlements 818,969*l.*; for 111 yearly tenants at will, claims, 38,959*l.*; settlements, 21,704*l.* For the property on the Embankment by which the street is continued westward from Blackfriars claims for 327,107*l.* were settled for 221,309*l.*; and again the difference between the two sums was not so large in respect of the freeholds as of the lesser interests. In the Kensington improvement,—widening part of the High-street, and forming a new street from Young-street to King-street,—claims for 216,704*l.* were settled for 160,469*l.*; freeholds, claims, 129,875*l.*; settlements, 102,820*l.*; leaseholds, claims, 78,183*l.*; settlements, 53,247*l.*; yearly tenants, claims, 7,953*l.*; settlements, 4,230*l.* In the Whitechapel improvement,—the new street from Church-lane to Leman-street,—the last account shows claims, 252,795*l.*, settled for 193,757*l.*; freeholds and copyholds, claims, 129,860*l.*; settlements, 108,293*l.*; leaseholds, claims, 114,301*l.*; settlements, 79,907*l.*; yearly tenancies, claims, 8,599*l.*; settlements, 4,610*l.* The Stingo-lane improvement comprises a new street from Marylebone-road to Upper York-street; the settlements up to the date of the report amounted to 8,020*l.*, the claims being 11,986*l.* The claims for freeholds were 5,570*l.*; the settlements, 4,300*l.*; for leaseholds, claims, 6,416*l.*; settlements, 3,720*l.*

"ARCHITECTURAL COMPETITION ONE HUNDRED YEARS AGO."

REMINISCENCES of those who have gone before us in the world of art and architecture are always interesting. The distance of a hundred years is not so great as to prevent its traditional connexion with the present time. I can furnish a few traces of two of the names mentioned in the list given in your last number.*

No. 5 on the list, John and Samuel Hope, were architects in Liverpool. Samuel died early, but John continued in practice nearly half a century. Amongst other works he built, about 1790, Trinity Church, Wavertree, a neat Italian design, with a west-end tower and lantern,

* See p. 781, ante.

* "The Fen and Marshland Churches, with Historical and Architectural Descriptive Notes." This series of photographs includes the churches of Walsoken, Walton, Emmeth, Wisbech, Walpole, Terrington, Tilney, Leverington, Elm, Ely Cathedral (six views), St. Margaret, Lynn; St. Nicholas, Lynn; Upwell, Outwell, Terrington; St. John, Thorney, and Whittelsey. Paraphrase illustrations by E. Johnson, London: Simpkin, Marshall, & Co.; Wisbech: Leach & Son, 1869.

crowned with a cupola. He also built, in 1799, a large Wesleyan Chapel in Leeds-street, Liverpool, since pulled down.

The business established by him was continued down to a recent period. He was succeeded by Mr. William Byrom, who married his daughter. The Unitarian Chapel in Renshaw-street, Liverpool, was designed by him about 1809.

Mr. Byrom was succeeded by his nephew, Mr. Samuel Rowland, who carried on a large practice for many years, and accumulated a handsome fortune. He built St. Bride's Church, a classical building, with an Ionic portico; a large pile of buildings in Dale-street for the unfortunate Royal Bank, now the Queen Insurance Buildings, &c. He died childless about 1850, without a successor.

No. 8 on the list, Timothy Lightboller, was rather celebrated at the period in question in Cheshire and Lancashire. He was the architect of St. Paul's Church, Liverpool (opened 1769). The design is not common, and possesses considerable merit. The plan is quadrangular, nearly square, with a projecting portico on each front, the columns carried up in one order. The building is crowned with a large dome, supported by a circle of columns inside. The dome was originally open to the church, but the acoustics were so bad that a lower internal ceiling had to be constructed.

Lightboller also erected (1776) St. John's Church, near St. George's Hall, a veritable specimen of the Batty Langley style of pseudo-Gothic.

J. A. PICTON.

BRADFORD TOWNHALL COMPETITION.

The council have selected as the first best of the designs for the new townhall, those bearing the motto, "Let Bradford Flourish" (Medieval); as the second best, those bearing the motto, "Justitia," and as the third best, those bearing the motto, "Gaiety."

The authors of the first designs, who will have the erection of the building entrusted to them, are Messrs. Lockwood & Mawson; the second designs, which gain a premium of 200l., are by Messrs. Milnes & France; and the third, to which a sum of 100l. is allotted, are by Mr. S. Jackson, all Bradford architects.

That the authors of all the selected designs should be all Bradford architects has already led to comment.

The first design has a central clock-tower, based in design upon the campanile of the Palazzo Vecchio, in Florence. The principal contents of the building as designed are called 475,258 ft., and the architects are confident that the work may be executed within the limit of cost,—40,000l.—prescribed by the council.

The plans of Messrs. Milnes & France show the accommodation in the building distributed in the same manner as in the successful design. The style is Venetian-Italian. The Market-street front is about 90 yards in length, and in its centre is the principal entrance, the chief approach to which is formed by a noble portico, two stories in height. The building is surmounted by a large cupola, with clock, bell-turret, and dome. The architects calculate the cost at 34,650l., leaving 5,350l. for extraneous ornamentation, as towers, cupolas, and other architectural features.

Mr. Jackson estimates the cost of carrying out his design at 45,000l.

ARTISANS' AND LABOURERS' DWELLING ACT.

I BEG to inform you of the fact that the vestry of St. George the Martyr, Southwark, commenced to carry out the "Artisans and Labourers' Dwelling Act" on the 18th September, 1868. About seven weeks after the passing of the said Act, the Medical Officer of Health certified the houses Nos. 1, 2, and 3, Charles-court, Charles-street, to be in a condition dangerous to health, so as to be unfit for human habitation. The certificates were referred to a surveyor, and copies of the report served upon the owner, with time and place appointed for the consideration thereof. When the owner appeared with legal adviser, and raised objections, which the vestry overruled, it was arranged that the houses should be closed, and not again be let for human habitation, which houses are at present closed. This case I believe to be the first under that Act. I am desirous that credit should be given where due.

JOHN EDWARDS, Inspector.

MURAL RECORDS.

You have more than once, Mr. *Builder*, suggested that there should be inserted into the wall of the house that had been occupied by any person of literary, scientific, or artistic eminence, a stone bearing a short inscription, little more than the date of birth and death, such as are found in various cities on the Continent, much in the style of such records in Rome, as in the case of Poussin and Salvator Rosa.

I take the liberty of calling your attention to this subject at this present moment, because there has passed from among us a man of extraordinary learning, known by his habitual urbanity and kindness to all the frequenters of the reading-room of the British Museum,—I mean Mr. Thomas Watts. Surely a stone in the wall of the British Museum might be made to speak a word of recognition and approval of such rare public services. Of course, it would be for the trustees and the architect to determine where such records might be appropriately placed.

B.

ARCHITECTURE AS A POPULAR STUDY.*

ARCHITECTURE is too much overlooked by us as a study. There is no science which is forced so much upon our attention; no science which pleases us so much, even although we do not understand it; no science of which it is easier to learn something; no science which carries us further back in the world's history, and presents such a vivid picture of the manners and customs of nations, that would otherwise have been hurried out of sight and remembrance; and yet as an accomplishment it is the least chosen of any. All the arts and sciences are useful in civilising and enlightening a nation, but we question whether any is more useful than architecture. We can fancy a nation having wonderful architectural structures (like Great Britain in the thirteenth century), with little knowledge of poetry, philosophy, or astronomy; but we could not imagine a nation learned in all the sciences living in huts and wigwags. It is necessary for the well-being of the other arts and sciences. It is also useful in being the best means by which a nation can record its greatness, and hand it down to future generations and ages. As Ruskin says, "How cold is all history, how lifeless is all imagery to that which a living nation writes and uncorrupted marble bears! how many pages of doubtful record might we not spare for a few stones left one upon another!" One of the deepest feelings implanted in man is that of wishing his name to be remembered after he is passed away. Akin to that is a patriotic feeling, desiring that his country may long be preserved, and its name, actions, and acquirements remembered to the world's end. What, then, is to accomplish this latter desire? Is it the poetry, the philosophy, or the manufacturing skill of a nation that is to do it? No! Let us wander down the banks of the sacred Nile to the interesting land of the Pharaohs, and whom do we find there as representative of the greatest nation in old-world history? A few wandering Arabs living in tents, and surrounded by cattle, with no architecture, no literature, no art, no science, and who expect to reach heaven through the narrow gates of Mecca. Let us ask them for the language, the religion, and the literature of the ancient possessors of the soil, and the only answer we obtain is a movement of their finger towards some colossal ruins in the neighbourhood, signifying that the architecture of the Egyptians alone is left a witness to their greatness. Yet it is sufficient. Go into the Hypostyle Hall of Karnac at Thebes, and wander among its groves of massive and gigantic pillars, sculptured with figures and hieroglyphics from top to bottom, along whose innumerable vistas we gaze in wonder and awe, till the gradually-receding columns are lost in a gloomy obscurity. The number and magnitude of the buildings show us the Egyptians' power and wealth; the images and bas-reliefs of their religion and ceremonies; the carvings and details of their culture and taste; the precision with which each joint is fitted, of their skill and workmanship; and in the great size of the materials, and the strong and almost imperishable manner in which they are put together, we perceive that they, more than any other nation that ever existed, were possessed of the desire to live for ever in history.

* From a paper by Mr. A. Dewar, read before the Halifax Literary Society, Nova Scotia. We print it as agreeably indicative of advancing taste in the colony.

so that all nations of the earth might behold and reverence their greatness and power.

We read in Spanish history how Cortez invaded Central America, and destroyed many great cities and magnificent buildings occupied by a highly-civilised and intelligent people; but the present degraded Indians of that country, living in huts, often tell us nothing of their ancestors, nor do they preserve any books or traditions regarding them. It is only by examining their ruinous and forest-bidden cities, discovered only a few years ago, that we can prove the truth of the Spanish historians, and only by reading these stone books of the nation that we can determine their position in the scale of civilisation, their knowledge, their power, and their religion.

A few years ago a traveller was threading his way through an almost impenetrable and uninhabitable jungle in Camhodia, Siam, when, through an opening in the trees, there burst upon his astonished vision the massive wall of an old deserted city. Entering therein, he discovered, among other buildings, a magnificent temple, rich in ornament, beautiful in style, and grand in design. Long shady corridors ran round the outside, constructed better than modern works of a similar nature. The pillars were ornamented with the most exquisite mouldings and carvings, and the walls were enriched with the most graceful bas-reliefs, depicting the people in one long procession, the ladies in magnificent attire, and the men carrying swords and spears of apparently beautiful workmanship, or driving in wheeled carriages of elegant design, the whole demonstrating to the astonished gaze of the traveller, that a powerful, wealthy, and highly-accomplished nation, whom Europeans had never heard of before, once occupied these ruins; that about those streets people hustled in ahneystream of life, where now all was solitude and desolation; and in that temple, where the voices of thousands joined in a universal song of praise, the serpent and the tiger now made their shod. Thus do we find, and in many more instances besides those we have mentioned, when a nation has been swept off the earth, or sunk into barbarism, when its descendants possess no traces of their ancient history, and no traditions of their ancient glory, when their books have been destroyed, and all the other knowledge and skill that they possessed have failed to witness to their greatness, that architecture, like a faithful sentinel, has stood by it in its centuries of neglect and danger, brought it out of the mist and obscurity with which it had long been veiled, and placed it in its proper rank among the nations of the earth.

Architecture is the one language which every nation can read and understand. People point to literature, and say that there is an influence which reaches from the highest to the lowest, but its universal influence is cramped by languages; to painting, but by its scarcity it influences only the wealthy and the educated; to individual religions, but their influence passes away with the nations that adopt them. Books may be written, yet we are not forced to read them; pictures may be painted, yet we are not forced to look at them; sermons may be preached, yet we are not forced to bear them; but architectural buildings cannot be erected in our midst without our regarding their appearance and meaning, and there they will stand, coloured by hoary age, exerting an ever-present influence over future generations when the name of the builder has been lost in oblivion. People may, without thinking, deny the intellectual influence of architecture, but what a man sees every day has as much influence on his mind and feelings as the meat he daily eats has over his body.

Architecture has as ennobling and refreshing an influence on our minds as the advance of spring and summer has on our bodies, accomplished also in as gradual and imperceptible a manner. For whatever suggests thought and causes research, and is accordingly a most beneficial and powerful instrument for improvement. The nobler the feelings also that are aroused the greater is the pleasure.

In travelling, a knowledge of architecture is invaluable. In visiting a foreign country, and entering their cities, every one takes most interest in that which illustrates or teaches him more regarding his special study or hobby. The student ransacks the libraries for ancient classical lore. The artist lives in the picture galleries, admiring and studying their contents. The antiquary frequents the museum, and patiently threads his way through narrow, dirty

streets, seeking for old buildings. The geologist, like Hugh Miller, wanders to the churchyard, and there discovering a fossil in a stone, passes away hours in looking at it, investigating the causes of its appearance there, musing over the story that it tells, and noting the lessons that it teaches. The merchant examines the shops and stores. The man of pleasure frequents the restaurants, the billiard-rooms, and the theatres. But one and all make a point of examining the principal churches and public buildings. Yet though they see the structures they do not understand them, nor can they comprehend their full meaning. They are as much understood as a starry sky is by one who does not know astronomy, or a collection of wild flowers by one who is ignorant of botany.

THE EDINBURGH POOR-HOUSE.

A NEW poor-house for the city of Edinburgh has been erected at Craiglockhart. The site is within a very short distance of the city, and yet the scene is as quiet and as thoroughly secluded as if it were miles away. The principal approach to the building is from the Morningside-road, about a quarter of a mile to the south of the Morningside toll-bar.

The new poor-house faces the south, and will ultimately consist of three groups of distinct buildings, viz., the main poor-house in the centre, the infirmary to the east, and the lunatic asylum to the west. At present only the poor-house and infirmary have been erected, though the site of the lunatic asylum has been partly excavated and levelled.

The style of the buildings is Scotch. The whole is treated in a plain and simple way, without expensive or ornamental details. The architectural effect is chiefly obtained from the mass and extent of the building, and by the arrangement of the plan in breaking it up into a number of separate blocks. At the centre of the main poor-house a corbelled tower, octagonal in form, rises to the height of 105 ft., and a picturesque and varied outline is given to the long fronts by numerous projections, crowned with crenelated gables. The classes are entirely isolated from one another in separate blocks of buildings, each complete within itself, and every class has a spacious airing-court allotted to its own use. Those for the doubtful classes are surrounded by the poor-house buildings and offices, while the better-behaved have airing-courts facing the south, tastefully laid out with walks and plots in which flowers and shrubs will be cultivated. The separation of the building into a number of detached blocks, joined only at one point by a connecting corridor, is a peculiarity of the Craiglockhart Poorhouse. The separate block system adopted gives facilities for ventilation and for obtaining sunlight and fresh air for the inmates. A second peculiarity of the building are the special facilities afforded for efficient administration, and for the smooth working of the establishment with a small staff of officials. The poor-house consists of an administrative block in the centre—two blocks in line with it to the west for the male paupers, and two blocks in line with it to the east for the female paupers. As the females are considerably more numerous than the males, a third block is provided for them to the north of the other two, and facing eastward. The buildings are three stories in height, except the east wing block, which is only two stories high. The central corridor of communication, which connects the various blocks on each floor, is in one unbroken line from end to end, without any steps or difference of level; and from it the officials can, both by day and by night, keep a constant supervision over the various classes without requiring even to enter the wards. The corridor is 6 ft. 4 in. wide, and is thoroughly well lighted, and ventilated directly from the external air between each block. In the administrative block at the centre, and separating the male and female portions of the building, are the offices of the governor and matron, and the other official apartments. Immediately behind is the dining-hall, and beyond it the kitchen department and stores. The stores are concentrated in a two-story block immediately facing the back entrance, so that all goods on their delivery are at once carried into them. They are in the immediate neighbourhood of the kitchen, where so many of the articles are to be used, and have also separate serving-rooms attached for males and females, where articles not used in the

kitchen are distributed to the parties coming for them from the wards. The kitchen, which stands between the stores and the dining-hall, has also serving-rooms attached to it communicating both with the dining-hall and the wards. From the special arrangements adopted, none of the paupers, except those regularly employed in the kitchen and stores, can ever be there without immediate detection, and thus pilfering and many other evils are avoided. From the concentration which has been effected, not only can the governor and matron keep a constant supervision over these important departments, but also a much smaller staff of paid officials will be able to do the work than could otherwise have accomplished it.

We come next to notice the sanitary arrangements. Each class is provided with separate water-closets, lavatories, and baths, upon every floor, to which they have ready access both by night and by day. The closets are placed in projections opposite the staircase at the centre of each block, and are entirely cut off from the wards by doors and intermediate lobbies, having thorough cross ventilation. The two walls of the central corridor are built hollow, and a series of chambers about 3 ft. 6 in. are formed along the whole extent of the wall on both sides of the corridor. These chambers are made use of for extracting the foul air and supplying the fresh-heated air. In every block two hot chambers are provided, in which fresh cold air brought from the outside of the buildings is heated by powerful coils of steam pipes, and is covered by the hollow chambers to the various floors. For ventilation a central foul-air trunk is provided in the roof of every block, and each ward has several of the chambers in the hollow walls, acting as extracting flues, and leading the foul air up to the central trunk. At the middle of each block a hot chamber is formed, where the foul air is rarified by the heat from a hot-water cistern, and a current being thus produced, the foul air escapes through a large ventilator into the open atmosphere. Each ward is also provided with Sheringham's patent ventilators in the external walls for the supply of fresh cold air, so that a constant circulation is maintained during the night, and at other times, when the windows are all closed. The day-rooms and dormitories for the various classes of paupers are all large and spacious apartments. They are 35 ft. long by 18 ft. wide, and have 12-ft. ceilings, giving in the dormitories a cubic air-space on the average of nearly 500 ft. per bed. The wards are heated at each end by large open fireplaces, with an iron grate and mantel-piece of new design, projecting boldly out into the apartment, and having fire-brick back and sides, so as to radiate the heat in all directions. The fireplaces openings have circular heads, and the spandrels on each side are ornamented with foliage, having the poor-house monogram and the date in low relief. The walls of the wards and passages have been all lined to the height of 4 ft. 6 in. from the floor. The plaster-work of all the bath-rooms, lavatories, and water-closets is painted in oil, and the woodwork varnished.

The dining-hall is 74 ft. by 48 ft., with accommodation for dining 600 paupers. It is divided by iron columns into a centre and two side compartments, and the ceiling is panelled in squares, with ornamental main couples, brackets, and pendants. There is a platform at one end, suitable for addresses, concerts, &c.; and as the dining-hall is at present to be used as the church for the poor-house, the pulpit will be in the mean time placed here. The seating is all open, supported on iron standards, so arranged that the seats can be folded up for cleaning out the hall daily.

The kitchen is 30 ft. square by 19 ft. high, and is thoroughly lighted and cross ventilated by large casement windows on each side, going right up to the ceiling, so that all steam or vitiated air can be swept away. The kitchen and the scullery adjoining are fitted up with a most powerful steam cooking apparatus. In the kitchen there are six steam-cooking vessels, several of them 5 ft. in diameter; and in the scullery there are two large steamers for vegetables, which are prepared by steam in open wire trays much quicker and better than they could be hoiled in water.

At the back of the internal female airing-courts is situated the washing department, and the enclosed drying and bleaching greens.

At the back of the internal male courts are the workshops for the smiths, carpenters, plumbers, tin-smiths, painters, tailors, shoe-

makers, bookbinders, &c., and adjoining these are extensive farm offices.

The infirmary is designed upon the pavilion system, now universally adopted in all new hospitals. There are four pavilions arranged in pairs for ordinary cases, and a fifth pavilion at the back, entirely detached, to be used exclusively as a fever hospital. At the centre of the corridor which connects the pavilions is placed the administrative block, which contains the officials' apartments, the dispensary, store-rooms, and kitchen accommodation. The pavilions are two stories in height, and contain one ward on each floor.

The governor of the poor-house is accommodated in a detached villa erected on the ground to the west of the main building, and the other officials have apartments within the house.

As the Edinburgh Water Company's Act did not embrace the poor-house within the area of supply, it became necessary to obtain a Bill to extend the area so as to include the poor-house. This was passed during the last session of Parliament, but the necessary works authorised in connexion with the Bill have not been begun yet.

The total number of pauper inmates for whom accommodation is at present provided is 1,000,—viz., 740 in the main poor-house, and 260 in the infirmary. The lunatic asylum, which, as we have said, is not yet begun, will accommodate 160 additional.

The contracts for the poor-house, infirmary, and governor's house at present erected amount to about 45,000*l.*, exclusive of roads; and we understand that there is every prospect that the whole expenditure will not exceed the sum originally contemplated,—viz., 50,000*l.*

Messrs. George Beattie & Son, Grove-street, are the architects of the building. The contractors are Mr. Robert Hutchison for the mason work; Messrs. Kemp, Murray, & Nicholson for the joiner work; Mr. William McCalman for the plumber work; Mr. William Anderson for the slater work; Messrs. Ross & McLean for the plaster work; Messrs. J. Young & Co. for the ironwork; Mr. Andrew Cunningham for the glazier work; Mr. John Meiklejohn for the heating; Messrs. John Brydon & Sons for the bells; Messrs. Andrew Muirhead and G. H. Potts for the painting; and Mr. John Mellon for the roads, &c. The clock and bell have been supplied by Messrs. Robert Bryson & Son; and the iron cistern and tanks by Messrs. John Whitelaw & Son, Dunfermline. Mr. Andrew Wood is the clerk of works.

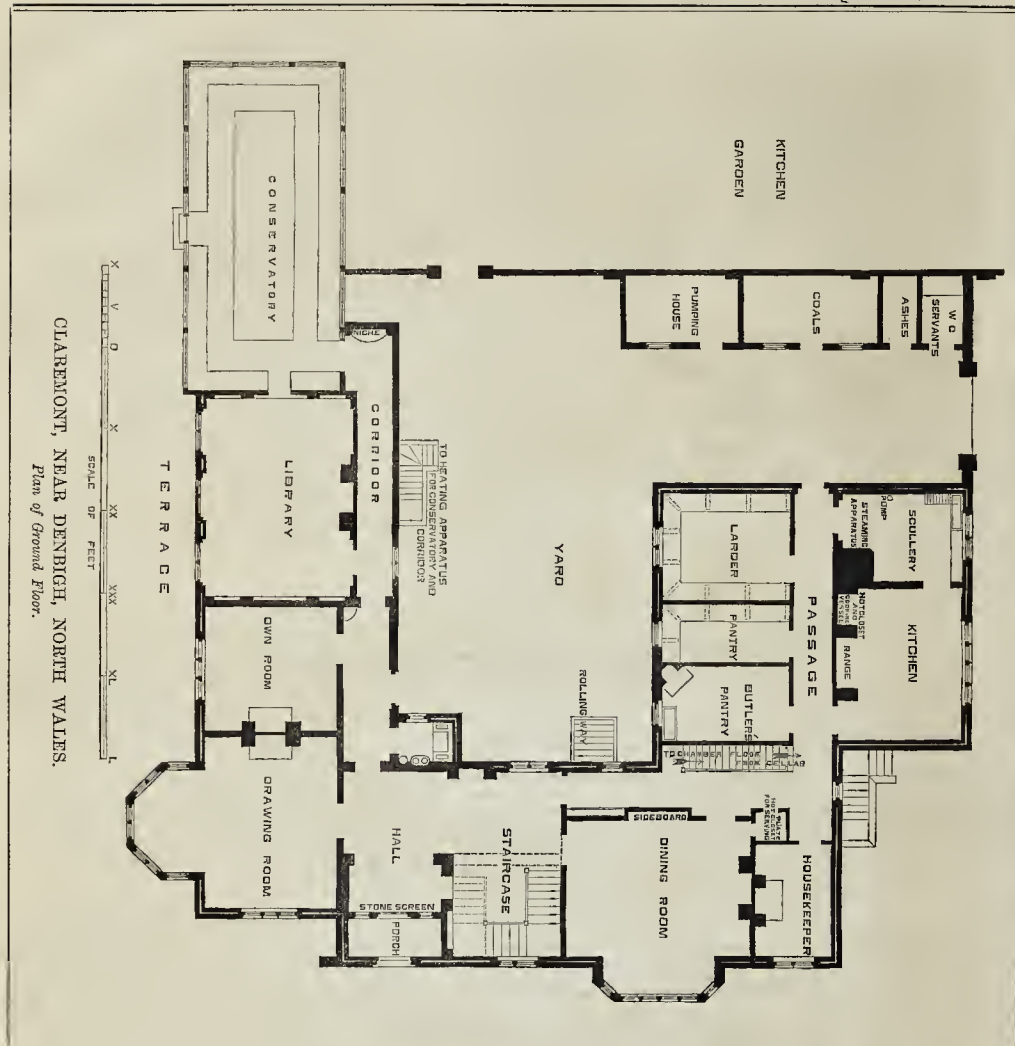
CLAREMONT, IN THE VALE OF CLWYD.

THE works at Claremont, in the vale of Clwyd, North Wales, the country residence of Mr. John Taber, of London, have just been completed. All the out-buildings, stabling, garden walls and sheds, lodge and park walls, terraces, and gardens, have been carried on simultaneously. The house itself is Domestic Gothic in style, the principal material for the walls being red brick from the brick-yards at Birmingham belonging to the builders, there being at the time of commencement no bricks in the locality. The whole of the window and door dressings, bay and oriel windows, parapets, &c., are of Cefn freestone, one of the best building-stones used. The outside woodwork is red deal, all the joinery being of pitch pine, five or six times varnished, the different coatings being rubbed down so as to get a fine surface.

The house on plan consists of entrance-lobby, paved with encaustic tiles, hall, and staircase-hall laid with parquet; the ceilings here being open timber-work, with moulded beams. The chimney-piece is of freestones, designed in character with the rest of the house; it has marble shafts and bases, carved caps, stone fender, and tile hearth. The staircase is of stone, with wrought-iron continuous balusters. Dining-room, with large bay-window and parquet border; drawing-room, with octagonal projection; library, own room, and conservatory. There are the usual servants' offices, and arched cellars under the main portion of the building.

In connexion with the private or own room is a W.C. and lavatory, with hot and cold water supply. An entrance is provided to the yard, so that fishing or shooting parties need not enter either the front door or servants' offices; the owner being also able to see his out-door servants without the necessity of their having to pass any portion of the house.

The dining-room has a serving-closet within, so that the doors need not be opened during dinner.



The whole of the water is pumped from the well to the tower, and thence conveyed to the different parts of the house, gardens, and vineries.

The position of the drawing-room has been so arranged that fine views are obtained of the whole of the vale of Clwyd. Standing in the octagonal portion, to the right is seen Denbigh, crowned with its castle; beyond is Rhyddlan Castle; and farther on, the sea. In front are picturesque ranges of hills, small valleys running up from the larger vale. To the left is Ruthin, with its picturesque town, where the church-spire and the castle are conspicuous, peeping over dense masses of foliage; views south, east, and west, embracing Ruthin, Moelfamma, and the opposite mountains, are obtained. At the bottom of the grounds, to the west, runs the River Clwyd, which gives much beauty to the surrounding magnificent scenery. Owing to the tremendous force of the wind as it rushes up the valley from the north-west, and direct from the sea, care has been taken with the view of keeping out the weather. All outside walls are built hollow; the casements of the windows have copper weather-bars top and bottom; the siles are strengthened with strong copper flanges, one portion of which, shutting into the frame, may prevent the heating in of wind or rain. Brass bolts, the entire height of the casements, with clips top and bottom, force the window to,

the handle as it is turned acting as a lever. All sills are weathered by a moulding worked on them, the ends having carved stops.

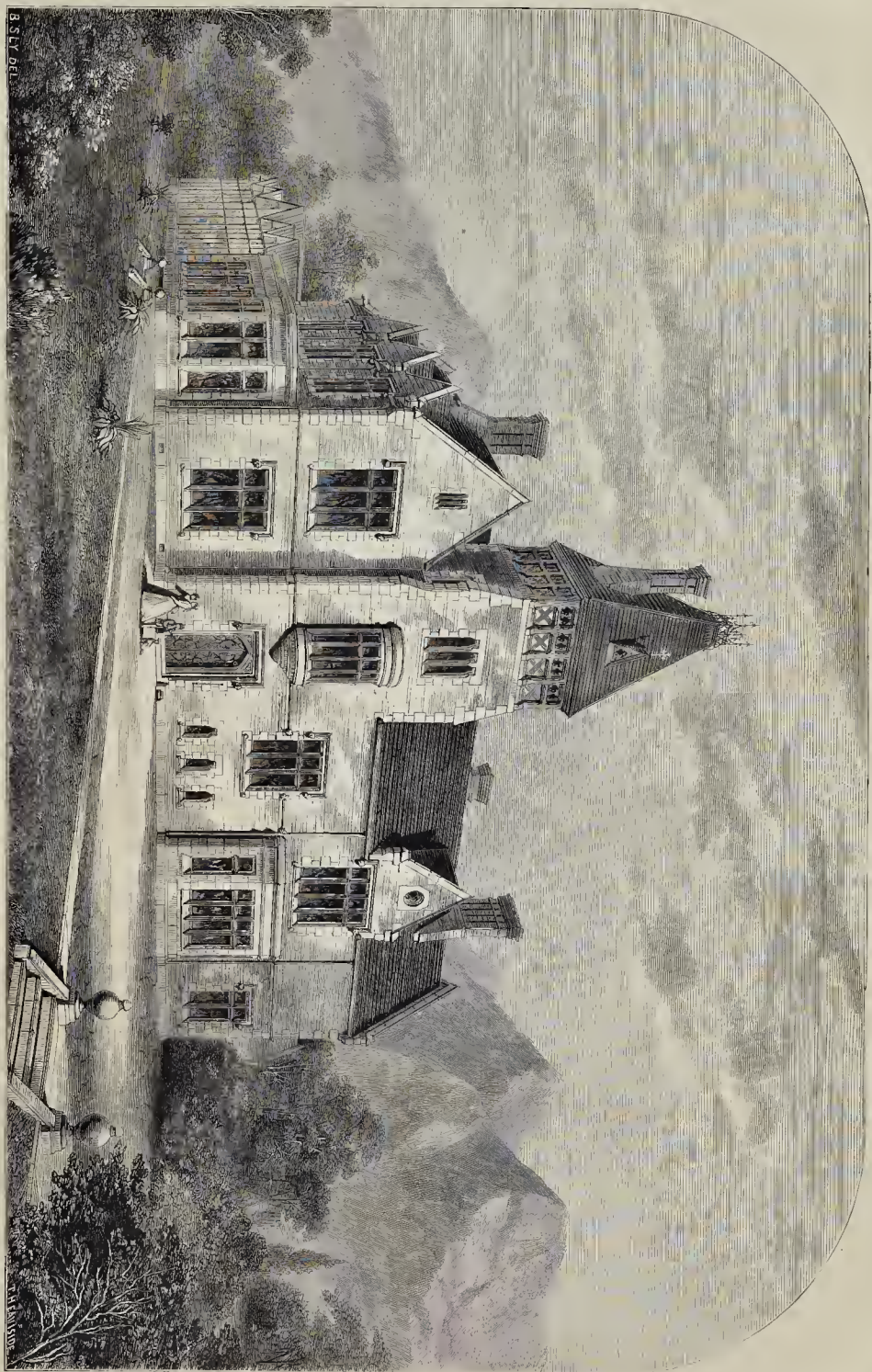
The carving throughout, by Mr. Griffiths, of Chester, is good. The same carver modelled all the enriched ornaments for the plaster cornices.

The library, which can be used as a music-room, opens into the conservatory, which is 40 ft. by 21 ft. The library has been specially designed for decoration; in its length it is divided by piers into three bays of uniform size, the ends having three, the central one being wider than the others. The fireplace is specially designed, and has a marble fender and encaustic tile hearth. The cornice has a large and enriched cove, somewhat more freely treated than the other cornices. The garden wall is built hollow for strength and protection from cold.

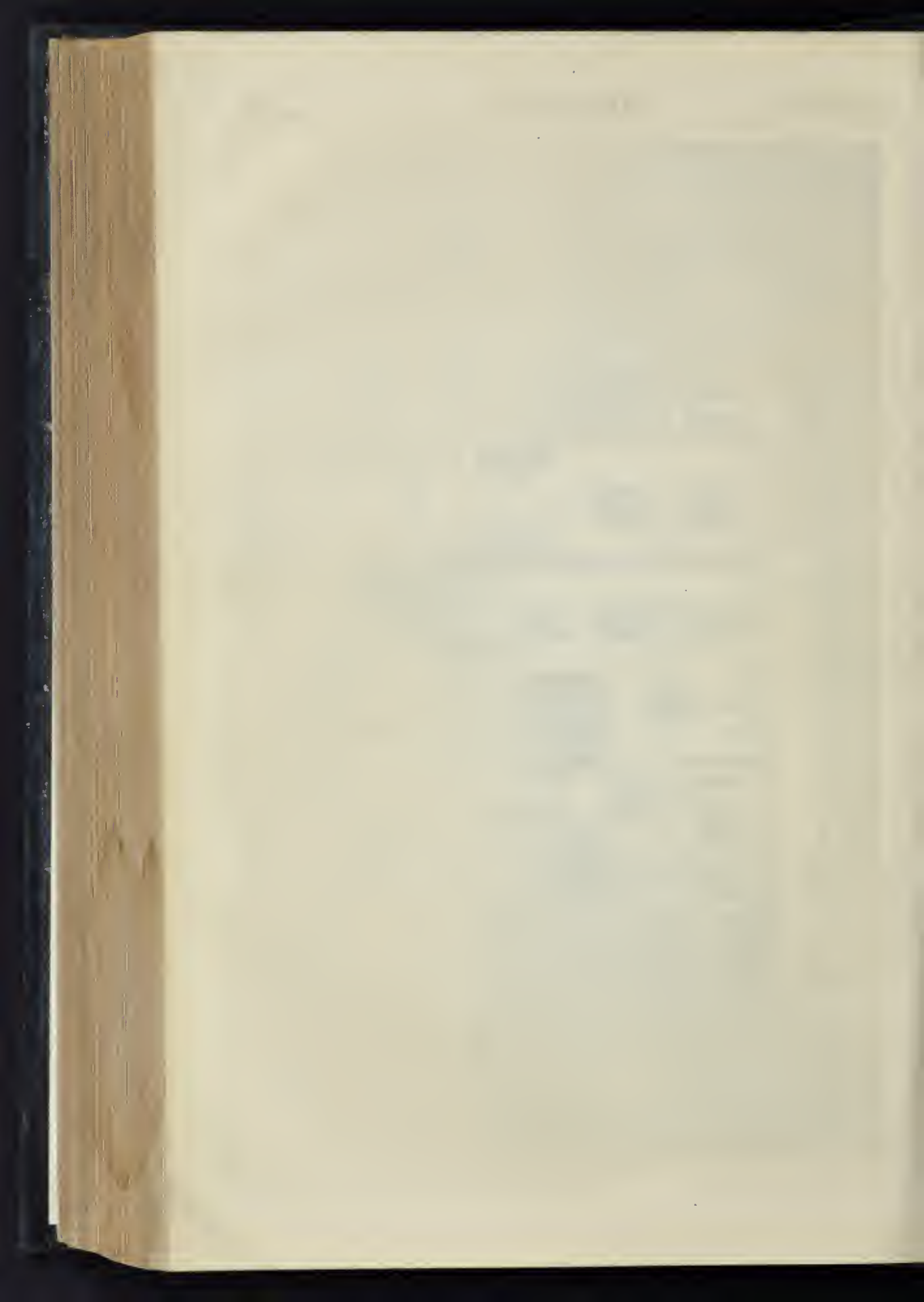
The river, which runs so near, is in a prolonged drought, such as we had last summer, almost dry. A well has therefore been sunk, and as quicksand was found, iron cylinders had to be used. In case the water here should fail, pipes are connected with a large rainwater tank, 12 ft. deep, and 12 ft. in diameter. Tanks of similar construction are provided for the lodge and stabling. The water supply for the range of vineries and forcing-houses, besides being supplied from the tower, is supplemented by large slate cisterns.

The whole of the works, with the exception of the woodwork for the vineries, has been satisfactorily carried out by Messrs. Barnsley & Sons, of Birmingham and London. Mr. Ewing, of Chester, laid out the grounds, and designed the woodwork for vineries; the architects undertaking the conservatory, which, adjoining the house, had to be in character with it. Messrs. Haden heated the conservatory, and designed and supplied the cooking apparatus. Mr. Tilley, of London, sank the well, and supplied the cylinders. Messrs. Maw supplied the tiles for lobby, conservatory corridor, and conservatory. Messrs. Arrowsmith the parquet floors; Mr. Crace the decorations, with the exception of the wrought-iron balusters, which were done under the architect's direction before Mr. Crace came, so as to prevent the "monzing" of wrought-iron work, had an inferior decorator been employed. The balusters were creditably done by a local blacksmith, Mr. Thomas, of Denbigh.

The architects were Messrs. Lloyd Williams & Underwood, of Denbigh; Mr. King, of London, filling the place of clerk of works efficiently. The contract for the house, exclusive of the conservatory and room adjoining, was 4,250l.; the cost of conservatory and adjoining room, 1,400l.; the garden walls, stabling, lodge, vineries and potting sheds, park walls, gates and piers, terrace steps, &c., raising the amount to between 10,000l. and 11,000l.



CLAREMONT, IN THE VALE OF GLWYD, NEAR DENBIGH.—MESSRS. LORD WILLIAMS & UNDERWOOD, ARCHITECTS.



DRAINAGE AND POLLUTION OF
STREAMS.

Liability of Drainage Commissioners for "Negligence."—The case of Collins v. The Middle Level Commissioners was held by an Act of Parliament certain drainage commissioners were to make and maintain an embanked cut to carry off their drainage water through lands on a lower level, and not within their jurisdiction, to the river Ouse; and also to make and maintain a culvert under the cut, to carry the drainage of those lands from the east to the west side of the cut. Owing to their negligence the bank of the cut burst, and the water flooded the land on the west side of it. The plaintiff, who occupied land on the east side of the cut, stopped up the culvert to prevent the water coming up it; but the occupiers on the west side broke down the obstruction, and consequently his land was flooded also. It was held by the Court of Common Pleas that he was entitled to recover from the Commissioners for the damage done.

Pollution of Streams.—The Corporation of Halifax had erected certain works so that the sewage of the town flowed into an ancient brook, which passed the mill of a manufactory, and thereby the brook or stream was so far polluted as to affect the health of the workmen and others in the manufactories residing in the neighbourhood of the stream, and also affected the property of the manufacturers. The balance of the scientific evidence proving that what had been done by the Corporation caused a nuisance and was injurious to the public health, it was held by Vice-Chancellor James, in the case of the Attorney-General v. The Corporation of Halifax, that the relators were entitled to an immediate injunction to restrain any further extension of the works by which the pollution of the stream had been caused, and a further injunction (to commence on the 1st of June, 1870, to allow time to the Corporation to apply to Parliament for additional powers if so advised), against causing the sewage to pass by or through the present outfalls.

The Beccles Drainage.—At a special meeting of the Town Council the Mayor read a report of Mr. Bruff, on the drainage of the town, which, after a long discussion, was adopted, by nine out of thirteen members present voting for it. The town-clerk was instructed to ascertain the expense already incurred; and also whether any and what further expense will be incurred to put the Council in possession of plans, sections, and information which may be necessary to carry out an improved system of drainage by degrees, as the requirements of the town and the state of the borough fund may warrant.

CHIPSTABLE CHURCH, NEAR
WIVELSCOMBE, SOMERSET.

In the early part of the year 1858, the body of this church, being in a dilapidated and unsafe condition, was taken down. The work of rebuilding was then commenced, from the designs of Mr. Ferrey, F.S.A. The new edifice consists of nave and chancel, and south aisle with porch. The eastern portion of the aisle is separated by an ornamental wood screen to form the vestry. The massive Perpendicular tower, which had been substantially repaired some few years since, has not been interfered with, except by the removal of the modern screen which blocked up the arch opening into the nave. The old body of the church appeared to have been rebuilt, or at any rate considerably altered (in the last century most probably).

The arcade dividing the nave and aisle was of the Perpendicular period, and possessed some curious caps composed of figures of angels bearing shields, &c. Several of the bench ends to the nave were of the late Tudor style, of an elaborate and beautiful character, and profusely carved.

The old roofs to the chancel and aisle were of the Somersetshire type, barrel shaped, formed of arched and longitudinal ribs, with paterae at the intersections; there were carved figures at the springing of the ribs; the panels were filled in with plaster.

The whole of the features thus described, whenever they were not too much decayed to be used, have been reintroduced into the new church. The roofs are of similar character to the old ones. The new nave benches and ends found requisite are designed in harmony with the ancient, though somewhat more simple workmanship. The new building, generally speaking, follows the form and dimensions of the previous

church, but is slightly larger. The new pulpit is of stone, with carved panels of the four Evangelists; and, no old font remaining, a new one has been designed. The chancel benches are of wainscot, with shaped ends and sunk carved panels. The local stone (the gift of the Rev. W. Nicholls, the rector, and Mrs. Nicholls) has been employed as the material for the walls, with Ham Hill stone for the dressings. The roofs are covered with Bridgewater tiles. The chancel is separated from the nave by a bold arch of discontinuous character, so that little or no interruption is presented, and the entire church and aisle are well open to the chancel. The altar-cloth, lectern, and kneeling-mats were given by relations of Mrs. W. Nicholls; two carved Glastonbury chairs by a relation of the rector; and two carved alms-boxes by the builder.

The total cost of the work has been upwards of 1,500*l.*, and it was carried out by Mr. Henry Davis, of Taunton, builder.

THE POULTRY: UGLY BIRDS.

SIR,—Can you afford a corner in your usefully-filled journal to protest against allowing such a hideous block of houses as those on the south side of the Poultry to occupy one of the most valuable sites of the richest city in the world?

I never have the pleasure of sitting at any of the western windows of the Mansion House; but if I had, I should fancy that, although the demolition of "Charlotte-row" had increased the range, it had by no means improved the beauty of the view.

Our architects of the present day are wisely and successfully combining beauty and utility; give them such a site as the above to deal with, and we may feel assured that the result would be such a transformation as would, at the same time, afford a more agreeable picture, develop the resources of the situation, add to the wealth of the City at large, and provide greater accommodation for the traffic.

USEFUL AND ORNAMENTAL.

TELEGRAPHIC PROGRESS IN AMERICA.

The purchase by our Government of the telegraphs appears to be exciting a desire in the States to go and do likewise. The *New York Herald* of the 1st ult. understands there is a new and remarkable invention, an automatic system of self-telegraphing power, which will multiply eight or ten times the facilities of telegraphic communication over the present system. There is reason, he thinks, to believe this is one of the most astonishing inventions of the age, and destined to produce a great revolution in the commerce, financial affairs, intercourse, and social condition of the world. The United States Government will be asked, it is said, to test this invention, and to take control of and use it for the public good. "Congress, we hope," says the *Herald*, "will not hesitate to investigate the matter and to make the necessary appropriation,—first, to try the new system between Washington and New York, and then, if successful, to obtain the patent and give the whole country the benefit of it under Government control. Congress should pass at once, on reassembling, Mr. Washbourne's Bill appropriating 30,000 dollars for an experimental postal telegraph line between New York and Washington, with an addition of any other sum, if necessary, to test on such line the new automatic system. It is known that the object of Mr. Washbourne and those who act with him in proposing an experimental postal telegraph line is, if that should prove successful, to place the whole telegraph system of the country under Government control. This is the secret of the determined and powerful hostility of the existing telegraph monopoly to his measure. The time has come when the telegraph should no longer be in the hands of private companies or individuals. The British Government has had the sagacity to see this; has purchased the lines in England, and on the 1st of January next will take entire control, in connexion with the post-office department, of all telegraphic communications. The great nations have moved slowly in this matter, and have followed what the lesser ones—such as Belgium and Switzerland—had done before. All will have to come to it in time. There is no other way of preserving the secrecy of communications, of preventing monopolies from using the telegraph to the injury of the public, and of cheapening the transmission of messages."

THE PLYMOUTH MEMORIAL, MASSA-
CHUSETTS.

MANY memorial monuments have been raised in various places throughout the United States, to commemorate the deeds of the Northern army during the late war, and one has just been erected at the seaport of Plymouth.

It is a column of the Doric order, composed of fine Hallowell granite. The mound on which it is placed is 60 ft. in diameter, and nearly 4 ft. high. On this mound are three steps of Rockport granite. The base of the monument is 9 ft. 6 in. square, with a sub-base 6 ft. square supporting the dis—a single block of stone—on which are placed the four tablets. The base of the column is round, with heavy mouldings, as are column and capital. The capital is ornamented with a sculptured laurel wreath, and is surmounted by an eagle standing erect, and having underneath its feet a crushed serpent and a broken chain. The total height of the structure is about 40 ft. The inscription on the front tablet bears in deep-out letters the following:—

"MEMORIA

IN

ETERNA.

THE SOLDIERS AND SAILORS OF PLYMOUTH WHO
GAVE THEIR LIVES FOR THEIR COUNTRY
IN THE WAR OF 1861."

The remaining tablets contain the names of seventy-two who perished in the war. The builder was Mr. Peter Blessington, of Boston. A similar monument for Derby is now being exhibited at the builder's works in Cambridge-street.

BUILDING LAWS.

SIR,—I am glad to see you taking an interest in the fallacies of trade. I sincerely hope you will continue to attack the subject, and not let it rest until the Government take stringent measures for its suppression.

You mention houses that will just stand, locks that will scarcely last a week. The class who are to blame are those who style themselves manufacturers, whereas they are only factors. It is that class by whom the capitalist who is willing to pay a fair price for a good article, and the good workman who will produce a good article at a fair price, are defrauded. I repeat my conviction that it is high time for the British to adopt the plan of Napoleon I. with regard to the laws affecting the building trade. On his accession to the throne of France he found the laws of France to be most defective. He chose a number of young men and set them to make a code of simple, just laws, and fastidiously into their minds that the simpler the laws they framed suited for the administration of justice, the greater would be their reward: he locked up the old laws and issued the Code Napoleon which those young men of integrity framed, under which the building trade of France is prospering. Therefore they are able to build a city worthy of a great nation, and to make great advancements in the march of arts, commerce, and manufactures.

ALEXANDER KAY.

CONCRETE BUILDING.

SIR,—In your leading article of October 2nd you particularly call attention to the fact that ballast sensibly diminishes in bulk when made into concrete. Of this I am perfectly convinced; and, after making several accurate measurements, and building within these last six months over a thousand cubic yards of concrete walling, I find that 6 cubic yards of river ballast or clean gravel are required to build 5 cubic yards of finished walling.

Now I find Mr. Tall, in his pamphlet, page 3, gives—to use his own words—"the proportion of materials employed in the construction of houses now in progress opposite Perry-street, Gravesend, as follows:—7 yards of burrs from brickfields; 7 yards of gravel stone; 1 yard of Portland cement (16 bushels to the cubic yard)". This will do 15 cubic yards of concrete walling. He therefore not only allows nothing for diminution in bulk of the ballast and burrs, but measures the Portland cement as well. Any one tendering for the building of concrete walling on the basis of these figures would be sadly wrong. Moreover, these works are copied, word for word, into current price-books. Another error, I find, is given credit to, and which I have not seen contradicted,—"The walls being of one solid

mass, sound is completely deadened." This is quite wrong: a gentle tap on the hard cement angle of the chimney-breast of the adjoining room is heard so distinctly where I am writing this, although a 9-in. wall intervenes, that one unconsciously looks round to discover whence it proceeds.

That concrete walls have many advantages is an undeniable fact; they are cheaper and stronger, and in country places where bricklayers are difficult to be procured, agricultural labourers are only too glad to obtain 6d. a day more wages than they usually earn; and farmers—except at hay-cutting and harvest—are glad for some other employment for a portion of their hands. Living in a very exposed situation, I find that 9-in. concrete walls give not the least evidence of the "sweating" so usual to see on the plastered walls of newly-built brick houses in damp weather.

For tanks for storing rain-water, undoubtedly concrete is "the" material. I find it requires somewhat more cement in proportion—about one part in six. I use a wooden circular drum or core, 6 ft. in diameter and 3 ft. in height, and made in four quarters, to facilitate moving and refixing; I dome the top with concrete, leaving a manhole in the usual manner. These tanks do not require plastering or facing with Portland cement. Nor does the water waste,—a sufficient evidence of the imperviousness to water of concrete. The cost is less than half that of brick tanks, as the latter always requires plastering with Portland cement, unless glazed bricks are used.

It is not uncommon for the circular walls of brick tanks to be filled up behind with pieces of brick or other rubbish: with concrete it is one solid mass. W. W.

THE POINTING OF FIRE-BRICKS.

Six.—Will some of your practical readers inform me what is the best material to use for the pointing of fire-bricks in open stoves? I find that where fire-bricks are set in ordinary fire-clay, the joints soon burn out for a depth of about half an inch, which gives the fireplace an untidy appearance. W. G. L.

ASPHALTE.

I SHOULD feel much obliged to any of your readers who would tell me how to lay down asphalt; what substances to mix with it, in what proportions, so as to form the hardest and toughest composition; I am building a small yacht, and wish to fill up the space between the floor-timbers, so as to make the bottom water-tight, and to form a waterway. S.

QUANTITY SURVEYORS.

Six.—In the *Builder* of the week before last there is a list of tenders for "building houses, Church-street, Blackfriars," the quantities by Mr. Shrubsole. My client (Mr. Cohen), whose tender was accepted, has requested me to say that he knows nothing whatever of Mr. Shrubsole, and that he did not receive any quantities from him. I shall feel obliged by your giving this publicity. J. C. TRAVIS.

* * We have received letters to the same effect from other builders who tenders, and feel it necessary to say that the statement objected to came to us from Mr. Shrubsole himself.

COMPETITIONS.

Manchester Reform Club.—In this competition the design by Mr. E. Salomons has been selected.

The Proposed Church on the Beaconsfield Estate.—In reply to the protest from competing architects (see p. 733, ante), the committee, by the Rev. J. Thompson, said,—“That, agreeing neither in the justness nor charity of its several allegations, they adhere to the decision of their previous meeting.” Mr. George Fowler Jones, whose name was accidentally omitted in our copy of the protest, in the course of a rejoinder, says,—

“As some of the committee, on being told of the facts, admitted that the proceedings were wrong, and as it was quite clear to the public, from the exhibition of the designs, that the choice was not according to the instructions, the stigma of injustice must remain with the committee, not with the allegations of the competitors, who have only required what was personally promised to at least two of them, and which all had a right to demand—a fair and impartial decision in fulfilment of their agreement.”

“It may be satisfactory to those of the committee who think their sense of justice and good faith has been called in question, to see nothing of their inability to appreciate the time and skill required in preparing a set of architectural drawings, to know that they have needlessly put four professional men to the expense, in the aggregate, of 200*l.*, for which they, in their justice and charity, consider 20*l.* sufficient remuneration!”

I have purposely avoided making this a personal matter, as I might have done. Considering all four competitors have been equally badly treated, even the one chosen by the committee has no credit in being the selected one; and with the hope that a little good may come out of a grievous wrong, I wish, in all charity, the new church success.”

VENTNOR CEMETERY COMPETITION.

A GENTLEMAN at Ventnor, named Saunders, considering himself aggrieved by a note under this heading in a recent number (p. 750, ante), requested the name of the author of it. We have submitted the request to the writer of the note, and append his reply:—

Sir,—I decline to consent to my name, as the writer of a letter on Ventnor Cemetery Competition, being disclosed. I can only say that in writing that *jeu d'esprit* I had not the remotest idea of hurting any one, my only object being to fairly criticise the questionable proceedings of a public body, and I hold that all such criticism should be anonymous.

The gentleman who has written to you complaining of the letter may be consoled when I state that it was not his name, but quite another name, that was given to me, when I made inquiries about the competition, as the name of the person whom the Bursal Board had looked out for their work.

You are at liberty to send a copy of this to Mr. Saunders, and to publish it if he wishes. VERB. SAT. PAP.

ACCIDENTS.

London.—Whilst two men were repairing a gas meter at Mr. Dieder's photographic rooms, in Hanover-square, the gas became ignited, and an alarming explosion took place. Both were injured, and one of them is in a dangerous state.

Liverpool.—The greater portion of the dwelling-house in No. 5 Court, Stockdale-street, has fallen down. The house, which was an old one, and belongs to the corporation, was unoccupied, and fortunately no one in the court was hurt. Notice was sent to the borough engineer's office, and some men were sent to take down the remainder of the building, which was considered in a dangerous state.—During a heavy fall of rain and thunderstorm two boys were asleep in the garret of a house in St. Domingo-road, Everton, a slate fell in off the roof, and the rain poured down upon the bed. The boys had not been many minutes removed to an adjoining apartment before that portion of the roof over the bed on which they had been sleeping fell in upon the spot, carrying with it the ceiling, which lay upon the floor in a large mass where the bedstead had stood only a short time previously.

Birmingham.—An immense mass of scaffolding in front of the Odd Fellows Hall, Temple-street, has given way, falling forward upon the houses on the opposite side of the street. The men at work on it were precipitated to the ground, and hurried among the debris. With great difficulty five of the workmen were extricated, and conveyed to the Queen's Hospital, one of them not being expected to recover. A number of other persons, including three ladies, were hurt by the accident. One lady and two other persons have since died.

Dudley.—On Saturday, Mr. Hipkins, lessee of a pit at A'vidale, near Dudley, was engaged with some workmen in certain operations for stifling a fire which had broken out in the mine. One of the men having descended to a scaffold in the shaft, and not answering when called for, Mr. Hipkins himself went down to look for him. Subsequently some water was thrown down to disperse the gases supposed to have accumulated, and then a party of men descended, and discovered the dead bodies of Mr. Hipkins and the miner Bradley at the bottom of the pit.

South Shields.—A lad employed as a labourer recently fell from the top of a chimney in course of erection in Claypath-lane, 114 ft. high. The lad was assisting the mason erecting the chimney, and while standing on a temporary platform at the top, some planks gave way, and he was precipitated down the chimney. Upon being picked up it was a matter of surprise that he remained alive.

SCHOOLS OF ART.

Proposed School for Rotherham.—An influential meeting of manufacturers has been held at Mr. Barra's office, Howard-street, Rotherham, for the purpose of considering the desirability of establishing a local school of art. It was admitted on all hands that the district needed an institution such as the one proposed, which would be a benefit to the town, both commercially and morally. Mr. Barra described an interview which he had had with Mr. Buckmaster, of the Science and Art Department, on the subject, stating that that gentleman had expressed his readiness to render what assistance he could, should the matter be taken up by the townspeople. After the question had been discussed at some length, and various suggestions made, it was decided to invite Mr. Buckmaster to Rother-

ham some time in November next, when the subject will probably be brought before the inhabitants by means of an address from that gentleman. Considering the important connexion there is between the art of designing and the local manufacturers, there is reason for believing that the proposal will be carried out in the form either of a branch school in connexion with Sheffield, or an independent institution.

The Hanley School.—The desirability has been suggested of calling the attention of the inhabitants of Hanley to the effect which the opening of the Burslem and Tunstall School of Art is likely to have on their own school. Since the collapse, ten or twelve years since, of the Burslem School of Design, says the *Staffordshire Advertiser*, a substantial proportion of the students of the Hanley School of Art have been residents in the former town, and it is calculated that on the opening of the new school, the arrangements for which are approaching completion, between twenty and thirty of the present students of the Hanley school will draft themselves off to Burslem. Now, although the opening of another school of Art in the Potteries under the management of an intelligent and influential committee is a subject for unqualified satisfaction, it is of course undesirable that this should be done to the detriment of a neighbouring institution, which has been for a considerable number of years the *alma mater* of many a young artist and modeller. If the manufacturers of the Staffordshire potteries expect to redress themselves from the imputation of "having very little real appreciation of true art," they must do something more than subscribe their two or three guineas a year to the local art schools, or applaud well-worn platitudes at the annual meetings. It is a fact that at the present time several of the largest and most influential manufacturers of Hanley do not send a single pupil to the school of art; some eight or ten firms have upon the books one each, and only one house appears to recognise to the full its obligations in this particular. The exception is a singularly honourable one, and is the case of Messrs. Brown-Westhead & Co., who send twenty-five of their apprentices to the afternoon classes, and pay the fees.

The Yarnmouth School.—The annual distribution of prizes in connexion with this school took place at the town-hall. The mayor (Mr. S. Nightingale), presided. The report of the committee stated that the past year had been one of progress. The attendance had improved—especially in the artisan class—and the results obtained at the annual examination had been highly satisfactory, under the able tuition of Mr. Dornay. At the same time, the more advanced students were not so numerous in proportion to the rest as was desirable. The number of prizes given in the third grade was seven; a Queen's prize was gained by Walter Platt, for a design on wall-paper. The number of prizes awarded in the second grade was eleven. The total who passed in connexion with the central school was 41; hospital, 112; charity, 28. The attendance at the central school for the year was—ladies' special class, 16; general day, 26; artisan evening, 59; total, 101. Attendance of schools—hospital, 270; charity, 60; grammar, 100; Mr. Tomkins's, 120; total, 550. As to the School of Navigation and Mathematics, the committee presented a more favourable report than that of last year. The committee's report was adopted, and the prizes were then distributed.

The Nottingham School.—A first-class exhibition of the works of modern artists, both in oil and water-colours, has been opened at the large room in the school of art. The pictures are on sale. Many local artists are exhibitors. The prices of pictures marked in the catalogue vary from two guineas upwards to 750*l.*

Caversham Bridge.—This new structure is completed. It is of cast-iron, supported by iron columns, embedded in the river. The bridge is 30 ft. in width, 20 ft. being the carriage-way, and 5 ft. on each side being appropriated to foot passengers. This width of carriage-way exceeds by 2 feet that of Henley Bridge, and also Magdalen Bridge and Polly Bridge in Oxford, and that of Dorchester Bridge. The cost of the new fabric will be between 6,000*l.* and 7,000*l.*; one half of which will be paid by the borough of Reading, and the other half mostly by the county of Oxford.

CHURCH-BUILDING NEWS.

Islington.—St. Thomas's Church, Hemingford-road, has been recently re-opened, after having been closed for a time, for the purpose of cleaning, carving, and completing the interior of the edifice. The church was first opened for divine service in 1860. Much work remained to be done towards the completion of the edifice, as also a debt of 1,900l. remained to be cleared off. Having succeeded not only in liquidating the debt on the church, but likewise in purchasing an organ, at a cost of more than 800l., the pressing want of school accommodation forced itself upon the committee and congregation. This was completed in less than two years. About 4,500l. were forthcoming for this work. Until this had been accomplished, the church question had been permitted to remain *in statu quo*. Since then, strenuous efforts have been made to secure its completion. A lightning conductor has been placed; an improved system of lighting has been introduced, fitted by Mr. A. Fernhead, Caledonian-road; the whole of the interior has been cleaned; and the rade blocks have been carved by Mr. Bromfield, of Kennington-road. Mr. W. G. Caldwell, architect, from whose designs the schools were built (a member of the congregation), consented to superintend the whole of the work, of which Messrs. Williams & Son were contractors. Towards the expense of all the improvements already made, a sum of about 70l. is still needed to make good the deficiency of funds. Other improvements are in contemplation, viz., the erection of a reredos, carving of pulpit, &c., to defray the expenses of which, a committee of ladies has been formed.

South Kilworth.—The parish church here has been re-opened, after undergoing a restoration. The old structure was in a dilapidated condition and inconvenient for public worship. It was of the Romanesque style, and would appear to have consisted of a nave and chancel, with a narrow aisle to the former on the north side. At the end of the fourteenth century the church was enlarged by the addition of a tower and south aisle, and the edifice was probably increased in length. In comparatively modern times the church lost the fourteenth century aisle. The original narrow Norman aisle had been replaced by a broad one, with brick walls, and was of very poor character and construction. The chancel had been rebuilt with thinner walls, and its length curtailed. Its old square east end had been replaced by an apse of miserable design and character. The pitch of the roof had been considerably lowered, and the whole of the ancient windows, the old roof, and other parts had been destroyed. Indeed, almost the entire edifice, the tower excepted, had been built in a mean and inconspicuous manner. The roof was not of a kind meant to be exposed to view, and the fittings were of an uneccelesiastical character. The restoration of the building was entrusted to Mr. C. F. Bodley, of London, architect. The tower and spire were in a good state of repair. The south aisle, the architect recommended, should be built in character with the tower. The slope of the lean-to roof is shown in the east face of the tower. The new work is planned to harmonise with the fourteenth century work of the tower and spire. The north aisle, which was of a narrow width, has been rebuilt, with stone walls. The only other feature of interest, and that chiefly from its antiquity, is the arcade of three arches on the north. Though of no great beauty they have been preserved, unaltered in character. The interior has had to be entirely re-modelled—the work, in fact, being one, not of restoration, but reconstruction. The opening out of the tower arches has been effected. The stonework of the arches has also been restored, and two new arches now divide the new aisle from the nave. The fittings have been re-arranged throughout, and the chancel rebuilt with a place for the organ and vestry on the north side. The whole of the floor has been concreted to keep the building dry, and open seats of oak have been constructed. To carry out these works the outlay has been about 2,000l.

Chipstable.—The parish church of Chipstable has been re-opened for divine service. The old church had become very dilapidated, and its condition almost dangerous. It possessed no features of architectural interest, except some good carved seat-ends of late Tudor character. These have been preserved, and form the ends of some of the seats in the new church. The building is designed in the Second Pointed style, and consists of a nave, chancel and south aisle,

porch and vestry. The walls are built of a local stone, having Hamdon Hill dressings. The roofs are covered with Bridgewater tiles. The chancel is separated from the nave by a bold arch of discontinuous character, so that little or no interruption is presented, so that the entire church and aisle are well opened to the chancel. The ceilings are formed in a parallel arrangement, the ribs at the intersections having carved bosses. The floor is paved with red and black tiles, the chancel having encaustic tiles of a better kind. The new seats are of deal, varnished, all the old seat-ends being used again. There are a stone pulpit and font, and appropriate chancel-seats. The whole of the work has been carried out by Mr. Davis, of Taunton, from the designs of Mr. B. Ferrey, of London, architect, at an expenditure of about 1,500l. The old tower was restored some few years since, and has not been interfered with, except the lower part, which has been thrown open to the church by the removal of a modern wood screen. The arches of the old arcade have also been preserved.

Huntingdon.—St. Mary's Church has now been closed for several months, but is about to be re-opened. At the outset it was merely proposed to erect a new organ, and stalls in the chancel. For the former a new chamber was built. Since then the old ceiling has been removed, the roof opened up, and hoarded. The large gallery at the west end has been demolished, and a lofty arch thrown out at the western entrance. The columns have been cleaned and restored, and many other minor alterations and additions have been effected. The organ is being built by Messrs. Foster & Andrews, of Hull.

Llanvannan, Monmouthshire.—The very old church here has been re-opened for divine service, having undergone restoration. Before the alteration it had a most comfortless and neglected appearance. Traces of decay were visible on its damp walls and floor, and the pews were heavy and old-fashioned. The pews have been now, however, superseded by new and open sittings, the gallery over the western entrance has been removed, and the choir now occupies a place in the chancel. The alterations are devoid of any approach to ornamentation. A new window has been put in the chancel. During the progress of the works, several stone arches, separating the nave from chancel, and chancel from mortuary chapel, and covered with white-wash, were exposed to view. The architect for this work was Mr. E. A. Lansdowne, of Newport and Bristol.

Beaconsfield.—The parish church of St. Mary and All Saints, which has been under restoration and alteration, has been consecrated and re-opened. The cost of the alterations has been 4,800l., of which 600l. have yet to be provided. The wooden galleries that disfigured the building have been removed, with one exception. Mr. Woodyer has been the architect, under whose superintendence the works have been carried out, and the builders have been Messrs. Gibson Bros., of Southall. There are about 500 sittings in the church. The reredos is a specimen of stone carving; the centre panel represents the Crucifixion, and in the panels on each side are groups of angels worshipping. The screen, presented by the architect, is surmounted by a large gilt cross, on which is a shield containing the initials "I. H. S." Both the pulpit and font have been presented, the former by Mr. George Charley and family, and the latter by Mr. E. Waller.

Longtown.—The church here has been re-opened. The township of Longtown is one of four, comprising the parish of Clodock, the other townships being Llanvaynor, Craswell, and Newtown.

The township of Newtown alone now possesses an independent incumbency, Longtown and the others being but chapels-of-ease to the mother church of Clodock. Longtown Church, to quote the words of the pastor, had "long lain in a most sad and fearful state." It consisted of nave and chancel only, and, previous to its restoration, a portion of the west end of the nave was partitioned off to serve the purpose of a school-house. There was no flooring of any kind save the earth, and no seats or benches; the only accommodation in this way being some low, rough forms, which were transferred from school to service, and from service to school, as occasion might require. In addition to all this, the walls and roof were in a deplorable state, the weather having found its way through to such an extent as to render the building more uncomfortable even than many a well-kept barn could possibly be. The little chapel being

situated on the side of an eminence is in that position that the earth on the north side is some 5 ft. higher than its floor level, whilst on the south side the porch is entered by a flight of steps of some ten or a dozen. The church, which is an Early English structure, has undergone an entire restoration, under the supervision of the diocesan architect, Mr. T. Nicholson. The walls, externally, have been pointed, and internally have been treated to a coating of plaster. The roof is new, the old timbers only being used as far as was practicable, the ridge ends being completed with ornamental iron finials. A new bell-gable, containing two small bells, which were formerly in the roof, has been added, the bells having been recast and toned. A new stone porch has been erected on the south side of the church, which, we may remark, has a somewhat unusual acquisition in the shape of a stone seat running along it from the porch to the buttress at the south-east angle; probably only a utilitarian of the extra thickness of the foundation on this the sloping side of the church. The seat has been restored to its original state, and the buttresses have been rebuilt. New windows have been inserted, with the exception of the west window, and one window has been added both on the north, where formerly was none, and on the west end, where used to be the fireplace of the school. A new schoolroom has been built at a short distance from the church, on a site the gift of the Earl of Abergarnny, the lord of the manor. Flooring has been laid down, and the nave provided with benches. A new octagonal pulpit of Caen stone with pierced panels, in the Early Decorated style, and provided with an oak book-rest, has been erected. The chancel arch, too, is new, and a new font has been added. The old flat ceiling has been removed, and the timbered roof opened out; the timber being in a wretchedly disfigured condition has been the source of a great deal of trouble to the workmen. The fabric has been supplied with a system of drainage, and with new spouts, neither having existed before. The work has been carried out by Mr. Pritchard, a local builder, at a cost—the schools and church combined—of 1,060l.

Stenton Wynville.—The church here has been re-opened for Divine service. There is but the nave to the church, besides the chancel. The nave has been rebuilt, the whole of the old stone preserved, and used again in the work. A new south porch has been made with a plain arch. In taking out the ground for the porch foundation, a stone coffin was found, containing bones, which were reburied. On the outside of the church is a memorial stone inserted, which no doubt occupied the same position before; on it is the following inscription:—"Here lieth buried William Brundell, gent., aged 88 years. Died 30 October, 1636." There has been inserted a chancel arch, the screen having been removed, and now there is a view of the chancel and the east window. The east window is of three lights, filled with stained glass. The centre and principal one is a representation of the Crucifixion, and bears the following inscription:—"To the glory of God, and in thankful remembrance of many mercies. J. W. 1863." The other two lights have been filled in with stained glass in accordance with the wishes of the giver of the centre light, Mr. J. White, of the Inner Temple. On the left side is Jesus speaking with Mary. At the bottom the text "Jesus said unto her, Mary. She turned herself and said, 'Rahmuni.'" The other light represents Jesus appearing to his disciples, and the text, "Then came Jesus, the door being shut, and stood in the midst, and said, 'Peace be unto you.'" In the centre of the head of the window is the patron saint, St. Dennis, and on either side are angels with scrolls. On either side of the window are the Commandments, and beneath the window, in a scroll, containing the vine leaf and fruit, and ears of wheat, is the text, "My flesh is meat indeed, and my blood is drink indeed." A border surrounds the whole. This work has been done at the cost of Mrs. Burnaby, the mother of the rector, from the proceeds of sale of work which she has made for the purpose. On the south side is a memorial window of two lights, in remembrance of a brother of the rector. The subject is Christ walking on the sea. The pulpit is the gift of the rector's sisters, and has been made by Mr. John Wilson, of Kibworth. It is an octagonal one of English oak, supported by shafts of polished ebony, with carved capitals and annulet mouldings. The termination of each shaft above the panelling, and down upon a base of Ketton stone, is by a foliated boss. The panels are

circular, and carved, and to the moldings of the framework is added the relieved early dog-tooth ornament. There are open deal seats in the church: the floor is of Whetstone's tiles. The church is heated by a flue with open grating, by Messrs. Johnson, of Leicester. Mr. Haycock, of Rothwell, was the contractor; and Mr. Drewry has done the decorations. The architect was Mr. J. Goddard, of Leicester.

Compton.—The parish church has been reopened for public worship. The building has for some time past been undergoing alterations, which have improved the appearance of the interior. The coating of lath and plaster, which formerly hid from sight the oak beams and the roof of the nave and north and south aisles, has been removed, and in many instances the time-worn timbers have been replaced. For the windows in the roof others have been substituted more in conformity with the character of the building, a third having been inserted on the south side, while that on the north has been filled up. Among the alterations one is the addition of a painted glass window, erected to the memory of Mr. George Smallpiece, of Field Place, and his widow. The subjects are St. Peter raising Tabitha to life, and the Good Samaritan. The work of restoration has been carried out by Mr. Mitchell, of Shalford, at a cost of about 500*l.*, raised by subscription. Mr. Woodyer, of Grafham, was the architect. The peculiarity of the church, which is chiefly Norman, its arches and columns constituting specimens of that style, is the chancel. This is of Norman architecture. The roof is extremely low, and above it, open to the church, is an apartment, anciently a chantry chapel, now the Losely pew. It is fronted by an ancient wooden balustrade, covered with white-wash.

NEWS FROM IRELAND.

The dedication of St. Peter's Roman Catholic Church, Dungourney, took place on the 19th ult. The R. C. Bishop of Cloyne officiated. The present structure has been so much restored that it may be virtually called a new edifice: 18 ft. have been added to its length, so it is now 108 ft. in the clear. Its height has also been increased, the walls partly rebuilt, and the church newly roofed. The spire is the principal addition. It opens into the body of the church through a lofty Gothic arch of 22 ft. span; and the chief feature of the edifice here is a three-light stained-glass window over the high altar. Two smaller stained-glass windows adjoin the side altars dedicated to the Virgin and St. Patrick. Ten lancet windows pierce the side walls of the church, filled with coloured glass; and a Gothic window of large size lights the other end of the building. A gallery is provided over the principal entrance. The roof is open timbered, stained, and rests on corbels; the intervals between the rafters being ceiled. The church is 30 ft. in breadth. In addition to the porch which forms the main entrance, a Gothic doorway opens in the western wall of the structure. Vestry-rooms occupy the angle formed by the apse and the body of the church; and in the chapel-yard a residence for the curate is provided. The edifice will afford accommodation for about 1,400 or 1,500 persons. The architect is Mr. Richard R. Brash; and the builder Mr. Barry, of Middleton. The church stands on elevated ground, surrounded by trees, and on the banks of a small river which takes its name from the locality. The village is a neat one, and besides the church a large and conspicuous school-house adds to its appearance.

The consecration of the altars of St. Ronan's Church, Roscrea, has taken place. The columns are of green Galway marble, highly polished, with carved capitals fluted. The central panel of the high altar is enriched with a half-height figure of the Redeemer. The throne is of Caen stone, carved. The canopy is supported by red marble shafts, polished. A figure of the angel is fixed on the apex of the pinnacle. The altar steps and predella are of Portland stone, and the space between the lower step and the first pace at the back of the altar, is laid with Portland flags. The screen is composed of Corsham Down stone. It is well carved. The columns that carry the tracery are of polished Cork marble, and the capitals and cornice are carved. On the top of the cornice are six angel figures, the wings carved in wood and gilt. The table of the altar is of black polished marble. The side altars, which are in keeping, are also of Corsham Down stone. They are enriched with figures of the Virgin and St. Joseph, mea-

suring 4 ft. 9 in. high. The retables is of ashlar, capped with a cornice. The steps are of Portland stone. The Communion-rail is of stone and marble, polished, with simple capitals, a marble slab, 10 in. wide, 1 in. thick, with rounded moulding in the front, &c. The gates are of wrought iron and brass. The altars have been built by Messrs. Barley & Powell, of Dublin, from the designs of Mr. J. J. McCarthy.

In Waterford several improvements have of late taken place in the matter of widening streets, flagging, lighting, and improving the park. A public market is spoken of, and a safe bathing-place for the people. The present Mayor of Waterford has exerted himself very creditably for the improvement of the city; and under his suggestions and advice much has been effected. The old historical ruin of the city has also been pinned up and protected from decay, and the town-hall is to be provided with a portrait of O'Connell, in recognition of his services in aid of civil and religious liberty, and the reforming of the municipal corporations of Ireland.

The Ennis and Athenry Railway has been opened; but the public of the south-west do not appear to reap much advantage from the circumstance.

There is a strike of masons and bricklayers employed in the construction of the Dundalk and Greenore Railway. They demand a rise of 2*s.* a week. Their present wages are 2*s.* They also ask a decrease in the hours of labour.

The Town Commissioners of Galway, who not long since laid out 1,000*l.* in connection with waterworks, will not be moved to give a farthing towards keeping the town cloak from going into delirium tremens. It is a disgrace to the old historical town of Galway, *alias* "The City of the Tribes." A ten-pound note would remove a stigma from the town.

The building trade is rather dull in every part of Ireland.

Books Received.

The Scenery of England and Wales; its Character and Origin. By D. MACKINTOSH, F.G.S. London: Longmans, Green, & Co., 1869.

This is an attempt to trace the nature of the geological causes, especially denudation, by which the physical features of the country have been produced. It is said to be founded on the results of many years' personal observations, and is illustrated by many woodcuts. The author had previously written papers on Denudation, which appeared in geological and other journals.

The influence of rain, rivers, frost, glaciers, icebergs, waves, and ocean currents, as well as earthquakes and other physical convulsions, are all brought under consideration; and on such subjects there are great diversities of opinion amongst geologists. Doubtless all have had a share, smaller or greater, in cutting out the present features of the country, but the question is, have any of these causes had a paramount influence, and if so, which of them, one or more?

A powerful influence is here, rightly we think, attributed to icebergs and glaciers, but not to the probable extent to which, after the great elevating and depressing forces, the modern features of the land are due to ice and flood conjoined. As for those geologists who do not realise to themselves the tremendous power of these conjoint agencies, Mr. Mackintosh utters a mild protest against their view in terms such as these:—

"*Alleged Dormancy of the Sea during the Glacial Submergence.*—Some writers, and amongst them Professor Jukes, are of opinion that during the glacial submergence, the sea did next to nothing in the way of denudation. But have we any reason for supposing that the 'calm of desolation' then 'brooded over the face of the deep?' Were the winds then stagnant, and were the billows miraculously enchained? . . . Was there no ground-swell, and were there no rapid currents at the time when the Welsh and Cumbrian hills were islands and their passes straits? Is it not more reasonable to suppose that the Atlantic breakers were then more furious, the Atlantic ground-swell more incessant, the Atlantic currents more impetuous than now?"

The truth is, that geologists seem, in not a few instances, to have imagined the glacial or arctic era, over now temperate climates, to have been an era of stagnant and perpetual wintry ice, in which everything was bound up for centuries, without anything like intervening summers, or summer-floods, with moving glaciers and icebergs; whereas, if the winters were extreme in coldness, so, in all probability, were the summers extreme in heat; since such is the present law of winter and summer, in the arctic region, from the operation of causes still in operation.

The glacial era was just an extension of the arctic region, farther south in the northern hemisphere than now, and farther north in the southern hemisphere. And as the icy and snowy winters were produced by the sun passing farther away to the south in the northern winters, and farther to the north in the southern winters, the summers were extreme in heat as the winters in cold; and the commotion which modern arctic summers produce amongst the glaciers and icebergs in the far north was as nothing to what it must have been over England and the Continent in the glacial era. It was then that the tremendous ploughs and harrows of nature were brought into full operation, to pulverise and prepare the soil for the human race; and it was then that valleys were ploughed out and mountains denuded, and that the main features of England and other countries were carved out of the rough block which the great elevating and depressing agents provided for their more special carvings, and for the finishing touches of rainfall and rivers, frost, &c.

Geologists have allowed themselves to be more or less restricted and deprived of resort to natural agencies of vast power, by the dogmatic dicta of astronomers, who, as such, know nothing of the necessities, and the geological evidences, of the case. But, however positive astronomers may be as to the impossibility of certain cognate secular changes, regarding which their data are admittedly very limited and uncertain, the conclusion is irresistible—and they must be instructed by geological facts—that the arctic region itself—the cause which makes it arctic being known, and still in operation,—in truth extended, during the glacial era, or rather the era of ice and flood, far farther south than it now does in the northern hemisphere; and probably also far farther north than it now does in the southern.

The alternations of summer and winter, and of ice and flood, in the arctic regions, as we have already indicated, are astronomically ruled by the obliquity of the ecliptic, or the oscillation or pendulation (figuratively or popularly speaking) of the sun into and out of either hemisphere; so producing summer and winter. And astronomers not only admit the fact that the obliquity of the ecliptic was at one time greater than it is now, but that it is still on the decrease; so that the plane of the ecliptic is, and from time immemorial has been, on the way at least towards a coincidence with the plane of the equator. The extent and limits of this diminution constitute the only question with astronomers. They insist that the limits can only be very small; while it would appear, from the geological facts, that these limits must be very considerable; and it would be easy to show (as indeed the writer of this has, to a certain extent, already done, in the *Scotsman* newspaper, of January 5th, 1842), that the "great uncertainty" in which candid astronomers admit this question to be involved, is still farther increased, and to an extent which drives them entirely out of the field, by virtue of weapons supplied by themselves.

If, will we hope, be seen, from what has been said, that we need not resort to the hard hypothesis of a change in the amount of solar emission, or in the temperature of space traversed by our system, for an explanation of the era of ice and drift; because we have shown how it is explicable, to the fullest extent, by simple and natural causes, in one sense still in actual operation.

It is not the first time we have urged this (see, for example, the *Builder* of October 4, 1862, on "The Alps in the Glacial Era"), but it well merits repetition, till geologists snatch the subject out of the hands of the astronomers, who have much less to do with it than geologists have.

The hook before us is both suggestive and interesting, however far short we may conceive it to be of duly proportioning the causes which have given England its modern outlines.

Laxton's Builders' and Contractors' Tables, for the Use of Engineers, Architects, Surveyors, Builders, Contractors, Lend Agents, and Others. By HENRY LAXTON, C.E. London: E. & F. N. Spon.

UNDER this title Mr. Laxton is preparing a series of tables likely to be very useful to many. He has now issued the first instalment, appertaining to the bricklayer, which contains twenty-two tables, with nearly 30,000 calculations. The headings of four of the tables will serve to show their character:—"Value of any number

The Sanitary State of Stafford.—A correspondent of the *Staffordshire Advertiser* says:—In the principal thoroughfare, and within a stone's throw of my bedroom window, are two places for the boiling of offal, and another for the manufacture of tallow candles. The foul and sickening fumes from these places penetrate every house in the neighbourhood and "murder sleep." Then the two channels which flow the entire length of the picturesque Greengate-street are neither more nor less than open sewers, and their condition, especially at night, would be a disgrace to Cologne itself, the city of a thousand stinks. As a people we plume ourselves upon being more cleanly than our Continental neighbours; but I protest with all my might against the people of Stafford sharing this credit. Verily they are heathens (begging the pardon of the constructors of the *cloaca maxima*). They worship Beelzebub, the god of flies, and of that from which flies spring, as saith the prophet Carlyle.

Cambodia, Cochín-China.—The ruins which have been discovered in Cambodia, says the *Revue Coloniale et Maritime*, prove that the inhabitants must at one time have been as highly civilized as they are now debased. Remains of sculpture have been discovered rivaling those produced in Greece in its best days. Well-built bridges have been discovered in many parts, and the expedition conducted by M. de Lagree found remains of the same and other constructions as far as the 15th degree of north latitude. So extensive and numerous are these remains that they are considered to prove beyond dispute that at the time when they were built the country must have been densely populated by people rich and prosperous to a very high degree; indeed, there is positive evidence of the fact in the writings of a Chinese traveller, who speaks with warm admiration of the lavish manner in which gold was employed in the decorations of their monuments.

The Suez Canal.—The working rules for the transit of ships through this canal have been issued in a printed form by M. De Lesseps, as president of "the Suez Universal Maritime Canal Company." The navigation of the canal is to be "opened to all vessels without distinction of nationality, provided they do not draw more than seven metres fifty centimetres (7 m. 50 c.), equal to 24 ft. 7 in. English; the canal being eight metres (8 m.) in depth, equal to 26 ft. English. Steam vessels will be allowed to navigate through the canal using their own propellers; sailing vessels, about 50 tons, will have to be towed with the service established by the company." There were two Suez Canals, one a preliminary or temporary canal, and the other the permanent one. On a previous occasion the Suez Canal was announced to be opened, but it turned out to be only the smaller one: in this case, of course, the public understand it to be the permanent and great canal which is about to be opened.

The Bath City Water Supply.—Mr. Bateman, C.E., has prepared his report for the Bath City Council. "The gist of it," says the local *Chronicle*, "if we mistake not, will be found substantially identical with that of our own city engineer, Mr. Mitchell, prepared and presented in 1864. He declares emphatically for resorting for water to St. Catherine's Valley, as the only certain, sufficient, and satisfactory source of supply, and attaches little if any value to other localities that have been named. He confirms, in fact, the conclusions on which the Bill of 1866 was framed, so that we are come, after three years' delay and three years' inconvenience, to the precise situation in which we were in the autumn of 1865, with all the work of preparation and negotiation to do over again." The entire cost of the measure, adds our authority, will probably be more than covered by a sum of 80,000l.; while any outlay which may be made for the purchase of the Bathwick and other private springs will yield an ample return in the income already derived therefrom.

The Anti-drink Movement.—An experiment is about to be tried at Bradford, in the way of providing a substitute for the public-house. It is proposed to erect a large building, in which all sorts of amusements will be provided, together with library and reading-room. No intoxicating drinks will be allowed on the premises. The capital required is 1,000l. 800l. of this sum have been taken up by working men themselves.

The Iron and Steel Institute.—The first provincial meeting of this Institute has been held at Middlesbrough, in the Odd Fellows' Hall, under the presidency of the Duke of Devonshire. About 180 of the members of the Institute gave notice of their intention to attend the meeting, and about seventy more gentlemen were candidates for membership. There was a very large attendance, all the principal ironmasters of the district being present, and also many distinguished strangers. Besides the president's address, various papers were read; Mr. Isaac L. Bell, of Newcastle, one on "The Development of Heat, and its Appropriation in Blast Furnaces of different Dimensions;" Mr. Josiah T. Smith, of Barrow-in-Furness, one on "Siemens's Regenerative Furnace, and its Application to Reheating Furnaces connected with Rolling-mills;" Mr. E. Williams, of Middlesbrough, one on "The Manufacture of Rails;" Mr. R. Howson, of Middlesbrough, one on "The Siemens-Martin Process of manufacturing Steel;" and Mr. J. P. Budd, one on "The new Process of removing Silicon from Pig-iron."

Lincolnshire Sea-side Convalescent Home.—The total amount of subscriptions now promised is 2,100l., exclusive of the site, nearly two acres, which has been presented free of cost. The committee appointed at the general meeting having requested Mr. Fowler, of Louth, to prepare plans for a building, these plans were submitted to Miss Nightingale, and met with her approval. On the 3rd of September, the following tenders were sent in:—Mr. Clark, Louth, 3,530l.; Mr. Pattinson, Ruskington, 3,190l.; Messrs. White & Wood, Alford, 3,179l. 10s. The last tender was accepted. Mr. Fowler has promised to return one-half the usual architect's charges for plans, &c. All the living-rooms will be lined inside with Portland and Parian cement, as at Netley Military Hospital. The building will be 180 ft. long, providing for twenty men and twenty women. There is at present a deficiency of 800l. in the funds. The Hon. A. L. Melville, the treasurer of the fund, receives subscriptions at the bank, Lincoln.

Hoist Apparatus.—An invention, said to be new, is being introduced into the mining and manufacturing districts, under the name of Calow's patent safety hoist apparatus, for preventing accidents in hoists of mines, works, hotels, &c. By this arrangement the mechanism is not brought into play by the mere slackening of the rope, but when the rope breaks only; the rope not being in any way connected with the apparatus. The cage has to gravitate before the machine is acted upon. As described to us, "a bar has on it a lever weighted; this weight keeps a spiral spring compressed; when the cage becomes a falling body (i.e., falls at 16 ft. in the first second), the support for the spring ceases to exist, and it becomes of a greater length, thrusting the eccentric jaws or grips into the slides, and effectually preventing the cage descending."

The Metropolitan District Railway.—At the last weekly meeting of the Metropolitan Board of Works, Sir William Tite, M.P., pursuant to notice, presented a memorial from certain bankers, merchants, &c., of the city of London, calling attention to the proposition of the Metropolitan District Railway Company to continue their railway to the Mansion House, and to form a covered way to the Royal Exchange; and expressing their conviction of the great public convenience that would result from such arrangement. The memorial was referred to the Works and General Purposes Committee for consideration in connexion with the reference already made to them on the subject. In course of the proceedings, Mr. Lowman Taylor objected to have a railway station opposite the magnificent Royal Exchange. Where else, he asked, could they get an outlet?

Science Instruction for Women.—We are very glad to hear of an important experiment which is about to be tried at the South Kensington Museum, to promote the instruction of women in science. By permission of the Lord President, Professors Huxley, Guthrie, and Oliver are about to commence a course of lectures on Natural Science, beginning in November. The fees will not exceed a shilling a lecture, with voluntary examinations, and the terms will even be lower to schools and governesses. Some distinguished ladies have expressed their willingness to assist this experiment. The Hon. and Rev. F. Byng, of Onslow Gardens, London, S.W., is the treasurer and secretary.

New Forge Works at Fontypool-road, Monmouthshire.—The formation of new forge works is in course of completion. The ground occupied will be about 2½ acres. A capacious reservoir has been formed adjoining the river to supply the works with water. Messrs. Neville, of Llanelly, are the contractors for the engines and machinery, a great portion of which is now on the ground. The contract for the iron roof work was undertaken by Messrs. Steel & Rake, of Newport. The roof is arranged in two spans of 44 ft. each and 120 ft. in length, supported on three rows of lattice girders, which latter are carried by cast-iron columns in the usual way. The works will be styled the Panteg Forge.

Paper Carpets.—An American paper suggests the following piece of domestic economy:—Save all your newspapers, and when you get enough for the purpose, make a paste as for putting on the wall, and lay them down one by one, pasting them till your floor is covered, then let it dry; then lay another in the same way. When again dry, get some wall-paper of a suitable colour, and paste all over it. When dry, go over it again with a good coat of varnish, and you have a nice covering for your floor, which will wear as long as a carpet [will it?], and look as well as oil-cloth. This is a cheap method of covering bedrooms which are not much used.

Dock Work Expenditure at Liverpool and Birkenhead.—Mr. Lyster, the engineer to the Mersey Dock Board, on Thursday presented his annual report of the expenditure on dock works at Liverpool and Birkenhead from June, 1868, to June, 1869. The figures were as follow:—New works at Liverpool under the Acts of 1858, 1859, and 1863, 55,995l. 11s. 7d.; repairs and maintenance, 80,664l. 15s. 5d.; proportion of official charges, 4,640l. 0s. 7d.—total expenditure for Liverpool, 140,900l. 7s. 7d. New works at Birkenhead under the Acts of 1858 and 1866, 71,289l. 9s. 8d.; repairs and maintenance, 22,254l. 11s. 11d.; proportion of official charges, 3,185l. 8s. 6d.; total expenditure for Birkenhead, 96,729l. 10s. 1d.; conservancy expenses, 1,383l. 5s. 10d.; grand total of expenditure for the year, 239,013l. 3s. 6d.

Opening of an Industrial Exhibition at Jarrow.—An exhibition of works of art and mechanical skill, curiosities, articles of vertu, &c., has been opened in the Mechanics' Institute, Jarrow. Mr. C. M. Palmer, who has been designated the maker of this sort of ship-building enterprise, did the honours on the occasion. The object of the promoters of the exhibition is to wipe off a debt which encumbers the Institute. The hall is decorated permanently, and in the recesses are painted in bright colours a variety of mottoes suggestive of the aims of the Institute. The apartment is 80 ft. long and 40 ft. wide.

The Liverpool Tramways Company.—At an extraordinary general meeting of this company, held in London, the contractors, Messrs. Fisher & Parrish, reported that the line from the Adelphi Hotel to the borough boundary is finished; and that the centre line, running from the Adelphi Hotel, down Lime-street and St. John's-place, along Dale-street, Castle-street, Lord-street, and Church-street, and up Elliot-street, back to the Adelphi Hotel, will be completed this week. The contractors expect to have the road ready for public traffic within a month from the present time.

Surveyor for Margate.—A special sitting of the watch committee was held last week for the purpose of receiving the five gentlemen whom they had selected among the forty applicants for the office of town surveyor, from whom they intended to make their final choice. The committee and the five gentlemen selected were present—viz., Mr. P. Coghlan, of Liverpool, who required a salary of 200l.; Mr. G. J. Stead, of Liverpool, 150l.; Mr. Rumbell, Maida-hill, London, 200l.; Mr. Watson, of Crewe, 200l.; and Mr. Perry, of Stoke Newington, 250l. After consideration of the testimonials of these gentlemen the committee's choice fell upon Mr. Coghlan, and he was duly informed of his success.

The Pigs in Fulham.—The Fulham Board of Works is determined upon a war of extermination against the disgusting pig-breeding nuisance. The medical officer reports an instance of eighty of them kept in two narrow sheds, surrounded by human habitations.

The "Tentoonstelling" of Amsterdam. Professor Pepper has visited the International Exhibition of Amsterdam, and is now giving visitors to the Polytechnic Institution in Regent-street a most agreeable and instructive account of it, with particulars of Holland, and the habits and manners of the people. It is done in Mr. Pepper's best manner, good at all times, with excellent taste and consciousness, and is illustrated from beginning to end by a series of dioramic pictures. The building is a permanent one, and of considerable pretensions.

Drinking Fountain for Keighley.—A drinking-fountain has been erected in the Church-green, opposite to the parish church gates, Keighley, at the expense of Miss Butterfield, of Cliff Hall. It is formed of grey Scotch granite, highly polished, from the works of Messrs. D. H. & J. Newall, Dalbeattie, Scotland. On the west side of the fountain is the following inscription:—"This fountain was erected by Miss Butterfield, of Cliff Hall, 25th September, 1869. 'Let him that is athirst come.'"

A New Church for Southwark.—The foundation-stone of the new district church of St. Anne, Bernadette, has been laid by Mr. Alderman and Sheriff Cotton. The building is to be in Gothic composite style, and is to accommodate 800 persons. The builders are Messrs. Browne & Robinson; and the architect is Mr. Porter.

Epitaph on an Architect.—A writer in *Notes and Queries* says,—On a monument in Walton Church (the original parish of Liverpool) is the following epigram epitaph on an architect, A. H. H., d. 1655:—
"Thy mortal tenement, immortal germ,
Hath sunk to dust, while all thy works stand firm.
O may'st thou at the rising of the just
Thyself stand firm, when all thy works are dust."

Steam Omnibuses in Scotland.—The authorities of Glasgow have granted permission for omnibuses drawn by patent road steamers with india-rubber tires, built by Mr. R. W. Thomson, C.E., Edinburgh, to be run experimentally through the streets of their city.

Haulbowline.—The Lord-Lieutenant of Ireland has laid the foundation-stone of the naval dockyard about to be constructed at Haulbowline. His Excellency's visit to Cork was marred by very inclement weather.

The Wolverhampton Free Library.—The free library and reading-rooms at Wolverhampton have been opened in a building which has been rented by the corporation for the purpose.

Carisbrooke Church.—According to the *Illustrated Standard*, her Majesty has forwarded a donation of 25l. to the organ fund of Carisbrooke Church, a place of historical interest.

King's College: Arts of Construction.—The lectures of Professor Kerr commenced on Thursday, October 7th, and will be continued on every Tuesday and Thursday, at half-past three.

TENDERS.

For rebuilding the Rose and Crown, and dwelling-house adjoining, in Chapel-street, Guildford, for Messrs. Crooke, Mr. Henry Peak, architect:—

	Gross Estimate.	Deduct for Old Materials.	
Burdett	£1,147 10 0	£73 15 0	
Dickinson	1,144 0 0	59 0 0	
Stroudwick	1,148 0 0	72 0 0	
Mason	1,148 0 0	72 0 0	
Mason	1,108 0 0	61 0 0	
Pollard & Son	1,083 2 4	60 0 0	
Loe	1,073 0 0	150 0 0	
Garnett	1,065 0 0	106 10 0	
Beagley (accepted)	974 0 0	106 10 0	

For alterations and additions to two cottages at Farmcombe, Surrey, Mr. Henry Peak, architect:—

Goddard & Son	£384 0 0
Moon & Son	335 0 0
Atfield (accepted)	245 0 0

For house and offices at Hidenborough, near Tunbridge, Mr. W. G. Bower, Jan., architect. Quantities supplied:—

	With Wainscot Fittings in Dining-room.	With Deal Fittings in Dining-room.
Pennett	£3,685 0 0	£3,412 0 0
Wheatley	3,143 7 0	3,091 13 0
Dove	2,862 0 0	2,915 0 0
Wiltshire (accepted)	2,859 0 0	2,818 0 0

For house and three cottages at Rochampton, for Mr. Bevilacqua, Messrs. Beeson, Son, & Brerton, architects. Quantities supplied by Mr. Burnett:—

Dawson	£2,612 0 0
Myers	2,843 0 0
Easton, Brothers	2,838 0 0
Avias & Co. (accepted)	2,299 0 0

Accepted for supplying a new boiler, also for works required to be done in setting the same, and for an additional coal-cellar, for the Waterchapel Union:—

For Boiler.	
Hodge & Son	£109 0 0
For Setting, Boiler, and Coal Celler.	
Wood, Brothers	538 0 0

For villa residence in St. Alban's, Mr. Frank E. Thicke, architect. Quantities supplied by Messrs. Pain & Clark:—

Arnold	£1,150 0 0
Snell	1,100 1 10
Hasley	1,094 0 0
Savage	1,090 0 0

For oil-mill, grain warehouse, engine-house, chimney, &c., at Boston, for Mr. J. C. Simonds. Plans and quantities by Mr. W. H. Wheeler:—

Patinson	£7,400 0 0
Baker	7,200 0 0
Sherwin	6,880 0 0
Otter & Elsey	6,800 0 0
Garnet & Wright	6,862 0 0
Huddleston (accepted)	6,208 0 0

For the erection of a building on the site of Nos. 23 and 23, Change-alley, Cornhill, for the "Estates Company, Limited and Reduced," Mr. E. A. Gruning, architect:—

Tansley	£3,890 0 0
Mansfield & Price	3,875 0 0
Ashby & Sons	3,859 0 0
Coleman	3,848 0 0
Trollope & Sons	3,788 0 0
Newman & Mann (accepted)	3,685 0 0

For the excavation and construction of a double basement on the site of Nos. 11 to 15, Fotheringhay-street, Lambury, for the "Estates Company, Limited and Reduced," Mr. E. A. Gruning, architect:—

Hill, Reddell, & Waldram	£3,619 0 0
Sharman & Co.	3,339 0 0
Newman & Mann	3,276 0 0
Trollope & Sons	3,100 0 0

For the erection of two houses and offices upon the Conservators Land Society's estate at North End, Fulham:—

Kinliff	£564 0 0
Sharman	536 0 0
Taylor & Pilets (accepted)	510 0 0
Brown	500 0 0

For new gallery and repairs to John Knox's Church, Stepney, Mr. Barker, architect. Quantities not supplied:—

Johnstone	£1,250 0 0
Stevens	873 0 0
Carey & Son	770 0 0
Girling	735 0 0
Mackert & Co.	710 0 0
Brady	510 0 0

For rebuilding two warehouses, Wood-street, City, Mr. Herbert Ford, architect:—

Moutrie	£5,720 0 0
Henshaw	5,693 0 0
Wardell	5,273 0 0
Gammell	4,960 0 0
Pritchard	4,906 0 0
Lawrence	4,865 0 0
Myers	4,877 0 0
Killy	4,855 0 0
Ashby & Horner	4,790 0 0
Craib & Vaughan	4,723 0 0
Brown & Robinson	4,463 0 0
Brass	4,381 0 0
Couder (accepted)	4,248 0 0

For erecting a lodging-house in White-row, Spital-fields, Mr. Chas. R. Peters, architect:—

Wardell	£1,093 0 0
Christophers, Brothers	1,090 0 0
Languead (accepted)	785 0 0
Palmer	784 0 0
Masters	780 0 0

For erecting three villas in Greengate-street, Plaistow, Essex, Mr. Chas. R. Peters, architect:—

Languead (accepted)	£700 0 0
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TO CORRESPONDENTS.

Consent for Concrete.—Messrs. Hilton, Anderson, & Co. ask us to state that they made and supplied the cement used in the concrete warehouses & other buildings described in our last. We are sorry to hear that J. E. R. (in the press of other country cannot) influence the decision of the commissioners as to a railway across the Straits. It must be of little consequence to projectors what the press says.—E. H. (The Building Act does make owner and contractor liable for default surveyor's fee.)—Ketter (the metal) his question are obtainable in Birmingham, but we do not give addresses.—B. P. (4 inches.)—J. W. Louth (brick and stone buildings have been named in Chicago, but we do not know exactly.)—J. A. (see paper by the late Prince Comar, in *Society of Arts Journal*).—A. J. A.—E. O.—H. & F.—M. H. L.—P. B.—C. G.—H.—A.—K.—R.—M.—A.—W.—R.—K.—C.—G.—W.—W. G. (see paper by the late Prince Comar, in *Society of Arts Journal*).—E. J. R.—T.—W.—J.—R.—T.—P.—C.—Sons.—S.—W.—H.—R. G.—A.—L.—N.—H.—O.—B.—E.—J.—C.—W.—E. B. We are compelled to decline printing out books and giving addresses. All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Notiz.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

TO SUBSCRIBERS.

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Advertisements cannot be received for the current week's issue later than THREE o'clock, p.m., on THURSDAY.

NOTICE.—All Communications respecting Advertisements, Subscriptions, &c., should be addressed to "The Builder," No. 1, York-street, Covent Garden. All other Communications should be addressed to the "Editor," and NOT to the "Publisher."

BENOS AYRES GOVERNMENT CERTIFICATE.—TRANSLATION.—"We, the undersigned, at the request of Messrs. J. C. Thompson & Co. certify that the IRON SAFES of Messrs. CHUBB & SON, London, of which these gentlemen are Agents, were exposed for several hours to the fire that took place in the offices of the National Government on the evening of the 26th instant; that in our presence they were easily opened with their respective keys; that the money and important documents they contained were found in perfect order; and that these Safes are now in use in the National Treasury Office.—Benos Ayres, July 31st, 1867. (Signed) J. M. DRAGO, Treasurer of the National Government. JOSE M. ALVAREZ.

A true copy.—A. M. BELL." A large assortment of these Safes may be inspected, and lists of prices obtained, at CHUBB & SON'S, 57, St. Paul's Churchyard, London; 63, Cross-street, Manchester; 28, Lord-street, Liverpool; and Horseley-fields, Wolverhampton.

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The Builder.

VOL. XXVII.—No. 1393.



Technical Education in France.*

THE Imperial School of Arts and Trades was founded to train educated workmen and overseers in the industrial arts. It owes its origin to the following circumstances. In the year 11 of the Republic, Napoleon, then First Consul, paid a visit to the Government College at Compiègne, and asked some of the pupils what they intended to do when they left college. The answers he received he considered very unsatisfactory. Said the

subtle Corsican, "The Government pays large sums to educate these young men, and when their studies are ended none of them, save those who join the army, are of any use to their country. Nearly all of them remain at home, a burden to their families, which they ought to aid. This must be put an end to. I have visited the great manufacturing establishments in the North and the larger workshops of Paris; I everywhere found foremen clever in the manual labour of their trades, but scarcely one among them able to draw the outlines or make the most simple calculations of a machine, or to convey his ideas by a sketch or a written description. This is a great defect, and I will provide the remedy for it. There must be no more Latin here, that will be learned elsewhere, but the study of trades, with so much theory as is necessary for their progress. By this course we shall obtain well-taught foremen for our manufactories."

In this speech the great Napoleon gave the *raison d'être* for these well-organised institutions. We may observe that some of his remarks as to the deficiencies in technical instruction as it existed in France in his time, apply with considerable force to certain shortcomings of our own at the present day.

After acquiring an elementary education elsewhere, the pupils passed to the School of Arts and Trades, where, according to the occupations they intended to pursue, they were distributed among the different workshops, as,—1. Smiths, filers, fitters, turners in metal; 2. Founders; 3. Carpenters, joiners for furniture, building, and machines; 4. Turners in wood; 5. Wheelwrights. In these shops the pupils worked eight hours a day. There were half a dozen classes, according to the proficiency and aptitude of the pupils. Out of the eight hours only two were given to study and to theory, including geometry, descriptive geometry applied to the arts, and drawing and shading of plans and machines. Pupils were admitted without regard to age, and the number was fixed at 500.

Many improvements were introduced in the course of the subsequent years; but the chronicle of these changes would be too long to be inserted in this place. It will be preferable to give a

brief sketch of the organisation of the school at the present time.

As we have seen, the studies are both theoretical and practical. The pupils are admitted, after an examination, only once a year, on the 1st of October. The instruction extends over three years and a half, and there are no vacations, not even a half-holiday. Sunday is the sole day of rest. By this system no time is lost, and the pupil learns to grow accustomed to the six days of unceasing labour, which are his lot in life. Twelve hours and a half of work have to be got through daily. Five hours and a half are given to theoretical studies, and seven hours to practical work.

The theoretical study is divided into two parts,—four hours and a quarter in the morning, and one hour and a quarter in the evening. The morning, as being the time when the head is clear and the ideas fresh, is chosen for mathematics and questions, also drawing. The workshop duties are divided into two equal portions,—from ten till half-past two, and from half-past three till seven. The interval is devoted to dinner, and playtime after it. This interruption of manual toil rests the body, as the work itself rests the mind for the evening studies. The pupils rise at a quarter-past five and make their own beds.

The school is classified in three divisions, or years of study, each having its own professor of mechanics, or mathematics, and of drawing. There is also a professor of grammar, and during the first two years a professor of writing. The chaplain gives every week a lecture in religious and moral instruction.

During the first year the professor rapidly passes through the programme of admission, his object being to systematise the knowledge acquired elsewhere, before proceeding with his own teaching. In the subsequent two years he teaches them,—arithmetic, algebra as far as and inclusive of quadratic equations, elementary geometry, comprising curves of the second degree demonstrated geometrically, plane trigonometry, the elements of descriptive geometry, and of the construction of geometrical machines. In the third year a professor teaches industrial mechanics, including hydraulic machines and steam-engines; the principal elements of physics; lastly, the rudiments of chemistry, its nomenclature, and its applications to materials. The pupils are interrogated whilst at their studies by the professors and by the foremen of the workshop.

A very simple method of teaching drawing is practised. During the first year the pupils acquire a free use of the hand by making designs with a drawing-pen of curves, &c., which at a later period they will require when drawing machines. Most of these designs are taken from architecture, of which the scholars are taught the rudiments. For this portion only the drawings are copied from models. The first year's drawing studies are completed by making drawings of joints in carpentry and joinery, exercises tinted with Indian ink, and two drawings of plans.

During the second year, first the elements of machine drawing; next follow, in the hours of study, working drawings of descriptive geometry, which require the most rigorous accuracy. On attaining this point, the pupils, having acquired neatness, clearness, accuracy, and precision, should be able to draw well. They immediately apply their skill to the geometrical drawings of machines, gearing, &c. In this second year they make sketches in the workshops of tools and various machines to scale, with dimensions given. In the third year they make drawings of machines, and illustrations of the lectures on mechanics. They also calculate the principal parts of the machines, and conclude with making drawings of machinery in black and white.

We have thus given in detail this simple and

natural gradation of studies in drawing, it having been found to afford the most successful results. The complete three years' course comprises upwards of a hundred designs or working drawings. The projects and details of the machines to be made in the workshops are executed by the professors in the office of the engineer of the works. It now remains to describe the practical instruction. The pupils are classified in this way. One-third of them are distributed in the preparatory workshops, that is from twenty-five to thirty-five in each of the three: the pattern-shop, the foundry, and the smithy. The remaining two-thirds (about 200) are sent to work in the fitting-shop.

In the pattern-shop the pupils commence with making simple patterns with boards; next they learn to execute all the different joints used by carpenters and joiners; next come patterns for foundries, proceeding from the simplest to the most difficult and most complicated; straight or bevelled gearing, with and without mortising, cylinders and framework for steam-engines, and so on. By way of practice in cutting and manipulation of wood, the pupils also make articles of furniture, pulpits, and woodwork for churches, and other things more or less ornamented.

In the smithy the students commence with welding scraps of old iron into masses, and making tongs and other tools used in forging. They next forge small articles for exercise in filing and fitting, and afterwards make parts of machines. In the third year they are taught the use of the steam-hammer.

In the foundry they commence with plain castings of medallions, balustrades, and palisades, as well as the simpler parts of machines. They next make huts and statuettes on a small scale, before proceeding to execute in large dimensions. By degrees they come to the framework of machines, and the casting of large wheels, either with cogs or with mortise holes, to receive wooden ones. Lastly, they proceed to the casting of small cylinders.

By way of showing how successfully these things are taught in the Imperial School of Arts and Trades, we may mention, that in 1861 this school turned out a fine casting in bronze, upwards of 9 ft. high—a statue of the Duke de la Rochefoucauld, which was set up in the public square of Liancourt. As a rule, however, these castings are in iron. All the processes of the workshop are performed by the pupils themselves, as making the moulds, charging the furnace, casting, paring, and trimming.

In the fitting-shop the pupils begin with simple pieces of regular forms, requiring considerable attention to symmetry and precision, and for that reason very instructive. For example, they first of all make two small iron straight edges, perfectly true in every way; then two squares accurate in every respect; next they make a regular quadrangular prism, and from it an octagonal prism. Subsequently they execute various kinds of compasses, hand and claw-vices, keys for screws, ratchets, bow-lathes, and bench-vices, and, finally, machine tools, steam-engines, and parts of machines, according to the orders in hand.

In carrying out these multifarious practical operations, their work is regulated by certain general principles. In accordance with these principles the pupils, as a rule, make only one piece of the same kind, in order to learn how to execute the greatest possible number. All their work is done, as far as is practicable, by hand, and with the simplest tools.

The intention of this training is to teach the pupil to make all kinds of things, so that he may be able to turn his hand to any branch of his trade where he may find an opening, and to fit him for entering any workshop, large or small. It is stated by the Government reporter, that after a year's work, in any spe-

* See p. 757, ante.

cialty, a clever pupil will acquire all the rapidity of execution characteristic of good workmen.

Until the pupils can work well with the hand, they are never allowed to use the machine tools, or the mortising, planing, or filing machines; but the less skillful always have the advantage of seeing these machines in use; and having been compelled to make drawings of them, they must be well acquainted with their principles. Each pupil has a vice to himself, and at each bench the more advanced pupils teach the juniors. There are also in each shop one or two workmen as examples for the lads.

The pupils are classed, according to merit, at the close of the year, at which time the most deserving are rewarded with prizes. These prizes consist of silver medals bearing the words, "School of Arts and Trades—Reward," for the pupils who are about to leave the school, and who constitute the first division. In the second and third divisions, the rewards consist of hooks on science or the industrial arts. Sometimes a successful pupil is fortunate enough to obtain the award of a sum of money to help his start in life, but this money is never paid till the following year, and then only on condition of the claimant's producing certificates that he has been working at his trade for the past twelve months.

Among the prizes may be mentioned those of M. Xavier Jourdain, founded in 1863, as a testimonial of gratitude for the education he received in the school, to which he attributes most of his success in life. The first prize is a gold medal worth 300 francs (12*l.*), and a sum of money, 1,000 francs (40*l.*); the second prize is a similar medal and 500 francs; the third prize is a silver medal and 400 francs.

The average annual number of pupils during the last four years has been 312; but at least six times that number presented themselves as candidates.

The question will naturally arise, do the pupils on leaving the schools readily find employment, and at remunerative wages? A return shows that from the very entrance of those pupils upon active life they have obtained employment in factories, workshops, and in railway and other establishments. Out of 465 pupils who left the establishment during two years, two only were returned as being out of employment. All these young men seem to have obtained fair wages. Every department of France has the right of sending three exhibitors;—one without any charge, the second to pay one-fourth of the charges, and the third one-half.

How such an establishment would work in this country it is no part of our plan to dilate upon. Our intention in this article is to give facts, which may be accepted as trustworthy, being founded upon official documents. We have no theories to advance, we wish simply to give an account of certain things as they exist.

Let us now turn our attention to some other institutions for technical instruction in France. Among the most important of the minor establishments may be named the Polytechnic and Philotechnic Associations. These two associations have in Paris no less than 150 professors, who perform their functions gratuitously. The instruction consists of courses of arithmetic (first and second years), geometry (first and second years), descriptive geometry, physics, chemistry, machines, drawing of the figure and of ornament, geometrical drawing, book-keeping, geography, natural history, elementary astronomy, grammar, hygienics, singing. The Philotechnic Association has also established courses of English and German, which are not given by the sister establishment.

This association has been rightly called the Working Men's College, as the Conservatory of Arts and Trades has earned the title of the Manufacturers' College. Admission to all the courses is not only gratuitous, but the pupils are also received without any conditions as to their previous education.

Various objections have been raised against courses of teaching for adults, which the director answers. Among other objections it has been urged that the artisan, after a hard day's work, must be, as a general rule, little disposed for intellectual effort. Again, the workman being obliged sometimes to work over-hours in the evening, cannot be regular in his attendance. The first objection, says the director, is unfounded. Intellectual effort after bodily labour is a recreation rather than a fatigue. Energetic workmen who know the value of instruction find a pleasure in attending classes, if not every day, at least once or twice a week. To the second

objection, which the head of the establishment admits to be more serious, he remarks that in certain establishments over-hours are rare, and that, when the men miss lessons, they may easily learn what has taken place in their absence from the notes of their comrades.

We now come to the important establishment founded at La Ciotat by the Company of the Messageries Impériales, for supplying its workmen with the means of acquiring or extending their technical education. There is an infant school and a primary boys' school at La Ciotat; but these do not fall into our plan.

In 1863 evening classes for instruction were opened for workmen and apprentices. Three times a week there is a drawing class from eight till ten in the evening; three lessons per week in the English language are given; and there are courses of orthography, grammar, &c.

At the Graffenstaden Factory, in the Department of the Lower Rhine, there is a school for technical instruction. The term of apprenticeship in this factory ranges from four to six years, during which the lads are bound to attend the school. Experience having shown that the school to be successful must not be altogether gratuitous, each pupil has to pay a tenth of his earnings into the school fund. These boys are taught calligraphy, French and German grammar, dictations and compositions in French and German, free-hand and geometrical drawing, drawing of machines, arithmetic, elementary geometry, physics, and mechanics.

The classes are held every morning from six till eight o'clock (including Sundays), and every evening from five till seven, except Wednesdays and Sundays. Firm discipline is maintained. The schoolmaster presents to the director of the factory a daily report respecting absent pupils, or other facts. The punishments to which the pupils are liable, according to the character of their faults, are a reprimand from the director, a pecuniary fine, or expulsion from the factory. There are monthly and yearly examinations, on which occasions prizes consisting of useful hooks are awarded. The efforts of these lads at self-improvement are aided by an excellent library provided by the factory, containing the best scientific and technological works which have appeared in the French, German, and English languages.

The Imperial manufactory of arms at Tulle provides classes for the instruction of its workmen. Attendance at these classes is compulsory on all the workmen proposed for promotion, either in the manufactory of arms, or as head armourers in the different army corps. They are optional for all the other workmen; but none are placed on the lists for promotion who have not attended them to good purpose.

In founding these classes the objects in view were,—1. To give the heads of workshops and factories the instruction necessary to enable them without the aid of others to keep the daily accounts of the workmen under their orders. 2. To give the men destined to become controllers of arms or chief armourers to corps of troops, a sufficient knowledge of elementary geometry and linear drawing to enable them, if called upon, to take the direction of workshops for the manufacture or repairs of arms, or to superintend the working of machines in factories, and to keep the same in repair. These classes are held three times a week, and are taught by three Government officials, one for arithmetic and elementary geometry, another for drawing, and a third for the manufacture of arms. All these courses are attended by workmen employed by the Government.

The Upper Commercial School is another representative institution. It was founded in the year 1820 as a scientific institution of a kind then unknown. Its curriculum requires three years of study by the pupils, and no pupil passes from one class to the next without undergoing an examination.

Though in some manner elementary, the first class admits only such pupils as have received a good primary education, and are pretty well versed in French grammar, arithmetic, and geography. It is devoted to improving their handwriting; to the study of arithmetic, geography, and history; to an elementary course on the usages of trade and the rudiments of accounts; to natural philosophy and chemistry; and to the knowledge of raw materials, of which the school possesses samples. In this class the pupils begin the study of languages: the foreigners learn French; and the French pupils make a more profound study of the rules of their native idiom. The second class does

not receive pupils under sixteen: it carries on some of the preceding studies, adding book-keeping, the theory of accounts, in all parts, the application of arithmetic to all the operations of trade and banking, a course of correspondence, essays intended to accustom pupils to express their thoughts rapidly with precision and clearness, linear drawing, geometry, the elements of algebra, commercial geography, and the study of the code of the commerce of France.

The third year is devoted to the higher branches of learning, and to practical exercises. It includes the study of the exchanges, and of arbitration, as to transactions with foreign Governments; application of accounts to commerce, manufactures, and agriculture; analytical chemistry and chemical manipulations applied to the study of merchandise, and to the discovery of adulterations; technology of the principal manufactures; the requirements of trading ports, railways, and docks; mercantile and marine law, and political economy. The pupils are divided into groups, or commercial firms, which are from time to time renewed, buy and sell goods, keep hanks, charter vessels, assure, commission, correspond, and perform, under the guidance of an able and experienced professor, all the most difficult and most varied operations of commerce. The pupils rise at half-past five all the year round, and at six commence the business of the day. The hours of every day are thus employed:—Five hours' lessons, six hours' study, and four hours' recreation.

We have now noticed at some length all the representative establishments for technical education which exist in France. Throughout the length and breadth of that country there are scores of similar establishments,—trade schools, farming schools, drawing schools, and schools of architecture and engineering.

By way of conclusion, we may give a *proleptic* of the views enunciated by General Morin, the Government reporter, on technical education with respect to the very important question of the education of apprentices.

With regard to apprenticeship, and its connexion with education, three principal solutions have been put forth. The first is, that the workshop alone can attain the object of all apprenticeship, properly so called, namely, training the artisan, and giving him the requisite manual dexterity. To combine with a real apprenticeship to the future trade the degree of instruction that all workmen ought to possess, two principal means have been successfully employed. One consists in placing the school in the workshop or factory, and in compelling, either by law or internal regulations, the daily attendance of the apprentices for a certain number of hours. Of this kind are the important factory-schools at Mulhouse, Graffenstaden, Wesseling, Le Creusot, La Ciotat, &c. The second solution is that which has been organised by certain municipalities, and private firms and societies of patrons, which take the apprentice under their protection, and watch over his interests until he has served his time. The third manner of preparing youths for the practice of the different trades, consists in establishing a workshop in the school itself, and dividing the pupil's time between study and manual labour.

Such, in a condensed form, are some of the opinions and reports of the authorities charged by the French Government with the duty of examining the real condition of technical education in France.

ARCHITECTS AND ENGINEERS.

The generalising tendencies of the present day, the result mainly of the broader analysis of modern science, concur to draw together and assimilate, in many points, pursuits and professions formerly separated by an easily-recognised line of demarcation. As we draw nearer in our researches to first principles in science and art, we come almost insensibly to find things which we had been accustomed to regard as essentially diverse in their nature, resting, in fact, very much upon a common basis; we discover that knowledge and information which have been supposed to hear specially upon one particular occupation, come in usefully also, or even indispensably, in the practice of other pursuits more or less analogous. The primary effect of such discovery is, as we have hinted, to unsettle and confuse the nominal boundaries of professions, a process which is still more accelerated by the rapidity of modern life and the comparatively short time in which everything

nowadays is expected and demanded to be done. "That is best which lieth nearest" is the principle adopted by the practical man as well as the artist. The client goes to whomever he thinks will supply him most readily and quickly with what he wants. But the secondary effect of this state of things must necessarily be in the end to narrow the circle of individual practice in any art or profession, to promote the principle of the division of labour, and to break up large and ever widening spheres of labour into smaller sub-divisions, so that each practitioner may be able to grasp fully what he professes to do, and to render efficient aid and co-operation towards the grand result to be attained.

It is under such general influences as above indicated, that the two professions named at the head of this article have, at present, got themselves a good deal confounded together in the public mind; which confusion has been, if not initiated, at least encouraged and stimulated by sundry members of the engineering profession, individually or through their recognised journalistic representatives, on the principle, assumed if not stated, that "an architect and an engineer are very much alike,—especially an engineer." The distinction between the two professions was formerly sufficiently recognised by every one, and might in broad terms be expressed thus: that the engineer was concerned in providing for transit from one place to another, the architect in erecting buildings *in situ* at the various termini of locomotion. The older engineers made their fame by their canals, their bridges, their roads over impossible places; the architects by their mansions, their town-halls, and public buildings generally. But the advent of that great democratising agent, steam, for a time very much modified all this. In the first place, the discovery of so new and valuable an agent in locomotion naturally drew everybody's attention, much more than formerly, to the constructions required in connexion with locomotion, rather than to those needed for habitation or display. Railways became an end rather than a means, so that in some cases the natural order of things was reversed; and instead of the railway being used as a means of communication between two towns, unimportant towns were made the excuse for a railway, projected and surveyed, if not completed. In such a state of things the engineering profession of course got a long pull, and a strong pull, and a pull altogether, alike upon the purse and the confidence of the public; giving, let it be said, good and strenuous labour in return. Then there were, in connexion with railways, such things as terminal and roadside stations to be built; things bearing the semblance of being strictly architectural work, but which, nevertheless, fell largely into the hands of the engineers, as many direful structures up and down the country can and do abundantly testify. Then also, since the time saved in travelling has led inevitably to our much faster rate of living generally, and the demand for the execution of edifices of all kinds on much shorter notice than was once deemed necessary, it has been discovered in some important instances that the engineer, from his constant grappling with tough constructional problems under adverse circumstances, is a readier man in an emergency than the architect; and so there has passed into his hands the superintendence of sundry erections, from time to time, which, if there be anything at all in the architectural profession, certainly ought not to have been built without, at least, the co-operation of an architectural designer. However, the mischief is done now; and that which has in some instances come to pass in practice, has been justified in theory, in certain quarters, with a persistence and an ability which have not been without their effect on the public, who will believe anything if they only hear it often enough, and many of whom are already quite prepared to accept the engineers' own account of themselves, as the persons best qualified to superintend the contriving of all such structures as might, could, or should be erected upon the surface of the earth. This view of the matter is partial and incorrect in itself, disconcerting to the student of architecture, and exceedingly pernicious to the student of engineering.

Of course, as we all know, every design must have a structural basis, and therefore knowledge of construction is necessary to the architect, whatever he is engaged upon. It is only when the constructive necessities of a building, or of a structure of any kind, completely override in importance its artistic necessities, or

when the constructive problem is so difficult and complicated as to be itself an object of special study, and of the application of abstruse scientific and mechanical principles, directed by a judgment resulting from long practical experience, that the aid of the engineer is really necessary. There are classes of works which belong purely and absolutely to the engineer, and wherein there can scarcely be said to be any scope for architectural embellishment; there are again works, such as ordinary houses, churches, &c., where the only problems really requiring thought and intellect are those of design (including plan) and ornamentation; and there are again works belonging by custom and in their initial form to the engineer, which would yet be susceptible of much embellishment from the hand of the architect; and, conversely, works of which the main object is beauty, but which are erected under structural conditions which demand special engineering skill and science to grapple with them successfully.

And this latter class of works, of what we may term the mixed kind, is much more numerous in the present day than ever it has been hitherto, and is not perhaps likely to become less so. It might seem natural and right that the mere channels of locomotion, of access from one centre to another, should fall solely under the hand of the engineer, as works purely of necessity and for use. And in the old road and osal-making days this was of course the case. But now that the railway system has necessitated so many stopping-places on the road, apart from ordinary towns and villages, where erections of great size are required for the daily use and under the daily sight of many thousands of people (not to speak also of the multitude of roadside stations, importantly, their number and frequency, if not by their size), it is surely desirable that some special attention should be paid to the aesthetic beauty of such structures, in addition to their mere constructive strength and fitness. In some cases this has been done, but chiefly in the matter of small roadside stations; the large termini being still left, for the most part, under the sole care of persons whose very education tends to draw their minds completely from considerations of beauty and expressiveness in an edifice, and to develop their faculties on the practical and calculating side only. On the other hand, the demand for the production of very large buildings on very short notice, and sometimes under peculiarly difficult conditions, which has arisen under modern civilisation, tends to put the architect in a very different position with regard to the practical requirements of his profession. A Gothic cathedral was a thing elaborated slowly and deliberately, and may have been the result of many accurate scientific theories than of practical experience attained by men who were constantly engaged on their work, thinking of little else, and who had time to deliberate and experimentalize. Now, everything is wanted to be turned out of hand by a certain date, and its constructive security must be guaranteed, or the insurance companies will have nothing to say to it. And all this seems to lead us to what we have called the secondary but inevitable result of the conditions of modern life, viz., the carrying out to a greater extent the principle of the division of each profession within closer limits. In other words, we think that not so much a fusion of the professions of engineer and architect is called for, as a co-operation of the members of those professions each in his own strictly-defined sphere.

It may be said that we should rather attempt to educate our engineers better in design, our architects more thoroughly in construction, and so dispense with the inconvenience of having two professions to do, as it sometimes seems, the same thing. Our system of education would have to be very much methodised and improved before any such result could be obtained. But we believe the idea is chimerical, except with regard to peculiarly gifted and exceptional individuals. Architectural design, in a high form, rests, as we have frequently urged, upon very subtle and refined principles, not apprehended without considerable study, even by those who have a special gift that way; and the very quality of mind which predisposes a man for this class of study is that which has most antipathy to, sometimes even absolute inability for, mathematical and mechanical studies. "Ah! sir," said William Blake, on being shown some mechanical engravings, "these things we artists hate." On the other hand, it cannot be doubted, not only

that the highest engineering talent is very often found totally unaccompanied by what we may term aesthetic perception, but that, as before remarked, the very course of an engineer's education tends to draw his mind solely to the consideration of the mechanical properties of material, without any reference to their capability for beauty of form or finish. And the very rapidity of demand in the present day intensifies the importance of this distinction. Were there more time allowed for maturing the design and carrying out the construction of a large building, there might be more chance that one man would be able to provide at once for its constructive and artistic requirements. As it is, except in cases where one of these two classes of requirements is at a minimum, it is next to impossible for one mind to attend properly to things so diverse, and calling into play such a different class of faculties. Where the constructive and the artistic problems are equally balanced, and are each important in themselves, a fully satisfactory result can scarcely be obtained but by co-operation.

We should probably not have much difficulty in recommending such an idea to the consideration, at least, of members of the architectural profession. In some instances within our knowledge the calling in of an engineer as consulting constructor has been adopted by an architect, and that voluntarily. And there are probably many cases where, in carrying out very large works especially, an architect who was solicitous for his future fame as a designer, would be really glad to be relieved of the onus and responsibility of the thousand and one practical difficulties and dangers to be provided for or guarded against, and have his mind left free to bestow all its faculties on the great end of all architecture, rendering a building a delight instead of a nuisance. We are sorry that we can feel no such confidence, or half-confidence, in the converse case. The attitude taken by the engineers towards their architectural brethren has too much savoured of an antagonistic, or, at least, a kind of "we-can-do-without-you" feeling. When Professor Kerr, some years ago, in a paper read at the Institute, and printed in full in these columns, ventured to advocate something like the same system of co-operation which we have been hinting at, he was answered in an indignant and injured tone by an engineer correspondent, who assured him that engineers "would not put themselves into architectural harness." No one ever asked them to do anything which ought to be so defined. Those who take this tone, no doubt, think that they evince their superiority by so doing; that they speak from a superior standpoint to that occupied by those half-taught people the architects. They are quite mistaken. Their arrogance is that, not of knowledge, but of ignorance. But the mischief is that, from the nature of the case, it is often impossible to convince them of this. Mathematical and mechanical knowledge is a thing that can be defined; and if an architect is deficient in this, his deficiency can easily be proved to him, though he is, of course, open to say, if he choose, that he thinks it of no consequence to him. But if a man is insensible to the difference between beauty and ugliness, between an artistic and expressive, and an inertistic and meaningless structure, what can we say? He is insensible, and there is an end. You cannot demonstrate to him, logically, that he has erected a monstrosity upon the earth; for all that he can see, it looks all right, and he does not know what more you can wish for. The absurdity is, that with all this ignorance and indifference to what constitutes the aesthetic in building, the engineers still seem to have a kind of lurking conception that something called architecture is needed to give the finishing touch to their constructions; and this they set about supplying by the light of nature; that is to say, instead of letting the real construction of their work appear, they mask it behind something, which resembles something else which has been done somewhere else by somebody else at some other period, ancient or modern, and which has no conceivable relation to the matter in hand, and then complacently think they have done the architect's work in addition to their own. All that they have really done is to deprive their work of all the solid and satisfactory expression which it might have had as a piece of unadorned construction, and to make it, externally, a meaningless and often hideous sham. Pure constructive provisions, when made on a large scale, will often produce a fine general effect in spite of the engineer. We remember on one occasion being struck by

the fine bold outline of a machicolated water-tower seen in the distance from the streets of a provincial town. The machicolations were used for the practical purpose of obtaining a wider area for the tank at the top. We took an opportunity of making a closer inspection of the edifice, and scarcely know how to express the effect it produced upon us. An attempt had been made at what might be called "lunar Gothic," and every detail in the tower, and the surrounding buildings, was so moonish, so inconceivably hideous and barbaric, that we stood lost in wonder how any man could possibly have invented such ugliness. Yet this was the work of an engineer eminent in his profession, and who, as we incidentally learnt afterwards, prided himself particularly on the appearance of this very building.* He is dead now, and we trust his iniquities are forgiven.

The real remedy for this engineering intrusiveness of barbarism upon us lies with the public. And if the directors of railways and water companies, and such-like concerns, could be got to insist upon the introduction of artistic as well as constructive excellence in the great works which their business requires, we might be spared some very painful sights, and even gain some very fine ones, with little or no extra expense. Consider what a fine thing might be made of such a large railway station as that of Crewe, for instance, with its long perspective, if treated with architectural breadth of effect in the general arrangement, and fitness and elegance in details. We see no reason why the engineers should feel inattentive at such a proposition. We believe the architects are quite willing to recognise the importance of engineering experience and knowledge, and to avail themselves of it where it is really desirable. They may surely ask in return that their art should be recognised, and that engineers should be willing to consult the judgment of persons who have studied the art of beauty and expression in building, which they themselves have paid no attention to. One piece of advice we give the engineers in the meantime. If they still wish to keep clear of the architects altogether, they had better be contented with naked construction, and avoid dabbling in architectural design themselves. They could do nothing which would illustrate more emphatically their need of the architects' assistance.

A FEW WORDS TO SOME WORKMEN.

WE adopt, as we naturally should, the observations made by the third speaker (Mr. Codwin) at the Working Men's meeting held in Bristol during the recent Social Science Congress. At that remarkable gathering no fewer than 3,500 persons attended, of whom at least 3,000 were of the wage-paid class. The Health Department of the Association considers the various questions relating to the Public Health, discusses improvements in house construction, drainage, ventilation, the functions of government in relation to public health, and the machinery expedient for its preservation. The Council always desire that this part of their programme should be brought prominently before the meeting of workmen invariably held during their congresses; and very properly so, for it concerns no part of society more, if so much: health is the workman's stock-in-trade; without it, he is nowhere; knowledge of the laws which regulate it is of the utmost consequence to him, and should be systematically taught: every item of such knowledge that he can obtain will be of value to him. Much has been done in Bristol within the last dozen years to improve its condition. Clark's report shows what it was in 1850. A board of health and an anxious medical inspector have since been at work, and have lessened the death-rate; but they must not rest on their oars: the removal of the sewage will demand their most serious consideration; hundreds of houses are still unfit for human habitation, and smoke is still allowed to disfigure the city, to interfere with health and to prevent cleanliness, although the Act of 1866 would enable them to remedy the evil. Walpole called Bristol "the dirtiest great shop I ever saw;" and inattention to the smoke nuisance

* In another place, we have seen a large reservoir built on the top of a hill, in a pretty country, which might have been made a striking object. It was built in the form of the smallest and most simple of cottages, under a single roof, the tower at one end taking the usual aspect and position of an outside chimney upon the centre of the gable! The effect was, literally, to dwarf the scale of the whole landscape round.

leaves it, to a certain extent, still open to a similar remark. Smoke interferes with the spirits, makes life less buoyant, and lessens happiness. Surely it should be fought with; surely it should be conquered. It is too late in the day for objectors to express any doubt as to the value of good sanitary arrangements. What has been effected by improvements in this direction in Salisbury, Ely, Croydon, and Bristol itself, as well as many other places, affords sufficient proof of their value. The great test, is the death-rate. What lessening the death-rate of a town means is not fully felt by all. Take a practical illustration of it. The population of Bristol is called 172,000, and the death-rate in 1863, if correctly given, was 23 in 1,000;—for every thousand persons living 23 died in the year; 3,956 in all. Now the death-rate in Manchester for that year was 32; and if it had been the same in Bristol, 1,548 persons alive at the end of the year would have been dead. This is a serious matter, and worth comprehending.

It must be remembered, too, that for every death there are seven or eight cases of illness that do not so end. Besides the 1,548 additional deaths, there would, therefore, have been eleven or twelve thousand additional cases of illness, with their consequent pain, poverty, pauperism, degradation, and misery. To lessen the death-rate of Bristol one per annum, is to save 172 lives yearly, and some 1,200 cases of illness. Are not all concerned in striving to effect this? The consideration of the importance of sanitary improvements should surely make us less impatient of the taxation they might lead to. What is wanted, we say again, is knowledge. If the Board of Health were fully supported out of doors, they would probably soon apply themselves to enforce the improvement of some of the dwellings, for example, lying between the cathedral and the gasworks,—dwellings wherein, as at present occupied, health and virtue are scarcely possible. At the place called the Quarry, also, great changes are called for. Here habitations are planted against the sides of the excavation, so that proper ventilation is out of the question. The effects of overcrowding should be inquired into, and the value of air understood. How is it that so many children still die before they are five years old? The number comparatively is enormous and damnable. With adults, badly-constructed houses and overcrowded rooms produce a low state of health in the whole population, and dispose it to receive readily any infection, physical or moral. The bad food they get, and the habits some of them indulge in, increase this disposition to the bad. Nor is the latter evil confined to their class. Each class has its bad habits. What might not be done if we all gave up some of our indulgences with a view to the general improvement—say, for example, that less was drunk. Some 50 millions a year are spent in intoxicating liquors, with a crowd of fatal consequences to boot. Suppose we gave up half our drinking,—not to be too good all at once,—the 25 millions sterling so saved could be made to save 25 millions more. It is not alone the working-classes that need to be taught temperance. All classes require the lesson: there should be temperance in other things besides drink. Education is a more profitable investment than beer, and has a money value. Artistic skill, the result of education, has given foreign nations a great advantage over us. If our workmen will not go to the School of Art themselves, if they are too firmly fixed to get out of their regular groove, at any rate let them send their children: the hope of the nation is in its children. A knowledge of drawing not merely brings delight but profit, and its acquirement in youth is as easy as that of writing: it gives a new sense, a new power. Connected with these subjects,—the public health and the education of the masses,—are the adornment of cities and the spread of taste for works of art and knowledge of art. One of the speakers at the same meeting, commenting on this observation had filled the people's bellies with nonsense. Such a remark is worse than nonsense a vast deal. Are we to wait until all the bellies are filled before we talk to any of the value and delights of art? If so, depend on it there will be less and less power in the country to afford that material aid. The ignorance in respect of art amongst all classes is sorrowfully great. Our public bodies should attach more value to art, and spend more money on it. We want large pictures in our meeting-places open to all, teaching, elevating, purifying; we want more sympathy

between masters and men, between men and men; we want universal education, and the spread of knowledge. Knowledge is not merely power, knowledge is health; and without health there can be little happiness or progress.

THE LATE MR. THOMAS WATTS, OF THE BRITISH MUSEUM.

The following observations by Mr. Henry Stevens (of Vermont), long and honorably known in this country in connexion with books, will be found interesting:—

Mr. Watts used to say that his first position in the library was the very humble one of supernumerary assistant for arranging and cataloguing the accumulations of Chinese, Russian, and other books of the kind, which no officer or assistant felt disposed to take hold of.

In 1838 Mr. Panizzi, then keeper of the printed books, detecting and appreciating his uncommon abilities, nominated him as second officer on his staff, Mr. Jones being the first. One of Mr. Watts's chief recommendations to the appointing powers was his practical and working knowledge of twenty-five languages. For nearly twenty years it was part of Mr. Watts's duty to examine, classify, and place all authors as they came crowding into the library. Thus every hook, from whatever part of the world it came, passed under his eye, affording a rare opportunity for a man of his linguistic powers. Many a time has he been noticed beside his loaded attendant stood yawning. He gave great attention to the bibliography of the literature of the north of Europe, including the Icelandic, the Swedish, and other Scandinavian languages, nor was he less mindful of the Russian and Solovay languages generally, especially the Hungarian. Mr. Panizzi, and afterwards Mr. Jones, with commendable zeal, purchased all the books in these languages recommended by Mr. Watts, in so much that the museum is now probably richer in books of each of these languages than any library in Europe, not excepting perhaps the best collection of each language in its own country.

Soon after 1843, when Mr. Panizzi, aided by Mr. Jones and Mr. Watts, drew up his famous report on the deficiencies of the British Museum in the literature of the several countries of the world, it was found that though every English book might in time be acquired, yet the books wanted from all parts of the world, in all languages, would soon outnumber and dwarf the English department. It was, therefore, thought desirable to give especial attention to the collection of American books, as if they were English; that is, to procure them all. A parliamentary grant of 10,000*l.* a year was asked and obtained for the purchase of books alone, the binding and all other expenses to be provided for by other funds. That sum is still the annual grant. In 1843, a few American books were purchased, but probably at that time the whole collection of American books in the library did not exceed 1,000 volumes, nor was there at that time any just idea of the vast amount of books that had even then been produced in the United States. In 1845, a young man from Vermont dined at the Museum, introduced by Mr. Sparks. He had taken a degree from Yale, had heard Story lecture, and was a good deal interested in American literature and history. Mr. Panizzi, Mr. Jones, and Mr. Watts, soon drew from him a report on American books, comprising a list of some 10,000 volumes not in the library. Measures were at once taken for purchasing the entire list, and from that day to this the American department has been filling up so rapidly that now there are probably not less than 100,000 volumes of American books and hooks relating to our country in the British Museum, including especially all the more bulky and costly works, and not excluding pamphlets and the unconsidered trifles of the day. This noble work, begun by Mr. Panizzi, and steadily carried on by Mr. Jones for nearly ten years, has been pressed on by Mr. Watts during his brief administration of about three years. In 1856, the trustee sanctioned the printing of the catalogue of the American department, which when completed will go far towards a history of American literature.

Mr. Watts possessed a most remarkable memory. He could instantly point out the press and shelf of probably more than 100,000 works. He liked to meet Americans, and always prided himself on knowing something of the personal

history of every prominent one who came to see him. The writer well remembers two attempts to test this faculty. One day, without any notice, he took a friend into Mr. Watts's recess, and said abruptly, "Mr. Watts, let me introduce to you Professor Silliman, of Yale College." "Oh," said the rising, and cordially extending his hand, "how very fortunate, Dr. Benjamin Silliman, that you should appear here of all places in the world, just fifty years since your first visit, when in your 'Travels' you wrote a most interesting account of our library. Come, let us go and see your rare little book, and at the same time I will show you the library, and afford you the opportunity of writing another account, showing our half-century's progress,"—and he walked off the professor to a remote part of the library, and laid his hand on the volume, as if it had been one for his daily reading. A similar readiness delighted and astonished the Hon. George P. Marsh with respect to his little privately printed Icelandic grammar.

Among all his pressing duties (and when 10,000 a year are spent, and an average of 30,000 volumes acquired, duties are pressing) which he never neglected, he found time to do a good deal of literary work, one of his earliest productions being "A Letter to Mr. Panizzi on the History of Early English Newspapers," showing, to the regret of antiquaries, that several of the earliest and most interesting respecting the destruction of the Spanish Armada were forgeries. He contributed largely to the cyclopedias and magazines on biographical, bibliographical, and philological subjects. His "History and Description of the British Museum" in the English Cyclopaedia is an exhaustive production, and his "Essay on the Hungarian Language" made him a member of the Hungarian Academy.

Mr. Watts was the first superintendent of the new Reading-room,—a living, breathing, and answer-giving index to the vast library of 1,000,000 volumes within. He had seen the library grow from 250,000; and, as he had placed most of the authors as they arrived, none knew so well as he who they were, and where they were to be found. He held this post for nearly ten years, when, on the retirement of Mr. Panizzi in 1866, Mr. Jones succeeded to the office of principal librarian and secretary to the trustees, and Mr. Watts was soon after promoted to be the keeper of printed books.

HOW BRISTOL WAS RETARDED, AND IS PROGRESSING.

DURING the recent congress of the Social Science Association,

Mr. Charles Nash, timber merchant, of Bristol, read an interesting paper on "Some Causes which have tended to retard the Commercial Progress of Bristol." After general remarks on the interest attaching to the study of the causes of the advance or decline of great cities, an extract from Seyer was read in proof of the importance of Bristol in early times, showing that in the thirteenth century the citizens carried out a great improvement in their harbour. In the next century, when Edward III. fitted out an expedition against France, London contributed 25 ships and 662 sailors, and Bristol 22 ships and 608 sailors. The prevalent idea that Bristol was now a declining place was then combated. Its population, wealth, and commerce are all greater than ever, and are rapidly increasing, although the rate of progress has not been equal to that of Liverpool, Glasgow, and one or two other towns. The question was then asked—Why has a city, with almost unrivalled natural advantages, with a safe channel only a few miles distant, surrounded by mineral wealth, and with all the prestige of historic greatness, lost its place of second city in the kingdom? The first reason given was the difficulty experienced in the last century from the want of floating accommodation for the shipping frequenting the port. Every tide the vessels were left on the ground, and thus damage often occurred.

From 1765 to the end of the century, one plan after another was proposed and laid aside, until, in the year 1802, Jessop's was adopted with some modifications, and the existing floating-harbour was commenced. The estimate was 200,000l., but the cost was 600,000l., and from this circumstance arose the next cause of retarded progress. Oppressively high charges were imposed to eke out a dividend, and thus the advantages of the improvement were partially neutralised. The trade increased so slowly that

in the third decade of the new works the dock receipts were only one-third greater than in the first, while heavy town-dues and other charges increased the pressure. It was stated that since 1848 the foreign trade of Bristol has increased threefold. The next cause named was the want of accommodation for large ocean steamers, which are now conveying the most valuable part of the trade of the country. Bristol proved Dr. Lardner to be wrong, and when the *Great Western* had triumphed, nothing was wanted here to secure the West Indian and North American mails but suitable accommodation. The opportunity was lost, and Liverpool and Southampton obtained the prize. The *Great Britain* was built only to leave us for ever, and even the *Great Western* was soon afterwards withdrawn. After many schemes for supplying this want had failed, the Channel Dock Company was formed, and is now actively engaged in constructing a dock of fifteen acres at Avonmouth, with an entrance wide enough for any ship but the *Great Eastern*.

Another more recent cause was then noticed as some length—the want of agreement among the commercial men of Bristol: divided counsels have hindered many onward movements. As instances of this pulling in different directions, the defeat of the Bristol and Clifton Railway Bill by two or three influential individuals, and the Parliamentary contest of 1863 as to the great river deepening scheme, and the construction of docks at Avonmouth, were noticed. A truce ensued, by the terms of which the river improvements are going on, but on a reduced scale, although still perhaps too large and costly for the results to be obtained; and the Channel Docks are also being constructed. The fact of these large works, as well as the Porthead Pier, the Harbour Junction Railway, and extensive street improvements all going on together, was noticed as a proof of the life now stirring in Bristol. Most of the causes enumerated may be classed under four heads:—Deficient water communication; faulty railway arrangements; high charges, and divided counsels. They are enough to have stopped altogether the growth of a place less favourably situated than Bristol. The paper concluded thus:—"And now that many of these causes are removed, or are in course of removal, a second youth has developed itself in Bristol. The suburbs are extending in every direction; new public buildings, warehouses, and manufactories are rising in our midst; and the foreign trade is increasing more rapidly than at any former period."

NEW WORKSHOPS FOR BLIND PERSONS IN LIVERPOOL.

THE foundation-stone of new workshops for blind persons able to work has been laid in Cornwall-street by the Archbishop of York. The site, containing about 1,000 yards of ground, has been granted by the corporation. The building, according to the local *Journal*, is to be of a horse-shoe shape or plan, having its closed end to Cornwall-street, and will cover, with the yard at the back, 962 square yards. It will have a frontage to the street of thirty-six yards. The central portion of the front will contain upon the ground floor a vestibule, show-room, manager's office, and principal staircase leading to the two upper floors of the central block. There will be on the first floor a committee-room, library, and lady-visitor's workroom, lavatories for lady-visitors, and for workwomen, adjoining their workroom in the left-hand wing. Along the back of these rooms there will be a corridor from the landing of the stairs, leading to the women's workroom and to a large room in connexion with it in the left wing, to be used for the holding of classes, women's dining, and general gatherings. Upon the top floor of the central portion is arranged house accommodation of four rooms, with scullery, pantries, &c., for resident officers. The wings right and left of the centre, with the exception of the floor on the left-hand, are devoted to class-room, &c., and will be occupied by the several trades carried on in the institution, viz., basket-making, mat and brush making, &c. The basement of the wings will be used for stores and the preparation of the willow rods, &c., for the basket-makers, and under the central portion will be a dining-room and lavatory for the workmen. Provision will be made in the gateway and porch for sheltering the children or others who guide the workpeople to and from their work. The staircases will all be of stone,

providing easy access to the several workshops and safe egress from them in case of fire or accident. The whole of the floors, except those of the horse part, will be carried upon wrought-iron girders, and the principal part of the floor will be of fire-proof material. The whole of the workshops, corridors, and staircases, class-room, and dining-room, will be warmed and ventilated with constantly changed hot air. Externally, the building will be faced with cream-coloured bricks and red-stone dressings; and the style of its architecture is to be Pointed Gothic of the simplest character. The architect is Mr. G. T. Redmayne; and the builders are Messrs. Haigh.

MORE ABOUT FLYING.

IT is one fortunate privilege of the humble undersigned to have "many adversaries." He may not possess the pleasure of their acquaintance, neither need they in the minutest measure know him; but he can nevertheless afford to thank his foes for their constant and notorious zoilistic kindness. Every smallest imputation of that happy but persecuted individual, whether it be poetic or prosaic, or both or neither,—whether breaking a lance for Byron or taking a fly with Dædalus,—is through them forthwith by common consent fiercely assailed and thereby advertised, and soon made famous by their ridicule and censure; by reason and means whereof the light shuttlecock of reputation is kept well in the air (unintentionally, doubtless, because to a certain person's benefit) through the blessed and inexorable hattle-dorres of spleen. Long may such useful slanderers flourish; and so let them help to keep a man at peace in the midst of notoriety, and of a good English courage winal, in spite of the skeleton of those healthy horse.

But to my brief text after this just personal exordium: "More about Flying." Well, that exordium has some small warrant even as to our present aerial hobbyhorse of human flight; for my short paucity on the virtues of flapping has been perverted at length, even in a full London leading article, into total denial of the expediency of levitation. No one ever said this,—or meant to infer that comparative lightness would be no advantage to the flying human. By every means give us elevating power through a lighter gas, if any can. Some sort of "fame gunpowder," or woven gun-cotton to be leisurely exploded in detachments on a regulated-cracker system, or some exhalation of extraordinary buoyancy yet to be discovered by the chemists,—these, stored in a vertebral tunnel, with lateral tubular appendages, might well be imagined as helps to our heavy manhood (or, perhaps, better as lifters of the machine in which he sits), before and beside the potent flapping mechanism, which must ever constitute the main motive-power for flight. We may reasonably recollect that no bird has anything analogous to hallowing for its elevation; feathers may be the lightest clothing, and hollow bones the least ponderous of skeletons; but anyhow, so far as we can discover, there is not only no lighter gas in them by way of lifter, but actually all accessories, even to the downiest of pinions, are heavier than common air. It is possible to buy a pound of feathers. If, then, we men may avail to help our weighty material by carburated hydrogen or some new gas lighter, and shall add to this levitation a tireless and unlimited flapping power by clever mechanism, we ought manifestly to be able to heat the birds; and it only requires the shrewd inventor to arise—no he soon will—to enable us to do so. Where is the Faraday to levitate our grossness by that lighter gas? Even dining tables float up to the ceiling nowadays; sometimes not without (so seers and believers have testified) spiritualized men-mediums upon them! If there be some natural secret here (and who shall say there is not?) it behoves our Royal Society physicists to find it out. And when this is "found and made a note on," where is the ingenious mechanician to fabricate steel muscles for our breasts and shoulders, and to give us the strong but light and delicate tissue whereof we may float on wings? Such things remain to be discovered; and in these stirring days of energy and competition will probably be caught by their predestined inventor, before the nineteenth century is ten years older. Wealth and well-earned honours await any such inventor; and the *Builder* is the inventors' organ, for which cause we drop our word in here. If Whitworth and Fairbairn, as consummate earthly artisans, are worthy of the "bloody hand of Uster," what glory short of straw-

berry-leaves should crown the head of the coming discoverer of the heavenly art of flying? Ambition of every kind, from Censols to the peerage, herein may find fulfilment,—in that near but future day; but just now no doubt we are practically hounds at fault, barely scenting, and not finding: the present cover-heater has but little help to offer, beyond throwing out a suggestion, giving an idea to the winds, and hiding any one catch and keep it as his shrewdness best can. For human flight we must imitate birds rather than hubbles, and get all help from chemistry for a lighter gas to levitate our flesh and bones, as well as from mechanism, to supply us with stronger muscles.

MARTIN F. TUPPER.

THE NEW CITY AND COUNTY BANK, KIDDERMINSTER.

The new bank is now nearly completed at the corner forming the angle of High-street and Vicar-street. It is on the site of premises heretofore occupied by the same establishment (the Worcester City and County Banking Company), but which premises were ill calculated for banking purposes, whether as regards arrangement or substantiality. At present the business of the bank is conducted in other premises near at hand, rented temporarily while the new bank is being raised, and the opening of which will probably take place in the course of a few weeks.

The building was designed by Messrs. H. & E. A. Day, of Worcester, and completed under the supervision of the junior partner of that firm, Mr. Ernest A. Day.

Owing to the irregular shape of the site, and the small depth of frontage in High-street, great difficulty was experienced in providing the necessary requirements of the establishment. This was to some extent, and with regard to appearance, overcome by the introduction of a portico at the angle formed by the two streets. Mr. R. Thompson, of Kidderminster, is the builder. Mr. Gooling was the clerk of the works. The contract for the building was 3,550*l.*

The frontage to Vicar-street is 69 ft. 9 in. long, exclusive of the portico. White brick, with freestone dressings, are the materials used in the face-work, and the structure consists of two stories, divided on the outer wall by an enriched stone string-course. At the base is a plinth of freestone, moulded and sunk. On the ground floor is a series of segmental-headed windows, and on the chamber floor there are semicircular-headed ones, the arches springing from pilasters having carved caps, and the key-stones with moulded capping: there is a stone balustrade to each window. The entrance to the manager's house is by a doorway near the centre of the Vicar-street façade, while the bank entrance is by the portico before named. The slated roof rests on a cornice, which has a panelled scuff, moulded and cut cantilevers, and stone frieze; and the brick chimney stacks have stone panelled and bracketed caps.

Entering by the portico or colonnade we observe four Ionic columns, supporting an entablature and balustrade. We then pass into a lobby underneath a semicircular arch, having on its carved key-stone a shield bearing the City and County Bank arms; and next into the principal banking-room for public business. This apartment is 27 ft. 8 in. by 23 ft. 5 in., and is 20 ft. high. There are four columns of Bath stone standing on moulded and panelled pedestals, and having capitals sculptured after the model of the Temple of Jupiter Stator, supporting an entablature, from which springs a panelled coffered ceiling, and in the centre of the ceiling is a circular wheel light, sufficient for the requirements of the banking-room. From the great bank-room doorways lead to the strong-room, the bank parlour, lavatories, and closets. The strong-room is fire-proof, being lined with glazed brick, and having a semicircular vaulted roof, an iron door, and thick stone slab pavement. The floor of the public bank-room is of oak, but encaustic tiles are laid down in the entrances, lobbies, halls, staircases, lavatories, &c. Fine oak, panelled and varnished mahogany, and red deal have been used for the doors and internal woodwork generally, the doorways in the principal apartments having moulded architraves, with cushion frieze and moulded heads. The manager's entrance-door has a fan-light with segmental head, moulded spandrels, and square top. A half-glass screen separates the lobby

from the entrance-hall; then, passing under a semicircular arch resting on pilasters having carved caps and moulded archivolts, we arrive at the principal staircase, which is lighted by a lantern 30 ft. above the ground-floor level, with a coffered ceiling and ornamental panels. The staircase is fitted up with close carved face-strings, moulded wall-strings, turned balusters, moulded hand-rails, and turned and carved newels. There is a drawing-room 20 ft. by 17 ft., a dining-room 24 ft. by 17 ft., eight bed-rooms, bath-room, closets, store-room, cellaring, servants' staircase, kitchen, scullery, china-closet, cook's pantry, coach-house, stable, and all other usual offices. The bank is heated by a hot-water apparatus, supplied by Messrs. Rimington & Son, of Skipton, Yorkshire; Mr. Whetstone, near Leicester, laid the tiled floors; and Mr. Forsyth, of Worcester, did the carving. At the rear of the premises is a small garden, which will probably be enclosed by a wall having an ornamental balustrade, and a gateway with panelled doors and pillars with ornamental caps.

OPENING OF SHREWSBURY MARKET HALL.

The new General Market and Corn Exchange at Shrewsbury is so far completed that it has been formally opened for use. The building is in a mixed style of architecture, and is built of blue, red, and white brick, with Gainsborough dressings. Its total length is 313 ft., and its greatest breadth 150 ft. On the basement are fifteen vaults, for the storage of goods, with inclined roads leading thereto. At the entrance the cart-way is 10 ft. wide, and in the centre 24 ft., so as to permit of a wagon going to the entrance of the vaults, and of turning, previous to coming out. This approach to the vaults is from Claremont-street. On this floor are also a number of shops, the fish-market, and the ice-house; and here, also, it is intended that the heating apparatus shall be fixed.

The ground floor consists chiefly of the general market, the vegetable market, the arcade, the butchers' market, and a number of shops. The general market is well lighted and ventilated, and so, indeed, is the whole of the building. There are six entrances to this portion of the building (the general market), the principal one being from Mardol, by means of an arcade 16 ft. wide. In Claremont-street a covered cartway is being erected for the loading and unloading of goods in wet weather. The roof of the cartway will be of glass. The windows and doorways are all circular-headed, and the majority of the doors are made to slide, in preference to having hinges. The height of the Corn Exchange is 88 ft., and of the tower, which rises near it, 151 ft. The latter is surmounted by an ornamental iron vane. The tower is square, and has a large circular opening on each side for the clock dials, which will be four in number, and upwards of 8 ft. each in diameter. The clock will be supplied by Mr. Joyce, of Whitechurch; the bells will be supplied by Messrs. Mears, of London.

An improvement effected by the erection of the new building is the widening of the streets in the vicinity. Formerly, Shoplatch and Claremont-street were narrow and dangerous thoroughfares. At present Shoplatch is a street 40 ft. wide, while Claremont-street is 30 ft. At Mardol Head the width is 28 ft., and in Bellstone 30 ft.; and the whole have been re-metalled, curbed, the footpaths flagged, and in some cases the levels have been altered.

On the Shoplatch end of the Corn Exchange is a piece of carved work, in stone, representing, in figures of colossal dimensions, the allegorical characters, Peace and Plenty. The figures are 11 ft. 6 in. high, the shield 13 ft., and the length of the whole is nearly 25 ft. The figures project 2 ft. 6 in. The design was provided by the architect of the building, and the work has been carried out by Mr. C. Landucci, sculptor, Shrewsbury. The side of the market in Claremont-street very much resembles that in Shoplatch. The estimated cost of the building was about 41,000*l.*, but of this 3,250*l.* were furnished by the Corn Exchange Company for the erection of the Exchange.

Immediately on entering the market from the doorway in Mardol, is an arcade with a row of pillars on either side. This space, it was originally intended, should be formed into shops; but as it was doubtful whether the general market would accommodate the whole of the market people, it has been left vacant till that

question is solved. At the end of the arcade, and below the tower, are closets and other conveniences; and, immediately beyond, is the fruit and vegetable market. It has an entrance from Shoplatch, and one from Claremont-street, and communicates also with the general market and the arcade. It contains forty-eight stalls. Of these twenty-eight are arranged in rows down the centre; and the remainder are fixed around the walls. Along the centre of the general market are two rows of wooden stalls, the main "thoroughfare" of the hall running between them. They are thirty-six in number, and are so constructed that the salesman stands within, and has a counter in front and on one side. On the Shoplatch side are thirteen rooms, well-lighted shops. Behind the stalls, in the general market, are the benches for the market-people proper. The accommodation consists of long rows of tables for holding the commodities offered for sale, with seats on either side.

There are, at present, fifty-four tables, and it is calculated that each will accommodate eight persons, making a total of 432. The butchers' department is at the north-west corner of the building. It contains five shops and thirty-four stalls. Along the whole of the Shoplatch side of the general market runs a gallery, which is approached by a stone staircase at the Bellstone end, and one of iron at the opposite end. It contains six shops. The fish-market is situated at the Bellstone end of the building. It is somewhat below the street. Adjoining is a large ice-house, capable of holding about 200 loads of ice.

The vaults extend beneath the whole of the general market, and have a wagon entrance from Claremont-street, with additional incline communication with Mardol Head and Shoplatch. In the Claremont-street section are seven vaults, and on the Shoplatch-street side six. They vary in dimensions, but all are lofty, drained, and ventilated. The whole of the market proper has been fitted with gas. The general market will be lighted by twenty-two star-lights, with twelve burners in each, and the gallery and vegetable-market by bracket-lights. During the daytime the general market is lighted by a large lantern light. The corn exchange may be approached either from Shoplatch or from Claremont-street. It is 90 ft. long by 45 ft. wide, and at the ends it takes the form of an arc. It is lighted by a large lantern light, running the whole length of the room, by three bull's-eyes on one side, and large windows at each end. At night it will be lighted up by four star-lights, with forty-eight burners in each. In the ceiling, which is 52 ft. from the floor, there are eighteen large apertures for ventilation, and the room will be heated by hot air. Over the doorway is a small gallery. Adjoining the exchange is a sitting-room, 17 ft. by 11 ft., and 22 ft. high.

The whole of the work in connexion with the market and exchange has been carried out under the superintendence of Mr. Price, as clerk of the works, from the designs of the architect Mr. Griffiths, of Stafford.

The *Shrewsbury Chronicle*, to which we are indebted for these particulars, gives a view of the new edifice.

OPENING OF BRECON COLLEGE.

The new Congregational College at Brecon has been opened. The site of the building is just above the station of the Brecon and Merthyr Railway, on the Camden-road, the ground for the purpose having been bought from the Marquis of Camden. The elevation of the ground adds to the appearance presented by the college, besides the advantages derived in a sanitary point of view. The college consists of a centre building with a wing on each side, leaving a considerable area between. The length in front is 152 ft., and the depth is nearly 100 ft. A tower, 100 ft. in height and 10 ft. square, projects 7 ft. from the line of the front. The design is Gothic, and the material employed is native stone, with dressings of Bath stone. The basement floor consists of a kitchen, 30 ft. by 17 ft., and 10 ft. high; scullery, 20 ft. by 16 ft.; wash-house, 30 ft. by 17 ft.; lavatory, 20 ft. by 16 ft.; and an arched muniment-room, fire-proof, 12 ft. by 12 ft.; large pantry under the tower; corridor, lumber-room, 16 ft. by 12 ft.; coal-house, &c. There are on the ground floor a dining-room, 35 ft. by 21 ft.; library, 35 ft. by 21 ft.; in the tower two wide flights of stairs leading into the entrance-hall; corridor, 6 ft. in width, extending the whole length of

the front; chief staircase, 16 ft. by 12 ft.; lavatory; four studies, each 11 ft. by 9 ft.; matron's room, 12 ft. by 12 ft.; store-room, 12 ft. by 6 ft.; staircase, &c. The height of the rooms on this floor is 13 ft. 6 in. On the first floor are two class-rooms, each 25 ft. by 16 ft., and 11 ft. high; 16 studies, 9 ft. by 12 ft., 11 ft. in height; a hospital; two servants' bedrooms, and large landing and passage. There are on the second-floor six studies, twenty-two bedrooms, each 12 ft. by 9 ft.; bath-room, and staircase leading to the tower. The bedrooms are 9 ft. 6 in. high. There is a yard for the use of the students 90 ft. by 80 ft. At each end of the college is a tutor's residence. There are two large oriel windows in the front of the college projecting 7 ft. outwards, and serving for the three lower stories, which are also lighted by square windows with mullions and transoms, the bedrooms on the top story having dormer windows. The roof is pointed with coping and parapets of Bath stone. There are square buttresses projecting from the tower, and going to a height of several feet above the eaves of the building, and a good deal of stone dressing of an ornamental character. The studies and bedrooms are all fitted with ventilators, the former with fireplaces also. In part of the building there is a terrace 18 ft. long, and 56 ft. in width, with a road leading to the back. The college is well fitted up in every way for the convenience and comfort of the students. The contractors are Messrs. Watkins & Jenkins, of Swansea; the amount of their contract is \$2500; the extras will probably amount to 2000, or 2500. The plans were drawn by the Rev. Thomas Thomas, of Landore.

A FALL IN BELFAST, IRELAND.

A STRANGE occurrence is reported by the local *Newletter*. The inhabitants of Byron-street, Belfast, and that neighbourhood, were alarmed the other night in their beds by a sudden report resembling thunder, or the discharge of a battery of artillery, under their windows. In the morning it was found that the cause of the night's alarm was the total demolition of a whole street of new houses, fortunately as yet not occupied, which came down with a sudden crash. Doors, windows, bricks, &c., all lay in one heap of ruin. Where, the previous night, a row of partly-completed dwelling-houses stood, there was now a pile of rubbish and debris. The mystery was cleared by the production at the police-court of a man named Clarke, who, with a number of others, was found by two constables, immediately after the fall of the building, concealed in the vicinity. A subsequent search about the premises led to the finding of a number of strong ropes, like ships' hawsers, which leads to the supposition that the mischief was done by passing the ropes round the narrow walls between the lower windows underneath, and pulling down the buildings by sheer force. Eleven houses in one row have been completely demolished, and it was also found that in another line of buildings behind the interior walls had likewise been pulled down.

BUILDING TRADES' MEN IN THE ARMY.

His Royal Highness the Commander-in-Chief is not disposed to let the subject of the civil employment of the soldier fall to the ground. The Duke of Cambridge has sent a circular respecting the employment of soldiers in trades to Chatham, in which the attention of commanding officers is called to the approval given by the Secretary of State to such employment. Returns are now called for of all soldiers who have been educated in any of the building trades, — as carpenters, plumbers, painters, glaziers, bricklayers, and gable-tiers. So far from there being any attempt to impose on those soldiers extra and uncompensated labour, it is proposed that the privilege of obtaining employment as a civil workman shall only be accorded to tradesmen-soldiers who have been in the service for two years, and who bear good characters.

The gist of the echeme lies, as we have more than once insisted, in the rendering useful employment acceptable to the soldier. The elevation in the social scale which he will acquire by the occupation of time that would otherwise be wasted, or worse, in the practice of a craft, cannot be acquired *volens volens*. It must be *volens* alone. That a judicious management may make this supplementary service

highly popular, we think there is no room to doubt. In the appropriate employment of the hands and muscles of a picked part of the population in useful works, lies an element, not at all to be neglected, of national wealth. The case should not be regarded from the miserable standpoint of trade competition. The burden imposed on the country for military defence forms no inconsiderable portion of our entire annual outlay. No very brilliant prospect is open as to the means of permanently reducing that outlay. The distinct tendency of the advance of science is to increase it. The right direction in which to look for the alleviation of the pressure is that of making, as far as may be, the service of our defence self-supporting.

TILE PAVEMENTS.

At the cost of the Freemasons of Bristol, Mr. William Powell, acting on their behalf, a very handsome pavement has been laid in the Lady Chapel of Redcliff Church. It is composed of varied combinations of rough encaustic tiles, with rich glazes of yellow, green, and black, being partly reproductions, and partly imitations of ancient examples. These tiles are especially made with a roughness in the body, which produces depth and richness of tone in the colours, and prevents the patterns from being too mechanical and true, giving them the spirit of the ancient work.

The tiles are of Messrs. Maw & Co.'s manufacture, and the pavement was executed, under the general directions of Mr. Godwin, by their London agents, Messrs. W. B. Simpson & Sons, who have lately given special attention to the introduction of this class of work.

A pavement lately executed by the same firm, under the direction of Mr. G. G. Scott, at St. Asaph Cathedral, is also a good specimen of tile work, the special characteristic in this case being the introduction of incised tiles of a coarse body, floated over with a richly-coloured glaze, in imitation of some ancient tiles recently found in the cathedral.

These rough tiles seem to us worthy of the notice of architects, as they are suitable for ecclesiastical purposes, especially in cases of restoration.

A mosaic chancel pavement has just been completed in Blackley Church, in memory of the Rev. Andrew Doria, who for seven years was curate of the parish, and who died at the age of 34, two years ago, at Lindow, the school church of which village he took the sole charge of on leaving Blackley. He was a lineal descendant of the Genoese branch of the Doria family, celebrated in Italian history as warriors, statesmen, and patrons of art. The pavement was designed and laid down by Messrs. Dale & Sons, Manchester.

THE THEATRE.

The Princess's.—The most noticeable point in the new drama here, "Escaped from Portland" (an adaptation of "Le Mangeur de Fer," which may be freely rendered The Bracelet Breaker), is the completeness of the disguises assumed by Mr. Chas. Mathews (*Gentleman Jack*), five in number. These even do what stage disguises seldom effect, deceive the spectators. Mr. Vining, too, plays several parts with much vigour. Mrs. Chas. Mathews is charmingly tender as *Liza Tyrell*; and we must say a word for the intelligence displayed by a new young lady, Miss Carlisle. The scenery is bright and appropriate. A view of Putney Bridge, by Mr. Lloyds, makes the bridge much too low; the excitement caused by the fall from it, too, would be greater if the bridge were higher.

The Olympic.—This theatre has been very elegantly decorated, in the manner adopted at the Princess's, and by the same decorator, Mr. James Macintosh. Scroll ornaments are applied to both tiers of boxes, and to parts of the ceiling, and are richly gilded. The proscenium is wholly gilt. The curtains are of a dark cerise satin, and the backs and ceilings of the boxes are kept of the same dark colour. The effect of the whole is rich and comfortable. The *carton pierre* decorations were executed by White & Co. The house, now under the direction of Mr. W. H. Lippin, has been opened with a version of "David Copperfield," titled "Little Em'ly," which is so good, and for the most part so remarkably well acted, that we may take an opportunity to refer to it more fully.

THE LONDON HOUSE PAINTERS.

At a meeting last week, at the Artisans' Club, in Newman-street, of members of different societies of house-painters and decorators, having for its object the formation of an association of workmen, for the purpose of technical education and improvement of the execution of work in painting and decoration, a statement was made by Mr. G. Shipton, general secretary of the Amalgamated Society of House Decorators and Painters, of the views of the executive council of that society. The statement was to the effect that employment in the trade might be greatly extended, to the advantage alike of the community and of the workmen and their employers, by directing public attention to the educational advantages and cultivated pleasure derivable from buildings decorated in harmonious colouring, and characterised by refinement of taste,—points about which great want of apprehension prevailed. By general improvement in the execution of work there would be a sufficiency of work at all times in the hands of employers of the better class, to the exclusion of those who are regardless alike of the interest of their customers and of demoralising efforts on their workmen. The operatives would be more steadily, regularly, and pleasingly employed; the community, by systems of economised labour, and by cultivation on the part of the men and masters, would get better and more pleasing returns with less original cost. To effect practically such objects, the proposal was to establish a school or system of class instruction for education in matters technical, or otherwise, related to the special industry, the instruction being confined first to what would be most useful in daily work. This instruction was proposed to be given indifferently to society or non-society men, whilst backed up, and perhaps in the first instance set going, by the trades' societies, whose organisation could not but be valuable for such a movement. Several members spoke to the same effect. There was a slight difference of opinion about the extent to which the association should supply qualifications to those men who had never passed the training of an apprenticeship; but ultimately resolutions were passed affirming the want of such a society, appointing a committee, and arranging for a second meeting.

A STRANGER ON THE THAMES EMBANKMENT.

Sir,—On Saturday morning, the 9th instant, curiosity led me to take a morning walk along the Thames Embankment. The morning was beautiful and fine, but, without any more novelistic preliminary, I shall come to the subject of my remarks. As I expected, from the description which I have read in the *Builder* and the London daily press, the river wall, as a work of tidal engineering and the building art, is all that might well be desired; but here my encomium must finish. Now for the footway or roadway between Westminster Bridge and the Temple: it is open to the gravest criticism and censure, for a variety of reasons. The flagging of the footway is one of the most unworkmanlike pieces of work I have met with for some time. In the first place, the flags are badly laid, and worse jointed, and there is hardly any attempt to obtain a uniformity of level. I do not mean to say that a level could be carried out, strictly speaking, between Westminster Bridge and the Temple, but I do mean to assert that the unsightly up-and-down appearance, so painfully and palpably apparent, could have been avoided. In following the direction of the river there is nothing more easy to obtain than a certain uniformity in the rise and fall of the roadway; but from almost every perch in some parts of the Embankment a wave-like undulation can be seen.

I have said that the flags are badly jointed, the outer half of the footway being wretchedly so. I looked again and again to convince myself, and I almost came to the conclusion of believing that one-half of the footway had only been temporarily laid, for hundreds of the flags lap at their joints one above another ½ in. and in some cases ¾ in. None of the open gratings which protect the trees, and which are let in in quarter divisions, in the flagging, preserve their level, but are quite unsightly in appearance, being up and down, although the work is but quite recent. In fact, one half of the Thames footway is taking its good-bye from the other half, and exhibits all the features as if the shock of an earthquake warned it that its hour of settlement had come.

Another very grave complaint I have also to make. The entire length of the footway of the Embankment is very filthy, particularly along the angles between the flagging and the bottom of the river wall. Dirt has accumulated in many places to the depth of 2 in. or 3 in., and I regret to observe offensive nuisances are allowed to remain unmoved in the "set-offs" and break along the wall. Surely a dastard or two, with hand-cart, might be told off every morning for keeping this, what might be a beautiful promenade, clean. Notice should also be put up; and where any infraction of the rules of decency is committed, the delinquents, when discovered, should be summarily and rigidly punished. I have also noticed that in the ebb and flow of the tide much mud is drifted up on the stone stairs and landings. This, on the fall of the tide, should be at once swept down, as, besides being dangerous, its appearance is anything but a pleasurable sight.

The Thames Embankment requires at once a Conservancy appointed as well as the river Thames itself; and if something approaching to this power be not vested either in the police authorities or in a separate body, our river-side roadway and esplanade, instead of becoming a blessing and an improvement to this mighty city, will become an eyesore and a questionable advantage to the citizens of London.

Some remarks have already appeared in the daily press concerning the invasion made by the wild boys and tomboys of the streets of this favourite lounge, and the unlimited licence enjoyed by this wanton and unenlightened stratum of the town. I would not debar one of God's humblest creatures from the participation of an enjoyment, no matter what its garb might be; but at the same time I would have order and decorum enforced, and all riotous behaviour put down with a strong arm. These are the views, whatever they are worth, of

A STRANGER ON THE THAMES EMBANKMENT.

SCHOOLS OF ART AND SCIENCE.

The Reading School.—The annual distribution of prizes to the successful students of this school took place at the town-hall. There was a very good attendance. The hall was hung round with numerous specimens of the work of the students. The chair was taken by the president of the society, Mr. D. Higford Burr, of Aldermaston Court. The annual report stated that—

"With regard to the present year, although numerically the school is no stronger than it was, the committee believe that in the various departments its efficiency has been considerably increased. Drawings executed by forty-seven students during the year were transmitted to South Kensington in March last, in accordance with the regulations of the department. Of these, three were awarded prizes, whilst forty-four received marks showing that the pupils by whom they were submitted had received sound instruction. At the local examination held at the school on the 9th and 10th of March last, eighty pupils attended. Of these twenty-seven were pronounced good, and six excellent. The latter received prizes, the former cards of merit. A communication has been lately received from the Department in which the establishment of science classes is recommended in connexion with schools of art. In deference to this recommendation, and believing that the instruction thus afforded will be valuable to many, it is proposed next term to form classes for teaching the following subjects, viz.—1. Practical plane and solid geometry; 2. Machine construction and drawing; 3. Building construction."

Mr. Havell, the master, read the list of prize winners, who received their prizes from Mr. Burr. The meeting was afterwards addressed by Dr. Wells and other gentlemen, and a vote of thanks was given to the master by acclamation.

The Oxford School.—A large and deeply interested meeting, comprising a great number of artisans and mechanics, was held at the Town-hall to hear the report of the proceedings of the science classes which have been in operation during the past year in Oxford, the success of which is said to have been alike creditable to the students and to the teachers. The Rev. J. E. Thorold Rogers occupied the chair. After the report of the committee was read, Mr. Buckmaster addressed the meeting. At the close of the proceedings, it was unanimously resolved,— "That the amalgamation of the science committee with the art school is desirable for the purpose of forming a combined School of Science and Art." The Oxford school of art was established four years ago.

A Watford School.—A class in connexion with the Science and Art Department of the South Kensington Museum has been formed at Watford, and several gentlemen have consented to act as a committee of management, with Mr.

A. T. Brett as chairman. Mr. J. B. Fairman is the teacher of the class, which meets on Thursday evenings in the room under the Literary Institute. The payment by the members is merely nominal (9d. per month), and is only intended to meet the incidental expenses. The science now engaging the attention of the class is "Animal Physiology," and the lessons are illustrated by diagrams, dissections of animals, and the microscope. Mr. Buckmaster has given a lecture (Mr. Brett in the chair), at the Literary Institute, in reference to the Government scheme for promoting a knowledge of the principles of science and art.

THE NEW OFFICES FOR THE POPLAR DISTRICT BOARD OF WORKS.

SINCE the issue in which we announced the discontinuance of these works, the differences of opinion between the builders and the architects have been discussed at several meetings of the Board. An earnest desire has been expressed at these meetings that Messrs. Baker & Constable, the contractors, should complete the erection, and, by order of the Board, they have been formally called upon to proceed with the carrying out of the contract. Messrs. Baker & Constable, however, declined to do so; and have placed the matter in the hands of Messrs. Noon & Davies, solicitors, who, on the part of their clients, have served a writ upon the Board for non-compliance with the provisions of the contract, in refusing payment for work actually done. On the other hand, the architects, Messrs. Hills & Fletcher, and Messrs. Harston, stoutly refuse to certify for the amount demanded by the builders, and state their conviction that they are perfectly justified in withholding the certificate, inasmuch as timber had been supplied which was not in accordance with the contract, and that under the circumstances it was competent for them to require that the timber to be henceforth used in the building should be deposited on the premises before certifying for further payment. The members of the Board appear to be greatly annoyed at the phase the affair has assumed, and at their last meeting decided to make a stand against the action taken by the contractors. It was agreed that as the builders preferred litigation rather than to proceed with the contract, the Board had no other course open to them but to invite, by public advertisement, tenders for the completion of the building; and it was resolved to institute the necessary proceedings against Messrs. Baker & Constable's securities for the recovery of any loss which the Board might sustain in consequence of the non-fulfilment of the conditions of the contract.

ACCIDENTS.

A "STEEPLE JACK," Thomas Buterton, of Every-street, Manchester, has met with his death while repairing a tall chimney at Mr. Farmer's chemical works, West Gorton. The rope by which he was holding on broke, and he fell from a height of twenty-three yards.

A fire has occurred at the Crystal Palace High Level Station of the London, Chatham, and Dover Railway. The firemen of the palace and those of the metropolitan brigade quickly attended, when it was found that about 8 ft. of the staircases had become ignited, but by the use of hatchets and water the fire was soon extinguished. It was caused by the overheating of a flue.

NEW VOLUNTEER QUARTERS, LIVERPOOL.

THE First Lancashire Volunteer Regiment of Rifles having found that the storehouse now occupied by them in St. Anne-street, Liverpool, does not afford that accommodation which the rapidly-increasing strength of the regiment demands, have, at the cost of two of the commanding officers, been enabled to purchase a site for a new drill-shed, the erection of which will be proceeded with forthwith.

The new quarters, which will be situated at the corner of Low Hill and Gloucester-place, will consist of the drill-shed proper; length, 220 ft. by average width 72 ft., and the usual storehouse, armoury, magazine, officers' quarters, &c.

The local architects selected to design and carry out the work are Mr. C. Sherlock and Mr. T. B. Troughton, jun., of the firm of Troughton & Prescott, of this town.

THE LIONS AT SALTAIRE.

SCULPTURED representations of the lion are to grace the open spaces in front of the Mechanics' Institute and the schools at Saltaire. These lions were designed by the sculptor, Mr. Thomas Milnes, of London, for the base of the Nelson Column in Trafalgar-square; but, after he had completed the models and made preparations for proceeding with the work, the commission was taken out of his hands and given to Sir Edwin Landseer. In the meantime the models remained in Mr. Milnes's studio, where they attracted the notice of Sir Titus Salt. Mr. Milnes is the sculptor who executed the bust of Sir Titus, which was presented to him a few years ago by his workpeople, and is now at his seat, Crow Nest. Sir Titus was desirous of having the lions at Saltaire, and after a consultation with Mr. Lockwood, his architect, it was decided to place them in front of the buildings named, two on each side of the road. The lions are four in number. Two of them have just arrived, and one has been set up on its pedestal. They have all been modelled from animals in the Zoological Gardens. The figures are each 8 ft. long, 3 ft. wide, and 5 ft. high. They have been sculptured in Pateley Bridge stone, and the weight of each is nearly 3 tons.

ANCIENT FOUNTAIN IN FREIBURG.

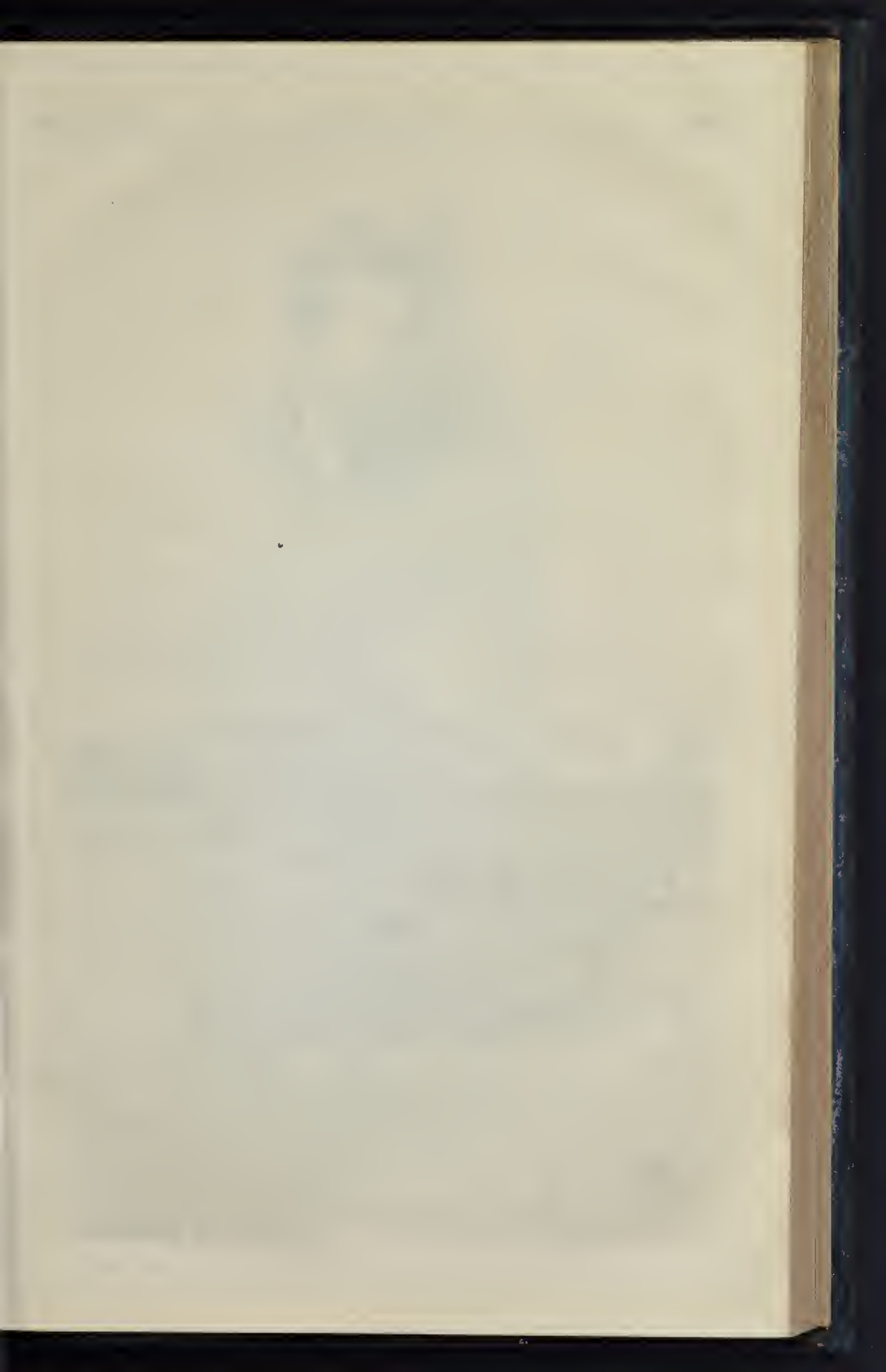
THE town of Freiburg-in-Breisgau is justly celebrated for its magnificent minster. Few more interesting churches exist in Europe, and it would be difficult to find one which offers a more beautiful subject, or collection of subjects, to the pencil of the artist. No engraving can give an idea of the great beauty of this cathedral, as one of its greatest charms is the exquisite colour of every portion of the building. The stone of which it is built is of a delicate crimson tint, and is overgrown with lichen of the richest orange. Nor is the interior less remarkable for its picturesque beauty, as nearly all the windows are filled with old stained glass of the most brilliant description; and most of the altars are ancient, some of them adorned with pictures of great merit. The high-altar pictures are the works of Hans Balding Grien, and were painted at the beginning of the sixteenth century. Over an altar in one of the side aisles of the choir is a painting by Holbein; and over another, a large silver crucifix of very early Romanesque work. The pulpit, which is ornamented with statuettes in bronze, is said to have been carved by an artist of the name of Hauser in the year 1561; but from its appearance, and the entire absence of Italianism in its details, it might date from fifty or sixty years earlier.

The other churches in Freiburg are not very remarkable.

The Protestant church is noteworthy from the fact that it originally stood at Thennenbach, and was removed here "stone by stone" (?). Probably it was, in its original condition and position, a fine and interesting abbey church; but its "removal" and "reconstruction" have robbed it of all interest, and as it now stands it is a dry, hard, lifeless Romanesque building. The doorways, however, which are probably the only portions of the building that have been really "reconstructed," are good examples of the style. The interior consists of plain whitewashed walls, entirely devoid of ornament, and painted deal galleries and benches,—a precious "reconstruction" of an ancient abbey church!

The Minorite church has been a good fourteenth-century building, but has suffered from modernizations perpetrated during the last century. It contains a good set of stalls, and a curious cloister.

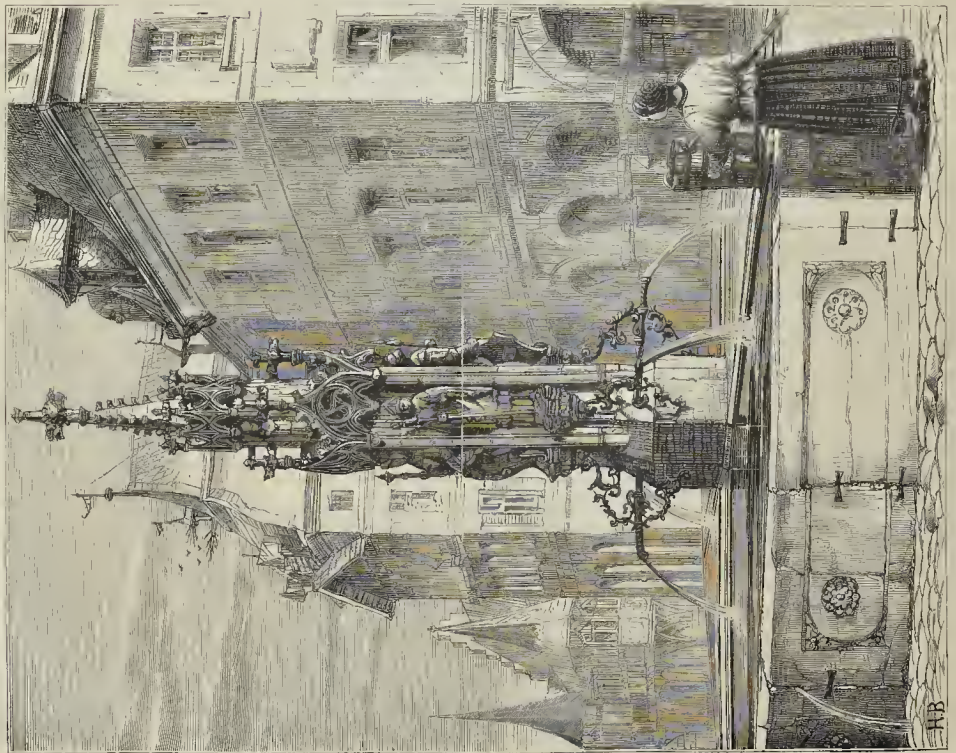
The Kaufhaus, opposite the cathedral, is a charming little Gothic building, built upon an arcade of four segmental arches, with how windows at each corner, and the font decorated with rich niches, containing statues of the German electors. The roof of this building is shown in our engraving to the extreme left. Not far from the Kaufhaus is the beautiful little fountain of which we give an illustration. It is built of red stone, with white stone figures. Its probable date is about the year 1480. It is ornamented with four large statues, two representing bishops of Freiburg, and two of them knights in full armour, probably intended to represent counts of Zähringen, the original possessors of the town. Opposite the cathedral is another ancient fountain, which had the misfortune to be "restored" about thirty years ago, and has been quite destroyed in the process.





MR. ALFRED WATERHOUSE,

Architect of the Manchester Assize Courts and Manchester Town-Hall.



ANCIENT FOUNTAIN IN FREIBURG, GERMANY. — CIRCA A. D. 1480.



CHESTER TOWN-HALL.—MESSRS. LANYON, LYNN, & LANYON, ARCHITECTS.

CHESTER NEW TOWN-HALL.

For the last ten years or more the subject of town-halls has been prominently before the public; and we doubt much if there be a town-councillor living, however small and insignificant the corporation to which he belongs, whose attention has not been, at some time or other, officially directed to the question.

An alderman of the present day is not content, as were his predecessors, to spend the time that he is called upon to devote to municipal affairs in the small, dingy, and often unhealthy rooms that collectively were dignified with the title of town-hall. He seems to think, and justly too, that if he gives his time and labours gratuitously to promote the welfare of his fellow-townsmen, the least that they should do for him in return is to provide a suitable building in which all the offices connected with his duties may be brought into convenient proximity in order to make the necessary calls upon his time in visiting them as small as possible. Many men with large businesses to attend to willingly devote part of their day to public matters, when they know that every opportunity is seized of lessening useless waste of time, and so obtaining the greatest result for the amount of labour bestowed, who would not consent to the old system of trotting from one corner of a town to another whenever a fresh department had to be visited.

That the new building erected upon this principle of concentration and saving of time and labour should be handsome, and an ornament to their town, is only a natural result of the wide-spreading influence that our art publications and instructors have produced on the mind of the general public during the last quarter of a century. Whether the public hall of one town is finer or more costly than another, is a subject that the citizens of rival communities will now very warmly argue.

A glance over our past numbers for the last decade will show a long list of new town-halls; and add to these the number that are nearly finished, or for which designs have been submitted in competition, and the sum total is really imposing. The influence for good that some of these exert on the minds of the population is invaluable.

The corporation of Chester at length, tired of plodding on in the old style of conducting their municipal business, determined to have a new town-hall; and in the spring of 1864 issued their instructions, and invited architects to submit designs in compliance with them. Their call was very numerously responded to, and a fine array of architectural essays was the result. The local professionals, to a man, we believe, came to the scratch, and the picked men of London, Manchester, Liverpool, and Dublin entered the lists. Upon the receipt of these designs the corporation, with a due and praiseworthy sense of their responsibility that it would be well for other municipal bodies under similar circumstances to imitate, retained the services of Sir Matthew Digby Wyatt, to examine and report upon the plans. After a lengthened scrutiny, he sent in his award, in which he stated "the design sent in under the motto, 'Love's Labour' is by far the best;" and "I would therefore respectfully recommend that the premium of 100l. should be awarded to the author." "No one else has succeeded in the combination of so many good points." "There is an air of quiet dignity in the well-balanced proportions and elegant forms of the design under consideration, which is, to my eye, wanting in anything like the same degree in any of the other designs." On the matter of the estimate, the report goes on to say, "that while 'Love's Labour' is the best design, it is far from being the most costly;" and then compares it favourably with a design, the quantities of which had been taken out by a surveyor, and an estimate obtained upon them under the amount suggested by the instructions.

In the face of the above, however, strenuous efforts were made by some members of the council to have "Love's Labour" rejected; but the majority had the grace to abide by the award of their professional adviser. On opening the sealed envelopes containing the mottoes, "Love's Labour" was found to be the work of Messrs. Lanyon, Lynn, & Lanyon, of Belfast and Dublin.

We lately gave a plan and view of the first prize design for the New Houses of Parliament, "Sidney," submitted in that international competition by Mr. W. H. Lynn, a member of this firm.

The new town-hall contains on the lowest or

ground-floor the ball-keeper's rooms. The police department has a separate entrance in Princess-street, and includes the prisoners' cells, which are placed under the Quarter Sessions Court. Direct communication by staircases is provided from these cells to the docks of this and the police-court. The kitchen and its offices are on this floor, and it is connected with the council-chamber by a lift and turret stairs for the use of servants. The entrance for the public to the courts is also on this floor, at the back corner of Princess-street, from which steps ascend to the level of the public corridor. The principal entrance is approached from the road by a double flight of broad steps, with pierced parapet in front, and steps in the porch under the central tower. The porch has a double-arched entrance and groined ceiling. The tympani of arches round the sides of this porch, and the principal doors to the same, have figure-subjects carved in stone, by Messrs. Williams, of Manchester, from models designed by Mr. S. F. Lynn, sculptor, late pupil of Mr. Foley, and gold medallist, illustrating events in the history of Chester.

On the principal floor, as well as on the one above, the front portion is devoted to the use of the town-hall proper; and the rear part to the courts and their offices. The principal entrance leads into the grand staircase-hall, from which corridors branching right and left lead to the municipal offices. By passing directly under the first landing of the principal stairs, the public hall is reached. It is placed between the courts, that on the left being the quarter sessions, and the one on the right the police-court. In connexion with these are judges', justices', lawyers', and witnesses' rooms, &c.

The upper or council-chamber floor is gained by the grand central staircase. The mid-landing of this stair is open to the public hall, with three arches. The ceiling over is hoarded and stained and varnished, forming a semicircular apse;—an arrangement which considerably enhances the effect of these apartments. From this landing a separate flight of steps turning to the right, over the justices' passage, behind the police-court, leads to the lower end of the council-chamber, by which means the general public may have access to the chamber, without necessarily passing through the lobby, or near the rooms in immediate connexion with the council-chamber. The mayor's parlour is placed in the centre, under the tower, and between it and the council-chamber on the Princess-street side is an ante-room, and, on the opposite, are two committee-rooms. All these rooms are *en suite*, for the convenience of receptions and public banquets, &c., and the walls panelled for about 4 ft. in height; the ceiling being treated with diagonal hoarding arranged in patterns.

The opposition party in the council that tried to turn out the design originally, not content with the failure of their first efforts, have continued their labours, and in every possible manner attempted, and in many cases with a fatal result, to thwart the intention of the more liberal party that was anxious to have the work well and handsomely finished. We learn, that it was by the councils of the former that the grand staircase-hall is lined with red brick, instead of ashlar, an accident that has very much detracted from the finished appearance of this composition.

The first contract was for 21,600l., and included heating, plumbing (internal) carving, grates and chimney-pieces, fireproof flooring, &c. The estimate for the tower was subsequently entered into for 1,980l., and both by Messrs. Clarke & Son.

A strike occurred on the subject, we believe, of the clerk of works, and long delay in the progress of the building followed; during which time the contract changed hands, Mr. Thomas Hughes, of Aldford, eventually completing the works.

The building is executed in white sandstone, relieved by bands of red Runcorn stone, and shafts of slate, with the exception of those to the principal entrance, which are of polished Aberdeen granite.

The external doors are of oak, and the interior woodwork, generally, is of red pine.

Messrs. Edmundson have applied two circular stained-glass windows, one of which is placed in the public hall, and one in the waiting-hall.

The gasfittings, and ironwork generally, have been supplied by Skidmore, of Coventry. The roofs are covered with green slates. Mr. Hughes, the contractor, delivered up the keys of the building to the town council on September 30th.

Mr. J. Pearce was the clerk of the works, under

whose superintendence the town-hall has been completed, and the preparation for the opening carried out.

The building is situated between Princess-street and the new markets, and can be very fairly viewed from the west front of the cathedral, which it faces.

H.R.H. the Prince of Wales was to open the town-hall in state on the 15th of October; arriving in Chester on the previous evening, and remaining during Thursday night at the Grosvenor Hotel, which was taken for him and his suite by the Earl of Grosvenor. Hoarding was set up at the ends of all the streets past which the royal *cortège* would pass, to prevent crush, and stands were erected in front of the town-hall to accommodate about 3,000 persons.

"THE COCK MAY CRAW, THE DAY MAY DAW," &c.

SIR.—The writer of the article, "News from Ireland" in the *Builder* of last week cannot be an Irishman, else he would not express any surprise at the Calway town commissioners laying out 1,000l. "in connexion with the water-works," and refusing to grant a farthing for the repair of the town clock. Had he been a native of the land of good whiskey, he would have been at no loss to perceive a logical connexion between the two courses of conduct of the commissioners. How on earth can whiskey punch be made unless you have plenty of hot water? And as for the time—hang the time!—who cares to know what o'clock it is while there is abundance of the raw materials for the "flowing bowl?"

POTTEEN.

ARCHITECT FOR RAMSCATE BURIAL BOARD.

THE Burial Board (elected by the town) appointed Mr. Scott, jun., to be their architect, and the appointment was reported to a vestry meeting, and accepted. A meeting of ratepayers has since been held to protest against the appointment, on the ground that there are competent architects in the town, and we are invited to express an opinion on the subject. We are bound to confess that the impression given to us by the reports of proceedings is that the meeting in question was an indecorous affair.

THE SOANE MEDAL OF THE INSTITUTE.

SIR.—Will you kindly allow me to reply to a competitor who asks me to do so through your journal, that the number of drawings deemed sufficient is,—two plans (*viz.*, of the platform and roof), two elevations, one section, one perspective view, and one sheet of details; in all, seven drawings.

It may be presumed that so much of the side elevation as can be contained in the length of a double sheet of elephant drawing-paper will suffice.

JOHN P. SEDDON, Hon. Sec. R.I.B.A.

OPENING OF NEW (CONCRETE) SCHOOLS AT CATTISTOCK, DORSET.

THE new national school-house at Cattistock which was commenced in April last, and which, says the *Dorset Chronicle*, from whose report we quote, is regarded as a great acquisition to this pretty little village, has been formally opened amidst general rejoicings. The building is constructed of concrete. The design, a Gothic one, was furnished by the late Mr. J. Hicks, of Dorchester; but it has been modified to the plainest form possible. The concrete walls are faced to a comparatively smooth surface, and the quoins, which are cast in separate blocks, are neatly lined out. The building measures from end to end 50 ft. by 52 ft. in width, and comprises a school-room 50 ft. by 18 ft. in the clear, classroom 16 ft. by 14 ft., and a schoolmaster's house containing six rooms, with offices and appurtenances complete. It stands on a pleasant site near the parish church and rectory, the north side of the school-room facing the road. There are entrances by wooden porches at the ends, and a verandah runs around to the schoolmaster's house-door, which is on the south side. The roofs are of slate, with numerous gables over the windows and the pointing ends, and on the centre of the main roof is a small bell-turret surmounted by a gilt vase. The school-room is of a height measuring upwards of 20 ft. from

floor-line to ridge; and is well lighted by four square-headed windows in the north side and a larger four-light window at each end. The open-roof timbers are painted a chocolate colour relieved with blue, the iron ties being also blue; which, with a variety of lamps depending, give an air of simple decoration to the interior. The pure white of the ceilings also contrasts with the sombre grey of the walls, the thickness of which is 12 in. in the school-room and 9 in. in the dwelling. The work has been performed by local contractors,—Messrs. Jones & Wightman, under the superintendance of Mr. Brooking as clerk of the works. The edifice is not yet quite finished. The foundation-stone was laid, on Easter Monday last, by Mrs. Digby, of Chalmington.

The site, which provides for play-grounds adjoining the house, is the gift of the lord of the manor, Mr. G. D. Digby, of Sherborne Castle, who also contributes 350l. towards the cost of the building. The total cost of the work, it is said, will be about 1,100l. or 1,200l. The old building in which the school has hitherto been carried on is pulled down.

NORTH AND SOUTH LONDON.

SIR,—In the discussion of the subject of the proposed new bridge east of London Bridge, I do not see the "East London Railway" alluded to. This will doubtless relieve the traffic, and arrangements might perhaps be made for carts, &c., to be conveyed in the trains through the tunnel. Allow me to take this opportunity of suggesting that the moveable platforms used for access from the river piers on the Thames Embankment to the steamboats should be made double, so as to allow people to go on and off at the same time. A.

MARGATE.

SIR,—The sanitary committee should forthwith procure a return of the number and depth of cess-pools contaminating the soil; the number and extent of the wells; the distance between the former and the latter; the number of undrained houses in the town; and the necessity of the drainage being carried say to a midpoint between Birchington and Margate, where it could be employed on the marsh lands.

A LONDON SURVEYOR.

DECAY OF INTERNAL STONEMWORK.

Sir,—Will any of your correspondents advise me on the following?—
The best plan of preventing the decay of the internal walls of a church from which the plaster and whitewash of many years have been removed. A large quantity of mouldering stone in the form of dust keeps continually falling, and I should be glad to know of the best mode of preventing it without resorting to plaster.

W. D. SKELTON.

* In such a situation, Ransome's process would probably answer the purpose.

QUANTITY SURVEYORS.

HOUSES, BLACKFRIARS ROAD.

SIR,—In consequence of a remark made in your edition of last week, I feel called upon for a reply, and beg to state that I consider it was perfectly justifiable in this instance to say, "Quantities supplied by Mr. Shrubsole," inasmuch as I did prepare the quantities at my own office, from the drawings handed to me from the architect for that purpose, and the following contractors were furnished with and based their estimates upon my quantities:—

Merritt & Ashby	£1,471 0 0
Taylor & Pitt	1,480 0 0
Werne	1,575 0 0
Crabb & Vangh	1,370 0 0
W. Smith	1,355 0 0
Gore	1,340 0 0
Nightingale	1,297 0 0
Pitcher	1,253 0 0
Soden	1,228 0 0
Cooke & Green	1,227 0 0
Till	1,205 0 0
A. Smith	1,178 0 0
Hutchinson	1,150 0 0
Shirley & Horne	1,110 0 0
Stone	1,110 0 0
Turner	1,085 0 0
Brown	1,047 0 0

Of course I could not prevent Mr. Cohen, or any other contractor, from tendering without my quantities; and, in my opinion, it was more courteous on my part to furnish you with a complete list of competitors than to have omitted the names of one or two contractors simply because they were not supplied with my quantities. S. SHRUBSOLE.

* We do not consider that any person has a right to claim having "supplied the quantities" unless this has been done by direction of the architect, or, with his concurrence, by the joint action of all the contractors. We threatened some time ago to set forth the proceedings of some of the "quantity surveyors," which were very irregular, and postponed the intention simply from unwillingness to damage individuals.

WORK IN THE CITY.

SIR,—A new era has dawned on the City; innovation, in the shape of the Metropolitan Board of Works, has invaded the sacred place, and its ancient authorities have taught a lesson. Any of your readers who pass the end of the new Mansion House-street cannot help seeing the strong contrast between the work recently done there by the Metropolitan Board of Works and the old rough and ugly style of the Corporation. It is most striking. See where the new work terminates and the old work adjoins. The first with neat arries and close joints to the curb, the paving well squared and neatly finished; the second, rough and ugly, no arries, joints you could lay your finger in, both in the curb and also in the paving. Nor is this confined to the old paving work. Go to the new Viaduct, and I think you will agree with me that a good piece of work is spoiled by the rough and ugly footpaths. Surely the City can pay for having its work well done. Is it that the Corporation, through its officers, still adheres to cobble-stone for its footpaths, although it has banished them from the carriage-way? T.

HOW MUCH IS A BUSHEL?

SIR,—Perhaps some intelligent reader of the *Builder* would explain a puzzling difference that occurs in some of our ordinary measures of quantity. The bushel, according to "W. W." letter in last week's number of the *Builder* (concrete proportions), is the 18th part of a cubic yard. A bushel (per table of standard measures) contains 221.912 cubic inches, and requires twenty-two such measures to make a cubic yard; 21 bushels = 1 cubic yard, according to "Laxton's Price-book."

In an old number of Weale's "Engineer's and Architect's Pocket-Book" I find a table of "measures for various purposes," containing among others, the following:—

A load of lime, 32 bushels,

and, 36
This table is probably retained in this year's issue of "Weale's," but I have not one.

I humbly submit that it would be most useful to men who have to buy cement to have the bushel and merchants' accounts, &c., to have measures of capacity determined. I dare say you have had similar applications from persons placed as I am at present; your calling attention to the matter will be productive of good in drawing forth perhaps an explanation from those most concerned with such materials. A BUILDING MAN.

IMPORTANT TO BUILDERS' CARMEN.

HELEY v. HILL & OTHERS.

THE defendants, Messrs. Hill, Keddell, & Wadram, well-known builders, were summoned at the Shoreditch County Court on the 11th inst. by the plaintiff, one of their carmen, for a debt of 16s. 3d., alleged to be due from the defendants to the plaintiff for wages. The plaintiff said that he had been employed by the defendants as carman, and as a weekly servant at a salary of 41 per week, and that he was discharged from their service on the first day of the week without notice, and was, consequently, entitled to a week's wages, less 3s. 3d., which they had paid him for one day's work. The defendants, on the other hand, maintained that the plaintiff was not a weekly servant. They reserved to themselves the right to discharge any of their carmen at any time on payment of a day's wages. At the same time, however, they made it a rule not to do so except in a case like the present, where the plaintiff was discharged for insolence to one of their foremen, and refusing to obey orders. The judge immediately decided in favour of the defendants.

MONUMENTAL.

THE Birmingham town council have resolved to erect a statue of Mr. Josiah Mason, the founder of the Erdington Asylum, either in the Orphanage or elsewhere in the borough; and have requested the mayor to ask Mr. Mason's consent to give to the sculptor who may be selected the requisite sittings for the model. It was also resolved that the mayor be requested to lay before the General Purposes Committee Mr. Mason's answer; and, in the event of his consenting to sit for the statue, the committee be instructed to select the artist, and commission him to execute the work in such a way as they may think desirable, and that the committee be instructed to report to the council their opinion as to the best site for the statue and the proper mode for a public inauguration. Some of the members expressed their regret that the working classes would thus be shut out from doing honour to Mr. Mason by subscribing for his statue.

In the Liverpool Town Council Mr. Gladstone recently mentioned that it was proposed to have the following inscription on the statue of the Queen to be erected in front of St. George's Hall:—"Erected in honour of her Majesty Queen Victoria, and as a companion to the memorial statue of the lamented Prince Consort, by the Corporation of Liverpool, 1869. Long live the Queen." The finance committee, he said, had thought it right to take the sense of her Majesty as to what should be inscribed on the pedestal, and it had received her special sanction and approval. He thought it right to observe that cutting and carving granite was an expensive process, but, under the circumstances, it was quite unavoidable; and although the words were more in number than might be

desirable, yet they must agree to what was suggested.

The Derby and Mayer statues in St. George's Hall, Liverpool, have been unveiled. They occupy adjoining niches on the east side of the hall. That of Lord Derby is by Theed, and was voted by the corporation in recognition of his lordship's distinguished talent as a statesman, an orator, and a scholar, of his connexion with the county of Lancaster, and of his gift to the town of the collection of natural history known as the Derby Museum. The statue of Mr. Joseph Mayor is by Fontana, and was also voted by the corporation in recognition of a splendid gift to the town, comprising the Fausset Collection of Anglo-Saxon Antiquities, the Pulsley Collection of Ivories, and a fine collection of Egyptian gems, curiosities, &c. Both of the statues are of heroic size, and the cost of each has been about 1,000l. The ceremony of unveiling was witnessed by a large concourse of spectators. Mr. Best presided at the grand organ, and during the interval which preceded the entrance of his worship performed a selection of music.

The recumbent effigy of the late Countess of Devon, in Eyedorcham Church, near Exeter, Mr. E. B. Stephens, sculptor, which was shown during last season at the Exhibition of the Royal Academy, is now fixed in the church, as a monument to the memory of the deceased lady. The figure is placed upon a raised stone table in the Contrean Chapel, on the south side of the chancel. The work and its surroundings, the flooring, the wall-painting, the lighting, the whole setting, so to speak, of this monument is of a costly character. The figure, which is of full length and life-size, is sculptured in pure white Italian marble. It represents her ladyship as she lay in death, awaiting burial. The head is partly covered with lace, imitated by the chisel of the sculptor, and on the shoulders and upon the wrists are shown a collar and wristbands of the same material. The hands lie across each other on the breast, resting upon a cross decorated with flowers. A voluminous white ermine covers the form from the waist to the feet. The tasselled pillow and beaded mattress, like the effigy, are carved in marble. The chapel in which this monument is placed is over the old Courtenay vault (the late Countess was buried in the new vault in the chancel). Everything in this chapel is new, or restored and beautified for the reception of the tombstone, except one of the two coloured memorial windows, which is "in memory of Thomas Pergrine Courtenay, born 1752, died 1841." The window in the south wall is just erected, in memory of the lady upon whose mantle effigy the tinted figures fall. It is, like the older one, in the Perpendicular style. The chapel is a study in ecclesiastical decorative painting. The flowers and figures are cheerful, while solemnity and fitness are preserved. On the hand under the spring of the roof, quite round the chapel, appear, in large size, the different family arms. In the roof the ribs and the spaces between are specially painted to correspond with the walls, while the large bosses at the intersection of the timbers are gilded. The floor of the chapel is a costly example of artistic paving. Next the skirt of the wall, and round the foot of the monument, run lines of dark Devonshire marble. Then comes a string of white Italian marble. Between these the floor is a mosaic, formed partly of encaustic tiles and partly of Devonshire marbles of various kinds. A line of slabs, however, of ordinary stone runs along the north side of the chapel, on which the ancient inscriptions belonging to the vault are restored. In addition to the effigy and tombstone, Mr. E. B. Stephens laid the floor of this chapel; while the decorations and the new window were done by Messrs. Clayton & Bell, of London. The style of the tomb is of the fourteenth century, and the general decorations are adapted to the same period.

The ship *Queen*, of Swansea, was wrecked in Gull Island, Newfoundland, in December, 1867. The owners, Messrs. Richards & Power, have, as a mark of their sympathy for those who perished, instructed Mr. Philip Rogers, of Swansea, to design and execute an obelisk monument, for the purpose of marking the last resting-place in that desolate island. The obelisk stands 8 ft. high, and is cut out of the forest of Dean stone. The following is the inscription:—"On the front view:—"To the memory of the crew and passengers of the ship *Queen*, of Swansea, who were wrecked on Gull Island, December 12, 1867, and there perished. This monument is erected by

the owners of the *Queen*, Messrs. Richards, Power, & Co., of Swansea, Great Britain." Right view:—"Passengers—Felix Dowsley, William Hoskins, Patrick Duggan, Thomas Power, William Kennedy, Grinelda Hopkins, and Caroline Stitson." Left view:—"John Owen, master; Thomas Morgans, mate; and six seamen, names unknown." The block will be shipped shortly for Newfoundland, the place of its destination.

CHURCH-BUILDING NEWS.

Croydon.—The restoration of St. John's Church is now nearly complete. After the destruction of the edifice by fire in 1867, a contract was entered into for rebuilding the church at a cost of 22,000*l.* Mr. Gilbert Scott was the architect, and Messrs. Dove were the builders, by whom the work was undertaken. It was commenced in the latter end of 1867, and the contributions to meet the expense have been most liberal while for pulpit, altar-rail, font, and other matters, subscriptions have been raised without the slightest difficulty. The building is in the Perpendicular style of architecture. The total length of the nave is 97 ft., and the width is 36 ft. The chancel is 56 ft. 6 in. long, and 30 ft. wide. The tower is 28 ft. square, so that the total length of the church is 123 ft. 6 in., and the total width is 80 ft. 10 in. The height to the ridge from the nave floor is 55 ft., and the western tower is 120 ft. high. The tower is battlemented, and at each angle rises a small embattled octagon tower, surmounted by a crocketed pinnacle. The chancel is divided from the north and south aisles by an arcading of two bays. The detached pillar is in rich polished Devonshire marble. The roof of the chancel is oak panelled, having carved bosses, and the chancel is divided into three bays, the trusses coming down the walls into carved corbels, the intermediate trusses having angels with musical instruments in their hands. The nave is in six bays, with an oak roof. The roofs of the aisles are of deal, all the timbers of which are shown, the trusses coming down into corbels having angels carved upon them in attitudes of devotion. On the trusses under the nave roof are angels holding shields. The church is lined throughout with Godstone stone and blue Corsham intermixed, and the pillars of the arcading are of Ancaster, and the arches of Little Casterton stone. The seating of the church is all oak. A window in the south aisle of the chancel is memorial in character, given by Mr. Blake, and there is another given by Mr. Robinson, both being by Messrs. Lavers, Barrand, & Westlake. The western window is the gift of Mr. R. A. Heath, and it is executed by French artists. The organ is a large and powerful instrument, placed at the end of the north aisle of chancel. It was built by Messrs. Hill & Son. The gas fittings are of brass of a costly character. The pulpit will be of oak on a stone base, but it is not yet erected. The reredos behind the altar is executed by Messrs. Farmer & Binsley, of Lambeth. It is of alabaster, and in three divisions, the subject on the first being the Nativity, the Crucifixion in the centre, and on the other division is the Ascension. The font is of alabaster, of octagonal shape, having on the four cardinal faces carvings representing the Baptism of Our Lord, the Blessing of Little Children, the Baptism of the Centurion, and of the Centurion. The other faces are filled in with shields and monograms. This font has been subscribed for by ladies. The work has been carried on under Mr. Dove, general foreman for the contractors, while the architect has been represented by Mr. W. Prosser. A movement has been set on foot for having the sittings in the church free.

Eye (Suffolk).—The parish church here has been restored and re-opened. Entering by the west door, we find the heavy old outer doors replaced by gates of open work. From the roof of the west entrance the successive coats of paint and whitewash have been cleared away, and the groining which they formerly hid revealed. The entrance is paved with Pease's tiles. The inner door is new, and of oak. The nave is 74 ft. long and 24 ft. wide, while the north and south aisles are about 14 ft. in width, giving a total width of upwards of 50 ft., broken by the plain octagonal columns of the nave. The height of the nave is in proportion to the other dimensions, and the oak roof has been restored, and relaid with new lead. The roof of the nave is a hammer-beam roof, with curved ribs richly moulded. The original design has been preserved in its entirety, the old woodwork

being retained, except where it had become decayed. The carved work about the roof, of which there is a profusion, has all been renewed, care being taken that they should be in accordance with those portions of the old work which were remaining. The principal ribs in the nave roof were for the most part sound, but the carving had suffered greatly. In the north aisle a similar plan has been pursued, new oak being substituted for that which was decayed, and all the carving which was deficient replaced, and the roof of the south aisle, which was in a very dilapidated state, has been entirely renewed, the new one being a counterpart of the original. The easternmost bay of the nave roof differs from the rest of the roof in that it is panelled. It was originally painted, and this ornamentation has been reproduced by Mr. Short, of Eye. In the centre of each panel is the sacred monogram in red letters upon a white ground, surrounded by the crown of thorns in green, there being borders of blue and other colours. Upon the wall above the chancel arch being freed from the whitewash with which it was covered, the remains of a painting of the Doom, some portions of which gave evidence that it was the work of a vigorous hand, were discovered, and Mr. Short made a copy of those portions which remained. In the clearstory of the nave are five three-light windows on each side, all of which have been restored and glazed with cathedral glass, and the tracery of the five windows in the north aisle, and the four in the south, has been renewed where necessary, the west window of the north aisle glazed with cathedral glass, the whole of the stonework cleaned from disfiguring paint and whitewash, and the plain portions of the wall replastered. A gallery in which the organ was placed formerly blocked up the tower arch and concealed the west window, which has four lights; but of this a clean sweep has been made, and the organ, which is still in the hands of the organ builders, will, when finished, be placed in the north chancel aisle. The tower arch is now open, and the west window has been restored. The chamber, which was formerly that in which the ringers stood, has by the opening of the tower arch become open to the church, and, a light stone screen being placed in front, is available as a gallery, the ringers being promoted to a floor above. At present the gallery is approached by a staircase which opens in the church, but it is proposed to make a new staircase in the thickness of the north wall of the tower. For the old pews open benches of uniform character throughout the nave and aisles have been substituted. They are made of wainscot oak, and the ends of the benches have elbow rests carved in a variety of designs, all from nature,—such as ivy leaves and berries, the hazel with its nuts, sea-weed and shells, the hawthorn, ferns, the water avens, and many others. These were designed by the architect, Mr. Colling; and the carving has been executed by Mr. Groom, of Ipswich, by whom also the remainder of the wood end much of the stone carving has been done. Many of the seats are free, and rich and poor are mingled together. The whole expense of the chancel, which has been restored from the designs of Mr. Colling, in a similar manner to the nave, has been borne by Sir Edward Kerrison, and the total cost of the work in this part of the church must have amounted to about 1,000*l.* The clearstory windows of the chancel have been filled with cathedral glass, the work being done by Mr. Neale; and the stonework restored where necessary, and the side arches of the chancel, which were formerly of brick, have been renewed throughout with stone. Various other restorations and improvements have been made. Mr. James K. Colling, of London, was the architect. That gentleman estimated the cost of repairing the roofs at 759*l.*, and that of the general restoration and re-seating the nave and aisles at 1,183*l.*, but the total cost of the works ultimately determined upon by the committee, irrespective of the chancel, has reached 3,000*l.*

Bramham.—The parish church of Bramham, which has undergone a restoration, has been re-opened. The work has been at the expense of the rector, the Rev. S. R. Carter, the only assistance of any moment that the rev. gentleman has received being from Mr. W. Gurdon, of Bramham Court, who undertook to defray the cost of the new seats. Mr. J. H. Hakewill is the architect. The total expense incurred approaches 3,000*l.* Before the restoration the walls were plastered, the roofs bad, the windows out of repair, the aisle had been pulled down by the parishioners about sixty years before in order that money might be raised by the sale of the

lead of the roof and the building presented anything but an attractive appearance. The rubble walls have been dressed with Bath stone. There formerly was about 8 ft. of height above the string course of the tower, below the belfry windows; this part of the tower was pulled down and it was rebuilt to a height of about 14 ft., and new belfry windows have been put in, and the tower finished with a parapet with circular tracery of Bath stone filled with hack flints, while the moulded string-course immediately below the parapet is ornamented with ball flowers, and two new carved gargoyles are placed on the west side. The mullions and tracery of the two-light west windows, as well as the stonework of the outer windows in the tower, have been repaired. The walls of the nave, chancel, aisle, and porch are similar in character to those of the tower, and the roofs, which are entirely new, are of plain tiles. The only old wall to be seen from the outside is the south wall of the nave, in which are three windows, one three-light and the others two-light, the stonework of which has been renewed where necessary. The chancel is entirely new, is considerably larger than that which formerly existed, and is lighted by the east window, and by three windows on the north and one on the south side, all of which have tracery. The aisle is new, and does not cover quite so much space as that pulled down some years ago, the foundations of which were discovered in the course of the work. The relieving arches over the windows have been faced with alternate squares of white Bath stone and hack flints, the monotony of the rubble walls being by this means broken, and further relief is given, as far as the aisle is concerned, by the formation of what may be called cross-shaped panels by the stonework of the buttresses, these panels being filled with flint. The nave would appear to have been originally much narrower than it now is, probably hardly wider than the tower itself, but, at some subsequent period, several feet in width were added to the south side, no corresponding addition being made to the north, and the consequence is that the chancel and west arches being in line, the chancel is all on one side of the nave. The roof of the nave is an open wagon-roof, with moulded tie-beams supporting king-posts, these king-posts being, with the exception of the wall-plate, the only portions of the old roof which have been made use of. The columns and arches of the north side are the old ones, which were bricked up in the wall when the former north aisle was destroyed. The architect was not aware of their existence, but when the mean wooden windows which had been put in were taken out, and the brick wall began to be pulled about, the old arches were found, and Mr. Hakewill had them repaired where necessary, and made use of. The benches are of English oak, with wide seats, but the backs are not sloped. The nave, porch, and aisle are paved with Staffordshire tiles; the chancel, which is raised three steps above the level of the nave, with Minton's tiles. On the wall at the back of the font is a painting by Constable—the first public work, it is said, of that artist—representing our Lord rebuking his disciples when they would have prevented children being taken to him. This painting formerly hung over the communion-table. The west window is filled with stained glass, and in one light the subject is the baptism of our Lord, that of the other being John the Baptist in the Wilderness. All the windows in the chancel are filled with stained glass. The east window has five lights. In the centre compartment is the figure of our Saviour, those at the sides being filled with angels, the legend being, "Angels, archangels, all the company of heaven laud and magnify Thy glorious name." The subjects of the south window are the angel meeting the two Marys at the grave of Jesus, and the angel at the Ascension. The subjects of the windows in the north wall are, "Out of Egypt have I called my Son;" "They shall call his name Emmanuel;" the angel appearing to St. Paul; the angel and Cornelius; and St. Philip—"Arise and go toward the south."

Lincoln.—The foundation stone of a new church for the united parishes of St. Peter-in-Eastgate and St. Margaret, has been laid, with Masonic honours, by Major Smyth, D.F.G.M. of Lincolnshire, in the presence of the Bishop of Lincoln, and a large concourse of people. It was determined, under the advice of the architect, Mr. Arthur W. Blomfield, to pull down the old church, and build another and larger church more in the centre of the ground. The new

church will be seated for nearly 500 persons, and will consist of a nave and north aisle, chancel and large vestry, and south and west porches. There will be no tower, but a bell-turret in the west gable. The dimensions are:—length of nave and aisle, 82 ft. 9 in.; ditto chancel, 29 ft.; width of church, 40 ft. 10 in.; ditto chancel, 22 ft.; height from floor to wall-plate, 22 ft.; ditto to ridge of roof, 42 ft. The style of the church is First Pointed, of simple character. The material used for the walling is Lincoln stone rock-faced with dressings of Bath stone, the ashlar of the old church being employed as far as it will go. Bands of red Mansfield stone are introduced at intervals. Internally the walls will be plastered, Bath stone being used for all quoins and arches. The roofs and sittings will be of stained deal. The church will be heated with hot water, an apparatus room being provided beneath the vestry. The contractors are Messrs. Oter & Binns, of Lincoln. The contract for the church, exclusive of one or two items, such as the pulpit and stained glass for the east window, which will be private gifts, is about 2,500*l.* (the amount of the architect's estimate).

Worcester.—The work of restoration in connexion with St. Andrew's Church will, it is calculated, cost about 2,000*l.* Of this sum over 1,100*l.* has been subscribed. It is proposed that the sittings shall be free and unappropriated. A contract has been entered into with Mr. Warner, of Malvern, builder, and he has commenced work.

Kilworth.—The parish church of South Kilworth, Leicestershire, having been almost rebuilt, with the exception of the tower, by Mr. G. F. Bodley, at a cost of about 2,000*l.*, has been re-opened.

St. Bees, near Whitehaven.—The parish church of St. Bees has been re-opened, after various restorations. The communion chancel has been restored by Mr. James Lumb; other gentlemen have restored other portions of the edifice; and a number of memorial windows have been inserted by Messrs. James Lumb; William Lumb; Spedding, of Summergrove; Benn, of Greenbank; Fox and Rigg, of St. Bees; and Harrison, of Linthwaite. The whole of the windows on the north side of the church were put in at the cost of Mr. Benn. At the western end there is a memorial window of the late Captain Sharpe, of the Cumberland Militia, which has been inserted by the officers of that regiment as a tribute of respect to his memory. The roof is in a very bad condition, and it is to be hoped that ere long the necessary funds will be raised to complete the restorations, which have been going on occasionally for some years.

DISSENTING CHURCH-BUILDING NEWS.

Driston.—The new Wesleyan chapel, which occupies a prominent site in the Moseley-road, has been opened for public worship. It is built in the style of Gothic architecture prevalent in the early part of the fourteenth century. It has in the front three entrances, giving access to the ground floor and galleries staircase. At the north-west angle are a tower and spire, the total height being 160 ft. The interior arrangements consist of a nave and aisle, divided by clear-story arches of moulded Bath stone, supported by columns of cast iron, with enriched capitals. There is sculptured foliage distributed over the external surface. The building is adapted to hold 1,100 persons. At present only the chapel is finished, but it is intended to build extensive schoolrooms adjoining the apex end of the present structure. The architects of the building are Messrs. Tarring & Son; contractors, Messrs. Myers & Son; heating arrangements by Mr. Boulton; lighting by Mr. Rothwell; and the decorations by Mr. Sansom.

Ashford (Kent).—The new Primitive Methodist chapel here is nearly completed, and has been recently opened. Owing to the adjoining property, the light is obtained from the back and front principally by large wheel windows in the gables. The building may be said to be in a Single Pointed style, with medium pitched roof. The architect was Mr. John R. Collett, and the builder Mr. James Clifford.

Stoke-upon-Trent.—The Baptist chapel in the London-road has been re-opened for public worship, after having undergone a renovation and improvement. The old square pews have been removed, and modern open benches have been substituted in their places. The new Sunday schools, class and lecture-rooms adjoining,

which have been erected during the past four months, about to be opened, are built of red and blue bricks, with moulded brick dressings. The whole of the chapel and school works have been carried out by Mr. Nathan Barlow, contractor, from the designs and under the superintendence of Mr. Edwin Penn, architect, at a cost of 650*l.*

Swansco.—The memorial stone of a new Baptist chapel at Morriston has been laid. The new chapel is to be one of the largest in the Principality. It measures 74 ft. long, by 49 ft. 6 in. wide, and will contain sittings for 1,250 people. The edifice is to be built in the Tuscan style of architecture. The architect is the Rev. H. Thomas, Ystradgynlais. The contractors are Messrs. Jones, Evans, & Jones, Clydach. The estimated cost of the chapel is 2,140*l.*; and when it will be opened the old chapel will be converted into three vestry-rooms, &c., at the cost of about 500*l.* It is estimated that the new buildings altogether, when completed, will cost 2,800*l.*

Leighton Buzzard.—The chief stone of a new Primitive Methodist Chapel has been laid here. The edifice, which is being erected on the site of the old one by Mr. Dawson, of Leighton, is to accommodate about 800 persons, and its dimensions will be 60 ft. by 40 ft., with a height in the interior of 25 ft. The external design is to be Italian, the front elevation being plastered with Roman cement; there will be four pilasters in front, and two on each side—of cement. Two schoolrooms, over each other, will also be built for "the children of the industrial classes." The total cost of the buildings will be about 750*l.*

Nottingham.—The memorial stone of a new Presbyterian Church of St. Andrew, of Belgrave-square, Goldsmith-street, has been laid. The edifice, when completed, will comprise a nave, 50 ft. by 30 ft., with circular bays or aisles on either side, and a gallery at one end, extending over a vestibule in connexion with north and south porches, in which are stone staircases communicating with the gallery. Over the south porch are carried the tower and spire, 120 ft. high. The style of architecture adopted is Early Decorated; and the walls will be built of Bnlwell stone, with dressings and window tracery of Ancaster stone. The interior of the church will be generally of a plain and unpretending character, and the open benches so placed that every one can see the minister, each bench being slightly raised above the one in front, and fixed circular on plan. The pulpit and fittings connected therewith will be placed against the western wall. The nave will have a wagon-headed boarded roof, supported by carved principals. There will be seat accommodations for upwards of 600 adults. On the western portion of the site will be a lecture-room, 48 ft. by 25 ft., with sessions-room or vestry, and other offices, communicating with Vickers-street, all in character with the church they adjoin. The architect is Mr. Robert Evans, of Nottingham; contractors, Messrs. R. Bennett & Co.; clerk of the works, Mr. Robert Speed. The cost will be about 4,000*l.*

Yardley Hastings (Northampton).—The Congregational Chapel at Yardley Hastings has been reopened for Divine worship, after a restoration and renovation. With the exception of the galleries, the whole inside of the chapel has been taken out, a new floor has been laid down, new pews of deal, varnished, have been put in, with a large pulpit, of the same material. The chapel is lighted with paraffine-lamps, placed on pillars. The work has been carried out by Mr. John Watkin, of Northampton, from the plans, and under the superintendence of Mr. Sharman, of Wellingborough, architect. The cost is about 400*l.*, the greater part of which has been raised. Schools are attached to the chapel. The chapel has been painted throughout, the walls, ceiling, and pillars being of a French grey colour, relieved with white cornices, and some bright colouring.

Fenton.—The memorial-stone of the new Mount Tabor (Methodist New Connexion) Chapel, the erection of which has recently been commenced at Fenton, has been laid. The new edifice will occupy the site of the old chapel, with the addition of ground at the rear, from which some old houses have been removed. It will be in the Gothic style of architecture, according to examples in France and Germany of the thirteenth and fourteenth centuries. The total length, exclusive of the entrance, will be 55 ft. 6 in., the width 40 ft. 3 in.; the height from ground line to ridge 51 ft. The front gable, facing Market-street, will contain the

principal entrance, and will have three wide doorways with moulded arches, and stone labels with carved terminals, supported by circular stone shafts, with circular moulded bases, bands, and curved caps, the whole surmounted by a large five-light stone window with tracery in the head. The gable will be covered with stone, having moulded cornels, crockets, and finial. To the right and left of the entrance are to be staircases leading to the galleries and orchestra, the right staircase being surmounted with a tall, slated, spire roof, and the left staircase surmounted by a tower with buttressed angles and spire, the total height of which is to be 110 ft. to the top of the metal finial with which it is to be crowned. There will be two-light windows on each face, the angles being surmounted by pinnacles 10 ft. high from the base to the apex. The minister's vestry will be near the entrance, and the other vestries at the further end of the chapel, with the heating-chamber below. The walls are of brick, plastered internally; and the front faced, externally, with stocks, relieved with Hollington stone dressings, moulded, carved, and traceried work. The bays are to be marked in the side walls, by buttresses, between the windows. The roofs are to be open, carried by framed principals with curved trusses filled in with cut and perforated boarding, supported by moulded stone cornels, and to be stained and varnished. The opening to the orchestra from the chapel is to be 15 ft. between the piers, and the height from the floor to the apex of the arch 43 ft.; the arch being supported by moulded stone cornels, and finished round with plastered archivolts. There will be a gallery round two sides and one end, with a circular enriched and moulded front. The chapel will be lighted at the sides by two-light pointed and curved windows, and at the end by a five-light stone traceried window, the latter being filled with coloured glass. The entrance floor will be laid with tiles to a pattern. The benches and fittings throughout are to be of deal, stained and varnished. The buildings will be warmed by means of hot air. At the entrance to the chapel from Market-street will be sliding wrought-iron ornamental gates, and the space in front will be enclosed by a wall surmounted by stone and metal work. The school, which is to be at the further end of the chapel, will be two stories high, the entrances to which are from Park-street. The total length is 56 ft. 6 in., and the width 35 ft. 6 in. The rooms are to be divided into departments for boys and girls, with separate entrances, in which are to be a number of class-rooms. The room may be used as a lecture-hall, or for public meetings. The chapel, it is calculated, will accommodate between 800 and 900, and the schools will be sufficiently large for nearly that number of children. The estimated cost of the building is 2,440*l.*, exclusive of the old materials. The architect is Mr. H. Finchbeck, of Manchester, under whose supervision the work will be carried out; and the contractors are Messrs. Wade, Brothers, also of Manchester.

Stowport.—The memorial-stone of a new Congregational Chapel has been laid here. The architect is Mr. Bidlake, of Wolverhampton; and the builder Mr. Nelson, of Dudley. The total cost is estimated at about 1,400*l.*, towards which some 700*l.* or 800*l.* have been promised.

SCHOOL-BUILDING NEWS.

Elmley Castle.—New schools, which have been erected in this village, through the generosity of Lady Pakington, have been opened by the bishop of the diocese, the ceremony being combined with the harvest-home celebration for the parish. The school which has hitherto existed afforded accommodation for only thirty or forty scholars, and was in many ways inconvenient. The new building will accommodate about eighty scholars, and will be used as a day and Sunday school. The cost will be about 500*l.*, and would have been about 70*l.* more had not the farmers of the village undertaken the carting of the material free of charge.

Middlesbrough.—The National Schools for the parish of St. Hilda, Middlesbrough, which have been erected by Mr. Bolekow, M.P., on ground granted by Messrs. Hopkins, Gilkes, & Co., situated in West-street, have been opened by the Duke of Devonshire. The new schools cost 6,000*l.*, exclusive of the land, and will accommodate 900 boys, girls, and infants.

Abingdon.—New National Schools have been opened here. The building is of brick, and has

More Complaints as to the Metropolitan Underground Railway.—The *Kensington News* writes a leading article complaining of the great want of accommodation for third-class passengers on the Metropolitan and District railways:—

"For two hours at evening daily," he remarks, "saving Sunday and Saturday, and on the latter day for five hours, may be witnessed a scene that is without parallel in the civilised world. . . . The company does not recognise any rights but its own. The tenure of a seat for the journey is not, in the company's view, rented or purchased by the traveller. The company wants money, and to get it breaks the law, and breaks faith too, by allowing sixteen, twenty, and even in one instance twenty-six persons to occupy the space of ten. The extreme case we heard complained of by workmen themselves, who protested afterwards that they could not breathe the hot, fetid, deadly air in the compartment."

Correspondents of our own make other complaints as to the way things are managed on the Metropolitan. One, who went from King's Cross Station to South Kensington, not knowing the price of a third-class return-ticket, which is sixpence, laid down two sixpences at the wicket, which betrayed his ignorance to the check-giver, and received threepence change, which, as he afterwards discovered, was thievery to the extent of threepence. Another asked for a ticket for Chelsea at the Portland-road station of the Metropolitan, which has only one station in Chelsea, namely, the station at Sloane-square. On reaching their Chelsea station, full fare was re-demanded from him, on the ground that the ticket was not given for the Chelsea station of the Metropolitan, which issued the ticket, but of another company, a mile or more away from the Chelsea station of the Metropolitan. Passengers, to escape such thimble-rigging jugglery, and prevent the Metropolitan Company from thus reaping double fares, must take care not to say to the ticket-clerk of the Metropolitan that they want a ticket on their line for Chelsea, but for Sloane-square, where their only Chelsea station happens to be!

The Brighton Drainage.—The Town Council, by a vote of 22 to 20, have rejected the recommendation of the General Purposes Committee to cause immediate steps to be taken for obtaining an Act of Parliament to carry out Mr. Hawkshaw's plan for the construction of an intercepting sewer from Cliftonville to Portobello. An element of doubt is as to the ventilation of the seven-mile sewer. In his original report, Mr. Hawkshaw spoke of "ventilating shafts, which could be so arranged as to be unobjectionable," but did not specify the character of them. In a subsequent interview with the General Purposes Committee, he seems to have been questioned on this point, and it was then ascertained, as we have already stated, that his plan for ventilating this seven-mile sewer, with a fall of 3 ft. per mile, was by a line of gratings, running at intervals of 200 or 300 yards in front of the marine promenades. Mr. Hawkshaw was, it seems, requested by the Committee to put his views upon this matter of ventilating in writing, and this he has done in a supplementary report, made public on Monday in last week, in which the plan of ventilation by gratings "along the margin of the sea" (to adopt Mr. Hawkshaw's own expression), was strongly urged, "because," says Mr. Hawkshaw, "in my opinion, no more serious mistake can be made, and none more likely to be attended with bad results, than to neglect such precaution."

New Process of Refining Iron.—Mr. Palmer Budd's new process of refining iron was shown, in the works of Messrs. Bolckow & Vaughan, to the members of the National Iron and Steel Institute, after their meeting at Middlesbrough. It appears that the patent has been taken out by Mr. Budd for the invention of such "improvements in the manufacture of iron and steel" as shall henceforth render the process of puddling much quicker and easier. This valuable result is said to be accomplished by the subjecting of molten cast-iron to the action of soda and soft hematite iron ore—or other oxide of iron—previous to its being subjected to the puddling process. It was alleged by the patentee that the puddlers much prefer the iron in this condition, as it lessens and helps their work, and also that it will tend materially to cheapen the process of manufacture. In his opinion, the money value of the invention to the iron trade will be enormous; greater, perhaps, than that arising from the use of blast-furnace gases, said to be 1,000,000*l.* a year, and which Mr. Budd first introduced into this country, and made known to the iron trade at the meeting of the British Association held at Swansea in 1849.

Workhouse Bakehouses.—The Poor-law Guardians of the hamlet of Mile-end Old Town, have recently been engaged in frequent discussions as to the advisability of establishing a bakery in connexion with their workhouse, in Bancroft-road, for supplying the in- and out-door poor with bread. A committee of the Board was appointed to privately discuss the benefit likely to result from the adoption of the scheme, and at a meeting of the Board, held on the 7th inst., a report was presented by the committee, recommending that the proposal be adopted, and stating that "we have obtained from Mr. W. Dobson, architect, a plan showing the proposed alteration, and the cost of the same. The erection of the bakehouse, oven, flour-store, and chimney-shaft, were estimated by Mr. Dobson to cost 460*l.*; and the erection of two 12-bushel ovens, to cost about 120*l.*, making a total of 580*l.* Should the Board decide on adopting this our recommendation, we further recommend that one of Stevens's hand-power bread-baking machines be obtained, at a cost of from 25*l.* to 50*l.*" Some opposition was offered, on the ground that the adoption of the scheme would seriously injure the tradesmen of the hamlet, but eventually the report was carried, and advertisements ordered to be issued, inviting tenders for carrying out the works.

The Bath Water-Supply.—The insufficiency of the present water-supply was well illustrated by Mr. Bright, in a recent debate in the town council, reported in the local *Chronicle*. The past few weeks have not been remarkably dry, yet it would seem that during that time certain of the inhabitants of Southgate-street have been on such short commons of water, that they have had only two days' supply each week, and Mr. Bright, who stated this, added that had it not been for a pump in the Fall Moon-yard, to which they were allowed to resort, they would often have been absolutely without any water. Mr. Lewis capped the statement with the remark that the pump, which thus supplied their pressing wants, stands in a stable yard, near the river. Mr. Bateman's report fully bears out all that has been said on the insufficiency of the existing water-supply. He lays it down that an adequate provision of water would give from 25 to 30 gallons a head per day to the population, and remarks that the corporation can afford no more than 14½ gallons, while the smaller private companies do out something less than 2 gallons daily per head to their customers. It would seem that the corporation are deriving an income of 2,300*l.* less the interest of 4,000*l.* (say 200*l.*), from their water-works, or something like 9 per cent.

A New Opening for Labour.—There is a good opening for any capitalist or philanthropist who would endow London with street porters after the pattern of the German *diensmann*. The commissionaires are efficient, but they are scarcely numerous enough; and, besides, they do not perform one of the chief functions of the *diensmann*, which is to carry large parcels, boxes, or portmanteaus. For many years Edinburgh has been provided with such porters, who stand (or at least used to stand) at street corners or other stations, with belts or ropes over their shoulder, ready to carry trunks, &c., as well as parcels, or to run messages or carry letters, at any one's orders. It is one of the petty discomforts of London, on the contrary, that when a person wants to have a tolerably-sized box carried he does not know by whom to send it. If a brigade of street porters, with belts, as at Edinburgh, or light barrows, as at Margate, were established, having stations scattered about the different parts of London like cab-stands, as the *Pall Mall Gazette* suggests, it would render a real service, and there is no doubt it could be made to pay.

Acidulated Non-inflammable Wood.—In a letter to us, signed "R. Taylor," sulphurous acid is suggested as a means of rendering wood inflammable. A small splinter of fir wood was inclosed, which we find ceases to flame the moment it is taken out of a gaslight, although it materially increases the volume of the gas flame while burning, as it does, in it. The acid, our correspondent says, is diluted with ten parts of water before steeping the wood in it, and floor-planks, he adds, require but a few minutes' immersion.

The Surveyor of St. Luke's.—The salary of Mr. Nihlett has been increased from 250*l.* to 300*l.* by the vestry. An amendment that a gratuity of 50*l.* be voted instead was rejected.

Wolverhampton Free Library and Reading Room.—The inauguration of this new Free Library has just taken place. It has been started and will be carried on under the Free Libraries Act, which was adopted at a unanimous public meeting held some months ago. The building in which the institution is located was formerly and for many years used as a Mechanics' Institution and Athenaeum, in Queen-street. It has been cleaned, repainted inside and out, and refitted. There is an upper room which will be used for the library, and a lower room which has been furnished for readers. There are also smaller rooms that may be used, if necessary, for reading or writing, and out-offices. The Athenaeum committee have transferred to the new institution upwards of 2,000 volumes of books to form the nucleus of a library: some effects, and a number of shares in the building, and gifts of books had also been received.

The Penzance Borough Surveyorship.—There were 78 applicants from all parts of England for this office, and the special committee recommended that the following four gentlemen be invited to attend, receiving 5*l.* each for travelling expenses:—Alfred Morris, aged 27, surveyor to Rusholme Local Board of Health; Clement Clitheroe, 25, assistant-surveyor to Local Board, Kingston-upon-Hull; George Livingstone, 26, assistant-surveyor for Preston; and John Hume, 27, assistant-surveyor to Derby Corporation and Local Board. To this an amendment was proposed that the name of Mr. Thomas Carne, builder, of Penzance, be added to the list; but, on a division, it was opposed the eight who supported the amendment, and it was lost. The duties of the new surveyor were then defined in writing and agreed to; and at an adjourned meeting of the town council and local board, Mr. Alfred Morris was elected as borough surveyor, the services of Mr. John Matthews being retained as consulting engineer.

Big Ben's Inscription.—A writer in *Notes and Queries* points out an objection to the inscription under the face of the great clock of the Houses of Parliament. It is as follows:—"Domine salvam fac regiam nostram Victorianam primam." He says, the glaring absurdity of *primam* will perhaps more clearly appear when I tell you that a near relation of my own was once acute enough to discover (as a solicitor) that a deed had been forged by its beginning, "This Indenture made the . . . day of . . . the year of our sovereign lord King Charles the First," &c. Until there has been a second Queen Victoria the error of calling her Majesty Victoria the First has been pointed out. Who knows but that she may be Victoria the first, or the only Victoria of her class?

"Drunken Blackburn."—The vicar of Blackburn, in the course of a speech made the other day in that town, after showing that Blackburn stands A 1 as a drunken town, made a suggestion, according to the *Rock*, which is worth repeating. "If people will drink," said he, "it is far better for them to go and drink together, than that the rest of the town should suffer. There ought to be a 'Drunkards' Quarter;' if there ought to be any drunkards at all. You have often heard and seen in towns—in most large towns—that there are shambles where the butchers' meat is to be sold—the do not allow it to be sold in other parts of the town;—and in Blackburn it would be far better if we had a kind of 'Drunkards' Shambles' say at the top of Brandy House Brook, a very proper locality in which to drink; let them go up to the top of the hill to drink."

A Covered Market for York.—The question of a covered market for York, which has for some time past excited great interest, has been brought before the corporation for discussion. A special committee, appointed some months ago, had reported in favour of what called the Davygate site, the cost of which was estimated at about 30,000*l.* A number of petitions, signed by 3,097 of the ratepayers, against the scheme, were presented, and only one petition in its favour. The adoption of the report was moved, and an amendment to refer it back to the committee was rejected by a majority 22 to 17. The original motion was therefore carried. The town clerk was authorised to take the requisite steps for applying to Parliament for an Act to empower the council to erect the market.

TO LIME-BURNERS, WHITING AND CEMENT MANUFACTURERS—TO BE SOLD, in consequence of the death of the late owner, in NOVEMBER next, by PUBLIC AUCTION, under previously shewed of a FREEHOLD PROPERTY of 32 Acres, containing open pits of grey and white chalk, sand, and brick earth. The property is situated at Amberley, Bucks, on the River Avon (having water communication with London and Portsmouth), and abuts on the Amberley Station of the London, Brighton and South Coast Railway. The most productive has been used for the Foulness Fortifications.—Apply to Messrs RICHARD & GEORGE HOLMES, Solicitors, Ainstock.

EALING—The Castle-hill-park Estate.—A very attractive and valuable Building Property, Freehold, within seven miles of Hyde-park corner, containing 66 acres of ornamentally-landscaped and public park land, well laid out with new roads and sewers partly complete, and ready for immediate building operations. The land admits the new line on the Great Western Railway for the Metropolitan Traffic, and is called the Drayton Green Station.

MESSRS. DRIVER have received instructions to sell by AUCTION, at the MART, Tottenham-park, Tottenham, on TUESDAY, OCTOBER 19th, at 12 o'clock precisely, in one or more lots (unless previously otherwise ordered by private contract), the above very valuable PROPERTY, situate within one mile of the Ealing Station, and close to the proposed Drayton Green Station on the Great Western Railway (main line), from Ealing, and via Kensington from Victoria. It comprises about 66 acres of ornamentally-landscaped, park-like land, the most desirable portion of the Ealing-hill-park Estate. It is elevated, commands extensive views, and has a southern aspect. There are a valuable gravel and brick earth, or pit, roads, with sewers partly made, and gas and water laid on to two sides of the estate. A temporary church has been erected. This property is fit for immediate occupation, and especially recommends itself to building speculators and capitalists. Also a superior detached Residence, fronting the Ealing Station, containing 10 rooms, with ample garden, office, and outbuildings, to be had of Messrs TRAVES, SMITH, & DE GUN, Solicitors, 27, Abchurch-lane, London, E.C. 4. Also of Messrs DRIVER, Surveyors, Land Agents, and Auctioneers, 4, Whitehall.

TABLES showing the WEIGHT of DIFFERENT LENGTHS of Round, Square, Flat, Bar, and Cast IRON, STEEL, BRASS, COPPER, LEAD, and TIN, BY SAMUEL FENN.

In consequence of the death of Mr. CHARLES FOX, the above Table will in future be published by JAMES MAGRICK, 67, Pall-mall-east.

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VOL. XXVII.—No. 1394.



Notes on Church Organs.

CERTAINLY the most proper and advantageous method of placing in a church so large and important a piece of furniture (if it may not be rather called an erection) as the organ, so that the different desiderata of safety to the instrument, adequate dispersion of the sound, and satisfactory architectural effect, may be equally provided for and attained, is, or ought to be, an important point for the consideration of church architects. Unfortunately the architect's difficulty by simply erecting too often gets over it alone. He knows that there is to be an organ placed in the church which he is designing (unless it be for one of those sects who hold "all such as handle the harp and the organ" in reprobation), but he contents himself with marking off a certain space on the plan as "organ-chamber," or "organ-gallery," as the case may be, without any inquiry as to the space required for the instrument, or the conditions under which it will sound most effectively; and it is generally not till the church is completed that the unhappy organ-builder, who may have been commissioned to place a large and valuable instrument in it, discovers that he is restricted to a space quite inadequate for the convenient arrangement of his mechanism, and a position where the finest effects of his instrument will be muffled or distorted, and where even the safety of its delicate mechanism may be seriously endangered. And considering that a good organ costs a large sum of money, and when put up is expected to last a long time (according to the German builders, a first-class organ, under proper care, should last four hundred years), it would be well if architects would give a little more consideration to the subject.

With regard to the best acoustic conditions for an organ, the most important are that the pipes should not be too much crowded together internally, and that the organ should have as much free space all round and over it as possible. If, for economy of space, the pipes are densely packed, the sound of those at the back has to struggle onward through a formidable barrier, besides that there is danger of the pipes interfering with one another's sound, "sympathising," as the organ-builders term it. And if the organ is hoisted up in a confined recess, the effect will be not only to muffle and obstruct the sound, but to destroy the balance and proportion of the different parts. This will be particularly felt with the louder stops, those pipes which happen to be near the front will be heard harshly, and with undue prominence, while others at the back of the recess will be comparatively lost. It is only when an organ has a large space round it, plenty of breathing-room, that a really grand effect can be obtained from it; and the reason nearly all cathedral organs sound fine is, not that they are a very superior class of instru-

ments (in some cases they are much the reverse), but that the sounds have space to develop and blend together into a total effect, in which any little roughnesses and inequalities of individual pipes are lost and submerged. But the fashionable method, which seems to be adopted by architects with one consent, and as a regular custom, of placing the organ in a sort of recess adjoining the chancel, called the "organ-chamber," is positively the very worst plan that could be adopted. There is generally a roof close over the top of the pipes, so that all the sound is driven down again the moment it is produced; and the tones of the louder stops, especially of the "reed" class, which are intended to be heard at a due distance, homard the ears of those near them in a most disagreeable manner, while from those further off the whole effect is deadened by the interposition of a wall or a massive pier; and as the organ-chamber is always put close to the choir seats, the organist has only a choice of evils: he must either play so loud as to be very distressing to the ears of his choristers, in order to be heard in the church; or, if he "aggravates his voice" so as not to incommode them, his accompaniment will probably be inaudible to the congregation. On acoustic grounds, the old west-end gallery, when not placed too high up, was far better than the organ-chamber in vogue at present. Then this chamber is almost always made too small for the convenient arrangement of a large organ; consequently, not only are the pipes crowded together in the detrimental manner before mentioned, but the mechanism has also to be fitted in so closely that scarcely any room can be left for the ready inspection of every part of it, which is absolutely necessary if the organ is to be kept in proper order, but is in the case of many church-organs next to an impossibility, in consequence of the close packing which has been resorted to in order to fit them into the meagre space allotted. Proper tuning is also rendered much more difficult, as very often some of the pipes cannot be got at without displacing others, which should never be the case; for, in addition to the loss of time, it is very bad for the instrument that the pipes should be handled and pulled about in this fashion.

The one advantage of the "chamber" system over the gallery is that it brings the organ near the floor, which is always a gain to its effect, as the sound travels very much upwards, and the larger pipes, too, gain great additional sonority when in contact with the floor of the building, which then becomes to them very much what the body of a violoncello is to the strings. Those who have to place an organ in an organ-chamber already built will find it an advantage to excavate as low as may be done with safety, cementing the bottom and sides below the ground line; the bellows will then go into the space thus formed, and the pipes above can stand proportionately lower, and thus have a better chance of speaking out. The best position for the organ, both acoustically and architecturally, would, in fact, be on the floor at the west end, where it could be designed, if necessary, in two towers at each side of the west window, the lower portion in the centre under the window. In a church where the singing was intended to be entirely congregational, this would be the best position on all grounds. But where there is a choir it seems imperative that they should be at the east end in sight of those whom they are to lead, and equally imperative that the organ should not be far from them. In this case we would place the organ in the transept, if not a very deep one; or, if there be no transept, against the south wall of the nave, on the floor if possible; or, if seat-room be valuable, in a hanging gallery against the wall, placed no higher than is just necessary to keep it out of the way of the congregation. In neither case would it be so far from the

choir as a cathedral organ commonly is, and being between choir and congregation would be equally audible to both. It is best, however, not to place it close against an outside wall; still less, as is often done, between two, or even three, outside walls. Every change of temperature affects both the tuning and the mechanism of an organ. In heated air the pipes sound sharp; in a colder air flat; consequently no large gas corona should be placed near the organ, unless it be so high above it as not to affect the air immediately around the pipes, otherwise the result will be that the organ may be in perfectly good tune at the morning service, and out of tune at the evening service, when the gas is lighted; the larger pipes which rise into the stratum of heated air of course feeling its effect in a different ratio from the smaller ones. Every precaution should be taken to prevent damp from getting to the instrument, and to neutralise as much as possible the effect of atmospheric changes, which is sometimes disastrous. The internal mechanism is of a more delicate description than most persons who have not had to do with organs are at all aware. It consists mainly of carefully-finished woodwork; and the connexion between the keys and the valves or "pallets" which admit the wind to each pipe is effected by long strips of wood called "trackers," of a section of about $\frac{3}{4}$ in. by $\frac{1}{2}$ in. Under the influence of cold, of course, these, when of any length, contract, as many an unfortunate organist knows who comes to his church on a frosty morning and finds half a dozen notes "ciphering" (i.e., speaking without being asked), the pallets having been pulled open by the shrinking of the trackers. As to damp, a very little of that will throw the whole mechanism out of working order, the swelling of the wood causing the action to bind in various places. These hints will sufficiently indicate the necessity of providing for the safety of the instrument against damp and barometrical change. If necessarily placed against outside walls, these should be built with a cavity. The organ should not be near an outer door, and any window that may be in close contiguity to it should be double glazed. Provision should also be made for a small gas-stove, either close to the organ, or, what is better, inside it, by which the temperature can be regulated and adjusted, and which will also serve to counteract the effects of a damp atmosphere in rainy weather.

As to the architectural design of the organ, people will follow their own predilections; but it may be observed that the design of the organ may be made to harmonise with the general design and plan of the building to a far greater extent than is usually the case, if the subject he made a matter of forethought instead of afterthought. Indeed, if the precise contents of the organ can be determined on beforehand, it may even be made to appear as an integral part of the edifice, standing on a surbase of stone or marble, or stone with marble shafts or dressings. It has become customary to use the larger diapason pipes as the principal constituent of the "front," and this is certainly the cheapest way of producing an effective appearance; but it is not altogether without its drawbacks, as the pipes in this case, instead of standing in their natural position on the soundboard, have to be "conveyanced off," as it is termed, the wind being taken to them by supplementary tubes called "conveyances,"—a plan which naturally renders the pipe less prompt in speaking, and increases the chance of leakage of the wind before reaching the pipe. Whenever the pipes are so used, the larger ones should be placed at the sides, and the smaller ones in the centre, as they are thus nearer their "wind," and require shorter conveyances; for the system of arranging pipes on the soundboard is always (except in very small organs) to place the large pipes at either end alternately, the

low C standing at the extreme left, the "C sharp" at the extreme right, D on the left, "E flat" on the right, and so on, the smallest being in the centre. Were the pipes arranged on the sound-board in the order in which they sound, all the large pipes forming the bass placed at one end, the effect would be to suck away all the wind from the little pipes at the other end. At the same time care must be taken, in arranging the front pipes, not to bring the smaller centre ones too close over the head of the player, as the wind, passing over the lip of the pipe, produces a whistling and hooting, when in close proximity to the ear, which becomes an intolerable nuisance in pipes from about 4 ft. length downwards, besides preventing the player, when he is using those pipes, from hearing the other portions of his instrument, and knowing properly what he is doing. We have known cases in which it has been found necessary, after the organ was built, to put up a very unsightly projecting screen over the head of the organist, in order to shut out from him the noise of the diapason pipes in front. Besides the large metal pipes which are commonly made use of ornamentally, the architect may avail himself of the large square wooden pedal pipes, which are generally placed at the extreme opposite sides of the instrument, and may, if panelled, painted, or otherwise decorated, form an appropriate side finish to the case. In the great organ at St. George's Hall, Liverpool, the late Mr. Cocke-rill availed himself of these wooden pipes in a striking manner, placing the largest of them, with ornamental heads, in a semicircle round the back of the instrument, where they form the best feature in a design otherwise a good deal wanting in unity and simplicity. We are decisively of the opinion, too, that where the pipes are need in the front design, some kind of decorative finish should crown them and conceal their tops: the prevalent fashion of leaving them to stand nakedly up, a row of cylinders truncated at different lengths, is simply a barbarism; and so also is the habit of splashing them over with all manner of colours like a display of fireworks. Indeed, if the diapason pipes are made with a good proportion of tin, they will often have the best effect if left unpainted, and with merely a little well-considered decoration round the mouth of each pipe.

The complacent manner in which the "organ-chamber" arrangement has been accepted is due perhaps partly to the fact that a large proportion of church organs are now turned out in a sort of wholesale fashion, of no great size, and of such similar arrangement and make that a chamber that will do for one of these regulation organs will do for any of them; indeed, one very large firm has been accused of making its smaller church organs in lengths of 300 ft. at a time, and cutting off as much as is wanted by each customer; and country churches, too, have been overrun with things called "Scudamore" organs, consisting of one keyboard and three or four sets of whistles,—things which are the abomination of desolation, standing where they ought not. It should be remembered that an organ is really nothing unless it attains a considerable size, and that every properly-laid out large organ will have, or should have, its own individuality, and its own peculiar characteristics, which require to be duly provided for. In the case of an organ standing free against a west end or transept wall, it is well not to spread the instrument out laterally to too great an extent, as the two sides will be unequally heard by those in its vicinity. It is possible, at a little extra expense, to place the keyboard so that the organist may sit with his back to the instrument and facing the choir; the "tracker" movement being carried under his feet. The mechanism requires a little extra care, but the advantage of the player being able to see those whose singing he is accompanying and supporting, is obvious. All certains and staff hangings near the instrument are disadvantageous, they tend to absorb the sound. On the other hand, in a large edifice, curtains and such things dispersed about the building have a beneficial effect in densening and reducing the echo; the dresses of the congregation conduce to the same effect. It is an absurd superstition with those who do not know much about the matter, that the effect of an organ is improved by an echo in the building. On the contrary, there is no instrument to which the absence of any marked echo is so important. The sound of an elaborate piece of music played on an organ in a place with a redundant echo, is rather like the effect of a pen-and-ink drawing made on

blotting-paper; all the outlines are blurred and confused. The position of the instrument should be calculated for a perfectly clear definition of all the sounds that issue from it.

THE SLADE ENGRAVINGS AT THE BRITISH MUSEUM.

The British Museum, on re-opening, after its very brief and well-earned "close time," presents its visitors with three important additions to its visible treasure. Of these, the most imposing, at all events in point of magnitude, is the collection of antique marbles;—alas! for the most part fragmentary, from the famous mausoleum, or sepulchral monument of Mausolus, in Caria, which is now being arranged in the hall adjoining that occupied by the Elgin marbles. The second is the very rich collection of Arabic and Venetian glass, lamps, pottery, gems, and cognate objects, forming part of the bequest of the late Felix Slade, which is to be found near the cases containing the objects collected by Sir William Temple, in the Vase and adjoining rooms. The third, to which we propose to introduce our readers, is the small but highly valuable collection of engravings, also bequeathed by Mr. Slade, which are admirably exposed to public view on a dozen screens, in the King's Library.

The historic progress of the art of engraving is represented by the prints here grouped together in a very striking and instructive manner. The catalogue is not yet prepared, and the great defect of most public exhibitions,—the absence of well-digested and really instructive labels,—is a sad drawback on the value of this exhibition to the public in general. We trust that the catalogue will be so drawn up as to give the fullest reliable information with regard to each engraving (which may be done in but few lines), and that extracts from this document may be affixed, in the form of printed labels, in each instance. There are rather more than 350 engravings, of the Italian, Dutch, German, and English schools, commencing with proofs from some of those early *nielli* which appear to have been the grandfathers of all modern incision on metal with a view to reproduction on paper. Such, indeed, was not the object of the workers in *niello*, who in fact did little more than transfer to the more appropriate medium of metal the method of pictorial representation, by a mixture of incision and colouring, which is as old as the Theban tombs, and which had been gradually brought to so high a state of perfection by the Etrurian, the Magna-Grecian, and the Grecian potters. But the admirable sharpness and beauty of the proof that can be "pulled" on paper from a fine *niello* is evident from an examination of some of the specimens in the first case. In one, a female figure is seated in a chair, and heet by a rabble rout of satyrs and dancing figures, recalling the description given by Milton of the Lady in "Comus." Another is an Arabesque design, including masks, satyrs, and griffins, of extreme delicacy and freedom of touch.

Italian art is but poorly represented in the collection. The name of Baldo Baldini is one of the earliest that occurs. There is a group attributed to Andrea Mantegna,—a portion of the triumphal procession on the Arch of Titus, commemorating the capture of Jerusalem,—which, though somewhat rough and hurried in drawing, and especially in shading, has all the characteristic dignity and life of the master in question. Of Marc Antonio Raimondi we have a noble design of David, with his sling in his hand, and the head of the fallen Goliath. A pendant to this fine engraving may be selected from the classical subjects of the same artist, in a graceful standing figure of Apollo with his lyre. There is a very careful and, apparently, truthful portrait, in profile, of Michelangelo, by Giulio Bonasone, in which the dilapidated bridge of the great sculptor's nose (the *fon* handiwork, according to Benvenuto Cellini, of that same Torregiano who executed the monument of King Henry VII. at Westminster) is disastrously apparent. An extremely spirited battle-piece, by Marco Dente da Ravenna, is another admirable product of the Italian school of engravers.

German artists, working either in their own country or in England, have contributed more copiously to the collection, and it can hardly be disputed that the finest, as well as the most numerous, specimens bequeathed by Mr. Slade are thus of German origin. Among these the

attention of the student will be arrested by a group by Martin Schongauer, hearing the monogram M + S, representing Christ and the Virgin, each wearing a lofty and overshadowing crown, with a sort of window interposed between them, filled by a glory of angels. The death of the Virgin, a quaintly crowded, but very boldly designed picture, is also marked by the same signature. The Madonna lies on a large bed,—a four-post bed, it ought to have been, but two of the posts are omitted,—and one of the curtains at the foot is looped up to the tester, in order to leave room for the twelve apostles, who crowd around the moribund figure. The Virgin's face is, in accordance with the Romish tradition as to her actual age, far more youthful than is generally represented to be the case at so late a period, comparatively speaking, in her life. St. John the Divine is placing a taper of formidable dimensions in her hands. Another large taper is fixed on a pricket candlestick near the foot of the bed. The apostles are all barefooted, and clad in the monastic garb. One holds a tremendous processional or pastoral cross. Two are reading, prayers out of an illuminated missal. One is coming in to the apartment with a bronze *scara*, or hocket, in his hand, the attachment of the handle of which is adorned with a goat's head and horns in relief. The expression of grief and reverence on the face of one of the apostles, probably intended for Peter, which is turned towards the spectator, to the left of the picture, is wonderfully real and impressive. Near this crowded scene should be observed a single figure of a crowned female with an open book in her hand, adorned with floating hair, of extremely delicate execution. A companion to this engraving may be found in that of a female bearing a scutcheon, on which is blazoned a salient horse. There is also a descent into Egypt, hearing the monogram M + S, in which five little angels are clinging to the shoots of a palm tree, in order to weigh down the clusters of dates and bring them within the grasp of Joseph.

A most extraordinary mixture of piety and of heraldry, or rather an attempt to bring before the mind the incidents of the Passion under the disguise of the science of hiszory, bears the monogram C. S., and is attributed to "the master, of 1466." An esoticheon, bearing the instruments of the passion, is borne up by supporters of no less dignity than the Saviour and the Virgin, aided, after a manner not altogether unfamiliar to the French heralds, by the four Evangelic beasts. The Paschal Lamb and the sacramental chalice are depicted below, in the place occupied in English hiszory by the scroll for the motto. The eagle and the winged bull and winged lion below them. The vined helmet (in Continental heraldry it is not ordinarily placed full face, as in English representations of the crest of a sovereign) is encrowned by the crown of thorns, and bears, as a crest, a dextrocheir, or arm with the thumb and first two fingers extended, in the form peculiar to the act of giving the sacerdotal benediction. The wafer, charged with a cross, is behind this open hand. It may be remarked, *en passant*, as not generally known, that the badge of the Jewish priests, or what Christian heraldry would call the crest of the family of Cohen, is a pair of hands joined as if in prayer or in benediction.

Two figures in clouds to the right and left, in the corners above the group, are altogether non-heraldic. The shield is made to assume the appearance of some of those crowded and paltry Italian coats of arms on which the severe taste of French heraldry works with so much contempt. The cross, occupying the centre, quarters the field. On the dexter are to be seen the spear, the ladder, the kerchief of St. Veronica, with the miraculous portrait and the scourges. On the sinister, are the hammer, the nails, the pillar, the rods, the reed and sponge, a bucket or *scara*, and three heads in profile, one surrounded by a nimbus.

A remarkable plate, by Israel von Meilman, represents the delivery to Judas by the High Priest of the thirty pieces of silver, the price of blood. The scene appears to be laid in the Temple, but the artist commits the strange outrage on a well-known peculiarity of Jewish custom of making the traitor uncover his head before the priests. He is removing his cap with a sort of cringing, clumsy, bow. A pricket candlestick does duty in the sanctuary, and a tabernacle or ark, something similar to that made use of in Jewish synagogues, is inscribed in front, with some very orthodox-looking letters,

which, however, on inspection, turn out to be neither the square Hebrew character familiar to the Oriental scholar, nor the Phœnician, still to be found at Nabona. In the distance is represented the scene in the garden.

Near this quaint but striking engraving, is an entombment, by Albrecht Glockenton, in which seven figures take part, one of whom, with his back partly turned towards the spectator, has a pair of pincers stuck in his girdle. The expression of grief in the countenance of one of the Maries is very truthful and touching. In the extreme distance, on a low, bleak hill, a cross, with a ladder reared against it, stands out from the misty horizon.

The grand name of Albrecht Dürer is illustrated by twenty-eight engravings, including some of the most famous and well-known of the productions of this vigorous artist. Among these are the celebrated pair of sententious, one displaying a lion, with a cock for the crest, which does all but crow, and the other, adorned by a skull, and held by a richly-draped female, to whom a weird and goblin old man, with a shock of twisting and curling hair that is a picture in itself, is offering very pressing attentions, not, it would seem, altogether *invita Minerva*. A little group of three boys, playing on musical instruments, almost recalls the *amorini* of Il Fiamingo. The extraordinary design, now well known by its multiplication by photography, of the mounted Knight and Death (the origin of the tale of "Tristram"), is represented by a very fine impression. A Temptation, and the appearance to St. Hubert of the miraculous stag, are among the most beautiful specimens of this valuable series. A little frieze of *amorini*, marked with the monogram J. B., should be compared with the three little musical lovelets of the German master.

Wenceslaus Hollar has executed a Dance of Death, the delicacy of the execution of which may be advantageously compared with the hold, firm touch of Kaulbach. From the arabesque framework which surrounds each scene the little series appears to have been designed to illustrate a book. The first plate represents the Temptation. In the next, which is the Expulsion from Eden, one skeleton is making an unwelcome companion, running side by side with Adam and Eve, while a second, brimfull of delight at the prospect of a rich harvest for the sycote of Death, is at the same time dancing before the group, and playing merrily on the fiddle,—appropriate music for that wild march! In the third plate the same rueful visitor takes a part in the tilling of the earth by the sweat of the brow of man, while Eve sits by, tending her hounding children, and industrious in the use of distaff and spindle. Then follows, with the motto "*Moriatur Sacerdos magnus Josue*," the approach of Death to a throned figure, wearing the triple Papal crown. Cardinal Death, duly hated, stands near among other ecclesiastics. "*Percediam pastorem*" applies to the visit of Death to a bishop. "Woe to him who justifies the wicked for a reward" is illustrated in a method for which the Congregation of the index would have shown master Hollar small consideration, had he given them the chance, by a cardinal selling a pardon. "*Principes induitur merces*" is the motto to the message of Death to Hezekiah. "Woe to those who walk in pride," and to the "women who are at ease," are two other examples of the unwelcome intrusion of the grisly visitor. The plumed head of a figure on the last plate of the series is as imposing as that of the King in the *Cotes Drolatiques*.

With the grim satire, and delicate workmanship of Hollar, may be compared the figures of a not altogether dissimilar series, that of the Seven Deadly Sins, by Jacques Callot. It is painful to be compelled to add that most of these highly improper personifications are made to look rather attractive than otherwise. *Invidia*, indeed, with a snake in her holy grasp, and a filthy dog at her feet, and a microscopic devil in the air tugging at her hair, is disgusting. *Avaritia*, with a hoisted toad and a money-bag, is not much better. *Ira*, with sword and shield, and a lion for attribute, is spirited enough. *Gula*, attended by a gluttonous hog, bearing a hotted case in wicker, and a cup, is attended, like her sisters, by a flying little devil. *Pirateria*, is reposing on an ass, which is also reposing, and is attended by a seated demon. *Superbia* has a mirror and a peacock, with a flying minister of Evil; and *Luxuria* is a beautiful female, scantily draped, with a sparrow on her fist, a goat by her side, and a familiar imp gently combing one of her long and floating locks.

From this homily of Callot we pass to the sordid and vulgar life which David Teniers and Adrian van Ostade have rendered immortal. Twenty-eight engravings illustrate the works of Rembrandt. There is the well-known appearance of the angels to the shepherds, and the flight of the terrified rascals from the "glohe of circular light." Then follows the honour paid to Mordecai, by a grotesque and disconsolate Haman. A fine engraving of a man giving a sheaf of arrows to a youth recalls the story of David and Jonathan. Next is the hospitality of Abraham, in which the low Dutch character given to the glorious angel guests, one of whom is positively bald, can only be termed disgusting. The same expression must be applied to a scene in which Barabbas is made the central figure, a low vulgar ruffian, standing in relief against the dark shadow of a doorway, with Pilate, attired in a voluminous and spirally-formed turban, and hearing a long rod, on the one hand, and HIM, to whom the people preferred Barabbas, on the other.

Pilate's wife is visible at a window. The figures and faces of some of the rabble are very characteristic. It is impossible to look at this, and indeed at many other of Rembrandt's groups, without coming to the conclusion that this great colourist came to grief in his drawing in a manner not uncommon in the case of children when first using the pencil—namely, making the head, and upper part of the figure, so much too large for the space there is to occupy, that the legs have a large parenthesis cut out of their dimensions, and the figures are squinted not as Dutchmen are equal, but with the impossible proportions of ill-designed dolls. A youth hearing the ewer of water to wash the hands of Pilate, and several other figures, require holes to be sunk in the pavement of the *person* to accommodate their feet—if they are to be supposed to have feet at all.

Again, we have the engraving of Philip and the Eunuch, one of the same grotesque illustrations of sacred story. An engraving of a solitary tree, shown dark against a light background, gives the wonderful *Chiaroscuro*, in which Rembrandt was altogether unrivalled, without the countervailing coat of proportion that characterises most of his figures. There is an admirable scene of a man giving alms to two beggars and a child, a fine impression of the Alchemist, and by far the finest work of the series, a portrait of the artist himself, at a period of life intermediate between those which date the two portraits in the National Gallery.

The names of Van de Velde, Antony Waterloo, Theodors Stoop, Nicolaas Berchem, Joannes Brengel, are all illustrated by fine specimens of the art of the engraver. Antony Vandyk, among some superb etchings, or half-printed engravings, which are by far the most noticeable works in the collection, has a curious portrait of Titian and a Lady, illustrated by an Italian verse, which it will better suit English decorum to leave untranslated. We have passed by the names of Lucas van Leyden, of Ieronimus Wieser, and of Heinrich Goltzius, the latter of whom has executed a very fine head of King Henry IV. of France; and the second, one of that great king's evil genius, Henrietta de Balzac d'Autringes.

Among the engravings of Wenceslaus Hollar are two which possess unusual interest for our readers. One of them is a view of London in 1644, with the Gothic nave and tower of St. Paul's Cathedral, here of its eighty-fathom spire, rising proudly over the City, the bridge laden with horses, and furnished with two draw-bridge openings, and forty-four other churches, palaces, and buildings of importance indicated by numerical references. The designer of the view, which is one of great historic interest, addresses his purchasers in verse, concluding,—

"London, the glory of Great Britain's Ile,
Behold her Landskep here, and tru Pourraile."

The companion print is one of the interior of the Royal Exchange, which is filled by a disproportionately numerous crowd.

We must not omit to mention a pair of engravings by the same artist, hearing the date 1651, in one of which is represented King Richard II., meekly kneeling on his knees, while to his left stand St. Edmund, with an arrow in his hand, Edward the Confessor, holding a ring, and John the Baptist, whose raiment of camel's hair contrasts with the royal robes of his brother saints. In the pendant is represented the Madonna, accepting the prayers of the king; the most noticeable feature in the design being the dense and lofty palisade which is formed in

the background by the pointed wings of the attendant angels.

From the school of Rembrandt we pass to a screen containing twelve engravings, which even when seen together with so many specimens of unusual excellence in the art, assert an unquestioned superiority in certain details of execution. In the whole collection there are no prints which so much resemble paintings,—which have so much the effect of actual colour,—as those of Johan Georg Wille. Most of those here displayed are too familiar to all amateurs of engraving to need description. "The Satin Gown," "The Boy blowing Bubbles," "The Tricoteuse," "The Boors Smoking," "The Girl Scrubbing a Porringer," "The Singing Party," "The Fiddler," "The Madonna with the Bambino," "The Girl with a Sparrow," "The Schoolmaster," and "The Old Woman with a Tulip," are here,—no one of them representing a truly noble or beautiful subject, and yet each unsurpassable in its method of rendering the subject unfortunately chosen by the artist.

The name of Thomas Cecil is annexed to a fine portrait of the Black Prince, which has every appearance of being an accurate likeness. It bears a strong resemblance to the more generally known features of the martial Edward III. We are told that the impressions "are to be held by Roger Daniel at ye Angel in Lombard Street," and informed further that—

"The terror of his fights the Black Prince won
The name of Black, not his complexion.
This to his deathless memory be erected,
And to famous archery too much neglected."

Five English portraits, by Simon, Crispyn, and Willelm van der Passe, occupy the next screen. One, by the second of these artists, of Queen Elizabeth, with the motto, *Posui Deum adiutorem meum*, and the legend, giving the date of her death in the artificial form, *mortua anno MISERICORDIE* (the large letters signifying the year), should be compared with a finer and younger portrait, by an anonymous artist. A portrait of James I., dated 1621, with Prince Charles standing by, by Willelm van der Passe, is very noteworthy, and gives an admirable physiognomical study of the vain and cruel pedant, with signs of hope and promise in his ill-fated face. Robert White has engraved George, Earl of Cumberland, K.G., with his armour, and even the handle of his lance, powdered with gold stars. W. Hole has produced a fine figure of a knight holding a rod or pole, as if about to strike at a mark. The large folio-sized portrait of George Villiers, Duke of Buckingham, with flowing hair, and profusely-strung collar of pearls, by Willelm Jacob Delf, is positively superb.

The eleven engravings by W. Hogarth do not include the best productions of that artist. Among them are the well-known portraits of Wilks and of Lord Lovat, High Life, the Times (in 1762), and the four plates of the Election. There is a fine portrait of Bishop Hoadley, by Bernard Baron, and we then come to the admirable mezzo-tinto engravings of the most celebrated portraits by Sir Joshua Reynolds, which are for the most part the work of John Raphael Smith. Among these are the Honourable Mrs. Stanhope, Lady Catherine Pelham Clinton (a child feeding fowls), and the Banished Love. Roxalana is engraved by Dankarton; the Strawberry Girl, and Barbara, Countess of Coventry, by Thomas Watson.

King Charles II., Fairfax (spelt Farfax), Sir William Paston and Lady Paston, are fine portraits, engraved by William Fairbairn, cir. 1659. The last case contains vignettes by Bartolozzi.

It will be seen that the collection is one of great artistic and historic value. It should be added that one great characteristic of the series is the rare excellence of almost every print. None but good copies appear to have been purchased. The mounting, in simple cardboard mounts, with the engraver's name alone distinctly printed, is worthy of the engraving, and the plain locked case allowed to each engraving leaves nothing to desire in the way of preservation and accessibility. The Museum is to be congratulated on this great acquisition; and so is the public.

Holborn Viaduct.—The New Viaduct is now open for foot passengers. It will be formally opened by her Majesty on the 6th of November, together with Blackfriars Bridge.

BRADFORD TOWNHALL COMPETITION.

The authorities in Bradford have at length been seized with the townhall mania that has raged with such virulence of late years, in this part of England especially. They made a stahorn resistance against the malady approaching a crisis, but it at length got the mastery, and, as we now see, has broken out in an architectural rash, that will lead to a heavy doctor's account, and, we hope, a good condition of things afterwards. The patients seem anxious to stipulate as to the amount of the medicine bill, but we fear that, as is often the case in such architectural eruptions or surface diseases, they will be liable for something more than they propose to pay. It is quite true, too, that the corporation got through this "liability of youth," for the longer it is delayed the more dangerous, that is, expensive, it becomes. Her sisters, Leeds, Halifax, Rochdale, Chester, &c., have pulled through with comparative ease; while Manchester, who waited so long, has had to pay dearly now that her time has come. It is the more surprising, too, that Bradford has resisted the "soft impeachment," until the present moment, as so much good architectural work has already been done in and around her, and so much more is promised for the future. Considering the close affinity that exists between the Scotch and Yorkshire characters in their love for "filthy lucre," and intimate knowledge of its full value, a stranger arriving for the first time in Bradford is unexpectedly gratified to find the streets so well stocked with good specimens of architecture.

Sidney Smith's remark respecting Scotchmen and humour may be very aptly applied to Yorkshiremen and art,—something approaching the severe character of a surgical operation being requisite in both cases, with this difference, however, that after the surgeon has done his duty on the Yorkshireman, the result will be lasting and perfect.

Either the honour of his town, the desire to be considered liberal and wealthy, which in America induces so many to submit to double taxation by returning their income at twice its real amount, or the advantage they expect from a stately building serving as an advertisement, by causing them to be generally talked about, may be the motive; but the result is the same, and beneficial both to the town and the profession; it should not therefore be too closely examined, but the fact itself "received with thanks."

The intentions of the Bradford Corporation to build a Town-hall were made public in May last. About 400 applications for instructions were received by the town clerk from architects in all parts. These rules and requirements were found to be so unsatisfactory in many respects that letters of inquiry and explanation passed in great numbers, until at last the different points of the instructions were so modified that the competitors were virtually told that they might do just as they liked. This was enough to raise suspicions in the minds of many, and it was further increased by a letter asking architects what amount of space they required for the hanging of their drawings, having a number attached to the form to be filled up and returned, thereby affording a clue to the ownership of each design, all being required to appear under motto only. The result of all this was that of the 400 applicants only about thirty were trapped, and we shall see below how effectually their wings were afterwards clipped. "In vain is the trap set in the sight of any bird," this has been very markedly illustrated in the present competition, as nearly half of the competitors come from London, and others from a still greater distance, Leeds and Liverpool being slightly represented, but Manchester and Halifax being "conspicuous by their absence." Putting out of the calculation the local men, the numbers of the competitors increase according to the inverse ratio of their proximity to Bradford. The reason being that the further they were removed the less they knew of the "family feeling" of the Bradford "good folks." There was an old rule that if any thing good chanced it was to be kept in the family. What a "happy family" must this one be when all the plums are given to its own children irrespective of good behaviour. This seems still to be in force in the case of architectural competitions, although in cases such as Government examinations the value of patronage has been greatly lessened.

It is a remarkable fact that such a small percentage of the applicants submitted designs, as in the case of Manchester, Bolton, Chester, and

even for the small hospital at Rotherham, a quarter, or even a third, of the number put in an appearance. The cause of their "backwardness in coming forward" is not to be found in the amount of work that is at present inflicting the profession, for whatever may be the case as to a few of the great guns, the "minor cannons" have scarcely a "shot in their locker."

The corporation having received the designs, stowed them away in three rooms, one over the other, in an empty building near the intended site, known as Gath's warehouse. The mode of arranging the designs, especially those that were intended for the prizes, was very good, being similar to that adopted at Lincoln's Inn for the "Law Courts" designs. There was an attempt at placing these plans according to their supposed quality, as the curator informed us that those in the top room were scarcely worth looking at; but in this we certainly cannot agree with him. The councillors next proceeded to go through the ceremony of selection, which they had in all probability done some days or weeks previous to the receipt of the plans, and straightway voted the first prize, or the execution of the building, to Messrs. Lockwood & Mawson; the second, or 200*l.*, to Messrs. Milnes & France; and the third, or 100*l.*, to Mr. Samuel Jackson, all of Bradford. There was a very pretty bit of innocent hy-play at the opening of the sealed envelopes after the announcement of the awards, calculated, however, to deceive few, for when the mottoes and names of the first two had been declared, the third design, marked "Gablet," was said to have no known author.

The first premiated design, by Messrs. Lockwood & Mawson, under the motto, "Let Bradford flourish," is the most elaborately set forth of any in the collection, and is illustrated by six beautifully drawn exterior and interior views, coloured in sepia with great artistic feeling, and one external view cleverly worked in pen-and-ink. The elevations and section, only one longitudinal, are executed in brown ink; the sectional portions, corresponding with the plans, are filled in with black, a contrast to the brown lines that is too severe and crude.

Fortune has treated Bradford much better than might have happened, for the plan that accident has thrown in her way, *bon gré mal gré*, is one of the best in the collection, both in arrangement and architecture; but the fickle lady has taken her revenge in the character of the second and third designs, which appear to be selected on the principles of extremes meeting. The nature of the proposed site, as to the advisability of adopting which so much has been advanced *pro* and *con*, in the local journals, is very peculiar. As to its general position and character, it seems suitable on the whole. In shape it resembles the sole of a hoot of the late fashion, the rounded end or heel facing Leeds-road, and the toe, across which a new street will run, Great Horton-road, the north side Market-street, and the south side Chapel-lane and Norfolk-street.

In addition to the principal plan, which is completely worked out to fit the Gothic design, an alternative for the first floor, showing a different position for the borough court, but not nearly so good as the original, is submitted, arranged to suit the Classic design, which is as inferior to the Gothic as are their respective plans, along with some minor "revisions of separate parts, such as prisoners' cells, &c. We will, however, content ourselves with describing and commenting on the original plan only.

The basement, although required for little more than cellars, is well lighted and convenient, with the exception of the entrances, which, though forbidden in Market-street, might with advantage be more numerous in the remaining streets. We may here remark a defect in the preparation of the drawings, viz., in the colouring of the floors, they being all of one tint, instead of having the rooms belonging to each department tinted differently from those of another, a method that would have greatly assisted in reading the arrangement of parts. As to the ground floor, the police entrance is placed in the centre of the Leeds-road end, or heel of the building, semicircular on plan. From a spacious hall open chief clerks, detectives, and district surveyors and other offices, as well as the parade room for police, placed under the borough court, and connected with it by a staircase leading into the prisoners' dock. From this hall a large staircase rises, for the use of lawyers, witnesses, and others having business in the borough court on first floor. Next to these, proceeding along Market-street front, we find the curator's house, messengers' and porters' rooms either

side of the main vestibule, with central staircase leading to the principal floor, and also stairs descending to the basement. On the opposite side of the central doorway lie the market superintendent, superintendent of fire brigades, scavenging nuisance, and hackney-coach offices, there terminating the Market-street front.

Proceeding along the toe of the hoot, facing New-street, towards Chapel-lane, we find in the centre the entrance to the municipal offices, which leads into a spacious hall, on the opposite side of which, facing the entrance, is a handsome circular staircase, with columns in front, around which the groined ceiling of the main corridors sweep. On this stair access may be gained either to the municipal offices on principal floor, or to the basement below. Further on, proceeding in the same direction, are placed the inspector of weights and measures; beyond him, at the corner, and turning down Chapel-lane, is the fire brigade department, and room for engines. The remainder of this front is devoted to police cells and day-rooms for men. The whole of this floor is well arranged, with no unnecessary loss of space. The areas, or open courts, are spacious, and the corridors well lighted and ventilated.

First or Principal Floor.—The main approach to this level is by two easy flights of steps, in a spacious vestibule, placed in the centre of the Market-street front. Through this an entrance-hall is gained, one side of which is occupied by the principal staircase, placed under the central tower, that rises to the second floor by a single flight of steps, which branch right and left from the first landing. The base of this tower has the same fault that is said to have lessened the chance of Mr. Charlesworth's design for the Manchester Town-hall, viz., the walls are not sufficiently thick adequately to support a superstructure some 200 ft. high. On the left of this staircase-hall a corridor leads to the borough court, and between it and Market-street is placed the mayor's reception-room, and beyond it, in the direction of Leeds-road, the rooms for magistrates and their clerks. The space lying between these latter and the Norfolk-street and Chapel-lane angle of the site is occupied by the borough court (the police parade area being underneath, as before described), bounded on the right by a groined corridor, lighted from a large internal open area, which gives access to the court from the municipal end of the building. The extremity of the borough court, opposite to the magistrates' bench, which is next to their rooms before mentioned, is semicircular on plan, and behind it, in the angle of the site, comes the public staircase leading to the gallery, over this end of the court. In the semicircular end of the site, facing Leeds-road, are placed the jury-room, waiting-hall, gained by steps starting from the police entrance-hall, on the ground-floor; also, lawyers', witnesses', and police-officers' rooms. From the above it will be seen that the arrangement of this borough court is admirable, the magistrates, public, and those having business in the court, are all and each kept separate and isolated, and unable to interfere or tamper with each other,—an important point that has been very little attended to by most of the competitors.

Returning to the principal staircase hall, and thence proceeding westward in the direction of Great Horton-road, or to the toe of the hoot, we find the town-clerk's and borough surveyor's offices with the upper flight of the circular staircase before mentioned. From this end, stretching down Chapel-lane, are the water and rate offices, with the remainder of this front taken up by committee-rooms.

In the centre of the building adjoining the back of the circular staircase, and lighted from a large internal court, are the offices of the borough accountant,—a judicious position in which to deposit a man whose attention should not be distracted from his work.

We may here remark that we see no necessity for planning off the square all the rooms looking on to Chapel-lane, with the exception of those influenced by the walls of the council-chamber, and these even could have easily been altered.

Second Floor.—Over the principal entrance in Market-street is placed the room for receptions and assembly of councillors. Three doors lead from this into the staircase vestibule, from the centre of which a bridge crosses the principal staircase to the council-chamber door. Immediately behind the screen masking this door is the mayor's chair, and in front of it, arranged in a semicircle with prolonged ends, are the seats of the aldermen, and behind and above them those for

councillors. Reporters are provided with a couple of tables at the back of the benches and facing the mayor; and the opposite end of the chamber, which looks into Chapel-lane, and is segmental on plan, is occupied by a gallery; and on either side of this are other galleries opening into the chamber, and approached from the back corridors. The gallery for the public, over the semicircular end of the borough court, is gained from this level. Two balconies project into the court on either side, one in the centre of each wall, and connected with the passages. The library, grand jury-room, recorder's room, with those for witnesses and lawyers, occupy the space from the centre of Market-street front of the building to the Leeds-road end of it. The offices for coroner, guardians of the poor, and end of the Chapel-lane front. The mayor's private rooms and some minor offices do the same for the remaining portion of the Market-street and New-street elevations.

The third floor contains little more than unappropriated rooms. Having given our readers a pretty clear view of the interior of the building, we expect that they will be thereby all the better prepared to understand our remarks upon the exterior or architectural portions of it.

The style of the design may be described as Early French, with a spice of Northern Italy of the same period in it.

The beautiful and artistic manner in which the drawings are got up would make nearly any style "go down"; it is fortunate, therefore, that the one selected is so good as it happens to be.

The principal elevation in Market-street is made up of a central and two side-gables springing from the level of the main cornice, and bounded at the angles by octagonal and engaged turrets terminating above in arched pinnacles; the whole united by façades, composed of six bays each. The central feature of this elevation presents a wide pointed doorway, with jambs of three orders, having attached columns. The arch over is moulded, the outer order being enriched with radiating diapers. On each side of this door are massive pilasters supporting canopies containing statues. Above the door, and under a shallow crocketed gable, are three trofiled arches with figures; and higher up a decorated band or frieze.

The windows of the square portion of this gable correspond with those of the main façade, with the exception of those to the first-floor, which are narrower, and contained under gable moulds. A projecting oriel window, of good design, is shown by the perspective view in the central pavilion, over the doorway, but omitted in the elevations. The gable proper is filled up with three pointed and traceried windows, the centre one having two lights, with three of their miniatures in the apex.

The proportions of this gable are unpleasant; it is too wide even in the elevations, and would appear much more so in execution. The angle turrets might with advantage be drawn some 3 ft. closer together, or the springing of the gable raised considerably.

The ground-floor line of the main façades is treated in a plain and massive style, with square-headed and shafted coupled windows. Above them runs a band of oblong panels containing shields. Upon this band rest the main floor windows, which are composed of coupled and shafted pointed lights, deeply recessed under a flat-pointed arch, with broad soffit, springing from a broad carved impost or string the depth of the foliated caps, under which is a circle with a cinquefoil-cusped opening and diaper work. The spandrels of the main arches are in like manner filled in with square horizontal diapering, having a circle and medallion in the centre. Again, another bepanneled band, and then come the second-floor windows, which are rather plain and small, running in couples, divided by recesses of similar outline, and containing figures, the whole forming a continuous arcade round the entire building,—a convenient arrangement by which a window that will not "work in" may be changed for a figure that must. Where this arcade meets the angle turrets, figures are made to cluster round them, one on each of the faces. The usual Gothic cornice, with arched parapet over it, completes the whole, allowing for an occasional dormer window of two lights, or a first-floor window of tondies, under a gable of its own.

The semicircular end facing Leeds road is like the main façade, curved to the required shape by hydraulic pressure, and suffers from the process; for the great span of the main arches

planned on such a short radius throws their crowns very much in advance of the hanches. The construction is had, and presents the appearance of a very corpulent man suffering from repletion. The dormer that occupies the centre of this curve is twice the size of the others, and suffers in the same way as the portion below, for the line of its gable coping has an unpleasant twist in it. It is desirable to avoid placing arches in a curve, especially those of considerable span.

The doors in the centre of both the ends of this design are poor, and the portions we have before alluded to, require reconsideration. The central clock tower rises from over the principal staircase. Its design is meagre, however much its original may be admired. It shoots up like a rocket, with a variegated tail, and when the "pop" comes, a heavy macciolated cornice with swallow-tailed battlements appears, and the "hang" produces a large open belfry with pyramidal roof. A small clock is crammed in somewhere amongst the swallow-tailed battlements. It is wonderful, judging from the designs before us, what hazy notions architects have as to the proper diameter of a clock for a given altitude, scarcely any being satisfactory on this point. Probably it is a good rule to make a clock face 1 ft. across for every 10 ft. it is raised above the ground. Many of those we speak of would require a telescope to read them, and appear more like a watch than a clock.

We must reserve further notes.

PLYMOUTH GUILDHALL COMPETITION.

THE Town Council very properly took professional advice in the selection of designs entitled to the offered premiums: Mr. Alfred Waterhouse was the architect who so assisted them, and the first premium has been awarded to "Fiat Justitia, ruat Caelum" (Messrs. Alfred Norman & Jas. Hine), the second to "Ich dien" (Mr. Charles Foster Hayward), and the third to "Nina," name unknown.

We give the referee's report on the selected three:—

"The first, 'Fiat Justitia, ruat Caelum,' proclaims the master. A nobly grouped and most picturesque exterior expresses the magnificent purposes of the buildings. Guildhall and Courts all assert themselves. The design is at once solid and inexpensive; the richness being confined to the parts requiring it. The public entrances to the galleries of the courts are well arranged. They lead direct to them, and to them only, and thus keep those who come to be amused merely, distinct from those who have business to transact. There is, also, a commendable absence of long corridors in the Assize Courts' end of the building, which, however, would have been better 1 ft. or 2 ft. wider.

The hall, 42 ft. by 80 ft., exclusive of its apseid end, would make an admirable *salle des pas perdus*. It is covered by a roof of somewhat novel construction, but which I think would be successful, both aesthetically and architecturally; all the more so, however, if it were kept somewhat lower. The courts, 48 ft. by 36 ft. and 40 ft. by 36 ft., seem to me of about the right size, but would surely be improved if, with the hall, they were reduced in height. I think, also, a passage under the Bench in each case would be desirable, and that the gallery for the grand jury in the Crown Court should be lowered in height. The municipal offices, as exactly in the line of Union-street, placed so that both the council-chamber and the various offices, which are drawn 22 ft. wide, could well afford a reduction of, say 3 ft. from front to back, thus giving more space to the central square, and reducing the cost of the building. It would be well, also, if the public had not to come to the front of their gallery in the council-chamber in order to reach their seats at the back.

Consider this not only one of the very best, but also one of the cheapest designs in the room. In all probability it could be erected in its entirety for a sum but little exceeding the higher figure named in the instructions. The tower, though a striking feature, and from its entirely different character, hardly interfering with the church, might be omitted without taking so much from the composition as would be the case with the towers in some of the other designs. The Assize Courts, also, might for a time remain unbuild, without preventing the erection of the Guildhall and Police courts.

"Nina" is a good design as embodied in a most artistic and admirable design. The author, unlike the author of 'Fiat Justitia,' who follows the arrangement set forth in the lithographic plan furnished to competitors, places his principal block of buildings towards Westwell-street, with a tower of great beauty in the centre, so placed as to come not only opposite the tower of St. Andrew's church, but exactly in the line of Union-street, designed so that an approach from Devonport the main thoroughfare would seem to have been made to lead up to what would be the most striking architectural ornament of the town. On the one side of the tower are grouped the municipal buildings, and on the other the Guildhall. Passing through the tower, you enter a fine open space, 130 ft. square, with St. Andrew's tower, as before stated, opposite; the courts on the right, and on the left, a space for future extension. From this side the exterior is, if anything, more attractive than from the other, and, as a general scheme the plan seems to me preferable to that of 'Fiat Justitia.' If the arcade to the east were dispensed with, more light would be secured to the rooms at the back of it, and some expense saved. The stores at the back of it, in this design, kept so entirely to themselves as in the design already described, and I think some re-arrangement would be needed in the municipal offices. The great hall could be made lower by omitting the aisle-rooms, if the mayor's gallery could be dispensed

with, and would average 120 ft. by 60 ft. The cost of this scheme would far exceed the sum suggested; indeed, the author himself, to a certain extent, admits it.

"The design 'Ich dien,' though not equal to others in artistic ability, has the merit of being far less expensive than 'Nina,' yet still, in my opinion, likely to cost considerably more than 'Fiat Justitia'—than which, however, it contains more extra accommodation, and is of a more modest, but effective group, rather late in style, leading up to St. Andrew's tower, as their common centre, to the effect of which this design is, perhaps, more subservient than any other. The plan was generally excellent in its arrangement. The public hall is of good size, and likely to be successful acoustically. The arrangement for judges (except as to their fireplace), and for the grand and petty juries are unexceptionable. There should be a way under the bench of the Crown Court to allow the bar ready access to the Civil Court. The bench, however, should not be so far above the floor as shown (7 ft. 6 in.), and the galleries in this design generally have not sufficient slope to enable those occupying the back seats to look over those in front. There is no way into the enclosed spaces behind the single turret and central gables. The author's calculation as to cost may be taken as very reliable. After the three designs thus reviewed, I am at some difficulty to continue my selection, and several claims of several seem to be nearly equal. Of this class, bearing the mottoes 'Nota Bene,' 'Medio Tutissimus,' the figure 13 in a circle, 'Uniti Civium Decori Urbium,' and the designs with the device of a resolute man with a black circle, deserve special mention. The author of 'Nota Bene' has allowed the Leeds town-hall to guide him both as to his plan, and, partially so, to his elevation. Still it is not a sorry copy. The exterior possesses a simple dignity, and the arrangements of the interior are to be commended. A few points in the design appeared to me to be open to criticism; for instance, there would be a deficiency of light in the great hall, if such a design. This, however, might be obviated by lightening the windows on the north side. The means of communicating between the hall itself (a noble room of 157 ft. by 60 ft.) and the surrounding corridors are insufficient. This also might have been easily obviated, as at St. George's Hall, Liverpool. The mayor and magistrates would suffer from this room being placed behind the screen for the Westwell-street portion. The cost of executing this design will probably exceed the sum named."

Considerable opposition to the proposed erection is manifested by a portion of the ratepayers, but they can scarcely shut their eyes to the fact that a new Guildhall is necessary, and ought to be provided as speedily as practicable.

Srs.—It seems superfluous to write judgment comments upon the many flagrant instances of jobbery under the present system of competition, but this instance at Plymouth presents so entirely a new feature, that it seems worthy of a special notice. Professional advice was obtained, and then I should say the competitors breathed freely, thinking that all the conditions would be thoroughly considered, and an impartial selection made. The instructions were not to exceed 25,000l.; but, as usual, showy perspectives,—prepared regardless of cost,—were submitted. To my great surprise, Mr. Waterhouse (the adviser) recommended in his report three of the most expensive of the designs, viz., 'Fiat Justitia,' 'Nina,' and 'Ich dien,' and, although recognizing his own error, entered in his report a pretty little piece of special pleading as an attempt at justifying his peculiar recommendation.

He then says,—"I would venture to remark that the clauses in the conditions referring to the cost were not such as would be interpreted by architects to the them down strictly to the sum specified."

In answer, I need only quote the instructions to the architects, which are now before me. "It is intended that the outlay on the foregoing buildings shall not exceed from 20,000l. to 25,000l." I think most of us in business would understand that sentence to mean what it says, and it certainly says enough to put such designs as would cost 60,000l. out of court altogether. I would ask Mr. Waterhouse if he could not make a better design for 10,000l. than he can for 25,000l.? And I hold that it is the duty, and most sacred duty, of a professional adviser to a committee who select him for their guidance, to set aside all those designs so evidently prepared without regard to cost, violating, as they do, the first and most important condition of the competition, and take into consideration only those which can be carried out for about the sum stipulated.

As a rule, one is not surprised at building committees (when we remember the class of humanity of which they are generally composed) being caught with bats in the shape of prettily-prepared perspectives with the chimneys omitted, "because they are no ornament;" but when it comes to this, and professional men in the position of Mr. Waterhouse overlook those who design with beauty and build with truth, to recommend those who lack the first requisite of an architect, which, in Mr. Ruskin's opinion, is "to do fine work economically," we may indeed say, where will this injustice end? AGENTS.

ON THE APPLICATION OF SEWAGE.

Waste not—want not. Words applicable to states as well as to individuals, while the amount of paperman is so great, and the means of increasing the food-producing powers of the country is allowed to run to waste, polluting our rivers and coasts; while it is possible to see ships laden with manures from distant lands, heating against a flood of loathsome matter containing the same elements of productiveness as they are burdened with.

In England produce is consumed from every part of the world. To increase the fertility of the soil not only are manures imported, but the stores of it accumulated in past ages are now ransacked, by which posterity is being impoverished both here and abroad, since the

debris arising from their consumption is thrown into the sea, and other lands are unable to manure their soils, as the means of doing so are sent away to us.

Although in towns of limited population other means may be found of removing *debris* without the aid of water, it is a settled point that in all large towns it is impossible to alter the present system of drainage; therefore my remarks are confined to the disposal of sewage as it is now obtainable, so as to return to the earth that which has been taken out of it.

As yet no method sufficiently economical to be practical has been discovered of entirely separating sewage so as to render its water pure; all methods yet tried having failed to fix the salts; the inability to do so causing the substance obtained to be of inferior value, and the water is not rendered innocuous.

The only agent found capable of accomplishing the result is the earth. As rain falling in one place finds its exit many miles distant, so let sewage be applied, when it will be found the earth has deprived it of its noxious qualities, and the water will have drained away into the water-shed of the country.

From the experiments of a few years, it is demonstrated that sewage contains extraordinary fertilising powers; but it is an important question, if the lands on which the experiments have been tried are those of a suitable character, since low-lying lands have not a porous subsoil whereby an amount of moisture is retained which renders them unfit for general cultivation.

For the profitable and successful application of sewage, it is absolutely necessary the land should have a subsoil affording *natural drainage*, which is only to be obtained by taking it on to high lands. I am prepared to hear the cost of pumping, &c., would be enormous: that thought would have deterred me from venturing on such a proposition, were it not that the expenditure of twenty millions for the construction of a tunnel to connect England and France for the accommodation of a few passengers who dislike the effects of an hour's rough sea, is thought worthy the consideration of our ablest engineers. It is to be hoped, therefore, that a subject bearing on the present and future welfare of England is as worthy an object of their attention, though perhaps, from the well-known bias of the craft, who are never so pleased as when there is a work to be accomplished that is nearly impracticable—a scheme involving but money will not meet with approbation. To reach lands of the foregoing description the sewage must be raised to such a height as to command the greater part of the line of country through which it would have to be taken, and to avoid heavy works the natural configuration of the country could be followed to its outlet.

As an example, take the case of the sewage on the south side of London. From Plumstead raise it into an aqueduct leading to the high land of Belvedere; raise it as necessary, having regard to the convenience of crossing rivers, until the chalk downs and waste lands of the southern coast are reached: by this means it would flow over a large area, and would be kept near the surface. To distribute it still further, branches could be led off.

The next point for consideration is the method of applying it to the land. That practised in India for irrigation should be adopted, with this difference, that whereas there water is applied to growing crops, here the sewage would be poured on to fallow lands. The land would have to be terraced to allow the fields to be laid out level, on to which the sewage would be conducted by pipes, and allowed to flow over them until they were well flooded, then the supply stopped, and allowed to drain away, which, with a subsoil of chalk or gravel, it would soon do, leaving the soil highly manured, and in a fit condition for any crop.

The great objection to a scheme which is mooted, *viz.*, that of embanking the Maplin Sands, and conducting the sewage from Plaistow on them, is—they are low-lying, and would have to be kept drained by artificial means; also, in consequence of the thinness of what would be called dry land, the sewage would pour out, through the drains, as fast as it went in, giving no time for the salts (the valuable ingredient) to be eliminated.

MIRROS.

Royal Institute of Architects.—The first ordinary meeting of the session will be held on Monday evening, the 1st of November.

THE PRESBYTERIAN MISSION HOUSE, SEACOMBE, CHESHIRE.

This building, which has just been completed, from the designs of Mr. H. H. Vale, Liverpool, consists of a large central hall, with triplet windows at each end, and clearstory lights on the sides below the eaves, with two transepts, divided from the hall by coupled arches, pillars, and moveable screens. The hall is flanked by two wing buildings, forming smaller gables on the front elevation, the roofs being relieved by rows of dormer lights. These wing or aisle buildings contain two stories. The lower one is used for class-rooms, reading and smoking rooms; and the upper one for keeper's residence, Bible-woman's house, class-room, store-room, &c. In the rear of the hall there is an infants' school, with cloak-rooms, lavatory, waiting-room, and other offices and outbuildings. The materials used in the construction generally are grey brick with red bands, quoins and arches, stone, and terra-cotta. The interior of the hall and transepts is lined with white bricks, having red brick bands, arches, and quoins. The roof is open-timbered, and counter-coiled between the rafters. The whole of the exposed timbers are stained and varnished. The gable factables are of fire-clay, made by the Roughdales Company from the architect's drawings, and while being less porous than the local stone, present an appearance equal to masonry. The chimney-stacks are formed of the same material. The group of buildings is crowned by a bell-turret, serving also as a ventilator: it is supported upon the centre of the ridge upon a pair of coupled principals. The wrought metal-work has been supplied by the Midland Architectural Metal-workers' Company, the cast iron by Messrs. Weber & Co., of Liverpool. Messrs. J. & T. Mason, of Egremont, were the sole contractors; Mr. Reddy was the sub-contractor for the carpentry and joiner's work; Messrs. Cherry & Lawlor, for the plumbing; and Messrs. Forrest & Co., of Liverpool, for the glazing. The cost of the whole undertaking, exclusive of the land, is about 2,000l. The hall and transepts will accommodate, need as a church, 400 people; and the infants' school, 100 children.

THE DECLINE OF SHIPBUILDING ON THE THAMES.

MR. JOHN GLOVER, in discussing the cause of this, gives a table, which shows "the daily rate of wages, on the Thames, Wear, and Clyde, of carpenters, joiners, platers, caulkers, riveters, painters, riggers, sailmakers, boiler-makers, engineers, turners, and pattern-workers. The cost of one day's labour from these combined crafts is, on the Thames, 72s.; on the Clyde, 58s. 8d.; on the Wear, 55s. 8d. The Thames price is 22-73 per cent. higher than the Clyde, and 29-34 per cent. higher than the Wear. I submit that this single fact is an explanation of the decline of shipbuilding on the Thames so conclusive as rather to suggest a demand for another explanation, *viz.*, how the trade was carried on until recent time with such a disadvantage. The answer is simple. It was not a profitable trade. One after another the builders failed, and some more than once, and their estates usually yielded very small dividends. Moreover, it was what I may call a hot-house trade. The buyers were not individuals spending their own money, looking for the cheapest market, and taking the benefit of competition therein; but, on the contrary, they were chiefly Governments (British and foreign) and large companies, often highly subsidised and rich, with whom price, and an adequate return to be earned thereon, were not primary considerations. While the Thames workmanship was, or was thought to be, unrivalled, the buyers I have described contracted almost exclusively with Thames builders, who obtained high prices in the absence of competition from other rivers. But Thames workmanship can now be equalled both on the Clyde and Mersey, on the Tyne and West; our own and other Governments and the large companies no longer restrict their contracts to the Thames; in such competition the lowest price wins. The Thames has lost—lost inevitably—with its labour rate 22-73 per cent. above the Clyde, and 29-34 per cent. above the Wear. There is good reason for believing, moreover, that this difference in the rate of wages is aggravated by the extent to which work is done by the 'piece' in the northern yards. Ironwork on the Clyde is nearly all so done, and I am informed that on the Wear nine-tenths of it is so done."

"Some further disadvantage to this industry on the Thames has accrued through the comparative disuse of wood in the construction of ships. Formerly all vessels were built of wood. Coal and iron, and the cost thereof, were not then very important items in their construction. Now, a steamer built of wood is a rarity, and nearly all large sailing vessels are built either entirely of iron, or of iron in the interior with a wooden skin. These last are called 'composite' vessels. It is apparent how the disuse of wood, and the greatly increased use of iron, favours the rivers in close proximity to the banks of which iron is manufactured, and where coal—so important an item in all work with iron—is also found proximate, and therefore cheap."

"With regard to the chief reason, it is most natural to ask why Thames wages did not fall with the decline of trade until such a level had been reached as would have enabled Thames masters to compete successfully with other rivers. The 'Union' seems to have decreed otherwise. They fixed a limit below which wages ought not, in their opinion, to fall. They succeeded thus far. Wages remain nominally high. But there is no work: trade is destroyed. It is perhaps an extreme illustration of what happens when the men become masters."

SCHOOLS OF ART AND SCIENCE.

Crystal Palace School of Art, Science, and Literature.—To what extent the Crystal Palace, in a passive sense, has been instrumental, if not in directly promoting education, at any rate in improving the tastes of the masses, it is impossible accurately to determine; but that it has had a great influence for good there can be no possible doubt. It was, in the first instance, with a view to utilise its valuable resources for educational purposes that the directors, some ten years ago, established the school, and success has year by year attended it. Its operations are confined to female education, and comprise lessons and lectures by eminent professors and teachers on all subjects embraced in a liberal education, and the courts and collections of the Palace are made available by way of examples and illustrations. The new session (1869-70) commenced on the 16th inst. According to the prospectus, which is already issued, there are many privileges accorded to registered pupils, such as the free use of a good reading-room and library, and an opportunity of purchasing a season ticket to the Crystal Palace at half-price.

Technical School, Chelsea.—The opening meeting of a new school has taken place in College-street, under the auspices of the Rev. Gerald Blunt, Rector of Chelsea, and an influential committee. Mr. Buckmaster delivered the inaugural address, in which he urged the necessity of such schools for the instruction of the boys of the better class of artisans, apprentices, and young men. Mr. Bickerton, the teacher, also addressed the meeting on the industrial and educational objects of the school, which promises to be successful. A good number of mechanics and young men were present, who appeared much interested in the proceedings.

Bristol School of Science.—A scientific *conversonione* has taken place in the lecture-hall of the Athenæum, Corn-street, in connexion with this school, which is in union with the Department of Science. A number of etchings, engravings, photographs from Besaëlie's cartoons, diagrams, anatomical drawings, &c., were exhibited on the walls of the hall. There was a large attendance, mostly of young people of both sexes. The chair was taken by Canon Girdlestone, and Mr. Buckmaster delivered an address on "The Value of Scientific Instruction, and the Aid Government affords for its Promotion." Referring to the Bristol Trade School, he said it had now outlived all its difficulties, he was glad to say, and made itself a name and reputation, not only in Bristol, but throughout every part of the country, sufficient to ensure its continuance even if the Parliamentary grant were entirely withdrawn. An address on "Inorganic Chemistry," by Mr. F. T. Ewens, followed, and was illustrated by numerous experiments. During the evening, several selections of music and songs were given.

School of Art for Leicester.—A meeting to consider the desirability of establishing a School of Art and Design in Leicester, was held in the Town-hall, on Thursday evening before last. The Mayor presided. Appropriate resolutions in favour of the object in view were unanimously

passed, and a committee appointed to draw up rules for the management of the school, &c.

The Maidstone School of Art.—The distribution of prizes to those students of this school who have successfully passed the Government examination has taken place. The concert-room of the Corn Exchange was well filled with a fashionable assemblage. Mr. James Whatman, M.P., took the chair. The report stated that the school continues to be well attended by students. From the commencement of this year, which is the second since its commencement, 73 middle-class students and 30 artisans have been under instruction, making a total of 103. This is a slight falling off in the numbers from the first year, and, in the case of a new institution, is what might be expected. The number of prizes obtained for drawing sent up is seven. The school continues self-supporting.

The Lincoln School of Art.—Through the efforts of Archdeacon Mackenzie and Mrs. Mackenzie, classes for the study of drawing, painting, and design are about to be established in Collingham, as a branch of the Lincoln School of Art, under the direction of Mr. Taylor. Already a sufficient number have joined to make a good beginning. Some of the works done by the Lincoln students, and other paintings, have been exhibited at the Farmers' Club room, and an address has been delivered by Mr. Taylor, headmaster of the Lincoln School of Art, showing the value of art to all classes, and explaining the course of study. There was a good attendance. The archdeacon presided, and in opening the proceedings delivered a short address.

BRIDGE ACCOMMODATION FOR LONDON.

In connexion with this subject it may be useful to put on record the pith of a report by the Bridge-horse Committee laid before the Court of Common Council on the 13th inst.:

"The committee stated that they proceeded in the references made to them, and were attended by the Lord Mayor and Mr. James Medwin, the respective movers thereof, and also by a deputation of the petitioners, who were severally heard upon the subject; and his lordship having suggested the propriety of inquiry being made to ascertain whether it would be possible to obtain for the benefit of the public the use of the footways adjoining Cannon-street Railway-bridge, they directed the City Engineer to draw the footways of the bridge to the attention of the committee, and the railway company upon the subject, and the architect has since reported to them that the railway company would be willing to allow the public to use the footways upon such terms as might be agreed upon between the railway company and the corporation; but the architect stated that, with the present means of access thereto, the footways, if opened, would be but slightly used, and of very little benefit to the public, and the committee were informed by the controller that the Act of Parliament authorising the construction of the railway-bridge did not contain any provision for compelling the company to do so; and the committee, in consequence of the use of the public, They had considered a report presented to them by Mr. Henry Carr upon the general question of communication between the north and south sides of the Thames, which, in that report, it was stated that increased accommodation might be given on London Bridge by widening the structure without affecting the stability or adding to the weight of the foundations, and without changing the general elevation of the bridge; but he added that in his opinion the question as regarded London Bridge could not be dealt with irrespective of Southwark-bridge, and of its proposed improvement. Mr. Carr attended before the committee, and submitted a model, showing the manner in which he proposed the bridge should be altered, whereby the footways on each side might be increased 2 ft. 6 in. in width, at an expense of about 18,700*l.*, or half that amount if the footway on one side only was widened. Mr. Carr also submitted a plan for increasing the width of Southwark Bridge, and improving the steep gradients thereof, at an expense of 100,000*l.* to 110,000*l.*, together with a plan showing the northern and southern approaches of both London and Southwark Bridges. The committee had also considered a design submitted to them by Messrs. Happle & Stockman for increasing the width of London Bridge by strengthening both the present footways into the carriage-way, and constructing additional footways 12 ft. 6 in. wide on each side of the bridge, the cost of which alterations was estimated at 27,000*l.*; also a plan submitted by Mr. Hamilton H. Fulton for widening the bridge by throwing the existing footways into the carriage-way and constructing additional footways of a width of 12 ft. on each side on wrought-iron cantilevers, the probable cost of which Mr. Fulton estimated at 100,000*l.* The committee were attended by Mr. E. W. Bryant, who submitted a model showing the manner in which he proposed to afford increased facilities for the foot traffic on London Bridge by the addition of a footway 6 ft. wide to be connected on wrought-iron cantilevers outside the parapet on the eastern side of the bridge; and Mr. Bryant stated that by the removal of the present parapet an additional width of 1 ft. 3 in. might also be allowed, thus increasing the footway from its present width of 9 ft. to 17 ft. 3 in., the cost whereof he estimated at 9,820*l.*, which amount included the cost of a temporary footway to provide for the traffic during the progress of the works. Mr. Bryant further stated that the carrying out of his plan would not affect the stability of the bridge. Mr. Frederick Braslay also submitted a model showing the footway 5 ft. 6 in. on the eastern side in a similar way, at an estimated cost of 6,000*l.* At the request of the committee, the City Commissioners of Police caused returns to be made, from which it appears that the average number of foot passengers crossing London Bridge during six days in December, 1867, was 110,519, whilst the number on the 17th of March last was 105,350, showing a diminution

between the two periods of 5,191; but, taking the largest number of foot-passengers that crossed the bridge during one of the six days in December, 1867, and comparing it with the number that passed over the bridge on the 17th March last, it would appear that a diminution had taken place to the extent of 17,302. The committee had presented them a further report from the City Architect and Mr. S. W. Leach, relative to the gradients and approaches to Southwark Bridge, and in conclusion they stated that, having given the whole subject their consideration, and having regard to the diminution that had already taken place in the traffic over London Bridge, they were of opinion that the further consideration of the question as to improving the communication between the north and south sides of the Thames, and that of providing increased accommodation for the foot traffic over London Bridge, should be postponed until the committee had had an opportunity of ascertaining the effect on the public traffic that may be produced by the opening of the new bridge at Blackfriars, the new street to the Mansion House, and the Tower Subway now in course of construction, and until the traffic over Southwark Bridge and Cannon-street Bridge shall have been more fully developed; and they therefore recommended that the references made to them on the above subjects should be discharged.

The report was agreed to. At the meeting, it was stated that after the opening of Blackfriars Bridge, London Bridge would be closed twelve working days, in order that it might be repaired, as had been agreed upon at a former court. It would, however, be closed only to vehicular traffic, and not to foot-passengers.

THE TELEICONOGRAPH.

The account we gave of M. Revoll's invention for facilitating the drawing of distant objects has been reprinted far and wide, not least so in America; the result has been claims on the part of more than one gentleman of having long previously devised and used the same arrangement. Mr. Sharpe, in our pages, showed that he had done so, and mentioned an improved arrangement, with the same object in view, exhibited by the late Mr. Varley, at the Great Exhibition of 1851.

An American gentleman, Mr. Edgerton, of Fort Wayne, Ind., now writes thus to the *American Gas-light Journal*:

"In your issue of the 16th inst. I observe an article, copied from the *London Builder*, describing a new instrument called a 'Teleicograph,' devised by one M. Revoll, a Frenchman.

I have a transit theodolite made for me to order, by Messrs. Troughton & Simmes of London, December, 1852, and among other appliances devised and attached to the same, is M. Revoll's 'Teleicograph.' I never thought the idea of sufficient importance to give it a Greek name, or describe it in the journals, although I have used it to great advantage for seven years. At the time I devised this apparatus, I supposed the idea was one that might have occurred to many; but since it has come in for a Greek name, and found place in the *London Builder*, I write to claim a share in the device. Messrs. Troughton & Simmes will well remember constructing the apparatus, and I have it here now to substantiate my assertion. Without knowing it I have practised 'Teleicography' for seven years; and it may be never had before constructed one, as I had to make a sketch of the device."

HOW TO BUILD.

We read that the builders of ancient Rome were obliged to warrant their private buildings for ten years, and their public ones for fifteen. Moreover, every accident arising from bad construction during these periods, was to be made good by them or their heirs. If they were unable to make the necessary repairs, they were whipped, amanded, and banished. Some such law like this, if it could be enforced in the nineteenth century, within the bills of mortality of this great city of London, would work a salutary and lasting reform. It is not "how to build," but how not to build, consequently structures are very often, in fact are daily, being erected, whose best recommendation is that they are certain to kill off some portion of every family which may have the misfortune to live in them.

In the first stage of their existence, they effect this by dampness, want of ventilation, and the absence of any proper system of drainage.

In the second stage of existence of these houses, they kill off their inmates by the presence of too much ventilation. Doors, windows, and roofs exhibit the effects of employing green or unseasoned timber; aching pains begin to trouble the joints and shoulders; and, like the human body, the framing body of joinery creaks with a chronic asthma. In the house where there was insufficient ventilation first, there is any quantity of wind and weather now, for tenon and mortise part company, and paper, lath, and plaster follow suit, with a groan for the internal genii.

The third stage in the life of those model structures is this,—that they suddenly drop to the earth with an epileptic spasm, without the

least external warning; and in annihilating themselves they bury several families in the one general crash.

Need we add the sequel? Scarcely. We will simply note an "inquest,"—verdict, "accidental death."

Not a word of censure on the "jerry builder" or sham contractor, who made a nice thing out of speculating in the blood of his fellow-beings. Not a word of reproach on the man that "did not want any of your confounded architects." Not one word on the jack-of-all-trades who was surveyor, engineer, architect, and all. No, not a word. He, like other "lucky dogs," caught up the "tip" of the day, and his trade is to build to sell, and not to build to last.

Oh, would that the old Roman law were still in force, or that a vigilance committee were embodied so that the building ghouls of London could be "whipped, shamed, and banished" from the country!

AMERICA.

A Roman Catholic Church, dedicated to St. Paul, has been built in Worcester, Massachusetts. The length is 171 ft.; the width, 91 ft.; the height of basement, 16 ft.; height of walls above audience-room floor, 24 ft.; height of clearstorey walls, 12 ft.; height of tower from pavement to top of cross, 212 ft. The material for exterior walls and tower, including spire and cross, is to be granite; colour for the body of the work, white; for the trimmings, dark. The porch in the front is to be supported on red granite columns, polished. The trimmings are fine hammered, and the body of the work laid in square ashlar-work.

The church is being built for a new society under the direction of the Rev. John G. Power. The architects are Messrs. E. Boyden & Son, of Worcester, who also superintend the work. At present there are no persons following the business of what is called in England "the clerk of the works;" but the architect superintends the erection of their own designs, except in some few very large and extensive buildings requiring constant oversight.

ARCHITECTURAL SOCIETY OF NORTHAMPTON.

At the annual meeting of this society, held on the 13th inst., Lord Alwyne Compton presiding, the Rev. N. F. Lightfoot read the report, which referred to various restorations under the auspices of the society. In reference to Earl's Barton Church, it was stated that there was an opinion that the tower was not secure, and subscriptions were invited for obtaining the necessary fund. References were also made to restorations at Peterborough Cathedral, Loxwick (which was re-opened on Tuesday, by the lord bishop of the diocese), Deene, Cransley, Sirixton, Rozett, and Abthorpe.

The Rev. G. Ayliffe Poole then read a lively paper "On Ways and Means." Mr. Poole referred to the enormous amount of church work done immediately after the coming of the Normans into this country; and having given some amusing and serious instances of the steady perseverance of the early church-builders and their modes of obtaining ways and means, he gave a vivid description of the characteristics of modern begging, and of bazaars, which he said were, of all methods of raising ways and means, the most extravagant. He gave some humorous evidence of this in the nature of a debtor and creditor account, of the cost of raising 500*l.*, which he made to appear to be 1,232*l.* Some conversation followed on various points in the paper, in the course of which Mr. Smyth said that one of the difficulties of raising funds in modern times was that it was necessary that the work should be done at a heat.

Sir Henry Dryden said that he thought it was clear that a great deal of the work in Medieval times was done by amateurs. Wages, too, were lower, as was the case in France at this day, where a wonderful amount of church work was doing, and how the funds were raised he never could ascertain.

Lord Alwyne Compton said, that one reason why church building was so popular in the twelfth century, was that there had been a general belief that the world would come to an end in the tenth century; and when that was found to have been a fallacy, the Normans set to work to repair the neglect that had so long prevailed.

The Rev. F. H. Sutton then read a paper "On Painted Ceilings," and the Rev. W. D. Sweeting one "On the Application of Medieval Wills to Archaeology."

At the excursion previously the society retraced much of their old ground, visiting Earl's Barton and Brixworth.

COMPOSITE METALLIC BEAMS.

In a letter addressed to the editor of *Scientific Opinion*, Mr. Thomas Stevenson, C.E., of Edinburgh, says:—The combination of wrought and cast iron has been long in use for trussed girders; but for bolted or riveted beams the problem which seems hitherto to have engaged the attention of engineers, and which has been successfully solved, is the proper distribution of the material. What I have now to propose is the employment of composite metallic beams, composed of metals possessing different qualities, the pieces of which those girders or tubes are composed being bolted or riveted together in the usual way. Such pieces should consist of metals or combinations of metals which possess powers of resistance to compression and to extension, varying as nearly proportionally as possible to the varying crushing and tensile stresses in the beam or structure. In the event of its being cheaper to limit the application of this principle the stronger and more expensive material might be used for the upper portions only where the compressing force has to be resisted.

For example, in the case of a flanged girder of malleable iron there would be bolted or riveted to the upper flange plates of cast iron or steel, or some other material possessing greater powers of resisting a crushing force than malleable iron. There might also be bolted or riveted to the lower flanges plates of steel, or some material possessing greater power of resisting extension than malleable iron. In the case of lattice bridges and similar structures, the metals possessing greater resistance would, of course, be in like manner employed for the upper and lower beams.

In some cases, as, for example, when the load which has to be supported is fixed and constant in amount, as in buildings where a girder is employed to support a mass of superincumbent masonry, it would economise the cost if the same principle as has just been described for the depth were also applied to the length of the girder. Here, then, the top plates of steel would be placed only in the middle, while the rest of the top plates might be of cast iron. In like manner, with the bottom flange, the steel plates would be reserved for the middle, while those near the abutments might be of wrought iron.

By adopting this principle of applying metals of different strength to different parts of the section, bridges of larger span than have hitherto been attempted might, I think, be made without materially increasing the cost of construction.

I may mention that in some experiments lately made with two bars, one of which was composite and the other homogeneous, there was, with a load of 5½ tons, a decided superiority in the rigidity of the composite beam, which consisted of cast iron, malleable iron, and steel. I am making further experiments on the subject, with the view of getting formulae for composite beams; but, in the mean time, the above account may prove interesting to your readers.

MONUMENTAL.

Dean Davies's Memorial, Hereford Cathedral.—The memorial of the late Dean of Hereford has arrived at the cathedral. It consists of an altar tomb, in white marble, having a recumbent figure of the late Dean on the upper portion. The statue is represented in full canonicals, and is in a recumbent position, with the hands gently pressed together, as if in deep and silent meditation. The face, in which the character of the original has been successfully preserved, is treated in keeping with the hands, and, indeed, with the whole figure, so as to embody as completely as possible the idea of deep and inward prayer, just as it may be imagined would be assumed before the spirit leaves its earthly tenement for ever. On the borders of the pillow upon which the head rests the following texts from the sacred volume are inscribed:—"The morning cometh and also the night." "Thy will he done." "In Thee is my trust." The whole rests on a tomb, which is the work of Messrs. Farmer & Brindley, of London, and is wrought

on the sides and ends in Staffordshire alabaster, either angle being supported by shafts of verd antique, with foliated capitals and bases. The entire work will cost between 800l. and 1,000l. The tomb is placed in the north-east transept. The work has been designed by Mr. Scott. Mr. Noble was the sculptor of the effigy. Mr. Noble contends strongly for the tomb being placed north and south in the position it is to occupy, on account of the much better effect produced in the toning of light and shade on the countenance of the effigy. But the authorities are unwilling to depart from the conventional rule of "due east and west."

Adam Smith's Statue.—A committee was recently formed to purchase M. Gasser's statue of the great political economist, to present to Oxford University as a memorial of one of the most illustrious persons who have received their education at the University. 700l. are required to purchase the statue, which is now for public view in the University Randolph Gallery. The committee consists of Lord Taunton, Lord Justice-General Inglis, Mr. Gladstone, the Dean of Christ Church, the Master of Balliol College, and Professor Rogers. Upwards of 400l. have already been subscribed.

THE LEIGH HUNT MEMORIAL.

Some year or so ago, at a meeting of the little social and antiquarian club, the Noviomagians, Mr. S. C. Hall urged the desirability of putting up a fitting memorial of Leigh Hunt at the place of his burial, Kensal Green. The guineas of those present were at once promised. A small committee was afterwards formed, which had the advantage of the active co-operation of Mr. Townshend Mayer as treasurer, and Mr. E. Ollier as honorary secretary, and a few circulars soon obtained the modest sum that had been determined on as the extent of the outlay. Mr. Joseph Durham, A.R.A., undertook the preparation of the memorial, a marble bust on a pedestal, inscribed, "James Henry Leigh Hunt. Born October 18, 1784. Died August 28, 1859. Write me as one that loves his fellow-men;" and on Tuesday last Lord Houghton, in the name of the subscribers, presented the monument to the public. Lord Houghton's address was eloquent and felicitous, and was delivered with much feeling and the best possible taste. Mr. Durham has produced a good likeness and something more. The thanks of every lover of letters is due to Mr. Hall for the successful accomplishment of this good work.

THE THEATRES.

St. James's.—An objection has been raised by one of our correspondents to the advertised description of the new drop-scene here, King Charles II. leaving St. James's Palace to go to the play, on the ground that the king never lived there. If the writer had seen the playbill, he would have found that the king is supposed to have been dining at the palace with the Duke of York, and going thence to the new theatre in Dorset Gardens. The drop is an interesting work. Mr. O'Connor has given a capital view of the gateway and adjacent buildings, with a view eastward of the Pall Mall of that time, 1678; while Mr. White (with Mr. Planohé for his good authority) has depicted the king in his coach, officials and attendants, Rochester, Popsy, and a group of the ladies of the time. For the comedy with which the house opened, "The Stoops to Conquer," some capital scenery of its kind has been prepared. The scene for the last two acts, Mr. Hardcastle's Drawing-room, by O'Connor, is too elegant and fresh, not mistakable for an inn; but it is such a charming room *per se*, so elaborately built up and fitted up, that we are content to admire without questioning. Mr. Lloyds also provides some capital work. The acting is even and good, Miss Herbert, Miss Henrade, and Mr. Shore being always safe; but the play affords no opportunity for a display of their special powers. The bright spot in the picture is the *Tony Lumpkin* of Mr. Lionel Brongh, whose remarkable display of boisterous vigour in two or three of the situations renews the audience to enthusiasm. We are disposed to think the management, in seeking to revive some of our standard comedies, have not made the best possible choice, if a long run he looked for; however, we shall see: the intentions are evidently good. We doubt, too, the wisdom of abolishing the pit. The house

has been gaily decorated. The prevailing colours are light blue and rose pink, not particularly harmonious, although "a French association."

The Gaiety Restaurant.—A lofty and costly building of stone, Gothic in style, has been erected, adjoining the Gaiety Theatre, Strand, and at the corner of Catherine-street, to be used as a restaurant, in accordance with the programme the proprietors of the Gaiety Theatre put forth at the opening of the house. All the upper apartments communicate by short lobbies with the tiers of boxes. The idea entertained by the proprietors is that a great convenience will be afforded to the public if they have the opportunity of partaking of dinner, either singly or in parties, previously to witnessing the entertainment provided for them in the theatre, or of supper afterwards. The principal dining-room of the restaurant, which faces both Catherine-street and the Strand, is a handsome room, measuring 60 ft. by 35 ft., richly decorated and furnished. Smoking-rooms, cabinets, a large circular luncheon-bar, wine-counters, and other extensive arrangements for the refreshment of the public, form part of the restaurant, which communicates with the theatre on the balcony floor. Mr. Phipps was the architect. We are free to confess that we have no great admiration for the arrangement which seems intended to approximate the theatre to the music-hall. We see no necessary connexion between eating and drinking and the stage, and trust that other theatres will not be led by the example to connect themselves with a tavern.

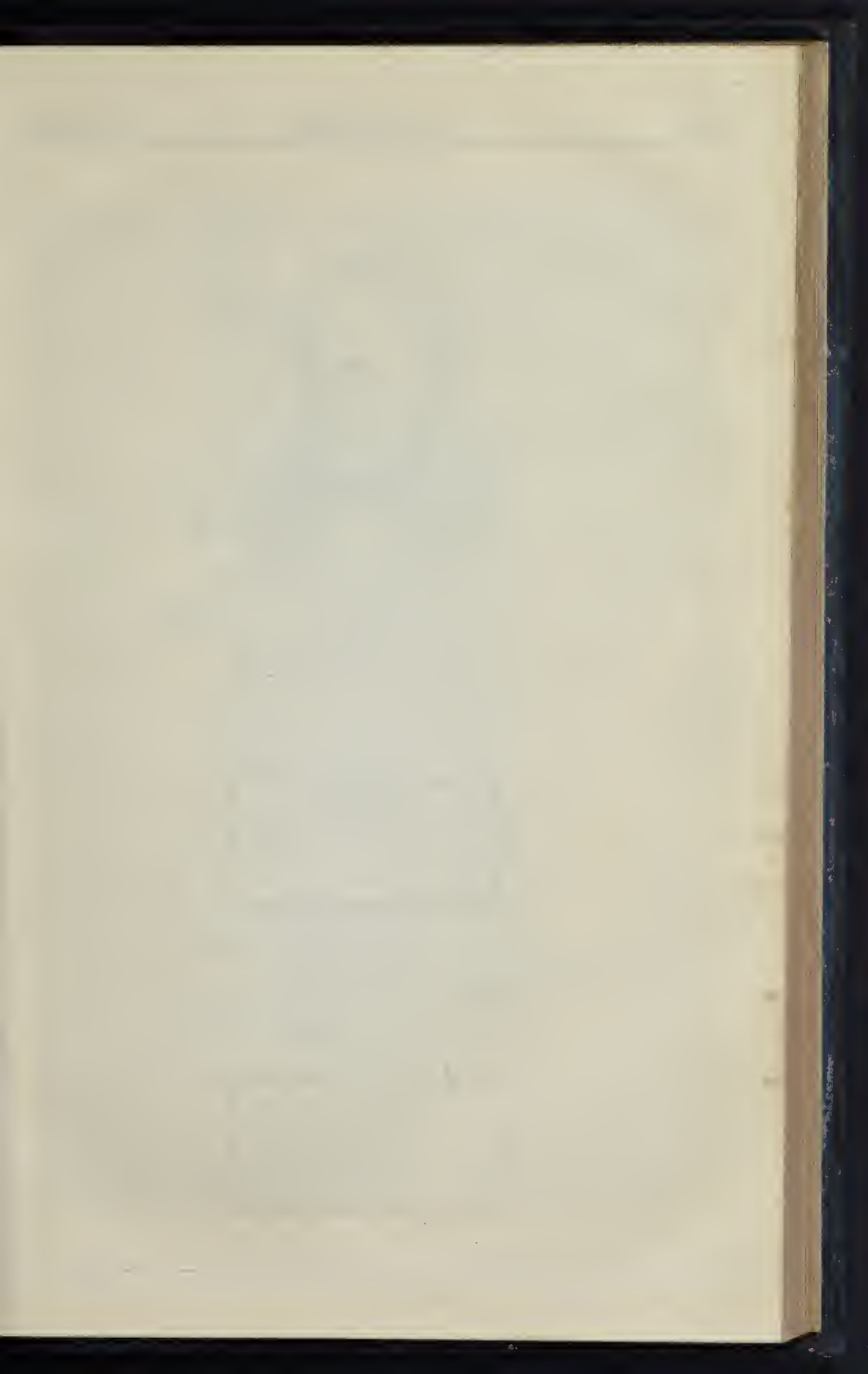
THE SEWAGE QUESTION.

Nuneaton.—The following letter, from Mr. R. Rawlinson, Government Engineer, has been received by the Clerk to the Local Board, in reply to a communication recently addressed to him:—

"Sir,—In reply to your note of the 25th ult., I beg to say that I cannot attend your Board to advise as an engineer privately. With respect to the sewage difficulty, if the Local Board can obtain land on which to use the sewage in irrigation, this will be both best and cheapest. Some 80 or 100 acres will be sufficient. Let the sewage be properly applied, as at Bedford, Banbury, Rugby, Craydon, &c., and the ratepayers will be at the least cost, if at any. Disinfectants, or chemical treatment in any form known to me, do not remove the causes of mischief from sewage, and cannot be remunerative. John Lawson, esq., C.E., of No. 3, Westminster Chambers, or Baldwin Lubham, esq., C.E., of No. 4, Westminster Chambers, will, on application, safely advise you what to do. But there are also other engineers, whose names do not so readily occur, equally able to advise.—Yours truly,
ROBERT RAWLINSON."

Banbury.—The Board of Health at Banbury collects the sewage of 11,000 people in tanks (covered), whence it is pumped by means of a steam-engine about a mile to a farm of 137 acres, which it irrigates. The rent is £l. 10s. an acre. Thirty-five acres have been under Italian rye grass for the last three years, and the whole of the farm, with the exception of twelve acres, has been irrigated. Immense crops of rye grass, and natural or mowing grass, have been obtained during the last two seasons. The sales of the produce by public auction realised in 1868 1,900l. During the present season, up to this time, the amount obtained has been 1,160l., and there are further sales to come off. Fourteen acres of mangolds were grown this summer, says the *Field*, and two acres of the same field were devoted to cabbages, carrots, parsnips, and onions. The wireworm thinned the mangold plants in the spring, but the crop in those parts where there was abundance of roots was splendid. The land was flooded with sewage last winter, and the crops had limited applications of it during their growth. The effluent water from the farm has no smell, and scarcely any taste, as it enters the Cherwell.

Mechanics' Institute, Huddersfield.—At this Institution, which has become one of the largest educational establishments in the country for working men, having about 1,200 members, there is a large elementary class studying architectural drawing. It consists mainly of young men, masons, carpenters, wood carvers, &c.; and the committee, rightly considering it of great importance, do all they can to further the views of the students. The fresh drawing classes here have been well attended for some time past; when our informant last looked in there were seventy-nine pupils hard at work. We cannot too strongly advise the members to avail themselves of these classes.



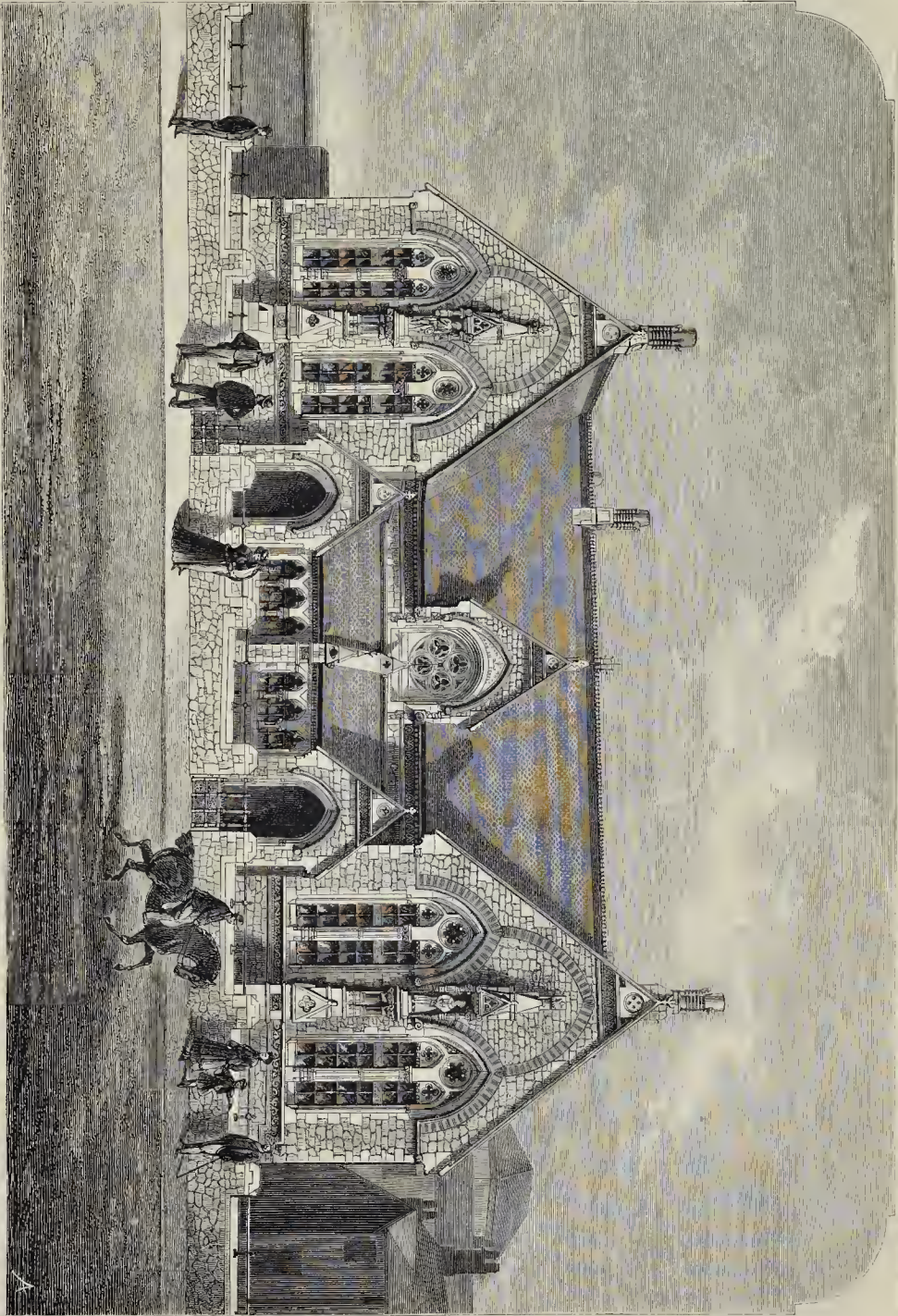


MR. ROBERT KERR,

Professor of the Arts of Construction in King's College, London.

ST. MARY'S PARISH SCHOOLS, LEICESTER.
Plan.





ST. MARY'S PARISH SCHOOLS, LEICESTER.—MR. JOSEPH GORDON, ARCHITECT.

ST. MARY'S PARISH SCHOOLS,
LEICESTER.

The buildings of which the accompanying engraving is a representation have lately been erected on the site of the old schools, which were in such a dilapidated condition as to necessitate urgent measures being taken for raising sufficient subscriptions for the erection of new schools on a more extended scale. The preparation of plans and designs was placed in the hands of Mr. Joseph Goddard, of Leicester, architect, and the handsome buildings have been erected by Mr. John Firm, the successful competitor for the contract.

The material of the walls is Enderby granite, with Bath stone and red brick dressings, lined with brick. The roofs are open-timbered, of good design, stained and varnished, and covered in with Newcastle tiles, of two patterns.

The window-openings are filled with iron lights and casements. The cost of the whole of the buildings, fence-walls, &c., but exclusive of land, amounted to 1,950*l*.

The two very good terra-cotta figures (boy and girl) in the niches were in common brick and stucco recesses on the old building, covered above a quarter of an inch thick with whitewash. They have been carefully cleaned and reinstated, as shown in the engraving.

KIRKE WHITE'S MONUMENT, AND ALL
SAINTS' CHURCH, CAMBRIDGE.

Sir,—The above subject having just "turned up" through the demolishing of a new church at some distance, of *All Saints' Church, Cambridge*, and the inscription being probably much less known than fifty years ago, whilst I trust probably equally worthy now to strangers,—that at least may be worth reproducing. And a few words on the Church, of which, however advisably, its place will know it no more, may interest some formerly acquainted.

The Tablet (by Chantrey) is large and hold, of the best "statuary" with "medallion" of the unfortunate young poet. This inscription is by the amiable Professor Smyth. Besides any vivid touches of character, it seems to have not been noticed that the abrupt introduction of name strongly resembled (very likely unintentionally) what Johnson pronounced very felicitous in one of *Pope's* epitaphs:—

"Frangit with fond hope, and learning's sacred flame,
To Granta's bowers the youthful student came.
Unconquer'd powers th' immortal Mind display'd;
But, worn with anxious thought, the flame decay'd,
Pale o'er his lamp, and in his cell retired,
The Martyr Student faded and expired.
O! Genius, Taste, and Piety sincere!
Too early lost, must studies too severe!
Foremost to mourn was generous *Southey* seen;
He told the tale, and show'd what *WHITE* had been;
Nor told in vain. Far o'er th' Atlantic wave
A Stranger came and sought the Poet's grave:
On yon low stone he saw the humble name,
And traced the fond memorial to his fame."

Of the honourable "United States" visitant I have forgotten the name; but it, of course, can be identified. He, at least, paid a kind tribute to the "old country."

"Fortes creantur fortibus et honis."

A proposal to remove the monument now to the opposite (new) chapel of *St. John's* (the poet's college), seems certainly the best possible.

The Church, anciently sometimes styled "All-hallows," with "Fulbourne" added (which is now obsolete), was, though small, if not mediocre, not wholly uninteresting. Its chancel had been rebuilt, or else eased, with brick, and barbarised, as also the window of the body. On each side of the latter were three obtuse arches, with good clustered columns; the rising panelled ceiling was also effective. The old organ, given from the chapel of *Jesus College*, situated (as three more) in the parish, was considered grand in tone for the size. Shortly before the close, on the death of the popular ministry—at least to undergraduates—of *Dr. E. D. Clarke*, the interior was handsomely repaired, with new organ-loft, oak pulpit, &c., and a small copy by *Dr. Downman*, *Harding*, of *Carlo Dolce's* "Last Supper" (at Berlin, as *Dr. C.* informed me), provisionally to which the pews, according to

* Of this amiable, and accomplished, and active man, distinguished traveller and mineralogist, a "sketch" appeared, with the writer's name, in the *Literary Gazette*, (1822), which at least obtained a flattering, spontaneous (unmerited) approval from a lady, justly considered of elegant taste, the then Duchess of Bedford.

some inexplicable fashion popular above 100 years ago in some churches, and even colleges,—as *Islington*, *Little St. Mary's*, *Cambridge*, and *All Souls' Chapel, Oxford* (1817),—had been painted of a dark green colour. At the west end was a tower far from imposing, containing three poor bells. When an opening was cut through this, which narrowed the pavement (1820), it was discovered that, as in reported foresight of *Sir C. Wren* at *St. Magnus, L.B.* (which was not open at first), an arch had been "built" south and north within the walls. *J. D. FARR.*

TYRANNY.

Sir,—There is an old saying often used in the West of England, when a person is describing something strange and unaccountable, "If I hadn't a seed it, I wouldn't a believed it." It is with much the feeling of such a speaker that I send you the following:—

A master plasterer of Liverpool has, among other contracts, a job a few miles from Chester, which is now nearly completed, and there remain two or three plasterers and one labourer to finish it. More labourers have been working there, but they have been drawn off to other jobs. The man is a native of the place where the work lies, and was engaged on it, and is paid the same rate of wages as the others who were sent away. There is a Labourers' Trade Society in Liverpool, and this society went out of its way to near Chester, to call upon this labourer to join their society. This the labourer refused to do. They then applied to his employer to discharge him, and gave a short notice that unless he was dismissed the whole of the labourers employed on the various jobs would be withdrawn. The threat was carried out on Monday, the 11th inst., and the men left their work. Finding this had no effect on the employer's resolution, the Labourers' Society have legged with the Plasterers' Society, and they too have given the contractor notice that unless the matter is settled amicably (which, of course, means according to their demands), the whole of his plasterers will be withdrawn, the burden of their support to fall on the Labourers' Society. This is how matters stood on the 18th inst. The sage advice recently given here to trade-unionists appears to be quite lost upon these people, and it seems that, as far as they were concerned, *Lord Stanley* might as well have stopped at home. *E. G.*

RE-OPENING OF COGENHOE CHURCH,
NORTHANTS.

The parish church of Cogenhoe has been reopened for Divine service, after undergoing a complete restoration.

The church, which is familiar to all lovers of architecture in the district, is an interesting specimen of Early English work, and dates back to the first part of the thirteenth century. The following notice of it occurs in the "History and Antiquities of Northamptonshire," by *John Bridges* and the *Rev. Peter Whalley*:—"The church, dedicated to *St. Peter*, consists of a body, north and south aisle, chancel, and south porch, leaved. At the west end is an embattled tower, in which are three bells. The church and chancel are 65 ft. 10 in. in length; the body and aisles are 45 ft. in breadth. The length of the tower is 12 ft., and the breadth of it 10 ft. 6 in. In the north-east corner of the porch is a receptacle for holy water. The register begins in 1558. . . . Under the upper window of the south aisle lies the figure of a Knight Templar upon a tomb, completely armed, with a dog at his feet, and having on his left arm a shield, whereon are these arms:—a fess between three martlets. This is said to be the tomb of *Sir Nicholas de Cogenho*, lord of this manor in the time of *Edward I.*, and reported to have been the founder of the church. The like arms are cut upon the pillars which support the nave. Against the upper pillar of the chancel, on the western side, is a sinister bond. In this church was a chantry founded by *William de Cogenho*, for one priest to sing for ever at *Our Lady's* altar; and endowed with lands and tencements, which, in 1555, 26 *Henry VIII.*, were rated at 67*l*. 4*d*.; but in the second of *Edward VI.* amounted only to the yearly value of 50*l*. 9*d*. oh. This chantry seems to have been situated on the north side of the chancel, as there are marks of a large arch, now filled up, through which was probably the entrance into the chantry-chapel."

The edifice, having, through lapse of years, fallen into decay, and being likewise found very ill-adapted for Divine service, a parish meeting was convened by the rector and churchwardens in the early part of last year, when it was resolved that an endeavour should be made to effect its thorough restoration. Liberal donations were promised, and the patron of the living, *Mr. George Burnham*, of *Wollaston*, undertook to restore the chancel at his own cost, and the rector to rebuild the ancient "Chantry Chapel" referred to in *Bridges' History*. The parishioners, moreover, came forward with offerings, and under those auspices the work was commenced in the autumn of last year, by *Mr. John Watkin*, of *Northampton*, under the supervision of *Mr. C. Buckridge*, of *London* and *Oxford*, architect.

The aisles and chancel have been re-roofed with pitch pine. Open seats of oak have taken the place of the old square pews and other seats, many of which were in a most dilapidated condition. The west window and the helmy arch, which were blocked up, have been re-opened. The tracery has been re-inserted in the windows, the arches have been relieved of their many coatings of plaster, and the stonework throughout has been pointed and renewed. A two-light Early English window on the north side of the chancel, which had been for years blocked up, has been opened out and filled with stained glass in memory of the late rector (the *Rev. Edward Watkin*), by his widow, the subject being the two figures of *St. Peter* and *St. Paul*. The window is by *Messrs. Clayton & Bell*, of *London*.

THE PRESERVATION OF STONE.

Sir,—In reference to the letter of your correspondent, asking for a method of preserving stone in the interior of a building, I would ask him to try a solution of oxalic acid, so as to obtain a surface of the oxalate of lime in place of one of friable carbonate. I have not had many opportunities of trying experiments upon the subject, but as far as I have gone with pieces of Bath stone, the result is most satisfactory, the surface of the stone showing under the microscope a brilliant coat of crystallized oxalate which is nearly insoluble, as I have soaked it in water for twelve or fourteen hours, and then find it is not acted upon by moderately strong hydrochloric acid. The process seems so cheap and simple that I should like to see it tried on the interior of some new building, as it would altogether prevent the destruction of the stone by the sulphurous and other acids formed during the combustion of ordinary coal gas. I think it would also at all times allow the carved work to be cleaned either with a common dusting-brush or even to be washed with water.

I should much like to see the process tried, but as I have not the pleasure of knowing any good stone carver or architect, I have not had an opportunity of seeing it carried out.

ROBERT PALMER.

ACCIDENTS.

The fatal accident from the fall of a scaffolding in *Temple-street*, *Birmingham*, to which we have already alluded, was a cornice accident. The *Odd Fellows' Hall*, has been undergoing repairs, both interiorly and exteriorly. The work has been carried on by *Mr. Matthews*, builder, who contracted for the work, and he was assisted by *Mr. Holmes*, plasterer, who acted as a sub-contractor to *Mr. Matthews*. Both *Mr. Matthews* and *Mr. Holmes* had men employed under them, and a large scaffold was erected outside the building for them to work upon. That part of the work performed by *Mr. Matthews* was the raising of the building a story higher, or from three stories (its original height) to four stories; the scaffolding, therefore, extended along the entire length of the premises (about 40 ft.), and was also carried round the opening on the lower side of the hall to some extent. It was constructed in the usual way, and consisted of long poles and deal planks, fastened together by ropes, and connected with the building by pulleys, driven through the wall. The bricklayers' work was finished, and plasterers were engaged upon the scaffold, when the cornice at the top of the building gave way, and fell on to the scaffold. The consequence of the sudden heavy fall of bricks, stones, and mortar upon the boards was that the pulleys gave way, and the planks and boards, deprived of their support, came crashing down to the ground. At the time of the acci-

dent there were five men engaged upon the scaffold or beneath it, and these and other persons who were passing were more or less seriously injured, and some of those hurt afterwards died. The scaffolding appeared to having given way first on the upper side of the hall, as it was seen that it was still fast at the lower end.

THE DICTIONARY OF ARCHITECTURE.

We are glad to be informed by Mr. Sydney Smirke that considerable success has attended the endeavour to obtain a sufficient number of new subscribers to ensure the completion of the "Dictionary of Architecture" without any further call on the present members of the society. This success has, however, been the result chiefly of the exertions of a few energetic friends; and further vigorous exertions are absolutely necessary in order to justify the committee in proceeding with the scheme. Still more new subscribers are wanted, and we hope that some of our readers will use their best endeavours to bring in friends. The new list of subscribers comprises persons of all classes of society, from noblemen of the very highest rank, and great public bodies, down to the huddlers in country towns and clerks of the works. If the apathy and indifference of the subscribers and of the profession allow the Dictionary to remain incomplete, and permit a proposal so eminently favourable to fall to the ground, it will be a great disappointment, and a discredit to the profession. This contingency must not, however, be allowed to occur. Each school of art throughout the country should be provided with a copy of the Dictionary.

The committee have just now issued two parts of the work, one consisting of twelve plates to illustrate L and M, the other comprising 112 pages of text, "Lead" to "Lytus." This includes a vast amount of information under the heads it contains, greatly increased in value by innumerable references to works that treat of them more at length.

OUR GOOD THINGS DONE BEFORE US.

Sir,—I have just finished reading the *Builder* for September 18th (for I was abroad at that time, and so missed seeing it). A patent seems to have been taken out by a Mr. Steel for the improvement of water-closets. He proposes to place them one over another, setting each of the upper closets back a little, so that a clear space down to the ground will be left from each. It is somewhat amusing to find a patent being taken out for this in the nineteenth century, when precisely the same arrangement was adopted by the builders of the old castle of Raglan, in Monmouthshire, hundreds of years ago.*

I wonder, sir, if they took out a patent for it, and whether the patent has yet expired; or whether, if they were alive now, they would say that Mr. Steel had stolen their ideas!

F. B.

FROM MELBOURNE, VICTORIA.

The Exhibition has been closed with a grand concert, attended by 1,000 persons. The Governor was present, and was thanked by Sir Edmund Barry, on the part of the trustees, for his patronage of the undertaking. The results of the exhibition are interesting. The exhibits of oil-paintings, said Sir Edmund, amounted to 756, a fact which demonstrated most undeniably and most cheerfully the love of art largely existing in so young a country. All these were contributed at a very short notice and in response to the trustees' solicitation, within a radius of five miles from Melbourne. He was happy to inform his Excellency that the trustees, like Chancellors of the Exchequer, found themselves inconvenienced by a balance to their credit. They proposed to devote the first portion of the funds to institutions which were the pride of the city,—the one for the relief of the sick and suffering, the other for the support of the aged and infirm. The hospital and the benevolent asylum deserved their first care; and, secondly, the object announced in the programme, namely, the endowment of a scholarship for the best pupils of the year in the School of Design. That school had been struggling on for years, yet still it had not been burthen of

* In rough stone, of course, but the same principle. I saw it about four years ago.

fruit. The pictures on the walls, exhibited by several of the pupils, were entitled to considerable commendation. The pupils now numbered over fifty, and, under a proper tutor, their latent ability would be developed.

The Victorian Permanent Building Society's New Offices will stand on an allotment of land in the best part of Collins-street east. The front building will be three stories in height, with a warehouse and store in the rear, and a large cellar underneath. The society will occupy a suite of offices on the ground-floor, the other parts of the premises being let for various purposes. The façade is to be in the Italian style of architecture, and will occupy the full frontage. The lower portion of the building will be ornamented with rusticated piers, and is to have two pair of circular-headed folding-doors (enriched with elegant ironwork), the one leading direct to the company's offices, and the other opening into a broad passage leading to the upper offices and the warehouse. The windows on the first story will be circular-headed, embellished with Ionic pilasters, entablatures, and cornices, while those of the next story will be pedimented, ornamented with moulded trusses, Corinthian pilasters, enriched friezes and cornices. The building will be surmounted with an appropriate balustrade, having a centre panel bearing the name of the society. The architects are Messrs. W. H. Ellerker & Co., of Elizabeth-street. The contractor is Mr. H. Lockington; and the total cost, including land, will be about 11,000l.

The rate of wages in the colony is still maintained at former rates, skilled labour and domestic servants being in great demand. The following are among the rates of wages:—Stonemasons and brickmakers, 10s. per day; carpenters, 9s. ditto; builders' labourers, 7s. ditto; country labourers, 12s. 6d. to 16s. a week.

An Australian Diamond Mine Company has been established at Melbourne. Extensive discoveries of gold, diamonds, sapphires, and other gems have been made near Mudgee, and it is said that the miners have been in the habit of throwing away small dust diamonds, though worth about 600l. an ounce.

A large number of builders and contractors have met for the purpose of receiving rules prepared by a committee. The rules, with a few amendments, were adopted; and after the enrolment of several new members it was resolved that the association should be named the Builders' and Contractors' Association of Victoria, and that its business be conducted by a president, vice-president, secretary, treasurer, and committee of seven. The following gentlemen were nominated and elected:—Cr. Amess, president; Cr. O'Grady, vice-president; Mr. William Ireland, secretary; Mr. William Cain, treasurer; and Messrs. Cunningham, Young, Mitchell, Cooper, Leitch, Pigdon, and Martin for committee. It was resolved to forward a copy of the rules to the Board of Land and Works, and to all the engineers and architects in Melbourne, as it was felt desirable, for the success of the association, that it should have the support of these gentlemen.

A meeting of master brickmakers has been held to consider rules agreed upon by the master brickmakers of Brunswick. Mr. John Glew occupied the chair. The rules were submitted *seriatim*, and were passed with a few trifling amendments. The object of the association is to guard against unprincipled and fraudulent persons in the building trade, who have neither means nor intention of paying for bricks or other material supplied them. The association is divided into five divisions, viz., Brunswick, Hawthorn, Richmond, Collingwood, and Prahran. A large number of members were enrolled, and arrangements were made for a future meeting to elect office-bearers.

THE FOOTPATH OF THE THAMES EMBANKMENT.

Sir,—In your impression of Saturday last appears a letter from "A Stranger on the Thames Embankment," in which the writer complains of the state of the footpath between Westminster Bridge and the Temple. Will you, sir, permit me,—as the contractor for the footpath, in justice to myself,—to say that the cause arises from the fact that the larger part of the paving, viz., that next the river front, is laid over the subway on solid concrete, while the bed for the outer portion is composed of ordinary rubbish filled in to a depth of 30 ft., which had not had time to become solid at the time the work was done, although the Metropolitan Board of Works pumped many thousand tons of water upon the filling-up up to the time of the paving being laid down.

Of course, a subsidence would necessarily take place under such circumstances, and hence its paring company.

JAMES KENTON.

CHURCH-BUILDING NEWS.

Ashbourn.—Mr. Francis Wright, of Osmaston Manor, near Ashbourn, has for some time past contemplated erecting a second church at Ashbourn. About two months ago an advertisement appeared inviting tenders for the construction of the new church. The new edifice is to be built on the north-east side of the town, immediately adjoining the cattle-market, and fronting to the Buxton-road. The contractors for the erection of the building are Messrs. Critchlow & Ward, of Uttoxeter, whose contract, we believe, amounts to 4,500l., but this sum does not include plumbing, glazing, and 42 ft. in breadth, with centre and side aisles. The chancel, a circular apse, has a radius of 15 ft., and will contain an oval communion-table. The vestry on the north side will be 12 ft. long, and 9 ft. wide. The tower, which stands at the west end, will be 22 ft. square, and 61 ft. in height from the floor line, and will be without a spire. The height of the building to the ridge is 38 ft. The chief entrance will be on the west side, immediately underneath the tower. The exterior walls will be Mayfield stone, caed inside with bricks. The interior is laid out to accommodate 500 persons, and will be heated by an improved hot-water apparatus. The contractors have already entered upon the work, the foundations have been cut, and the walls of the building are rising above the surface of the ground.

Heworth.—The new church at Heworth, near York, has been consecrated and opened by the Archbishop of York, under the designation of Holy Trinity. It is situated at the corner of the road leading to Tang Hall. It has been erected in remembrance of the Rev. J. Willey, by his widow, who has recently been deprived by death of her second husband, Sir Trevor Wheeler, bart., of Leamington, Warwickshire. The building consists of a nave and chancel, with side aisles for children, a tower at the north-east angle of the nave, and a porch at the north-west end of the nave. The vestry and porch for children are on the south side of the chancel. The nave, which is of one span, is 35 ft. wide by 73 ft. long, and 47 ft. high to the apex of the open roof, the walls being 25 ft. high. There is a centre and also two side passages, with two rows of seats, to accommodate 280 adults. The north and south aisles are seated for 134 children, and are each separated from the nave. Two arches spring from corbels and a centre shaft of red Mansfield stone. The chancel is seated for sixteen adults on the south side, and children of the choir in seats on the north, in front of the organ-chamber, in the tower. There are 300 free and 150 appropriated seats in the church. The chancel measures 33 ft. by 22 ft., is 38 ft. high, and is paved with Messrs. Maw & Co.'s encaustic tiles. There are three entrance porches: one by the tower, the second by the vestry, and the third, or principal entrance is at the north-west. The walls internally are plastered. The dressings are of stone, the corbels and capitals being all carved. Round the chancel there is a frieze of majolica tiles, and under the east window is a series of majolica and painted tiles. The centre window is filled with stained glass, the gift of Mrs. Bell, of Heworth, in memory of her late husband, the subject being a single figure of the Ascension of our Lord. The glass in the cinquefoil window over it was given by Mr. J. Keswick, the builder of the church. The three windows at the east end are deeply recessed, and the moulded arches inclosing them spring from carved capitals resting on detached shafts of red Mansfield stone. Similar shafts, &c., divide the side walls into compartments, supporting the principals of the roof, which are all slightly stained and varnished, and the panels boarded. The side walls throughout the church up to the stone string-course under the window-sills are coloured green, finishing with a coloured border of a conventional pattern. The roofs are all open-timbered, with framed bammer-beam, principals, purlins, &c., and boarded in panels under the rafters. The wheel window in the west gable, of five trefoiled openings, is filled with stained glass, of geometrically-arranged foliage, the gift of Mr. Jones, the architect; and the quatrefoils and vesicas of the eastern windows, and that over the front, are filled with glass, given by Mr. George Harrison, the clerk of the works. The church will be lighted by gas, from rows of jets along the sides, on a level with the window-sills, and the building warmed by three hot-air stoves under the floors of the passages, the flues being taken through the

vestry fire. The walls of the church outside are faced with Bradford walling stones, on brickwork, and all the dressings are of Ancaster stone. The tower is square, without buttresses, and 20 ft. at the base, diminishing into an octagon of 18 ft., with ornamented angle brackets, gabled parapet, and pinnacles at the angles, and terminated with a spire, which, with the iron vano, gives a height of 129 ft. The roofs are covered with dark Westmoreland slates, with stone girding and Staffordshire tile cresting. The ground round the two sides of the church is inclosed with a sunk fence wall of stone. The entrance-gate pillars are of stone, with some architectural character, and the gates are open-framed, with ironwork in the panels. The architecture is all of the Early Decorated period, but of simple character, from drawings and designs, and carried out under the personal superintendence, of Mr. G. Fowler Jones, of York. The organ, presented by Mr. W. Gray, was built by Mr. Hopkins, organist of the church of St. Olave, Marygate, York. The cost of the church and parsonage-house attached will, it is said, exceed 10,000*l*. The masonry and brickwork have been carried out by Mr. J. Keswick, builder; the carpentry and joinery by Mr. J. Holmes; the plastering by Mr. Rawlings; the slating by Messrs. Wood & Son; the plumbing and glazing by Mr. R. Walker; the ironwork by Messrs. Fryer & Son, Mr. Ayers, and Messrs. Dent; the painting by Mr. R. Gowland; the stone carving by Mr. C. Cole, and that of the woodwork by Mr. James Jones; Mr. W. Knowles having supplied the stained glass and the painted tiles of the reredos, and the decoration of the organ case and pipes. The whole of the tradesmen thus employed reside in York. Mr. George Harrison acted as the clerk of the works.

Flamborough.—St. Oswald's Church has been re-opened after restoration and rebuilding. It is five years since the work of restoration began: it commenced with taking down the old turret and new roofing and repairing the chancel; but as the work proceeded the other parts of the church were found to be in such a state of decay that it became necessary to extend the works to the entire rebuilding of the chancel, and to effect other improvements and alterations. These works have, however, been protracted by several unavoidable causes. The south walls of the nave have been nearly rebuilt. The nave has been new roofed; the timbers are stained and open, and slated. Six windows, three on each side, and two more in the south clearstory, have been restored. All the windows have been glazed with cathedral glass, with the exception of one in the south aisle, which is of stained glass, and was the gift of Mr. C. H. Childers of Flamborough. The walls have been replastered, and the pillars and arches, which were previously coated with whitewash, have been cleaned. The pillars are of a yellowish chalk. All the old high-backed pews have been swept away, and replaced with stalls of pitch pine and varnished. The aisles have been new flagged, and a heating apparatus introduced. One of the arches in the north aisle has been opened out and restored, and an arch on each side of the chancel arch, and dividing the aisles from the chancel, has been erected. The old arch formerly leading into the belfry has been hared. The chancel has been rebuilt, except the interior gallery and arches, at the cost of Mr. Walter Strickland. The roof is open and of stained timber, corresponding with that of the nave. Instead of the old square windows in the clearstory, new circular ones, intersected with crosses and other decorative ones, have been substituted. In the east end a large five-light perpendicular window, and a smaller one at the end of each aisle have been introduced. The old Norman arch between the nave and the chancel has been restored, the floor new flagged, and other restorations carried out. The architect was Mr. R. G. Smith, of Hull, and the contractors were Mr. J. Bennett, of Bridlington Quay, and Mr. A. Hall, of Flamborough, for the masonry; Mr. J. Harrison, of Flamborough, for the wood work; and Mr. R. Redhead for the glazing.

Peckleton (Leicestershire).—Works of restoration are now being carried out at the church here. The stucco is to be removed from the exterior of the walls, and the perished stonework of walls and windows renewed. The new roofs will be raised to the original pitch, and the chancel rebuilt. This church was originally erected in the fourteenth century. The works here being carried out by Mr. John Firm, of Leicester; the architect is Mr. Osborn.

Leicester.—A new church is to be commenced immediately, in Belgrave-gate. The edifice is to be dedicated to St. Mark, and will be built (at the sole expense of Mr. W. Perry Herrick, of Beamanor, and his sister) from the designs and under the superintendence of Mr. Ewan Christian, of London. The building is to be erected by Mr. John Firm, of Leicester.

Attenborough.—The parish church of Attenborough has been re-opened. The restoration of the edifice has recently undergone (under the direction of Mr. R. C. Sutton, architect), has involved a new seating, and a restoration of the interior walls, which previously had upon them a thick coating of yellow-wash. The restoration also includes the taking down of the gallery at the west end, the throwing open of the belfry arch, and the erection of a new door.

Baconsthorpe.—The church of Baconsthorpe has been re-opened for divine service after a restoration by Mr. Chapman, by whom the execution of the work has been carried out from the designs of Mr. Teulon.

Addiscombe, Croydon.—St. Paul's Church, built for the Rev. M. B. Ollie, by Messrs. Wright, Brothers, of Croydon, from the designs of the late Mr. E. B. Lamb, at the sole cost of Mr. R. Parnell, has been opened for divine service. The stonework of the exterior and interior is carved in natural foliage. This, with the internal fittings, consisting of pulpit, desk, and font of Caen stone and various marbles, brass altar-rail, pulpit-rail, font-rail and lectern, oak sedilia, chancel seats, &c., is the work of Messrs. Cox & Son, of London.

Armley (near Leeds).—The foundation stone of Christ Church, Upper Armley, has been laid. The site was selected and promised by the late Mr. Gott, who also gave a large subscription in aid of the building fund. The church, when finished, will have a square tower, and will form a conspicuous object. The architects are Messrs. Adams & Kelly, of Leeds. The style adopted is Early English, and the plan comprises a nave, with north and south aisles. Inside the church will have a total length of 145 ft., and a breadth of 65 ft. 6 in. At the west end of the nave will be the tower, 26 ft. square at the base, and rising to a height of 107 ft. There will be a ringing-chamber and belfry stages, and provision will also be made for a clock having four faces. The entrance will be by a porch in the westernmost bay of the south aisle, and by a doorway in the south wall of the chancel. By the vestry there will also be a separate entrance. An arch in three orders will open the tower into the nave. Sandstone from the Horsforth Quarries is being used in the building, and effect is given by introducing double hammer-dressed facing and finely-tooled dressings. The church will seat 650 adults, but increased accommodation may be obtained without enlarging the edifice. The contractors are Mr. Thomas Whiteley, mason and carpenter; Messrs. Watson & Wormald, slaters; Mr. Geo. Wilson, plumber and glazier; Messrs. Heaps & Robinson, ironfounders; Mr. William Dewhurst, plasterer; and Mr. W. Switbank, painter. The contract estimate for the work is 6,407*l*.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Newcastle-upon-Tyne.—The foundation stone of a new church, which is to be erected at the Red Barns, situated at the head of Elwick's lane, in the eastern district of Newcastle, has been laid. The site is on an open space of ground, in the midst of a large portion of the working population of the town. The edifice is dedicated to the patron saint of the order of monks located in Newcastle, who have undertaken to raise the funds for the erection of the edifice, viz. St. Dominic. The entire cost of the church itself is estimated, will be about 8,000*l*, of which upwards of 4,000*l* have already been subscribed, principally by the people of the parish of St. Andrews, in which the monastery of the Dominicans is situated. It is also intended to erect a new monastery on the site after the church is completed, which will require a further large sum of money. The church is of the Romanesque style of architecture, and has been designed by Mr. Archibald M. Dunn, of Newcastle, architect. It will be chiefly remarkable for its great simplicity and large size, the number of sittings being over 1,400. The dimensions are as follows:—Nave, 112 ft. long, 30 ft. wide; chancel, 48 ft. long, 30 ft. wide; aisles, each, 134 ft. long and 18 ft. in width. The total length of the

church, including the narthex at the west end, is 180 ft.; and the height of the nave roof, 75 ft. The plan is cruciform. The exterior of the church will be built of stone, and the interior will be lined with a cream-coloured brick (as a substitute for plaster), mixed sparingly with bands of red brick. These are manufactured by Messrs. Robson, of Wideopen. The present contract, which extends only to the foundation, is let to Mr. William Gibson.

Bloxwich.—The new church which has been erected at Bloxwich has been solemnly dedicated to St. Peter, in the presence of a large and influential congregation. The edifice is built after the French Medieval style of architecture, and consists of nave and aisles, the chancel being a continuation of the central nave, which terminates in an apse. The cost of the structure, with the adjoining presbytery, or priest's residence, is about 1,900*l*, and the greater portion of that amount has already been raised in the way of subscriptions and voluntary donations. The designs for the building were prepared by Messrs. Bucknall & Donovan, of Birmingham, architects, and the work of erection was carried out by Mr. Hemming, of Redditch, builder. There is very little ornament of any kind; and the decorations of the interior—which were done by Mr. Stensell, of Tannton—are not at all of a costly character. It is calculated that the church will accommodate about 400 persons. The walls are of brick, with Bath stone dressings, and the benches and abraded roof are of stained deal. The only part of the interior on which any degree of ornamentation may be said to have been applied is that inside the apse, the roof in that part being painted green, relieved with gilt stars and borders. The dimensions of the edifice are 75 ft. by 35 ft., and attached to the chancel is a small sacristy. The organ at the west end of the church was constructed by Mr. Nicholson, of Walsall, and some parts of the instrument that was used at the old chapel have been worked up into it.

STAINED GLASS.

Holy Trinity Church, Bordesley.—The old stained glass in the east window has been replaced by new glass. It is a large rose, with sixteen principal openings, surrounded by a circle of quatrefoils, and themselves surrounding a geometrical centre. The principal openings are filled with figures of the twelve apostles, and four evangelists, the antipodean effect avoided by locating the evangelists two on each side, in a recumbent position, and ranging the apostles, six above and six below, in a position as nearly perpendicular as circumstances will allow. The centre and outer ring of quatrefoils are filled with floriated ornaments on a ruby ground, the figures themselves being on a blue ground. The designer and executor of the window was Mr. Swaine Bourne, a young artist.

St. Saviour's, Nottingham.—A stained window has recently been placed in this church. The window is on the south side, at that end of the aisle nearest the chancel, and has been erected in memory of Mr. Gilbert Gaunt, of West Bridgford, and his wife, by their two daughters. One of the two principal compartments of which the window consists is filled with a representation of the Resurrection; and the other depicts Christ bearing His Cross. Messrs. Cox, of London, were the artists. The top compartment represents the "Agus Dei," or the Lamb. The window is the first of a series. The church certainly requires a few more of these windows. We may here mention that a new reredos has been placed in the chancel.

Horncliffe Church.—A window in memory of the late vicar, Rev. W. H. Milner, Prebendary of Lincoln Cathedral, has been unveiled. The work has been done by Messrs. Heaton, Butler, & Bayne, of London. There are five lights, and tracery above, in which are placed the following subjects, commencing at the top on the left hand:—1. "The Annunciation;" 2. "The Birth;" 3. "The Adoration of the Magi;" 4. "The Flight into Egypt;" 5. "The Crucifixion;" 6. "The Entombment;" 7. "The Holy Women at the Tomb;" 8. "The Charge to St. Peter;" 9. "The Ascension;" 10. "The Descent of the Holy Ghost." In the tracery pieces are various emblems of the Passion, *i.e.*, a cock, hammer and pincers, ladder, scourge, reed and hyssop, crown of thorns, spear, scarlet robe, coat for which lots were cast, &c., and above are angels with censers, and an "Agus Dei." The

surrounding stonework is of the fourteenth century, and, therefore, the glass is treated so as to match, the subjects being in panels, under short decorated canopies, and the details being copied from old glass of the fourteenth century.

St. Michael's, Handsworth.—A memorial window has been put up at the west end of this edifice, in memory of the late vicar, the Rev. Walter Thursty. The commission for the memorial has been executed by Mr. Bourne, of King Edward's-road, in this town. The window is in the Second Pointed style, and contains four main lights, in each of which is represented an archangel, with the conventional emblems which it has been customary to associate with him from the earliest times, namely,—Michael; in armour, resting his left hand upon a shield, and trampling upon Satan, whose head he pierces with a spear; Gabriel, with shield and sceptre, a lily growing beside him; Raphael, hearing a fish in his right hand and a pilgrim's staff in the left; and Uriel, clasping a sword across his breast. These severally rest upon a floriated base, and are surrounded by an elaborate canopy, the background being blue and the ornamental enrichments ruby. In the geometrical tracery above are other figures with musical instruments, to typify the heavenly host.

Butler's Marston.—Two painted windows have recently been placed in this church, to the memory of the late Rev. George Fuller Thomas, for twenty-two years vicar of the parish. The subjects selected are "The Good Shepherd," and "The Good Samaritan." The work was designed and executed by Messrs. Clayton & Bell, of London. The one light window in the church is an offering from the widow and relatives of the late vicar. The subject is "Our Saviour breaking bread with the two disciples at Emmaus." The church was restored by the Rev. George Fuller Thomas shortly before his death.

FROM SCOTLAND.

Edinburgh.—A site for the public fountain presented to the city by Mr. Ross, of Rockville, has at last been secured in West Princes'-street Gardens, and the city will in a short time be embellished by the erection of what the Scotsman styles "one of the most elaborate and ornate structures of its class in Europe." The fountain, which was designed by Durenne, of Paris, has just arrived from France in 122 pieces. It cost Mr. Ross upwards of 2,000*l.* It will be erected on the middle walk in the lower part of the gardens, between Castle-street and Frederick-street. Being visible from Princes'-street, it will form a great ornament to that thoroughfare, while it will, at the same time, afford an interesting feature in the landscape as viewed from the Mound. It is proposed that on the days when the fountain plays, the public shall have free admission to the gardens. It devolves on the public to defray the expense of its erection on the chosen site. Already 100*l.* have been received; but between 400*l.* and 500*l.* more will be required.—A discovery of some interest has been made in connexion with the street improvements at present being carried on in the Grass-market. For years past, a St. Andrew cross within a circle has been pointed out as indicating what was supposed to have been the ancient place of common execution. The street is in course of being relaid, and while doing so the workmen uncovered near the spot what turned out to be the socket of the old gallows. It was at a considerable depth below the present street level. It had a lining of wood, and was about 18 in. in depth by 9 in. square. The contractor, Mr. McIntosh, replaced the cross immediately over the site as now accurately ascertained.

—The directors of the North British Railway have resolved to proceed immediately with the new station at Waverley Bridge. The first step taken will be the erection of a New Waverley bridge. The present structure will be removed, and a bridge, after a design similar to that at Westminster Bridge, London, will be erected in its stead. It will be higher than the present bridge, and more on a level with Princes'-street. It is also intended to remove the goods traffic to the old market.—The directors of the Bank of Scotland having got their new offices in Bank-street nearly completed, are making arrangements, according to the Scotsman, for turning to account the large space of ground lying at the south-west corner of the bank. A portion of this ground was until a few years ago occupied by a tall land of houses, and it was when these houses were removed as

being unsafe that the directors of the bank acquired possession of the site, which adjoined a space formerly owned by them. Various proposals have been made from time to time as to the purpose to which the ground should be devoted, and it was one of the sites named as being peculiarly suitable for a town-hall. Now the proprietors have determined to construct a new street upon it, and to carry out other works which will improve the surroundings of their edifice. Mr. David Bryce, R.S.A., the architect of the bank, has prepared plans for the contemplated works, and already some preliminary operations are in progress. The plans embrace an extension of Bank-street eastward for a distance of fifty yards, the formation of a new street, southwards from that extension to the High-street, and the erection of a broad stair giving access to Market-street. Owing to the situation of the ground on the slope of the High-street ridge, it is necessary, in extending Bank-street, to put in a strong retaining wall, founded on the rock 70 ft. below the street level. The construction of this wall is now being proceeded with. The wall will run in a line with the front of the bank, and will be surmounted by a railing. The street between the wall and the houses on the other side will be 50 ft. in width. The elevations prepared by Mr. Bryce show that the houses will be in the Baronial style, and that some of them will have four stories, and others five stories and attics. In all cases, the street floor will be let for shops or offices, with saloons behind. The east side of the new street will have a frontage of 212 ft., and the west side a frontage of about 160 ft. Including the new space in Bank-street, there will be a total frontage of about 500 ft. At its junction with the High-street, the new street will be 38 ft. wide, but about midway down it will expand to 45 ft. The gradient will be 1 in 40. From near the north-east corner block a wide stone stair will lead down to Market-street, and afford a convenient access to the railway station. The fens are being rapidly taken up.

PATENTS CONNECTED WITH BUILDING.

BRICKS AND TILES. *J. & W. Adams.* Dated 29th October, 1868.—This consists in treating or preparing clay, loam, or brickearth, by adding thereto and mixing therewith street-slop, or drift, ash, and sand, or waste from stone sawing, commonly known as stone sand, or stone crushed for the manufacture of bricks and tiles, whereby we are enabled to dispense with ashes, also at the same time improve the texture, colour, and quality of the said articles, and produce superior bricks and tiles from inferior clay. The number and quantities of the mixing materials above mentioned must be varied according to the colour required and the quality of the materials. The drift and sand or waste and other similar matter, the drift and chalk, or the whole of the materials being mixed together and added to the clay or loam, as the case may require.

ROOFING.—*W. D. Young.* Dated 27th October, 1868.—All the edges of the tiles or plates are bent over in the form of a hook, so that when laid in place they overlap, catch, or interlock into each other. The joints of the tiles or plates, by being so interlocked, form an effectual protection against rain or wind passing through. The tiles or plates may be fixed to the beams or frame by hooks or clips, firmly secured to the beams or frame, the hook portion passing into and bearing upon the overturned or bent edges of the tiles or plates.

WINDOW FRAMES.—*J. Johnson.* Dated 27th October, 1868.—The barrels or drums are caused to rotate by cords, hands, or lines, running through suitable guides and passing down the window frames in the manner of ordinary roller-blind cords, such cords, hands, or lines being secured to and passing around large pulleys or wheels attached to the barrels or drums for giving a certain amount of leverage, so that by pulling the cords at the sides of the frames and thereby causing the large pulleys, and with them the barrels or drums to rotate, the cords attached to the sashes or shutters will be wound around the barrels or drums, and the sashes or shutters consequently raised while on the barrels or drums being caused to rotate in a contrary direction so as to unwind the cords, ropes, bands, or chains, the sashes or shutters being released, will descend by reason of their own preponderance over the sash weights, which latter are for this purpose made so as only partially to counteract the

descending tendency of the sashes or shutters. The cords, hands, or lines, by which the barrels or drums are actuated, may be kept lightly drawn down the sides or linings of the window frames by adjustable pulleys or hantons held in position by spring catches capable of being slightly raised or depressed when requisite, so as to somewhat slacken the cords, bands, or lines, and thus permit the sashes or shutters to descend by their own weight, or to be raised by the pulleys or hantons are again released, when the action of the spring catches will cause the cords, bands, or lines, to be again drawn tight, and thus to instantly arrest the downward progress of the sashes or shutters.

VENETIAN BLIND TAPES.—*James Carr.* Dated 25th January, 1869.—The inventor uses a Jacquard loom, and furnishes it with four sets of warps, or warps which may be divided, as is well known, so as to form sheds for more than one web of cloth, and to supply these warps with weft he employs a rising box loom, and prefers that it should be furnished with four shuttles, one for each of the two tapes, and one for each of the short strips, although a smaller or larger number may be used, and the arrangement of loom the inventor employs is that which is known as the Marionette. The machinery, however, may be of any arrangement used for similar purposes, and the order of making the sheds varied.

WINDOW SASHES.—*Edward Ruston & W. W. Mills.* Dated 26th January, 1869.—In connexion with an ordinary sash, on either of its sides, and projecting slightly from the edge thereof, the inventors place a toothed wheel turning in a frame fixed to the said sash. The teeth of these toothed wheels are inclined to their axes, the said wheels somewhat resembling ordinary worm wheels. The teeth of the wheels may, however, be parallel with their axes. Working in slots in the sash are spring checks or catches, which prevent the rotation. On either side of the sash frame, and in the line of the motion of the sash, strips or ribs of vulcanised india-rubber or other similar elastic material are fixed; they make these elastic strips or ribs by preference of a nearly semi-circular figure in cross section, the convex side of the strip or rib being situated outwards, and being presented to the projecting parts of the toothed wheels fixed on either side of the sash. When the sash provided with the toothed wheels described is in its place in the window frame, the toothed wheels compress and flatten the india-rubber strips or ribs. By the elasticity of the strips or ribs such an amount of resistance is offered to the toothed wheels as to support the said sash in any position in which it is placed. In order to raise or lower the sash the spring catches described are lifted from the toothed wheels so as to permit them to rotate. They prefer to arrange the handles of the catches so that the disengaging of the catches and the lifting or depressing of the sash are effected at one operation. Or the catches may be geared together in any convenient way so that pressure at one part of the sash may simultaneously release both catches.

TREATING TIMBER.—*John Pickering.* Dated January 26th, 1869.—This consists in applying to the surfaces of the timber to be finished rapidly moving surfaces of grinding or polishing material, such as sandstone, grindstone, emery, in combination with other substances or other suitable abrading materials. The finishing surfaces of the abrading and polishing substances are circular and made to revolve at a high velocity against or upon the surfaces of the timber requiring to be treated by them, the effect of the treatment being that heat is generated by the friction of the abrading surfaces upon the wood, so that the surface of the wood becomes covered to the required extent, besides being rendered very smooth and polished in a rapid manner.

VENTILATORS AND CHIMNEY-POTS.—*G. Hawksley.* Dated January 29th, 1869.—These ventilators or pots are formed from a long metal band, say of hoop-iron, which the inventor turns into a coil by extending it on one edge more than on the other. He does this by passing the hoop-iron between rollers which are set so as to form a taper nip, and the rollers may be so formed as simultaneously to give to the iron a curved face; or in place of expanding the outer edge of the hoop-iron, a similar result may be obtained by corrugating its inner edge. He then takes a cylindrical mandril of the size of the interior of the ventilator or pot which it is desired to produce, and having in it a number of longitudinal

radial grooves equidistant the one from the other. In these grooves other flat pieces of hoop-iron are placed, having inclined notches in them at equal distance apart from end to end of each piece.

Books Received.

"THOMAS Civil Engineering College, Roorkee; Annual Examination, August, 1869: Report at Close of Session 1868-9, &c. Roorkee: Printed at the Thomason Civil Engineering College Press, 1869." These papers show the nature and extent of the examinations which Royal Engineers and others undergo in the Government College of Civil Engineering at Roorkee, in India; and we have no hesitation in saying that the student who successfully passes a fair examination on the many practical and theoretical questions here put cannot but be in a fair way to become a competent engineer, overseer, &c.; and he must do so before he can receive a certificate of qualification for one or another of the several grades of the Public Works Department. The senior and first departments of the college are composed of officers and civilians who are candidates for the engineering grade; the second department, of soldiers (chiefly) who are candidates for the overseer grade; the third department, of natives, who are candidates for the sub-overseer grade, and whose examination is conducted in Oordoo. There are papers which must be taken up by all; and voluntary papers for college honours only. There are also monthly examinations in mathematics, civil engineering, and physical science, and other tests as the education proceeds.

Miscellaneous.

Halifax Waterworks Extension.—The Hehden extension of the Halifax Waterworks has been formally inaugurated by the cutting of the first sod of the Castle Carr tunnel, by which the waters of Hehden and Liddenden valleys will be connected. The scheme is a gigantic one, and will cost nearly 200,000*l.* The Widdop reservoir embankment alone will be over 89 ft. high, and 245 yards long. The depth, at the foot of the embankment, will be 71 ft. 3 in., and in the centre 56 ft., and then it shallows to the head, forming a winding lake nearly a mile in length, and a quarter of a mile wide at its broadest part. In the Walshaw Dean valley will be three reservoirs. The upper one will have an embankment 233 yards long, and 71 ft. 10 in. deep, the water being 64 ft. at the greatest depth. The middle reservoir is to be about half a mile long. The embankment will be 313 yards long, 74 ft. high, and the depth of water 68 ft. The lower reservoir will be smaller, having an embankment 6 ft. high, and a depth of water of about 66 ft. The water from the Widdop and Walshaw Dean reservoirs will be connected and conveyed by aqueduct and tunnel to near Castle Carr, where will be the junction with the Liddenden scheme. The Castle Carr tunnel will be 2,500 yards long, and have a fall of about 5 ft. to the mile. It will be 3 ft. 9 in. wide, by 4 ft. 6 in. high, having a diagonal bottom the whole length. The contractor for its construction has been let to Mr. Parkinson, of Halifax, who has also constructed the Fly Leats, Upper and Lower Dean Head, and the Castle Carr reservoirs. At the cutting of the first sod by the mayor, it was stated by Mr. Hill, M.P., representative of Mr. Bateman, that the cost of construction of the tunnel would be 70,000*l.* There would be three shafts. The one where they stood would be 392 ft. deep. No. 2 would have a depth of 476 ft., and No. 3 would be 331 ft. deep. The time given to the contractor for the completion of the work was four years.

Birkbeck Literary and Scientific Institution, Chancery-lane.—At this Institution, which is in connexion with the Science and Art Department, Mr. W. J. Wilson (Prince Consort's Prize-man, &c.) is to deliver a course of thirty cheap lectures on Electricity and Magnetism, on Friday evenings, at nine o'clock, commencing October 22.

Lake Dwellings.—Traces of lacustrine dwellings have been discovered in Llangorse lake, a lonely lake on the western side of the Black Mountains, and the island in its centre is said to be evidently artificial, and constructed partly of piles and wattling.

Heating Railway Carriages.—We are now familiar with gaslight in railway carriages. Why should we not have steam-pipes to heat them? In the first-class carriages we can generally in cold weather get a tin containing hot water for the feet; but this is a luxury for-holders, we believe, to second and third-class passengers, and even first-class passengers have at times had to tip the porters before they could obtain the boon. Experiments, according to the *Daily News*, have been made with steam warming on the Brunswick Railway, on the Prussian Eastern, on the Hanoverian, and on the Lower Silesian. The Hanoverian Government Railway runs daily two mail trains with steam heating apparatus between Cologne and Berlin. The steam comes from a tubular boiler in the luggage-car. In the Brunswick Railway it comes directly from the locomotive. In either case the temperature of the carriages is raised from 20 to 30 degrees Fahrenheit. Is it too much to hope that our engineers will one day allow us this comfort? A little less of the extravagant and worse than needless waste of steam in the perpetual screeching of the mammoth-pig-stop whistle (which seems to indicate that signalmen are usually asleep at their posts) would help to make up for the loss of steam by heating the carriages.

Opening of Truro Public Rooms.—These rooms have been opened with ceremonial and festivities befitting the occasion. The rooms occupy a central site, near Boscawen-bridge, on the north side of the Green. The edifice consists of a central block, with two small wings. The walls are of stone from Mylor, the greenish drab of which is relieved by the cream-coloured Bath stone dressings. There is an oriel in the green front. The accommodation provided comprises a large concert or assembly room, with adjuncts; provision for the Cornwall library and the Truro Institution; billiard and club rooms in the main block; a Masonic hall in the east wing; and in the western wing apartments for the theological library left to the county by the late Bishop of Exeter, and the depository of the Society for Promoting Christian Knowledge. The hall is 85 ft. long, 38 ft. wide, and 34 ft. high, and has, not including the gallery, five entrances, three direct from the staircases and passages, and two through the supper-room. It is calculated to seat about 800, the gallery holding 100, and the orchestra, at the other end of the room, being capable of accommodating about 130. The roof is half open-timbered, in six bays, quatrefoils being introduced in the spandrels and shields, which will hereafter be decorated. The windows—six in number—open on the Green. Artificial light is supplied by a number of gas pendants hanging from the roof. An organ, built by Messrs. Hill & Son, has been erected in the orchestra.

The "Iron Blacksmith."—A Stenbenville mechanic named Wm. Kenyon, says the *Sharon Times*, an American paper, has invented, and has now in operation in that place, a very marvellous piece of mechanism, which he styles the "Iron Blacksmith." It occupies the space of an ordinary-sized cask, is very compact, is driven by an engine of herculean strength, and the machine itself is of almost incalculable power. It is at present constructed for the manufacture of wrenches used by machinists—gasfitters more particularly. These wrenches are produced from solid steel, at the rate of one every three seconds, doing the work in three seconds which would require the swiftest and most expert workman a whole day to do, besides executing the work much better. When the "Iron Blacksmith" is "fully armed and equipped," it will produce, as if by magic, any description of tool or implement; also, chains, horse-shoes, fingers for mowers and reapers, all with the same facility and exactness; in fact, almost every article which now comes from the stalwart blows from the arm, and directed by the mental skill and ingenuity of the intelligent smith. This machine, which is the result of many years of thought and labour, besides an expenditure of many thousands of dollars, is destined, our authority thinks, to revolutionise the smithing trade.

Working Men's Club and Institute, Holloway.—In the course of the present month, according to the *North Londoner*, this new hall will be completed, and opened with a *soirée*. It is situated in a good position in the Holloway-road, and consists of a lecture-hall, class, reading, committee, club, and conversation rooms, and gymnasium ground.

Model Cottages for Farm Labourers.—There have been recently erected by Lord Vernon, at Sudbury, near Dorby, several model cottages for farm labourers. Each cottage contains a living-room, three bedrooms, entrance porch, scullery, pantry, fuel store, piggery, privy, cesspit, and ashpit. Each cottage is provided with a washing-copper, sink, and a fireclay baking oven. The living-rooms are fitted with dwarf cupboards, each side of fire-place, with cottage ranges, and the bedroom fire-places have small cottage stoves. The rainwater from the tops is conveyed to tanks for domestic use, having a pump to each cottage fixed over the sink in scullery. The cottages have been built with local bricks made on the estate; the external walls being hollow for dryness, relieved with hands of dark blue Staffordshire bricks. The roofs are covered with blue and brindle tiles, having ornamental ridge cresting. The entrance porches have projecting eaves and gables, with barge-boards and brackets. The works have been carried out by Mr. S. Deville, of Burton-on-Trent, from the designs, and under the direction of Mr. John Birch, of London, who gained the Society of Arts' premium and medal for such designs.

Reopening of Bunhill Fields.—Considering the efforts made in past years by the *Builder* to induce the authorities to set the Bunhill burial ground in order, it is gratifying to be able to state, as we now do, that this ancient burying place has been reopened to the public; not as a repository for the dead, but as a pleasant place of recreation, having been planted with trees, and converted into an additional park for the metropolis. Being part of the Great Fishery estate, Bunhill Fields lapsed a few years since to the Ecclesiastical Commissioners, who resisted the temptation to convert the place into a building site, and decided that it should be made conducive to the health and recreation of the inhabitants of the surrounding district. Bunhill Fields, as is well known to our readers, contained the remains of John Bunyan, Defoe, Dr. Watts, and many other of England's worthies, and it is satisfactory to know that the corporation have taken care to preserve the monuments and tombstones which marked the places where the illustrious dead repose.

"Going, Gone!"—The sale of stock at a farm called Methlem, twenty miles beyond Pwllheli, brought a large gathering of the leading farmers of Anglesey and Carnarvonshire together. Whilst the auctioneer was selling off some articles of furniture in a room above the dairy, the bidders, to the number of about 150 persons, proved too great a weight for the floor, which gave way just as Mr. Owen was giving his final "Going, going, gone," to a piece of furniture, and the whole party was precipitated to the dairy below. An ex-mayor of the borough of Pwllheli was thrown into a pail of cream, and was slightly injured, whilst a solicitor found himself sunk in a ten-gallon cask of hutter-milk. A corpulent farmer, weighing a little over 16 stone, was precipitated on a pot of butter, which broke and besmeared him sadly. The bidders, after the accident, would not follow the auctioneer to other rooms up-stairs, and the articles of furniture that remained unsold had to be taken downstairs. Accidents of this kind are not unprecedented. Some consideration should be given to the state and strength of floors, under such circumstances, beforehand.

How Disease is generated.—The following extract from the report of the medical officer of health of St. Olave's, Southwark, which has been presented to the Local Board of that district, reveals one of the risks to which poor people in over-crowded courts and alleys are subject. Dr. Vinen says:—

"In the yard of No. 1, Cow-alley, is a large water butt for the supply of that house and two others in Goat-street. In consequence of the butt not being provided with a lid, the water is exposed to the influence of air and light, encouraging the development of animal and vegetable life, as certain effects of water being thus exposed. I exhibited some specimens of conferva and other vegetable productions found growing in very considerable quantities on the sides of the butt, and also a sample of the water, in which were plainly to be seen freshwater shrimps, blood-worms, snails, and more minute creatures—the water-leas, cyclops, &c. Small as the water-leas is, its appearance in water implies the presence of other creatures, still more minute than itself, upon which it feeds. This water, in the condition I here describe, so utterly unfit for any domestic purpose, has been constantly used, the larger animal growths being first strained off."

It is satisfactory to know that the Board issued an order directing the erection of cisterns with covers and the necessary appliances.

Workmen's International Exhibition, 1870.—Very considerable progress has been made, not only in this country, but in foreign countries. Side by side with the contributions of our own country will be the productions of the French artisan, of the thoughtful German, of the artistic Italian, of the persevering Dane, and of our American cousins. To meet the very energetic efforts made in foreign countries, seventy local committees have been formed in the United Kingdom. It is hoped that the artisans of this country will make a most determined effort, so that the Workmen's International Exhibition of 1870, in the Agricultural Hall, at Islington, will not only be a display of the best foreign workmanship, but an exposition of the talent, industry, and manipulative skill of the British workman.

Opening of the Industrial Exhibition, Basingstoke.—The new Mechanics' Institute has been opened with an Industrial Exhibition, similar to those recently held in some of the principal towns of England. The collection included works in wood, models, needlework, paintings, photographs, drawings, illuminations, stuffed animals, works in straw, rush, and other materials, &c. The rooms were classified as follows:—On the basement, works in wood and metal, and miscellaneous articles. On the first-floor, loan department, needlework, and natural history,—a separate room for each. Two rooms at the rear of the building were furnished as refreshment-rooms. The entrance was fitted up with flags, and an iron hammered gate made by Mr. J. B. Soper. There were nearly 600 exhibitors.

Antwerp.—Antwerp is utilising its fortifications. The *Precurseur* of Antwerp says:—"The sale of the Southern Citadel is now an accomplished fact, the contract having been signed at Brussels between Dr. Stronberg, of Berlin, on the one hand, and M. Frère-Orban, Belgian Minister of Finance, on the other. The price is 14,000,000 of francs. The State reserves ten hectares (two acres and a half each) of land, to be employed for a new passenger and goods station; Dr. Stronberg engaging by his contract to establish large docks, warehouses, &c., at his own cost."

The Maclesfield Town-hall.—A record has come to light here, after the lapse of nearly half a century. The extension and improvement of the Town-hall premises have necessitated the taking down of a portion of the old building; and, during the progress of this part of the undertaking, the workmen found the foundation-stone of the hall, which was laid in 1823, lying at the south-west corner. A brass plate, bearing an inscription recording the event, and eight coins and three medals were found.

Bursting of a Steam Boiler.—Nineteen persons have been killed and nearly a hundred injured by the explosion of a boiler at the State Fair, Indianapolis, in the United States. The boiler was attached to a saw-mill, and had just been fired up for test with another machine, arrangements having been made to take it up as soon as the trial was over. Many of the bodies were horribly mutilated and burned, and in some cases it would be impossible for friends to recognise them.

The Architectural Association.—The annual *conversazione*, with which the business of the session commences, will be held at Conduit-street, on Friday evening, the 29th inst. This is the right time for new members to join. Architectural students, and those interested in cognate arts, cannot take a better first step than by enrolling themselves members of the Architectural Association, and availing themselves heartily of the advantages it affords.

Relics of Roman Winchester.—Extensive excavations have uncovered a variety of interesting articles in connexion with the Roman occupation of Winchester. There are several cinerary urns, all more or less broken, and in one calcined bones were found. There were also a couple of urns, with one handle each, of fine earthenware

The New Townhall, Chester.—Sir: In your notice you say, "the gas fittings and ironwork generally have been supplied by Skidmore, of Coventry." I beg to say that I supplied the wrought-iron work for the exterior, which was made from the designs of the architect.—ALFRED WEBB.

TENDERS.

For the United Methodist Free Church, Fishbury, Messrs. Woodhouse & Potts, architects. Quantities supplied by C. N. McIntyre North:—

A. & J. Smith	6,231 0 0
Browne & Robinson	6,231 0 0
Dove	6,196 0 0
Colls & Sons	6,193 0 0
Brass	6,743 0 0
Ennor	5,857 0 0
Newman & Mann (accepted)	5,636 0 0

For the erection of the Blechley Park Hotel, Blechley Station. Mr. Gokto, architect:—

Snell	£1,647 0 0
Chappell	1,644 0 0
Haddon	1,395 0 0
Honour	1,373 0 0
Barker	1,175 0 0
Taylor (accepted)	1,155 0 0

For alterations and additions to the Tavistock Union Workhouse, Devon. Messrs. W. Doreley & Son, architects:—

Miller & Mitchell	£1,590 0 0
Born & Gosling	1,397 0 0
Jenkins	1,364 0 0
Webber	1,273 10 0
Saunders, Brothers	1,192 10 0
Bishop & Son	1,123 0 0
Call & Pethick	1,097 0 0
Blatchford	1,075 0 0
Brimblesome & Rowse	1,043 0 0
Dennis & Minchin	1,035 0 0
Arsons, Rows	970 0 0
Marshall	943 10 0
Boye	900 0 0
Waters (accepted)	853 0 0

For rebuilding house and shop, 41, Blackfriars-road, for Mr. W. Gilbert. Messrs. F. H. Fowler & Hill, architects. Quantities supplied by Mr. Nuttall:—

Moultrie	£1,189 0 0
Greenwood	1,189 0 0
Mills	1,170 0 0
Mellor	1,105 0 0
Rider & Son	1,084 0 0
Taylor	1,045 0 0
Manley & Rogers	1,044 0 0
Wills	1,035 0 0
Foster (accepted)	973 0 0

For rebuilding house and shop, 45, Blackfriars-road, for Mr. Dowie. Mr. Shea, architect. Quantities supplied by Mr. Nuttall:—

Moultrie	£2,046 0 0
Mills	1,990 0 0
Greenwood	1,975 0 0
Mallett	1,950 0 0
Rider	1,912 0 0
Taylor	1,721 0 0
Manley & Rogers	1,693 0 0
Wills	1,658 0 0

For the excavation for, and construction of, foundations and basement story, on the site of Nos. 11 to 15 inclusive, Tokenhouse-yard, E.C. for the Estate Company (Limited and reduced). Mr. E. A. Graving, architect:—

Trotter & Sons (amended tender, accepted)	£1,922 0 0
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For erecting five houses and shops, Middlesex-alley, Aldgate, for Mr. John Venables. Mr. Horace A. Alexander, architect. Quantities supplied:—

Brass	£3,375 0 0
Asby & Son	3,229 0 0
Asby & Horner	3,131 0 0
Rivett	3,083 0 0
Dudley	3,050 0 0
Reed & Son	2,754 0 0
Eastlake	2,740 0 0
Pavitt	2,679 0 0
King & Son	2,680 0 0
Ennor	2,493 0 0
Water	2,545 0 0

For rebuilding Nos. 22 and 23, Whitechapel High-street, for Mr. Dowie. Mr. Albert Bridgman, architect. Quantities not supplied:—

Little	£2,675 0 0
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For St. Mary's R.C. School, Swinton, Manchester. Mr. Herbert E. Tjøn, architect. Quantities supplied:—

Cockran, Parker, & Co.	£300 0 0
Connor	800 0 0
Statham & Sons	827 0 0
Adams & Marshall	771 0 0
Speakman	731 0 0
Gerrard	730 0 0
Thompson	733 0 0

For erecting a house and shop, at Chigwell-row, Essex, for Mr. Dowie. Mr. Albert Bridgman, architect. Quantities supplied:—

Bennett (accepted)	£350 0 0
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For additions and repairs to Harrington House, Hornsey. Mr. P. D. Tuckett, architect:—

Stapleton	£213 0 0
Smith & Son	474 0 0
Clements	469 0 0
Deveraux & Son	317 0 0
Jerrard (accepted)	379 0 0

For erecting new north aisle, and removing and re-erecting vestry, Bishop Stortford Church. Mr. Clarke, architect:—

Toolby	£1,350	Extra for Pitch Pine Roof	£25
Bracher & Son	1,300	30	30
Roberts	1,195	25	100
Gibbons	1,097	15	65
Mason & Green	1,809	35	68
Glassecock	1,625	15	30
Cooke	948	18	71
Bell & Sons	927	10	40

* accepted.

For alterations and additions to 75 and 76, Cornhill, for the Metropolitan Bank. Mr. T. F. Smith, architect:—

Henshaw	£1,250 0 0
Asby & Horner	4,180 0 0
Ryder & Son	4,140 0 0
Browne & Robinson	4,088 0 0
Bracher & Son	3,995 0 0
Brass	3,767 0 0
Ennor	3,614 0 0

TO CORRESPONDENTS.

J. T. (concluded).—Bastien (a venetian, if within the limits of the Building Act, cannot be of wood. Zinc is the cheapest cover. Incl.—J. A. D. (the charges named are fair).—F. F. (quotations in type)—W. S. (next week).—C. F. (we cannot meddle with what we know nothing of.—Beady (advertise).—T. L. (book has not arrived).—W. N. (no such party as yet appeared in our pages).—Public-Shop.—B. B.—W. H.—F. D. T.—F. S.—F. C.—W. B.—H. T.—R. & Co.—C. F. H.—J. F.—H. H. V.—Jack Plane.—H. H. S.—J. P. Jun.—J. R.—F. G.—H.—E. F.—A. W.—E. G.—J. K.—R. A. G. G.—W.—F. M.—J. O. N.—An Indian C.S.—T. H. R.—A. W.—T. P.—J. H.—M.—D. & Son.—E. J. S.

We are compelled to decline pointing out books and giving addresses. All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. None. The responsibility of stored articles, and papers read at public meetings rest, of course, with the authors.

BUENOS AYRES GOVERNMENT CERTIFICATE.—TRANSLATION.—"We, the undersigned, at the request of Messrs. J. C. Thompson & Co, certify that the IRON SAFES of Messrs. CHUBB & SON, London, of which these gentlemen are Agents, were exposed for several hours to the fire that took place in the offices of the National Government on the evening of the 26th instant; that in our presence they were carefully opened with their respective keys; that the moneys and important documents they contained were found in perfect order; and that these Safes are now in use in the National Treasury Office.—Buenos Ayres, July 31st, 1867.

(Signed) J. M. DRAGO, Treasurer of the National Government. JOSE TOMAS ROJO, JUAN M. ALTAREZ.

A true copy.—A. M. BELL." A large assortment of these Safes may be inspected, and lists of prices obtained, at CHUBB & SON'S, 57, St. Paul's Churchyard, London; 68, Cross-street, Manchester; 28, Lord-street, Liverpool; and Horsely-fields, Wolverhampton.

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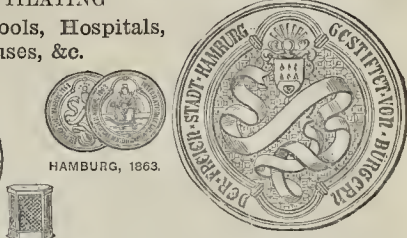
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FOR WARMING AND VENTILATING
Private Houses, Churches, Schools, Hospitals,
Manufactories, Greenhouses, &c.



HAVING had a large experience for many years in heating Houses, Churches, Schools, and other Buildings, both public and private, we are prepared to offer a Hot-Water Apparatus surpassing all others in economy and efficiency. The small size of the pipes enables us to introduce them with facility in buildings already erected. The pipes can be placed in any position, either along the skirting, or under the windows, or coiled up in pedestals, or sunk beneath the floor, in all cases being covered with iron trelliswork, of either plain or ornamental design, to suit the architectural decorations of the buildings. Buildings warmed on this system are more thoroughly under control than when large pipes are used; the tubes, from their small size, containing but little water, are quickly heated, causing great rapidity of circulation and economy of fuel.

The average cost of warming a house of ten rooms (exclusive of kitchen offices) having a chival content of 20,000 feet, would be about 80*l.*, or 4*l.* per 1,000 cubic feet warmed. For churches the cost would vary from 10*l.* per 1,000 cubic feet to 25*l.*; the cost of a church of ordinary size being about 16*l.* per 1,000 cubic feet. Schools and factories, about 2*l.* per 1,000 cubic feet.

An Apparatus is on exhibition at our office, where the public are invited to call and examine it, and we are prepared to prove to every one that this Apparatus stands unrivalled for simplicity, economy, safety, and durability; and, moreover, that it warms without vitiating the atmosphere.

Estimates will be given for any plans sent to our office, or on application being made for a personal inspection; and we guarantee every apparatus which we erect.

Testimonials,

SELECTED FROM MANY WHICH WE HAVE RECEIVED.

ALFONA RAILWAY STATION.
In the newly erected large railway-station, an architect of the name, has had all the rooms, without exception, heated by Mr. J. L. Bacon. I bear testimony to Mr. Bacon that this heating has been in full use all winter, and has during this time given full satisfaction to the public in general, as well as to the officials of the railway; whilst the consumption of fuel, an equal and agreeable temperature was produced, even in the coldest weather. The trials and pedicasts, which are necessary in the heated rooms, do not in any way disturb the rest of the decoration, not even in the least finely-furnished saloons; on the contrary, they are quite in harmony with the rest of the furniture.
In finishing, allow me to add, that the business intercourse with Mr. Bacon or his representative was always most agreeable, and that during the sitting of the apparatus, which cost 1,121*l.* I never experienced any hindrance in my building. It gives me pleasure to be able to testify the truth to others, and thereby contribute my experience to recommend Mr. Bacon.
Altona, 19th April, 1863. MANFRED SEMPER, Architect.

CITY SCHOOL OF ZEPHAR.
At the request of Messrs. J. L. Bacon & Co. of Berlin, we, the undersigned Commissioners of Buildings, pronounced favourably on the Hot-Water Apparatus erected in the New City School. Messrs. J. L. Bacon & Co. have entirely fulfilled the obligations of their contract, and have furnished the new school with a Heating Apparatus which leaves nothing to be desired. Not only the Apparatus properly proportioned to the different rooms to be heated, but the construction, taken in its whole, is as correct as any could desire. The saving in fuel is great in comparison with other modes of heating. We have to warm forty-five large rooms, 31 feet long by 24 feet wide; two large lecture rooms, the corridors, and four staircases; making altogether a cubical space of 872,760 feet. We are able to obtain the heat of an hour and a half of dry, Faber, whatever the external temperature may be, and our pupils keep the rooms at this temperature. During hard frost we burn daily four bushels of coal for each furnace; this cost, at about 5*l.* per bushel. Expenses has taught us that the daily consumption is on the average three bushels per furnace. We have to feed five furnaces, consequently the heating of the whole of our large building costs us 6*l.* 3*l.* per day. It would be impossible to warm our large rooms comfortably with ordinary hot-air stoves, however perfectly they might be constructed, and the consumption of fuel would be at least three times as great. The advantages of this method of heating are as follows:—The equal distribution of heat; the cleanliness which it results; no fuel being carried into the rooms; the cheap cost of maintaining the apparatus in three years we have had no expense for repair; the saving in fuel and situation; and lastly, the whole house has perfectly and uniformly, provided the necessary amount of work to admit pure air, and allow the vitiated air to escape. We are perfectly satisfied with the necessary amount of work, and we are about to give Messrs. J. L. Bacon & Co. some more very large orders.
The Commissioners of Towns Buildings,
E. TRUMMELER,
Director of Buildings.
Zittau, 5th March, 1863.

LUNATIC ASYLUM AT HAMBURG.
The undersigned, at Mr. J. L. Bacon's request, hereby certify that he has erected for us numerous Hot-Water Apparatus, in private dwelling, office, schools, and public buildings, and that the work which he has executed has entirely fulfilled its purpose everywhere. Amongst the public buildings, we mention especially the heating of the cells of the Lunatic Asylum, Friedrichsberg (near Hamburg); in this building the principle of insensational ventilation has been brought into use, and executed, in connection with high-pressure heating. The air is warmed in the heating chamber by passing over the surface of the pipes, and is driven to the most remote parts of the building, by the means of a small steam fan, through horizontal flues, and reaches the cells at a distance of 200 feet, with sufficient force to give, in winter, the required warmth of 66 degrees Fahrenheit, entering through small openings near the ceiling into the cells, as required by the physicians.
The large day-rooms in the main building of the Lunatic Asylum are warmed by Hot Water Pipes, placed behind the skirting boards, and covered with iron trelliswork, which equally fulfil their purpose.
We like to state, finally, that we have always been highly satisfied with the execution and the work of Mr. J. L. Bacon's High Pressure Hot-Water Apparatus.
CHR. TIMMERMAN & CO.
Civil Engineers and Architects.
Hamburg, May 1, 1867.

GERMAN AND FRENCH REFORMED CHURCH, COBLENHAGEN.
We, the undersigned elders of the German and French Reformed Church of this City, do hereby, at the request of Mr. J. L. Bacon, certify that the Hot-Water Apparatus, erected by him in the above mentioned church, has, during the whole of last winter, notwithstanding severe frost, worked perfectly well, and at all times, been able to give sufficient heat.
S. C. SCHWARZ,
C. K. DE CONINCK.
Coblenhagen, 20th May, 1860.

"COURT OF JUSTICE, BERLIN.
I certify that Messrs. J. L. Bacon & Co. have erected in the Court of Justice of this town a Hot-Water Apparatus to my entire satisfaction. This Apparatus gives a permanent heat of 62 degrees Fahrenheit, even with an external temperature of 14 degrees Fahrenheit.
Royal Bau Inspector,
Berlin, 9th March, 1858. HESSE.

PRESBYTERIAN CHURCH, CAMDEN TOWN.
Gentlemen,—I have the pleasure to inform you, that the Heating Apparatus which you constructed in Camden-road Presbyterian Church, gives perfect satisfaction. We have now given it a fair trial, and up to the present moment have discovered no fault. Anomalous as chief matters are the economy in the consumption of fuel, and the rapidity with which it takes effect. I shall be happy to recommend it in preference to any other system on opportunity occur.
I am, Gentlemen, yours, faithfully,
W. M. DINWIDDIE.
8, Middleton-road, 11th October, 1859.

LA SAINTE UNION, HIGHGATE.
We have much pleasure in being able to testify to the perfect efficiency of Messrs. J. L. Bacon & Co.'s warming Apparatus, which has been applied under our direction to a large institution at Highgate.
One of its chief recommendations is the small consumption of fuel, taking into consideration the results gained.
D. Kensington-square, 11th October, 1852. GOLDIE & CHILD, Architects.

PRIVATE HOUSE, TUFNELL PARK.
Gentlemen,—In answer to your inquiry, I beg to state that the Hot-Water Apparatus you fitted in my residence answers admirably, maintaining an equal temperature throughout the house, and being capable of adaptation to the varying circumstances of the weather.
I am, Gentlemen, yours, &c.
J. E. SCOTTE.
To Messrs. J. L. Bacon & Co.

LIST OF SOME OF THE PUBLIC AND PRIVATE BUILDINGS WHERE OUR HOT-WATER APPARATUS IS IN OPERATION. PALACES AND PRIVATE HOUSES ON THE CONTINENT.

His Majesty the late King of Hanover.
H.R.H. the Grand Duke of Oldenburg.
H.R.H. Prince Henry of Prussia.
H.R.H. Prince Louis of Hesse Darmstadt.
Franco-Kirche, Copenhagen.
Holmens Kirke, Copenhagen.
St. Nikolai-Kirche, Hamburg.
St. Nikolai-Kirche, Hamburg.
St. Nikolai-Kirche, Berlin.
Lunatic Asylum, Copenhagen.
Lunatic Asylum, Oranienburg.
The Hon. Sir F. W. Grey, K.G.B., Lynton, Sunningdale, Berks.
C. O. Eaton, Esq., Tolsthorpe Hall, Stamford.
R. H. Maxwell, Esq., Margrave, Richmond.
The Rev. F. Roper, Caterbury.
J. R. Scott, Esq., Trafalgar Park, London.
Wm. H. Prince, Esq., Longbridge Park, London.
A. Hall, Esq., Addis-mere, Berrow.
Mrs. Donibon, Highway Park, London.
F. Robinson, Esq., Little Fyfe-road, London.
Messrs. Ivall & Large, Victoria-street.

The Lord Chamberlain, A. von Stenigella.
Earl of Stollberg, Wroslawitz.
Baron von Schlegel, Ober-Stralau.
Baron von Eckstein, Havelberg.
Lidai Asylum, Copenhagen.
Kiliaseth Hospital, Berlin.
Yerke's Bank, Hamburg.
Credit Bank, Copenhagen.
German Bank, Berlin.
Private Bank, Copenhagen.
L. Behrens & Son's Private Bank, Hamburg.
The Rev. Mr. Moore, Esq., Walsworth.
W. H. Chapman & Co., Viders-Street, Strand.
A. Levy, Esq., Bistol.
W. O. Day, Esq., Mill-street, London.
Wm. Davy, Esq., Backhurst Hill, Essex.
E. Davy, Esq., Ashby, Fiddham, Lincolnshire.
St. Leonard's Church, Over-Stralau.
St. George's, Presbyterian Church, Croydon.
St. Martin's Church, Gaste-bury.
St. Sepulchre's Church, Skinner-street, London.

Narzynski, von, Jablonowo.
Baron von Wurzburg, Dresden.
Bürgemeister (Dr. N. F. Haller), Hamburg.
Compten von Puchler-Niesler-Thomae-Walden.
Post-office, Berlin.
University Library, Copenhagen.
Collegiate School, Dresden.
City School, Rome.
Hotel de la Ville, Berlin.
Zoological Garden, Hanover.
7 de Orphanum (Victor Garden), Berlin.
All Saints' Church, Hulsebom.
St. Mary's Church, Walsden, Cambridgeshire.
The Parish Church of Beaumont, Oxfordshire.
Presbyterian Church, Camden Park, London.
Church of St. Peter and St. Paul, Strathmore.
St. Paul's Church, Adelaide, S. W. Aust.
School for the Deaf and Dumb, Highgate.
St. Paul's Hospital, Stamford.
White's Hospital, Croydon.
St. George's College, Croydon.

PRIVATE HOUSES AND PUBLIC BUILDINGS IN ENGLAND.

OFFICE and SHOW-ROOMS:—FARRINGTON ROAD, LONDON, E.C.
ONE DOOR FROM RAY STREET.

The Builder.

VOL. XXVII.—No. 1395.

The High Court, Calcutta.

Public Works of India.



ATTENDERS architectural and constructional do not go on quite satisfactorily in India. With every disposition to listen to both sides, we cannot resist the impression that the Department of Public Works requires great reform. It is composed chiefly of a military element; everything smacks and smells military; and the assertion that reaches us from all quarters is that "The few civil engineers are snubbed and made to eat humble pie to military chief engineers, who really do nothing but sit at office and write minutes and reports, and carry out a system of scarlet tape unknown even in red-tape England."



We are disposed to think there should be a separate architectural division in the Public Works Department, as there is for railways and for irrigation works.

The building we illustrate in our present number is the new Calcutta High Court, designed by Mr. Walter L. Granville, late architect to the Government of Bengal, and which is now nearly ready for the roof.* It is on the site of the old Supreme Court, facing the Eden Gardens, and promises to be a handsome addition to the public buildings of the city. In plan it is a rectangular parallelogram, whose sides measure, respectively, 420 ft. by 290 ft. It therefore covers nearly three acres of ground. The building has three stories, and is 88 ft. high from the road to the parapet. The large central tower is 36 ft. square, and 230 feet in height. The interior quadrangle measures 235 ft. by 145 ft., and has vaulted cloisters or corridors all round on the two lower stories; whilst, on the third, the corridors are on two sides only. There are six large carriage entrances, vaulted and lined with stone, to the interior quadrangle; these form the chief entrances for the public. The building, however, may be entered through the large lower, and through six doorways placed in the south verandahs. There are also two doorways to the north and two private entrances, with separate staircases, for the judges. Carriages will not be permitted to remain in the courtyard, but will proceed to shelter under carriage-sheds, to be built in the avenues and gardens it is proposed to lay out on the maidan. The rooms on the ground floor are set apart for clerks' offices, principally natives, and the heavy records of the courts. The tower above the ground floor will be used as the depository for wills and other valuable records.

On the first floor there are in all seven courts of law, with retiring-rooms for the judges, a judges' library, a bar-library, with consultation-

room and retiring-rooms, attorneys' rooms, native pleaders' rooms, petty jury-rooms, a private office for the registrar, and a room for the Chief Justice's clerk, with a number of bath-rooms and other subsidiary conveniences. The corridor at the south front is for the private use of the judges, who will thus be able to communicate with one another without mixing with the public.

Of the two largest courts, one will be used for cases on the original jurisdiction side, the other for cases on the appellate side. They are each 82 ft. long, 72 ft. wide, and 50 ft. in height, and contain 200,000 cubic feet of air, being thus much larger than our Houses of Lords and Commons.

Ventilation by the natural process has been attended to in these courts by means of the following expedient. At a height of 30 ft. from the floor, runs a clearstory all round the court. This clearstory will permit the upper part of the court to be left open to the outside air, except during violent storms, when the openings can be closed. This system of top lighting and ventilating by means of a verandah or clearstory half-way up the room was first introduced by Mr. Granville, at the large waiting-hall of the Eastern Bengal Railway Station at Sealdah, Calcutta. In addition to this natural mode of ventilation, a high-pitched roof is added, plated with iron, over the ceiling of the court, under the impression that as the iron plates become heated by the sun, the interior of the roof will act as a furnace, and will draw up the heated air from the court below, through orifices made in the ceiling, and that this heated air will then escape outside.

The smaller courts, libraries, and other rooms, on this floor, are all nearly 30 ft. high. On the third story, chambers facing the south are provided for barristers. This will be a source of revenue to the court.

A few words on the construction of the building will probably be acceptable. The walls are of bricks obtained from the Government brick-works at Acra; they are of good quality, and the work is strong and sound. The walls on the lower story are faced on three sides, viz., south, east, and west, with a sandstone quarried from Barakur. Stone is used as a facing to the lower story in preference to the cheaper method of sand-plastering, on account of the rapid disintegration of all brick and plaster work situated in the lower strata of the Calcutta atmosphere. It is well known that, at almost all seasons of the year in Calcutta, there is more or less a certain saline nitrogenous miasma rising, chiefly at night, about 16 ft. or 20 ft. above the ground, which affects most injuriously every building in the town. By the use of stone, expensive periodical repairs are avoided. On the first floor stone is used up to the springing of the windows, also in the arches and quoins. The plinths, arches, string-courses, and corbels of the quadrangle are of stone. Inside, a very small quantity of stone is used, which is to be regretted; but economy apparently demanded a sacrifice, owing to the great rise of prices: so plaster is being substituted for stone in many places where it should not be. We will only add that the whole area upon which the building now rests was excavated to a uniform depth of 6 ft. (except in certain parts), and then filled in with good concrete, which was strengthened very greatly by two tiers of stout hoop-iron interlaced, the meshes being 18 in. square. This concrete mass formed a solid plateau upon which the brick footings were easily and neatly laid. Trenches and piling were thus avoided, and evenness of settlement was more likely to be secured.* The foundations of the tower were taken down 15 ft., and the operation of getting in the concrete was very tedious, as pumping had to be resorted to night

* A layer of asphalt, $\frac{1}{2}$ in. thick, was laid over the whole horizontal surface of the walls, at a level of 3 ft. from the ground, to prevent the damp rising.

and day. The concrete, however, was eventually put in on the top of a blue clay stratum of considerable thickness and tenacity, and was then paved with large flagstones, upon which the solid mass of brick foundations was commenced. At a higher level near the ground, the foundations were again paved with stone, so that the tower might be set out with great accuracy. We have already stated that the height of the tower, as designed, is 230 ft., its total weight is estimated at 600 tons, and its pressure on the earth is about $1\frac{1}{2}$ ton to the superficial foot.

The high-pitched roofs are all of iron, with strong cast-iron plates, on the same principle as in the roofs of the Houses of Parliament. The estimate for the building was originally 18 lacs, but it was ordered to be reduced to 16 lacs, or 160,000l.

Mr. Granville's five years' engagement with the Government, during which time he has designed and superintended a large number of public buildings, terminated last year, and was not renewed, though this and other edifices remain unfinished. The works at the High Court are being carried on under the superintendence of Mr. Barnfather, the executive engineer of the Second Presidency Division. This really seems neither fair nor wise. The architect-designer has almost a prescriptive right to superintend the execution of his own designs. At any rate, it is scarcely likely that the Department of Public Works, to whom the buildings are now confided, will be able to carry out the designs in their true spirit of integrity or with sufficient architectural ability, as their officers are all ordinary engineers, and not one of them, it is asserted, has any knowledge of architecture, save as an amateur.

Leaving this particular case, we would refer to some letters touching the Public Works Department brought to us by the last mail. Works of great cost, such as State railways and canals, are about to be commenced, and great concern is manifested lest the direction of these should not be confided to proper hands. In view of these works the Department, it is asserted, has prevailed on the Home Government to send out a batch of sixty Royal Engineers, and are industriously representing that civil engineers are not to be trusted with the expenditure of public money, unless military men are set over them to watch them. However this may be, it is certain they have published the following notification in the *Gazette*:-

"Whereas the Governor-General in Council is given to understand that in the *Civil Engineering profession* in England, it is a *recognized practice* for civil engineers employed by public companies and otherwise, to receive, in addition to the salaries paid them by their employers, commission on contracts given out, or stores and materials ordered or inspected by them, and other like pecuniary considerations for services done, or intended to be done, which are considered *legitimate sources of emolument*; and whereas a considerable number of civil engineers, who have practised in England, have lately been employed by the Government of India, and the number of such engineers is likely to increase; it is hereby notified for general information that every person in the service of the Government in the Public Works Department in any part of British India, whether civil or military, must consider his salary or pay, as regulated by the rules of the Department for the time being, or defined in any agreement with the Secretary of State for India, in Council, and whether it is drawn wholly or in part in the Public Works Department, or the Military Department, to be his sole legal remuneration; and that the receipt of commission, or any other consideration whatever, directly or indirectly, on account of any business or transaction in which he shall be concerned in behalf of the Government, whether in India or elsewhere, is prohibited."

This has caused great anger. One correspondent writes:-"We are fairly staggered by the audacity of this aggression, when we remember that before the mutiny, at a time when the Department was officered almost exclusively by military men, it was notoriously corrupt from top to bottom; and that sundry officers of Bengal Engineers would look very foolish if certain old scandals about their accounts were raked up. Why, sir, it was the introduction of civil engineers, with their high notions of professional honour, that has mainly rescued the Department from its former ill odour in this respect."

* See pp. 866, 867.

"In former days military men were not supposed to be particular about accepting a tip from a contractor. I do not mean to say that the Bengal engineers of the present day do this, but if they succeed in thwarting the wishes of the Home Government, and driving the whole body of civil engineers to resign in disgust, as they appear to desire, what has been before may be again.

"The Home Government will, doubtless, not allow the Bengal engineers to go quite to this length, but the latter may possibly succeed in their alternative object, which is to secure all the chief posts on the State works, with a body of civil engineers under them, who will do all the professional work, and supply that practical knowledge which they are conscious they do not possess, while they themselves appropriate all the praise and the pudding. The extent to which this system has been worked already is very well known behind the scenes in India.

"But I think both the Government and the Bengal Engineers are reckoning without their host in one very important particular. They talk very glibly of raising five or six millions a year in the London money-market, to be spent under military direction; but what think the capitalists? They have the means of forming a pretty good notion of what would follow, from the experience of the Indian railways. Ask such men as Mr. Turnbull and Mr. Puser to relate the many things they have suffered from many consulting engineers; or read the Blue Book on the delay in constructing Indian railways, and ponder over the skill copiously illustrated therein; or ask any civil engineer who has been in India, what he thinks of the Public Works Department, and whether he would like to invest his savings in railways and canals made by its military officials.

"The best test, however, of the efficiency of the military engineers is to ask what they have done already, and how they have done it? Mr. Kimnaird's committee on public works in India should take up this question, and ask about each of the great works which have been executed by the Public Works Department,—how long has it been in progress? what is its present state? what was the original estimate? and what has it actually cost, including not merely the money spent on works, but the loss of interest on capital, cost of establishments, and loss of revenue by unnecessary delay in completion? A searching investigation of this kind applied to three or four large undertakings, such as the Ganges Canal, the Lahore and Peshawar road, and the works on the Godavery, would bring to light such waste of time and money and professional incapacity that I feel sure no man in his senses would contribute money to be squandered under such auspices; for the sums to be expended are so enormous, that if these public works are badly constructed, or if their cost is doubled by the delay arising out of the inefficiency of the Department, which in its present condition will inevitably be the case, they cannot possibly pay the interest on the capital. The revenues of India are already strained to the uttermost to cover ordinary expenditure, and a failure in the returns from these works means an imperial bankruptcy. Fail they will, if entrusted to those who for twenty years have muddled and mismanaged the Public Works Department, until it has become a by-word.

Without endorsing all these remarks, there is sufficient evidence before us to justify fully the demand for inquiry and improvement. An Indian newspaper says:—

"Is there nothing, we would ask, to be told concerning the Great Northern (State) Railway, or is the Government ashamed of the disgraces and mismanagement which for so long has kept up a staff of engineers doing nothing, wasting the energies which they brought to their work, and at the outset being so disheartened with the impotence and vacillation of Government that they despair of ever accomplishing what at first seemed an easy enough task, and is indeed rendered difficult only by the gross ignorance and thick-headedness of officials who can work only by a system of pre-arranged budgets such as would ruin any contractor in Christendom. Is there nothing to relate concerning all the canals contemplated, and so beautifully drawn out on paper, but of which not a dot of soil has been turned, and which have been named and fully officered merely to deceive an ignorant and most limited home public, to whom distance lends enchantment and flattery seems like truth. Is there still no attempt to divulge of an imperial system of roads, which by opening up communications generally will defy the recurrence of famines by their constant recurrence are becoming a disgrace to our administration? Famines which arise from no other cause than want of communication, and which would become impossible by an organised network of roads passable throughout the year."

The latest specimen of failure sent to us is an account of the Jubbalpore Church, in course of

erection under a military engineer, which half-up is found to be unsafe and is condemned. "I have learnt," says our informant, "that orders have been received for the building to be dismantled; but as it will cost more than the materials are worth, to take the structure down brick by brick, it has been suggested to use run-powder in effecting the work of dismantling."

Again: from Nusserebad, we hear that a court of inquiry is about to be assembled at that station, to report upon the barracks there, that have lately been built at an average cost of 50,000 rupees each. One of these edifices fell the other day with a terrific crash. Providentially, warning was given by the cracking of the roof, and the men were able to move out in time, else we should have had to deplore as great a loss to the gallant Royals as that which happened some years ago to the old 50th at Loodianah, where suddenly, in the dead of night, a crash was heard: the roof of one barrack fell in. "Beneath that mass were the heroes who had escaped the carnage of the battle-fields in which three to one of the regiment had died! 51 men, 18 women, and 29 children were killed by the fall of those barracks; 126 men, 39 women, and 34 children were badly wounded—many maimed and disfigured for life!"

In the case of the new barracks at Nusserebad, which have cost on an average 50,000 rupees each, we trust that a searching inquiry will be instituted.

Enormous sums have been spent in India on public works, and are about to be so spent. Of the past it is of little use speaking; but we should keep a watchful eye over the future. The *Times* correspondent said in a recent letter:—

"This was what was spent on public works and railways in India in the year ending March, 1868, according to the official list:—

By officers of the Public Works Department	27,034,332
By civil officers from local funds	741,091
From feudatory funds	230,082
Expenditure on all works other than railways	8,006,115
Advances in India to guaranteed railway companies	3,150,932
Advances in England to ditto	4,282,303
	£15,419,860

Eight millions on ordinary public works, of which seven must be set against the land revenue; seven and a half millions on railways, the interest on which we guarantee! It is magnificent, but it is dear at the price of deficits. The sum assigned for last year was 161 millions, and that estimated for the current year is 161 millions, of which a proportion is from loans. Apart from deficit and the unsolved taxation in question, the mere fact that we are to spend 150 millions sterling before the end of the century on State railways and canals out of the loans should warn England to send as one of her most curious financiers."

We must go further and say, it should warn England to see that these works are executed under the best possible direction. We have no wish to curtail outlay on the public works contemplated, provided the money be wisely spent,—not wasted. Such works economically executed will produce a good return. But it is the duty of the Government who control them to see that they are executed in the best possible manner and at the least possible cost.

BRADFORD TOWN-HALL COMPETITION.*

"*Justitia*," by Messrs. Milnes & France, Bradford, has carried off the second prize of 200*l*.

On obtaining the first glance of this design from a short distance, the impression is gained that a vast hotel has got into the collection by mistake. The general mass would be rather imposing were it not for the questionable proportions and shape of the main features. From above the centre of the main block of the building, which is occupied by any number of windows squeezed in between small columns (the design is Italian), rises a low pointed, curved dome, with plain slating, crowned by a smaller one; the whole looking like a huge wire-gauze meat-cover. At each end of the main façade is an octagonal tower terminating in a cone-shaped roof. The perspective of these, as well as of the dome and apsidal end of the building is not quite correct. The principal entrance in the middle of the front elevation under the dome is protected by a gigantic portico. The impost of its piers is continuous with the minor cornice under the first-floor windows. From this springs a wide semicircular arch with cornice and parapet over, the former having the same relation to the second-floor windows as the

impost has to the first floor. The colouring of the principal view has gone far to redeem the picture as a work of art, and to it and the massive gilt frame the authors probably owe much.

As to "*Gabiet*," by Mr. S. Jackson, of Bradford, the motto is, we imagine, the abbreviated form of "*Gabiet on the Brain*" which would aptly express the state of mind that the author was in during the composition of this design. If we could count one we could add about a hundred more gablets to it. The "house with seven gablets" is a mere cottage to this fanciful building. The central feature of the main front is made up of a wide doorway under a gable. Above rise the tower and spire, which start with three lanky lancet windows, of course under three gables, next a string, and then another dose of lancets and gablets. Above these a minute arcade, with a gable over containing a clock-dial, the angles being occupied with gabletted pinnacles. On the slope of the spire are gablets. The design of the end pavilions is poor. In the whole there seems to be scarcely a square yard of plain honest masonry for the wearied eye to rest upon.

The plan occupies more space than that of the two former designs, and is straggling, and without any claim to praise.

These designs are proposed to be executed for 40,000*l*. each.

The reports accompanying the several designs had been removed before we entered the exhibition, which we regret, being curious to know the estimates attached to some, as well as a few other interesting particulars that the drawings alone could not supply.

We now turn from the consideration of the second and third premiated designs to those of the unfortunate.

"*Non quo sed quomodo*," This, we fear, is not the principle adopted by the Bradford corporation. This design is all parts and no whole. The main features are some hundred spikes, no end of gables, and an emaciated and cranky-looking spire of the ecclesiastical persuasion. Had the elevations, which are prepared with the finest lines, been bolder drawn, the author would have had a much better chance of steering clear of frippery. The plan is simple and good, but there is evidently some patent way of lighting corridors adopted which is not shown on the drawings.

"*Lycurgus*," Messrs. Mallinson & Bakewell, Leeds, is in the Flemish style of a late period, and is really very beautiful in parts, and would well bear execution. The spire portion of the main tower, however, is meagre, and the roofs of the angle towers facing the Leeds-road should be considerably elevated. The two pen-and-ink views are quite treats in their way; they are done with great feeling, and show a true appreciation of the picturesque. The plan, unfortunately, is very straggling, to some extent consequent upon the style adopted. Too much space is devoted to corridors. The two interior views of the borough court and council-chamber are nicely got up, but the inner hood arches to the windows are out of drawing.

"*Non Sibi*," Messrs. Connell & Adams, Birkenhead. This is a very original and fine composition, but very ill represented. It is eminently picturesque, and indeed one of the few in the collection we should like to see carried out. In this case the London "*Law Courts*" have been put under contributions for the circular angle towers; but then good use has been made of them. The roof of the central tower is out of perspective. It is very annoying to see so many elaborate and sometimes good drawings spoiled by inattention to the rules of perspective. If young architects could only be persuaded to sketch more from old or existing buildings, these specimens of professional deficiency would be much less numerous. The plan is good and compact, but greatly confused by the style of printing adopted.

"*Libra*," Mr. T. Harris must mean this title as a joke; for his design is conspicuous for the total absence of balance in it. The tower is too heavy; but the rest of the composition is bold, and the different portions of the building are well expressed. With a little more consideration, this would be an excellent design.

"*Fiat Justitia*," Mr. Mitchell has obtained his request. This is of the old English Classical type; a central pediment on eight columns, with projecting pavilions at the end of the façade, and a tower like that of the London Royal Exchange, at the Leeds-road end.

"*Vile Dulce*," Mr. G. Hall, London, is a quiet Italian group, looking better in the eleva-

* See p. 849, ante.

tions than in the view: the lines of the tower are very good. The arrangement of plan is satisfactory, with a few exceptions.

Quatrefoil in Circle, Messrs. Walford & Evill, is well worth looking at. It borders on the extra massive style, but has many charming hits, and makes a good group. The main entrance is composed of a bold and wide archway, from the haunches of which octagonal engaged turrets, decorated on the level of the second floor with canopies and figures, terminate in graceful pinnacles. Over this door and between the turrets are windows for the different floors, and these are surmounted by a gable. The central tower, which rises from the back of this gable, is quite plain until the arches are reached which contain the clock dials. Below the clock-faces in the recess of the arches are subjects in bas-relief. From the feet of the gables, over the clocks, project well-shaped octagonal spirelets, and between them runs a small arcade, from which the central lofty slated roof ascends. The main facade is very massive on the ground-floor, the light to the cells, &c., being admitted by small oblong openings. The windows of the first floor are contained in wide and deeply-recessed arches, with circles in the spandrels, from which project corbels holding sitting figures. The second floor has a continuous arcade of simple pointed windows. The dormer windows are not so successful. The chimneys are good. The main facade is terminated by graceful gables, with hay windows to the lower floors. The spiral slated tower at the Leeds-road end of the building is a fine composition. The plan is simple, and calculated to work well. The oriel turret to the Chapel-lane front is a great success. The authors have wisely, in their view, raised the central tower above what is shown in the elevation, but the dormer windows have suffered by the change made in them. We must give Messrs. Walford & Evill hearty commendation.

The design next in priority, but not in quality, falls under the sign of the "Boar's Head." The character of being important has not apparently assisted the author of this anonymous plan, although he has sent in two designs, Classic and Gothic, embodied in fifteen drawings. The tower of the Classic design is an original and fair composition, but the rest of it is tame. The circular tower of the Gothic design has something novel and good about it; but the portion over the dome is inferior to the rest. The plan is straggling, and, with some good, has several weak points in it. The exterior views are beautifully coloured.

"*Meum*," by T. Turner, Bedford-row, London, which the councillors have not wished to deprive him of, is evidently got up in a hurried manner, which is the greater pity, as the plan is the most compact and one of the best in the collection. The main tower is bold and well put together; but there is in the whole a want of that finish which the author has shown himself well capable of imparting; as, for instance, in the "Lancashire Insurance Buildings," in another chester. We should imagine this to be the cheapest design in the collection.

"*Honour*," by Mr. Ralph Nevill, shows signs of youthfulness and want of time. More care would have been of service.

In "*Honesty*" the tower is rather good and original, being apparently the last and best effort of the author.

Mr. Fairbank's design is well grouped and good in outline, and the tower is original. The details are too small and cut up; the plan, however, is quite up to the average.

The author of "*Spes est Solatum*," J. N. Crofts, Liverpool, is the most fortunate of the unfortunates, as he may be said by his motto to have created for himself a fourth prize, not mentioned in the conditions. He can with a safe conscience now inform his friends and admirers that his is a premiated design; and it is well for him that such is the case, for otherwise he never had even the ghost of a chance of reward.

Mr. J. P. Seddon, of London, has submitted a fine composition. The grouping is excellent, and there is great invention shown in the central tower, as well as elegance in other parts. The wings and end towards Leeds-road are agreeable, and the plan is good, although, perhaps, occupying more ground than any of the others. The colouring of the sky, in his principal view, interferes greatly with the design.

Messrs. Driver & Co., of London, must rue the day that ever they competed for this townhall. Their design is very fair, but the plan is not equal to it.

The remainder of the designs do not call for notice.

The effect that the examination of these designs has produced upon us is one of sadness; and for several reasons. First, that so much good work has been done, for nothing; secondly, that inferior work has received prizes; thirdly, that so much bad work should be executed; and, lastly, because of the immoral effect that such competitions have upon the profession. Architects are led to be untrue to each other. Some court of honour is required to restrain them, and the public in connexion with them, similar to that established in Austria for the control of the army.

THE IMPROVEMENT OF THE CITY AND THE PASSAGE OF THE THAMES.

THE human heart, we are told by anatomists, is divided into distinct chambers, destined for the reception, and for the discharge, of the full tide of life, through the pulmonary and the systemic circulations. It is not our purpose here to trace the gradual simplification of auricle and ventricle in the structure of the reptile and of the fish. We refer to the subject as an illustration of the operation of that great diaphragm which divides into two separate systems the circulation of the heart of the British Empire; or, in other words, of the obstruction caused by the Thames to the street traffic of London.

The functions of the river, indeed, are complex. While on the one hand it impedes, on the other hand it serves, the purposes of intercommunication. When London was only a city, and Westminster was another city, and no man had dreamed of the rise of a vast province overgrown with buildings, the Thames was the main highway, at once of commerce, of state, and of pleasure. The great natural harbour formed by its estuary was the cradle of the commerce, and thus of the liberties, of London. When Saxon kings held festival at Westminster, and when Tudor sovereigns sent their traitors to the Tower, the river bore their state, and formed their military line of communication. When Whittington sent out his simple, or desperate, venture, tradition says, his famous cat took ship at a wharf on the Thames. But, from times so remote as almost to pass historic memory, or, at least, to allow us to realise the state of bridgeless London, the sea-borne traffic of the great port has been kept eastward of the central part of the City, where the street frequented by the Lombard merchants ran into the line of retail shops called Cheapside, by the time-honoured barrier of London Bridge.

Since the first piles were driven on the spot that was then a ferry, a compromise has been carried out between the land-borne and the water-horne traffic of the city and port of London. A rude wooden structure,—first a fortified entrance; then a street lined with quaint overhanging shops, and peopled by frugal tradesmen, who lived, and thrived, and reared their children, over the rushing tides of the Thames; last of all a bridge, and nothing else,—London Bridge has in each case been the western limit of the seaborne traffic of the river. The unwieldy, shapeless troughs, which we might call peculiar to the Thames if we did not remember the *chalandes* of the Seine, seem to owe their origin to the necessity of passing through the low, narrow, apertures that were left between the clumsy piers and hissing dolphins of the ancient bridge. No mast, worthy of the name, could pass the barrier, after the plan of opening a swing bridge was once abandoned. The trade, the commerce, and that which did duty for the architecture, of London grew up on this principle. The Custom House stood hard below the bridge. The Tower, until its military importance gradually dwindled to its present nullity, kept watch over the thick of the shipping. And, to this hour, vessels, propelled by the power that is so rapidly revolutionising the world, from the ports of France, of Belgium, of Holland, and elsewhere, discharge their passengers on the wharf between the Bridge and the Custom House.

So far has it been taken as an accepted fact that the position of London Bridge was a physical feature of the country, as much to be respected as the cliffs of Dover, and as incapable of alteration as the hours of the tide, that a large province, covered with buildings, and containing nearly a million inhabitants, has grown up, on either bank of the Thames, below the bridge, without making any attempt to have a

bridge of its own. The time, and labour, and trouble, which the inhabitants of this district experience, when they wish to transmit their persons or their goods from the northern to the southern bank of the river, it is not easy to estimate. The waste is enormous. It has been submitted to almost as if it were a law of nature. One great passage, not over, but under the stream, was long the pride and the wonder of the engineering works of this country. But that the population never took altogether kindly to the use of the Thames Tunnel is evident from the fact, that it is at this moment being converted from a highway into a railway crossing. The small passenger tunnel from Tower-hill, to which we have repeatedly had occasion to refer, is as yet untried as to its receipt of public favour.

With the annual increase of the population and commerce of London comes an annual increase of the inconvenience experienced by the inhabitants of the eastern district. As they, to a very great extent, consist of the humbler classes, of course this is not a subject to excite much interest in amateur legislators or hungry speculators. For the shipwright, or the mason, or the small artisan or tradesman, not only is his time his money, but it may be called his bread and cheese. Make him devote half or three-quarters of an hour daily to an extra walk, in order to get over an out-of-the-way bridge, and he will weigh so much the less at the end of the week. Not only will he be, to some extent, reduced by the unnecessary exercise (which people who only walk when they choose may recommend as an excellent sanitary process), but he will have so much time the less for earning, or for sleep. We apologise for mentioning so humble a topic. To persons so impatient of the waste of five minutes, as are most of those to whom the rest of the twenty-four hours is spent in the effort to kill time, it must seem a very miserable matter to talk of a bridge for the poor people at the East end. Why cannot they stay on that part of the river on which they happened to be born? Why were they born at all?

But the shoe pinches in another place. It pinches us. We, City magnates and merchants, west-end speculators seeking our brokers, suburban residents on the Brighton line of railway, we all have need of London Bridge. And, to our intense disgust, we find that we are often hindered in crossing it. The immense flood of down-river traffic that is forced up to cross the Thames at this lowest available point, jostles with that natural to the locality. From Goldsmiths' Hall to Westminster Abbey we have a bridge every quarter of a mile. But to the quarter of a mile since of London normally appropriate to London Bridge, has to be added a width of six times the dimension for the Eastern district.

Not that, even now, London Bridge can be said to be altogether inadequate to the traffic which comes upon it. Year by year the difficulty becomes greater; but at this moment, it is rather a question of police than of engineering, and, still more emphatically, is rather a question of approach than of bridge.

The City officer, who has given much and well-directed attention to the thoroughfares of the metropolis (though he has added little or nothing to the statistical information collected so far back as the year 1868), both expresses an opinion coincident with our own, and furnishes us with the means of verifying those opinions. Looking at the London day as being nine hours long, we find that 19,000 vehicles pass in a day over London Bridge, as compared with 5,000 over its nearest neighbour, Southwark Bridge. This is not a traffic to choke a bridge which affords room for four uninterrupted lines of vehicles to pass at the same time, two in each direction. If we allow the vehicles to pass in equal numbers both ways, and consider the entire traffic to be carried on during nine out of the twenty-four hours, we arrive at 2,111 vehicles per hour in all, or at 1,055 passing either in or out of the City. If we further estimate that two-thirds of these vehicles use the quick line, and one-third the slow line (into which the traffic is now directed by the aid of the police), and allow a rate, over the bridge itself, of five miles per hour for the former, and two miles per hour for the latter, we shall arrive at the distance which would separate one vehicle from another, if they followed in one evenly-distributed string. Of course, they do not present this exact average, being closer at certain hours than at others. Still, the inquiry is by no means illusory. The swiftly-passing vehicles would

ollow at intervals of 12½ yards, and the slow ones at intervals of 10 yards.

We invite Mr. Haywood, on whom very much of the responsibility for a due provision to meet the public wants will probably devolve, to apply to the elucidation of the question of the hinderance to the City traffic that occurs on London Bridge and its approaches, a little more of that care to collect statistical information, by means of which he has taught us the relative duty performed by the principal street crossings. It is requisite to know, in order to deal exactly with the matter, the exact volume of each of the distinct streams of traffic that unite, cross, or separate, within the Y-formed belt of road north of the bridge. Each of the seven converging thoroughfares conveys distinct systems of traffic. The divisions of up and down, and of light and heavy, are obvious, though the latter is not distinguished in the details of Mr. Haywood's report. But it is necessary further to know what goes over the bridge from each feeder, what runs from feeder to feeder, and what runs straight across the main line of communication.

For instance, Cannon-street brings down a certain number of vehicles that turn to the right and cross the bridge. It brings down a smaller number that turn to the left, and go towards the Bank. But it brings down a third series, and we suspect that it is the largest of the three, that go up into Gracechurch-street. Now the first and the second groups are easily dealt with,—but every one of the third causes, or is liable to cause, a pulsation in the entire line of concentrated over-bridge traffic.

The same line of reasoning applies to Arthur-street, east and west, to Gracechurch-street, in short, to each of the converging lines of highway. We want to know, in the first place, exactly what the traffic is, not merely in block, but in detail; and then we shall be able to state with great precision what any local improvement will, or will not, effect.

It is clear that one of the main objects to be kept in view, is the relief of London Bridge, by the increased use of its nearest neighbour, Southwark. It is probable that all, or, at all events, the greater part of, the traffic which now comes along Cannon-street to cross London Bridge, is traffic properly belonging to Southwark Bridge; but which is diverted from its proper course by two serious obstacles. Of these one is the steepness of the incline over not only the approaches, but the bridge itself. On the northern side the gradients are actually as steep as 1 in 18, making the horses lift nearly one-fifth of the load which they ought to draw. On the Surrey side they are 1 in 24. The other obstacle is one of plan. When the narrowness of the northern part of Queen-street is also considered, it is clear that, as far as the City side is concerned, Southwark Bridge has not a fair chance, especially as regards heavy traffic. On the Surrey side, again, the approaches lead nowhere. The noble new avenue of Southwark-street, which as yet has not attracted its due share of traffic, curves northward as it approaches London Bridge, so as to be as unfavourable as possible for diverting any of the traffic coming from the south, which might, on a better plan, naturally follow the Southwark Bridge route.

The consideration of the gradients of Southwark Bridge, with a view to their being brought more into accordance with the requirements of heavy traffic, and the rearrangement of the approaches, so that they should invite, instead of repelling, traffic, are matters incumbent on those who are responsible for the improvements of the metropolis.

With regard to the east and west traffic, which causes so serious an inconvenience to the course of the more active intercourse from north to south, two methods may be pointed out for obviating the evil. The adoption of one or the other will, sooner or later, prove imperative. The aid of police arrangements would be requisite for the accomplishment of each, as well as certain enlargements and alterations in the existing streets. The great facility to traffic which is afforded by the unobtrusive action of the two policemen who now act as sieves on London Bridge, sifting the light from the heavy conveyances, is, however, such as to reassure the most strenuous advocates of British freedom, and to convince them of the fact that, in crowded thoroughfares, the policeman is a true and useful adjunct of the surveyor, and that the exercise of his preventive functions will, if neglected, be replaced by that of his more costly function when evil has actually occurred.

The two methods in question are these. First,

to divert all the east and west traffic when, or a little before, it strikes the line of the London Bridge approaches, and to cause it to pass under a land arch at a lower level. The objection to this plan is, not so much the outlay necessary for adopting the existing passages to this new service, as the addition to the labour of the heavy vehicles in descending and reascending from the level of Cannon-street to that of Thames-street.

The second method would involve a partial widening of King William-street, as well as the removal to a more convenient spot of the statue which is at present, as a question of interference with traffic, so extremely ill placed. The plan by no means applies to London Bridge alone. It might be applied to all the great cross knots of the metropolitan traffic. It is based on the fact, that while a direct cross traffic causes a double and formidable interruption to both streams, it would be quite possible to *dam* the same amount of vehicles in between one another with very small inconvenience. To effect this, two dolphins, or islands, or points of resistance, must be taken, at equal distances above and below the intersection of the cross-roads. Let us suppose, for the sake of illustration, the statue of King William to be removed to the point opposite the intersection of Arthur-street, and a similar pillar to be set up in King William-street (which for that distance must be widened), at an equal distance to the northward of the fork of the Y. Every carriage coming from Cannon-street with the object of passing into Gracechurch-street, should be compelled to turn to the left on entering King William-street,—to fall into the file of northward-moving vehicles on the western side of that street, and to *dam* its way through this file to the centre of the road. Arrived at the dolphin, the vehicle would have to turn round the island, which could be done without any arrest of the proper traffic of the street, to make its way into the southward-bent line of vehicles, and to edge out of this at the corner giving access to Gracechurch-street. For west-bound traffic a corresponding route would be taken; the lower dolphin, opposite Arthur-street, being in this case the turning point.

By this method, at the cost of two turns, and of a few additional hundreds of feet of traction, the hinderance caused by the crossing of the two lines of traffic at right angles would be greatly lessened. The difficulty would be "turned," not met full in the face. The plan, as a novelty, may seem complex upon paper, but, with the experience of the London drivers, and the almost insensible aid of the police, a very few days would suffice to admit of its introduction, to the great saving of delay, and avoidance of foul language, so only that sufficient width of roadway were accorded for the purpose.

Supposing all this to be effected, there still remains the unquestionable fact, that the means of passage across the river are urgently demanded by the great metropolitan district east of London Bridge. East of a straight line drawn five miles to the north, and five miles to the south of London Bridge, are no less than thirty-seven metropolitan districts. Of these the twenty-five to the north of the Thames, in 1861, had a population of 667,000. The nine to the south of the river at the same date included 282,000 souls. A total of 949,000 inhabitants cries out for an over or under river bridge. It does not require the gift of prophesy to predict that, before many years, we shall see the approaches to the existing bridges arranged on the principles of common sense (civil engineering is only common sense reduced to form), and a new bridge constructed for East London either under or over the Thames.

REVUE GÉNÉRALE DE L'ARCHITECTURE.*

OUR much-esteemed contemporary, the *Revue Générale de l'Architecture et des Travaux Publics*, often noticed in these columns, has now attained the thirtieth year of its issue under the auspices of M. César Daly, its founder; and we cannot but say again a few words in praise of the high character it has maintained, and the good service it has performed up to the present day. The last half-dozen numbers are now before us, and they appear in every respect to come up to the

* *Revue Générale de l'Architecture et des Travaux Publics*, publié sous la Direction de M. César Daly. Numéros 11, 12, 1868; 1, 2, 3, 4, 1869. Paris: A. Morel, Rue Bonaparte.

lofty standard it has set up for itself. It will give, perhaps, some of our readers information concerning the manner in which an art journal is conducted in France if we state that it appears in single or double, and sometimes triple and quadruple numbers at irregular intervals, but with sufficient method to insure the issue of twelve numbers in the course of a year. The price of the folio volume thus composed of a dozen parts is forty francs in Paris, and forty-five francs in the departments. Although new buildings are described and illustrated, as well as ancient monuments, building-news forms no part of the scheme; but the death of architecta of every country is recorded, and accounts are given, when possible, of their works. Current competitions are briefly mentioned; and a short chronicle is drawn up of any distinctions conferred upon architects. The volume for 1868, which we take as a fair sample, concludes in the numbers before us with a bibliographical list of works, published within the year, relating to architecture. Six books, only, appear in this catalogue. The illustrations consist of about sixty steel engravings, executed, for the most part, with a painstaking finish that may be taken as a explanation of the irregularity in the publication of the numbers. Besides these there are, occasionally, chromo-lithographs and woodcuts.

The volume for 1868 is brought to a close with notices and illustrations of several more than ordinarily interesting buildings;—notably a plan and sections of the French Exhibition of 1867, with those of some of the principal foreign pavilions erected around it. These have not now the attraction of novelty, but they have the value of exactness in the matter of details. The Indian pavilion and the Chinese kiosk or the constructions shown in the last numbers for 1868; and the Tyrolese houses, with all its details and practical peculiarities, and the magnificent palace of the Bey of Tunis, follow up the subject in the volume for the present year. But before parting with the old year's work, we must notice two other buildings illustrated in it,—*habitations d'artiste*, or two houses, the one designed especially for a painter by M. Amoudru, the other for a sculptor, by M. Uchard, and both built in Paris. Many an English student, doubtless, casting about in his mind for a suitable subject for designs for exhibition, has thought of residences specially adapted for a poet, painter, sculptor, and musician, as opportunities to show power of arrangement and contrivance, but ultimately abandoned the scheme. In Paris, however, there are many realisations of this wandering thought, some of which have been illustrated, and here we have mansions for a painter and a sculptor. The first is shown in a section only; the latter by plans of the four floors, including basement, in which easy access to the different *ateliers*, and contrivances for the removal of large pieces of sculpture, are the most noticeable features. There is, too, a sheet of plans of workmen's dwellings that we should not pass unnoticed. On this we have six types of houses erected for foreign working people, which have, naturally enough, a strong family likeness to those provided by large firms for our own artisans. There are the houses built by Messrs. Japy, Brothers, & Co., at Beaucourt, Haut-Rhin; those by the Baron de Behr, in Pomerania; Messrs. Houget and Teston, at Verriers, Belgium; and those erected by the Auzin Company in the department *du Nord*, France; some built back-to-back; some with what the French call *caves*, but which we term cellars; some with three and some with four rooms. Cramped and bare, as some of them are, the entrance-door opening at once into the room, all are an advance upon the four low walls that formerly formed the homes of the great mass of the working population all over the world; showing that if we have by no means reached perfection in this department of the necessities of life, we are, at all events, making progress. We are informed that the Société Verrièreuse has commenced building a new type of house, that was not represented at the Exhibition of 1867, in which further improvements have been made.

In the fifth and concluding article upon the antiquities of Eleusis, we note that the author, M. Lemonnier, quarrels with the English antiquaries who have published views of the restoration of the *Anactoron*, for having done so with but a partial examination of the remains. Three quarters of their restoration, he says, are composed of conjectures without foundations.

The volume of the *Revue* for the present year opens well with a varied collection of subjects.

Foremost is a description and illustration of a very curious and handsome casement in a free-stone building known as the house of the Three Nurses, in Narbonne, dated 1558. Rabelais is said to have loitered here in the course of one of his journeys to Rome, and to have received some inspiration from his inspection of the caryatides with which the casement is decorated. There are five figures in it, two of a large size upholding a frieze over the window, and three exactly corresponding with them, except that they are on a smaller scale, which do duty as mullions. Below the frieze are eight lions' heads, from whose mouths an ornamental chain is festooned across the width of the casement. The glass is in small panes arranged as hexagons inclosed in octagons. This architectural curiosity is followed by details from that part of the Petit Luxembourg, Paris, that was formerly the convent of *Les Filles du Calvaire*. The chapel of this fabric, it will be remembered, has been demolished, but the cloisters are utilized as a winter garden.

To these details, which are chiefly portal, succeeds an elaborate essay, entitled "De l'Architecture de l'Avenir à propos de la Renaissance Française," by M. Daly, in which architectural effort is traced from the primitive cone of the tumulus and pyramid to its highest achievements. This is accompanied by a table of styles-types, in which the various styles are referred to systems of social ideas. The first style, or that of the straight line, practised by the Egyptians in the first degree, all their evolutions being rectilinear, is associated with a political system described as *Unité puissante, Liberté nulle*. This same rectilinear style, expressed, in a second degree, by the Greeks, is attributed to a state of things exactly the reverse of this: *Liberté puissante, Unité nulle*. The Roman mixture of rectangular with curvilinear lines is supposed to be the result of a mixed political system. The styles of the Middle Ages represent order produced by authority, *L'Ordre par l'Autorité compressive*; that of modern times, from the Renaissance to the present day, is the growth of a mixture of political ideas and sympathies; that of the future, which is to be founded on the ellipse, is to be the result of order maintained by liberty, *L'Ordre par la Liberté*. A second table traces the influence of French society upon modern architecture, through the mazes of Renaissance, eclecticism, and rationalism, pointing again to the ellipse as the basis for an expression of the distinctive aims of the present day, and of the future into which we are immediately drifting. This essay, to which its author attaches much importance, may demand examination hereafter.

Following this review of the past, present, and future of architecture, is a description and illustration of the *tribunes* newly devised for the Parisian race-course, in the Bois de Boulogne. Paris. These are ornamental seats, arranged in groups, as in our "grand stands." The stand, which is almost as ornamental as the Tyrolean cottage illustrated, is divided into accommodation for three ranks of spectators: an imperial pavilion in the centre; private boxes on each side of this; and the public seats to which anybody can have access who likes to pay the sum charged for the privilege; and each class is furnished with a separate entrance. It is built of three stages, that on the actual ground-line being of no avail for seats; these are principally on the first or raised floor, but a second point of vantage is gained on the flat top thrown out over them, which serves as protection also from the weather to those below.

Another is provided in a light campanile, with which the attractive structure is furnished. The baths and public lavatories at Caen, by M. Auvray, are shown in two sheets of plans and elevations. A practical paper on retaining walls, with a sheet of profiles, by Lieut.-Col. Michon, is followed by a descriptive sketch of the church of St. Augustine, by M. Bouchet; and then comes a notice of the current competitions. The first of these last-mentioned *concours publics* is for a theatre in Constantine, Algeria, for the best designs for which three prizes are offered respectively, 3,000, 2,000, and 1,000 francs; an uninviting competition for a church at Arras follows, which the editor thinks can be scarcely intended seriously; a *concours* for a statue of Boerhaave, for Leyden, in the Low Countries, is mentioned as open; and one for a monument to the memory of Rossini, is noticed as having been decided in favour of M. A. Dillon. Austria has two competitions on the list, one for a grand hôtel-de-ville in Vienna, and the other

for a fish-market at Trieste. The prizes offered by various societies are also catalogued. A bookcase, by the brothers Gueret, and a collection of halsters of the seventeenth and eighteenth centuries, are among the smaller objects illustrated. Preceding the list of archaeological works, which, as we have stated, concludes the instalment of the *Revue* before us, is a summary of European items bearing upon the fortunes of architects and prospects of architecture, such as word of the distinctions awarded to architects in different countries, in the form of medals and orders, the honours recorded in this part of the work being the decoration of the order of the Medjidie, from the Sultan, upon the proposition of the Viceroy of Egypt, to M. Daly, and the gold medal of the British Institute to M. Lepsius; notice of the French archaeological congress at Loche, and the international exhibition at Munich; the names of the competitors from the School of the Beaux Arts for the great prize at Rome; and word of the formation, in Paris, of a new society for the building of cheap dwellings, under the title of *L'Épargne immobilière*. We wish our contemporary a strong tide and a fair wind, and should be glad to hear he had many subscribers in England. At the same time, we remind our readers, for their advantage, that this work, and those of other countries of a similar character, will be found in the library of the South Kensington Museum.

THE DUDLEY GALLERY, PICCADILLY.

THE third Winter Exhibition of Pictures in Oil, under the management of the committee of the Dudley Gallery, Egyptian Hall, now open, consists of 212 paintings and 3 terra-cotta figures. It makes no very high claim for critical admiration, but includes, nevertheless, a number of excellent and interesting works. We may especially point to those by Mr. G. D. Leslie, Miss Rebecca Solomon, Mr. F. W. Hulme, and Mr. George Mawley. The principal work of the last-named artist, "In the Borghese Gardens" (81), is a landscape of great completeness and beauty. Mr. Leslie's No. 134, marked,—

"Be pained, and counted,
While the church clock struck,
In measured numbers the appointed hour,"—
is full of grace and tenderness. "At the Fountain, Rome" (169), is as well painted as anything Miss Solomon has yet exhibited. "The Mouth of May" (16), by A. B. Donalson,—

"Mater amabile, ora pro nobis,"—

is brighter and cleaner than previous works, by this thoughtful and clever artist. 34, "Wandering Thoughts," by Miss Starr, a forcible head, serves to keep alive the good expectations entertained respecting her. 60, "A Train-bearer," Briton Riviere; 84, "Water Lilies,—on the Tiber," Talford; 110, "Whistle and I'll come to you, my lad," Kesley Halsewell; "Devouring," a favourite Author" (138), C. Goldie; and "Italian Gossips" (144), Frank W. W. Topham, are all works of merit, and are entitled to praise. Mr. Smythe should be mentioned for his 151, "A thick Night of the Goodwins," which tells a story forcibly; and Mr. Claude Calthrop has made considerable advance in his art, and bids fair to take a good place.

THE IMPROVEMENT OF OUR PUBLIC STATUES.

I WAS requested some time since to consider the subject of our public statues, and to offer some hints thereon. The accompanying memoranda occurred to me, which, if well considered and amended by the suggestion of others, might form a good basis of a scheme of action for securing satisfactory statues and memorials in the public places of the metropolis.

PROPOSAL FOR A COMMITTEE ON PUBLIC STATUES.

To consist of the Chief Commissioner and the other Commissioners of her Majesty's Works and Public Buildings; of the architect of that Commission; of the President and one other Fellow of the Royal Institute of British Architects; of the President and two other members (an architect and sculptor) of the Royal Academy.

It is suggested that on all occasions, when it is proposed to put up a statue or memorial of any distinguished public man, in some conspicuous place in the metropolis or its neighbourhood, the same should be done under the sanction of the said committee.

That a model or drawings of the entire memorial, comprehending any pedestal, steps, &c., must be submitted, with a description specifying—1. The intended size; 2. Materials of which it is to be composed; 3. The name of the artist employed; 4. The contemplated expense of the total cost; 5. Intended period of erection; 6. The expected site.

N.B.—It is expedient that the design or model should be submitted to the said Committee before the execution of the statue or memorial is actually begun.

When the full-sized figure is completed, and cast in plaster, it should be put up with an extemporised pedestal, or other accompaniments on the spot it is intended ultimately to occupy; and the committee should inspect it, so that, ere it be too late, a just appreciation can be had of its appropriateness, whether in size, proportion, or general composition, and any defect in these respects can be remedied before the execution is commenced.

That plans should be prepared in the office of Her Majesty's Commissioners, showing the sites of any public areas or buildings calculated to receive statues and memorials, and with elevations and dimensions of any pedestals already erected, and calculated to receive sculpture. *Et, gr.*, the pedestals at both ends of London Bridge and other bridges; along the line of the new quays of the embankment of the Thames; the four pedestals in front of the British Museum, and scrolls of the pediment, and of the pediments of the Royal Exchange, Mansion House, and Royal Palace, &c.; the entrances to the parks, especially the archways to Hyde Park, and completion of upper part of the Marble Arch, &c.

That a plan should be prepared, showing the present distribution of Trafalgar-square and Waterloo-place, St. Margaret's-square, Westminster, and other open public spaces and areas, with a scheme for the mode in which any future statues or memorials should be permitted, so as to harmonise with the present ones, in arrangement, altitude, area, and other particulars.

Such data being prepared will afford the committee the opportunity of knowing fitting positions for such memorials, and lead to their being able to advise with the promoters, and decide upon their nature and size.

That such committee should have the power of submitting to the Government propositions for completing the architectural and sculptural effect of various public buildings, which in London (with a few notable exceptions) are generally deficient in sculptural embellishment. That this is necessary, in order to give full effect, may be seen in the buildings of France and Italy, and is most obviously apparent in our Gothic edifices, all which are generally rich in external sculpture. This would also give encouragement to our sculptors, and advance the art,—objects which it was the aim of the late lamented Prince Consort to promote in the completion of the new Houses of Parliament.

In order to avoid as much as possible the disastrous effect of metal statues, which in a few years become black and heavy in tone, and to diminish the liability to destruction hereafter from the value of the material; and having in view the corroding effect of our atmosphere upon marble, it is desirable to promote the execution of statues, as much as possible, in grey granite unpolished, like the statue of King William IV. near London Bridge. Grey granite is not affected as marble or stone, and preserves its clear bright tone. That statue proves that all the essential parts can be finished with great precision (as among the Egyptians), and that sufficient accuracy of detail can be given to the minor parts of the sculpture exposed in out-of-door positions, and where they must necessarily be of sufficient scale to height them for the locality.

It is desirable to avoid placing bronze statues in places where trees or foliage would be heaved them, as they never come clearly out in relief from a dark background.

THOS. L. DONALDSON.

The Metropolitan District Railway Extension.—It has been resolved by the Metropolitan Board of Works, "That the Metropolitan District Railway Company be informed that the Board will strenuously oppose any project which will prevent the railway from being carried to Tower-hill, and the Inner Circle from being completed by them according to the original scheme."

WEST BROMWICH DISTRICT HOSPITAL.

Two memorial stones of a new hospital to be erected at West Bromwich have been laid by the Countess of Dartmouth, in the presence of a large and influential assemblage of the nobility, clergy, gentry, and various public bodies of this portion of South Staffordshire.

Situated in the midst of a wide and densely populated district,—surrounded on every hand by collieries, furnaces, and large works of various kinds peculiar to the Black Country, where the toiling thousands earn their daily bread, exposed to all the dangers of mining on the one hand, and accidents by machinery on the other,—injury to life and limb there are matters of continual occurrence. For the relief of the unfortunate sufferers, the only institutions where they can be accommodated and properly treated are the two hospitals, at Birmingham on the one side, and the South Staffordshire Hospital, at Wolverhampton, on the other, the distance to either from this neighbourhood being between five and six miles. It is with a view to meet the want thus so urgently felt that the new hospital at West Bromwich has been projected.

A committee for carrying out the details of the scheme was appointed in September last year, and the following facts are gleaned from their report, presented at a subsequent meeting. After stating that the committee had visited several of the principal hospitals in the adjoining towns for the purpose of collecting information both as to the construction and management of hospitals, the report proceeded as follows:—

"The committee gained important information from their visit to the Birmingham General Hospital, which embodied all the modern improvements so far as they could be adopted. There were two general principles upon which hospitals were built, viz.—the 'corridor' and 'pavilion' principles. The 'corridor' plan was that in which the wards and rooms abutted, and were parallel with a main central passage or corridor of the building, which rendered it impossible to have windows on one side. The 'pavilion' plan was that in which each ward was detached from all other parts of the building, excepting by a connecting passage, thus enabling windows to be placed on each side, and, if desirable, also at one end, in this manner securing three aspects, and an abundance of light and ventilation. The committee decided on the 'pavilion' principle of construction, with a minimum of cubical space per bed of 1,500 ft., and an abundance of light and ventilation. The hospital would contain forty-two beds, with administrative offices, but wards for only twenty-two beds would be erected at present, leaving the entire fulfilment of the design till the institution has, by its operations and usefulness, made the necessity for its completion to be fully recognised. The designs of Messrs. Martin & Chamberlain, of Birmingham, architects of the Birmingham General Hospital, had been adopted; and a site on the Lodge Estate, fronting Edwars-street, at right angles with Lombard-street, and containing an area of 6,000 yards. The present outlay will involve a cost of about 9,000*l.*, including the cost of 6,000 yards of land, 'Lodge Estate,' and the completion and furnishing of the building as an hospital."

The subscriptions already amount to about 7,000*l.* The following is a description of the building, as it will be when erected:—

The hospital will consist of a central building with two wings. The central building will contain the out-patient department and the administrative department. The wings form the hospital department, and will each contain two wards for patients. It is intended at first to erect one only of these wings.

The entrance doorway of the centre group of buildings opens into the waiting-hall for patients. This hall is 23 ft. long by 15 ft. 6 in. wide. It has on one side the surgery for general purposes, and on the other side the dispensary, each of these rooms being 16 ft. 3 in. by 14 ft. A door opens from the waiting-hall into the physicians' and surgeons' consulting-room. Next to this room there is a committee-room, and on the other side the central hall are the living-rooms for the resident surgeon.

Beyond this block of buildings, and running at right angles to it, is the corridor connecting the wings with the main building.

Each wing will contain two wards, each ward being 40 ft. long by 25 ft. wide, and 15 ft. high; and so each ward will accommodate ten beds, each bed will have a superficial area of 100 ft., and 1,500 cubical feet of space. The fireplaces will be built in the centre of the wards, and will be used both for warming and ventilation. The wards will be well lighted, having windows on three sides, and will be thoroughly well ventilated by a system of flues, to be used both for warming and ventilation. Adjoining each ward is a semi-detached block of buildings containing bath-rooms, sculleries, and water-closets.

There is also a room attached to each ward, which will be used as a sitting-room by the patients when their health is sufficiently improved.

The nurses' rooms will be placed adjoining the wards, and commanding a full view of them.

Each wing will have a separate stone staircase, and a mezzanine floor will be formed, leading off the staircase, which will contain linen-chests and stores for clothes.

The kitchen buildings will be opened at the back of the corridor connecting the wings with the main building. This group will consist of a kitchen, 18 ft. square; a scullery at the back, 18 ft. by 12 ft.; and a large larder and pantry. The apparatus-room for the heating of the building will be placed under the scullery.

A detached building will be erected at some distance from the general building, and will contain the wash-house, laundry, and drying-closets, and a dead-house and post-mortem room.

The buildings will be all of brick, with Pillough stone dressings. They will be faced with pressed bricks. The floors to the wards will be of oak, and the walls will all be finished in Parian cement.

The style of the building is Gothic, but, of course, not Ecclesiastical Gothic. There is very little ornament of any kind, and in fact none that is not directly obtained from the constructional necessities of the building. It is intended that both the workmanship and the materials of the building shall be of the best quality possible.

The total cost of the building, calculating on one wing only being erected at first, will be about 6,000*l.*

The architects are Messrs. Martin & Chamberlain, of Birmingham; and Messrs. Trow & Son, of Wednesbury, are the builders.

ENGINEERING AND ARCHITECTURE.

I READ with much pleasure the observations in your number of October 16th, headed "Architects and Engineers." I am only surprised architects and the public have not previously noticed the grievous blots made on the metropolis by the huge and ugly constructions which could have been made ornaments to our city in the hands of men educated in architecture. I will now especially allude to the Cannon-street arrival-shed, that hides from view in passing over London Bridge St. Paul's beautiful dome and its campaniles, as also the spires of the churches of Bow, in Cheapside, and St. Bride's, with many others of rare beauty; indeed, the thing is so monstrous and ugly, that it dwarfs all other buildings from that point of view. I used to hope that the business premises and warehouses on the banks of the north shore were very much improving, and becoming quite architectural. The brewery when Calvert's, now the City Brewery Co., began to have a classical appearance; and had it remained in the hands that commenced the river front improvement, would have had a most pleasing effect, and I suppose equally well adapted to its purpose as if it had been built only for use regardless of beauty. This is so effectually crushed, that it is unobserved by the side of its ugly neighbour, the said arrival-shed. Indeed, the monstrous City Boiler, far surpassing those of Kensington notoriety, I am afraid is likely to last in its place for many long years to come, and that we have no hopes of seeing it replaced by a beautiful building on its site, as we are at Kensington, where ugliness previously reigned supreme. I will also refer to the railway-bridge and its accessories on the Borough side of the bridge, once the most beautiful approach to a great commercial city; now, alas! a conglomeration of stunning noise overhead, equally annoying to the ears as the sight. All this could have been obviated, and the rail passed under the bridge approach at much less expense; but then the engineers would not have had the glorification of spanning an enormous thoroughfare with a scientific construction in iron; and it is this vanity of producing something wonderful in span, strength, height, or tunnelling, that has caused millions of money to be spent, and ugliness realised instead of beauty. I once asked a young man in an engineer's office (he being a drawing clerk, and knowing something of architecture) how it was that he could not introduce some of his architectural knowledge in his designs; his reply was that he had attempted it, and was told to bring none of his art there; it was not wanted.

Now, I can remember when the engineers' college was established at Putney, that there was a professor of architecture on the establishment, and that I received from Dr. Corie a note requesting the favour of the said professor and

his pupils to look at the progress, and take sketches and make notes of the works of a large house I was building for myself near Roehampton, and to which I gave a good deal of study, and which he was pleased to say was the most perfect of the style he knew of. This was some thirty years since: I still preserve his note. How greatly have the profession changed their views since the days of Dr. Corie! but the establishment did not flourish, and I suppose they threw the twin beauty overboard, and kept the young giant that has grown into a wonderfully powerful but ugly-featured monster.

This is the first time in my life that I have presumed to put pen to paper to an editor of a periodical that I esteem the pioneer of good taste, and which I have read from the first number to the present, and always with pleasure. W. H.

WASTE LABOUR TO WASTE LANDS.

At the Bristol Congress, Mr. F. Fuller read a paper "On the Increase of Wealth and Pauperism, Poverty and Crime, in this Country," in which, after pointing out, as we have often done, the cost to the country of ignorance and crime, and the growing numbers of uncared for children, he said,—

I may now be asked, Where are the means of doing all that you propose,—of maintaining, educating, and training these hundreds of thousands of pauper children, and these still more numerous ones who are growing up without any apparent prospect but that of vagrancy, mendicancy, vice, and crime? How keep our adult paupers and our prisoners at useful and profitable employment? how qualify them for such employment? and how find it for the latter when at large, without intruding on the already over-crowded market of the honest workman, who in all branches of industry experiences an increasing difficulty, an insuperable impossibility to obtain employment? Want of employment for the people, you say, is the principal source of other formidable evils. The labour-market is overstocked; there is not nearly work enough for those who are willing to do it, nor is there any tangible prospect of a diminution of the difficulty. Will you not increase this difficulty twofold by making our young paupers and vagrants, our adult paupers and criminals, competitors with our normal working population for a share of that which is already so inadequate to the demand for it?

I say emphatically, No. I would not narrow the field of employment for any,—I would expand it, in its several channels, for all, and prominently for the honest and untainted, now pining for want of it, by utilising inexhaustible sources of work, wealth, and general prosperity.

Briefly, then, I would apply "waste labour to waste land." In this principle lie the hope and certainty of natural safety and social regeneration. From a return presented to Parliament it appears that there are 31,861,040 acres of waste or uncultivated land in the United Kingdom. Of these it may be roughly estimated that an area of, say, 10,861,040 acres is unfit for cultivation, though, as is observed in the second report of the Industrial Employment Association, "the Chinese would probably cultivate most of these." It is further estimated in the same inquiry (which was not drawn up without due inquiry and consideration), "That other 10,000,000 acres would be adapted only to the growth of plantations of various kinds, such as timber, nursery stock, &c., but that the remaining 10,000,000 acres could be made as good for food-growing purposes as many thousands of acres of land now under cultivation, and that the annual value of such produce would be from 10*l.* to 20*l.* per acre." This calculation is justified by results obtained in innumerable instances, amongst others by Mr. Blackburn, at Aldershot, upon land formerly barren sand; and again by the Honourable Mr. Petre, at the Lodge Farm, Barking, where values varying from a maximum of 75*l.* to a minimum of 30*l.* per acre, according to the different descriptions of articles cultivated, have been produced. But taking the average produce of the new lands brought under cultivation at 5*l.* per acre, here we have the enormous aggregate of 50,000,000*l.* sterling added annually to the wealth, produce, and wages fund of the country, whilst the process of obtaining it would, as has been cogently remarked in some of the letters and articles which have appeared in the public journals, solve the whole labour difficulty by opening employment literally for millions of the people, not alone in agricul-

tural operations, but collaterally in all departments of manufacturing and productive enterprise, to which such an immense increase of the wealth created would impart a wholesome, solid, and permanent impulse.

The estimate of 5l. per acre may be challenged as too high, considering that the average product per acre of all the cultivated land in this country is under 4l.* But the kind of cultivation contemplated under the proposed plan is the thorough development, and at the same time the nutrition and sustentation, of all the resources and powers of the soil. Bearing this in mind, it will be seen that my calculation does not go above, but below, what could be accomplished.

It will be perceived from the tenor of my remarks that in the training of the young especially I regard employment in agricultural pursuits and the numerous vocations connected with them as the main resource on which we have to depend. My own long experience, confirmed by the unanimous testimony of all with whom I have been from time to time in correspondence, confirms the accuracy of this view. Twenty-seven years ago, when the school now at Redhill was located at St. George's Fields, and the boys were chiefly engaged at indoor, sedentary work, such as tailoring, shoe-making, mat-making, and so on (in all of which, let me remark, the labour-market is peculiarly glutted), they were greatly annoyed and troubled by the large proportion of desertions and relapses occurring amongst them, and by the restlessness and discontent of even the best disposed of them: not more than 30 per cent. of the whole were reclaimed. I beg you now to mark the difference when the scene and the occupations were changed. From the first report of the committee of the Industrial Employment Association, it appears that "when the school was removed to Redhill, and in addition to the above trades, the boys were employed at farming, gardening, brick-making, baking, laundrywork, and instruction in the duties of shepherd, cowherd, dairyman, the poultry-yard, blacksmith, butcher, &c., no less than 87 per cent. were reclaimed, and many of them became first-rate colonists, earning from 5s. to 10s. a day. A very large proportion of them are in regular correspondence with the chaplain of the establishment, and some of them have themselves become employers of labour." The fact is that active, varied, and cheering out-door exercise of the fields and gardens keeps up the boys' spirits, engrosses their attention, and also produces moderate and wholesome bodily fatigue, so that they sleep soundly, and there is no nightly planning and plotting for escape.

EXCURSION OF THE LONDON ASSOCIATION OF FOREMEN ENGINEERS.

On the 16th inst., the members and friends of this institution, more than 150 in number, paid a visit of inspection to the Abbey Mills Pumping Station of the great Main Drainage Works, West Ham.

At the entrance-gate of the high and middle level sewers, which cross the Stratford-road immediately beyond Stratford Bridge, the Associated Foremen, headed by their president, Mr. J. Newton, Royal Mint; and accompanied by Mr. Richard Moreland, Mr. W. Todd, and several other engineering employers, were met by Mr. G. Usher, resident superintendent engineer of the Abbey Mills Station. Passing along the grass-covered embankment through which the sewage tunnels at this point are conducted, an excellent view was obtained of the magnificent engine-house and its appurtenances which are on the south-west side of the embankment. The two chimney shafts, each 209 ft. in height, and standing isolated on either side of the building, appeared like sentinels constantly on guard. These large columns are externally octagonal in form, and are capped by ornamental iron roofs, pierced for the egress of smoke. The engine and boiler houses form one building. The decorations, which are very elaborate, consist of coloured bricks, encaustic tiles, and stone dressings, floriated carving being introduced at the caps of piers, columns, and pilasters. A cupola or dome of a highly ornamental character surrounds the engine-house, its topmost point being 110 ft. above the floor line. Right and left of the vestibule, and reached by descending

stairs of iron, are the stoking floors, in front of the boilers, of which there are in all sixteen, in two series of eight each. On ascending, the party was introduced into the engine-house, where the scene was striking in the extreme. The height of the building, the elaboration of all its details, its cruciform shape, and the gorgeously fitted-up engines within it, tended to convey the idea that it was a temple consecrated to the genius of science rather than an ordinary place of shelter for steam-engines.

The engines are eight in number, and are each of 112-horse power. They are disposed in pairs, and in such a manner that the eight steam cylinders stand round the centre of the edifice under the dome, from which the engines themselves are lighted. By this plan the visitor has an opportunity of surveying the peculiarities of the motors, which are the work of Messrs. Rothwell & Co., of Bolton, Lancashire. On the occasion of the foreman's visit, the whole of the engines were put to work simultaneously. Two hours were spent in unravelling the mysteries of the Abbey Mills Station, the gigantic pumps of which place lift the sewage of districts covering an area of 25 square miles a height of 36 ft., and whence it flows to the outfall at Barking.

At the termination of the visit some 70 of the visitors adjourned to the Royal Hotel in the Bow-road, where a collation was provided for them.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the second meeting of this society for the current session, on the 20th October (Mr. F. Horner, president, in the chair), a letter was read from the town clerk of Liverpool, requesting the society to consider a proposed amendment of the Liverpool Building Act, and to offer suggestions thereupon. It was stated that the council of the society had referred the matter to a sub-committee, who were going carefully into the subject, and that their report would shortly be forwarded to the town clerk. The Liverpool Builders' Association and the House-owners' Association, it was understood, had also been requested to co-operate in offering suggestions for the amelioration of the present Building Act, and for carrying before Parliament a draft of a more efficient and consistent Act.

Mr. G. A. Andley read the second part of a paper entitled "Notes of a Tour to Florence and Back," illustrated by numerous photographs of the cathedrals and churches of North Italy, dwelling especially upon the buildings at Verona and Padua. Among other buildings, he alluded to Giotto's Chapel at Padua, and strongly condemned the style of decoration employed there, especially the painted mouldings and cornices on the internal walls. He considered that Giotto's example in these respects had a very bad influence upon some of his contemporaries and immediate successors. The church of San Antonio, at Padua, in spite of its remarkable and picturesque outline, had, he thought, failed to solve the problem of the adaptation of the dome to Gothic architecture.

MOVING HEAVY BUILDINGS.

NOTICES of various feats of house-moving in America will be found in our volumes. Lately we have been pressed by correspondents to give further particulars of such doings, and finding the following account in the current number of *The Architectural Review and American Builders' Journal*,* we transfer it to our pages:—

"We had the pleasure of seeing lately an astonishing specimen of mechanical power and skill in Boston, which rivals the famous house-elevating process of the Chicago engineers. Tremont-street has to be widened from the corner of the Common out to the beginning of the new avenue. To do this it was necessary either to pull down the Pelham House, a fine new structure at the corner of Tremont and Boylston streets, or to move it bodily, sideways, about 20 ft., towards the Public Library. The house is 75 ft. wide by 100 ft. deep, five stories high, with a Mansard attic and a basement story, and is supported on square granite piers, with heavy partition walls of brick. These piers were first clasped with vertically-set timbers, and the whole house then jacked up a few inches from its foundations. Parallel foundation walls, about 2 ft. wide, were then built in the cellar floor in the direction of the intended

movement. Into the top surface of each of these low walls were embedded, side by side, five or six long strips of strap-iron. Under each pier or other support of the house were placed about twenty pieces of round rod iron, cut to an equal length of about 24 ft., and something over an inch thick. Each group of these short rollers, set crosswise of the strap iron ways, formed a square, upon which the bottom of the pier was allowed to descend and rest. Between all the rollers were interposed square rods of wood to moderate the motion. Of course, as the house moved forward on the ways, the hind rollers and their separating attics dropped out, and were re-inserted in front. The motive force was got by means of 60 or 70 huge wooden screws, with their heads against the first floor and their heels against the paving at the curbstone, the intermediate ground having been excavated. The building is said to weigh 50,000 tons; as it is a hotel arranged in the French mode, giving each occupant a complete apartment or suite of rooms on one floor, and is not only furnished but inhabited by all its boarders during the movement. It began to travel at eight o'clock in the morning of August 21, fourteen of the workmen being detailed to work the screws, and turning together at the sound of a whistle. The rate of movement was about 14 in. per hour. There seems to be no good reason for doubting that the Pyramid of Cheops, or St. Peter's at Rome, could be moved endwise or sidewise at pleasure, any required distance, by this same process."

What feats of this kind have been performed in England?

THE VICTORIA DEBATING SOCIETY.

SANITARY INSTRUCTION OF WOMEN.

The first meeting for the season of the members of this society—which appears to be an offshoot from the Victoria Institute, and the object of which is the discussion of all questions relating to women,—was held last week at the ladies' class-room of the Victoria Debating Society, 74, Newman-street, Oxford-street,—Dr. Hodgson in the chair.

Dr. Lankester delivered an address upon the necessity of Physiological Instruction for Women. One of the deficiencies, he said, in education in the present day was a want of the knowledge of the laws of life which regulated the existence of our bodies. It was well known to all who studied the statistics of the Registrar-general that a large proportion of the deaths which occurred from week to week were preventible. Since 1857 returns had been made of the mortality of 13 large cities and towns in Great Britain, and it was seen that sometimes the mortality of those towns was as large as 40 in the 1,000, while sometimes it sank as low as 17 in the 1,000. The difference did not arise from any dispensation of Providence; it arose from a neglect of an observance of the laws by which life was regulated. The Government had seen this, and had interfered so as in many cases to reduce the rate of mortality by the enforcement of sanitary laws—such as an improvement of drainage or the removal of vegetable matter. He asked his hearers to remember that the means which were effectual to save a life, saved at least thirty or forty illnesses as well. If harpurs were going at large and committing depredations, there would be a cry of "What are the police about?" But a murderer was at large—one who, in the form of typhus fever, was slaying its thousands—of the arrest of which they heard very little indeed. And yet the result of the exertions made in some parishes—such as St. James's, Westminster,—to stamp it out, showed that many of the lives now lost day after day might be saved. It was worth their studying how they were to gain the knowledge of the laws of the science of physiology, by which so much disease might be prevented. For his part, he believed that it would be better to teach children how to avoid disease, how they might live to old age, than to teach them to read and write. What he alluded to was to teach them—and particularly girls—the knowledge of simple things, such as the necessity of the proper performance of the functions of the brain, of the eye, and the other functions of the body; of the introduction of more air into the rooms in which we live by day and in which we sleep by night; and the use of pure and the avoidance of impure water. The learned lecturer urged the desirability of female servants being taught the deadly effects of bad drains,

* Mr. Mechi states that the present produce of all the cultivated land in the country is worth 170,000,000l. sterling, and that it ought to be 364,000,000l.

and the injurious results of burning an undue quantity of gas; teaching them that one gas jet consumed as much oxygen as four or five human beings. If the simple laws of life were more widely taught—and more particularly to those who ruled over and carried on the business of the household—the germ of disease would be destroyed, many thousands of valuable lives would be saved, much sickness would be averted, and great enjoyment of life promoted and secured.

NEW WARDS, MARYLEBONE WORKHOUSE.

THE St. Marylebone, like most other old work-houses, has been found quite incapable of accommodating the continually augmented demands upon its space arising from the increase of population and other causes. Moreover, the greater part of the building is fast decaying, and must of necessity be sooner or later entirely rebuilt. Some portions, past repair, have been taken down, as in the case of the old bakehouse, laundry, and kitchen. Other similar offices have been erected on more convenient sites, and the ground made available by their removal has been utilised in the erection of a building to accommodate the aged and infirm women.

The whole building now contains nine wards, each 40 ft. wide, 60 ft. long, 13 ft. high, and gives 780 cubic feet of air space to each of the 340 inmates. The cost of the buildings, including architect's commission and other contingencies, will be about 271, per bed.

The skirting at the back of the beds forms a box 9 in. square, with a perforated zinc front; below these boxes are channels containing hot-water pipes; at the ends of these channels and in the front and back walls are large openings, through which the external air is admitted. By this means the fresh air, being first warmed by passing over the hot-water pipes, will rise upwards and be emitted through the perforated front of the skirting boxes into the wards immediately under the beds. The foul air is carried off through wide channels in the ceilings, which communicate with large flues running up the side walls, and terminating just above the level of the eaves of the roof.

The upper wards are somewhat differently constructed from the lower wards, inasmuch as the ceilings follow the line of the sloping sides of the roof, which are supported at intervals on semi-elliptic cast-iron ribs. The emission of foul air in these wards is provided for by a channel in the apex of the ceiling, running the whole length of the room, and having zinc flues at intervals open to the air.

The architect was Mr. H. Saxon Snell; Messrs. Crabb & Vaughan were the builders; Messrs. Potter & Sons executed the heating, ventilating, and sanitary works.

A MISTAKE IN FARRINGTON-ROAD.

I AM in time to draw attention to, and I hope that I am in time to induce others to put a stop to, a piece of work which is now going on in Farringdon-road, not far from the Holborn Viaduct, and which appears to me to amount to a mistake. If you look over the north side of the viaduct bridge, you will see that the road immediately beneath your eye is broad and handsome, and so continues up to as far as new Charterhouse-street. But at Charterhouse-street it suddenly jerks to narrowness and misery. At the corner of Charterhouse-street and Farringdon-road, a building, said to be for a public-house, is being erected (it has already nearly reached to its first floor), and this building spoils the noble road by projecting into it and narrowing it. This is the only building at present commenced on that side Farringdon-road till you get some distance further on,—to Hatton-wall, I believe, but am not sure, for they do not condescend to put names up to streets in this quarter;—and at the corner of Hatton-wall stands another public-house called the "Metropolitan." Now the road should be continued wide up to at least as far as this,—that is, to about opposite the Clerkenwell Sessions House. I do hope that some leading member or members of the Common Council will at once take a walk, and look over the north side of the new viaduct bridge, and then see if something cannot be done to stop that which, if allowed to be continued to completion, will be an eyesore and a nuisance for ages. The vaults built under the pavement are nothing; they do not reach up the

road nearly so far as to the "Metropolitan" public-house. It should be remembered that the Pentonville end of Farringdon-road (or whatever the track is called in that part) will not always remain as it is, but that some day we must have a great improvement there, probably a cut from about Clerkenwell workhouse straight to the Angel at Islington, to admit North Londoners to have now and then a peep at the Thames Embankment and New Blackfriars Bridge, and to go down what might, if the foot-pavement were better, be one of the finest roads in the metropolis—Blackfriars-road.

SURVEYOR.

P.S.—A friend tells me that the part of Farringdon-road in question is not in the City, but in the district which is under the jurisdiction of the Holborn Board of Works. If that be so, I hope the proper authorities will see to it.

THE ARTISANS' AND LABOURERS' DWELLING ACT.

THE Marylebone vestry have heard and determined the appeal of Lord Portman and the lessees of the disgraceful house property in York-court, Paddington-street, against the condemnation of seven houses, Nos. 15 to 22, under the provisions of the Act, as wholly unfit for human habitation. Mr. Wilde, for Lord Portman, said that his lordship would make no appeal against the decision of the vestry. For the lessees and owners of the houses it was argued that the property was still capable of being put in repair, so as to render the dwellings tenable, if the vestry would again consent to forego its powers. At the conclusion of the investigation it was decided that the vestry clerk should forthwith serve the necessary notices and orders for the demolition of the premises.

A most disagreeable locality is about to be improved, under the operation of the Artisans' and Labourers' Dwellings Act, by the demolition of the buildings which lie between Bit-alley and Fryingpan-alley, Turmill-street, Clerkenwell, close to the Sessions-house. The buildings in question have long been known as the abodes of the worst and lowest class, and so close are the opposite houses both in Fryingpan and Bit alleys that two persons can hardly walk abreast through them. Recently the houses were reported to the Clerkenwell Vestry to be in a condition dangerous to health and unfit for human habitation; and the sanitary committee of the vestry recommended their demolition. Some doubts having arisen as to the power of the vestry to order the houses to be pulled down, that body submitted a case to Mr. H. B. Poland, who has stated his opinion that the vestry may require the whole if necessary, or a sufficient number, of the houses, to be pulled down, although there is no express enactment authorising houses to be pulled down merely on account of the narrowness of the street or court in which they are situated. The vestry have now adopted the report of the sanitary committee, and directed the demolition of the houses in question.

CHURCH DECORATION IN SCOTLAND.

THE church of St. James-the-Less, at Leith, has just been re-opened, after being painted throughout, from designs by Mr. E. Francis Clarke, architect, of London. The church, which was designed by Professor Scott, R.A., is now additionally interesting, as one of the few churches in Scotland which have as yet been treated with colour, and it is likely that many churches will follow the example which has been set at Leith. The chancel, which is finely arcaded in stone, contains richly-foliated niches, in which are figures of SS. James-the-Less, Andrew, Paul, Luke, Mark, Peter, and also of Ninian, Columba, and Margaret, of Scotland. Each figure is richly coloured, with a gold nimbus. The lower part of the chancel is treated with the conventional certain pattern, upon which are crested spaces with emblems. The organ-case displays figures of angels with instruments of music, and the organ pipes are decorated in gold and colour. The upper portions of the nave and transepts are diapered with the "ashlar" pattern, with foliated scrolls at the constructional parts, and at the west end is an ornate stencilled arcade. The nave and transepts below the string-course are painted in dark reddish brown, with diaper. The prevailing colour in the church is a warm cream-colour inclining to red, and the scrolls, &c., are principally in dull red, with light blue sparingly

used. The constructional parts of the chancel arcade are sparingly embellished, with light blue and gold, and the principal arches throughout the church are enriched with scrolls and diapers. The work has been carefully carried out by Messrs. Ballantine & Son, of Edinburgh.

CATHEDRALS.

St. Asaph Cathedral.—The chancel of this cathedral has been restored by Mr. Scott; also the crossing, groined with oak, which contains the stalls, throne, and choir seats. The original style, the Decorated, has been kept in view in the restorations, which comprised, in detail, six chancel windows, one of which is appropriated to a memorial in stained glass of Mrs. Hemans. The stalls have been cleaned and replaced, and a new pavement of Minton's tiles laid down.

Worcester Cathedral.—A screen is in course of erection on the north side of the sacristy or chancel of this cathedral. It is the gift of Mr. J. D. Allcroft, and will probably cost upwards of 600*l.* Messrs. Barher & Brindley, of London, who executed the reredos for the dean, are also constructing the screen, which consists of open arcade work in Early English style, decorated with carved foliage, finials, &c., and standing on a haemate, the face of which is covered with diaper work. The material employed is Caen stone, with Purbeck marble for the shafts. Mr. Scott designed the screen, which is intended to harmonise with the reredos, and the architecture of the east end generally.

St. David's, Pembroke-shire.—Further works are to be executed in this Cathedral, in addition to those which have been already carried on. The new outlay will, it is stated, amount not less than 11,000*l.* 18,000*l.* have already been spent on this cathedral. Mr. G. G. Scott is the architect.

COL. CHARLES VALLANCEY, ENGINEER AND ANTIQUARY.

IT is surprising what a number of remarkable Englishmen, whom the eighteenth and nineteenth centuries produced in every branch of the literary profession, either forsaking their country, or leaving it from accidental causes, cast their lot in Ireland; and, in achieving fame, conferred a lasting honour on the sister kingdom by their labours. In the architectural world we have already, in the pages of the *Builder*, rubbed the rust off a few worthy names, who deserve to be restored to popular favour. On this occasion it is our province to lift up from the shade a remarkable man, whose name is now rarely alluded to in this kingdom without a sneer, but who in his day was thought worthy of the fullest recognition.

Charles Vallancey, LL.D., F.R.S., F.S.A., &c., was a native of England, and was born about the year 1720. The family is of French descent. Vallancey received a liberal but not a collegiate education; and, while a comparatively young man, entered the army. He was quartered in Gibraltar for some years, of which celebrated rock he made a sketch, which was afterwards engraved by an Irish artist of the name of Ashford. Vallancey's regiment, after some time, was ordered to Ireland. Shortly after, our young captain of the 12th regiment entered the corps of Royal Engineers, and gradually rose to the position of colonel. His commission bears the date of 1782. Vallancey was not long in Ireland when his literary taste began to develop itself. He published the *Field Engineer*, a treatise on Stone-cutting, and one on Tanning, and other subjects. Next succeeded a military survey of Ireland, which not only received the approbation of George III., but also was rewarded with pecuniary favour.

In 1774 began that work with which Vallancey's name is more intimately connected, entitled "Collectanea de Rebus Hibernicis." This work was continued occasionally, and extended over a number of years. Fourteen numbers of this publication appeared, forming about five octavo volumes. In 1772 or 1773 Vallancey published an "Irish Grammar of the Ibero-Celtic Language." This work was reprinted in 1782, with additional matter. This grammar is very imperfect, but Vallancey had no mean difficulties to contend against in its compilation. There was at this time scarcely an available printed grammar of the language, excepting O'Malley's of 1677; and so an Englishman taking to the study of that difficult subject from a taste for it, it is surprising that our author acquitted himself so well. In 1772 he contri-

buted an essay on the "Antiquity of the Celtic Language." Vallancey's "Treatise on Stone-Cutting" was translated from the French of M. le Chevalier de Clair, to which were added remarks upon "Saxo's New System of Fortification proposed in his (Saxo's) Reveries or Memoirs of the Art of War."

In the minutes of the Society of Antiquaries, 1773, is a correspondence of Major Vallancey with Governor Pownall, on the subject of the monument at New Grange, near Drogheda; contending for its being an arch-Druid's tomb, the three cells three altars, and the characters the name of Aongus, the arch-Druid. In that year he was the active secretary of a society which had been formed in Dublin under the patronage of Sir Lucius O'Brien, bart., for the illustration of the antiquities of Ireland; "but so little," says Mr. Gough, "does this taste prevail in that nation (which, if we may believe Mr. O'Halloran, is one of the oldest in the world), that Major Vallancey, the secretary of this new society, may be considered as the society itself. In the year 1773 he prevailed on the Dublin Society to form themselves into a committee, which might have been serviceable to the kingdom in general. The plan of that committee may be collected from the queries they published. In four years' time they obtained only forty answers to 4,000 queries, many of them perfectly trifling. The committee is therefore dropped, and with it all Mr. Vallancey's hopes of ever being useful to Ireland in the great scale they hoped to work on. He is now engaged in taking surveys of Ireland for Government. [Letter to Mr. Gough, Dublin, April 28, 1778.] He had resolved to publish whatever antiquities had fallen in his way in some periodical work, and had actually begun in the *Hibernian Magazine*; but the proprietor executed the plates so miserably that he desisted, and met with no encouragement to print his discoveries in England; so that his 'Irish Grammar,' a 'Short Correspondence with Governor Pownall, on the Subject of the Drogheda Barrow,' and his 'Collectanea de Rebus Hibernicis,' are all we have of this onerous antiquary."

In a letter to Mr. Gough, Oct. 3, 1783, Mr. Vallancey says, "I am glad to hear you are about a new edition of Camden. Much information of the ancient state of Ireland may be had from Mr. O'Connor's letter to me in the twelfth number of my *Collectanea*; and in my former numbers no man could give me more help than Mr. O'Connor. I have prevailed on him to write a history of ancient Ireland; but I am much afraid his age and infirmities will not permit him to finish it. I am now proceeding with the next number, in which I shall give ten plates of the antiquities of Ireland. Some of these monuments are evidently prior to Christianity. Such is the *Jordan Morain* of the Irish, and *בְּרֵי מִיָּדוֹ* or breast-plate of judgment of the Chaldeans; and such the *Cloch Mashaic* of the Irish, or the *אֶבֶן מוֹסֵה* forbidden by Moses in Lev. xxvi. 1. For the confused accounts of this stone I refer you to the learned Spencer, 'De Legibus Hebraeorum,' and to the more learned Millius, 'Disertationes selectae variae S. Litterarum,' yet all their conjectures, and those of the rabbis, must have still passed for such, had not these monuments been preserved in this wonderful country. These are now in my possession. I have ordered some impressions to be struck off, and shall forward them to you in a few posts. These plates cost me (a poor man, with 15s. a day and 15 children) about 60 guineas; they are at your service for Camden on these terms:—Send to White as many copies as will produce £30L, and you may also insert my descriptions most of my next number. I can also give you an account of the Anglo settlement in the reign of Henry II., under Strongbow, and a map of their country surveyed by myself. They are seated in the county of Wexford, in the spot they first settled in,* speak the language of that day, and never marry out of the barony, or permit an Irishman to live in it. I have collected a short vocabulary of their language, and a long song on some game of ball. These are at your service to insert also. I found Strongbow's entrenched camp very perfect. This country, like language, monuments, and history, are subjects of great importance to antiquaries, in the studies of their bards. Thera was truth dispersed, but the living monuments of the day no man can be deceived in. I wish I could recover

my drawing of what is called Cormac's Chapel. I have lost it; it is the work of Etruscans: their monuments declare they sent colonies to Ogygia, and the Irish records declare they received some from Croton, the country of Tarasus."

Mr. Gough having thankfully accepted the offer of the plates, on the condition of being allowed to pay at least some part of their expense, Mr. Vallancey replies, Feb. 13, 1784:—"In my last, I meant to say that if it was agreeable to you to embellish Camden with the fourteen plates of Irish antiquities contained in that number, you should have the plates for half the sum they should cost me. The estimate was made at about 60 Irish pounds; but, by lessening the scale, and throwing many objects into one plate, they have been executed for 33 guineas. I should be proud to dispose of them to you, for your edition of Camden, and offer them to you for 15 guineas. As there were but 500 run off from each plate, they are not worn. My labours, I believe, have hitherto been little known in England. It is but of late I could convince my countrymen that the early history of this country was connected with Britain. I have good reason to believe they are now convinced that the inhabitants of the Britanno Isles, before the Welsh, were one and the same stock; and that many of the monuments of antiquity found in England are falsely attributed to the Romans." The plates were the embellishments of Mr. Gough's edition of Camden. In 1784, Vallancey was elected a Fellow of the Royal Society of London; and in 1786 he published "An Essay towards Illustrating the Ancient History of the Britanno Isles," 8vo., intended as a preface to a vindication of the ancient history of Ireland; and (by establishing the authority of the ancient Irish MSS. and exploring the sources of the language) to ascertain the origin of the people. This was followed by "A Vindication of the Ancient History of Ireland," wherein is shown:—1. The descent of its old inhabitants from the Phæno-Scythians of the East. 2. The early skill of the Phæno-Scythians in navigation, arts, and letters. 3. Several accounts of the ancient Irish bards authenticated from parallel history, sacred and profane, &c. The whole illustrated by notes and remarks, and remarks on each chapter, by Colonel Charles Vallancey, LL.D., F.R.S., and of the Societies of Antiquaries of London, Edinburgh, and Perth; member of the Royal Irish Academy, and of the Philosophical Society of Philadelphia, &c.; Dublin, 1786, 8vo. (being the fourteenth number of "Collectanea de Rebus Hibernicis"), of which see a very ample account by Mr. Gough in the *Gentleman's Magazine*, vol. lvii., p. 252, and the spontaneous effusions of Mr. Burke in p. 253. In 1797, he published "The Ancient History of Ireland, proved from the Sanscrit Books of the Brahmins of India; dedicated to the President and Members of the Royal Academy, in the Oriental Emigration of the Hibernian Druids," with all the inventive imagination of Stenkeley applied to the Indians (see vol. lxxiv., p. 1,036). In the "Archæologia," vol. vii., p. 276, are his "Observations on the Alphabet of the Pagan Irish, and of the Age in which Finn and Ossian lived," 1784; and in vol. viii., p. 302, his "Observations on the American Inscription," 1786. In the preface to his "Collectanea Hibernicis," p. 4, speaking of Sir James Ware, "the Camden of Ireland," he observes that considering his ignorance of the Irish language he did much: his works are the only and neither life nor abilities to finish; and it is much to be lamented that he had not the good fortune to meet with so experienced and intelligent an amanuensis as Mac Ferbas sooner. "Sir James Ware," Mr. Gough informs us, "collected and preserved the scattered monuments and antiquities of his native country. His pursuit of these studies began after he left the university, by the encouragement of Bishop Usher. When he was just turned of thirty, he published "Lives of the Archbishops of Cashel and Tuam, and of the Bishops of Dublin," about twelve years after (1639), "An Account of the Irish Writers," &c.; and 1654, when he was sixty-five, "Disquisitions on the Antiquities of Ireland;" and a second edition augmented in 1658, both in 8vo. together with "Annals of Ireland under Henry VII.," which were succeeded by several historical and other pieces. Many of these came out in different volumes, and translated from the original Latin by his son Robert and others, 1705. A completer and far better edition of all Ware's works,

except "The Annals of Ireland," was published at different times by Walter Harris, esq., in three volumes (fol.). The first contains "The Ecclesiastical Affairs of this Kingdom," adorned with prints of the cathedrals, seals, &c., Dublin, 1739. The second is a "Translation of his Disquisitions," with eight additional chapters, and other improvements from his own and other papers, distinguished from the rest of the work; with prints of antiquities, coins, and religious orders, Dublin, 1745. The third volume comprehends "The Irish Writers," with the addition of nearly 400 new articles, many from a copy interleaved by the author; these were reprinted in two volumes, folio, Dublin, 1764. Sir James found time for these studies, notwithstanding his engagements as Auditor-General at the Council Board, and in the Parliament for the university, and the negotiations he conducted for Charles I. with the Irish Catholics. When the Parliament were masters of Ireland, he retired first to France, and then to England, till the restoration reinstated him in these and other public charges. He died 1666, aged 73. His MS. collections relative to Ireland were purchased of his heir by Lord Clarendon when Lieutenant, 1686; and after his death by the late Duke of Chandos, whom the public-spirited dean of St. Patrick's in vain solicited to deposit them in the public library at Dublin; these underwent a second dispersion by public auction. Dr. Millos, dean of Exeter, whose uncle had large property in that kingdom, purchased a large part, and deposited them in the British Museum; Dr. Rawlinson others, and bequeathed them to the library of St. John's College, Oxford. Some part fell into the hands of Lord Newport, late Chancellor of Ireland.

Colonel Vallancey, in the memorable year 1798 in Ireland, occupied the post of Lieutenant-General in the Engineer Department, and in 1803 he became a general. He was also, in recognition of his literary and antiquarian labours, elected vice-president of the Dublin Society, to which society he devoted many years of zealous attention. In fact, the Royal Dublin Society owes to him much of its subsequent success and fame. It might with truth be said of Vallancey, as is said of the Norman who came to Ireland for conquest, that he afterwards became more Celtic than the Celts themselves.

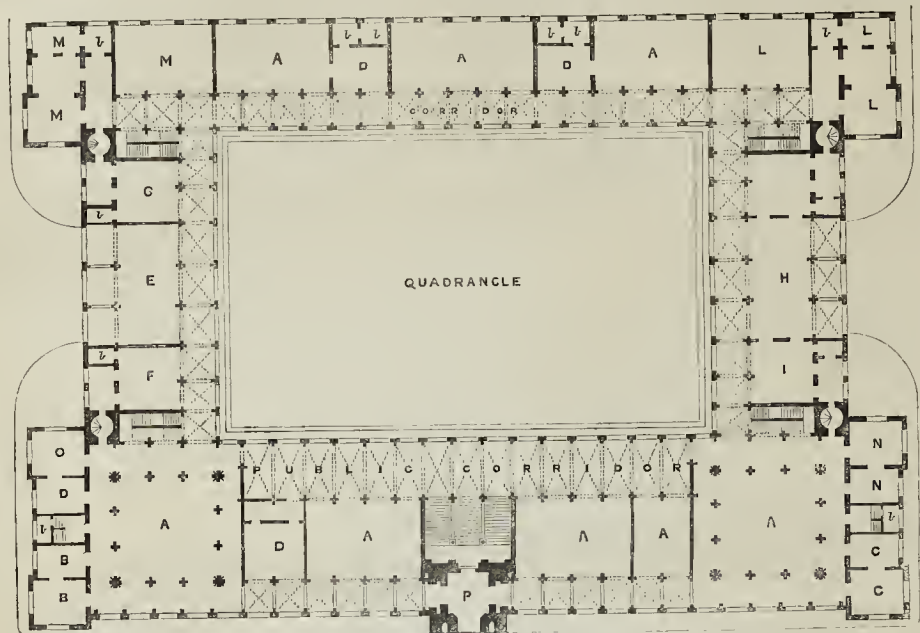
Vallancey made Irish antiquities his particular study, and his love never lessened for the subject until his death. He was much attached to Ireland, and his many works are a proof of this. The School of Antiquarianism which he helped to found and consolidate has now fallen into disfavour, yet the result of his studies and researches was a valuable contribution. He gave impulse to the study of Irish history and Irish antiquities; and had it not been from the remarkable sight of an Englishman in Ireland devoting such time and attention to the elucidation of the Irish language and the Irish race, many notably clever men who afterwards contributed their quota to the subject would not have studied the question at all. Vallancey's industry and perseverance forced the matter upon them, and stimulated such archeological philologists and antiquaries to bestir themselves in their own fields of inquiry.

Charles Vallancey died in Dublin, on the 8th of August, 1812, at the advanced age of ninety-two, much regretted. He left some rare MSS. behind him, which were doubtless taken possession of by his relatives. Whether any of these fell into the hands of the Royal Irish Academy, or British Museum, or Trinity College Library, Dublin, we know not, nor are we able to say at present, though we have made some inquiries, if any surviving members of his family are in this country. The writer made a search through the metropolitan Directories of the three kingdoms, but failed to meet with the name. The nearest approach to it is the name of Vallance. Of this name there are a few in Great Britain and Ireland. Strange if his fifteen children and their descendants (supposing these were married) had all died out. Perhaps in the Army List or in France some of the Vallancey parent stock, or English or Anglo-Irish descendants, may be found.

We are indebted for some of the particulars of this imperfect sketch to the pages of the *Gentleman's Magazine* for 1812, and to the "Anthologia Hibernica," 1793. Vallancey enjoyed the friendship and held correspondence with the most notable of the literary English, Irish, and Scotch celebrities of his day, and as an engineer and antiquary his name should not be wholly forgotten.

* The Barony of Forth and Bargie.

THE HIGH COURT, CALCUTTA.



PLAN OF FIRST FLOOR

SCALE OF FEET

A. Courts of Law.
 B. Chief Justice's room.
 C. Rooms for Judge of Court of Original Jurisdiction.
 D. Retiring-rooms for Judges, with bath-rooms attached.

REFERENCES.

E. Judges' library.
 F. Rooms for native Judge.
 G. Registrar's room.
 H. Bar library.
 I. Bar consultation-room.
 K. Bar retiring-room.

L. Attorneys' rooms.
 M. Pleaders' rooms.
 N. Petty jury rooms.
 O. Chief Justice's clerk.
 P. Record tower.
 b. Bath-rooms.

THE TOWN OF SHERBORNE AND THE DIGBY HOTEL.

THE completion of this large hotel is an instalment of the works to be ultimately carried out in improving this old town, centuries ago a cathedral town and an important one in the West of England. The chief glory of Sherborne and of Dorset is the grand church of St. Mary the Virgin, restored by Mr. Carpenter and Mr. Slater, by the liberality of the late Earl Digby and Mr. Wingfield Digby, of Sherborne Castle. The town, through the decay of its manufactures, lost much of its former attractions. Many churches were altogether pulled down, and its ancient buildings were converted into dwelling and store houses. Its principal streets are now not much better than winding lanes, and the main road to Dorchester and to the castle is crossed by the Exeter Railway on a level.

Plans have therefore been prepared by Messrs. Slater & Carpenter, at Mr. Digby's request, for extensive alterations on the south side of the town, between the Abbey Church and the railway; and following these plans a new street has been made, leading up in a direct line to the south transept of the abbey. This street will be continued over the railway and River Yevo by a fine three-arched bridge of stone, and will then branch off to the castle and to Dorchester; thus forming the chief entrance to the town, and opening up the hitherto crowded church and buildings. At the northern end of this street are proposed to be built the market-house and town-hall, facing the south side of the abbey, with the other necessary market buildings.

The Digby Hotel is built on the west side of the street, and its gardens and pleasure-grounds (laid out by Mr. Thomas) extend down to the railway, thus leaving open the charming views of the country and park to the three fronts. It

is erected not only for a general and commercial business, but for hunting men, and also as a "half-way house" for tourists on their way to Exeter and the far west. The fact of there being three packs of hounds very near, and especially the Blackmoor Vale hounds, make Sherborne headquarters for hunters and a West of England Market Harborough or Melton. For the use of these gentlemen suites of rooms are arranged in the hotel, and the lunting stables are built in separate blocks, so that each may keep separately his four horses and servants.

The building has a square court in the centre, round which run corridors on all the floors. It is three stories high besides the basement, and built of local stone, with dressings of Ham-hill stone. The style adopted follows out the style of the fifteenth and sixteenth century domestic buildings in the town and locality. The windows are all square-headed, with transoms; and all the upper ones have small gable roofs over them. There is a great dining-room provided, 40 ft. by 20 ft., a coffee-room, 27 ft. by 20 ft., and a commercial room of about the same size, besides many private sitting-rooms both on the ground floor and on the upper floor, *en suite* with bed-rooms. The offices are extensive, and are fitted up with appliances for cooking, heating, ventilation, and with lifts to each floor, bath-rooms, and lavatories. A billiard-room is at once to be built on the terrace in the grounds, and connected with the main block by a covered way.

The hotel stables are built round a large court to the north of the hunting stables, and are fitted up with boxes and stalls for seventeen horses, with coach-houses for twenty carriages, sick-horse boxes, singeing-room, lotts, grooms' rooms, &c., and a tap in connexion with the hotel.

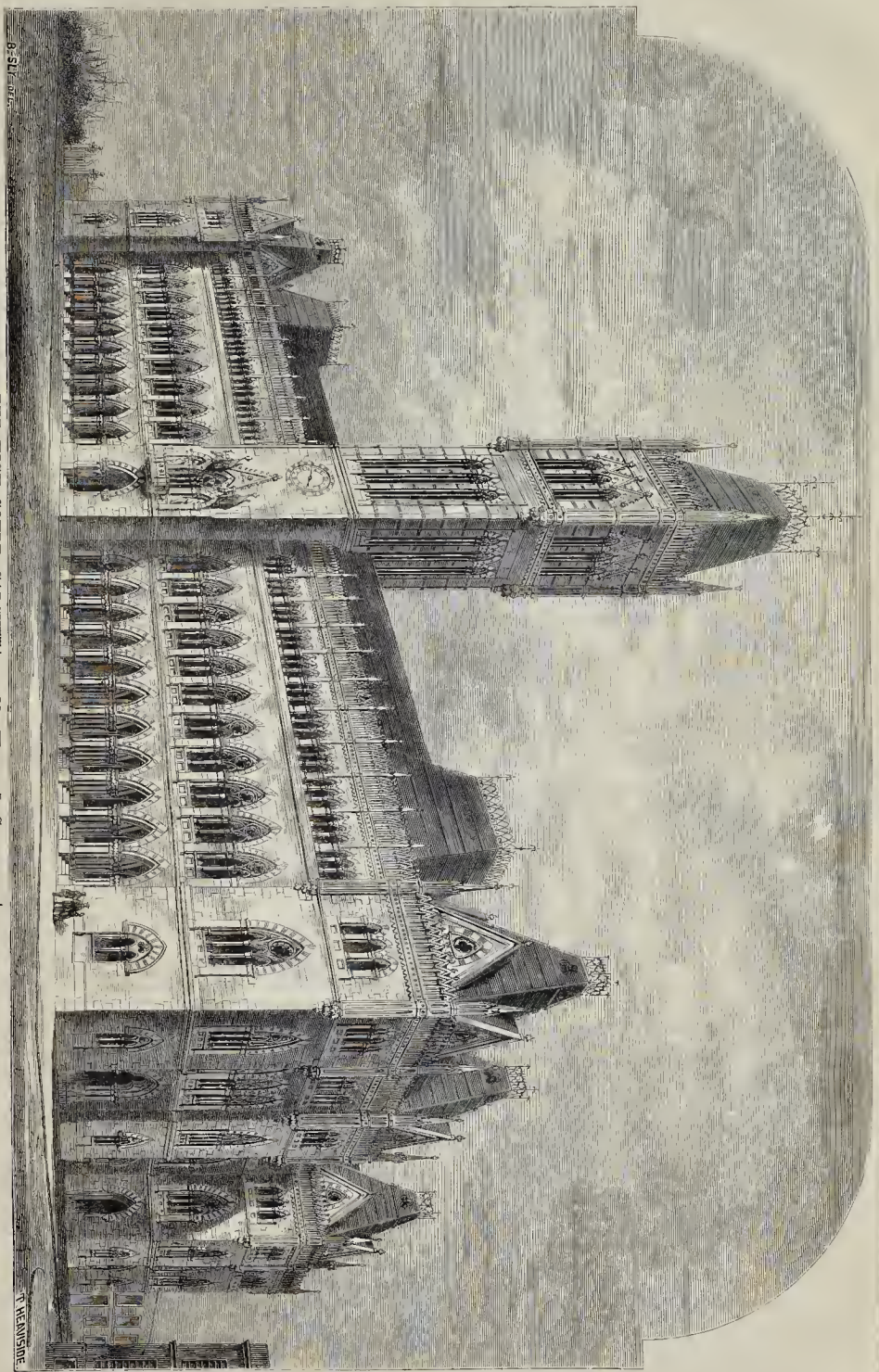
The works have been about two years in hand, by Mr. Estcorn, of Gloucester, under Mr. Thompson, the architects' clerk of works.

On the western side of the churchyard is the ancient Hospital of St. John, founded by Bishop Neville, of Salisbury, in the fifteenth century, with its curious chapel opening into the two stories of the main building, the upper being used as a women's gallery, and the lower for the men. Extensive additions have been made by the same architects to this institution; new board-rooms and dormitories for the pensioners have been built, and form a part of the group of buildings which, when completed, by the new town-hall and market-place, will form the entrance to the street from the close.

We may also mention the famous "King's School," the school of West England, expanded now far beyond the thought of its royal founder. The ancient Edwardian and Jacobean buildings were quite of inadequate size, and some years ago the ancient domestic buildings of the abbey were converted by Mr. Carpenter into school-rooms, chapels, and studios, and later still extensive ranges of buildings were raised northwards of the abbey, for dormitories, class-rooms, master's house, &c. A new department for "science and art" is about to be commenced, and a great school-room is contemplated.

All these buildings are designed by the architects in the local type of Gothic, so as to gain an effect of unity in the mass of new and old buildings grouped around the abbey church and its close.

The new Yeatman Hospital, on the hill above, is designed to harmonise with the ancient *abbot's* lodging, which remains singularly perfect, and overlooking the old monk's fish-ponds, at some little distance from the other monastic buildings. The grand ruins of the old Norman castle, and the later Elizabethan castle, built when all the church property had passed over to Sir Walter Raleigh and other lay proprietors, are too well known to need any words.



THE HIGH COURT, CALCUTTA.—MR. WALTER L. GRANT, ARCHT.

[See p. 857, ante.]

A WORKMAN ON THE TRADE-UNION CONGRESS.

RESTRICTION OF APPRENTICES.

Sir,—It seems the question of the limitation of apprentices is one on which the leading unionists slightly differ. Among the strange things said at Birmingham, none surpassed the papers and discussions on the restriction of apprentices; and certainly not any of the proposed schemes, if put in operation, would more affect the position and well-being of society. The resolution proposed and carried was,—“That this congress is in favour of a fair proportion being allowed in keeping with the demand, a limitation is justifiable; a fair proportion being allowed in keeping with the number of men allowed to teach them.” The first paper on the question was read by the secretary of the Glass-cutters' Association, and was in perfect keeping with the occasion and the trade.

The glass trade is, without doubt, one of the most unfortunate trades in this country, and has had more difficulties to contend with than any other. For a long series of years it was loaded with excessive duties and excise regulations, which prevented its development and progress. And since the duties have been repealed, it has been cramped and impeded by strikes and restrictions of the workmen. I suppose it is generally known that the production of glass, excepting in the higher work, is exceedingly simple, and easily acquired. And yet in opposition to all economic laws, the restrictionists would have the public pay a higher price for adult labour, when it is only a boy's trade, and all its details can be carried out with little learning and experience. Although the glass trade in this country has for a long time been entirely free, it has not progressed in the same ratio as in other countries. The number of glass-workers in France, at the last return was upwards of 35,000, and the trade was then in a most flourishing condition, while the whole number engaged in this country is but 15,046. In looking over the statistics of exports and imports, the results are still more striking, and I have often wondered whether the leaders of the glass-makers' protected union ever took the trouble to examine the returns. If they had they would have found that the great portion of the English glass exported was common glass bottles, whilst the foreign imports, are the higher and more expensive glass. The first mention of imported glass in the statistical abstract is for the year 1854, when 54,040 cwt. of all sorts, except common, were imported, and the quantity has continued to advance. The latest returns for 1867 give 422,574 cwt. as the total imports of all sorts, except bottles of green or common glass, into this country, valued at 791,832. As a set-off to that, there were exported from England 165,070 cwt. of flint and window glass, and 703,132 cwt. of common glass bottles.

With such figures as the above, it must be evident to the most obtuse mind that something must be wrong in the glass-making machinery, and that restriction of apprentices is not the remedy. The delegate representing the trade at Birmingham informed his brother delegates, with great unctiousness, that his trade had restricted the number of apprentices, and had regulated the supply to the demand; and yet the foreign glass manufacturers had found, to their advantage, that there were over and above the balanced supply, 257,504 cwt. of the best glass wanted in this country. It seems the glass-makers and the majority of trade-unionists believe the public wants are a fixed quantity, and some scheme was to be invented whereby the supply could be gauged to a shaving of the demand. The fallacy might, with a slight inquiry, have been discovered; and it was a great pity the glass-cutter, in drawing up his paper, did not examine a little into the history of his trade. I have specially alluded to the glass trade, because that, of all trades, shows most clearly the illusion of the members of a trade trying, by coercion and restriction, to limit the supply, and keep up the price of an article, to some fanciful idea of what the public will pay, and to what is its demand.

In turning to the resolution and the contents of the papers, I find the restrictionists "would allow apprentices when the state of the trade justified it;" or, in other words, when all the adult workmen were fully employed. I suppose there never was a time in the history of any trade where that condition was fulfilled. And to carry out the objects of the resolution, many trades would have to be entirely annihilated, as

there are many sources of supply independent of the workmen of this country; and where they do such artificial stratagems to raise prices to such a height that the public would not buy home-manufactured goods, the workmen of other countries would supply the public wants, and the last state of the home workmen would be worse than the first. As the members of some trades have proclaimed the dogma of a limitation of apprentices, and have called a council to ratify it, nothing can be fairer than to call upon them to carry out their principles to their legitimate conclusion, and keep their offspring within the prescribed limits of their own trade; for instance, the glass-cutter's child cannot have any claim outside his father's trade. And then the next step must be a restriction on marriage. As there are many unemployed in every trade, it is in perfect keeping with the objects of trade-unionists, that no increase of population for at least one generation should take place; for if the young are not allowed the opportunity to gain a living because some of the older happen to be unemployed, and as the workmen call upon the State to protect them from an influx of young workmen, it is certainly only in accordance with the foregoing that the State should require the restrictionists to keep from multiplying until all the conditions they wish to enforce are fulfilled. But supposing the law relating to restriction of apprentices were in force, and the machinery to regulate the number of apprentices were provided and in motion, and all the conditions as to the requirements of the nation,—for the productions of the glass-makers, or any other body of workmen,—were settled; and when it was decided that an additional carpenter, or tailor, or shoemaker was required, and there were ten candidates for admission, how would the favoured one be chosen? Would the employer or the workmen have to choose the fortunate candidate, or would it be by competitive examination or by ballot? Something ought to have been said about that part of the question when the wise heads of trade-unionism affirmed by resolution that a limitation of apprentices was necessary for the welfare of those who have by some means been fortunate enough to acquire a trade. They ought to have settled all the preliminaries, and not left the outside world in the dark as to their future operations. It appears the Birmingham delegates would, in their anxiety to relieve trade-unionists, add still further tyranny to their already unwise laws; and I think, in all consistency, the next time they meet they ought to add the following as an addendum to the resolution,—“That, in the opinion of this congress, a stern restriction on marriage is required by the state of trade, and that all marriages are totally prohibited until all the workmen are permanently employed. Yours, fraternally,—Peter Simple, President; John Clever, Secretary.”

JACK PLANE.

MONUMENT TO NICCOLO ALUNNO, AT FOLIGNO.

DURING a recent sojourn at Foligno, I had occasion to see and admire a colossal statue by a young sculptor of that city, named Ottaviano Ottaviani, destined for a monument to a great artist, a native of the same Umbrian city, Niccolò Liberatore, better known as "Alunno," whose works were produced between the years 1458-1492, and who may certainly rank among the greatest painters of this devotional class, and as first of the Umbrian school before Perugino, in the fifteenth century. Little is known of this truly great artist beyond the limits of Umbria; and it is therefore the more gratifying to find that his fellow-citizens have resolved to erect a worthy monument to one so gifted, at his birthplace. The original idea, however, as well as the execution of this work, pertain to the young sculptor who had the spirit to undertake a task so happily suggested before receiving the commission which the civic authorities have since given to him. He has availed himself of a supposed (not certain) portrait of Alunno introduced among the accessory figures of one of his finest pictures, "The Martyrdom of St. Bartholomew," at St. Bartolomeo, a church near Foligno. He represents the painter, in the costume of the fifteenth century, with an ample cloak thrown over his other clothes, a close-fitting cap on the head, brush and pallet in his hands, and in act of contemplating (as apparent) some picture which we may suppose him bent upon finishing or altering. The figure is about 3 metres in height, and is characterized by much individuality, by

a strongly-marked earnestness. I understand that it will be ready for erection in the ensuing spring, and that the site chosen will be either the principal piazza of Foligno or a planted esplanade between the city and the railway station. Assuredly such a project deserves to be noticed, and encouragement may well be bestowed upon such talent as is recognisable in the work of Signor Ottaviani. C. J. H.

THE PLYMOUTH GUILDHALL COM-PETITION.

Your correspondent, "Argus," in his letter to you last week, makes several admirable remarks as to the conduct of competitions in general, with which I entirely agree. In making their award, it is indeed the first duty of a committee, or of its professional adviser, to stand by the instructions issued to the competitors. It is because I feel so strongly on this point, and because I think "Argus" has overlooked, or, perhaps, not been aware of all the facts of the case, that I venture to ask your insertion of this letter.

On reading over the instructions to architects for the first time, after my appointment as referee, the impression produced on my mind was that a great deal of accommodation was asked for the money intended to be expended. On seeing the various designs, I discovered that the competitors had found it so. There was, I believe, hardly a design among the 25 which could have been erected in a creditable manner, at ordinary building prices, for the intended limit of "from 20,000l. to 25,000l." This I found had arisen, first, from the large number of requirements specified in the instructions; and, secondly, from the clause immediately following this enumeration. "The above particulars are not intended to exclude the provision of such additional accommodation, appropriate to the several uses of the intended building, as may appear to any of the competing architects to be desirable, and as the arrangements of the buildings will admit." Of this clause almost every competitor appeared to have, more or less, availed himself; some of them, as "Ich dien," acknowledging in their estimates that the cost of their schemes had been thus increased.

I concluded, therefore, that the hard and fast line as to cost could not, in this case, be drawn; but that so far as that one question was concerned, the merit of a design ought to be considered in inverse ratio to its costliness.

"Fiat Justitia, ratæ Cælium," and "Ich dien," considering the amount of extra accommodation provided, instead of being, as your correspondent says, among the most expensive, were among the least expensive designs sent in.

I, for one, should rejoice to see the day when the Institute, as our representative body, would take upon itself the duty of calling attention at the right time (that is, before competitors commence their labours) to what may appear to be defects in any conditions drawn up for the guidance of competing architects. It would save the latter much unnecessary labour, the referee some perplexity, and the critic some expenditure of righteous indignation.

ALFRED WATERHOUSE.

THE PRESERVATION OF STONE.

PERMIT me to suggest to your correspondent of October 16th, a method of preserving and hardening internal stonework, which will prove more effective and more permanent than the application of oxalic acid. It is true that a solution of this acid, or better still, of oxalate of alumina, will give for a time a certain amount of coherence to the particles of an oolitic limestone; but this substance has its drawbacks, with which I have become only too well acquainted through the experience of the last ten years. There is no better plan of hardening and preserving friable, absorbent, and decaying stones of all kinds, than the application of a process known as the "combined process," which I may, perhaps, be allowed briefly to describe. Three solutions are employed in succession, they are applied with a brush as easily as whitewash. These solutions are, 1st, soluble phosphate of lime; 2nd, caustic hydra; and, 3rd, a special preparation of silica, not ordinary water-glass. The process in its earlier form involved the use of the two first of these solutions, and was employed with considerable success in several public buildings. In its complete and perfected condition the method

has received the sanction of Mr. Gilbert Scott, and other authorities. It has been adopted with the stone of the St. Pancras Midland Terminus, and elsewhere. Caen or even Cors-bam stone thus treated ceases to absorb water (carved work in the rain in consequence becomes no darker), and though its colour is unchanged, its surface acquires a finish, which greatly improves its appearance. A piece of black cloth is not whitened when rubbed against Bath stone thus prepared, so that the mechanical abrasion of the surface is arrested. The materials cannot cause either dampness or efflorescence on the stone; the process, moreover, is cheap. The patent process is now the property of the Ransome's Concrete Stone Company, and is carried out by their licensees, Messrs. Hockin & Wilson, of Duke-street, Manchester-square, W., who have worked it under my direction for several years.

A. H. CHURCH, M.A., Professor of Chemistry, Royal Agricultural College.

P.S. Where the "combined process" is inapplicable from the pulverulent nature of the surface, a warm solution of solid paraffine in benzole or in mineral turpentine, answers admirably. For decayed internal carved work I prefer occasionally to mix white copal varnish with the solution of paraffine. These solutions or those of the combined process may be paid on to the surface with a syringe, or with *la bouffée*. I have employed them successfully for years. For preserving iron, bone, ivory, and many other materials (tessellæ of Roman pavements, for example), I sometimes use solid paraffine, driven in by the aid of heat.

A. H. C.

THE REFORM CLUB.

THE Reform Club, in Pall-mall, one of the late Sir Charles Barry's best works, has been painted and gilt inside, by Mr. Crossley, of Newark, and looks very bright and comfortable. With the exception of the coarse treatment of the Elgin frieze, in the morning-room, there seems nothing to complain of. We might even have gone further, and praised some of the combinations, but for the pretentious accounts which have appeared in other quarters. From these it might be supposed that the whole of the real decorations of the various apartments had just now been executed, instead of being simply tinted, and cut in with a certain amount of discretion. What possible occasion there was to send all the way to Newark in order to have this done, with Mr. Craze, Mr. Collmann, Mr. Sang, and two or three others living close by, it passes our comprehension to divine.

M. REVOILL'S TELEICONOGRAPHE.

I SEE that another inventor puts forward his claim for priority of conception of the instrument for facilitating the drawing of distant objects on an enlarged scale; in fact, an improvement upon the old camera lucida. In the present instance, the claimant is an American. We had already Mr. E. Sharpe's notice; and I believe that our able painter, E. W. Cooke, R.A., had also conceived years since a like instrument, and possibly many others. But, sir, M. Revouill's merit consists not only in this, that he has made the discovery and perfected it in execution, but that he has made it generally known and available to all the world, by its being procurable at any respectable instrument-maker's at Paris; and has sent over one to the Royal Institute of British Architects, in the library of which institution it is put up complete, and may be consulted by all. The great benefactor is not merely he who makes a discovery, but he who also puts it within reach of application, and for use by all the world.

M. I. B. A.

MONUMENTAL.

ON the 14th inst., a tomb in the form of a small Gothic chapel was uncovered at Kensal Green. It is built of stone, with marble shafts and tablets, stained-glass windows, gate, and iron enclosure for flowers. It is fully covered with carving, which, with the stonework, has been executed by Mr. L. T. Carter. The stained glass windows, with the mosaic over the door, has been executed by Bell & Almond. The iron-work by W. Pedlar. The tomb is erected to the memory of Marian Susan, the wife of Mr. George Ernest Augustus Ross, of Lavender Hill, from designs of Mr. Walter Blackett, architect.

ARCHITECTURAL ASSOCIATION.

THE syllabus of papers and discussions for the current session stands thus:—

- October 29th, Opening Conversations.
- November 5th, Annual meeting, and Address by the President.
- November 19th, Natural Science, as applied to Architecture. Mr. C. W. Quin, F.R.S.
- December 3rd, On the Limits of Variety in Architectural Design. Mr. W. Seagrill.
- December 17th, Art applied to Industry in France, as promoted by the new Association of Art Manufactures in Paris. Mr. Blanchard Jerrold.
- December 31st, On the Study of Architectural History. Mr. Spiers.
- January 14th, 1870, Timber Buildings of the Middle Ages. Mr. C. Baily.
- January 28th, The Churches of the Deaneries of Freebridge Lynn and Freebridge Marshland, Norfolk. Rev. R. C. Nelson, M.A.
- February 11th, The Bed of the Tiber. Mr. G. A. Sala.
- February 25th, Members' Soirée.
- March 11th, Domestic Architecture during the Reign of Queen Anne. Mr. R. Almond.
- March 25th, Recent Improvements in Building Appliances. Mr. J. D. Mathews.
- April 8th, London Brickwork in the Sixteenth and Seventeenth Centuries. Rev. J. H. Houli.
- April 22nd, The Progress and Development of Church Architecture, and Arrangement in England since 1830. Mr. F. T. Dollman.
- May 6th, General Business Meeting. A Discussion:—Subject—Was the Renaissance Style productive of any real Benefit to Architecture? Inroduced by C. Aldridge.
- May 20th, Some further Remarks upon Monumental Sculpture. Mr. T. H. Watson.
- June 3rd, A Paper on Papers. Mr. T. Blashill.
- June 17th, Nomination of Officers. Remarks on Rhenish Romanesque Architecture. Mr. C. Heesman, jun.
- July 1st, Election of Officers. An historical Description of an ancient Building in the Neighbourhood of the Metropolis. Mr. G. H. Birch.

Three courses of lectures on Heat and Ventilation; the Chemistry of Building Stones; and the History of Architecture (a small fee being payable for each course) have been arranged for.

The business at the *conversations* this (Friday) evening will consist of a short address by the President, the distribution of prizes, nomination of new members, and any remarks that may be made by gentlemen present.

STAMPED TENDERS.

SIR,—Please allow me a small space in your columns, so as to open the subject of stamped tenders. The question is, do tenders, or offers for the execution of contracts, require to be stamped? Perhaps some of your readers will give some information on the subject. A short time ago I had a county-court trial, with a party to recover a balance of account due for a contract finished. *I was non-suited, because my tender was not stamped.* If this is the law, I never knew it before, and I am afraid many more are in the ignorant of it.

I shall be glad to see any correspondence on this head, as it is a matter of much importance to the building trade.

* * * Our correspondent must surely have misunderstood the judgment. A tender *per se* requires no stamp.

TYRANNY.

SIR,—Since writing my former letter on the strike of labourers and threatened strike of plasterers, Liverpool, the man has been discharged, and the labourers have returned to their work. Comment would be superfluous.

E. G.

IMPROVED COMPETITIONS.

SIR,—Doubtless the profession have been much exercised in their minds by the result of some recent competitions, and by reason of the voluminous correspondence thereby engendered, editorial patience must have been taxed greatly. I have, however, a suggestion to offer which I am sanguine enough to believe would, if adopted, place the subject of competitions on a satisfactory basis.

I have to suggest that, for the future, competitions should be settled in the same way as vacant appointments, and instead of committees advertising for designs, that they should simply request architects to send in their applications, accompanied with testimonials, lists of charges, and so on.

In this case, such architects as were not troubled with foolish prejudices on the score of dignity, professional etiquette, self-respect, &c., would submit their applications and immediately commence a vigorous canvass of the committee. Entertainingly having to decide on matters the opportunity of underselling their professional brethren, trusting to recoup themselves by means of bills of quantities, and surreptitious donations from grateful tradesmen.

The advantages of this plan are obvious. Architects would be saved all the trouble and expense of preparing gorgeous competition drawings, and committees the annoyance and perplexity of having to decide on matters that they know positively nothing about, besides escaping the obloquy heaped on their heads by irate and unsuccessful competitors. Society would be spared the painful spectacle of a profession divided against itself, and the vexed question of competitions would disappear from the face of the architectural world.

The only parties to snicker from such an arrangement would be,—1st, the public, and they don't seem to care; and, 2nd, high-minded, conscientious, and talented men, and who cares for them?

R. LAMB.

GLASS PAINT FOR STOVES.

MENTION has been made in our paper of a German glass-paint used for stoves and fireplaces instead of blacklead. Inquiries have been made as to where it can be obtained. We shall be glad to receive address.

INTENDED NEW BOARD-ROOM AND RELIEF OFFICE FOR HACKNEY UNION.

THE guardians of Hackney Union recently decided to erect a new board-room and relief offices. Plans have since been prepared by Mr. Lee, architect, according to which the board-room would be 40 ft. long and 20 ft. wide (sufficiently large to accommodate twice the number of guardians returned by the union), at one end of which a bay window was to be placed. The waiting-room attached to the relief offices was to be 43 ft. by 50 ft., capable of holding 250 persons. The plans were forwarded to the Poor-law Board for approval, and a reply has been received, stating that "the Poor-law Board approved of the site and general arrangement of the building, but considered that the dimensions of the various rooms, &c., it was to contain were greatly in excess of what was required, and therefore the work would cost more than necessary." The Board objected to the expense of placing a bay window in the board-room, and also the size of the waiting-room, and "returned the plans, &c., for the reconsideration of the guardians."

A somewhat warm discussion ensued, at the termination of which the subject was referred to the building committee and architect for consideration and report.

WHAT IS AN ACRE?

SIR,—In the *Builder* of the 16th Oct. a correspondent asks a question, "How much is a bushel?" which reminds me of a similar one put in March, 1866,—"What is an acre?" Not having observed any notice of it in the *Builder*, although a regular reader, I consider there can be no harm in again bringing it under your notice. You give as an example that the Scottish acre contains 5760 square yards, which is not so,—it contains 6104-12750 square yards. The error is in making the fall, or pole as you call it, contain 36 square yards instead of ells: the Scottish ell measuring 37-0588 in., 1 square acre is = 1261183 imperial acres. The above is taken from Buchanan's Tables, authorised by the Lords Commissioners of her Majesty's Treasury.

A. BLACK.

MORTUARY FOR CITY OF LONDON.

AT the last meeting of the City Commission of Sewers, the Sewers Committee reported that they had secured a site for the mortuary in Golden-lane, at an expense of 5,000*l.*, and recommended that a chamber should there be constructed for the reception of 12, and afterwards 24, dead bodies, for the holding of *post mortem* examinations, for keeping the sick carriages and hearses, and for the disinfection of clothing. The total cost, including the site, would be about 13,000*l.* The report was carried, and referred back for execution.

THE WHITECHAPEL IMPROVEMENTS.

A REPORT to the Metropolitan Board of Works was brought up last week from their Works and General Purposes Committee upon the present condition of the works for the improvements at Whitechapel, stating that they had made but slow progress, and also that inferior articles had been used. They therefore recommended:—

"That the contractors for the works, Messrs. Marshall & Maxwell, be forthwith called upon to take out and remove all the upper rings of the vaults which have been constructed with inferior and broken bricks and bats, and in strict accordance with the terms and conditions of the specification; and that no more mortar be permitted to be used which is not properly mixed and tempered in a mill.

That the contractors be also forthwith called upon to take up all the so-called concrete laid over the vaults and gullways, and to fill in the same with concrete composed of good materials, with the proper proportions of lime as described in the 37th section of the specification.

That the contractors be further called upon, prior to reinstating the works, to at once remove the whole of the inferior bricks and earth sittings, and rubbish found upon the ground.

That the further services of William Fortescue, the clerk of works employed upon this contract, be dispensed with."

The first three were agreed to, and after some discussion of the fourth the subject was referred back to the committee for further consideration. Mr. Fortescue sent in a letter of resignation to the meeting.

CO-OPERATIVE ARCHITECTS IN ITALY.

THE co-operative principle meets with much favour in Southern Italy. The *Times* correspondent from Naples says a novel instance of the application of the principle is announced as having been made, not by workmen, but by masters—that is, by the architects of Caserta, with whom those of the neighbouring town of Maddaloni have united themselves. "Under the title of the 'Association of Architects of the City of Caserta' they undertake, in their common interest, any commission connected with their profession, and to resolve all questions of art in meetings of the society. While, therefore, not paying more than would be demanded by a single engineer, it is pointed out as one of the great advantages offered by the association that any person entering on a building or engineering enterprise would here have the benefit of the united study, intelligence, and activity of many. I do not say a word as to the merits or prospects of success of these associations, but report them merely as an indication of that awakening of the public Italian mind which in many directions and forms is so evident."

A HALL FOR THE "FORESTERS."

THE London United District of the Ancient Order of Foresters, comprising about 600 knights, and having an invested capital of upwards of 63,000*l.*, has at length seen the propriety of erecting its own place of business and hall in which to conduct its delegate meetings. A plot of ground forming part of the Charter House Estate, adjoining Wilderness-row, has been secured as the site of the proposed building, for which competition designs and plans (advertised for in this journal) were invited.

On Thursday, the 14th inst., the Committee submitted, from the eight sent in in response to the invitation, two designs, signed "Stability" and "I aim at the Mark," to the general meeting, on which a long discussion ensued. It was unanimously resolved, that the design "Stability" be received as first, "I aim at the Mark" second. Upon opening the letters of explanation, the second design was found to be from Mr. Walker, of King's Arms Yard, Coleman-street, City; and that marked "Stability" by Mr. W. L. Gomme, architect, Hammer-smith, who was unanimously elected architect to the Society to carry out the works.

A FUNNY THING IN COMPETITIONS.

Sir,—The committee of the London United District of the Ancient Order of Foresters having invited designs for the erection of a Foresters' Hall in Wilderness-row, received eight sets of drawings from as many competitors. The committee, on the reception of the designs, immediately proceeded to select two for the premiums they had offered, and, after a short deliberation, they unanimously selected the plans of Mr. W. L. Gomme, of Hammer-smith, the chairman of their own body, as being the best. This is intelligible, as far as it goes, for there is no reason why the chairman's plans should not be as good, if not better, than those of any other person. In proceeding to select the second best set of designs, the committee seem to have had a toss for it. They ultimately selected the plans of Mr. Walker, of King's-Arms-yard, Moor-gate-street, on the ground that the design could not be erected for 6,000*l.* (the required amount being 4,000*l.*), and because, in the opinion of the committee, the design could not be carried out according to the Metropolitan Building Act! This part of the committee's decision seems quite unintelligible, but probably they can explain it.

Soleo.

DERBYSHIRE BUILDING STONES.

Sir,—I have been asked to give my opinion upon the qualities of the Derbyshire stones. I have great pleasure in doing so, for I cannot overrate them too highly; they only require to be known in order to be more extensively used than they have been hitherto. There is in Derbyshire an abundance of marbles, limestones, and sandstones. The sandstones are in great variety; from the coarse-grained Bramley Fall grit to the fine-grained, hard, compact, Darley Dale stone. There is also every variety of colour as well as texture. The hard stones are costly, and expensive to work, but there are others of a milder nature that "fret" well under the tool. Most of them possess good weather qualities, and are well adapted for public buildings, especially in our large towns, as they will withstand atmospheric changes. It has been a matter of surprise to me that they have not been more largely introduced into the London market. Several of them have been tried with success in Derby, Birmingham, Manchester, Liverpool, and other places. I may have an opportunity of giving a fuller description of some of them.

Of limestones, in the first rank stands Hopton Wood; and of the sandstones, I may name Coxenoh, Duffield Bank, Cromford, Crich, Mattock, Darley Dale, Stanton Moor, Stanton Park, Wingerworth, and Pillingham.

SAMUEL TUCKETT.

CHURCH-BUILDING NEWS.

Rickmansworth.—A new church is about to be erected at St. Peter, Chalfont, Bucks. Mr. John Harris, of St. Alban's, is the architect. The following were the tenders received:—Mr. J. Honnor, Tring, 1,082*l.*; Mr. F. Taylor, Uxbridge, 980*l.*; Mr. D. Osborn, Tring, 939*l.*; Messrs. Savage, St. Alban's, 909*l.* 10s. 6d. (accepted).

Shrewsbury.—St. George's Church, erected in 1832, has been re-opened after undergoing considerable alterations. The high pews have been removed, and new and uniform seats are now provided, with stalls for the choir. The organ has also been repaired, and removed from the west gallery to the south side of the chancel. The pulpit, altar-rails, &c., are new; and an improved system of warming has been adopted. There are now wide central passages in nave and transepts. The work has been carried out by Messrs. Nevett, of Ironbridge, from the designs of Mr. E. Haycock, jun., architect, Shrewsbury.

Chesterfield.—The chief-stone of Christ Church has been laid at Stonegravel, near Chesterfield. The church will be in the fourteenth century style, and built of stone, and is intended to accommodate about 180 persons. The nave and chancel will be under a continued roof, with apsidal end, porch, and bell-turret, with open timber roof, porch, vestry, and heating vault underneath. The cost of the building will be 500*l.* The architect is Mr. S. Rollinson, Chesterfield, and the builder Mr. R. Maw.

Stanton Brudenell.—The parish church of Stanton Brudenell has been re-opened for divine service. The church is dedicated to St. Dennis, and consists of a nave, chancel, and porch. Formerly it had also a south aisle, chantry, and tower with four bells, the latter having been removed to the tower of Corby Church. During the works at this church an early British grave was found, in the shape of a kist-van, with the bones of an adult enclosed, mixed with a large quantity of ashes and charcoal. The restoration of Stanton Brudenell Church has completed the whole of the churches upon the Brudenell estates in Leicestershire. The Countess of Cardigan, notwithstanding an outlay of many thousand pounds at Deene Church (to be shortly opened), lent a helping hand towards the restoration of Stanton Brudenell Church, and personally attended at the re-opening.

Barnsley.—A new church has been consecrated at Bierley. The erection of the new edifice is mainly due to Mr. Fojambe, M.P., and other resident landowners and gentry. The building has been erected from plans and specifications furnished by Mr. John Wade, of Barnsley, under whose superintendance the works have been carried out. It is built entirely of stone, the inside being faced with tooled ashlar. The seats are open ones, with ornamental bench ends. A western gallery has been fixed for the organ and choir. The roof of the nave consists of three arched ribs, springing from carved corbels. The east window is filled with stained glass, the centre lights representing our Lord's resurrection. The two side lights portray His agony and represent Him bearing the cross. The western tower window is filled with stained glass in geometrical figures. A school-room, with class-room, as well as a residence for the mistress, is also erected close at hand. The contractors have been Messrs. John & Thomas Ridal. The entire cost is set down at 3,000*l.* The church is to be dedicated to St. Paul. It is situate in the parish of Felkirk.

Bradford.—St. Andrew's Church has just been enlarged and re-opened. The church has been enlarged by the addition of 170 sittings. The nave of the edifice has been extended for a distance of ten yards, and the porch removed to the west end. The expenditure is 1,200*l.*, nearly the whole of which has been defrayed by subscriptions.

Moston.—The new church at Moston, dedicated to St. Mary, has been formally consecrated. The land upon which the church is erected was given by the daughters of Mr. Samuel Brooks. The church has been built, licensed, and the services conducted for some ten months, but owing to difficulties that have arisen the consecration has been so far delayed. The edifice,

which is seated to accommodate 450 persons—210 appropriated seats and 240 free—is built in the Early Gothic style of architecture, and consists of nave, 66 ft., by 37 ft.; apsidal chancel, 24 ft. 6 in., by 16 ft.; organ chapel, and vestry on the south side. There are two entrances at the west end, with inner porches, separated from the church by a glazed tracered screen. The font, situated at the west end, between the two entrances, is of Caen stone, consisting of a circular bowl, with inscription round the edge, and supported by a red Mansfield shaft, with foliated capital of lilies. The pulpit, situated at the north-east angle of the chancel, is also of Caen stone, supported similarly to the font. There are seats provided in the chancel for the choristers. The chancel is raised two steps above the level of the church, and the part appropriated to the communion one, and both are laid with Shaw's tiles. The lighting is effected by standards in the chancel, and corbels on each side of the nave. The gas-fittings are by Messrs. Skidmore. Externally the building is of red brick, with blue brick bands, and the dressings to the windows and doors, which are of stone, are set in brick reveals. The west gable is surmounted by a simple little bell-turret. The roof is open timbered, and plastered between the rafters. The architects were Messrs. Horton & Bridgford, Manchester, and the contractors, Messrs. Bowden & Edwards, also of Manchester. The cost, including heating, lighting, extra foundations, fittings, and boundary walling, has been 2,600*l.*

Jarrow.—The church recently erected at Jarrow Grange, Jarrow, has been consecrated. The edifice is in the Early Pointed style of the beginning of the thirteenth century, and consists of a chancel, nave, 71 ft. by 24 ft. 6 in., with north and south aisles, and vestry, organ-chamber, and south porch. It is built of natural bedded parpoints from Tow Law, with ashlar stone dressings from Hehburn. The churchyard is surrounded by a dwarf wall and wrought-iron palisading. Mr. Henry Hudspeth was the contractor for the masonry and plastering.

Swinton.—The new church at Swinton, dedicated to St. Peter, has been consecrated. The edifice, which is seated to accommodate 900, is built in the Decorated Gothic style of architecture, and is situate immediately adjacent to the old church. The latter will shortly be removed. Although the new building is not yet completed,—a tower, for which a sum of 1,200*l.* is yet required, being wanted,—the building itself is sufficiently far advanced to permit of service being now held. The cost of the building will be about 15,000*l.*, of which amount 800*l.* are required for the church, and 12,000*l.* for the tower. The church consists of nave, north and south aisles, chancel and chancel aisles, organ-chamber on the south, and vestries for clergy and choir on the north side. The total length of the building is 144 ft. by 66 ft. There are two porches at the west end and one at the north, immediately adjoining the entry to the vestries. The exterior work is of Durnford parpoints, with Longridge dressings, and the interior of Hollington stone. The wood fittings are of varnished pitch-pine. The chancel is 38 ft. long and 23 ft. wide, whilst the north and south chancel aisles are 26 ft. by 15 ft. 6 in. The fittings of the chancel are of oak, and the reredos and arcades of carved Mansfield stone. The floors of the aisles and chancel are inlaid with Godwin's tiles. The chancel is raised two steps, and the altar is ascended by four. The chancel is lighted by a large corona, of 180 lights, with two brackets; each of the aisles is similarly lighted. The roof of the nave, which is supported by six clustered columns and four responds, is open-timbered. The chancel is lighted by a large five-light tracery window; the north chancel aisle by a three-light tracery window; the south chancel aisle, by two three-light tracery windows; all with carved bosses outside. The pulpit, of Mansfield stone, with marble columns and panels, has been presented by Mr. James Bowers. It is proposed to build the tower to a height of 105 ft., and in the turret provision will be made for the reception of eight bells. One-half of the seats are appropriated, and the remainder free. The architect is Mr. G. E. Street; the contractor, Mr. Horsman, Wolverhampton.

Brighton.—The trustees of Trinity Chapel, taking advantage of great improvements which have been, and are still being, effected in Duke-street by the municipal authorities, have made an addition to that place of worship. In widening Duke-street, the corporation took away the vestry and choristers' room of the chapel, which were situated on the southern side of the

building and to the west of premises which also belonged to the trustees of the chapel and formed the junction of Duke-street with Ship-street. In exchange for these premises, the corporation gave to the trustees a portion of the property which they acquired from other parties on the west of the chapel; and on this site a chancel, vestry, chorister's room, and other offices have been erected. This alteration gives room for additional seats at the west end of the chapel, occupying the place where the communion-table and pulpit formerly stood; and the entire body of the building has been re-seated, modern open benches having been substituted for the old-fashioned pews. To some extent this alteration has been carried out in the galleries. The chapel has now a light appearance, the new chancel, which is Norman Gothic in style, being open and airy. The chancel is about 21 ft. square, and 30 ft. to the ceiling, which is of stained wood. The whole of the alterations have been designed and carried out by Messrs. G. Lynn & Sons, builders, of this town. The reteros is composed of coloured glazed tiles, the most prominent features in it being the cross (Maltese) and the emblems of the Trinity and Eternity; the latter consisting of triangles in a circle and the fleur-de-lis. This portion of the work was executed by Messrs. Maw, of Broseley, Salop. Above the reteros, on the south, is the mural tablet to the memory of the late Rev. Robert Anderson, which formerly occupied a position at the side of the communion-table. On the north side are three small memorial windows of stained glass; but the most prominent feature here is the large window on the west, erected to the memory of the late Rev. F. W. Robertson. This window, which contains above 100 ft. of stained glass, set in Bath stone, has been erected by Messrs. Powell & Son, of London. There are three lights, the centre containing three medallions, and the other two a cartoon each, illustrative of the leading incidents in the life of our Lord and His disciples, and suggested by the most remarkable of Mr. Robertson's sermons. The designs of these medallions and cartoons, which form a Greek cross, are by Mr. Holiday, of London, and were selected by the committee. In the centre light is "Our Lord as a Child among the Doctors in the Temple," taken from Holman Hunt's picture. Immediately beneath this is "The Crucifixion." The bottom picture of this group is the "Doubt of Thomas." On the left of the centre of these three is "St. John preaching in the Wilderness," and on the right of the centre, "St. Paul preaching at Athens," taken from one of Raffaele's cartoons. The standards for the altar-rail, brackets, &c., are all emblematical of the Trinity, and have been supplied by Messrs. Cox & Co., of London. At the north-east corner of the chancel is a new pulpit of carved oak, and in the centre of the chancel arch is a carved oak eagle lectern.

Buxton.—The foundation-stone of a new church has been laid here by the Duke of Devonshire. The Duke gave the site, and subscribed 1,000l. towards the cost of the building. A total of 2,700l. has been received towards an expenditure which is estimated at 5,000l. The new church, which is to be dedicated to St. James, is situated near the end of the Broad Walk, and will accommodate 700 persons.

Monks Kirby.—The church here has been restored and re-opened. The restoration, which has been designed by Mr. Street, has cost, we believe, about 7,000l. The architect has introduced stone screens and screens of carved oak; also a reteros and ornamental pavement. There is a painted window by Messrs. Hardman, Hughes, & Ward, and Lavers & Barrand, and one of Walker's organs. Those of the windows which are not of painted glass have been prepared under the direction of the architect, with the view of giving a suitable tone to the church. The pillars are of a warm-coloured stone. The village of Monks Kirby is two miles from Stretton Station and five or six miles from Rugby. It is the parish church of the family of the Earl of Denhig, and contains old family monuments, which have been restored. The chancel was restored by Trinity College, Cambridge, the patrons of the living.

Ellesmere Port, Cheshire.—A new church has been opened here by licence from the Bishop of the diocese. The consecration had been delayed for the completion of the conveyance of site. On plan the nave is 63 ft. by 33 ft., north and south transepts, 14 ft. 6 in. by 10 ft. 6 in.; chancel, 21 ft. by 26 ft., with organ chamber on

north side, and vestry and bell-turret on south side, north and south entrance porches and priest's door. The roofs are open, all the timbers being stained and varnished, with plaster ceiling formed between the rafters. The sittings, choir seats in the chancel, pulpit, prayer and litany desks, altar-rail and table, &c., are of pitch pine varnished without any staining. The chancel floor is laid with encaustic tiles by Maw & Co. The passages of nave and transepts, &c., being laid with black and red tiles in patterns. The architecture is of the Early Decorated Gothic style. Messrs. Penson & Ritohy, of Chester, were the architects, and Mr. John Roberts, of Chester, the builder. The sittings provide for 363 persons. The cost has been about 2,500l., independent of churchyard enclosure, &c., of which 1,500l., together with a site forming an addition to the existing churchyard, have been supplied by the Marquis of Westminster. The church is built principally of Runcorn stone, the inside arches of transepts and chancel, organ chamber, &c., being of that material. The warming is effected by hot-water pipes upon the high-pressure system.

Wettenhall.—The foundation-stone of the new church of Wettenhall has been laid. The old church was cramped and inconvenient, holding at most but sixty or seventy persons, while there are near 300 in the district who require accommodation. The old building was pulled down, and a contract for a new fabric taken at about 700l. Good progress has been made. The architects are Mr. J. Redford, of Manchester, and Mr. J. A. Daveport, of Over-lane, near Winsford. The contractor is Mr. P. Hodgkinson, of Sandach.

Linfield.—The old parish church has undergone a restoration, by having its exterior roof pointed, and the whole of the walls of the interior coloured, &c. The work has been carried out by Mr. Keasterton.

Newnigh.—The chancel of Frettenham Church, which has been entirely rebuilt at the sole cost of the rector, the Rev. J. Shirley, has been reopened. The chancel has been rebuilt from plans by Mr. Phipson, and the work has been carried out by Mr. Cornish, of North Walsham. The benches and altar-rails are of oak, carved. The floor is paved throughout with encaustic tiles.

Liverpool.—St. Saviour's Church, Breckfield-road North, has been consecrated. The new church is built in the style of the early part of the thirteenth century, and is of unusual size in all its parts, the span of the arches of the principal arcade being over 20 ft. The pillars have been carried to a height sufficient to permit of the chancel arch springing from the same level with the other arches of the arcades. The clearstory is planned to have something of the effect of a lantern; the arcade of the same being continued over the last chancel arch. The pillars are constructed of Cefn stone, with attached shafts of red Mansfield. The main walls of the church are of local red sandstone, relieved with white Stourton. The roof, which is lofty, is of Baltic fir throughout, the whole of the fittings of the building being of varnished pitch pine. The architect was Mr. Gordon N. Hills; and the builder Mr. Tomkinson. It is intended at some future day to crown the edifice with a tower.

Birstall.—The church of Birstall has been reopened for divine service. Works of restoration have been for some time in progress at this church. The restoration and enlargement have consisted of the removal of the erection which divided the aisles, as well as the gallery, plaster ceiling and fittings, and the substitution of a stone arcade of three bays between the nave and north aisle, carrying open timber roof, and the insertion of new windows in the nave and aisle wall. On the north side of the chancel has been added an aisle, in which is placed the vestry and organ chamber, the vestry being enclosed by an oak screen. The chancel has been repaired, and all the architectural features restored. On removing the modern plaster from the walls, some interesting discoveries were made of ancient work. In the south wall were traces of early windows and a priest's door, and in the north wall was discovered a circular-headed lancet window in a perfect state. The body of the church has been fitted with open deal benches, and the chancel with oak stalls. The pulpit is of Caen stone. The cost of the restoration will amount to about 1,550l. The work has been carried out by Messrs. Halliday & Cain, builders, Greatham, Oakham, from the designs of Mr. G. G. Scott, architect.

Oxford.—St. Barnabas's Church, Jericho, has been consecrated. The style of architecture is a departure from the conventional type of church building. The church will accommodate 1,000 persons. There are no pews, chairs occupying the whole of the floor devoted to the congregation. Owing to the peculiar mode of construction, the cost will not be much beyond half the sum required for churches of similar dimensions. The plan, as described by the local *Herald*, is a Basilica, and consists of a simple parallelogram 100 ft. long by 60 ft. wide, divided into nave and aisles by two ranges of circular arches; at the east end is a lofty apse, ceiled with a half dome; at the opposite end is a smaller apse, in connexion with the porches. The lower portion of a campanile stands detached at the south-east corner, the ground floor of which contains the vestry. The internal arrangements, with such modifications as are deemed necessary by the Anglican ritual, are similar to those of the Early Christian Churches of this type. A choir is raised in front of the altar, and forms a kind of elevated platform, which is reached by three steps. It is separated from the nave by a low screen or septum of stone, on which is a railing of metal-work entirely surrounding it, having iron gates at the west end and on the north and south sides, and at the east end of the stalls. When the choir was filled with the choristers and the officiating clergymen, it presented a novel appearance. The altar is a conspicuous object on entering the church. It is raised nine steps above the nave floor, causing it to appear much higher than the choir. A lofty baldachin or pointed canopy of wood supported on four slender pillars, highly gilt and decorated with colour, forms a prominent object under which stands the communion-table, bearing two lofty brass candlesticks, each holding a large wax candle. At the back is a shining cross. Over the entrance to the choir is a floreated metal cross suspended from the roof, and conspicuous at the entrance. The nave is separated from the aisles by columns supporting semicircular arches, above which is a range of simple round-headed clerestory windows, with a large circular window, without stonework or tracery, at the upper part of the west end. The aisles are lighted by small square windows. The glass of the windows is slightly tinted with green, yellow, or blue, and floreated forms given to the lead holding the glass. The cheapest possible materials have been used, and methods of construction harmonising with the style, strength, and durability. No wrought stone has been used except for the columns supporting the nave arches, and on the base of which at the corners of the pedestals are conventional ornaments. The walls are 2 ft. 8 in. thick, built in rubble of local stone, in blue lias mortar. Brick has been used for arches, bands to level up the work at intervals, and at the groins. In various parts the brick is allowed to show, except where fresco decoration is contemplated. The outside walls are plastered with rough Portland cement to protect the stone, and on the inside rough stuccoed to receive decoration. Where hard stone is usually employed, Portland cement has been used. The floor of the church is of the same material set in concrete, and the floor of the choir is tiled. The nave has a king-post roof of low pitch, which with the aisle roofs are framed with all timber and boarding nawnrough. The roof is picked out in panels, and the whole decorated with colour, in which a warm tint prevails. There are no mouldings throughout the building, and the carvings are confined to the capitals of the nave arcade. Although there is little carving in the body of the church, there are some examples of carving by Messrs. Knowles, stonemasons, carvers, and builders, of Oxford. At the tops of the pilasters in the baptistery the heads of the founder and the bishop are carved. The heads, also, of the incumbent, and the vicar of St. Paul's, are carved in stone. The contemplated decorations have as yet only been carried out in the roof of the baptistery and the eastern apse. The dome of this apse is coloured a pale blue, with stars of various sizes. In the centre is a colossal figure of Our Saviour enthroned, the head surrounded by a nimbus, containing a cross. Below the cornice, in a series of arches, are the figures of the Apostles, two and two, SS. Paul and Barnabas occupying the centre. Below the figures the wall is panelled with a spreading vine springing from the centre of each panel. The base is a dado of Indian red. The building has been executed by Messrs. Castle & Co., under the direction of Mr. A. W. Blomfield, architect.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Weston.—The new church at Weston, Warwickshire, dedicated to "Our Lady of the Sacred Heart," has been consecrated by Dr. Ullathorne, Roman Catholic Bishop of Birmingham. The church is a simple structure, consisting of nave, chancel, and side chapel. The materials are brick, with dressings of local stone. The font and altar were executed by Mr. Jaquet, of London. Mr. Bromwich, of Rugby, was the builder. Mr. Gualbert Saunders, of London, was the architect.

West Drayton.—The new church at West Drayton has been opened for divine service. The edifice is dedicated to St. Catherine the Martyr, and will accommodate about 500 persons. It is built of brick, with stone dressings, and is in the Early Decorated style. There are a nave, two aisles, a baptistery, a sacristy, a chancel, and a small side-chapel near the chancel, dedicated to the Blessed Sacrament. The chancel is lighted by means of a carved stone oriel window, and is paved with Minton's encaustic tiles, with the initials of "Ave Maria," and with plain tiles. The nave and aisles are laid with blue and red Staffordshire sile tiles. The building is 80 ft. long and 40 ft. wide, the height to the ridge of the roof being 45 ft. The cost of the portion completed has been 2,500*l.*, and when a proposed tower has been erected, the total cost will have been 3,000*l.* The architects are Messrs. Wilson & Nicoll, of London; and the builders Messrs. Fassnidge & Son, of Uxbridge. Mr. Dale has been clerk of the works. A painting, by Spagnoletti, of the preparation for the Crucifixion of our Lord, has been presented as an altar-piece by Mr. Swift, of London, who has also been a donor to the building fund. The school-room is 40 ft. long and 20 ft. broad, and will contain about 250 children. This has been built by Messrs. Fassnidge & Son.

Cleator.—The foundation-stone of a new church, dedicated to the Virgin, by the title of "Our Lady of the Sacred Heart," has been laid at Cleator by the Roman Catholic Bishop of Hexham. The church is after the design of Mr. Welby Pugin, architect. The edifice has been for some time in the course of construction, and the builder is Mr. Henry F. Edwards, of Whitehaven. The foundations were completed on the 18th of August last. The masons then commenced operations, and the walls are now about 9 ft. above the ground. The design is cruciform, and the building will accommodate about 1,000 persons. Its dimensions inside are 130 ft. by 50 ft., and 75 ft. across the transepts, and its height is about 65 ft. The cost of the structure will, it is expected, be 4,000*l.* According to the design, in the centre of the aisle bays, spaces are left for the stations of the cross, and on either side there are placed lancet windows of peculiar form; externally a vesica, containing the emblem and number of the station, corresponds to the internal group. The chancel is lighted by an eastern rose-window, and by side windows of simple tracery; and the chancel arch is supported on clustered columns, crowned with carved capitals. Eastward of the transepts are two small chapels; and an organ-gallery is provided at the west end over the main door. The clearstory is composed of small coupled lancets, which admit a subdued light into the body of the church. A font in the north aisle, and a pulpit on the Gospel side of the nave, will be provided. The sides at the west end are flanked by buttresses, which, rising from the aisles and the walls of the projecting porch, form a spreading base to the bell-turret, which, with moulded corbels, and wrought-iron gilded cross, surmounts the gable. Immediately above the slope of the roof of the porch are three lancet windows, which are held in balance by two similar windows in the ends of the aisles. In the group of the east end, the transepts break the line of the main roof, and the transept chapels cluster round the chancel. The church is being built of Cleator red and Cockermonth yellow stone, and the foundations have been put in entirely of concrete from the iron furnaces at Cleator Moor.

The Smoke Nuisance.—The Leeds Town Council rightly are still carrying out various smoke prosecutions. A case against Messrs. Gantt, of Broad-lane, Bromley, woollen manufacturers, and their engineman, John Marsden, has been dismissed on payment of costs, the defendants having now put in an efficient smoke-burner.

FROM SCOTLAND.

Edinburgh.—Mr. Syma has urged the advantages and conveniences of one large block erection for the new Royal Infirmary; and Sir James Simpson, on the other side, has denounced the palatial mode of building, and advocated that of a village, or, in fact, the pavilion system elaborated so often and early advocated in the *Builder*.—The foundation stone of a church for the Free Methodists of this city has been laid. The site is in Park-place, at the east end of the University Music-hall, and the plans were prepared by Mr. Macrae, architect. The church will be 60 ft. in length, and 40 ft. in breadth, and will be seated for between 450 and 500 persons. About 150 of these will be accommodated in a gallery which it is intended to erect at the north end of the building. The church will have a northern frontage. It has been estimated to cost from 1,000*l.* to 1,200*l.*

Perth.—Arrangements have been completed for the erection of the new Free West Church in Tay-street. The site is about halfway between High-street and the County Buildings, on the line of Tay-street. The building has been designed by Mr. John Honeyman, junior, architect, Glasgow, in the style of architecture which prevailed about the middle of the thirteenth century. The extreme length of the building, exclusive of vestry, &c., will be 114 ft., and the width 63 ft. The principal entrance will be in the base of the tower at the end of the building next Tay-street, the lower part of the tower forming a spacious porch. The tower will measure 30 ft. over the buttresses, and the height from the pavement to the top of the steeple will be 212 ft. It will form a very conspicuous feature in every view of the city. The church will be divided into three aisles by iron columns supporting the side galleries and the roof. The ceilings will be all plastered, but the principal couples, which are ornamental, and the purlins, will be exposed to view. The height of the central aisle from floor to ceiling will be 43 ft. Provision will be made for ventilating the church by drawing the vitiated air into the tower. The pews will be 33 in. wide, and there will be accommodation for fully 1,000 persons, allowing 20 in. for each sitting. The contractors for the work are,—Messrs. C. McCarrach & Sons, masons; Mr. C. S. Whitte, wright; Mr. J. Peebles, plasterer; Mr. J. MacLeish, plumber; Mr. P. Reid, slater; and Messrs. J. Bruce & Son, glaziers, all of Perth. We understand that the total cost, exclusive of the site, the gift of the late Mr. Turnbull, will be about 8,000*l.*

Dunkeld.—The memorial which is to be erected in Dunkeld Cathedral, to the memory of the officers and men of the 42nd Highlanders,—the "Black Watch,"—who fell during the Crimean war, is now completed, by Mr. Steell, the sculptor, and is expected to be shortly removed to Dunkeld. Miss Burdett Coutts, the Countess of Rotbes, and the Hon. Waldegrave Leslie, were present in the studio during a recent visit of the Highlanders, to see the memorial. It is in the form of a large Gothic mural tablet, the upper part of which contains a sculptured group in high relief, representing a scene on a battlefield. The sculpture is in pure white marble, and will be surrounded by a deeply moulded border of sandstone.

Dundee.—The proposal to construct a railway bridge over the Tay at Dundee has been revived by the North British Railway Company. In the event of the work being now proceeded with, the plans and specifications will be nearly similar to those prepared in 1866. The present Tay Bridge scheme embraces, first, a branch from the main line at Leuchars to a point a little to the east of Wormit Bay, about a mile and a half above Newport; second, the viaduct; third, a station at each end of the town of Dundee; and fourth, a tunnel connecting the two stations. The branch from Leuchars to Wormit Bay will be five miles in length. In its construction, no heavy works will be required; and it will reach the shore at a convenient elevation for the bridge. The bridge, which will be constructed on the lattice-girder principle, will rest upon stone piers. The structure will be upwards of two miles in length, and will consist of 73 spans, of which 10 will have a width of 60 ft. each, 45 of 120 ft., and 18 of 200 ft. The latter will extend over the deepest part of the river, and beneath them all shipping will pass. In accordance with the Admiralty requirements, the central part of the bridge will be of great height, so as not to impede the passage of vessels. From the surface of the water at full tide to the under side of the girder,

the height will be 100 ft. A careful survey of the proposed line of the bridge has shown that foundations of solid rock for all the piers may be got at an average depth of 14 ft. below the bed of the river. Over the 18 great central arches the line will be level, and thence it will descend to the southern end with a gradient of 1 in 150, and to the northern end with a gradient of 1 in 60. The superstructure of the bridge will consist of girders of lattice-work, divided into three sections, one of which extends over the navigation channel, and the others thence to either shore. In order to make the structure as low as possible consistent with maintaining in the central spans the required height above the high-water-line, the rails will be laid on the top of the side sections of the girder; while in the central section they will be laid inside, on the floor of the lattice-work tube. The girder has a width throughout of 16 ft., and the central section is 25 ft. in depth. The side sections diminish in depth towards either shore.—Logie burying-ground, at the west end of the town, having been closed, in consequence of its greatly overcrowded state, a committee of the town council have been on the outlook for ground for a new cemetery. An arrangement was made by which not only a new cemetery but a large public park will be secured for the west end of Dundee and for Lechea. The arrangement is to feu 60 acres of the hill of Balgay, 20 to the westward to be used for a cemetery, and 40 to the east for the public park. The rate of feu is to be 12*l.* per acre, or 720*l.* for the whole. At a meeting of the town council as a Burial Board, the arrangement has been approved so far as the portion to be used for a cemetery is concerned; and as the police commission, which has the power of providing pleasure parks, is composed of the same persons, there is no doubt it will be approved of by it also. When the hill is laid out, it will form, it is said, one of the finest public parks in Scotland. At the east end Dundee already possesses the Baxter Park, of nearly the same size, so that both in the east and west there will be large public parks.

FROM AUSTRALIA.

Melbourne.—The foundation-stone of the Carlton Wesleyan Church, Palmerston-street, which is about to be erected on ground adjoining the school-house, wherein the congregation worship at present, was laid on the 27th of July by Mr. S. Grey King. The cost of that portion of the church which will be first erected will be 2,100*l.*; and towards this the congregation have 650*l.* in hand. The architects are Messrs. Reed & Barnes, who have produced a good design, and the contractor is Mr. J. Pigdon.

Fitzroy.—The new Roman Catholic Church of St. Bridget is now rising in the reserve at the corner of Nicholson-street and Reilly-street, Fitzroy. The foundation-stone was laid by the Right Rev. Dr. Goold with the customary ceremonial. The church is to be erected in the Decorative Gothic style of architecture, and will consist of a single nave, 28 ft. wide by 60 ft. long, with an octagonal chancel. It is intended to afford accommodation for 450 persons, and will cost about 1,200*l.* The material will be bluestone rubble, with pressed cement dressings to the windows and doors. Mr. T. A. Kelly is the architect.

Ballarat.—The Fine Arts Exhibition here was formally opened on the 21st of July, by the Governor of the colony. There was a grand banquet on the occasion, in the annex to the Alfred Hall. The Exhibition is in connexion with the Mechanics' Institute. It was lately asked what becomes of all the pictures. Here is what has become, or what is likely to become, of one old acquaintance, which, last time we saw it, graced the walls of the Pantheon in Oxford-street. The trustees of the Ballarat Mechanics' Institute are desirous of obtaining Haydon's picture, "The Banishment of Aristides," and they endeavoured to negotiate its purchase from the present possessor, Mr. Twentyman. Mr. Twentyman, however, is about to form a private picture gallery, and in replying to the overtures from Ballarat, he expresses himself in very strong terms respecting the authorities of the public library, to whom he had previously offered the picture.

Geelong.—At a meeting of the shareholders of the Geelong Gas Company, the directors recommended a dividend of 8 per cent., but this was overruled by a majority of votes that the usual 10 per cent. be given. Considerable dis-

cussion took place with reference to rate charged to the public, many shareholders urging a reduction to 15s. per 1,000.

Sydney.—As the gold fever subsides, the diamond fever supervenes. A reputed marvel of gems, "the Armidale diamond," has arrived in Sydney, and has at once been placed in the hands of the Rev. W. B. M. Clarke, geologist, for examination and report. Great excitement exists pending his inspection. In the mean time a gentleman, just arrived from Sydney, states that for some years past the finder of this precious stone has been engaged searching for diamonds, and that success has wonderfully attended his efforts, several jewels found by him having been already sent to England. This last one (if it be a diamond at all, which seems to be as yet an undecided question) is about the size of a turkey's egg, and weighs 7 oz. 14 dwt. The Bank of New South Wales, at Armidale, advanced 700l. after testing it. It is said that even should it prove to be a colourless topaz, the value is enormous. People in Sydney talk about its being worth a million and a half of money, but that will depend upon its purity. In the Brazilian diamond mines a stone weighing 1,680 carats, or 14 oz., was first valued at 224 millions, then 56 millions, then three millions and a half, but its true value (not being very brilliant) was 400,000l. It would seem that this Armidale "diamond" was picked up from the surface of the ground on a station, and not at the Armidale diggings. It was rumoured in Sydney that the proprietor of the station intended to test the ownership with the finder.

SCHOOL-BUILDING NEWS.

Wigston.—The old schools having been found quite inadequate to the requirements of the village, a movement was set on foot to obtain new ones, and the requisite funds having been gained to make a start, the superintendence of the building was undertaken by Mr. W. Barber, architect, London, and son of the Vicar of St. John's, Leicester. The means placed at his disposal were too limited to admit of anything in the way of ornamental detail. The schools are of red brick, and covered with Switthland slates, and are in the Early Pointed style. They comprise boys', girls', and infants' rooms. The boys' and girls' rooms can be used as a mixed school, and for village meetings. They can be separated by a moveable partition, so as to form distinct rooms if necessary. The new buildings are designed to accommodate 250 children, 150 boys and girls, and the remainder infants, and are set back some distance from the village street, the space between the street and the building forming a spacious play-ground. Yards and offices are provided at the back of the schools, and behind the yards is a large garden, which it has been proposed to utilise as a work-ground for the children, and as a means of teaching them something of horticulture. The contract was taken by Messrs. John Sharpe & Son, of Wigston, builders, at a cost of 969l. The schools have been opened by the Bishop of the diocese.

STAINED GLASS.

St. John's Chapel, Cirencester Church.—This chapel has been enriched by the setting up of two windows, representing a portion of the history of St. John. The story begins in the upper division of the western window, on the right-hand side, in which the angel is foretelling to Zacharias the nativity of St. John. Underneath is the Vision of Zacharias in the Temple. The upper division, on the left compartment of the window, represents the Nativity of St. John; and that underneath, the Visitation of Mary to Elizabeth. In the eastern window, the upper compartment on the right hand represents the Circumcision of St. John; and underneath, Zacharias writes, "His name is John." The lower compartment, adjoining, exhibits St. John in the presence of the Virgin Mary and the infant Saviour; and the compartment above, the Mission of St. John. These windows, we understand, have been set up to the memory of the late Mr. Lawrence and his wife, residents in this town. They were designed and executed by Messrs. Hardman & Co., of Birmingham.

Abbey Church, Cambridge.—Three more windows have been inserted in this church. The south side chancel window is filled with the figure of Charity, under an ornamental canopy; the one on the north side is a memorial window,

erected by the children of the late Sarah Preston, the subject being the Raising of Jairus's Daughter, with an inscription, "She is not dead, but sleepeth." The window opposite contains medallions of the four acts of Mercy, surrounded by ornamental groundwork. The tracing is occupied by an angel. The whole of these windows were designed and executed by Mr. W. H. Constable, of Cambridge, the same artist who filled the chancel window last year for Mr. T. Preston.

Knaresborough Church.—Messrs. Clayton & Bell have supplied a design for the intended window in memory of the late Sir Charles Slingsby. The subjects are taken from the lessons for the day (February 4th) on which he was drowned. There are two from the Old Testament—The Deliverance of Israel, and Healing the Bitter Waters of Marah; two from the New Testament—Jesus asleep in the Storm, and Jesus rebuking the Wind and the Sea. The design has been seen and approved by the bishop of the diocese and by Captain and Mrs. Slingsby, and has been placed in the shop of Mr. Hannam, bookseller, Knaresborough, for inspection.

PROVINCIAL NEWS.

Dury.—A plot of land, in Henhill, about 247 ft. frontage, and running 111 ft. back, was secured for the erection of new premises, for Messrs. Ashworth, hat manufacturers; and extensive buildings have just been erected on it, capable of making 3,000 hats per week. The front is 154 ft. long, and about 33 ft. wide, and runs down one side the whole length of the plot, viz., 111 ft., and the remainder of the land will shortly be occupied by dwellings for the workpeople. The premises themselves are so arranged that they can be converted into dwellings at any time, with very little additional expense. The principal portion of the ground floor is flagged with 4-in. Rosendale flags, and the whole of the upper floor is double boarded. All bearing timber and joiners' timber is best Savannah pitch-pine. The main front is built of Platt's best stock brick, and the remainder of selected seconds brick, with stone heads to windows, and stone quoins to angles, with stone cornice corbelled out. The masons' work has been executed by Messrs. Edward Hill & Brothers; plastering, Mr. Scholes; plumbing and glazing, Mr. Robt. Caton; slating, Mr. John Kay; and the carpenters' and joiners' work, by Messrs. Ashworth themselves. The cost of the building is about 3,000l., and it has been erected from the designs and plans of Mr. James Hart, of Southport, architect.

PATENTS CONNECTED WITH BUILDING.

STEEL PILES.—*J. H. Johnson.* A communication, dated 29th January, 1869.—This consists in the forming of iron or steel into piles, faggots, or billets, preparatory to rolling, by pressing the metal into forms of the required shape, also in forming iron or steel into hollow piles or billets preparatory to rolling into other articles, such as pipes or columns; various combinations or arrangements of machinery may be employed in manufacturing pressed and moulded piles or faggots, as above described, but that which the inventor has found to give the best results consists of a hydraulic or other powerful press, the ram of which carries a plunger which accurately fits inside a strong metal case or mould, of any desired size and transverse section, the sides of such mould being capable of opening on hinges, in order to release the compressed and finished pile. The blooms having been placed in the mould, and the sides closed down and secured, the plunger is caused to enter through one end of the mould, which is left open for that purpose, and to forcibly compress, by the action of the hydraulic press, the metal contained inside the mould, thereby not only expelling the impurities which may be in the bloom, and which escape through the joints in the mould, but causing the metal to be thoroughly consolidated, and to take the exact form of the mould.

PAINT.—*F. Joy.* Dated January 29th, 1869.—The inventor proposes to use any or all the ingredients now used in the manufacture of paints, but the peculiarity of his invention consists in utilising or using together with such ingredients the common resin of commerce in combination with oxide of zinc. This combination has not heretofore been employed in the manufacture of paint, applicable to the various purposes for which ordinary paint is used.

FIREPLACE SCREENS.—*C. Hoult.* Dated February 2nd, 1869.—This consists in making the use of sheets of glass, transparent, semi-transparent, or opaque screens, some of which are highly ornamented on the surface by cutting or being pressed, or moulded, or silvered at the back, to serve as mirrors, or in any other convenient way. It is preferred, however, to use one or more sheets of plain glass, and to apply to the surface intended to be the back thereof any desired ornamental design in gold, silver, or colours, or imitation jewels, or any combination thereof, or to place behind such sheet or sheets of glass any painting in oil or water (photograph, plain or coloured), or otherwise, into a frame of metal or of other material, by preference stamped out of sheet metal, iron, or tinned iron; or they may be cast in copper, brass, or steel, or other material, or varnished, in such a way that they are themselves of an ornamental character.

ARTIFICIAL STONE.—*C. D. Abel.* A Communication, dated February 3rd, 1869.—The principal components of this hydraulic cement are lime, silica, and alumina, the two latter being by preference extracted from refractory clays. In order to bring about the formation of the double silicate of alumina and lime, sulphuric and boric acid are added in small quantities to the compound.

CHIMNEY GUARDS.—*W. Blundell.* Dated 5th February, 1869.—The guard or casing, which is to be placed on the chimney-top in the usual manner, is made rectangular in cross section and covered at its top by a suitable cap. The sides at their upper parts are formed with openings, the combined total area of the openings at each side of the guard or casing being equal to the cross-sectional area of the guard or casing itself. Each opening is provided with a flap or louvre-piece, working horizontally on pivots or centres in such manner that the upper part of the flap or louvre-piece when it is closed shall slightly overlap the inner edge of the upper part of its opening, while the lower part of the flap or louvre-piece in the same position in like manner overlaps the outer part of the lower edge of the opening. Each flap or louvre-piece is so balanced by a weight, or by other suitable means, as to stand at an angle when at rest, thus leaving its opening clear for the escape of smoke or vitiated air, but so, nevertheless, that the slightest current of air from without shall have the effect of causing it to close its opening.

ROOFING TILES.—*L. A. St. Paul de Limay.* Dated 9th February, 1869.—The inventor provides the tiles with lateral flanges, by which they are connected together, and also with ears for securing the tiles to the framing of the roof. The ears are fixed at one corner of the tiles, while the ears are made to hook on to the flanges, and are also secured by nailing to the rafters. The number of these ears vary according to the size of the tiles; by making the tiles of small dimensions the inventor is enabled to use much thinner and cheaper metal than is the case when tiles are made of considerable size.

MASON'S TOOLS.—*A. Munro and W. B. Adamson.* Dated 18th February, 1869.—This consists in the construction of conical tubular tools. The tools under the first modification constitute a hollow truncated cone or short conical tube. The tools are fixed in the holders of the machine for cutting stone, slate, marble, rock, or other substances, preferably by means of a bolt, which passes into or through the hollow or tubular part of the tool, on or in the other end of which a nut, spring, or collar is placed, or the bolt may be made to tightly fill the hole in the socket, in which case the nut, spring, or collar is dispensed with. The bolt, on being tightened, draws the tool firmly into the recess formed in the socket or holder to contain it. Under a second modification the tool is made hollow for a certain length only, the after part forming a solid shaft or bar, which passes into a correspondingly formed hole in the socket or holder, and by which it is held therein. The tools constructed under the first modification are to be formed of chilled iron steel, forged or pressed into the requisite shape, or of chilled compounds or alloys of iron or steel.

BRICK PRESS.—*J. A. Wade and J. Cherry.* Dated 18th February, 1869.—A suitable frame mounted on wheels or otherwise, carries the fixed die or mould (for forming the sides of the brick, tile, or other article) to which is hinged

the movable upper die or lid. The lower die or loose bottom, which works vertically inside the fixed die or mould, and by which the pressure is given, is supported upon two eccentrics keyed upon a shaft, capable of revolving in bearings fixed to the frame, and having a hand lever keyed at one end thereof. The hinged upper die or lid when closed is held down by a catch, but when released by a cam on the eccentric shaft, or a pin on the lever is thrown back by means of a spring.

SLIDING WINDOWS.—A. Bartholomew. Dated 15th February, 1869.—The inventor applies a plate or plates, or surface or surfaces, to the side or sides of the upper sash, with holes tapped to receive a screw with a square or other head adapted to receive a loose key, by which such screw is placed in position, and when in position, by acting on the upper part of the lower sash, to prevent the one from being raised and the other from being lowered beyond a suitable distance, which may be varied by the position of the screw in the upper sash.

BRICK-MAKING MACHINERY.—F. Vandenberg. A communication. Dated February 3rd, 1869.—This consists of a pug-mill of the ordinary construction mounted above a series of moulds, which are placed in a circular or rectangular framing. The clay or other material is forced down to the lower part of the pug-mill, where it enters moulds carried upon a circular table, which has a rotary motion communicated to it in any suitable manner. Beneath the table a wheel or drum is placed, upon which the bottoms of the moulds are brought to bear in their rotation. This wheel causes the moulds to rise, so as to bring the upper surface against the underside of a fixed table or plank; in this operation the clay becomes compressed within the mould. The moulds, with the material within them, then pass on towards a second wheel or drum, by which the bottom of the mould is lifted, so as to cause the moulded article to project beyond the top of its mould. It can then be removed to a drying stack; or, if the clay is sufficiently free from moisture, it can be attacked or otherwise treated for burning.

SPRING HINGES.—J. Reap and W. H. Michelmore. Dated 26th February, 1869.—The pin or vertical axis of the hinge is mounted in bearings, so that it can freely turn through rather more than a quarter of a revolution either way. The upper part of this pin is squared so as to receive a lever or shoe which is affixed to the lower angle of the door, which thus turns on and with this pin as an axis. On the pin are mounted two rollers, so as to turn on vertical discs, which are at some distance from the axis of the pin itself. Two curved jaws are mounted on vertical axes, one on each side of the hinge-pin, and are acted on by a spring, so as to make them close tightly together towards the hinge-pin, and these jaws are geared together, so that when either one of them is caused to move from the hinge-pin the other also moves from the hinge-pin. The rollers already described bear on the inner surfaces of these jaws, one upon each, and each of these faces is made of such curvature that when, by moving the door, the hinge-pin with its roller is turned, the roller running on either face causes the jaws to expand against the force of the spring, and consequently, when the door is left free the force of the spring tending to make the jaws close together causes the rollers to be passed towards the middle position, and so closes the door.

SUBSTITUTE FOR FIRE-BRICK.—J. Cliff. Dated 1st March, 1869.—Instead of using fire-bricks, lumps, stones, tiles, or other forms of materials or compounds in construction, burnt or unburnt, the inventor uses powdered or reduced ganister, stone, quartz, sand, mica, sandstone, or other silicious material, plumbago, lime, baryte, steatite, and magnesia, alone or separately, or in varied proportions with fire-clays, or with each other, or with silicious or other solutions mixed or not with hair, fibre, sawdust, shavings, or pulverised coke, or with other analogous materials.

Convalescent Home, Manchester.—At a meeting of the trustees of the Manchester Infirmary, held on Monday evening, it was stated that Mr. Robert Barnes, late cotton manufacturer, had made the handsome gift of 10,000l. to the institution, with the intention of its being applied in support of a new convalescent hospital established at Cheshire. It was agreed that the new institution should be named "The Barnes Convalescent Home," in honour of the donor.

Books Received.

The Indian Economist (Street, Cornhill) is the title of a new monthly journal published in Calcutta, and devoted to Economic and Statistical inquiries concerning India. Judging from the two numbers before us, this is not a superficial scissors-and-paste affair, but the work of well-informed men, in earnest, and is likely to be found of much service.—*The Statistical Reporter*, also a monthly publication, gives valuable returns and other information concerning India.—"Cassell's Household Guide" is intended to supply information in a cheap form on the various departments of household management. Part I. contains much useful matter.—The astronomical illustration in De la Rue's Red Letter Diary and the Pocket-Book, of course, refers to the luminous prominences from the sun, concerning which so much has been discovered during the year. Mr. Warren De la Rue shows in the article accompanying the illustration how early he contributed important information on the subject.—*The Quarterly Review* for October (Murray) contains several papers of special interest. One is on the Water Supply of London; another on the Byron Mystery; a third on Islam, by the author of the remarkable paper in the *Quarterly* on the Talmud. There are also papers on Isaac Barrow; on Higher and Lower Animals; and others on political and ecclesiastical subjects. The paper on the Water Supply of London is a *bona fide* review of the Report of the Royal Commission on Water Supply, and other reports and returns. The reviewer draws particular attention to the Thames Basin as a source of supply treated of by the Commissioners; and to the desirability of transferring the water supplies to the metropolitan or municipal authorities, so as to have the consolidated water-supply under public control.—A notice of some ancient tombs, at Movilla, County Down. By W. H. Patterson, Belfast, printer. This is the substance of a paper read before the Belfast Naturalists' Field Club. It relates to certain ancient slabs in the churchyard of Movilla, of an ordinary shape, with sculptured crosses on them, of various designs.—Bakerian Lecture. On the Continuity of the Gaseous and Liquid States of Matter. By Thos. Andrews, M.D., F.R.S. From this abstract from the proceedings of the Royal Society, it appears that Dr. Andrews has discovered that carbonic acid gas can be made to pass without breach of continuity, from the gaseous to the liquid state, and

"As a direct result of his experiments, he concludes that the gaseous and liquid states are only widely-separated forms of the same condition of matter, and may be made to pass into one another by a series of gradations so gentle that the passage shall nowhere present any interruption or breach of continuity. From carbonic acid as a perfect gas, to carbonic acid as a perfect liquid, the transition may be accomplished by a continuous process, and the gas and liquid are only distant stages of a long series of continuous physical changes. Under certain conditions of temperature and pressure, carbonic acid fluids itself, it is true, in a state of instability, and suddenly passes, without change of pressure or temperature, but with the evolution of heat, to the condition which, by the continuous process, can only be reached by a long and circuitous route."

—*The Shipwrecked Mariner: a Quarterly Maritime Magazine*. No. lxiv., vol. 16. October, 1869. Morrish, Paternoster-row. This sixpenny quarterly is interesting to all connected with the sea, and interested in the extension of the lifeboat system. The number before us contains a report of the thirteenth anniversary of the Shipwrecked Fishermen and Mariners' Royal Benevolent Society; tables of sums given for relief to fishermen and mariners, their widows and orphans, &c., by the society referred to; and to shipwrecked crews, &c. It also contains various narratives and other interesting matter; and is usually purchased for distribution amongst fishermen and other seafaring people.

Miscellaneous.

Illustrations of Roman London.—The Common Council have agreed, at the suggestion of the Library Committee, that a detailed description of Roman remains found in the city of London be obtained, and the drawings of the pavement recently found chromo-lithographed at an expense not exceeding 135l., and a copy sent to every member of the court, and to the members of various learned societies and the Metropolitan Board of Works.

The Yorkshire Tumuli.—The Rev. Canon Greenwell, of Durham, has resumed his investigations in the British tumuli of the Malton district, with a view of completing his researches (so far as the North Wold range is concerned), there being no barrows left, except those which have been rifled years ago by the curiosity-hunter and treasure-seeker. The feature of one barrow was the finding of a sandstone slab having "cup" markings on both sides. Another barrow (which yielded no interment) abounded in these "cup"-marked stones. There were scores of them, in fact. The stone varied in shape and size; some had but one "cup," while others had a row of several "cups," some on both sides and some on the edges; six or eight being together at times, and often connected by a groove out in the stone. These cup-shaped hollows were perfectly fresh, and showed no sign of wear; in fact, the tool marks remained quite as sharp as the day when made. In this discovery there was not one single instance which showed any sign of use. Most of the striking examples will be engraved. The stones in which the "cup" markings are found are of a soft nature, and might easily have been worked by a flint chisel. Most of the marked stones will go to Durham. Nothing is said of any concentric circles, with which the cup-shaped markings are usually but not always accompanied on the rocks in Northumberland. Other barrows were opened; but these were the most interesting.

National Education League.—The vitally important subject of education, now being fully agitated, for the establishment of a public opinion on the subject, has our best wishes so far as regards the education of every child in the country. The first general meeting of the members of the National Education League has been held at Birmingham, with a large attendance both of ladies and gentlemen, the latter including many of the most forward promoters of the educational movement in all parts of the country. A deputation from the Society of Arts, consisting of Mr. Edwin Chadwick, C.B., Member of the Council, and Mr. Le Neve Foster, Secretary, attended. Mr. George Dixon was called to the chair. Various papers were read and discussed on successive days; and it was finally resolved—"That, in the opinion of this meeting, the scheme of the National Education League is the one best adapted to secure the education of every child in the country; and "That the executive committee of the League be requested to prepare a Bill, based upon the principles of the League, for introduction into the House of Commons during the next session of Parliament."

The New Workhouse, Ilington.—At the last meeting of the Ilington Guardians the clerk read a letter from Mr. Burden, the architect at the new workhouse, Upper Holloway, in which he stated that being informed that the Board had passed a resolution with reference to the appointment of a surveyor, it remained for him to state that it was necessary that one duly qualified party should be appointed to act as the surveyor on behalf of the guardians as against any party the contractors might employ on their side. The necessity for one party was occasioned by the fact that the duties to be performed involved responsibility. That the clerk of works would be in attendance when required was, of course, assumed. It was inevitable that accounts must under the contract be the result of measurements, and nothing short of the greatest confusion could be anticipated in the event of the measurement of the deviations being left, in the first instance, entirely in the hands of the contractors. He reiterated his opinion that it was most advisable that the surveyor appointed be one acquainted with the works. Should it be the pleasure of the Board to constitute the clerk of works the surveyor in question (a mode of procedure for a work of such importance most unusual), it must be obvious that his time would thus be very largely if not entirely absorbed, to the abandonment of his present very important duties, unless the whole matter be deferred until the completion of the works, which, for manifold reasons, would be quite at variance with the advice he had given to the Board as their architect.

A Railway Station Burnt.—The railway goods station at Heckmondwike, Dewsbury, accidentally caught fire on Tuesday night last, and was completely gutted. The damage amounts to nearly 20,000l. The east wall fell, and two men were severely hurt.

Value of Property in Bristol.—Stoke House, formerly the residence of Sir Henry Lippincott, with the adjoining park, in all about ninety acres, has been sold by auction in Bristol for the Birmingham Financial Company, who, having not long since purchased the property, divided it into forty-four lots, as a building-ground speculation. The house and grounds were knocked down to Mr. W. H. Budgett, of Redland, who also bought the greater portion of the land. The prices ranged from 350*l.* to nearly 1,000*l.* per acre, and it is said that the Birmingham Financial Company have realised a profit of over 22,000*l.*, the property having been purchased only a few months since for 30,000*l.*

New Masonic Hall at Stockton-on-Tees. The foundation-stone of a new Freemasons' Hall, for the Lodges of Philanthropy, has been laid on the north side of Wellington-street, with befitting ceremonies. The site is on the west side of the town, in a street recently laid out. The designs, which have been furnished by Mr. J. C. Adams, architect, comprise a building 72 ft. in length, with a height of 50 ft., constructed chiefly of red brick. On the centre of the front elevation will be a stone façade, projecting from 1 ft. to 2 ft. in advance of the rest of the building. In the interior there will be an entrance-hall, lodge-room, banquet-hall, kitchens, &c. The lodge-room will be lighted from the roof, which will be slated and of a moderate pitch. The estimated cost, with the land, is 1,400*l.*, and the entire contract has been let to Mr. T. Bowron, builder, Stockton.

A Welsh Railway on a New Principle.—The Portmadoc and Festiniog Railway is attracting attention among scientific men. It is now used as a regular goods and passenger line. The gauge is only 2 ft. broad. Hence, though the line runs through a very difficult country, the expenses of construction and working are so small that the traffic yields the enormous revenue of 30 per cent. The proportion between the dead weight and paying weight is much less than upon other railways. The engine and tender upon this line weigh about 10 tons, against 40 tons upon the wider gauge of other lines. Instead of a first-class carriage weighing 7½ tons, to carry thirty-two passengers, and representing nearly 5 cwt. of dead weight for each passenger, the carriages on the Festiniog weigh only 30 cwt. for twelve passengers, or 2½ cwt. for each person carried.

St. Pancras Schools, Leavesden, Watford.—At a recent meeting of the St. Pancras Board of Guardians, the School Committee presented a report stating that they had inspected the progress of the works in connexion with the erection of their schools, and found that the buildings are rapidly approaching completion; but that with respect to the progress of the drainage works, it appeared that Mr. Mann, the contractor for the erection of the schools, is of opinion these drainage works will interfere with the due performance of his contract, and that unless they are at once stopped, he will apply to the Court of Chancery for an injunction. Mr. North, the chairman of the committee, stated that the object of Mr. Mann appeared to be to get an extension of time and money from the guardians.

Granville Hall, near Ramsgate.—Mr. and Mrs. German Reed, who have been travelling through the provinces with great success, inaugurated, at St. Lawrence-on-the-Sea, near Ramsgate, the Granville Hall, a new building, which is capable of holding a very large audience. The hall is built in the Gothic style, and is lighted by windows fitted with coloured glass. In the centre stands the fireplace, with rug-royal columns, with Carrara marble bases and caps, representing the hop, vine, and various fruits. Over the arch is a free translation of the "*Lignum super joco*," &c., of Horace, and the whole is surmounted by the arms and supporters of the Granville family, with their motto, "*Frangas, non flectes*." Over the main entrance is the inscription, "Through these wide gates none come too early or depart too late." Mr. Pugin was the architect.

Chief Commissioner of Works.—Her Majesty the Queen has been pleased, by Warrant under the Royal Sign Manual, to appoint Mr. Acton Smee Ayrton to be First Commissioner of her Majesty's Works and Public Buildings in place of Mr. Lazard, who has been appointed Minister Plenipotentiary at Madrid.

Progress of the Channel Docks, Bristol. The dock, lock, and tidal harbour at Avonmouth cover an area of 25 acres. The dock itself will cover 16 acres of ground. It is 1,400 ft. long, by 500 ft. wide. The lock will take up 3 acres, and will be 450 ft. in length, by 85 ft. in width. The tidal harbour outside will occupy the remaining 6 acres. Sufficient progress has been made in the excavations to enable the visitor to understand without difficulty, the exact outline and size of the new dock, lock, and approaches. The average depth of the excavations is a little over four yards; in some places it is as much as six yards. A very large proportion of the soil excavated has been used in the construction of the dam which is made to keep back the tidal water whilst the lock is in course of construction, and the completion of this portion of the work (the dam) was one of the chief causes of a visit of the shareholders, which has recently taken place.

Trade Unionists in Manchester.—On Saturday a deputation from ten trade-union associations, including the building trades, engineers, spinners, and tailors, waited upon the Mayor of Manchester (Alderman Graves), at the Town-hall, for the purpose of "calling the attention of the City Council to the unnecessarily slow progress of the public works of the city, and the consequent privation entailed upon a large proportion of working men and their families, whose means of subsistence are entirely dependent upon the proceeds of their daily toil or on parochial relief." The Mayor suggested that the deputation should present their memorial to the council through the medium of a member, and then have the subject fully discussed. In his position as mayor he had no power to decide the question.

The Village Hospital Movement.—The Rev. Henry W. Majendie, the vicar of Spess, Berks, has just erected in that parish a village hospital for the reception of poor persons suffering from disease or accident. It is built of brick, and stands in an open and pleasant part of the village. Six or seven beds will be made up to commence with. A nurse experienced in the London hospitals will superintend; and the medical practitioners of Newbury will attend the patients. The building has been formally opened. A contemporary mentions, as "a most singular coincidence, that within a few hours after the opening ceremony, the founder of the hospital (Mr. Majendie) slipped down while conversing with a friend, and broke his arm."

Mark Masonry in Cornwall.—This is comparatively a new Masonic degree in Cornwall, or at least it has been revived during the last few years, and is making considerable progress under the auspices of its first Cornish Grand Master, who was installed G.M. about two years since at Truro. This degree is separate and distinct in its government from the Craft Masonry, of which Mr. Augustus Smith, of Scilly, is the Provincial Grand Master for Cornwall, and has its own charitable funds, schools, annuities, &c. Although every candidate for admission must previously have been a Craft Mason, they have no other connexion, and hold separate lodges. It is termed the Fourth Degree in Freemasonry.

Rome.—Galignani says,—"The Chevalier Pietro Rosa, director of the excavations in the part of the Palatine Hill that has become the property of the Emperor Napoleon III., admitted the public lately to visit the archaeological discoveries recently made by the side of the baths of Livia. This interesting discovery consists of a swimming-school, with a series of chambers constructed with reticular walls, coated with stucco, and adorned with fine encaustic paintings; these last covered with a preservative chemical varnish. They represent various mythological subjects, surrounded by some very delicate drawings, executed with great skill and in very brilliant colours.

Proposed New County Prison.—At a meeting of the Middlesex magistrates a committee reported the result of their inquiries in reference to a site upon which to erect a new county prison. The result of advertising was that offers of forty-six sites had been made, and of these the most desirable was considered to be one at Highbury Vale, between 12 and 13 acres in extent. The purchase of this at a cost not exceeding 12,250*l.* was recommended by the committee, and after considerable discussion it was agreed to. Considerable opposition is manifested to the proposition.

Metropolitan Tramways.—The Metropolitan Tramway (North) Company have given official notice to the Poplar District Board of Works that works for constructing the line of tramway between Whitechapel Church and Stratford will be commenced within fourteen days from the date of notice. The companies are bound under their Act not to break up more than 100 yards of the road at one time, and to leave a quarter of a mile between any openings they may make. It is understood that the works, when commenced, will be pushed rapidly forward, and that the carriages for the line have been ordered, some being already complete, while others are in course of construction.

Engineers and the India Office.—Since our leading article was in type, we have been informed that the Duke of Argyll received at the India Office, on Wednesday, the 27th inst., a deputation of the council of the Institution of Civil Engineers, on the subject of a notification lately issued by the Public Works Department of the Government of India. The deputation consisted of Mr. C. Hutton Gregory, president; Mr. Bidder, Mr. Fowler, Mr. Cubitt, Mr. Hawksley, Mr. Abernethy, Mr. Bramwell, Mr. Hsmanly, Mr. Murray, and Mr. Stephenson; Mr. Manly, honorary secretary; and Mr. Forrest, the secretary.

Mosaic Picture for Southgate Church.—Messrs. Salvati & Co. have just now produced in mosaic a "Last Supper," intended for the new reredos in Southgate Church, designed by Mr. G. G. Scott. The mosaic is of considerable size, and has cost 210*l.* To the workmanship as a mosaic we have no objection to make; it is an excellent specimen of the art. As a picture, it is somewhat monotonous, and wants force. The colours, however, blend harmoniously, and the general effect is agreeable. Some of the heads are exceedingly good.

Working Men's College.—The inaugural address on the opening of the sixteenth session was delivered on Monday night at the College, Great Ormond-street, by the principal, the Rev. F. D. Maurice, M.A. The Rev. Mr. Brewer (vice-principal), Mr. S. Amos (Professor of Jurisprudence at University College), Mr. W. H. Flower, and Mr. T. Hughes, M.P., also spoke. Mr. Hughes thought they should feel proud of the gold medal conferred on the College at the last Exhibition at the Hague, as a token of its usefulness among the working classes.

Altona Exhibition Awards.—Considering the small proportion of British exhibitors, it was not to be expected that any large number of awards would be made to this country. The official lists show 60 *diplomes d'honneur*, of which the Singer Manufacturing Company has one. There are 100 gold medals, among which figure Shand & Mason, Marshalls, of Geinsborough, and McCormick; also W. A. Wood, the "Grover & Baker," and "Elias Howe" sewing machines. Out of 34 silver medals the United Kingdom receives 15.

Home Bay.—The sea between this and the Reculvers is making rapid inroads, and no steps appear to be taken to check its advance. The distance is between three and four miles, and if a sea-wall were built, a very easy matter, the ground reclaimed would alone be a considerable boon. A concrete wall, in which the shingle would play a part, would effectually protect the land from destruction, and this applies more or less to the whole "coast line" of the Trinity.—S.

Harrogate Pump-Room.—It is intended to erect, in the Royal Pump-room, Harrogate, three stained-glass windows, for a two-fold object, namely, in memory of Captain William Slingsby, the discoverer of the Harrogate waters, and as a tribute to the memory of the late Sir Charles Slingsby, bart. To assist in this work the directors of the Royal Chalybeate Spa-rooms have just given a successful concert in aid of the memorial fund.

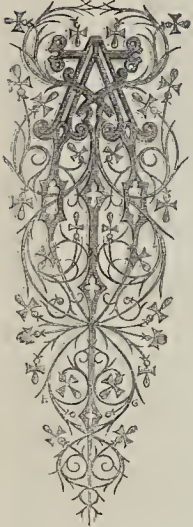
Buildings in the City.—The City architect has reported to the Court of Common Council that his estimate of the expense of the necessary repairs to the public buildings belonging to the Corporation for the half-year ending Lady-day next is 7,950*l.*, as follows:—The Mansion House, 1,000*l.*; prisons, 250*l.*; Guildhall, &c., 200*l.*; markets, 500*l.*; other public buildings, 6,000*l.*

The New Offices for Poplar.—The Board have terminated the contract with Messrs. Baker & Constable, and determined on obtaining fresh tenders for the work.

The Builder.

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Leeds Castle, Kent.



FEW miles from Maidstone, in Kent, rising out of a broad sheet of water, and casting embattled shadows into it, stands a large castle, that was once the residence and property of the good Queen Eleanor. When it came into her possession it was either a Norman building, or else a Saxon fortress with Norman extensions; but her gallant husband made several additions to it, some of which are still standing, and give the fabric an Edwardian character. In antiquarian circles

the old place is a familiar and appreciated object; but to the general public Leeds Castle is almost unknown. Yet not only was it once the residence of the brave and loving lady, whose womanly deed in Palestine will be told to every generation that has yet to come, but after her death it was successively the property of many illustrious persons, and otherwise associated with people of whom we are never tired of hearing. It first passed into the hands of her successor, Margaret, the second queen of Edward I., and was afterwards settled on Isabella, the wife of Edward II. By-and-by, we find the castle in the hands of no less a celebrity than William of Wykeham. Froissart, too, visited Leeds Castle, in company with Sir Thomas Percy and Sir William de Lisle, and placed on record an account of his stay at the "beautiful palace," and his kind reception by King Richard II. Then we find Henry VIII. there, pulling the old place about, and building more accommodation for one of his eight wives and her maids of honour; and, after a few more strokes of Time's scythe, it is in the possession of the famous Lord Colepepper, the friend of Charles II., and Evelyn is there directing a few repairs, and making other arrangements for the due keeping and accommodation of some 600 Dutch prisoners entrusted to his care; then it passed into the possession of the Fairfax family, not, however, until the famous commander-in-chief of the Parliamentary forces had departed this life; and, finally, George III. and Queen Charlotte paid a visit to the member of that family resident there in their days, his Majesty graciously recording the event with his own royal hand in the family Bible. Beyond, however, its associations with those and other celebrities, Leeds Castle has attractions of its own which we will endeavour to describe.

It stands on two islands in a sheet of water, about fifteen acres in extent; these islands being sufficiently close to one another to admit of being connected by a double drawbridge. It consists,

therefore, of two large piles of buildings, which, with a strong gatehouse and barbican, form four distinct forts or divisions, capable of separate defence after either fell into the hands of an enemy; and the water was so managed as to pass between these several buildings in three places. Thus it will be seen the Edwardian architect cleverly developed the natural strength of the position, if, indeed, he did not find this arrangement ready to his hand as left by the Norman *ingénieurs* who preceded him. Three causeways approached the castle: one of them was opposed by the barbican, which was composed of two parts, with a drawbridge between them; and when the barrier was successfully passed, those who were endeavouring to gain admittance found themselves exactly in the same position as those who approached by either of the other causeways, in front only of the bridge that spanned the moat, before the strong gatehouse protecting the fortress on the first island. Supposing, for convenience sake, that we have passed this second drawbridge in our path, we find ourselves standing outside the gates of the main entrance into the group of buildings occupying the whole of the area of the larger of the two islands. Passing this interior gatehouse, with the buildings adjoining it, we are admitted to an inner bailey, across which, at the opposite end, extends the large building, called the New Castle, in which are situated the principal apartments required for a modern dwelling. In the rear of this portion of the fabric, which has been modernised both in Elizabethan and Georgian times, as well as in our own, is the smaller island on which stands the old castle, often spoken of, too, in old writings as the *Gloriette*. Between the two structures were two drawbridges: thus communication could be cut off from either side. The position of the two islands with reference to their approach from the shore being thus indicated, we will observe the buildings upon them more narrowly.

We must premise that the particulars we are about to give are obtained from a valuable descriptive and historical work just completed by Mr. C. Wykeham Martin, the present representative of the families of Colepepper and Fairfax, and consequently the owner of the fabric.* We may add, as we know the fact will interest many of our readers, that Mr. Martin also comes of the same stock as the family of which William of Wykeham was so celebrated a member. The feeling for architecture shown so forcibly by the famous Chancellor is exhibited in a striking degree by him; and this appreciation of the subject, combined with a knowledge of other branches of antiquity, has resulted in the production of a very accurate and pleasant book. It is illustrated with a number of good photographs, which show the different periods of the masonry admirably; by a good plan; and several woodcuts; a few of which we are enabled to produce.† Under this escort, then, we will set out on our round.

The first outwork, approaching the castle from the Maidstone road, which is spoken of as a barbican, composed of two parts, contained the mill. After passing this and an outer ditch, we are confronted by the second defence, called the Inner Barbican. These two, taken together, the guide whom we are following points out, were designed with much ingenuity, for they not only formed the dam which kept the water in the moat, but they were strengthened with a ditch round the inner barbican, over and above the wide moat which yawned between this outwork and the entrance to the castle. At the end of the bridge giving access to the main portion of the fortress, still stands the gate-house, which is attributed to the reign of Henry III., on the

face of which are the stone corbels, inserted subsequently, for the support of a brattice; and on either side are guard-rooms, from which the entrance could be also defended. On one side of this entrance it is probable the stables were situated, and on the other the cellars for the reception of the vast stores of salt meat, beer, and other requisites for a garrison, and a kitchen; and on an upper floor, over these, were the guard-rooms for the private soldiers and yeomen of the guard, and a constable's room between them, having in front of it, exactly over the entrance, a portcullis-room. Every passage and staircase was of the narrowest dimensions, so that only one man could pass at a time, giving every opportunity for a hand-to-hand fight for every inch of ground. But there was not always fighting going on; and many an idle hour was spent within these chambers, as an inscription, incised on the chimney-piece, in the constable's room, proves. Some young gallant, in the fifteenth century, to while away his time, took the trouble to cut the following sentence upon the stone:—"Whyle that ye may my ladye please not sors of travayle they werke, quoth Oracius;" and as in very similar characters the word *Nefereit* is cut upon the arch of the outer gate, our guide thinks it likely the gallant may have borne that name. These rooms were enlarged by Edward I., who also gave additional windows to them. Beyond this key to the island the area was divided into an outer and inner bailey, the one encompassing the other. The massive wall of the inner *enceinte* has disappeared, but the foundations remain, and show its position; the outer bailey was surrounded by a lower wall, strengthened with bastions and towers, believed to be the work of Edward I. There are traces of several ancient buildings, besides the residence of the lord of the place on this island, but the only one standing within the inner bailey is the Maidens' Tower, to which we will presently direct our steps. We must first examine one of the towers of the outer bailey, built of Edwardian masonry, which was intended by the royal builder to contain a swimming-bath. Until recently this was always looked upon as a boat-house or water-tower, but the expense rolls of the executors of Queen Eleanor speak of a bath, "*Balnea Domini Regis apud Ledes*," with details of the expense, that indicate that this was the fabric. Mr. Wykeham Martin thus states the case of this interesting relic:—

"In the first place, this water-tower or boat-house had a very costly pavement, far beyond the requirements of a place intended for such a purpose only. The stones were about 2 feet square, faced on the upper side, and as carefully jointed as they would be for a modern dwelling. The pavement is now gone, but the impressions of the stones remain in the mortar, which has become so hard that I thought they remained *in situ* till I baled out the water to examine and clean the bath. For it appears from the extracts above, quoted from the expense rolls of the executors of Queen Eleanor (1391-3), that Reigate stone was purchased by Edward I. in the first of those years for the pavement of his bath. But the quantity bought was a 'centena,' or hundred of stones. Now this, if it means 100 ones, is precisely the quantity required for this floor, which measures 22 ft. by 16 ft. If this 100 meant 108, 112, or 120 stones, as a centena of iron is described by DuCange as 120 stones of 8 lb. each, there would be a few left for other uses. In the next place, the lead that was purchased at the same time was precisely the quantity required for the roof of such a building. If we take the quantity specified to me by my plumber and carpenter, allowing 10 lb. a foot for the weight, and allowing for the waste occasioned by the check rolls and the flashing let into the wall, the building being 30 ft. by 27 ft., it would come within less than a hundredweight of the quantity purchased *pro balneo Domini Regis, viz., 'cvi clareyrou'* of lead."

As we have said, beyond the residence of the lord, which is represented in the modern dwelling on its site, there is only the Maidens' Tower standing of all the buildings that must have once greeted the eye on emerging from the gate-house. The names of several, however, are preserved in various surveys and records. Thus we bear of a *vetus capella*, which also implies a new one; the "*granaria australis*"; the constable's stable; a Longhous; an Annessehouas, "le long stablyl," a "*magna coquina*," "le grete larder," &c. In 1367 it was recorded that the "*pens glorietta*" had been repaired, and the pipe of the aqueduct mended "*et in castro et in parco*," showing that

* The History and Description of Leeds Castle, Kent, by Charles Wykeham Martin, esq., M.P., F.S.A. Westminster: Nichols & Son, 1869.

† See p. 868.

the conduit-pipe existed before that time, and was, the author thinks, probably laid down by Edward I. Seeing, however, the ingenious system of waterworks constructed at Canterbury by Norman engineers, as recently described in these columns, there is no reason why this should not be of equal antiquity. Tiles are mentioned as covering some of the honsos, and lead as being furnished for others, showing that where not required to form a flat roof for fighting men to conduct their operations upon, the latter was spared on account of its expense. The "*magna coquina*" mentioned above, was recognised in the alterations made in 1822. Described as "*juxta pedem pontis gloriette*," and an oven also mentioned in connexion with the same bridge, there was no difficulty in identifying a kitchen found exactly on that spot, with a very ancient oven, part of which was thrown out beyond the wall on a corbel, as that in question. A woodcut shows this kitchen, with the *pons gloriette* and clock-tower adjoining. Crossing this bridge, now covered in, so as to form a long passage or corridor over it, with rooms above, we are on the smaller island, or in the old castle. Here our guide makes one little slip, though not upon the oak floor without a osiling in the place of the old drawbridge; but on clearing this way, to turn an arch in stone, a portion of a circle, or quadrant, was found in the stone-work in which the heel of the drawbridge must have worked when it was raised or lowered; and on the upper or bed-room floor there were indications of a similar arrangement to that at Cumnor Place, mentioned by Sir Walter Scott, "when Leicester traiter-ously calls Amy Robsart to him with the bridge drawn up between them." The great novelist imagined a far more sly piece of villainy; for he made Varney imitate Leicester's call to entice his victim out of her apartment across the trap-door which was to give way with her tread. But let this pass: it does not affect Leeds Castle. The entrance-tower, called in old records the tower of the Gloriette, has a curious old bell, with the Virgin and Child, St. George and the Dragon, and the Crucifixion depicted upon it, which is used as a carillon that custom having been maintained from the days of the Crevecoeurs, the owners of the castle before it became the property of Queen Eleanor. And there is also a very ancient clock which strikes upon this bell, supposed, on the authority of Mr. Octavian Morgan, to be of the same age. Turning to the left, on passing through the flat-headed trefoiled archway of this tower, we come upon the chapel built or improved by Edward I. It has been very much pulled about, one of Henry VIII.'s staircases having passed through it, and the site of the altar having been turned into a dark closet under the staircase; but still the owner can make out the original form, and, if we understand him aright, intends to restore it. He says:—

"It is easy, however, to trace the original arrangement, as, though one side wall and one of the end walls have been replaced, one side wall and the other end wall are in their original state, with the exception of one window, which lost its tracery when it was built up for the purpose of constructing the staircase of Henry VIII. There were two windows of a similar pattern, one of which remains, and the other is that which has just been described as having lost its tracery, which consisted of external arches of the Early English period, with handsome shafts, of which the bases and the bell-shafts are in good order; but in place of the original tracery some of a more recent character has been inserted. This is of a pattern which never prevailed beyond the county of Kent and a limited portion of Sussex, and is therefore called 'Kentish tracery.' In 1314 it is recorded, in Edward II.'s survey, that a violent hurricane had damaged the glass windows at Leeds Castle to such an extent that it would require Cr. shillings to restate them. Whether the tracery was also damaged is not stated; but, at all events, it seems that new tracery was put in at that time, as well as new glass. The level at which the bases of the shafts of the windows are fixed shows the steps leading to the altar and the original position of the floor. At the farther end there was a pew or gallery for the use of the lord's family."

Most of the rest of the work forming the old castle, save the outer shell, was the work of Henry VIII., and consisted of timber and plaster, with large oak or chestnut windows and handsome cornices. But the prisoners whom Evelyn lodged here, either accidentally or intentionally, set fire to this part of the fabric, and left a scene of destruction as a memorial of their detention. Lord Fairfax rebuilt some of the injured parts, especially the banqueting-hall, leaving the original doorway, fireplace, with the Royal arms and supporters of the house of York on the spandrels, and windows. And in restorations made in the time of the present owner, as many as possible of the old cornices and windows have

been re-used; specially the fire-place, thus preserved by Lord Fairfax, has been re-inserted in a billiard-room above the hall. The banqueting-hall is now a kitchen. Alterations as still proceeding here to gain the accommodation afforded by the chapel, before it can be restored to its original purpose. In the kitchen in which the dinner for the banqueting-hall was prepared when King Harry banqueted in it, there is a fireplace with its chimney divided into two flues with a window between them, an arrangement, from the character of this light, that appears to have been made by him. There were also a buttery and pantry, besides accommodation for the storage of provisions in the event of a garrison occupying it during a siege. There was a sally-port, too, opening on to the moat from the foot of a novel staircase, which is still there, with its flight of steps descending below the present level of the water. But the drawbridge with which the author believes it was furnished as a means of reaching a little inlet in front of the doorway, which, he thinks, was the centre of a bridge that was placed there for convenience in times of peace, and removed when danger was apprehended, has disappeared. On the way down the novel staircase is a chamber now used as a dairy, which is supposed also to have answered that purpose in old times, as the water from the conduit was turned through it as though for the purpose of keeping it cool. Beyond it are a few inferior offices; and then we come to a handsome room, the opposite end of which adjoins the tower of the Gloriette, at which we entered. This room is noticeable for having a Tudor fireplace, with the arms of Guldeford, quartered or impaled with Halden, in the spandrel, a circumstance Mr. Wykeham Martin accounts for by the fact that Sir Henry Guldeford was employed by Henry VIII. to build an upper story to this building. Ascending now to the upper floor of the Gloriette, which we can reach either by the staircase built by Henry VIII. in Edward I.'s chapel, or by the passage occupying the position of the old upper pair of drawbridges over the deep, glassy waters, lapping between the new castle and the old, we land in a large lobby lighted by a window with oak or chestnut mullions. This was occupied by some of the Dutch prisoners before referred to; and traces of their confinement were to be seen in rough chess or draught boards on the floor, as well as in a large glazed sentry-box at the head of the staircase. The author's sister, Mrs. Simcox, gives a drawing of this scene of old sights. The queen's drawing-room was approached from it; also another apartment which the author conjectures may have been the queen's "wardrobe," from the fact that the royal arms are in the spandrels of the fireplace, but no supporters. This room, he says, was in a state of great decay; the ceiling was perished, and the floor so rotten as to fall with the weight of four men upon it, as soon as it was touched for the purpose of being renewed. A bedroom beyond this slipped into the moat in the lifetime of the Robert, Lord Fairfax, who received King George, and Queen Charlotte, weakened, doubtless, by the fire kindled by the Dutch prisoners, which left a gap at this point. On the other side of the lobby, after a small room with a Tudor fireplace in it, extending over the banqueting-hall below, were two rooms and a lobby, which had the appearance of once having formed the queen's withdrawing-room, which would thus have been of the same size as the hall. In the spandrels of the fireplace of this apartment we learn, from the arms of the house of Lancaster on one side, and the castle of Castille and the pomegranate of Arragon on the other, that it was built before Katharine of Arragon had ceased to charm the royal Blackbeard. This fireplace has, of course, been re-used, as, indeed, have the numerous door-heads, with the royal arms, fleurs-de-lis, or Tudor badges upon them, found in this part of the building; for not only have these rooms been restored, but the gap made by the Dutch prisoners has been filled up. A garderobe was found in this locality, which had been inaccessible for two centuries; thus it was disclosed in its original rudeness, "a mere chimney, so to speak, with a low wall in front, capped by a stout piece of oak." One of the Tudor firebricks is delineated.

We have now to sketch the features of the main building on the larger island, known as the New Castle. In Elizabeth's reign Leeds Castle was the property of the Smith family, ancestors of the present Lord Strangford; and on the site of the principal residence in older times they built a handsome Elizabethan house.

When the place came into the possession of Lord Fairfax, he took out the stone mullions of the fine windows, and inserted sashes; and then he placed boards before them cut to a point, to look like Gothic openings, and stuccoed the old mansion over to give it the appearance fashionable at that time called rustic work. The author says a village churchwarden never made a more hideous disfigurement. Even Walpole looked down upon it and wrote of it,— "The Fairfaxes had fitted up a port, bad apartment on the fore-part of the castle. . . . They had a gleam of Gothic in their eyes, but it soon passed off into some modern windows, and some that never were ancient." No wonder, then, that when the author's late father came into possession of it with an understanding that he would put it into repair, this spurious work was condemned and pulled down. As this house was built against the exterior wall of the castle, a part of the ancient work thus perished with it; but, with that exception, Mr. Wykeham Martin regrets only the old Elizabethan drawing-room, of which both walls and ceiling were panelled in oak; and of this the oak chimney-piece has been preserved and re-used. The old building was smaller than that now standing on its site by 9 ft. in length and 7 ft. in width. The new one is quadrangular, and two storied, with the entrance in the centre of the principal front between two octagonal turrets of 12 ft. diameter carried up the full height; and there are turrets at each angle to correspond with these. The walls are embattled, and rising above them are Hampton Court chimneys. The assistance of Mr. William Twopenny in the design is recorded by the author.

The Maidens' Tower, which we have left to the last, because its owner has done so,—although from its position it is, perhaps, entitled to an earlier description,—is shown in a woodcut with the bath of Edward I., near to which it stands.* It is built upon the wall of the outer bailey near the bath, and thence projects into the inner bailey. It is a large quadrangular three-storied tower finished with battlements that are evidently modern; but a drawing of it on an old plan of the estate shows that the roof was once gabled. The ground floor contains the brew-house, in which is a very wide chimney, which the author thinks can only have been required for the heating of many large cauldrons of water at a time, pointing to a period before the introduction of coppers with flues. There appear to have been two staircases and two sets of rooms above; and two garderobes still exist, from which circumstance it is concluded it was occupied by several persons, probably guests, though not necessarily the maids of honour, with whom tradition has associated it. Mr. Wykeham Martin thinks, if Henry VIII. built it, enlargements were made to it, subsequently, by the Smiths.

In his inquiry into the date of various parts of the fabric, the author raises the question whether the Gloriette was not in the first instance a Norman shell castle on the site of a Saxon mound fort. Tradition affirms that the chief councillor of Ethelbert II., Led, Ledan, or Ledian, built a castle on this site, which was destroyed by the Danes; and the same authority sets forth that Robert de Crevecoeur began Leeds Castle on the site of an old Saxon fort. The Gloriette presents a strong resemblance in the mind of the antiquary, Mr. Clark, to what we might expect to find from such a sequence of events. It has a splayed base for 17 ft. above water, and as many at least below; and, arguing in favour of the supposition, we are told,—

"If, then, we suppose that the stream ran round the old castle, and was deepened and widened into a small moat, we should have a nearly rectangular shell of considerable size, the lower story of which, battering as it rose, attained a height of quite 35 ft. before the ground floor was reached, and the would foundation a very respectable work for defence. In addition to this, there are two loopholes of the same soft sandstone with the adjacent window, to which some persons, as noticed before, assign the date of Edward I., and somewhat of Edward II., and which it is possible may be somewhat older, in an adjoining semicircular projection; and under each loophole is the bottom of a still older loophole of Caen stone, giving a greater antiquity to the foundation of the semicircular projection than that of the superstructure. And this, with the adjoining wall, is clearly a portion of the work of Edward I. This would seem to indicate that Edward did not build the old castle from its foundation, but merely altered and improved an existing building, thus confirming Mr. Clark's conjecture, at least to a certain extent, in addition to the strong internal evidence supplied by the shape and appearance of the building, and the very peculiar nature of the mound on which it stands."

When discussing the date of the drawbridges, the author refers to M. Viollet-le-Duc's state-

* See p. 880.

ment respecting the period in which these ingenious contrivances came into use, and points out two instances in which they were mentioned at an earlier date than that he assigns to them. He says they were attached to the gates of towns about 1350. The regulations drawn up by Stephen de Pencestre for the ordering of Dover Castle, in the reign of Henry III., set forth that the bridge should be drawn at sunset. And in the twenty-third year of that monarch's reign, according to the Liberate Roll, he ordered a breausche and drawbridge to be constructed at Winchester, this being as much as a hundred and twelve years earlier than allowed by M. Le Duc. Generally, the author finds this installment of the work left by our Medieval ancestors indicates an early and higher order of culture than the term "dark ages" suggests. The masons especially were equal to those of the present day, and the same must be said of several of the other trades. A Russia, "destitute, indeed, of many of those improvements and appliances which have been invented in recent times, but still containing a wealthy, powerful, and luxurious aristocracy, surrounded by a rude, barbarous, and unenlightened serf population," is perhaps the nearest realisation we can approach to those old times which gave us our incomparable cathedrals and left us such cleverly-contrived fortresses as Leeds Castle. In some particulars we have made no progress, or rather broken off the thread. Vine-growing is a case in point. The Norman engineers, mapping out their waterworks at Canterbury, showed vineyards round that abbey, and there were vineyards attached to Leeds Castle in the days of Queen Eleanor, and wine made from them. The expense-rolls of that lady's executors mention various sums paid to Arnold le Vinern, who could have been nothing but a vine-dresser. No vines are now grown for wines. But at the cottages, however, in the locality there are still to be seen vines of a peculiar kind, growing in very short, thick clusters, which the author thinks are descendants of those with which Queen Eleanor made wine in 1290. The expense-rolls quoted above afford a great deal of very interesting information, for which we have scarcely left ourselves space. Thus a visitor was expected, Eleanor's son-in-law, the Count de Barr, and straightway many purchases were made for his proper reception. Bread, fish, ginger, mustard, sugar, "powder to make pimento," eggs, flour, "galentin poudre," or spice for galantines, saffron, and almonds are amongst the provisions laid in for his entertainment, whilst large quantities of wax and firewood were also bought; and 8 ells of canvas and 8 ells of cloth are entered as having been purchased for napery and "coverture of the dresser." The same rolls show that on the anniversary of the queen's death a sum equal to between 300*l.* and 400*l.* of our money was spent in memorial ceremonies at this castle.

William of Wykeham's connexion with the fabric was in virtue of his office of surveyor of the castles of Windsor, Leeds, Dover, and Hadow, to which he was appointed in 1369. He appointed a deputy in 1363. Mr. Twopenny looks upon one window as the work of the reign of Richard II., but the author contends that it is not likely the chancellor would have interested himself about such a small matter, and forbears to claim any part of the castle as his work. There are accounts which show, however, that he deputed the Prior of Leeds to put the palings of the park into good repair.

From the many historical facts noted by the author, which pass pageant-like over his pages, we must content ourselves with singling out the siege in 1321. Although Leeds Castle was settled on his wife, Isabella, it appears that Edward II. had exchanged it for a seat in Shropshire belonging to Lord Badlesmere. Perhaps to try her right to it, the queen appeared before its gates when his family was in the occupation of it and demanded lodging for herself and train, then on pilgrimage to Canterbury. Lord Badlesmere's castellan refused her admittance, when she attempted to enter by force without avail, several of her retinue being slain. When the king was informed of the occurrence he determined to resent it, and accordingly summoned a large force to meet him in front of the castle. Every man between the ages of sixteen and sixty from the counties of Essex, Hampshire, Surrey, and Sussex, was to repair there, and the whole *posse comitatus* of Kent was to be in readiness on the same spot three days previously to their arrival, which was to take place on October 20th. Accompanied by men from London and the

Cinque Ports, and his two brothers and four earls, the king appeared in person before the walls, and conducted the besieging tactics. Meanwhile, Lord Badlesmere, who was from home at the time of the repulse of the queen, but fully concurred in it, supported by other noblemen, drew near with the view of rendering his garrison assistance. They took up a position at Kingston, whence the Archbishop of Canterbury headed a deputation requesting the king to raise the siege and refer the dispute to Parliament. This he refused to do, and afraid of opposing so considerable a force Lord Badlesmere was obliged to leave his castle to its fate. On the 1st of November it capitulated, and twelve or thirteen of the defenders paid for their prowess with their lives. In cleaning out the moat in 1822, the author says a very large and ancient key was found, which, he thinks, is likely to have been the key of the castle thrown into it by the castellan after he locked the gates in the face of the queen and her train, that nothing might induce him to alter his resolve. The desperate, defiant castellan, the Amosonian queen on her palfrey, her little circle of retainers making ready to try their strength as the autumn evening was closing in, the bill mist rising off the still waters of the lakelet, the lights flitting to and fro in the dusky castle, the way-guards passing like shadows behind the embattlements, are all before us as we close the book. Mr. Wykeham Martin has presented us, in this way, with many a pretty picture besides those provided by the photographer's pen. He may be nearly as proud of his work as he is of his castle.

THE KNOT OF THE RAILWAY DIFFICULTY.

PUBLIC attention, if we may trust the usual barometric indication furnished by the columns of the daily press, has of late been fixed, with unusual intensity, on two distinct subjects, the intimate connexion between which has not hitherto been pointed out. We refer to the unprecedented rapidity with which the whitewash of a coroner's verdict has been passed over all parties concerned in the production of a grievous railway collision; and to the accounts given of the performance of Mr. Fairlie's "Bogie Engine" at Hatching. To stimulate the interest already excited, comes the report of a fresh collision near Manchester, an "accident" of which, *per se*, as nobody was killed, and only six or seven persons were wounded, no one but the sufferers themselves would have been likely, in ordinary times, to take notice.

The connexion, however, between the two subjects, of railway collision, and of possible improvement in, not only the details, but, to a great extent, the principles, of railway locomotion, is intimate and essential. The natural and every way important completion of the railway system has been checked by inattention. Railways, as a rule, do not pay; at least, the exceptions to their economical success are so numerous that no one will risk the money required to carry out the secondary lines, and to extend the ramifications of the true circulation of our traffic to the extremities of the country. This is, unfortunately, an old story. What is new, and what is a good omen, is the fact that for the first time, after so many years, men competent to the investigation are turning their minds to the solution of the question, "Why do not railways pay?"

Want of traffic is not the cause. For many of the lines are absolutely choked with traffic. Were this deficiency the root of the matter, the lines which are over-fed would earn such enormous dividends as to cover the shortcomings of their less active neighbours. The over-work of the lines finds a grim exponent in the list of collisions, often fatal, always costly.

That these collisions are not, properly speaking, accidental, we think will be made out. But beyond this immediate question of police, lies the further difficulty. "How is it, that with a traffic requiring such precaution from its frequency, dividends are so small?"

Now the ray of hope,—and it is a very bright one,—that is freshly turned on this point, is this. We have made a great mechanical mistake. We have directed our attention the wrong way. We have so constructed our running stock as to inflict great and altogether unnecessary damage both on itself and on the permanent way. And we have apportioned so enormous an amount of dead weight to the freight of our trains, especially of our passenger trains, as at the same time to choke our tracks and to starve our pockets.

Let us first regard the question of the preventability of collision.

"Give my tenantry distinctly to understand," wrote an Irish absentee landlord to his resident steward, "that no threats to shoot you will have any effect on me."

The perfect *travaux* of the remark, or rather the evidence which it affords of a mode of regarding matters from an exclusively personal standpoint, is such as would be highly appropriate to many of those easy-going gentlemen who have assumed the responsible functions of railway directors, with so little appreciation of the weight of the responsibility which they have thus incurred. It is not enough that the shareholder bears daily witness to the monstrous evils attendant on amateur management. It is not enough that the report of the directors of one of our large railways coolly dilates upon the fact, that the Board of which the reporters are the present constituent members has spent eight millions of money without earning a single halfpenny by the outlay. It is not enough that, when some terrible disaster wags a convoy in flames, or hurls train against train, a terrified engine-driver, or an overworked pointman, is put upon his trial for manslaughter. None of these threats touch the Boards. Therefore the Boards, as a rule, are content to leave things as they are. Penalties, no doubt, must follow on the occurrence of those breaches of the rules, alike of common sense and common prudence, which are the fruitful sources of what are ironically termed "railway accidents." But these penalties chiefly affect the purse. And the purse in question is not that of the directors, but that of the shareholders. When the case is so flagrant that public indignation cries out, "Who is to blame?" there is always some unfortunate official ready to be offered up as an altogether involuntary sacrifice.

This pleasant state of things—pleasant, that is to say, for the directors; decidedly unpleasant for the rest of the world,—for officials, passengers, and shareholders alike—appears to have attained the stability of an institution. Of what use is it to complain? No threats to shoot the steward stir the fears of the master. No diminution of dividend by heavy compensation, no ruin of the family of an industrious servant by the results of a prosecution, toncubes the exalted repose of the Board-room; nor, so long as this is the case, will any amount of public indignation prevent the recurrence and the increase in number of these terrible and fatal railway collisions, the season for which has this year set in with early and unusual severity.

We do not go the length of saying that accident, properly so called, is impossible on a properly-regulated railway; but, in point of fact, real accidents are extremely rare. They hardly ever occur. To call a case of gross neglect an accident is a perversion of language,—an unjustifiable and dangerous perversion. The verdict of "Accidentally killed" which was returned by the jury in the inquest on the bodies of the persons killed in the recent railway collision near Nottingham, was, we cannot hesitate to say, altogether unjustifiable. Till coroners and coroners' juries have rather more definite ideas as to what is and what is not accident, they are likely to have ample occupation.

Murder, by the English law, does not necessarily imply malice towards the murdered person on the part of the murderer. If A, intending grievously to harm B, kills C unintentionally, it is murder. If in pure covetousness, or neglect, or in the performance of an unlawful act, one man unintentionally kills another, it is murder. And if we look at the legal decisions on the point, we shall find that the neglect of any necessary precaution in circumstances of known danger involves, to say the least of it, a very serious responsibility.

Now there can be no doubt that all collisions of the character of that to which we now refer arise in consequence of the neglect of a well-known precaution, the adoption of which would render such occurrences impossible. The electric telegraph places in the hands of the controllers of railway traffic the means of absolute prevention of collisions. To allow a train to rush over a given portion of railway, in utter ignorance whether that portion is or is not clear from obstruction, although with the means of acquiring that knowledge at the fingers' ends, is a neglect of due precaution which, when death ensues, would have a very ugly name given to it by an impartial judge.

It must be borne in mind that the adoption of the positive safeguard of what has been called

the block system is a matter for which the directors of a railway are responsible. Let them be held so. Let the jury who sit on the bodies of the next hatch of sufferers give a little attention to this part of the case. In an accident, no doubt, no one may be to blame. But a collision, which would have been prevented by the use of a known measure of precaution, is *not* an accident, and the guilt of aggravated manslaughter lies at the door of those who neglect to prescribe the adoption of such a precautionary code of rules.

We are not about to enter into the details of the block system, or to insist upon its absolute perfection. On every line, according to the distance of its stations apart, the density of its traffic, the nature of its gradients, and other differences of detail, the *modus* of the working code may be special and peculiar. But the broad idea of dividing the entire line of railway into a series of districts, of magnitude proportioned to the traffic and the other details of the case, and of never allowing a train to enter one of these districts, at any considerable speed, until it is known by telegraphic information that the preceding train has left it, is one the adoption of which would render collision impossible. Some extra expense might attend the introduction of the rule. Some interference with the punctuality of trains (if it is allowable to use such an expression, merely for the sake of argument, and without at all intending to intimate that such a thing exists) might ensue. But human life and limb would be perfectly safe. Great cost of repairs and compensations would be avoided. And, in committing his body to the custody of the conductors of the traffic of the country, the traveller would have the comfort of knowing that it was no longer a mere question of minutes whether his train should, or should not, come in collision with any other train.

Let the absentee landlord be made to understand that his head, and not that of his agent, will be made the next running target. Let directors learn, by the large text of a verdict of manslaughter, that it is for them to enforce the adoption of a rule which is essential to the safety of the passengers. Let those who influence the public mind aid in putting the saddle on the right horse. It is only necessary to do this to put a stop to railway manslaughter.

No country in the world possesses a more deserving, industrious, careful, intelligent, body of public servants than are the men who constitute the great mass of those employed on our railways. Often overworked, often underpaid, they are now laden with a responsibility which is not duly their own. The stress and strain thrown, in many instances, on an officer who is in no adequate way compensated for the tremendous anxiety to which he is exposed, are altogether disproportionate. To avoid collision, as a general rule, railway directors depend almost entirely on the prudence and activity of their servants. They exact, from their conscientious care, that security which ought to be independent of any thing but the most ordinary adherence to routine. First, the lines ought to be so constructed as to allow of the circulation of the different systems of traffic without mutual interference. Secondly, the code of working regulations should be so drawn up as to render collision impossible. The first requisite would, no doubt, involve considerable expense, if it were now rendered compulsory. It is carried out, to a very considerable extent, in the system of lines converging at Victoria-station. It is disregarded and despised, in a very unnecessary manner, in the system of lines crossing and recrossing one another between London Bridge, Cannon-street, and Charing-cross. Re-arrangement of these lines is loudly demanded by public safety, no less than by public convenience. But, apart from this provision, which sooner or later must be carried out, such a modification of the block system as will prevent collision, as a normal rule and not as a happy chance, ought to be rendered imperative. Legislation, in the mere interest of the public, is of course not to be expected. But the public have the matter in their own hands. A sharp and sure remedy lies within the province of the coroner's jury. A single verdict of manslaughter, not against the over-wrought officials, but against the negligent chairman and directors, would in all probability settle the matter. No second case would be likely to occur, for, at the next weekly meeting, every railway board in the kingdom would take the steps proper for preventing collisions.

At the same time that the density of that unremunerative traffic, with which the result of

the last twenty years of railway management has encumbered most of our main trunk lines, is calling so imperatively for absolute regulation by telegraph, the attention of the public is directed towards a proposed reform, from which consequences of the most brilliant nature are anticipated as likely to arise. We are not about now to commit ourselves to an absolute approval of Mr. Fairlie's system, or to urge that he, or any other engineer, has attained the *ne plus ultra* of economical mechanism. But we do say, and that without hesitation or qualification, that the inventors and advocates of light railways, and of corresponding light engines and plant, are looking in the right direction.

The internal communications of this country, having received such a stimulus as is unknown in the entire preceding history of the world, have been arrested in their due development by a check of corresponding severity. It is all very well to lay the blame on the greediness of promoters, the selfish anxiety of great contractors, or the ingenuity of civil engineers in the creation of occupation. All this is, no doubt true; but there is something more fatal behind. It is well known that the continued paralysis of public enterprise has been such as to disappoint even the least sanguine of those who have looked forward to an improvement in industrial enterprise as a question of bread-and-cheese. For over-speculation, over-haste, over-railway production, we have paid, God knows, an ample penalty of starvation. But the main, unprecedented, intolerable feature of the present long stagnation has been its apparent permanence. Not only have our burnt dogs carried on an unusually prolonged dread of the fire, but it has appeared as if fire would never again be kindled, at which they or their successors could stinge their tails. In a word, the depression attendant on a period of over-work and over-speculation has been so profound, so enduring, and so hopeless, that a politician who looks beneath the surface is driven to the conclusion that some cause, hitherto undiscovered, must be his work to aggravate our present gloom. In 1845 the fury and vigour of the railway mania was far wilder than it has been at any subsequent period. Great and permanent evil was inflicted on the industry of Great Britain by that mania of 1845. But, though for a time crippled, the industry survived, and again sprang into active life. Money was wasted, dividends were thrown to the winds, resources were devoted to the production of unused lines of communication, to the utter loss of the subscribers. But the railway system,—regarded not only as a mode of carrying traffic, but as a net of lines requiring great extension and increase, survived the shock. Since the recovery from the depression of 1846 and 1847 there has been no difficulty in raising millions when required, or, unfortunately, when not required. What is the reason of the difference?

It is not because the railway system, as a method of intercommunication, has arrived at its natural maximum of extension. Main trunks, indeed, have been run in almost every available direction. But the entire system of secondary lines, the natural feeders of the 14,000 miles now at work, has to be completed. And the trunk lines are, often, so choked and loaded with traffic, that the rails are continually occupied by successive trains, running at each other's heels with intervals far less wide apart than public safety demands.

At last,—a long last,—the *tertium datus* is pilloried before the public. No doubt, there are many who do, and who will to the last possible moment, deny that such is the case; but we shall be mistaken if the public hold with them. Respect for the authority of great men is an admirable thing. But it is carried too far if it fetters the course of improvement. All honour to George Stephenson! His name will rank ever high among the benefactors of mankind. None the less true is it, that, in creating a new department of practical mechanics, he made, and led his followers to make, a grievous mistake. Our railway engineers have overlooked one of the chief elements of the problem to which they have addressed themselves. They have effected locomotive transport by means which have disregarded the necessary economy of the case. They have whirled across the country such disproportionate loads of dead weight that the entire railway system has well nigh collapsed beneath the burthen.

The cause, then, of the non-prosecution of the necessary works of completion for our system of internal traction is not financial, but economical. The difference is essential. Finance, checked

to-day, springs and reveals to-morrow. Economic returns, when absent, cannot be galvanised into existence, and economic failure, in the present case, results from mechanical reasons. So long as these prevail economic death will remain as our normal state.

Let us regard the question in a light which will admit of no hesitation. Our ordinary railway traffic is conducted at an average speed which is less than double the maximum speed of the more rapid coach traffic, on the best lines of route which it has displaced. On the other hand, the strain and shock to which a carriage running over a smooth continuous surface of iron rail is exposed, were expected to be, and *ought to be*, very much less than the half of those to which one is subject on an ordinary road. The same vehicle drawn along a turpentine road at the rate of sixteen miles per hour (the rate of some of the fast Shrewsbury coaches), and along a much less severely graded railway at the rate of thirty miles per hour, would suffer far more strain in the former than in the latter case. At all events, as of the two forces which oppose motion, gravity and friction, no human wit has found the method of obviating the action of the former, it is clear that in the diminution of friction lies the great economic saving which railways were designed to effect.

How comes it to pass, then, that for the vehicles which have to run with the minimum of friction, we have introduced a ponderous mode of construction far more in excess of the requirements of the case than was ever employed for the vehicles subjected to the larger amount of strain and of shock? What is the difference between the power of a galloping team of four good horses, and the resistance of a macadamised road, measured by the tendency to pull a mail-coach asunder, and that of the tug of a locomotive over a pair of rails? The question is one that answers itself.

Again, in our road engineering (which we may compare with that of the *diligences* of France, the ponderous but well-knit carriages of Italy, the marvellous chairs, suspended over a long perch, used in Portugal, or the ready-made shift of an Irish car), what has been the rule? For increased speed we have diminished the weight of the vehicle. Where hundred weights, or at all events quarters, were in question for Pickford's vans, or for the broad-wheeled wagons which recall the memory of Whittington, pounds were looked after in the hull of the Quicksilver Mail. In our ponderous vehicles, and yet more ponderous engines, for our express trains, we have retrograded, positively retrograded, in mechanical science.

We have not space at our command here to enter into the canons which have led to the enormous overweight of our railway plant. We can now only bear our share in calling the attention of all those interested in the matter to the subject. It is certain that the hammering, oscillating, grinding motion which now accompanies railway travelling may be, to a great extent if not altogether, avoided. It is certain that, to resist, or rather to *produce*, this destructive action,—destructive alike to carriages, to permanent way, to the nerves of the traveller, and to the dividend of the shareholder,—we have, for a quarter of a century and more, been proceeding in the wrong direction. While the London omnibuses carry a ton of passengers to a ton of dead weight, we are told, on authority which ought to be good, that our railways carry nineteen tons of dead weight to a ton of passengers! A man need not be an engineer to understand that this is radically wrong. If the *débris* of the Stephenson school of engineers will not address themselves to the subject, it is tolerably clear that they will be superseded by a set of men,—self-taught, it may be,—who will. On our existing lines of iron road, let us convey passengers with as much attention to the exigencies of mechanical law as that which has been brought to bear on road vehicles, by the owners of the London omnibuses. To carry a dozen passengers from London to Liverpool at a velocity of thirty miles an hour, does not, as a mechanical necessity, require a greater proportion of dead weight for passengers (exclusive of the propulsive power in either case), than was necessary to convey the same load down the declivity now spanned by the Holborn Viaduct. Let the subject be faithfully and honestly wrought out. Let the ill-constructed vehicles be superseded, first by experimental trials, then by special trains; by degrees by the introduction of a more mechanically perfect working plant than that which at present grinds

us in the dust,—and dividends will swell, like the olive harvest in a prolific year; shareholders will fatten upon something more substantial than hope; and then we, engineers, builders, labourers whose name is legion, may smile at the good time coming, when we shall again pull off our coats, hurr our nightcaps, and turn the lines of deserted parish roads into the likeness of the entrance to a beehive. Let us correct our mechanical blunder, and our railway economy will right itself.

WINTER EXHIBITIONS: THE FRENCH GALLERY, PALM MALL, AND THE OLD BOND STREET GALLERY.

WER weather was no preventive last Saturday to the assemblage of many visitors in the Old Bond-street Gallery, nor to others who availed themselves of Mr. Wallis's invitation to the French Gallery, to see privately how well he has catered for the aesthetic taste of the British public, and how pleasantly he has combined home with foreign produce in what he sets before them. With no novelty to introduce he has, at all events, contrived very ably to renew confidence in his judgment, and acknowledgment of the energy with which he proceeds in his self-imposed task; a task it must be, with so many opportunities offered the painter for a double picture season. November may claim some affinity with genial May, with only the difference of a *suntlight* and a *sunshade* between them. November, with its mire and muck, its foggy veil that is never half thick enough to hide any of its ugliness but only adds to it, as in some other plain cases; the month of all months that most people have disagreeable reason for seeing none that it should ever be forgotten, with its associating reminiscences of asthma, bronchitis, catarrh, and a whole alphabet of ills ranging from large to small type, has now some claim to a welcome in virtue of what art can do to improve Nature.

The collection of pictures exhibited at the French Gallery comprises many admirably executed. It was to be expected that M. G. De Jonghe would repeat his assertion of mastery over the difficulty of making brilliant yellow preponderance subservient to a harmonious result; and this time with no lack to control in its management. The fair patient who was "Recovering" last spring, and receiving the congratulations of a lady friend, is again represented still in bed, but so much better apparently,—and nearly as well actually,—as to allow of her eldest child's presence: she is amusing this morsel of four or five years' human experiences by explaining to him "The Picture Book" (65), that gives the picture's title. As an example of very skillful workmanship, this is scarcely less remarkable than its predecessor, the memorable combination of black, white, and vivid yellow. Mr. W. Q. Orchardson is not often more successful as a colourist than he has proved himself to be when confined to a similarly limited chromatic scale: black, white, and yellow have been tamed into very softer harmony in his depiction of a fond mamma, regarding her dot of a daughter, "The Idol" of her affection (87), to the effect of conveying the sombre suggestion that she is her only idol now. Somewhat slight and sketchy this is very dexterously painted; as are Mr. Pettie's two contributions, "A Hard Fight," seen before (98); or it may be a second edition of the educational primer published more than a year ago, at the Royal Academy, revised and corrected. The vicissitudes of poor governesses have afforded endless themes for both pen and pencil description; but, thanks to civilisation, emigration, and sewing-machines, the subject is bereft of much of its romantic interest now, though Mr. Pettie's clever characterisation and clever manipulation are none the less attractive on that account. The same praise for dexterity is due to his rendering of "Romeo and the Apothecary" (126), even if style of execution, in this instance, borders too closely on the careless indelicacy of a first sketch only.

M. G. Koller's first method makes all such deficiency the more apparent. For clean, solid, luminous depiction, and the attainment of finish without loss to breadth of effect, his Mediceval interior, wherein the presiding mistress of the household is receiving a visit from a female friend (120), is exemplary, with more show of labour—of the means by which the end has been gained. M. J. Devricnd's similar performance (140), "Going to Mass," will exact a similar acknowledgment. They are excellent specimens of completeness. Breadth and freedom in execu-

tion are the most remarkable attributes of an important work by M. S. Liezenmayer (130), "Maria Theresa of Austria nursing the poor Woman's Child," a fascinating picture for its beautiful colour and graceful treatment, though it is a treatment that intimates the adaptation of nature rather than its direct copyism. M. J. Portails has selected a very dangerous phase and face of "Jealousy" (74). Moody and morose, his victim seems to gloat on the sense of her wrong and the sense of her right to avenge it; however, M. J. Bouthoune assists to relieve apprehension in his emodiment of females' extremes: like all other extremes, they meet. "Friends for Life" (71) is but a day's intention, and "Enemies until Death" (80) scarcely an hour's, it is to be hoped, since the ladies who are supposed to be actuated by these diverse emotions are obviously too well brought up and highly connected not to be above such common human influences; and if they were, not to take very great care to hide their failings and feelings.

Mr. T. Ead is represented by one of his very estimable correspondents, who are always "his very truly." On this occasion her epistolary composition is costing her more trouble than it did the artist to record the fact of her being "In doubt" (55); but she need be in none with regard to a capability of expressing herself comprehensively, for that has been done for her—most easily and most admirably by the consummate skill of the painter.

Mr. J. B. Burgess shows an accession of power in his portrait of "A Little Spanish Lady" (40), who is a great deal Spanish, and a great deal of a lady, to the credit of him who has made her look so. "The Padre's Visit" (135), though but an ordinary incident, has served to the purpose of exhibiting great proficiency in technical attainments, and is a pleasant companionable picture. Mr. Burgess always paints conscientiously, and leaves never a trace of hurry or neglect in his works.

Mr. E. Long, with a more ambitious design, is less distinct in elucidation of the story he wishes to convey. Has "Liberty of Creel—Andalusia" any reference to turning the Jesuits out of Spain? One would suppose not, but that it was rather "taking liberties" with a creed, and very properly perhaps (176). The composition—a large one—embraces a variety of Spanish characters who seem to differ from the opinions of two priests, one gesticulating as if in pious horror of the indignities offered to the Church, whilst the other appeals for some show of the respect due to its representatives from too stolidly indifferent an audience to pay much attention to any such demand. Method here is superior to matter, for good workmanship and picturesque costume go a great way towards exciting inquisitiveness and a wish that some further description in the catalogue were there to satisfy it. The "Forbidden Fruit" (184) is a plant, *nicotiana*, "put by people in their mouths and noses, or smoked;" the fruit of the forbidden is the smoking, and the fruit of the disobedience is—sure to follow; at all events, M. C. Schlosser leads expectation up to this point, for his smokers are a herd of school-boys, whose idea of the niceness of the act exists but in the knowledge of its naughtiness, and they evidently are beginning to be sorry for their transgression already, and to feel that they have reason to be, or very soon will have. Even he, who in assumed ease of attitude leans against the usher's desk, and with head thrown back watches the curling cloud issue from his wide month, will presently wish he had been a better boy: *sic transit gloria fumi*,—if you commence too early,—and you cannot begin too soon, for then, perhaps, you will never do it again.

Mr. B. W. Leader's splendid sunset picture, "Head of Derwentwater" (22), is a Leader in a double sense of the word, for it is an exquisite performance, and would take a prominent position anywhere; and Mr. Vicat Cole's "View on the Arun, near Arundel" (196), though not so comprehensive, and of lesser pretensions with regard to size, is scarcely less beautiful.

Two sea-pieces (9), "Calm off the Coast of Holland," by M. P. J. Clays; and a lifeboat "Going to the Rescue" (64) through such a sea and to such a wreck as few could represent so well as M. Th. Weber, are likewise exceptionally fine performances.

To return to the figure-pictures, Mr. Folingsby's dead throuadour (12), "The Song is finished," M. L. Goupil's lady (17), "Arranging the Flower Vase;" Mr. E. Nicol's pair of comic impersonations (28), "The Tenant's Letter," and "The

Steward's Letter" (15); M. C. Beyachlas's highly-finished episode, "Grandmother's Birthday" (35); Mr. J. Archer's admirably painted young knight in armour of the fifteenth or sixteenth century, certainly misnamed as "Sir Lancelot," of King Arthur's time (41); Mr. T. F. Dicksee's charming and highly elaborated "Kate and Bianca," from "Taming of the Shrew" (70); Mr. G. B. O'Neill's physician comforting an anxious daughter or wife,—or one who but lately thought she should never become a wife,—with the gladdening intelligence that the precious life was now "Out of Danger" (79); and "A Wallachian Team," by M. A. Schreyer, with some human figures to manage it (106)—these, with Mrs. M. E. Freer's veteran, who, *minus* an arm, is still impregnated with the martial greed for glory, and regrets that he should be "Left Behind" by his comrades, who on the march, are passing his window (109); M. C. Blanc's fortunate and unfortunate young Italian heggars, the one "Counting his riches," and the other lamenting that she should have but a solitary coin for her "Hard Day's Earning" (127 and 137); "All Anxiety," by M. T. Rosiere (150); "Christmas Charities," by Mr. G. Pope (157); and Madame de Thullier's little imp of an intruder regarding with curious interest a mask or some mysterious trifle of a lady's wardrobe, wondering "What can it be?" (180),—have all some special claim for consideration.

Just as tastes may differ, choice,—where no great right of precedence really exists,—would vary so much that it is best to leave it to its various elections of leading works amongst the whole number that a judicious selection has restricted already to the category of chosen: a system, by the way, that might with advantage be more commonly followed, if the institution of winter exhibitions is not to outgrow its strength, and its production become but a very pale offshoot from the real stem of cultivated art as it now flourishes, poorly indicating its real health and strength.

Mr. G. H. Boughton may be taxed with anachronism in his application of "Indifference" as he illustrates it (4): at the period that the costume of the two would-have enslavers betoken it to be,—the regency or reign of George IV.,—the gentleman would have been considered singular indeed who sang,—

"When my hair is grey,
Then I shall be wise;
Then, thank Heaven, I shall not care
For bronze brows eyes"

(which are called "coffee-coloured" now); for most likely he would have worn a wig and thought more of his eyes than ever, had any desire to be considered at all fashionable. However, it is a very agreeable little picture, original in its treatment, and very truthful in general effect. Mr. H. Le Jenne's peasants making "Preparations for Dinner" (10) form a pretty group of highly-coloured rustic properties, as carefully and admirably painted, and as conducive to "Happy Thoughts" (16) as any of the speculations of Mr. G. Smith's visionary, in the present evidence they show in common of quiet content and academic skill in their representation: the infant in the cradle, the cyosnure of its mother's mind's eye in its minute's contemplation of a ten years' progress, is a beautiful study to more than her who is most of that opinion.

There are works by Mr. T. S. Cooper, Mr. T. Creswick, Mr. J. C. Thom; by MM. H. and H. P. Koekkoek, M. J. Bertrand, Mr. J. C. Horsley, M. L. Portielje, Mr. F. Goodall, M. C. Champ, Mr. E. W. Hulme, and others, that to notice as they deserve would extend our say of this exhibition very considerably. As it is, further notes on winter exhibitions must be postponed until next week.

Utilizing the Tides.—A proposal to utilize the power of the tides on the Thames at Westminster, was made some time ago in the *Builder*. This idea, we observe, has been taken up by a Frenchman of Italian origin, one Ferdinand Tommasi, who claims to have discovered a valuable mode of employing the force of rising and falling tides as a motive power. M. Tommasi, who is an engineer, and who has patented his invention both in France and abroad, says that the force of tides can be employed on his system at no matter what distance from the sea. A pamphlet on the subject, bearing the title of "Le Flux Moteur," and accompanied with numerous pictures and diagrams, will shortly make its appearance.

OPENING MEETING
OF THE ROYAL INSTITUTE OF BRITISH
ARCHITECTS.

THE opening meeting of the session took place on Monday evening, Sir W. Tite, M.P., president, in the chair.

The discourse during the recess of Mr. E. B. Lamb and Mr. Charles Freeman, Fellows, and Il Commendatore Luigi Poletti, of Rome, hon. foreign member, was announced. A large number of donations to the library and collections of the Institute were also announced, including donations to the amount of 42l. to the library fund. Mr. E. A. Grünig, of Gresham House, and Mr. E. W. C. F. Schmidt, of Great George-street, were elected, the latter as Fellow, and the former as an Associate.

The President then proceeded to deliver his opening address in the presence of a very crowded meeting. He commenced by congratulating the Institute upon the success it had attained. The number of persons connected with it in the various classes of fellows, associates, honorary fellows, honorary foreign corresponding members, students, &c., amounted at the present time to 675. The funds and finances of the Institute were in a flourishing condition, and, after payment of all current charges, a considerable sum had been carried to a reserve fund. These were incidents gratifying to them as men of business as well as artists; and he congratulated them, with all sincerity, on the present position of the Institute. The few remarks he would trouble the meeting with he could arrange under three heads, viz.: first, the position of the Institute during the past year, and what it had done during that year; secondly, some slight notice of what is at present doing in London; and thirdly, some general considerations referring to the present position and the possibility of the increased future usefulness of the Institute.

Having enumerated the papers read during the last session by Sir Digby Wyatt, Mr. A. H. Layard, the Rev. R. Burgess, Professor Lewis, Professor Donaldson, and others, which were distinguished for their ability and the interest which they excited, the president passed a high encomium upon the late Mr. Arthur Ashpitel and Mr. George Smith; and then referred in terms of satisfaction to the award of the Royal gold medal of the last year to Professor Lepsius, the eminent archaeologist of Berlin; also to the election of Emilio de Fabris and Il Cavaliere Professor Giuseppe Poggi, of Florence; and Il Conte Francesco Augusto Vespignani, and Il Commendatore Luigi Poletti, of Rome (the latter recently deceased), as honorary foreign members. The president then mentioned the fact (already known to our readers) that the grand prize of 100,000 francs given by the Emperor of the French to the most distinguished architect, sculptor, or painter, during the preceding five years, had been awarded to M. Duc, of Paris, architect, honorary and corresponding member of the Institute, who, he said, had appropriated 25,000 francs for the foundation of a scholarship in architecture. On the second head of his remarks, the president observed that it was impossible for a contemporary architect to give an opinion, unless it were a kind and friendly one, of the works of his contemporaries, but it would be expected that he should say a word upon some of the remarkable works that had been carried on in London during the past year, and he was sure his remarks would be received in the spirit in which they were dictated, viz., of good nature, good temper, and, he hoped, of kindness. The first work he would notice was that of Mr. James Pennethorne (London University, Burlington Gardens), and on that he had not a word to say except to the exceeding success of that building, which, he thought, was in every way worthy of the time, the architect, and the purposes to which it was devoted. He was quite sure all present would agree with him in regarding that building, the latest of Mr. Pennethorne's works, as one of the most successful he had ever executed. He now came to the new rooms of the Royal Academy. Were not these again a great success? He thought in this work of Mr. Sydney Smirke's every thing they saw demanded their approval. He thought the architect had done all that could be expected. The rooms were elegant, convenient, extremely well ventilated, and were all that the public could require in a building for such a purpose. No doubt there would eventually be a better access to it by the assistance of Mr. Charles Barry, whose firm had the charge of the front buildings, and

he thought, when completed, it would be a most eminent success. They as architects had been a little annoyed,—perhaps the fault was their own; but he had felt that architecture had hardly had justice done to it in the Academy exhibition. The room originally appropriated to it was perhaps well enough in itself. It might be that the drawings sent were not of sufficient interest or merit, and that had been suggested by some persons as a reason why the exhibition last year was not a successful or satisfactory one; but he hoped some amongst them, especially the younger members of the profession, would be found to do something to redeem the lost position at these exhibitions which, either from the want of a proper place, or want of purpose, or from some other cause, they had experienced. The next work to which he referred was the great hospital now in course of erection by his friend Mr. Curry, on the banks of the Thames, opposite the Houses of Parliament. It would be folly for him as a governor of that institution to say that they gave the architect power to spend as much money as he pleased upon decorations. They wanted a hospital and usefulness; they also wanted great economy; and he thought, when finished, it would be a building in every sense of the word worthy of its uses, and no inelegant decoration of the metropolis itself,—useful to the suffering public, as well as creditable to the governors who had directed its construction. He now came to the two great incidents of the day, Blackfriars Bridge and the Holborn Viaduct. The latter work had been constructed by Mr. Haywood, who styled himself architect and engineer, but he (the President) had long known him as an architect, and he thought all they had said and felt with regard to the viaduct was to that gentleman's credit. Perhaps he might make this criticism in all good nature, that he thought the decoration a little overdone. The Romans and Greeks built for antiquity and apparently for eternity. He was not sure that could be said of the buildings of the present day. We had grown to be fond of ornament, of gilding, and other characteristics which we did not see in the remains of Greece and Rome, and which he thought in a certain sense might be a little spared in our modern works. With regard to the new bridge it was in the whole a most successful work in regard to usefulness in every sense of the word. He had on other occasions given his opinion upon the architecture. He recollects the one which Mr. Mylne built, and he confessed he admired that more than the one he now saw. He thought it, like the viaduct, was overdone in decoration; but in both cases, he was bound, as a man of considerable experience, to say he wondered at the enormous success that had been achieved in the working of the materials. The hardest qualities of granite were worked with a dexterity and ability which commanded their highest praise. In parts of the viaduct the granite was almost wrought like joiners' work, and that no doubt would be as perpetual as they desired anything of that character to be; and in the case of the bridge, though he could not say he admired the cornices, the workmanship was beyond all praise, and, together with the polishing of the granite columns, was in every way creditable to the executors of it. Passing on to the third part of his subject, the President remarked that they were called upon in connexion with their position in the State to perform certain duties in their corporate capacity, and he ventured to think that those duties had been carefully and anxiously performed. One of those duties was the examination of candidates for the office of district surveyors under the Metropolitan Board of Works. That was now becoming a matter of exceeding importance. The Board of Works could, if they pleased, place these examinations in other hands; but they had been satisfied with the pains hitherto taken, and that part of their duty, he hoped and believed, had been well performed. During the past year a proposition had been made by that board to bring a Bill into Parliament to repeal the existing Building Act. The subject was referred to a committee of this Institute, and much time was occupied in the consideration of the subject; but on the whole it was thought better to leave well alone. Some changes, no doubt, were required in that Act; but, on the whole, they thought it would work well, and that it was not desirable to make any great alterations in the legal provisions which the present Building Act supplied. They had during the year an application from the Builders'

Association, who had brought under their notice the very grave question of the relations between builders and architects, and had urged upon them a great many changes. His own experience supplied him with the fact that engineers never allowed any interference between themselves and their contractors or builders, but kept the whole of the affairs in their own hands, as well as the settlement of questions of payment. For his own part, he would say it had always been his own practice that he would not be interfered with as architect. If the work was ill done he interposed; or if the materials were bad he sent them away. But he had never in any of his buildings interfered with questions of payment to builders, and they would accept that as the experience of a somewhat long professional life. It appeared to him, when a man had done his work, if any question arose out of the contract, he had the greatest right in the world to represent himself, or to be represented, in the matter, upon a reference to indifferent parties. He was glad to find this Institute, after going into the question, had come to the same conclusion as he had himself, viz., that the architect should be the sole dictator in matters of architecture and building, without interfering with the agreement between the employer and the builder as to the amount to be paid for the work. The next topic he would touch upon was a very grave and important one. The point was this,—that their object and end must be, and always ought to be, to promote architectural education; to make their members wiser, more learned, and more able men. He thought that was not to be done by those advanced in life urging on one another, because their duty was for the most part done, and their work ended; but they wanted to encourage and teach the young and rising architects: therefore this had been a subject of great anxiety on the part of the council, and they would see presently what had been done to encourage the rising architect to cultivate his genius and talents. The whole direction of architectural education, he felt persuaded, must be in that way, and in that way the regulations proposed by the council would, he hoped, be firmly and finally carried out. [Mr. Seddon here read the resolutions based on the suggestions of a general committee of the Institute on architectural education, which have appeared in this journal.] The president having publicly testified to the kindness of Professor Lewis and Mr. Waterhouse, in having undertaken the task of preparing the text-book, which he felt confident would be of the greatest benefit to students, remarked that he had only one more topic to notice, and that was, that during the past month there had been two letters addressed to him personally, in print, which had appealed to him on two distinct subjects. He thought all he could say on the matter was pretty well condensed in what he had just remarked in regard to their being able in some way to assist the young architect,—not those who, like himself, were advanced in life, who must be content with the position that had been formed for them. The writer to whom he alluded appeared to think that when a person aimed to become a Fellow of this Institute, he should be subjected to an examination. He would say he never knew of such a course being taken in any other professional society, nor could he conceive it would be submitted to in this. A man, before he obtained the rank of Fellow, attained a position in his profession, which his skill, age, and experience warranted. It appeared to him that the title of Fellow of this Institute was valued by those who bore it, because he found it need in all directions, appended to their names, and he did not believe that anything more could be done in that direction. The other point brought forward was this,—that Fellows should measure for builders. Well, perhaps that might be quite right; but at the same time he thought they, as architects, ought to hold themselves as much as possible distinct from interests of that character. A man of honour and a gentleman could be a man of honour and a gentleman anywhere. A distinct regulation was established at the foundation of the Institute, that Fellows should not measure for builders. It was there still, and he did not himself feel inclined to disturb it. It was a very distinct practical question, which every man of business could understand; but it was not a subject which they could discuss at that large meeting. The president concluded his address by repeating the expression of his gratification at the progress which the Institute had made, and its growing success, and said he should

be happy in the thought if by any means he had been instrumental in promoting that success.

Professor Donaldson, in moving a vote of thanks to the President, remarked that the address was practical and useful, and dealt with topics interesting to all present. He had not led them into wide fields of fancy, but had confined himself to practical points connected with their art. In reference to the magnificent prize which had been awarded to their honorary and corresponding member, M. Dno, the Professor remarked that it was a matter of pride to them as professional men that it had been bestowed upon an architect. Amongst the more striking works lately executed in London he considered the new building of the Bible Society in the City, by Mr. T. L'Anson, worthy of notice. It was, he said, a noble structure, and did honour to the architect, the society, and the art of the present period. He expressed his concurrence with what had fallen from the President as to the undesirability of interfering with the more material enactments of the Building Act. On the subject of the title of "fellow" of the Institute, the Professor remarked that it was to be regarded as a guarantee to the public that the bearer was worthy of the confidence of his employers; if not he would not continue to be a member.

The motion was seconded with great cordiality by Professor G. G. Scott, R.A., who suggested that no greater boon could be conferred upon the profession at large than the publication by the President of the results of his long experience on the numerous practical, as well as artistic, questions which had come before him, and he hoped his hon. friend would find an opportunity of gratifying them in that respect. The resolution of thanks having been passed by acclamation, the President briefly acknowledged the compliment paid to him, and said the suggestion should have consideration.

FINSBURY MIDDLE-CLASS SCHOOL.

A good work is being done in the city of London by the Middle-Class School Corporation, recently established, and whose purpose is to give the means of a sound every-day life education to the children of the middle and lower middle classes, at small charge. The first of their intended buildings has been erected in Cowper-street, not far from Finsbury-square, and is now occupied. It is intended to accommodate 1,000 boys, and has been built by Messrs. Brass, under the superintendance of Mr. E. N. Clifton, architect, at the cost of about 16,000*l.* The site, nearly 2 acres in extent, cost 29,000*l.*, but this included some house property, which will bring a small rental to the school. English, French, arithmetic, mathematics, drawing, and French, form the general course, under the direction of the Rev. W. Jowitt, with some twenty assistant masters. The Rev. Mr. Rogers, it is but fair to say, has been the mainspring of the undertaking. For the advantages offered, the charge to each pupil is one guinea per quarter. The buildings being provided by the subscribers,—*domus*, as at the universities, being free,—this small payment will, it is considered, defray the cost of instruction and maintenance of the building. Drill is attended to by a sergeant, and greatly improves the hearing of the pupils. There are now 900 boys in the school, and by Christmas the full number, it is believed, will be there. Visiting the building last week in the afternoon, we saw the boys dismissed, and a very agreeable sight it was. They marched out to the playground, round which with military precision they arrange themselves in double file. The head-master makes this the opportunity for a general review and a few words of the right sort here and there, according to circumstances. A certain number of the musical class have by this time mustered in the centre, the National Anthem is played, all saluting, and then, forming fours, they march to the gates, and break up, to take their several ways. The brass band would be larger but for the want of instruments, funds for which are not at present available.

The boys having left, we can look at the building. It has no architectural pretensions; it is plain to bareness: still, externally it has a sort of dignity. It is of four stories, including the basement (which contains the dining-hall), and is wholly of brick. A sufficiently-wide corridor runs through it longitudinally, with a large well-staircase at each end, so as to empty the building rapidly. The stairs are caged in with iron bars (side and top), the aspect of which is disagreeable. Given, however, a well stair-

case, and such a precaution is absolutely necessary. Without it an accident might have been expected within a week. On first thoughts, a square staircase, with a wall between the flights, would seem best adapted to meet the circumstances. Considerations, however, as to ventilation and light have to be weighed, and though these wants might be met in another way, they afford very good reasons for adopting the present arrangement. The dining-hall to which we alluded will seat 500 at a time. The charge for dinner to each boy who takes it is 6*d.* Many bring their own "nosebags," but all sit down to acquire habits of order and propriety. The other floors consist of class-rooms and lecture-rooms, with good lavatories and closets. In the upper story additional light is obtained from the top. A small room on one floor will be fitted up as a laboratory, in aid of which a grant of 100*l.* has been obtained from the trustees of the Gilchrist Educational Fund.

The walls of the rooms are lined with boarding to a certain height, the brickwork itself, whitened, showing above. Everything appears well and soundly done, but no trace of colour or ornamentation of any sort appears. Of course, the first great requisite is to provide apartments in which the business of the school can be conveniently carried on, and to this exclusively the funds have hitherto been devoted. We trust, however, no long time will elapse before Art be brought in to do its silent teaching.

The value of the Association that has resulted in the establishment of such a school as we find here, and which is prepared to carry on the work in other districts, cannot be over estimated; nor can we praise too highly those individuals by whose efforts it has been brought about.

ANTIQUITIES OF ROME.

We have received the third part of "A Catalogue of 1,500 Photographs illustrative of the Archeology of Rome," prepared under the direction of Mr. John Henry Parker, F.S.A. Printed for private circulation. We are not surprised that Mr. Parker does not think it expedient to publish this in its present imperfect state: it is natural that he should wish to make it complete before it is published; but, considering what a great undertaking it is, and that he has been already five years about it; remembering also the uncertainty of human life, and that he may never live to finish it; we are glad that he gives as much publicity as he can to what he has already done. He bids fair to produce the same sort of revolution in the archeology of Rome that Rickman produced fifty years ago in England, to put the subject into a new groove which others will soon follow, and the next generation will derive the full benefit of what he has set going. It is the application of this system, the close examination of detail and comparison of one with another, of less perfect remains on one spot with more perfect remains of the same kind and of the same period in another place, which forms the basis of modern archeology. Mr. Parker has also sent us proof sheets of his chronological table of buildings in Rome from the foundation to the time of Constantine, with the authorities for the dates. These two things ought to go together, and to be published together.

He has marked in the table all the buildings of the remains of which he has photographs, so that a scholar or an archeologist can now, with the help of a good magnifying glass, judge for himself whether the dates Mr. Parker boldly puts upon them can be relied upon; he has given the means of correcting them if he is in error. We observe that he lays great stress on the primitive earthworks as having governed the plan of the city, and dictated the sites of the principal buildings, and often the plan of a building also. We suspect that the same will be found to be the case with many other ancient cities and castles. This is a new subject for investigation, which has hitherto been overlooked. We are sorry to see that he states that his funds are exhausted, and that he cannot carry on the work he had undertaken in Rome without assistance. He has not called on others to help him until he had done the utmost that his own means allowed, and we trust the example he has set will be followed. We have heard it whispered that he received as much as 10,000*l.* (all now expended on archeological objects) from the estate of the late Robert Stephenson, the engineer, which, though legally at his own disposal, he chose to consider as trust money only for archeological

purposes, and, therefore, devoted a moiety to this object in Rome, believing that such would have been the wish of Stephenson could he have been consulted. We gather from the end of the catalogue that persons desirous of assisting in this work can do so by paying donations to the Roman Exploration Fund, at Messrs. Coutts's, of which Mr. Parker is treasurer.

SCHOOLS OF SCIENCE AND ART.

Technical Education in Clerkenwell.—A school for the instruction of apprentices and workmen has been opened at 44, Clerkenwell-green. The Hon. Anberon Herbert occupied the chair. He referred to the progress of education in North Germany, especially in those subjects which make the apprentices and workmen more skilful and perfect. Accept, said he, the assistance which the Government offers, and make the best of it, although it is not all we think they ought to give. A working man in the meeting said the working men had never made any effort to secure a better education, or taken any trouble to impress the Government that they desired it. The chairman said it was quite true the working classes had not as yet felt the importance of the subject. We are progressing, said he, towards a great organisation of labour, in which the co-operative system will prevail, in which there will be a brotherhood of workers directing their own industry. He believed such a co-operative system was the only means of providing employment for the population; but it required a high state of intelligence to reap the full benefit of such a system. We must also endeavor to give working men more taste. Some of the best designs in former days were made by men engaged in the industries in which the designs had to be executed. We have a great arrear of ignorance to wipe off. We want more light. We must decide on what we want from the Education Office. Mr. Buckmaster then addressed the meeting with great earnestness, urging the importance of a better education for all classes of society, masters as well as workmen. Mr. Young, a picture-frame maker, said he felt the importance of a school in the district like the one proposed. Mr. Donati said he was a wood-carver, but he had never been taught drawing. He feared, up to the present time, the instruction had been too expensive for working men. Mr. Lucas said he feared the employers of labour were quite as indifferent to scientific instruction as the men. So long as the men could do their work and make a profit for the master, it was, in most cases, all that was cared for. There was an entire absence of all opportunities for improving the art education of the working classes in this district. There was nothing to be seen but bricks and mortar. A man could not walk in Paris without seeing something beautiful at almost every step, but there was nothing to be seen in our streets but wretched, dreary-looking objects,—nothing to improve the taste. Mr. Sollas and Mr. Coles, salaried teachers, then addressed the meeting, and explained the course of instruction which they proposed to give. The school, it appears, promises to be successful.

The Oxford Schools of Art and Science.—A meeting of the friends and students of the School of Art has been held in the Town-hall. There was a large and highly respectable attendance. The walls of the hall were decorated with the drawings of the pupils. There were present on the platform the Dean of Christ Church in the chair, Dr. Adlard, Professor Rogers, Mr. Burchett, head-master of South Kensington Museum School, and various others. The report stated that the committee had a much more satisfactory account to give of the institution than last year. The receipts for the last year have been more than sufficient for the expenses, &c. It appears that 350 pupils have attended the schools during the past year; being an increase of 142 over the numbers last year. Of these 96 were in the artisan class, and of their works 436 have been sent to South Kensington for approval, preparatory to the claim for a money grant from Government. It is satisfactory to observe that in each year since the establishment of the school the annual grant has regularly increased; partly on account of the more liberal arrangements of the Department, but principally owing to the increased quantity of works executed, for which claims may be made. The chairman announced to the meeting that the Art and Science Departments in Oxford would henceforth be under one management. They were under

one management at South Kensington, and he hoped their union in Oxford would be attended with advantageous results. He hoped the gentlemen of the Oxford Science School would, as far as possible, induce their pupils to avail themselves of the opportunity of attending the Art School. Professor Rogers, one of the chief founders of the Oxford Science School, explained the origin of that school by gentlemen who were interested in the spread of industrial and economical education. The chairman reminded those present that the School of Art had yet to clear itself of a very large debt. The plant was worth much more, but the School was at present chiefly maintained by fees; and they required subscriptions. He thought it was only fair that the managers of the Art School should, on joining the Science School, make an appeal to the University to contribute some small sums towards the assistance of the joint concerns. He should be very glad to give something himself.

A School of Art for Lewes.—The formation of a School of Art in Lewes has been a success, so much so, that it has been decided to erect a building for the purpose as soon as a suitable site can be secured. The Government will grant 300l. or 400l. of the money required for the purpose.

The Gloucester School of Science.—The Science Classes, under the Science and Art Department, successfully started by Mr. Jeffery, at the Free Library, in 1867, and continued last year under the management of Dr. Davis, of Cheltenham are about to be recommenced under the united management of these teachers. It is hoped that they will be able to establish a permanent Science School in this city, in connexion with the Government department, so that young men here may have the opportunity of obtaining the diplomas in science now granted by the Committee of Council. A preliminary meeting has been held in the class-rooms, 10, Eastgate-street, to announce the plans for the winter months, and to enrol students. There was a good attendance, and twenty-five members joined. The prizes obtained for successes in the examinations in May last, and the certificates of success from the Committee on Education, were distributed to the pupils.

Classes for Technical Education in Liskeard.—Mr. Buckmaster recently delivered a public lecture in the Temperance Hall, Liskeard, under the auspices of the Mechanics' Institution. Mr. Sandey, J.P., occupied the chair. After the lecture a discussion took place, in which Mr. Buckmaster's science was questioned by a practical builder as to the forces acting upon an arch; he also stated that the mechanics of Liskeard were much better acquainted with science and drawing than had been credited by the lecturer. After Mr. Buckmaster's reply, a number of persons of both sexes gave in their names for classes, probably in physical geography, and on experimental science. The drawing is already provided for by a branch school of art, which has been successful, although the number of artisans in the school is very small.

The Birkenhead School of Science and Art.—The prizes awarded by the Science and Art Department to the students of this school have been publicly distributed in the Music Hall, Clangton-road. Mr. John Laird, M.P., presided. Various works executed by the students of the school were submitted for inspection. Mr. Laird said he had ascertained that the following was the number of working men, apprentices, and others, who had attended during the five years ending December 1867:—Workers in iron, 259; workers in wood, 109; bricklayers, masons, and plasterers, 77; house painters and plumbers, 44; architects, surveyors, and apprentices, 24; schoolmasters and governesses, 52; sundry trades, 41; and schoolboys and girls, 53; total, 659. Therefore no one could doubt that the school had been eminently useful for the class for which it was intended. During the past year 20 students sent up 75 drawings in the advanced sections. The works of 12 were commended, and prizes were awarded to two of them. The works of seven were selected for national competition, in which one was successful, and five studentships were awarded to three others. The total number of drawings sent up was 630. It was only due to those attending the school that the people of Birkenhead should support it liberally; and what was required to make the school more generally useful was a larger building. If there was a larger building, the number of pupils could be increased, and the school made of much higher

standing, and this could be done at a very small expense. The proposed building would cost from 2,800l. to 3,000l.; the Government pay was about 1,000l., there had already been subscribed 850l.; and only 1,000l. or 1,200l. were wanted to complete the work. There were surely 100 men in Birkenhead and the neighbourhood who could give 10s. each, in order that the school might be gone on with. Under Mr. Bentley's charge the school had taken a high position in the country. Some appropriate resolutions were unanimously agreed to.

THE THEATRE.

Haymarket.—Three particularly good scenes, Library at Cleve Abbey, Croquet Lawn in the ruins of Clove Abbey, and Drawing-room at Beaumanoir Park, have been provided by Mr. O'Connor for Messrs. Tom Taylor and Dubourg's comedy, "New Men and Old Acres," described as an original work, and, at any rate, a very interesting and effective piece. The first interior in the house of the old county family, with its stamped leather wall-hangings, old pictures, furniture, and plate, is cleverly contrasted with the drawing-room at Beaumanoir Park, where everything is gorgeous and new. The croquet lawn within the ruins is a charming picture, and the architectural portions show commendable care. The piece is very well acted by Mr. Buckstone, Mr. Howe, Mrs. Chippendale, Mrs. E. Fitzwilliam, and others; but the honours are fairly carried off by Miss Madge Robertson, who, as the daughter of the house (*Lilian Favaour*), talks gentle slang in the first instance and affectionate good sense in the second, with a vivacity, discretion, and power of pathos that hold her audience in smiles and tears from first to last.

Crystal Palace.—A handsome new theatre has been formed here, but is at present wanting in some main qualifications of a good house for operatic representations. As defects will, doubtless, be early remedied, we shall take another opportunity to visit it before making any comments.

An Offer to Unread Dramatists.—The editor of the *Gaiety Gazette* makes the following offer to the "nacted and unread":—

"Any gentleman—or lady—who has a play and a guinea on hand, may forward them both to this office, with the name of some gentleman in the published list of contributors to the *Gaiety Gazette*, to whom he would like his production to be submitted. The gentleman of their choice shall be invited by me to read the piece, taking the guinea for his trouble. Should he decline to look at it, the writer shall be so informed, and in that event there shall be no second choice—either the play and the guinea must be taken back, or the selection of a critic amongst the staff of the *Gaiety Gazette* shall be left at my discretion. And in no case shall any one be expected to answer the complaints of the rejected. I am not to be held responsible, nor is any one else connected with this paper, for the loss or injury of any MSS. All that is guaranteed by the *Gaiety Gazette* is this,—that the plays shall be fairly read by persons entirely competent to criticise them, and not, unless it be wished, by those gentlemen who are suspected of monopolising the stage."

The second part of this amusing proposition is:—

"The editor of the *Gaiety Gazette* has received a formal intimation from Mr. John Hollingshead, that if the above programme be carried out, he, for his part, will put the *Gaiety Theatre*, with its company and its properties, at the disposal of any author whose piece shall be approved by the critics of the *Gaiety Gazette* for one morning performance—of which the author shall take all profits—on the simple condition that he pay all expenses, and make his own arrangements, by letter, with the *artistes* whom he wishes to include in his cast; so that, in no event, shall the cost of their salaries fall upon the theatre. The manager shall not be asked to receive any strange actors, nor shall the author demand an introduction to Mr. Hollingshead, or to myself, or to the critic of his piece, nor accept any, unless by invitation."

WOLVERHAMPTON CORPORATION NEW BUILDINGS.

THE foundation stone of the new town-hall, sessions-court, police-court, barracks, and cells, for Wolverhampton, has been laid. The site is the ground which was occupied by the old town-hall, facing North-street, but enlarged and improved. The proposed premises may be considered in two divisions, the first fronting towards North-street, which will be devoted to corporate purposes more particularly, and the second, fronting Red Lion-street, for the police.

The Italian style of architecture has been adopted, and the front of the structure will be executed in stone, and the rear in red brick, relieved with blue bands. The estimated cost of construction, which Mr. Ernest Dates, of Manchester, the architect, arrived at, was 17,000l.; but some alterations and additions have been made

to the plan in the provision of cellaring, from which a revenue of 80l. a year is likely to be derivable, so that the contract has been let to Mr. Philip Horman for 17,300l.

The ground-floor of the building will be approached by a flight of steps from North-street, and the public hall, measuring 39 ft. square, will have a dome-shaped ceiling with a lantern light. The offices for the town-clerk and the rate-collector will occupy a prominent position in the front of the premises, and on the floor above will be a chamber for the mayor, rooms, for committees, for the recorder, for robing, and for cloaks. On the right and left of the hall, on the ground floor, will be the council-chamber and sessions court, respectively 49 ft. by 38 ft. 6 in. in dimensions, and not far off a court for the magistrates, all approached by wide corridors. There will also be a host of minor apartments, for counsel, witnesses, officials, &c. In the police department there will be provision made for every requirement, including seventeen cells for male and fifteen for female offenders, averaging in size 15 ft. by 6 ft., well warmed and ventilated by a suitable apparatus; barracks, including twenty-one bedrooms, and apartments for baths and for the sick. The front of the town-hall will be of bold design. The centre portion of the facade will project, having double Corinthian pilasters at the angles, and a dome-shaped roof, with ornamental iron cresting. The two wings will also slightly project, and be supported by single Corinthian pilasters at the angles, and be in keeping with the rest of the edifice. There will be a large balcony for use on important occasions, and a public clock may be introduced conspicuously.

THE SAXON CHURCH IN WORTH, SUSSEX.

The following communication from "A Sussex Correspondent," demands immediate attention:—

"I have just now returned from visiting Worth Church—that was; Worth ruin that is! I found the chancel had vanished clean away; and six or seven rough men were picking away, with large picks, at the strong plaster over the rubble work of the Saxon walls! Their heavy blows resounded like screechle all about the venerable pile. In my sorrow I called out to the head workman,—"What are you doing, picking off that plaster! You'll have to put it all on again; and you can't make anything half so good as that!" "Oh, no, we shan't put any more on," said he; "we shall point down the stones." "Point them down!" I exclaimed; that rough work was never meant to be shown; it was always plastered over." It was afterwards mentioned to me that more than one of the Saxon pilasters was out of the upright, and would have to be taken down and rebuilt! Pray do what you can to prevent further damage. This curious and interesting churob does not belong to Worth only, but to the whole country, and ought to be preserved intact with the greatest care."

We fully agree with our correspondent in this opinion, and earnestly implore those who are concerned in the work, to pause before they knock down another stone. They will have to justify themselves for what they have already done.

CONVERSAZIONE OF THE ARCHITECTURAL ASSOCIATION. EDUCATION.

The Architectural Association's session of 1869-70 was opened on Friday (the 29th ult.), at the House, in Conduit-street, with a *conversazione*. The attendance was numerous, and included many ladies. The chair was occupied by the president, Mr. Lacy W. Ridge.

The report of the judges awarding the Association prizes was read by Mr. T. R. Smith. The President said,—I think a few words are necessary to mark the connexion of this meeting with the Architectural Association, and to distinguish it from similar meetings which other societies might hold in these rooms. Secondly, we have on these occasions hitherto been favoured with words of wisdom which have fallen from some of the professional elders who have come among us. With their words of wisdom we are not willing to dispense now. It would, however, be impossible to ask such gentlemen to speak unless first something were said on the part of the Association itself. But there are, I believe, still deeper reasons why these mixed gatherings

should not be allowed to fall into a state of absolute silence. To develop one such reason will be the object of the few thoughts I hope to put before you this evening. The fine-art architecture may be shortly defined as the art of spreading beauty to that which is useful. Man needs a building that therein some special object may be performed. Art-architecture enables him to make it beautiful. In the Middle Ages, a bishop wanted a building where men might meet in crowds to do honour to their God. The architect proportioned the parts thereof that it might be beautiful. He vaulted the roof, moulded the arches, carved the capitals. He made windows for light, and gave them beautiful forms. He glazed them as a protection from the weather, but he painted the glass for beauty. He wanted more colour; so his painter brought his art, and there he told his wondrous tales. There were doors, which the sculptor beautified. There were towers for bells, and these the architect grouped in lovely outlines; and a cathedral was built. Now, as in the building itself, so in each detail, we find first a requirement supplied, and then beauty incorporated in the work by the art of the architect; and this operation of combining utility with beauty is not confined to buildings, or even to the details thereof, but finds a field for its exercise in every kind of manufacture. The constant presence of wants to be supplied, while it is the groundwork of all true styles of architecture, and the great hinderance of all styles that are false, is the very reason for the existence of all industrial manufactures. A constant view to utility and a true love of beauty are the requisites alike of the architect and the designer of manufactures. Their art is identical; it is, in fact, the one great art-architecture that governs the whole. It is important to establish this, because many who enshrine architecture in the academic circle of the fine arts—with painting and sculpture—are surprised when asked to regard some common thing of daily life as a work of fine art. The furniture, the tapestry, the pottery, the glass, the dress of everyday life, are as capable of receiving art-treatment as buildings themselves. When in times past building has flourished, the art in these things has flourished too; and when architecture declined, first one manufacture and then another fell under an artless tradition. Think not that in thus claiming an extended way for architects I am anxious to increase the province of architects. Speaking generally, it might be said that when art most flourished we heard least of architects. It is as with the saints of ancient times—when the world was most wicked then they most abounded, and their deeds stood out in high relief, whereas in the general decency or appearance of more modern days the character is unknown, or at least unrecognised. In some respects the existence of architects is abnormal, for surely each man should be the best designer in the branch of art in which he works. In buildings, however, where so many arts are brought together, a chief is indispensable; and at this period, when all the subsidiary arts have fallen into a state of decadence, in which each is inconsistent with the others, some race of men who will study abstract design may well be tolerated. My object, therefore, in setting forth the close connexion, or rather the identity, of art in buildings and art in manufactures, has rather been to remind us of the Architectural Association, on the one hand, that the result of our studies must be to establish principles for an art which shall be applicable not in buildings alone, but in all manufactures, and to claim on the other hand that the true principles of architectural art shall govern all works of industry. If this is to be so, it is manifestly useless for architects to stop short at "the five orders," or the forms of this or that century. With these things art in industry has nothing to do. We find, however, common ground at once when we turn our attention to beauty of outline, grace of proportion, harmony of colour, and the laws, now constantly neglected in manufactures, which make ornament artistic. A constant view to utility is, however, the greatest bond of all. By it, character or style is imparted to an object (be it building or manufacture) in such a way that the very expression of use becomes a great source of beauty. I will illustrate what I mean; and first, negatively, from a building. Let me remark that I give no opinion on the building, which, in fact, I have not seen; I only use it as an illustration. During the past year a market has been erected, with extreme magnificence on the part of the donor, at the east end of London. You may possibly remember

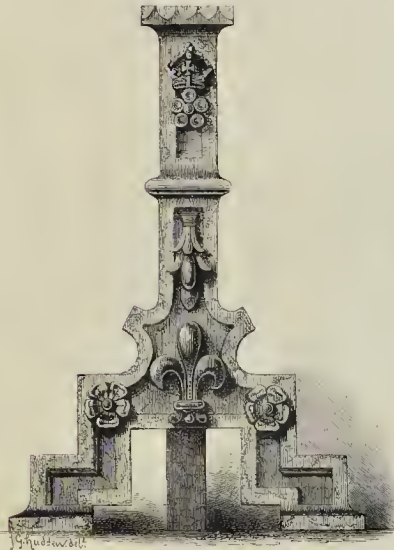
that in the descriptions of Columbia Market which appeared in the daily newspapers at the time of the opening, certain decorations and parts of the building were spoken of as "ecclesiastical." Now, the character of the artistic criticism which appears in non-professional journals is such that it is quite possible this word may have been used to express the forms of a style of architecture which was just as applicable, and just as much used in civil and military buildings, as in churches; and, if so, all may be well. If, however, any features or decorations did really suggest to intelligent minds that they would be more appropriate in a church than a market, then such features and decorations were worse than useless; they tended to destroy the character of the building,—they made it less fit for a market, and were sins against the laws of artistic utility. Now, let us turn to a common article of manufacture; and I must ask you to excuse its extreme familiarity, because it adds to its value as an illustration. Take an ordinary table-knife. It is simple enough, and, at first sight, you will say useful enough. Now, you will remember that it has constantly to undergo things laid down on a plate, and that one part only of the blade, a part near the end, is ordinarily brought into play. That may be seen at once by looking at knives that entered the head of the designer of the knife, or, at any rate, be disregarded. Take next an old-fashioned table-knife, such as still lingers among the inhabitants of old country-houses. First, we find a long sweep given to the point, at which the cutting ordinarily takes place, to lengthen the point on which the work comes. Then we find the point strengthened with additional metal; we find a place provided for the forefinger, and a knife produced which, while it is quite as useful for such purposes as cutting bread as any other knife, is characteristically and essentially a table-knife. It is far more utilitarian than the other, for it will far longer endure the special work for which it is designed; and it is a work of art, for it displays thought, and has given its designer the opportunity of introducing, graceful curves and outlines. In the first case we have a work which satisfies a simply utilitarian age; in the second place, we have more utility, with character and expressed quality—this derivation of the art from the use—because in this rests the only hope of associating the practical utilitarianism of the age with art. By this only can we hope to persuade the commercial man of "per cent." to entertain art with his manufacturers. By this only can we hope to arouse a lethargic public, and to persuade them that architects are something more than antiquarian pedants, and architecture something more than an obsolete amusement. Now, if our art of architecture may be thus legitimately extended into every manufacture,—if it should constantly intertwine itself with everything that is useful around us,—have not all of you, even those who have least connexion with the architectural profession, some share in the matter? and have we not been justified in asking you to listen for a few minutes? We ask you to share with us our position as artists, and in the common things of daily use to be patrons of art. Think not you can even see those arts which you may consider (and perhaps to some extent rightly) the nobler arts of painting and sculpture in perfection, if art be wanting in minor things. This is impossible; for both public taste and the minds of the artists will be perverted by the ugliness of their ordinary surroundings. It would not be difficult to show that at the present moment painting suffers under a fearful incubus, while sculpture has been brought to the verge of annihilation, from the want of artistic character, and from the intrinsic ugliness of the costume worn by the men of this generation. We ask, therefore, the sympathy of all in promoting the welfare of our art. That it is a good work for you to help in, we doubt not; the Government of the country says that it is a good work, for it establishes museums and schools for instruction in art. We believe art to be a blessing, because it can soften the too stern realities of life; because it can shed one bright beam over the daily toil of the workman; and because it can make both the worker in art and him that appreciates it advance one small step towards the nature of the Great Creator, who, in the simple allegory of the earliest of prophets, is represented as reviewing all that he had made, and "Behold, it was very good."

Professor Kerr, in response to an invitation from the chair, said he should like at the outset to enter a very faint protest against being regarded as one of those whom this president had designated "the elders of the profession," and he certainly did not lay claim to the high merit of always speaking "words of wisdom." A little wisdom, no doubt, went a long way; but on such occasions as the present he thought that a little amusement was perhaps as much in request. Leaving, therefore, the wise part of the business for the meeting to be held in due time upstairs, he would now address himself to the present meeting upon its own ground. He thought he had reason to congratulate the Architectural Association upon having on this occasion returned to the original principle of the presidency of the Association, in electing to that office a gentleman who (if he would excuse him saying so) was one of the juniors of the profession. It was only last year that the principle was departed from, and it was departed from then for what was regarded as a very excellent reason,—with which, however, in general practice, he could not agree. What they had to do in this matter was to put forward their best men, that was all that was asked for; and he would undertake to say that there were a good many best men in store before the supply could be considered fairly exhausted. Following up the remarks of the chairman, he proceeded to refer to the subject of the education of the architectural profession—a subject in which, of all others, the young members of the association were deeply concerned. There were one or two questions a good deal agitated at the present moment which were not very clearly understood. First, it was said, "You have only to go across the Channel, and there you will find professional architects in France, every one of whom is educated regularly by order of the Government, while those who have shown proficiency at the close of their curriculum become by that fact entitled to preference." Now there was something highly attractive about that system of education in France as compared with the system practised in our own country. And what was the reason of this difference in the practice of the two countries? It was not that the architects of England were inferior to the architects of France. It was not that this profession of architecture in England was less noble in the estimation of the public. It was owing to what he might call that accidental difference of constitution which prevailed, not in this only, but in a thousand other things of no less importance, and by reason of which the narrow channel which separated the two countries seemed to divide two peoples who never could be brought into any uniformity of practice on any question whatever. The principle which had always prevailed in France, whether under a despotic monarchy, a republic, or otherwise, was the principle of centralization. That principle had lain at the root of everything in France, whereas in our own country the ruling principle was one of anti-centralization. Which of the two systems was the best he would leave it to his audience to judge. While differing in their opinions on the subject of professional education, architects were agreed to this extent at least, that practical education should be supplemented by theoretical education—by the establishment of a sort of curriculum, not compulsory, but in some authorised form, by means of which the young architect might be enabled to supplement his practical training by what theoretical instruction might be thought necessary or desirable in the exercise of his profession. There was the question, of a cognate kind, of what was known by the name of the diploma system. Those young men who were training for the profession, when they were willing to pass an examination demanded that when they had done so they should have some recognition of the fact. At the end of one of Bulwer-Lytton's plays, it was remarked that in this world, in addition to the possession of intellectual requisites, there must be what was called "a little humbug." Now, there was no cause why these young architects should not desire a little of this very reasonable kind of humbug, in the shape of some acknowledgment of the fact that they had passed their examination. The Society ought not to be chary of its honours, and the Institute should not be chary of its compliments, but gladly welcome the students of the profession, and amply accord to them every reasonable recognition of success. Nor should this be done merely as a matter of formality, but it should be thrust upon them in the character

AT LEEDS CASTLE, KENT.



The Kitchen, the Bridge adjoining, and the Clock Tower.



Fire Dogs, which formerly belonged to King Henry VIII., found at Leeds Castle.



The Water Tower and the Maidens' Tower.

[See p. 877, ante.]

of a merited honour and distinction. If the diploma system were settled upon that principle, there would be a great deal of good done, and there would be an end to a great deal of misunderstanding. If, for instance, every person who passed the ordinary examination were thereby entitled to admission as an associate, that in itself would be one practical recognition; and if every person who passed with distinction were entitled to become a fellow after five years' standing, that would be a further practical recognition of excellence, which would certainly be appreciated by those examined. There might be other contrivances by which those who submitted themselves to examination, and passed, might receive recognition of their success. He would urge upon the Association to do their part earnestly and loyally, and meet the invitation of

the Institute of Architects, believing, as he did, that in a few years these examinations would be a source of great encouragement to the students of the profession. He congratulated the Association upon the prospects, which he believed were very bright, for the coming session. He remembered when that Association was first established, he had seen it in its early struggles, and had watched its gradual progress till now, when it certainly possessed a membership which entitled it to be regarded as one of the established institutions of the country.

Professor Lewis also added a few words of congratulation to the meeting, and, referring in the course of his remarks to the subject of examinations, which he had himself much at heart, said that although he had been somewhat disappointed at the results, he had no doubt whatever

as to the importance of the examinations themselves, on which, indeed, very much depended the success and distinctive character of the architectural profession. He could not approve, however, of making the examinations compulsory.

The prizes for measured drawings were awarded to Frederick H. Read (*Spero*), J. Hinton Bryan (*Sperantia*), and Charles Hanbury (G. E. R.); and for the essay, to Keith D. Young (*Austin*).

In the class of design the judges awarded the prizes as follows:—
“The first to R. F. Deal, whose ‘Landing Stage’ and ‘Warehouse’ are highly commended. The second prize to R. A. Came, whose ‘Warehouse’ is of very great merit. Mr. Henman is honourably mentioned for a careful set of studies.”

In the figure-drawing class the carefully-elaborated studies by J. E. Fogarty entitle him to the prize. S. F. Clarkson and R. M. Marnock show great industry.”



THE CENTRAL SYNAGOGUE, GREAT PORTLAND STREET, LONDON. — MR. N. S. JOSEPH, ARCHITECT.

THE CENTRAL SYNAGOGUE, GREAT PORTLAND STREET, LONDON.

UNLESS we view wrongly the Jews of the times, there is a party among the Jews who feel that the mass of their co-religionists are growing lax, not alone in religious observances, but in the acquirement of knowledge and the pursuit of those arts in which so many of their persuasion in all countries have superlatively excelled; and they are seeking to awaken attention to this fact and to encourage such endeavours as may be made to lead the rising generation into the right way. We hear of literary clubs and other similar associations. The *Jewish Record*, an intelligent journal, draws attention, too, to the careless manner in which the services are performed in many of the synagogues, and the want of other synagogues of proper character. Abroad, in Germany and France, some handsome synagogues have been recently erected. In our present number we give a view of a new synagogue now approaching completion in Great Portland-street, Portland-place, one entrance being in that street, and another in Charlotte-street. It is being built by Messrs. J. Perry & Co., from the designs of Mr. N. S. Joseph, architect; and the amount of the contract, including two houses for ministers and a building containing a vestry-room, is over 24,000*l.* Externally it is of brick and stone, in a style that may be called Moresque. The entrance-doors and other parts display a considerable amount of carving, executed by Mr. Sansom. The synagogue proper is 94 ft. one way, and 60 ft. the other; and it is 49 ft. in height to the crown of the vaulted ceiling. Below it are cellars. The roof and galleries are carried on cast-iron columns, which are turned in a lathe to give a good face for painting. The mouldings of the ceiling and arches are of plaster. At the northern end there are two galleries, approached by flights of stone steps. The iron work is supplied by Messrs. Shaw, Head, & Co. Mr. Stanley is the contractor's foreman.

The building, which is being erected under the presidency of Sir Anthony Rothschild, hart, is intended to be a branch of the ancient place of worship known as the "Great Synagogue," in Duke's-place, City, and is to supersede a smaller edifice in the same street, which has been found insufficient for the accommodation of the Jewish residents in that district. Like all synagogues (where, in accordance with the customs of the ancient race, the sexes pray apart from one another), the galleries are for the female congregants, the whole of the ground-floor being intended for the men.

The perspective view shows at the south-east end, elevated above the general level, the *echol*, or sanctuary, a domed recess, within which is the *arón-hakkodesh*, or sacred receptacle for the scrolls of the Pentateuch. In the centre of the building is the *almemar*, a raised platform whence the preacher, surrounded by the chorists, conducts the service. The seats, both on the ground-floor and in the galleries, are placed longitudinally, and raised tier above tier. All the internal fittings, the *almemar*, seats, and the bulk of the joinery, will be of oak.

HOLBORN VIADUCT.

On this Saturday (Nov. 6th), this important and costly improvement will be formally opened to the public, and, as we sincerely hope, by her Majesty the Queen. It may be useful to state that in our number for April 24th of the present volume* particulars of the viaduct will be found, with sections showing its construction, and a plan of part of it. The works, it will be remembered, have been performed by Messrs. Hill, Keddell, & Waldram, under the direction of Mr. William Haywood. We mentioned that the iron-work of the Farringdon Bridge had been supplied by Messrs. Cochrane & Groves. We have to add that certain portions of the structure were made by Messrs. Andrew Handyside & Co, namely, the iron bridge and parapet over Shoe-lane; the iron subway bridges and parapet over the London, Chatham, and Dover Railway; the ornamental gates at the four entrances to the subways in the Farringdon-road; the bronze foliage on the capitals of the polished granite columns supporting Farringdon-road Bridge, and the ornamental lamp pillars on the viaduct and approaches (not the large centre ones). With reference to the lamp-posts, it may be interesting to note that

each one is so arranged as to contain at the base a meter, and half-way up the post a disc plate is fixed inside to prevent any gas that may have escaped from the pipes in the subway ascending to the lighted lamps, and so causing an explosion. Under the disc, the pillars are pierced with ventilating holes to allow free egress to the open air of the leakage gas. It is well to mention that what is called the Patent Enamel Paint is used on the Farringdon Bridge, so that its behavior in the course of time may be noted.

The houses on the skew at the four corners of the bridge, to which we referred in our last account, are now nearly completed, and challenge criticism, as do various statues and other adornments. We prefer, however, to postpone our observations till a quieter moment in the history of this laborious undertaking.

BLACKFRIARS BRIDGE.

THE new bridge at Blackfriars, like the Holborn Viaduct, will be opened to the public this day, Saturday, November 6th, as nearly as may be 100 years after the opening of the first bridge, which took place November 18th, 1769. We only think it necessary just now to say that a view of the new bridge will be found in our volume for 1862,* as well as a view of its defacing neighbour, the iron bridge for the London, Chatham, and Dover Railway. Descriptive notices have been given on various occasions, the last in our present volume, p. 163, *ante*. Mr. Joseph Cahitt and Mr. Henry Carr were joint engineers; the clerk of the works was Mr. Pickett; Messrs. Thorn & Co. were the contractors; and their agent was Mr. F. Bryant.

ACCIDENTS.

Ipswich.—Mr. Seagar, builder, of Foundation-street, in this town, was walking on a scaffolding of a house which he is building in North-hill-road, Woodbridge-road, when he caught hold of some stonework on one of the windows. The stones having only recently been laid, the mortar was not set, and his weight caused them to fall, knocking him down. He fell on to some bricks below, injuring his ribs. Fortunately the falling stones did not touch him in their descent.

Woodchester.—The carelessness of a workman has been very nearly causing the burning down of Woodchester Church, erected only six years ago. Gas was being laid on, and a hole was bored through a beam over the chancel-arch, to put a pipe in. The hole was not large enough, and the clever workman actually burnt it larger with a heated rod! Directly after, the beam was in a blaze, but the fire was immediately seen and suppressed. The alarm brought half the village to the rescue, with their entire stock of huckets.

Swansea.—A few nights ago a serious gas explosion took place in the new Congregational Chapel, Walter-street, Frymore, which was opened about two months since. About the time stated the chapel-keeper, having turned on the gas at the meter, went into the left-hand lower to light the gallery preparatory to the service. In the tower he struck a match, and instantly a fearful explosion took place. He was knocked down and somewhat seriously hurt and bruised. The tower was considerably damaged. On examination it was found that the gasfitter, who had been at work during the day, had carelessly left an 1½ in. pipe unplugged, and the gas, when turned on at the meter, instantly filled the tower.

Glasgow.—An accident, resulting in instant death to one man, and fatal injury to three others, has occurred at the New College Buildings, Gilmore-hill. A number of masons and labourers were engaged on a scaffold at what may be called the clearstory of the library, when, from some cause or other, one of the main supports, or ledgers, on which the cross needles of the scaffold rest, broke, precipitating four or five of the workmen into the space below—a fall of upwards of 50 ft. There were five or six others upon the scaffold at the time, but those, finding their footing giving way, clung to the uprights, and so saved themselves from going down along with the scaffold and its load. It was found that an Irish labourer was killed, and that three of the other workmen were severely injured. Two of them died in the Royal Infirmary. The cause of the breaking of the ledger appears to have been a sudden jerk, occasioned by the emptying of a

harrow of stones. The men had not been working on the scaffold for some time previously to the occurrence of the accident, and had just resumed the use of it. When the stones were laid down, a crack of timber was heard, and when one of the men, who carried a hod of mortar, joined his companions, the structure gave way.

Leamington.—On Sunday night the Rev. John Craig, vicar of Leamington, narrowly escaped being seriously injured. Just before he entered the pulpit of the parish church, a piece of the moulding of one of the central arches, about the size of a brick, fell from a height of 40 ft. into the pulpit. The occurrence caused considerable alarm, and several persons prepared to leave the church; but the vicar quietly entered the pulpit and preached as usual. The church has recently been renovated at a great cost, and was only opened about a month ago.

COMPETITIONS.

Infirmary at Wigan.—A limited competition for designs for a new infirmary at Wigan has taken place. The competitors are four:—Mr. Grayson, Liverpool; Mr. Cooke, Liverpool; Mr. Worthington, Manchester; and Mr. Lynam, Stoke-upon-Trent. Mr. Hanson has been called in to advise the committee.

Plymouth Guildhall.—We have received another letter from "Argus" as to the selection in this case, made by an architect, but do not think it necessary to print it. The writer says in the course of it,—

"The time seems now come for action to be taken,—for something to be done. Mr. Waterhouse writes that he for one should rejoice to see the architects defended, and their efforts for advancement of themselves and their art protected. It is he, and men like him, that must make the reformation, if it is made. Let him exert himself in the cause of the Institute, and rescue the profession from the hands of ignorant meddlers."

Doncaster.—The successful competitors for the New Wesleyan Chapel and Schools at Doncaster are—First premium, 50*l.*, design under motto "Don," by Mr. William Watson, of Wakefield; and second premium, 25*l.*, design marked "Spes," by Mr. G. B. Ford, of Burslem. Mr. Watson is instructed to carry out the works.

THE MIDLAND COUNTIES IDIOT ASYLUM COMPETITION.

WHILST so many complaints are afloat of the duplicity and unfairness of committees in the matter of competitions, it may not be amiss to call your attention and that of your readers to the accompanying invitation issued by the committee for the proposed Midland Counties Idiot Asylum, by which you will see that the adjudication is left in the hands of a professional referee appointed, not by the committee, but by the votes of the competing architects. It appears to me that this plan satisfies every scruple, and removes all fear of trickery, nepotism, and backstairs influence:—

"In the event of your deciding to send in plans for the above, the committee desire that you will send to them, by the 1st day of December, the names of three experienced architects.

In electing their consulting architect, the committee will choose the gentleman nominated by the largest number of the competitors, and who shall be willing to advise them concerning the plans, for a fee of twenty-five guineas."

NOT A COMPETITOR.

THE HOLLOWAY WORKING MEN'S CLUB AND INSTITUTE.

This institution was opened under the presidency of Alderman Lusk, M.P., on the evening of Thursday, the 28th ult., the occasion being celebrated by an inaugural *soirée*, attended by a considerable number of the members of the club and their visitors, as also by a fair representation of those gentlemen by whose special exertions the present buildings have been called into existence.

The secretary gave a description of the position of the building fund, whence it appeared that the total cost of the works would be about 1,100*l.*, inclusive of furniture, of which sum about 500*l.* had been already subscribed, leaving a balance of 500*l.* to be still discharged; the above sum also included about 350*l.* spent on the adjoining premises, which were held on a building lease by the club with their own, and were now re-let at such a rent as left the club free.

Alderman Lusk then, in a short and appropriate speech, had all welcome to their new domicile, and declared the building opened,

* See pp. 321, 323.

* Vol. xx., p. 733.

calling upon the Rev. Mr. Tucker, the Rev. Mr. Mackenzie, the Rev. Mr. McCall, Mr. Levett, and Mr. Martin, who severally addressed the meeting. Mr. Martin dwelt on the educational advantages offered by the library and constitution of the club. For some little time afterwards the company promenade the rooms and inspected the various collections of art lent for the occasion, and there laid out. A selection of music concluding the evening.

Considering that the whole area occupied by the club premises is over 3,600 ft. superficial, and that the cost has little exceeded 650*l.*, it will at once be seen that no great amount of ornamentation has anywhere been displayed; the only decoration, indeed, being the colours of the distempers in which the walls are tinted. The rooms are all lofty, with skylights over them admitting ventilation and light, and three of them are capable of being united into a large assembly-room, by folding back the partitions.

The work has been done by Messrs. Fletcher & Canthey, under the direction of Messrs. John Turner & Son, architects.

ROUND ABOUT THE MANSION-HOUSE.

The new street just opened to the public from Cannon-street to Charlotte-row, terminated there by the extensive west façade of the Mansion-house (scarcely ever before seen), has, besides, thrown open along its line several most picturesque architectural vistas; but none more so than those looking eastward, whether it be that towards the Poultry end of the Mansion-house, looking up Cornhill, or that at the southern end of the same building, looking to the picturesque tower and dome of St. Stephen's, Walbrook. The former may be considered unrivalled, embracing, as it does, so many interesting and imposing buildings. The beauty of the scene may, however, be greatly shorn of its interest should the triangular piece of ground on the west side of Charlotte-row, be again covered with buildings, which would in that case entirely spoil the now handsome effect.

Having most enthusiastically enjoyed the architectural scenes opened to view, I may be excused for suggesting something more which, to my mind, would further add to the perfection; i.e., that besides keeping open the triangular space alluded to, the portico and entrance at the Poultry end of the Mansion House should be removed therefrom to the western side of that building, and have proper approaches made thereto. The chief entrance could then at all times be attained with ease and comfort, the architectural effect of that side would be greatly improved, and the portico shown by the light of the sun in all its beauty. By such an alteration the Poultry could also be further widened.

Should you concur in the idea herein initiated, and deem this communication worthy of insertion in your paper, possibly, as in the case of the open space at the east end of St. Paul's which you so ably advocated, the open space here named may, at least, be preserved.

JOHN TURNER.

BUILDERS' BENEVOLENT INSTITUTION.

The twenty-second anniversary festival in aid of the funds of the Builders' Benevolent Institution was celebrated on Thursday evening (28th ult.), at Willis's Rooms, King-street, St. James's; Mr. J. M. Macey, president, in the chair. There was a numerous attendance of the leading members of the metropolitan building trade.

The Chairman, in proposing the usual loyal toasts, referred to the health of her Majesty, which had unfortunately prevented her from appearing among her people so frequently as she otherwise would have done; also to the anticipated pleasure of her attendance, with the view of opening to the public those great constructions, the Holborn Valley Viaduct and Blackfriars Bridge. With respect to H. R. H. the Prince of Wales, he was sure the people of England felt it a source of great satisfaction his being connected with the leading learned and scientific institutions, together with his desire to promote perfect unity and concord between the colonies and the mother country.

Captain Stodal, of the Bloomsbury Corps (Rifles), briefly replied to the toast of "The Army, Navy, and Volunteers."

The Chairman, in proposing the toast of the evening,—"The Builders' Benevolent Institution," said it was not one of a complimentary character, but a business matter. He found, on reference, that during the twenty-two years' existence of the Institution, the sum of upwards of 14,000*l.* had been funded; 11,000*l.* being appropriated to the relief fund, and 3,000*l.* to the building fund. At the present

time, they were not going to consider the advisability of building almshouses or not, but to consider the desirability of the relief fund had done its work very well. At the present time they had forty-six pensioners on the funds,—twenty-three men and twenty-three women,—and from that fact, if they were to draw upon the funds, at the present time of the establishment of the Institution, it must be seen what an amount of benefit had been rendered to those who stood in need. If there were any trade liable to failures or adversity from unforeseen causes, it was the building trade; and under those circumstances he hoped that energy would be used, with the view of increasing the funds, so as to afford further means to assist those who were then waiting to become recipients. Out of the forty-six pensioners then on the funds, he found that thirty-three of that number were living with their friends,—one of these having reached the age of ninety-one,—and four others were in the Bricklayers' and Tilers' Almshouses. He mentioned this merely because he thought that, when persons became advanced in age, it would be better they should be with their friends than live away in almshouses. He, however, did not wish to stop the subscriptions to the building fund, but would leave the objects of the Institution open, viz., the giving relief to desamp members of every branch of the building trade, and their widows, and concluded by thanking them for their kind contributions.

Mr. Charles Lucas next proposed "The health of the Chairman and President," which was suitably responded to.

"The Patrons, Vice-Presidents, and Trustees" was next duly accepted.

The Chairman proposed "The health of the Treasurer" in a highly complimentary speech.

Mr. Geo. Plucknett acknowledged the compliment, and expressed his adherence to the Institution, of which he had the pleasure of being the treasurer.

The toast of "The Architects and Surveyors" having been briefly replied to,

The Chairman gave that of "The Directors and Stewards," accompanying it with the name of Mr. Nicholson.

Mr. W. Nicholson in reply expressed his regret that owing to the want of funds he could not have another election this year. The directors had sent out 1,500 circulars appealing for subscriptions, and the result was only six annual subscribers and four donations. This was to be accounted for in the depression of the trade, but perhaps never worse than at the present time. He, however, hoped that by-and-by, when trade would permit, many would come forward to their aid.

Mr. Harris, the Secy., announced the evening's subscriptions and donations amounting to 350*l.*

GLASS PAINT FOR STOVES.

We find we have already stated that the German glass paint for stoves may be obtained from Messrs. Kellau & Gumm, Nussdorf, Vienna.

The "Glass Paint for Stoves" can be obtained from Messrs. James Price & Co., Varnish and Colour Manufacturers, Edmonston, M.

ANGLE CHIMNEY.

Sir,—I am about to build a moderate-sized country house, which I am anxious to have as compact, convenient, and comfortable as possible. Can any of your readers tell me from experience whether there is any disadvantage in placing the fireplace in the inner corner of a room, provided that the doors and windows are all as far removed from it as possible? Such an arrangement would give more wall room, and would, as it seems to me, after careful consideration of the subject, make any room of fair size more snug and comfortable than having the fireplace in the ordinary position. A. H.

"TEMPLE BAR."

Sir,—In the pages of the *Builder* and the newspaper press, from time to time, several queries have been put respecting the retention or removal of that ancient and dilapidated bit of City architecture, Temple Bar. Although not invited by anybody, I want to have my say upon it. On what ground should it be retained? I see none, except the plea that it is an historical relic of the past. Surely it does not conjure up very delightful associations, nor does it teach very noble lessons for study or reflection. It is marked by deeds of bloodshed and watered with tears. I am not speaking unkindly of poor old Temple Bar; I look upon it as a dangerous block that ought to be removed elsewhere as soon as possible. If it can be preserved, when removed, by any anti-dry-rot solution from decay, so well so good; but as it stands at present it is an incongruity and an impediment to metropolitan progress and improvement, and its future retention cannot be compensated for by its inherent virtue if it rains. I am no Vandal, but the reverse, for I love antiquities; but I love handsome houses, wide streets, and unpimped thoroughfares more. I would wish that some retired merchant or accountant, with a genius for calculation, would give the public some figures of the loss of money through loss of time that this same old arch has caused. The work-day world of team and wagon, hansom and cab and other vehicles, makes streets of locomotion, has often heartily vented its curses, no doubt, upon this old arched *gibber* of the past.

Do, Mr. *Builder*, help us. You have already bridged some of our social swamps, and undermined some of our criminal bridges. Help us, pray, in carrying away the old gate, and packing up the old stone effigies.

Let the ultimatum of London go forth. There are poison and plague in our back streets and alleys. The hearts of the ferrid young are throbbing,—father and mother and child are choking for want of air. God's light is hidden out from the homes of our workpeople; there is darkness upon the City tines and pavements; let them hup their hands! All who are not? The "ays" have it. Temple Bar comes down at last,—A. D. 1870.

PO BOX PANICO.

* * * The removal of Temple Bar is included in the scheme for building the new Courts of Law.

THE FORESTERS' HALL.

Sir,—Will you permit me to offer a few remarks in reply to a letter in your issue of the 30th ult., signed "Solo." The committee on the selection of the plan sent in had no idea who were the authors until announced at the general meeting, and those that signed "Solo" were from its merits of design and perfectness of interior arrangements which the others failed to possess; and which your correspondent does not seem to question, only that Mr. Gosme was our chairman. Allow me to give this a flat denial, as his office expired at our October meeting, and in no way directly or indirectly interfered with our selection.

"Solo" seems to jump at conclusions in reference to the second design. The committee trusted to the honesty of the architects sending in their designs as to the estimated cost of the building, as also to the capabilities of its being in accordance with the Building Act. It was not their opinion, but was raised in discussion at the general meeting, which prompted this doubt expressed by your correspondent. It is plain "Solo" cannot know much about it when the committee deliberated some two days, and the general meeting some two days more, before it was finally decided, which he calls "short," although I am free to confess some of the plans did not require two minutes' consideration to consign them to obscurity. I am deeply impressed with your remarks, on page 858 of this week's *Builder*, relating to some competitors for the Bradford Town-hall, "The coloring of the principal view has gone far to redeem the picture as a work of art, and to the massive gilt frame the author probably owes much." I am free to confess these qualities did much for the success of the design at the general meeting, and were influenced by far weightier reasons. If architects would honestly show their designs naturally, and with the necessary chimneys and roofings, which he demands their consideration, it would be better, as men would not choose the picture in lieu of the straightforward elevation of a possible structure. GEO. DAYEY.

TRADE-UNIONS IN EARLY DAYS.

Sir,—Upon turning over some old papers, I found the accompanying circular, concerning trade-unions, from Sheffield, addressed to my father, in the year 1814. It appears to have been printed by Montgomery the poet, who for some years was the editor and printer of a Sheffield newspaper.* JOHN CHUBB.

"GENERAL CIRCULAR."

Sheffield, March 28, 1814.

Sir,—For several years past the manufactures of this place, it is well known, have been progressively advancing in price, chiefly in consequence of the extensive combinations of the workmen to raise their wages. This evil has now made a progress so alarming as to threaten the most dangerous consequences to the trade. Advances, immoderate beyond all precedent, have been demanded by these men, and means equally violent and illegal employed to enforce them. On the part of the merchants and manufacturers, it has at length been found necessary to counteract these proceedings by the most vigorous and comprehensive measures, of which one of the first has been a general suspension of their purchase, and stoppage of their manufactures. In order to facilitate the attainment of this object, they most earnestly and respectfully solicit all houses concerned in the purchase of Sheffield manufactures, both in the United Kingdom and abroad, not to purchase or present just now the execution of their orders, but wait until the powerful efforts now employed have restored the commerce of this town to its usual regularity. By a general co-operation of this nature, it may be confidently believed that the workmen will shortly be induced to recede from their unreasonable pretensions, the prices of goods properly regulated and fixed, and the whole trade secured from further interruption, by a judicious and permanent arrangement.

Signed on behalf of 'The General Committee of the Sheffield Mercantile and Manufacturing Union,' PETER BLOWWELL, Chairman.

ADVERTISING UPON HOARDINGS.

At a recent meeting of the St. George's, Hanover-square Committee of Works, the surveyor reported that in accordance with instructions of the committee, he had written to those gentlemen having boardings within the parish upon which were advertisements, and informed them that the license for these boardings would not be continued if the advertisements were allowed to remain.

Mr. Thorn said he thought this to be a serious matter. An accident occurred only on Sunday last, when the hoarding in Down-street, Etonally fell in. Had it occurred when the men were at work, in all probability there would have been a loss of life. He considered it high time that some steps were taken in the matter, for the more leniently treated, the builders, the worse the committee were treated. The hoardings were overloaded and were dangerous.

The law upon the subject was explained by the clerk, which was to the effect that any person erecting a hoarding without a license from the vestry or District Board of Works, or continuing to allow a hoarding to remain longer than the time stipulated in the license, was liable to a penalty of 5*l.*, and 4*s.* for each day the hoarding was allowed to remain. The vestry had the power to pull such erections down, and deposit the goods in any place they thought proper, and the charge for pulling down and removing the same were paid; and if it were not paid within eight days, they could sell the goods and hand over the surplus to the owners; but if the money raised were not sufficient, they could compel the owner to pay the deficiency.

An instance was mentioned by Mr. Thorn, where the owner of a hoarding received 1*l.* per annum for advertisement. He thought it was not so remunerative, the vestry should have a boarding of their own, for the money would be acceptable. He moved that the vestry be recommended to enforce the penalties against the owners, and that Mr. Smith be instructed to write to them informing them of the fact.

This, after some further discussion, was unanimously agreed to.

* The Iris.

THE GOVERNMENT ATTACK ON ENGINEERS IN INDIA.

WITH REFERENCE to the subject of the leading article in our last Number, the president of the Institution of Civil Engineers has addressed a letter to the Secretary of State for India, which reads thus:—

"Having reference to the interview your Grace was this day pleased to accord to the deputation of the Institution of Civil Engineers, I am desired by the Council of the Institution to state in writing for your Grace's more specific information:—

1. That the profession does not recognise the acceptance by civil engineers of commissions, or other payments, except openly and directly from their immediate employers.

2. That the profession distinctly disapproves, reprobates, and condemns the practice implied in the Notification No. 212, recently issued by the Public Works Department of the Government of India.

3. That it is a rule of the Institution not to receive into membership any person tainted, or believed to be tainted, by any of the improper and corrupt practices alleged in such Notification.

4. That if it be possible to cite instances of misconduct by persons calling themselves civil engineers, yet that any such instances are entirely exceptional, and amount to flagrant departures from the well-understood and well-recognised practice of the profession, and therefore cannot justify the broad accusation contained in the Notification in question."

FOUNTAIN IN THE JEPHSON GARDENS, ROYAL LEAMINGTON SPA.

A SHORT TIME ago, in a notice of the rise and progress of Royal Leamington Spa, we mentioned that a memorial was about to be raised in the Jephson Gardens to the late Mr. John Hitchman, who took an active part in all that pertained to the prosperity of that town. We have now to record the completion and dedication of the memorial, which has taken the form of an ornamental fountain. It is situated in the gardens near to the chief entrance, and may be said to be of Italian Gothic, with a tinge of Romanesque. The design was selected from 40 drawings, which were submitted to the committee. The design chosen was the work of Mr. Candale, of Leamington, and may be briefly described as consisting of a lower basin of quatrefoil shape, which rests upon two steps, which form the haemise. From the basement a shaft of red granite, polished, which bears an appropriate inscription. This is also supported by archoutants and counterforts, which also spring out of the basin. The granite shaft again supports a richly carved corbel stage, which, in its turn, carries a quatrefoil basin, which is of black marble, upon which are four jets of water, which issue from bronze grotesques. Another jet supports a group of other marble basins, and surmounting the whole is a pinnacled carved and gabled. The steps and lower basins are made from Derbyshire stone, whilst the stones used in the other parts are chiefly from Yorkshire. The cost is about 300l.

CHURCH-BUILDING NEWS.

Toucester.—Kilsby Church has been re-opened by the Bishop of Peterborough. Previously to the recent restoration it was in a very dilapidated state. In addition to what has already been done, we were informed that Mr. Cowley is about to restore the chapel. The work of restoration has been carried out by Mr. Gee, of Daventry, and Mr. Watts, of Knapton, from the designs and under the superintendence of Mr. E. Christian, of London, architect. The old lead has been taken off the roof and re-cast, and the church has been re-roofed. The old clearstory windows, which were blocked up, have been re-opened. The pillars and walls, which were covered with whitewash, have been cleaned and stuccoed. A new organ gallery has been taken away, and the chancel arch, which was blocked up with a large tablet, has been exposed. The windows on both sides of the church, which had been deprived of their tracery, have been renewed, and a flat lead roof over the porch has been replaced by a high-pitched roof. A portion of the north arcade and the chancel arch have been taken down and rebuilt, and the chancel roof is entirely new. The south arch in the chancel, which was blocked up, has been opened. The chancel is paved with Milton's tiles, and a new chancel rail has been erected. There are new stalls for the choir. The cost of the works is something over 1,000l.

Malsmore.—The parish church of Malsmore has been re-opened for divine service, after restoration. The architects who were consulted by the committee were Messrs. Fulljames & Waller. They recommended that all the existing pews should be swept away, so as to throw open the space from the chancel window to the western

window of the tower; the erection of a suitable chancel arch; the substitution of an open-timber roof for the decayed timbers and plastered ceiling; the pulling down of galleries; the building of an arcade on the line of the north wall; and the adding of a north aisle, 14 ft. wide, the full length of the church; the providing of organ-chamber and warming apparatus; and the entire refitting of the church with low open seats. There were sittings for 200 people. Mr. Fulljames proposed to provide seats for 200 adults and 50 children. The work, he estimated, would cost some 1,500l. The improvements have been carried out on this recommendation.

Thoroton (Notts).—This church has been re-opened, after a restoration from designs by Mr. Hakewill. A new chancel, new porch, and new north aisle have been opened.

Stanton Prior.—The church of St. Lawrence, Stanton Prior, has been re-opened, after having been closed for four months, during which time it has been restored. The work has been carried out under the supervision of Mr. C. E. Davies, by Messrs. R. Mann, Hunt, & Gregory. The church is fitted with open sittings for 90 persons. The chancel is paved with encaustic tiles, which form also the characteristic feature of the reredos. The five windows of the chancel are filled with stained glass by Messrs. Lavers & Barrand, that at the east end representing the Agony, Crucifixion, and Burial of our Lord. The west window has been restored in memory of the late rector by members of his family, and will shortly be filled with stained glass by Messrs. Hardman.

Cavendish.—The parish church is being restored under the supervision of Mr. William White, architect. The chancel required to be almost rebuilt, and a vestry has been erected on some ancient foundations on the north side, and the north aisle extended, so as to form a chancel aisle on that side. Additional accommodation is thus gained. Various other improvements are being carried out. The nave has also been renovated. No architect was employed on this and other parts of the work. Messrs. Green & Mason, of Haverhill, are the contractors.

Wilsford.—The church here has been re-opened after restoration, under the professional advice of Mr. Weaver, the county surveyor. The old roof has been removed, and replaced with an open frame roof of the original pitch, with ornate and moulded braces springing from the ancient stone corbels, and the whole is close boarded, stained and varnished, and slated externally. The south porch and buttress have been rebuilt, and are nearly reproductions of the originals. The floors and fittings have been removed and replaced by new floors on oak sleepers, and new seats with panelled and traceried ends. All the fittings are of pitch pine, oiled (not stained) and varnished; and the gangways and open part of the chancel floor have all been raised with concrete, and laid with Minton's tiles (black and red); and the soil has been lowered, and drainage provided round the external walls. The whole has been executed by Mr. Mullings.

Litchfield.—The church of St. James, at Ogley Hay, has been re-opened for divine service, after having been closed for several months for alterations. The alterations and improvements consist of an organ-chamber and vestry, with new painted windows, and the re-decoration of the whole of the interior. The east window is the production of Messrs. Edmundson, of Manchester, and has cost 85l. In the centre is represented a full-sized figure of St. James, to whom the church is dedicated, on either side being depicted four incidents in the Apostle's life, viz., his call, the raising of Jairus's daughter, the Transfiguration, and the three apostles in the Garden of Gethsemane. The other windows are the work of Messrs. Camm, of Smethwick. The painting and colouring have been done by Mr. Holmes, of Walsall, and the stonework by Messrs. Longmore & Brown, of the same place. Messrs. Paull & Robinson, of Manchester, were the architects. The total expenditure is estimated at 600l.

Ashfordby.—The parish church here has been restored and re-opened for divine service. The edifice has been restored by Mr. Scott, the builder being Mr. J. J. East, of Melton Mowbray. The work has extended over a considerable time, having been first commenced in 1866. The church was then in a most dilapidated state. Three years ago the chancel was restored, and a new vestry built. The east windows were fitted with painted glass, by Clayton & Bell, and also the window on the south. More recently, oak stalls

have been placed in the chancel. Last year the restoration of the body of the church was commenced. A sum has been expended amounting to about 1,300l. A large part of this sum has been devoted to underpinning the church, and making good the foundations. 500l. were spent upon the roofs alone, in which there was a great quantity of decayed wood. All the pews have been cleared away, and the church is now seated with chairs placed upon a boarded floor. The ancient screen of the time of Henry VII. has been restored; and a new oak pulpit on a stone base, a lectern, and a reading-desk have been set up. The western portion of the church has been thrown entirely open, and the west door has been restored for use as the principal entrance. Outside the church an improvement has been made in the churchyard by removing the soil round the church to a lower part of the ground; new entrance-gates on the western side have been made, and flagged paths laid down.

Kington.—The church here has been restored, at the cost of 370l., of which 300l. were raised by subscription. The architect was Mr. William Thompson, of Grantham; and the builders, Messrs. Rudd & Cooling.

Reigate.—The foundation stone of a new church has been laid at South Park, where within the last few years a considerable population has sprung up. The committee have determined on the erection of a simple church, capable of accommodating 250 people, at a cost of about 2,000l., and a considerable portion of this sum has already been subscribed. Much of the furniture of the church will be provided by special gifts.

Wolverhampton.—Some time ago it was found that dry rot had taken such extensive hold of the flooring of St. John's Church that it must be refloored; and it was resolved at the same time to replace the old narrow high-backed pews with those of more modern construction, re-colour the walls, repair the organ, and make other alterations. This (the organ repair excepted) has been done by Messrs. Higham, of this town, from the designs of Sir M. D. Wyatt, architect, and the church has been re-opened. The re-arrangement and re-construction of the pews are effective, and the result has been heightened by the addition of a kind of pseudo-chancel, on a platform raised about 1 in. from the nave, and provided with choir seats. A new oak pulpit has been erected, on a stone base; encaustic tiles have been laid down; the heating and lighting system remodelled; and gas-burners of ancient design, from Skidmore's, at Coventry, replace the former gaseliers. Lack of funds prevented the carrying out of designs for ornamenting the walls and ceiling. The organ has been repaired, at a cost of 200l. The total cost of all the repairs and improvements is about 1,600l.

Barnborough.—The parish church of St. Peter, at Barnborough, after undergoing a restoration, has been re-opened for divine service by the Bishop of Lincoln. It was thought there should be a new concrete floor placed underneath the whole structure in order to prevent the dampness, which had been complained of. This has been carried out. The old high-backed seats have given place to stalls of pitch pine, varnished. A new pulpit and lectern have also been erected, likewise a reredos, the gift of the Rev. H. Jubb. All the interior walls have been cleaned, and, where necessary, repaired. An ancient oak screen, carved, which divides a small chantry from the other parts of the church, has been washed, the paint removed, and renovated. The chancel end has been altered. Six new windows have been placed in the clearstory on the north, and two on the south side of the church. A new patent stove has also been introduced, by which the whole structure is heated during cold weather. All the sittings, of which there are about 200, are free. The total cost of the restoration is fixed at about 700l. The architect engaged in the work was Mr. C. H. Fowler, of Durham; the joiner's work was done by Mr. Smith, of Hemmingfield; and the masonry by Mr. Blackham, of Jump.

Snarden.—Snarden Church, popularly known as the "Barn of Kent," after an extensive restoration, was re-opened on the 28th ult., when there was a special service.

Lowick.—The parish church of Lowick, a village picturesquely situated about two miles and a half from the Thrapston Station of the Peterborough branch of the London and North-Western line, has been re-opened for divine worship after a restoration, from the plans and under the direction of Messrs. W. Slater & R. H.

Carpenter, of London, architects. The cost of the restoration has been about 1,400*l*. The original seats in the church have been copied for the new ones, and portions of the old roof have been retained. The church has been re-roofed, re-floored, and re-seated with seats of carved oak. It is heated by means of an apparatus supplied by Mr. Johnson, of Leicester. The work has been carried out by Mr. Allen, builder, Irthlingborough; the plumbing and glazing having been done by Mr. Alfred Downing, of Finedon.

Deens (near Oundle).—The parish church of this village has been re-opened after restoration, of which it was greatly in need. The tower and spire have not been touched, but the modern vestry has been removed. The nave of the church has been enlarged by one bay, the chancel has been extended, and two chapels have been added. The old high pews, which were painted white, with black cappings, have been replaced with wainscot oak open seats. The west arch was blocked up with a solid brick wall, and before this was a large family pew. The pew has been removed, a low-sided pew having been erected in the south aisle. The brick wall has been taken down, a new arch has been built, and a new west lancet light has been substituted for a perpendicular one. The clearstory has been taken down and rebuilt, and the old elliptical-headed windows have been replaced by new windows, with label mouldings round the arches. The roof of the nave has been replaced with a high-pitched hammer-beamed roof, of deal, stained and varnished, with pierced tracery in the spandrels, with carved wall-pieces, resting on stone corbels. A new window in the north aisle was rendered necessary in consequence of the extension of the bay; and, in taking down the chancel wall, a window, in character with the other windows in the aisle, was found built up in it, and has been made use of. The pulpit is of alabaster, with a base of Portland and Kern stone. The church is heated with Haden's apparatus, the heating vault being under the priest's vestry. The chancel is paved with Maw's tiles, and has a new stained-glass east window, representing twelve scenes in the life of our Lord, by Lavers, Barrand, & Westlake, of London. This is a memorial window to the late Earl of Cardigan. The old stained-glass window has been re-erected in the south recess of the Brudenell chapel. In the chancel aisle, on the south side of the chancel, is a triple sedilia, with a piscina; and on the north side is a credence-table. The chancel is divided from the nave by a dwarf stone wall, with iron rails. The altar cross is of brass, and is set with crystals. The work of restoration has been carried out by Messrs. Holland & Hansen, of London, under the plans and under the direction of Mr. T. H. Wyatt, of London, the principal management of the work having been undertaken by Mr. George Vials, jun., formerly of Northampton, a pupil of Mr. E. F. Law. Mr. Fowles was foreman to the builders. The wrought-iron screens, and other metal-work, were furnished by Hart, Son, Peard, & Co., who also executed the altar cross, from Mr. Viall's design. The tile pavements in the chancel and Brudenell chapel were laid by Simpson & Sons, Maw & Co.'s London agents. The carving was done by Mr. Earp.

DISSENTING CHURCH-BUILDING NEWS.

Halifax.—The memorial stone of a new Independent Chapel has been laid here, at Belle Vue, Hopwood-lane. The architects are Messrs. Roger Ives & Son, of this town. The style of architecture adopted for the church is the Early Geometrical. It will be built with Northwrayn pitch-faced wall stones and freestone dressings. The edifice will be 113 ft. 6 in. long by 53 ft. wide, and 53 ft. high externally, exclusive of the minister's and other vestries at the back. It will be divided into nave and side aisles by cast-iron pillars supporting the galleries and roof, and five bays in length, the end bay next the organ recess being much wider than the others, so as to allow of the church being enlarged at some future time by the addition of transepts, which will be prepared for in the erection of the new church. At the north end of the building will be an octagonal recess for the organ, 22 ft. wide and 6 ft. 6 in. deep, divided from the nave by a deeply-moulded deal and enriched arch, springing from granite columns with carved freestone capitals. Over the pillars dividing the bays will be moulded arches in brickwork and cement, between which and in the centre over each pillar

will be granite columns, and with carved capitals and moulded bases, supported upon carved corbels, upon which the roof principals will rest. The internal woodwork, where exposed, will be of pitch pine. The pews will be 2 ft. 10 in. wide, and allowing 20 in. for each person, will accommodate 568 persons on the ground floor, and 364 in the galleries, making a total of 932 sittings. In the south front to Hopwood-lane will be the entrances, vestibules, and staircases; at the south-westerly angle a tower and spirelet 120 ft. in height. The principal entrance will be in the centre of the front, through a moulded doorway, with moulded windows on each side, over which there will be a large five-light tracery window. On each side of principal entrance in the same front will be entrances to the galleries. On the side elevations in each bay of building, the windows under the galleries will be arranged in couplets, over which will be three-light tracery windows to light the galleries, with gables and ornamental finials over each. In the transept gables will be large four-light tracery windows, with coloured mullions and carved capitals. All the windows will be glazed with tinted glass in quarries, and with ornamental borders. The grounds will be enclosed with a low wall, and ornamented wrought-iron railings and gates. The various works have been let to the following contractors, viz.:—Masons' work, to Messrs. Michael Firth & Co.; carpenters' and joiners', to Messrs. John Dyson & Son; slating and plastering, to Messrs. Joseph Bancroft & Son; plumbing and glazing, Mr. George Walsh; ironfounders' work, Mr. Jas. Farrar; and painters' work, to Messrs. W. Leo & Son. The works are now being carried out under the direction of the architects. Mr. Powell is the clerk of works. On November 14, 1866, estimates for carrying out the above plans were received and adopted, amounting to 6,638*l*. 2*s*. 5*d*. In the estimates no provision is made for boundary rails, pulpit, and the heating and lighting of the chapel. These, with the cost of the land, will probably make a total outlay of 8,500*l*, exclusive of the cost of schools, which it is proposed to erect at some future time.

Bledlow.—The dedication of a new Wesleyan chapel has been celebrated at Bledlow. The entrance is by a double door in front, opening into a lobby with a door on each side. Over the door is a double-light window, divided by a stone column. It has a gallery at the end nearest the entrance. The light inside is subdued by rough plate glass. The pews are of picked yellow deal, and the seats and backs are slightly inclined. The pulpit is ascended by five steps, and is made with all the modern improvements, being low, shallow, and broad. The communion is in front of the pulpit, raised 6 in. or 7 in. from the floor, and inclosed by a rail, done in green, with white and stained capping. The chapel is made to seat, when required, about 290 persons, and a number of the sittings are free. The design of the chapel was furnished by Mr. E. Pierce, High Wycombe, who also superintended its erection. It is in the Italian style. The walls are faced with red bricks, and white string courses, with dressings of Bath stone.

Bradford.—The foundation-stone of a new chapel to replace the old Methodist New Connexion chapel at Adwalton, has been laid. The new edifice, a plain structure on the site of the old one, will be built from the designs of Messrs. Sheard & Hanstock, of Batley. The chapel fronts the Bradford and Wakefield-road, and 300 extra sittings will be provided.

Sturminster Newton.—The Wesleyan chapel here having been enlarged, beautified, and rendered more convenient, has been re-opened. The building is of brick, with stone dressings, and is enlarged in length 15 ft., being now capable of accommodating 350 persons. The interior has an end gallery of stained wood, of which material the roof is composed, the centre parts being of slightly tinted rose colour. The entrance to the chapel is by a vestibule, and the building is lighted by windows of cathedral glass. At the back of the chapel school-rooms are in course of erection. The architect was Mr. Stent, of Warminster, and the builder Mr. R. Edwards, of Fontmell Magna. The cost of the enlargement and the school buildings is estimated at from 600*l*. to 700*l*., of which about half has been collected or promised.

Norwich.—The French Church, formerly the parish church of St. Mary-the-Less, has been re-opened for divine service, after undergoing much alteration, and having been to a considerable extent restored. From its situation with regard to the Cathedral Church, to which it was appro-

riated, it was called in former days St. Mary's at the Monastery Gate. In 1637 it was granted to the congregation of the French Protestants, called the Walloon Company, who fitted it up for divine worship. This congregation became extinct about forty years ago, since which time it has been occupied by the Swedenborgians. But from them, too, it has passed into the hands of the congregation of the Catholic Apostolic Church. The nave and chancel have been cleared of pews. The latter has been raised, and for the present is fitted with chairs. The sanctuary is raised two steps higher than the rest of the chancel, with rails across, and the altar is raised on a footpace. Sedilia have been formed in the sill of the chancel windows, and a new piscina has been inserted. Another piscina was found in the nave, and restored. The nave has been fitted with open seats of deal. The western gallery has been removed, and the tower arch opened and restored. The parvise, or porch chamber, has been restored, and a new staircase constructed for it. Six consecration crosses, found in the nave and chancel, have also been restored. The woodwork was executed by Mr. Spencer, of Trowse; the carving and restoration of the stonework by Mr. Barrett; and the gasfitting by Mr. Bishop, of Elm Hill.

SCHOOL-BUILDING NEWS.

Earl Stotham.—The new school buildings, erected in memory of Mr. George Reeve, a farmer who many years ago left a considerable sum of money for the endowment of the schools of the parish, have been opened. The architects were Messrs. Corry & Fergusson, of Carlisle. The facings of the exterior are of white brick, with red brick arches, strings, and gables, and stone lintels, the spandrels of the arches being filled with herring-bone work. The windows at the ends of the buildings are of a more ornamental character than the others, the heads of these Gothic, with eye lights. The principal room in the interior is 43 ft. in length by 18 ft. in breadth, the height from the floor to the wall-plate being 11 ft. 6 in., and the roof is open as far as the collars. Light is obtained from twelve windows set in pairs. Besides the school-room are a class-room, lavatory, lobbies, and offices. The inside walls have white strings and dressings. Mr. W. G. Cunnold, of Ipswich, was the contractor. The building stands upon land which was given for the purpose by Pembroke College, Cambridge, the patrons of the living. The farmers of the parish carried the materials for the building.

Wigston Magna.—The old National School building being much too small, the vicar resolved to undertake the erection of more roomy and convenient schools. The architect selected by the committee was Mr. E. W. Barber, the son of the incumbent of St. John's, Leicester, whose plans were approved; and the contractors were Messrs. John Sharp & Son, builders, Wigston. The building, which is in the Early Pointed style, consists of two main portions, which open into one room, to be used as the mixed school for children above six years of age, with two separate porches for entrance, and a large infant-room at the extreme end, quite separate from the main room. The schools are placed back from the street about thirty-five yards, and the front space forms a playground for the boys; the girls' playground, with the necessary premises and offices for both schools, being placed in the rear of the building.

PROVINCIAL NEWS.

Birmingham.—The chief stone of the new workhouse for the Aston Union has been laid. The entrance building, with a frontage of 300 ft., has a hold archway in the centre; to the left (or male side) of which is a corridor leading to the clerks' offices, waiting-room, and a board-room, 34 ft. by 18 ft.; and beyond are the rooms for the male probationers and tramps, with all the requisite closets and lavatories. There are spacious airing-grounds in the rear, leading to the engine-house and such other places as will give useful occupation to the able-bodied men. On the right of the entrance archway are the wards and dormitories for the females of various classes, clothes-stores, dining-rooms, and other conveniences. In the rear of these entrance buildings are large airing-grounds, divided by a central avenue leading to the main building, of three stories in height, the centre carried somewhat higher than the other portions. The principal material used in the elevations is red brick, with

blue brick strings, and stone dressings introduced where appropriate. On each side of the entrance are the rooms for the master and matron, communicating with a large central hall, and corridors extending the whole length of the building. These corridors lead to the day-rooms and dormitories, for able, aged, infirm, and imbecile men and women, with store-rooms, lavatories, &c. There are two staircases of stone in each division of the building, and in the central hall a grand staircase in three divisions, lighted by a lantern tower, which forms the principal feature in the elevation. In the rear of this are various domestic offices, including a spacious cooking kitchen and bakery, and connected with the different wards are airing-grounds for the respective classes. On the male side there are workshops and a mill; on the female side a washhouse, laundry, and other appliances. The first floor has a large dining-hall, approached by the central staircase,—length, 68 ft., width, 35 ft.; and well lighted on each side. The front entrance is, as well below, appropriated to the master and matron, and on either side are the dormitories for the men and women, of different classes, with a corridor the entire length of the building, as described for the ground floor. On the second floor there is the same general arrangement of corridor and staircases, and a like division of the sexes on either side of the centre buildings; and on this floor some provision has been made for the future, as there are several spare dormitories. A small portion of the basement has been set apart for cellars, larder, boiler-room, and such other accommodation as could be properly provided underground; but otherwise the building is well above the ground level, and it stands in an elevated position. In the fitting-up of lifts, cooking and warming apparatus, &c., every well-proved invention of the best engineers will be used, under the direction of Mr. Yeoville Thomason, the architect. The infirmary will be a separate block of buildings. The builders of the whole are Messrs. Jeffery & Pritchard. The estimated cost of workhouse and infirmary is about 35,000l.

FROM SCOTLAND.

Edinburgh.—The new church built by the congregation of Free St. George's, in place of the edifice removed in the course of the progress of the improvements being made on the Caledonian Railway Station, has been opened for public worship. The site is at the corner of Shandwick-street, and Stafford-street. It measures 78 ft. from east to west, and 125 ft. from north to south, and has been all built upon. The style adopted is the Palladian. The principal front is towards Shandwick-street; and the west front is also elaborately finished. The main entrance is flanked by coupled Ionic columns, surmounted by a broken pediment. Above is a range of arched windows, with projecting keystones, to be carved. On either side is a slightly projecting wing, with a three-light square-headed window on the ground floor, and an arched window in the upper story. Corinthian attached columns rise from the basement story to the porch-arch, which, with the dentilled cornice, overhangs over them. This portion of the facade is finished with a balustrade, having pedestals to carry vases. At the south-west corner a tower is to be erected, but it has not been carried further in the meantime than the basement stage. The western elevation consists of a centre, in which are two ranges of rusticated windows, flanked by wings having attached Corinthian columns, surmounted by triangular pediments, the outer mouldings of which are broken off at some distance from the apex. The church will be entered through a vestibule and corridor. Over the vestibule and corridor there is a large hall, which is to be employed for congregational purposes. The church proper is divided into centre and aisles by iron Corinthian columns supporting a series of arches. The central portion of the ceiling is elliptical in form, and is divided into square panels, with bosses at the intersections, while the ceilings of the aisles consist of a series of small domes. Galleries have been erected in the aisles and in the south end opposite the pulpit. The seats are in the modern style, with low backs, and open at the ends. The pulpit has been dispensed with, and instead a platform erected in the apex at the north end of the building. The roof of the apex is a semi-dome. It is supported by six pillars of polished Aberdeen granite. Several feet lower than the preacher's platform there is a second platform

for the use of the office-bearers of the church, the whole being surrounded by a halustrade. The platform is in oak, and the pews, as well as the front of the galleries, are of pine. The church is lighted by windows on three sides, which have been filled with obscured glass, marked out with stars. At night, light will be supplied by means of central sunlights, and pendants from the roof of the aisles, and from under the galleries. The church is seated for a congregation of about 1,250. Mr. David Bryce was the architect; and the contractors were Messrs. Watherston & Son, builders; Mr. Annan, plasterer; Mr. Beattie, plumber; and Messrs. Purdie, Bonar, & Carfrae, painters. Mr. McPhail was clerk of works. The building, including 13,600l. for the site, was estimated to cost about 31,000l.

STAINED GLASS.

Gloucester Cathedral.—The eighth or easternmost window in the south aisle of this cathedral, according to the local *Chronicle*, has been filled with stained glass in memory of the late Lieut.-Col. Sir Harry Darell, bart. The window was originally of the same design as the others in the south aisle, but was altered and enlarged—probably about the beginning of the fifteenth century—as a memorial to persons commemorated by the tomb beneath. Four or five years ago it was proposed to restore the tracery to the original pattern, and a window for it, to the memory of the Niblett family, was executed in Munich under the direction of Mr. J. D. T. Niblett. The architect of the cathedral, however, determined to retain the present tracery, and the window was, therefore, given to the Rev. Sir Lionel Darell, of Frerethur Court. The glass contains two rows of figures, with tracery over. The tracery is filled with figures of angels. In the upper lights are the four Evangelists, with their symbols. In the lower tier are the figures of St. Stephen, Cornelius, the Centurion, and St. Peter. Mr. Rogers, of Worcester, was the artist.

Shrawardine Church.—A stained glass window has been placed in the east side of the church to the memory of the late Mr. Pryce William Bowen, of Shrawardine Castle, by some of his neighbours and friends. It is a Gothic window, of Gristhill stone, divided into four compartments with the following subjects:—"Naked and ye clothed me," "Sick and ye visited me," "Hungry and ye gave me meat," and "A stranger and ye took me in." Beneath the window is a marble tablet bearing the inscription. Both the glass and stone work were executed by Messrs. William Evans, Everall, & Dodson.

Miscellaneous.

Establishment of Tramway Omnibuses at Liverpool.—An unusual stir and excitement have prevailed in Liverpool, in consequence of the inauguration by the Liverpool Tramway Company of their new system of omnibuses, which are of great size, and built upon the American plan. They are formed of American ash, and each omnibus is about 16 ft. long, 7 ft. in interior height, and constructed to hold twenty-two passengers inside and twenty-four outside. They are tastefully fitted and finished, and the outside well protected by rails. There has been quite a rush upon the new vehicles, much to the disgust of the old-fashioned omnibus drivers, who, by "nursing" their rivals, do all in their power to worry and annoy them. The public generally, however, appear highly to appreciate the advantages which from increased size, readiness of ingress and egress, comfortable and safe outside seats, and the absence of jarring and jolting, are afforded by the new system. Each tramway omnibus is drawn by three horses, and furnished with breaks of great power. The fares are 3d. inside and 2d. outside.

Oswestry Cottage Hospital.—The foundation stone of the Oswestry and Ellesmere Cottage Hospital and Nursing Institution was laid on Monday last, November the 1st, with Masonic honours, by the Right Worshipful Provincial Grand Master of North Wales and Shropshire, Sir W. W. Wynn, bart., M.P., by request of the brethren of the Saint Oswald Lodge, No. 1124. The building is designed to accommodate twelve beds. Mr. W. H. Spanll, of Oswestry, is the architect; and Messrs. Trow & Sons, of Wednesbury, are the contractors.

The New Uxbridge-road Station, at Notting-hill.—The new station at Uxbridge-road, near the Royal-crescent, is now finished. Though small in size, it has some architectural pretensions. The *Kensington News* says, on the whole there are no less than five doorways in front, which is in great contrast to the Metropolitan Extension stations, which have but one doorway for egress and ingress, a circumstance which often occasions crowding and inconvenience. The projecting eaves give the building, above all, an ornate appearance, being supported on pairs of terra-cotta brackets. The apex of the roof consists of a large skylight and ventilator. The interior is thus amply lighted. In front of the station is a verandah formed by a triple ridge and furrow roof, glazed above, and supported by iron brackets, built into the walls, in lieu of columns, which latter are sometimes found to be an inconvenience and obstruction. On the platforms below are separate waiting-rooms and offices, the up and down platforms being uniform. Only about one-fourth of the length of the platform is roofed over at present, a plan which may soon call for rectification, as in wet weather it will compel the passengers to herd together under the roof, instead of ranging themselves opposite the respective classes of carriages, and immediately entering the same, as on the Metropolitan. It is stated to have been built for the London and North-Western Company, by Mr. Richard Danckley, of Blisworth, and to have cost 5,000l. or 6,000l.

Late Discoveries in the Peninsula of Sinai.—The vice-chancellor of Cambridge University has published to the senate a very interesting report from Mr. J. H. Palmer, fellow of St. John's College, a distinguished Oriental scholar, who was sent by the university to accompany the Ordnance survey in the peninsula of Sinai. The funds were supplied from the foundation of Mr. Worts, formerly devoted to travelling bachelors. Mr. Palmer has collected a great body of information on the nomenclature, the traditions, and the inscriptions of the country. He says,—In the course of our explorations we found many interesting remains, almost identical with the primeval dwellings and tombs found in various parts of the United Kingdom. These discoveries drew my attention to another fact, which I think may prove important to British antiquaries, as suggesting an analogous explanation of the curiously-marked stones of Scotland. It appears to have been a custom from time immemorial for the rude inhabitants of the desert to mark out their holders with large stones, on which each tribe cut or scratched its own peculiar symbol. This custom prevails to the present day, and it is a noteworthy circumstance that the marks now in use among some of the Arab tribes closely correspond in pattern and appearance with the stone-markings of North Britain. I have brought back a collection of these marks and symbols.

Whitworth Metal.—The quiet intimation given last spring about a new metal is now something to be talked about, says *Chambers's Journal*, for Sir Joseph Whitworth, after a long course of experiment, has succeeded in producing iron and steel, which, as he states, will resist any amount of shock or strain that may be put upon them. This "Whitworth metal," as it is called, is, while in a molten state, subjected to enormous pressure, by which all the air-bubbles—those sources of weakness—are got rid of, and the metal is rendered perfectly homogeneous. If Sir J. Whitworth be right in his conclusions, our iron trade is about to undergo another revolution. Besides guns of the largest size, which will send their bolts through anything and everything, and never burst, we shall have wheels for railway-carriage that will never crack, hoists that will never blow up, and wire for submarine cables that will not break in the laying.

The Smoke Nuisance at Gateshead-on-Tyne.—Mr. William Wharton Barlow, Low Teame, Gateshead, on the Tyne, at Newcastle, was summoned before the Gateshead magistrates, on the charge of allowing an illegal amount of smoke to issue from his works—twenty minutes of dense black smoke, and nine minutes of light, out of a period of sixty-eight minutes. It was stated on behalf of the defendant, who did not deny the offence, that hitherto he had tried every means in his power to prevent the emission of smoke, and finding his efforts as yet ineffectual, he was about to adopt fresh measures. A fine of 40s. and costs was inflicted.

Interesting Discoveries in America.—A party of explorers in the district to the south and south-west of the Mormon settlement, at Salt Lake, report the discovery of the remains of an ancient city now almost buried in the sand of the desert. The ruins consist of a collection of rocks, mounds, and pillars, covering several acres in extent. Remnants of what had once been arches, with keystones, are still perfect. There also remain a number of small stone pillars, constructed with a peculiar kind of red mortar or cement, set upright about 20 ft. apart, as if they had been used to support an aqueduct from a large stream half a mile distant. In some places, the report states, the lines of streets were made distinctly visible by the regularity of the stones, and seemed to run at right angles to each other. Some of the stones, it is added, had evidently been cut into squares with hard tools, although their original forms were scarcely perceptible. That the people of this long-lost city had attained a considerable degree of civilisation is further evidenced by the remains of ancient salt-works in the vicinity. Many traders have noticed similar ruins in other sections of the country between the Rocky Mountains and the Sierra Nevada chain.

Associated Arts Institute.—The first *conversations* was held last Saturday night at the Rooms, in Conduit-street. The object of the institute is "to deliver addresses and hold debates on questions connected with the fine arts, to exhibit sketches, and generally to promote intercourse amongst artists, and those interested in art." An inaugural address was delivered by Mr. R. Westmacott, R.A., the chairman. The members (140 in number) are chiefly young artists. Meetings are held on Saturdays during the session (October to May), papers are read, and debates follow. The great point of interest, however, is the competitive production of sketches by members. The committee name a subject, the members treat it according to their own notions, the sketches are brought together at a given meeting, and their merits are decided by the votes of all present. The winning sketch is then photographed, and preserved in the album of the institute.

The New Mansion-House Street.—At the last weekly meeting of the Metropolitan Board of Works, a memorial was presented from the inhabitants of the Mansion House, praying that the open space upon the west side of the Mansion House, between Bucklersbury and Charlotte-row might be left intact; and it desired also that the new Mansion-House Street might be terminated by an uncovered space capable of being appropriately ornamented, and in which case the ground beneath the surface might be used as vaults. The erection of a triangular building on the vacant ground would seriously interfere with the proposed public improvement. Sir John Thwaites said the purchase of that piece of ground would cost over 200,000*l.* The question was eventually referred to the Works Committee.

Opening of the New Cemetery for Rochester.—The new cemetery which has just been completed for this town has been opened and consecrated. It is situate about a mile from the town, and adjoins the road leading to Maidstone. The quantity of land acquired by the board of health was twenty acres. Only twelve acres of the land, however, will, for the present, be brought into use. The whole cost of the land and buildings is 8,000*l.* The chapels for both episcopalians and nonconformists are of brick, and plain. Adjoining the entrance-gates is the residence of the gardener and keeper of the grounds. The architect was Mr. J. Young, of this town. The building and boundary walls were erected by the executors of the late Mr. J. Stump, the contractor.

The Swansea Gaslight Company.—At the 17th half-yearly meeting of this company, the chairman stated that notwithstanding the reduction in price during the last half-year to 3s. 6d., and the large outlay for extension of works and mains, the full parliamentary dividend would be divided. During the last seven years the demand for gas had increased 105 per cent. They required additional capital for still further erections. The gas had been reported by the local medical officer of health to have the illuminating power of 15·5 to 16 sperm candles, or 33 per cent. beyond the requirement of their Act, and was free from all impurities. A noble suite of offices had been lately erected from the design of their engineer, and under his superintendence.

St. Mary's Church, Sandwich.—Archæologists may be interested to learn that the situation of the tower (which fell in 1667, and destroyed much of the interior of the church) has been ascertained, by means of excavations recently made within the building. The bases of the Norman columns were found in good preservation at some depth below the present floor, and are left exposed for the inspection of visitors. From their position they clearly show that the tower stood at the western extremity of the nave, but was internal to the church, occupying a position over the present font.

A Lock-out at the New Opera House, Paris.—On Monday, in last week, M. Viollet, the builder of the new Opera House, expelled all the men from the place, in consequence of a quarrel with his sub-contractors. After endeavouring in vain to persuade the journey-men to work for him at reduced wages, he sent for the police, and drove them out forcibly. It has now been summarily decided that M. Viollet was bound by the engagements of the sub-contractors, and a commissary of police, an attorney, and a huisier formally reinstated the men in the building.

Netherlands Exhibition.—The awards to the successful exhibitors—very few English, however, being present—were distributed by Prince Alexander in the name of the King. The Ministers of State and the representatives of the various countries interested took part in the ceremony, and a report was read by Baron Mackay, the president of the Central Jury, as to the results of the exhibition. A large company assembled at a banquet given in the evening. Illuminations and a display of fireworks brought the exhibition to a close.

Doncaster Church.—A subscription list, headed by the late vicar, lies at the bank, for the restoration of the pinnacles of St. George's Church, which, from original construction and fracture by storms, are in such a state that complete rebuilding of the parapet is requisite to make it safe. Mr. Teale estimates the cost at 400*l.* Mr. E. B. Denison, Q.C., has offered to pay half the cost, provided a contract is made to his satisfaction before next May.

Swansea New Hospital.—The formal opening of this institution has taken place. About 14,000*l.* have been expended in the erection and furnishing of the building; and it was opened free of debt. It was erected by Messrs. Thomas, Watkins, & Jenkins, of Swansea, builders. The original plan, as stated in the architect's description, comprised a north wing. This has not yet been built. There are, therefore, only fifty beds, instead of 100, the number originally fixed upon.

Cafes in Paris.—A journal publishes some curious statistics relative to the *cafes* in Paris, and states that the French capital possesses 4,730 of those establishments, in addition to sixty-four *cafes* concert. They give employment to from 8,000 to 10,000 persons, and the business done by them amounts to 120 millions of francs annually.

Proposed New Public Hall for Tunbridge Wells.—A public company is being established to erect a public hall for Tunbridge Wells; and out of 2,600 shares all have been disposed of, except about 400; and less than 2,000*l.* remain to be subscribed for. At a recent public meeting an appropriate resolution in support of the object in view was passed.

Macclesfield Town-hall Extension.—The new corner-stone of this extension has been laid. The addition is intended to give a more prominent aspect to that part of the exterior fronting to the market-place. Mr. James Stevens, of Macclesfield, is the architect; and Messrs. R. Neill & Sons, of Manchester, are the builders.

The Late Mr. John Bruce.—The sudden death, in the street, of this estimable and accomplished man will distress most those who knew him best. He was one of the most admirable of our literary antiquaries, and has left many solid and useful contributions to biographical and historical knowledge.

Opening of a New Market-house at Accrington.—On Saturday last the new Market Hall recently erected in this town was publicly opened by Mr. Samuel Dugdale, chairman of the local board. It will hold 10,000 or 12,000 persons.

Rome.—The foundation stone of the monumental column on the Janiculum, in commemoration of the (Ecumenical Council, was placed with due solemnity on Thursday, October 14th, by Cardinal Berardi.

Institution of Surveyors.—The next ordinary general meeting of this Institution will be held on Monday, November 8th, when the president, Mr. John Clutton, will open the session with an address.

Social Science Association.—It has been determined that the next Congress of this Association shall be held in Newcastle.

TENDERS.

For Girls' and Infants' School, New Malden, Surrey.—Turner (accepted) £305 0 0

For additions and alterations, 78, Cannon-street, City, Mr. Frederic Sparrow, architect:—
Hill & Son £818 0 0
Emor 601 0 0
Cook 573 15 0
Outhwaite & Son 572 0 0
Bridgman & Nathall 548 0 0

For new church on the Beaconsfield Estate, Bridlington Quay, Yorkshire, Mr. R. G. Smith, architect, Quantities supplied by Mr. G. W. Hawwell:—
Beauland £3,580 0 0
Sha'coe & Barry 3,608 0 0
Hall 3,450 0 0
Westbury & Rymer 2,201 0 0
Simpson & Malone 3,188 0 0
Renard (accepted) 3,683 0 0

For erecting two houses and shops at Brixton, for Messrs. Standish & Marten, Mr. A. M. Hiscocks, architect. Quantities supplied:—
Jackson £1,192 0 0
Capps & Ritso 1,017 0 0
Kifson 1,009 0 0
Ransay 892 0 0
Co-operative Building Society 925 0 0
Martin 809 0 0
Lidbetter 895 0 0
Turner 873 0 0
Nixon 872 11 0
Aitchison & Walker 825 0 0
Gates 820 0 0
Hutchinson 800 0 0
Heaver & Coates 797 0 0
Wetzel 797 0 0
Ramsay (accepted) 745 0 0
Michell 680 0 0

For alterations and additions to 150, Camberwell-road, for Mr. Machu. Mr. Robert Parris, architect:—
R. & T. Wilson 388 0 0
Clark 307 0 0
Tyler & Lewin 249 11 0
Fawcett 284 0 0
Donatall 280 0 0
Ritson 280 0 0
Smith 251 0 0
Gates & Bell 249 0 0
Hutchinson 240 0 0
Wares 240 0 0
Taylor & Pitts 240 0 0
Hart 240 0 0
Michell 239 0 0
Cubitt & Son 238 0 0
Davis 228 0 0
Horsdelle 227 0 0
Brown 224 10 0
Rowe & Verian (accepted) 221 0 0
Wetzel 221 10 0
Riches 220 0 0
Hasson 215 0 0
Stevens 211 0 0
C. & H. King 205 0 0
Jacobs 199 10 0
Childs 195 0 0
Chapman 185 0 0
H. Chapman 195 0 0
Heaver & Coates 194 17 0
Fisher & Sons 180 0 0
Barnes & Bates 175 10 0
Shirley & Horne 175 0 0
Pitcher (accepted) 173 0 0

For reinstatement of factory, and new chimney-shaft, for Messrs. Tull, Glasvill, & Co., at John-street, Blackfriars, Mr. H. W. Hayward, architect. Quantities not supplied:—
Merritt & Ashby £629 0 0
Deards 604 0 0
Wilson 585 0 0
Staines & Son (accepted) 560 0 0

For three additional shops at Beckenham, for Colonel Wilson, Messrs. Haywood & Blashill, architects:—
Gammam & Sons £1,968 0 0
Beeton 1,947 0 0
Kings & Sons 1,885 0 0
Tulley (accepted) 1,879 0 0

For building four cottages at Patcham, for Mr. J. Brown. The plans prepared, and quantities supplied by Mr. Tuppen, architect:—
Holloway & Son £325 0 0
Garrett 319 0 0
Blackmore 496 12 0
Fillyer 478 10 0
Deas & Dickerson 445 0 0
Miers 392 0 0
Still (accepted) 348 0 0

For re-building No. 110, Edgware-road, for Mr. L. Kyzor. Mr. H. Tabberer, Architect. Quantities by Messrs. Franklin & Andrews:—

Falman & Fotheringham	£2,764 0 0
Temple & Foster	2,735 0 0
Brown & Robinson	2,617 0 0
Bird	2,595 0 0
Ellis	2,555 0 0
Henderson & Cairns	2,125 0 0
Crabbe & Vaughan	1,179 0 0
Marks	1,120 0 0

Rolling Drainage.—This drainage has been let by the Local Board, the cutting and laying of pipes to Mr. Young, contractor, Sunderland; and the supply of pipes to Messrs. O. H. Hamay & Sons, Swallow Sewer Pipe Works, near Newcastle-on-Tyne.

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Erratum.—In notice of the Sherborne Hall, in "Ascotera" read "Ascotera."

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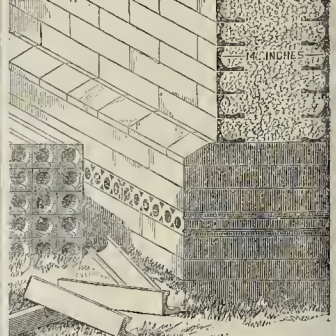
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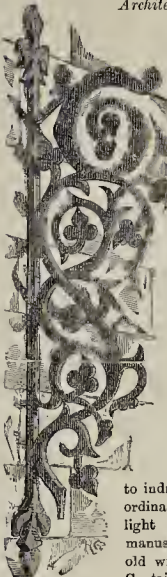
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The Builder.

VOL. XXVII.—No. 1397.

Architecture v. Archæology.

HE state of feeling which induces men to spend much of their best time and energies in studying, collecting, and preserving the records, literary or artistic, of a past age; which causes them to worship with a blind indiscriminate reverence everything that was done or said at some former period; the spirit, in short, of *Antiquarianism* holds, like other peculiar tendencies, its "movable feasts." There are always to be found, certainly, isolated individuals who rejoice to indulge this taste beyond ordinary limits; whose delight is in old songs, old manuscripts, old bottles, or old wine; the Oldbucks and Captain Groses who furnish



for the satirical novelist or rhymist. Such persons are regarded as harmless triflers, whose whims are of no serious consequence, and have no worse effect than to make themselves a little noticeable. But there are occasional periods when whole societies are possessed by the same kind of antiquarian predilection, to such an extent as to colour the whole history of the thoughts, manners, and habits of two or three generations. And it so happens that two of the most important antiquarian epochs of which we know much have been largely connected with architecture and architectural taste. The Renaissance, indeed, was in its initiation a literary movement; how far inspired by the sight of the ruined marbles of ancient Rome constantly before the eye may be matter of conjecture; but its first developments were literary, and it was only after the admiration for the treasures of ancient classic literature had led men to the conviction that the only thing left for them was to imitate the style and adopt the language of antique poetry, that the same impulse was communicated to the art of architecture, and led to the now much-ahmed revival. But the more recent Mediæval antiquarian revival may be said, if not to have been actually born of architecture, at least to have shown its earliest marked development in the quasi-Mediævalising of enthusiastic architectural students. In very truth, the causes of the movement lay deeper than this, and the modern Gothic architects have had the good fortune to float into prosperity on the full tide of a popular feeling which would have shown itself and run its course independently of their assistance; but it is likely that they have very much accelerated and assisted the movement by which they have been so much the gainers, in putting the worship of Mediævalism into so tangible a form, in the shape of new buildings and hooks illustrative of old ones; and that, as Pugin said, naively enough, in one of his letters, that when a certain very admirable new chapel was finished, he "thought he should

secede," so the public generally have been much encouraged and stimulated to a decisive declaration of Mediæval sympathies, on seeing the multitude of Gothic churches rising up around them in place of the old he-pewed and he-galleried structures in which their fathers and grand-fathers had slumbered.

Now, in the reverence commonly felt for things which are old there is much which is to be admired, even when the feeling passes the strict bounds of what is rational and logical. There is always a certain relief to the mind when at all over-wearied with the struggles of everyday life, in turning aside to contemplate the monuments and literature of a long-past age. There is a serenity about them which falls pleasantly upon the mind; whatever strifes they have witnessed or been connected with have passed away and are forgotten, and their records come to us—

"cool, and calm,
And shadowy, through the mist of passed years."

And there is also reason in such respect for that which has stood the test of time, and has remained for our contemplation to-day; for, as a general rule, whether in art or literature, that which is best remains, that which is worse is gradually forgotten; and one explanation of the fact that antique art and literature really do seem so far beyond that of our own day is this, that we commonly see only the best of them; whereas among modern productions we have to cull the best with difficulty from amid heaps of mediocrities and puerilities. So far, then, a certain amount of antiquarianism is not simply pardonable, but healthy, and minds which are without it must be called one-sided. But when this archæological sympathy comes to assume an unreasonable importance, and to develop itself in the practical imitation of forms of art which are long since dead, and are no longer the expression of the real inmost feelings or most pressing wants of humanity, it becomes a real and serious evil, to be combated by all who are alive to the value of human thought and labour, and are desirous that things so precious should not be thrown away in carrying out, with mistaken energy, work which will not in reality advance humanity, or have a lasting interest or value.

Not that we by any means ignore the importance of pleasing the present and existing taste, whatever it may happen to be, to some extent. It is a small consolation to a man who may happen to derive a maximum of pleasure from a certain form of art, to be told that another form, to which he is indifferent, will please his descendants better. Mr. Trollope, in one of his novels, sets up a plea in favour of mullioned casement windows, on the ground that, say what we will as to their inconvenience and practical inefficiency in some respects, no other form of window has produced so great an aggregate of happiness. Granting (as we are inclined to do) the truth of the premiss, the claim is a strong one. And on the same principle it may be urged that the Gothic revival, mere imitation as much of it has been and is, has nevertheless been the source of a great pleasure to thousands of people of a certain constitution of mind: to architects and their clients, lay and clerical; to numbers of young ladies who have taken a sentimental delight in it; to wealthy amateurs, and clever art-workmen, and honest masons who have taken a pride in carrying out well what they were set to do, with no provoking doubts as to the *cut bono* of the whole thing. And this would be all very well, and there could be nothing to grumble about in connexion with it, did we build for ourselves alone. No one can find fault with the enthusiastic misanthropic antiquaries (generally clergymen) who got up choral societies for the sole practice of Mediæval music, and concerts where Palestrina takes the place of Beethoven, and where nothing more recent

than the sixteenth century is admissible. The thing is interesting in its way as illustrating a certain phase of art, and when it is over it is over, and the recollection of it stands in nobody's way. But architecture, even in so far as it is purely an art, is too expensive and permanent an art to be played with in this way. A building is not like a concert or a picture, which we may go to hear or see, or not, as we please. Whether we like it or not, there it is in our way, and, if it is properly constructed, in the way of our descendants too, for many generations to come. And on these grounds it behoves those who employ their talents in designing or (may we not sometimes say) *compiling* buildings after the Gothic fashion prevalent at present, to consider whether their work really will have the value for posterity which would justify the expenditure of so much time and money in its erection. And all analogy seems to show that resuscitations of the form and spirit of the art of a past time have never anything beyond an ephemeral interest. The quasi-classic Latin and Italian poetry of the *Cinque-cento* revival never took a permanent place in literature, notwithstanding the talent, probably even genius, often employed upon it. The first followers of Stuart & Revett in England were as enthusiastic and industrious, as certain that they were in the right course, as are the slashing young Gothic men of the ultra-modern school, who now deride them and their works. The first developments of the Gothic revival even are passing into the limbo of contempt; and some works, counted once as the great successes of this said revival, are viewed with a kind of melancholy toleration by numbers of well-educated people both within and without the pale of the architectural profession. And if, as it appears, the large and costly building for the Courts of Law is again to be an antiquarianism, with ornamental niches and shrines for saints eminent in the history of the Bar, and so forth, it is not unlikely that the reaction, inevitable as it is, against this exaggerated Mediævalism, may assert itself to a degree unpleasant to the feelings of the architect even before his building is completed. No one can intelligently study the course which mental progress is taking at present in Europe, and especially the writings and deliverances of that highest class of intellects who in the end lead public opinion, without seeing that the temporary return to the ecclesiastical theory of life, which has formed the stage for the revival of Mediæval art, cannot finally commend itself to the wants and feelings of modern civilisation. And from such a point of view, the vast expenditure already incurred, and further proposed to be incurred on buildings which may seem to our immediate descendants anomalous, or even absurd in regard to artistic design, or providing for fancied requirements whose necessity may not be recognised beyond the present century at furthest, becomes a matter for very serious consideration indeed.

We cannot, in fact, afford to practise sentimentalism in architecture, except in special cases and on a comparatively small scale. There are certain classes of buildings (such as monumental and memorial erections) where fancies as to reproduction of old styles or of the effect of particular buildings of antiquity, may without impropriety be indulged in if desired. But on a larger and more extended scale the game is not worth the candle; it is too expensive an amusement. It is highly important for the best interests of the country that the great amount of potential talent and energy represented by the numbers of persons who look to make their living through the erection of buildings should be so directed as to produce results of the greatest possible permanent value to the country. And it must not be forgotten that architecture is a pursuit based on utility. No reader of this journal will suppose that we mean for a moment to ignore its claim to rank among the arts; but

we cannot leave out of sight the original force of the good old Saxou word "build," as it is defined in the quotation which has long stood as a motto on our annual title-page. It is this forgetfulness of the utilitarian basis of architecture which has led to much of the recent distastefulness in the style of other periods and climates. It has been forgotten that the real object of architecture is to render healthy, fitting, and beautiful those erections which are among the necessary conditions of civilised and refined life upon the earth. In the pre-sanitary Mediæval period the cathedrals really were the expression of what was deemed most necessary upon earth. The Church was everything; and if the every-day life of men was to use the words of a thoughtful if not orthodox writer, "poor, solitary, nasty, brutish, and short," it was sufficient if they had the Church, spiritual and material, as a refuge on occasion from the meanness and discomfort which oppressed soul and body respectively. But the social theory of life now predominates over the ecclesiastical (we do not say the religious). And the business that our architects really have before them in the future is to solve the problem, how to make the vast collections of dwellings continually increasing around our great towns places where human life may be carried on with comfort, with decency, with pleasure. Seeing that wherever men congregate they are obliged to cover the surface of the earth with more or less thickly-packed habitations, how may we devise these so that they may be a pleasure instead of a nuisance; so that they may give us something in return for the green trees and fields which are laid waste to make way for them; so that the surroundings of our town life, in all its branches, may be made as enlivening, as cheerful, say even as beautiful, as possible?

We noticed that during the Chureh Congress recently held at Liverpool, when, of course, there was an abnormal excitement of ecclesiastical feeling, Mr. Boreford Hope strongly urged the building of a cathedral in Liverpool, and it was stated that there were persons there ready to expend fifty thousand pounds down to commence such a work, and "as much more as might be wanted." Looking to the information supplied by the reports of the officer of health and other sources, we might almost venture to say that all this money might be better spent than in providing what might prove merely an expensive failure. Some are getting minded to think that the town itself, the laying out of streets and houses in the best and most effective manner, both as to salubrity and architectural effect, and the clearing away and rebuilding of bad, densely-packed, fever-breeding districts, sufficient places for worship existing, may be at present of even more importance, and has certainly been unduly neglected.

We recommend our rising architects to look more to the future, less to the past.* And we believe this advice to hold good on artistic as well as on practical grounds. Much of the battle of the styles, and the failure of many expensive buildings, and the confusion as to architectural style, has, we verily believe, and as we have again and again in years gone by expressed, arisen simply from beginning at the wrong end; from the habit of assuming that a new building must take a certain outward form or "style," instead of considering first, what are the requirements and purposes of the building, and what plan will best fulfil them; and, secondly, how may we suitably decorate that plan so as to make of it a pleasing and expressive building. Originality of style and expression in a building would be far more likely to grow up in this manner, in natural sequence, than they will be galvanised into existence either by Mediæval diletantism or by constant straining after novelty for its own sake. And if more time were spent in considering what are the real building problems peculiar to modern times, and how to deal with them, less time in acquiring merely an archaeological knowledge of former buildings, we should probably build to more purpose, and to the more permanent use and enjoyment of those who will succeed us. We do not expect this view to meet with any sympathy from the rather numerous class of persons who are only anxious to get as many jobs in hand, and turn out as many pretty drawings in the

* Lately, at a dinner where there were present a number of architects, a clerical speaker claimed affinity of feeling between the clergy and the architects on the ground that each found, in the course of their studies, that the further they went back the more admirable they found everything. The sentiment was loudly applauded; but, to be sure, allowance must be made for an after-dinner audience.

popular style, as possible in a given time. We appeal rather to that smaller class, to be found, we trust, in all professions, who wish so to carry on this pursuit that their labours may be of some permanent value to the world, and to whom the making of money is a secondary consideration.

METROPOLITAN FIRES.

THE tranquillity of the public mind has been disturbed, and the sense of public security rudely shocked by two recent disastrous fires which have occurred in the metropolis.

They were attended, in each instance, by a far greater sacrifice of human life than happily accompanies such outbreaks generally; but as to the circumstances and conditions under which both of these fires originated, there was little to call for exceptional remark.

The occupants of the respective premises may have unhappily considered themselves as fairly within range of protection as the inhabitants of most houses at this moment believe themselves to be; yet eleven persons out of twelve perished. It is in view of the alarming and precarious situation which these truly lamentable instances bring suddenly home to the door of every one that we are led to place under examination those provisions upon which, in the face of such emergencies, we are accustomed to rely for assistance and preservation. So perverse and intractable an element enters into many of our legislative arrangements in similar matters, that it can be characterised as nothing short of a fixed and natural law of irregularity, which, do what we will, cannot be satisfactorily brought under subjection.

This most precise calculations of the engineer may not prevent the possible falling in of a roof or bridge, involving, perchance, a loss of life and property. The most careful organisation of which railway management seems capable, can scarcely assure us of the impossibility of another Abercrombie accident, and even the precise and mathematical formula upon which the system of life insurance is projected, may not guard such institutions from failure, and those associated with them from disappointment and probable ruin.

In ordinary domestic households, however, where it might be supposed that more than usual precaution and watchfulness would be exercised in reference to the preservation of human life,—leaving the question of property for the moment altogether out of consideration,—from destruction by fire, we are actually brought nearer to this remorseless danger of which we complain in its more threatening forms. There is a never ending series of outbreaks of fire in this metropolis, occasionally arriving at such proportions as to threaten to engulf the entire city. At times throughout its interminable course this phenomenon assumes the features of a startling conflagration, calculated to spread dismay and apprehension in all directions. A very curious and painful reflection is suggested by official statistics in reference to the subject of metropolitan fires. Any one who may happen to wish for some opportunity of studying the incidents usually attending street fires in London might, by calling at any hour,—it might almost be said, at any moment,—at Watling-street, where the headquarters of the Fire Brigade are located, be put in possession of intelligence which would lead to some locality where a fire would be raging. How this wonderful continuity is kept up, it would be bootless to inquire. It is comprised at length within some such fortuitous doctrine of averages as that relating to the destruction of human life in street thoroughfares and elsewhere, and we could only wish that we could be assured that they were equally reliable.

Unfortunately there is not wanting towards the maintenance of fire averages, the too painful proofs that in many cases such outbreaks may be traced to the malignant wilfulness of human nature itself.

There are instances on record of the deliberate destruction of entire cities by fire, as in the case of Moscow upon the invasion of the French army only some fifty years since, where the inhabitants silently deserted the capital that they had themselves skillfully doomed, and devoted to destruction by this means.

It was by the light of the flames of the Kremlin that Napoleon sat down to forecast the closing of his great career, and never throughout that career did any incident arise capable of awakening an equal degree of consternation in his mind. It was a subject to which he would

allude as one of the most awful spectacles which he had ever witnessed, and the mere recollection of it used to end in rendering him for a short time completely insensible in after years. Troy, Antioch, Corinth, Jerusalem, and Imperial Rome have all been visited by dreadful conflagrations, and what more immediately concerns us is, that London itself has not escaped from being more than once almost annihilated by similar catastrophes.

The ravages of fire, when once that element obtains the mastery, are more fell and speedy than the exterminating sword, or the devastations of a pestilence. To leave, however, the domain of historical evidence, as well as the review of calamities which have long past occurred, let us revert to the case of those ordinary fires and conflagrations which are in course of continual occurrence daily and nightly in our midst, destroying numerous habitations, and to the manifest danger of surrounding property and life.

Up to within the past few years, and in keeping with that national instinct of oblivion in which other matters of equal importance yet remain shrouded,—sewage, water-supply, child-education, and poor-law relief,—we were in possession of no properly-organised system whatever to limit the extent to which any outbreak of fire might have happened to have arrived.

A promiscuous and voluntary aid towards the suppression of fire was brought into play by the Fire Assurance companies some years ago; but it was, of course, obvious that the remedy which was thus afforded could only have been expected to be employed in cases more particularly where the interests of such companies were involved. No such associations, unless founded upon gratuitous or benevolent principles, could undertake so wide and important a mission. The management of insurance establishments being professedly of a different scope, or not limited to such objects, it followed that fires which proved to be attended by certain losses pointed clearly, more clearly than anything else could have done, to the expediency upon which those associations were based. Far be it from us to seek to impute blame in any quarter upon such grave issues as those relating to this question. It was at length seen more evidently that where there was no fire there was no risk, and where there was no risk there was but little incentive to make provision for prospective losses by the payment of large annual premiums by way of insurance.

In occasional outbreaks of fire happily it may have been unattended by any loss of life, the necessity or prudence at least of providing against the loss which might have been sustained appeared undeniable. So far we think we may be permitted to put the case without being ourselves exposed to liability or danger of mis-construction.

It is the obvious policy upon which alone the business of any insurance society could be satisfactorily conducted, and far from misapprehending the important advantages which such associations confer, we would say that as things are, it would be more prudent and necessary than ever that their operation should be supported by public concurrence, and more widely extended and understood.

The consideration of this element of the subject may be momentarily deferred. The inconsistencies to which the situation gave rise at length led to the establishment of a Metropolitan Fire Brigade, which was ostensibly placed under the direction of the Metropolitan Board of Works; but some recent statements have been put forward with the view of relieving the public mind from any impression which it may have entertained as to the responsibility that would devolve in the direction of that body. We are thus brought face to face with an entirely new phase of the question which appeals to and demands a prompt and universal recognition on the part of the public.

Within the past few weeks it has been established by legal inquiry, that in two of the more insignificant class of fires with which we are mostly familiar, no less than eleven human beings have perished. One of these fires occurred at a small shop in Baywater, in which seven persons were sacrificed, and the other took place in somewhat similar premises at Newington, in which four, and very nearly five, lives were lost. The practical issue which usually arises out of such calamities, and more especially in view of their possible recurrence, is necessarily as to the direction in which we should be justified in looking for more effectual assistance. It is not so much the discovery as

to who may be to blame, if any there be to blame, for what has recently happened, that would prove of more practical avail; but more in a prospective than a retrospective view that we would approach the subject. An appendix was made to the verdict which was given by the coroner's jury in reference to the Bayswater disaster, recommending that arrangements should be made by the Metropolitan Board of Works to enable the fire-engine at the station in Queen's-mews to get to fires more quickly than it did in this case. This recommendation on the part of the jury has in its results afforded to the chief officer of the Metropolitan Fire Brigade an opportunity of apprising the public that he more particularly should be held responsible for any miscarriage in this direction, and by interposing between the public, as represented at the coroner's inquest, and the Metropolitan Board of Works, Captain Shaw has revealed some features of the fire-brigade system, as at present conducted, with which the public formerly were not so familiar.

In a letter to a contemporary upon the fatal fire at Bayswater, Captain Shaw has availed himself of the privilege which has been accorded to him of communicating to a large section of the community that "all the inhabitants of the district who take an interest in their local affairs must be aware that the Metropolitan Board of Works has been actively engaged for upwards of two years endeavouring to find a more suitable place for the men and engine." As we have no reason to suppose that this statement is put forward in all seriousness, those who, as Captain Shaw remarks, must be aware of the circumstance, may discover some slight difficulty in deriving any new consolation from the assertion to that which they have enjoyed all along through the period named. But it may become a matter of congratulation that the circumstance is now likely to engage a wider share of public recognition. We can only hope that we do not lose the full intent and scope of the observation, and in that case proceeding from the source to which it is attributed, it may be regarded by some as a display of activity beyond all praise. The letter goes on to say that the suggestion of the coroner's jury was that it would be advisable to make arrangements to get the Bayswater engine to fires more rapidly than on the occasion in question, which simply meant—and at this point we are precluded from following Captain Shaw's construction so clearly—which simply meant,—the gallant captain continues, that it would be an advantage to have all our men living in the station, and thus save the time now lost in secluding a distance of 111 yards for them. The greater comparative efficiency which it is apprehended would attend the accomplishment of this object has operated towards so liberal a view of the jury's report that its identity with the form in which it has come now to be presented may not be so generally perceptible. We are not so sure that the jury would itself recognize the original meaning or adhere to the construction with which it has been officially invested. The distance in question would, we believe, cause a difference of nearly one minute either way in the equipment of a fire brigade corps, presuming that no other obstacle than that of distance intervened: 330 ft. are, after all, only about one-third of the distance across one of the Thames bridges, and from one extremity to the other would practically be found within speaking limit. It is the distance only that in Captain Shaw's communication appears to be more especially observed.

In seeking to divert any possible blame from the Metropolitan Board of Works, and encouraging it rather towards himself, it may have so happened that too wide an interpretation may have been placed by Captain Shaw upon the jury's report, to the gratuitous detriment of, or at all events without contributing to enhance the reputation of, the Fire Brigade. We are rather inclined to shelve by a literal acceptance of the terms of the representation which the jury desired should be notified to the authorities, which were intended, and believe that, however complicated it may have appeared in other directions, or whatever task might have been involved in reducing its meaning to a more simple form, that the jury meant exactly what they stated in this instance, and no more. The inferences which may be drawn by the inhabitants of Bayswater from the singular construction which in some quarters has been placed upon the jury's recommendation may lead to more desirable arrangements in that locality. What we have more to consider are those circumstances arising out of

the unhappy occasion which concern the general public. Since the direction of the Fire Brigade system has been confided to the Metropolitan Board of Works, a sum of 70,000*l.* per annum has been expended in its management. There may not be a great many probably likely to entertain the opinion, that recent occurrences would demand the display of any unusual amount of congratulation as to the results which have attended such an expenditure. It is neither with the expenditure, however, nor the system that we have now to deal; for it is our conviction, notwithstanding the public complaints that are row likely to arise, that with such an expenditure and such a system, all that could be done has been done.

The undoubted courage displayed by the members of the Fire Brigade Corps upon occasions where they have arrived at seats of actual danger, has become proverbial, and we would be the last to withhold an acknowledgment of the bravery and succour which they have in so many instances rendered. But the risks which we now have to meet in occasional outbreaks of fire are disproportionate altogether to any available means towards their being effectually encountered at immediate command. An efficient and comprehensive remedy may no longer be expected from the Metropolitan Fire Brigade, or from the Metropolitan Board of Works, with the present resources which they are possessed of for this purpose.

It is possible to conceive of a fire of such magnitude, that in view of all London being burned down, the State itself might be moved to seek to provide some remedy.

The chief officer of the Metropolitan Fire Brigade remarks, "I have much pleasure in adding that we are now perfectly able to deal satisfactorily with any emergencies that may be expected to arise." While far from wishing to detract in any way from the value that such an assertion would be necessarily promoted to convey, its supercilious recognition would retrospectively condemn the marked negligence with which the system has recently been visited. Any organization which could so suddenly be brought up to now satisfactorily meet all possible requirements, and which was lamentably deficient of such perfection but a few days past, could not fail to provoke equivocal reflections.

The occurrences which are now fresh in the public mind were certainly, in their general features, of no unusual kind or emergency. We would incline towards an invitation to release the Fire Brigade and the Metropolitan Board of Works from the necessity of insisting upon pretensions which may so speedily be proved to be groundless. The emergencies that may be expected to arise out of any outbreak of fire present so wide a margin of contingencies that great discretion would be demanded in providing adequately for them all. It is not so long since Sycemham was destroyed by fire, involving a loss to nearly the extent of a quarter of a million sterling. Only a year or two since, a church at Croydon was destroyed, and owing to the weather, and state of the roads at the time, the means for extinguishing the fire actually could not be brought to the spot where it was raging, although the spectators were close and numerous. The combustion of fatty or volatile bodies on the surface of water would seriously menace the shipping of our great cities, and it is but a short time, comparatively, since all London was fairly startled by the great fire in Tooley-street. This is without regarding the more exposed and unprotected state of suburban property. If some of those emergencies which we have indicated, and to which we are liable at any moment, presented themselves again, we are not enlightened by the statement of Captain Shaw as to how they might more happily be met. A perfunctory assumption on the part of any one as to the transition from powerlessness to that complete efficiency which is within so short a time claimed on behalf of the Fire Brigade, would not only be calculated to engender erroneous ideas, but would invite criticism as to the causes by which it may have been delayed. It is to be hoped that there may be reasons for the supposition beyond any with which we are acquainted, and that any indication of increased efficiency in the management of the fire brigade system in the future may condone its possible shortcomings of late.

We observe that as an element of the present protective system, the Fire Insurance companies are called upon to contribute a sum of 10,000*l.* annually towards the necessary expenditure. It

may be thought unfair to employ the funds of such associations in the general suppression of fires, unless it so happened that the whole of the property in the metropolis be insured, which is far from being the case. This element may occasionally contribute towards some derangement of the present system.

The annual average loss of British property by fire is computed to reach ten millions sterling. The average annual home loss exceeds two millions, and indeed any casual outbreak of fire in Tooley-street would threaten to involve a sum as large as this.

The amount of property insured in England from destruction by fire now exceeds probably fifteen hundred millions. Some years since the value of insured property in France was computed at two thousand millions, while the value of insured property in England was at that time reckoned at twelve hundred millions.

The premiums which are paid on policies of insurance with respect to insured property in England exceed five millions sterling annually. Out of this the insurance companies return to the public the sum of one million, which represents the yearly value of insured property destroyed by fire in this country. There remains, therefore, to complete the two millions representing the total destruction of insured and uninsured property combined which takes place every year in England, a sum of one million which is in no way provided for, and which is, consequently, altogether lost and irreparable. The margin which has been claimed by insurance companies with reference to the tariffs upon which their operations are conducted has resulted in rendering them the net recipients of four millions annually out of the public industry, and it is within that margin that we believe the whole and only hope of future public safety resides.

The accumulated funds of the insurance companies, which may be said to be held in trust for some portions of the public, if applied to a protective rather than a restorative system, would render the country comparatively proof against fire.

This large annual gift to the insurance companies, if devoted only for one or two years towards the remodelling or reconstruction of household property in the metropolis, would tend to save countless lives and disasters, as well as enriching the nation by the substitution of improved habitations. It would be almost impossible for a dangerous fire to break out in the buildings lately erected in Victoria-street, and we could conceive nothing more to be deprecated than the application of modern methods of fire extinction against those ranges of dwellings should a fire actually arise.

The improvements which have been for some few years past gradually gaining favour in the practice of building and architecture by the more extended employment of fire-proof materials, tend more effectually to limit the ravages and destruction of fire, and also to abridge the labours of fire-engines and brigades. No one knows better than those concerned in the direction of fire-brigades, that their utmost efforts must necessarily be limited to arriving at the seat of any outbreak of fire at the earliest possible moment after discovery, and then seeking to suppress the spread of the flames by copious and immediate saturation. After the salvation of human life has been effected, that in cases where that object may have been happily secured, it becomes a matter of comparative indifference whether the destruction of property is continued by means of water or fire, and rarely is anything according to the generality of published reports preserved. The elements of unnecessary terror and destruction which fire-engines sometimes carry in their wake, the fury and onslaught of their attacks occasionally, and the puerile and inundating streams with which surrounding property is at times promiscuously flooded, has created a disposition on the part of many to resist the nature of the succour that is customarily rendered. It is questionable whether a greater degree of protection could be secured, however, by the expenditure of 70,000*l.* per annum in any other way than that by which it is at present expended, and which would at the same time comprise an equitable arrangement with the insurance companies as to the proportion of the expenses which might continue to be contributed by them.

Science, which may justly boast of so many triumphs in other directions, although the question of fire and fire suppression is so pre-eminently a scientific subject, yet curiously

leaves us to the contrivance of more or less perfect mechanical expedients for projecting deluging streams of water into the midst of burning materials. It is obvious that in many cases the water may not possibly reach the seat of fire, and consequently very little impression is produced, while any combustible materials may remain unconsumed. The persistence with which streams of water are projected into the body of conflagrations is incredulous. It must necessarily burst into steam, or be carried upwards by the force of ascending flames. When the flames subside, then only is water more applicable in being directed upon the incandescent remains. But there is a still greater danger than this, for at certain stages of combustion water will actually burst into sheets of flame.

To the occurrence of this phenomenon upon a small scale may be attributed the succession of explosions which mostly attend fires of magnitude in the metropolis.

It may be studied and observed to greater advantage in some of the London Gas Works upon the drawing of a bed of retorts, where volumes of water thrown from hand-pails upon the mass of red-hot coke explode with the lightning and concussion of artillery. A cubic foot of water may be resolved into 30,000 cubic feet of flame, and it is well known that water has been actually employed in the production of gases for ordinary illumination. As an instance very clearly indicating the laws and processes of combustion from a want of a more general knowledge of which, we believe, many erroneous opinions are entertained to the prejudice of life and property, we would revert to an occurrence which shows that a room enclosed in the ordinary way, if left alone, cannot burn beyond a certain quantity of materials save by some adventitious aid.

A gentleman sealing a letter dropped some flaming wax into a waste-paper basket, which blazed up and set fire to a woollen table cloth. He ran out of the room and shut the door, and, having sent for assistance, with the servants he watched the progress of the fire through a window from the lawn. Even after several minutes the paper-basket was still burning. An oil lamp on the table had burst, and the oil was running down one side of the table-cover, burning with a flame a yard high. The room was soon clouded so thickly that the actual flame could scarcely be seen; but at intervals a lambent flame passed about the room like a fire-cloud, and then subsided. The muslin curtains, in fact, wasted away by the effect of the heat, but could not burn for want of air. The window-glass cracked, but did not break out, and, after a few minutes, only a few smouldering embers were visible in the darkness of night. Scarcely anything was consumed, but everything in the room was destroyed. We are far from quoting this as an example to be imitated in all cases, but with the intention of showing in what way fire may be propagated, and that its propagation does not necessarily depend upon the successive ignition of contiguous bodies, but rather on a general increase of temperature affecting more or less volatile bodies, or bodies more or less disposed from their character to enter into a state of combustion without the actual contact of flame. A very important scope is afforded for a scientific investigation as to a more effectual method of fire prevention. Should the public not yet be sufficiently awakened to deduce out of the insurance system a means of lessening the general risk, the Metropolitan Board of Works might be induced to set some such inquiry in motion.

What the public are most concerned in bearing in mind at this moment is, that notwithstanding that it contributes five millions yearly to the insurance companies, and that a sum of 70,000*l.* is annually expended under the auspices of the Metropolitan Board of Works, with the view of limiting disasters incident to fires in the metropolis, as much human life has been sacrificed within the past few weeks at outbreaks of fire of the most ordinary description as would attend a railway collision or a colliery explosion, and that the chief officer of the Metropolitan Fire Brigade asserts that all that could be done in such cases by that body was done.

South Kensington Museum.—Professor Huxley gave, on Tuesday, at the South Kensington Museum, the first lecture of the course, on the elements of physical science, which is intended for the instruction of women. The course will consist of three parts.

DISASTER AT THE HOLBORN VIADUCT.

We have to mention, and we do it with extreme regret, that a number of the granite columns that carry the iron bridge over Farringdon-street are seriously fractured. If we followed our own inclination, we should say nothing on the subject till the engineer and contractors had told their own story. But the matter has already been made public, and it would be thought that we had neglected our duty if we omitted giving at once such information on the subject as we have. Entering from Fleet-street, the second shaft on the east side is split on five of its six faces, three of the splits being apparently about 1 ft. long. On one of these faces there are several fractures. The third shaft has a crack in its centre block that looks to be about 2 ft. long. In addition to this, three of the faces of the bottom course of this shaft are split in a very unmistakable manner.

For the sake of understanding it clearer, we may say here that the granite shaft of each of the twelve columns supporting the bridge girders is composed of three pieces, a lower one resting on the pedestal, which we may call the bedding-piece; then a middle piece taking up about two-thirds the entire length of the shaft, and which is surmounted by a third block of small dimensions.

One of the cracks of the third column is very wide. The fourth column has three fractures, one of them being the largest of any of the fractures to be found. Two of these splits look very unpromising. The top block is split on one of the faces. The fifth column is apparently not fractured; but its bearing inclines so much inwardly towards the road, as to have crushed a portion of the edges of the joint on that side, whilst the opposite side of the joint is open to the extent of the eighth of an inch.

On passing to the western row of columns we find that the second one shows a bad fracture. It consists of a split on two adjacent faces, starting from the middle of each face, and converging downwards to meet in a common point at the base. This is a heading-block fracture; and if it is as serious as it seems, the injured piece may at any moment be forced out from the block. The top course of this shaft is also cracked. The sixth column on this side has two cracks on opposite faces of the top course; they do not look very assuring. The second abutment column on the same side has two lengthy cracks upon one of its faces; one being about 22 in., and the other 14 in. long. The blue granite plinths are all right.

The fractures in the shafts have increased in extent since we first examined them, and we can scarcely resist the conviction that the disaster is very serious, and that some of the shafts, at any rate, if not all, must be taken out and reinstated. It will give us great pleasure to find, when Mr. Haywood has made a careful survey, that we are wrong. If, however, it turn out as we fear, we should be disposed to advise the substitution of iron, rather than of other shafts of granite of a size that would suit the present ornamental capitals. The red granite used ("Ross of Mull") is obviously less strong than the grey granites employed here. But the weight above is so considerable, and the traffic so enormous, that iron seems to us the only material for the position, if present sizes are to be adhered to.

This is not a moment for us to ask questions with a view to attribute blame, though it will have to be done, with reference, for example, to the way in which the blocks are bedded, and as to the experiments that were made on the power of resistance to crushing weights possessed by this granite. It is to be feared that the facilities afforded by Mr. David Kirkaldy's works, in Southwark, for ascertaining such facts with certainty, are not taken advantage of to the extent that public safety demands.

We must not, in our anxiety to avoid giving pain, conceal the belief we have that two, if not three, of the shafts may yield at any moment, if the traffic above be continued without the adoption of precautions below.

A CORRESPONDENT WRITES.—On Wednesday, at dusk, a further inspection showed that the fifth column on the western side, had cracked across on the bottom course of the shaft. The split is very sharp and clean, as if it had been cut. The centre length of the sixth column on the same side has also shown unmistakable signs of yielding. Hitherto these were thought to be flaws only, but they have developed themselves

into absolute fractures. Crowds of people, mostly building artisans, arrive all day, in one continuous stream, and the observations are numerous.

Some say that the foundations are defective; but they go down into the London clay 36 ft. below the old level of Farringdon-street. Then a bed of concrete 6 ft. deep was laid in two long trenches, one to each row of columns, 12 ft. in width. Upon this were built brick piers of the same superficial dimensions, nearly up to the ground surface; and finally the pedestals of grey Cornish granite,—hexagonal in form,—upon which the shafts were fixed. Another story is that the frost of three weeks ago produced a contraction in the main rib-girders of 1½ in.; and that such contraction, not being sufficiently allowed for, pulled the columns towards the centre and produced all the mischief,—mischief which the vibration of the great traffic overhead has brought to a climax.

STYLUS.

On the eve of going to press, we have received the following official communication:—

At a special meeting of the Improvement Committee held this (Thursday) afternoon, Mr. Haywood, the engineer for the Holborn Valley Works, reported that having this day made an examination of the bridge, he is of opinion that it is perfectly safe for public traffic; and at his suggestion the committee directed that three eminent engineers,—viz., Mr. Bidder, Mr. Edwin Clark, and Mr. T. Elliot Harrison,—be requested to examine and report forthwith upon the condition of the bridge.

WINTER EXHIBITIONS: OLD BOND STREET GALLERY.

If the number of pictures, drawings, and works of slight and slighter pretensions to either denomination now being exhibited at the Old Bond-street Gallery were lessened by one-half, with a view of bringing more closely together the best of them, the collection would stand a fairer chance of being well regarded as an adjunct to the several winter exhibitions already established.

Amongst the best must be recognised Mr. E. C. Barnes's "Prawn Seller" (6), with a special note of the admirable breadth of painting displayed in the heap of prawns; Mr. P. Jackman's clever interior introducing "The Net Mender," or menders, for there are two of them (12), indicating great executive power and a rare apprehension of colour and effect; Mr. T. Davidson's drawing-room is painted, likewise, brilliantly and forcibly, with its occupants,—an elder sister singing "The Old Song" to the younger, who listens to her fellow-mourner for those who so often listened with her formerly (80); Mr. F. H. Potter's contemplative lady adumbrates some cognate sentiment of heretemporary, temporary or for ever (33),—she recalls "The golden days in which she saw him first."

Mr. C. Lucy offers an antidote for thoughts of life's and death's shadows in his bright and well reasoned and seasoned reminder that the world is very beautiful, that happiness is as natural to it as grief. "Sunny Hours of Childhood," the pleasant alluring preface to—sometimes—a horrid story, if it promises "to be continued in monthly parts and annual volumes." Mr. Lucy's well-described children (61) imply their wisdom by basking in the warm light of present days, and blinking at the future; for the morrow is divided by a long bed-time,—the darkest hours they know as yet, the only hours they hate to think of, unless, like "The Sick Child" (57), alluded to by Mr. A. B. Houghton, they are forced to take physio three times a day; but this is a disagreeable episode. "The Grandfather" (18), by Mr. J. A. Fitzgerald, is another phase of childhood. "As the Twig is bent," &c. (20), is a clever sketch by Mr. V. W. Bromley, of an old reiner teaching the scion of a fighting family—for the costume betokens feudal times—how to cross swords, and learn by might to hold as right all you may feel disposed to appropriate, which is very wrong both in precept and practice; but it is astonishing how long some old customs and habits prevail. "An Attack," by some other geese of a different sort on common ground, but who are likely to get more than they want from the peasants they are assailing (59), is a very natural-looking picture by Mr. J. W. Bottomley. "Against the Jack" (62), by Mr. J. Emmes, reminds one—and a great many—of the Jack that frightened Mr. Briggs, by barking like a dog. "On Guard" (71), a

sentinel of Elizabethan period, is a clever sketch, by Mr. W. Small, and capital in style for a sketch. "The gentle Music of a bygone Day,"—*The Barshly Fiddlers*, V. M. Morris, and of Mr. J. R. S. Stanhope, too, with those whom he imitates; quite in tune with "A bygone Day" also (194); "A Chilly Morning" (205), by Mr. G. Earl, much more direct in observation of nature; "The impending Storm," not a landscape, but a trooper about to withstand stormers, somewhat mildly represented (217), by Mr. J. S. Lucas, "Doesn't he like his Bath!" the rivets of which rivet the attention, though the little Triton by no means denies the imputation that he shares in the love of a "cold tub" in common with all Britishers, and will climb the Alps with the best of them, presently, so far as Mr. J. S. Outbert has made him expressive (219), "Bless the Babies, how they abound!"—these, with Mr. J. J. Hill's Welsh peasants on "The Walk" (243); two studies of Irish cabins (244 and 265), by Mr. A. C. Stannus; and "The Harpsichord" (257), by Mr. C. Rossiter, are a very fair example of the most noticeable figure-subjects in the collection.

There are some clever landscape representations: for instance, "Autumn Woods" (17), by Mr. J. Knight; "September," a combination of landscape and figures, by Mr. E. B. Barwell (30); "Evening on the Arise," by Mr. G. Chester (85); "Where the Ferns grow" (123), by Mr. E. Holmes; "The Burial-place of Hogarth, Chiswick, on the Thames," with a late evening effect, by Mr. G. F. Tennisswood (191); "The Redlands, near Leith-hill" (210), by Mr. G. W. Mote; and some others also well deserving of attention.

The water-colour drawings include many pleasing and deftly manipulated, as well as highly finished, performances. They are numerous, and will repay a patient examination.

OUTRAGE AT WORTH CHURCH.

SOME of our readers are unwilling to believe the statement made by one of our correspondents last week, that the chancel of the Saxon church in Worth "had vanished clean away." With grief and shame, we have to assure them that the statement is perfectly correct. We visited the place on Tuesday, though with no doubt as to the accuracy of our informant's report, and found that the very foundations had been rooted out, the trench lowered, and that the new walling was being proceeded with. The work is in the hands of Mr. Dancy, a local builder, and the architect under whose direction this outrage has been committed is said to be, though we can scarcely believe it, Mr. Salvin. It is no answer to reply that it was desired to remove the large buttresses which had been built up at the east end by previous more reverent hands, and that the chancel would then have fallen. The wall might have been shored, and other and more slightly buttresses substituted with ease. When it is remembered that Worth was perhaps the only Saxon church we had presenting the original plan throughout, and that the chancel was probably the oldest part, the indignation with which this destruction will be heard of will be increased.

The removal of the plaster has shown the existence of various arched openings in the walls, afterwards blocked up, especially two pairs of coupled semi-circular-headed windows on each side of the nave above the string-course, and an opening on the west side of the south transept, the circular head of which is cut out of a stone lintel.

As to this removal of the plaster from the external face of the walls, less can be said, because opinions differ as to the mode in which walls of the Saxon period were treated. In this particular case, however, where the walls for the most part are of the roughest of rubble, we have not the slightest doubt that they were intended to be plastered, and were so from the first. Here and there, where the walling is of a somewhat better character, a stone may be seen with moss upon it, but it is not the moss of a thousand years ago. Be this as it may, we will make no complaint on that head. Our regret and our anger are for the destroyed chancel, and our fear is for the chancel arch, a most interesting example, and for the characteristic long and short work all over the remainder of the building. Some blame surely attaches to the Sussex Archaeological Society, so busy with its excursions and its dinners! Did they do nothing to try and save the building, the most precious in respect of its uniqueness in the whole county. Where are

the Rev. W. Powell and Mr. F. Barchard, the bona secretaries? Have they heard nothing of these doings, or, worse still, have they heard and yet not dared? We drew attention to the contemplated works here many months ago, and the Royal Institute of British Architects, at a meeting specially convened, passed resolutions declaratory of the great historical value of the chancel, and urging the necessity for the most careful conservation. The warning, however, was needless. A third of the church has been ruthlessly destroyed, and those who have been concerned in the work have earned for themselves lasting obloquy.

THE INSTITUTION OF SURVEYORS.

THE opening meeting of the present session of the Institution of Surveyors was held on Monday, the 8th inst., at the Rooms, No. 12, Great George-street. There was a good attendance of members, and the president, Mr. John Clifton, commenced the proceedings by delivering an address. In the course of it Mr. Clifton said,—

"It appears that 117 public Acts, and 159 private and local Acts, were passed during the last session; and, although so much time was occupied in discussion about the Irish Church, that several Bills which were of interest to us were put on one side for the present, others were passed which, more or less, directly concern us. 'The Irish Church Act, 1869,' incidentally promotes the interest of our profession, and promises to give employment for some years to architects, surveyors, and actuaries, whom the Commissioners are empowered to engage, and to pay out of moneys in their hands, on a scale approved by the Commissioners of the Treasury. Nearly all the directions for the partition, sale, or retention, of the Church property, are based on the present estimated annual value; and property directed to be sold is, in most cases, to be first offered to the parties in possession, at prices fixed by the Commissioners. Provision is also made for arbitrations, which are to be conducted in accordance with the directions of the Lands Clauses Consolidation Acts.

"The Valuation of Property (Metropolis) Act' is of considerable importance, not only as regards its immediate effects, but viewed as an experiment in the direction of an equalization of assessment, and probably of rating, throughout the country. Every one must admit the absurdity—many have experienced the annoyance—of the assessment of their houses by two or three Committees or Boards at different amounts, for various rates or taxes, each independent of the other. Oftentimes the assessment is raised by some zealous Surveyor, of Taxes simply by way of experiment, to see how much it can be increased before the occupier will submit to the annoyance of an appeal. This Act then, which applies only to those parishes which are wholly or for the greater part in value under the jurisdiction of the Metropolitan Board of Works, provides that copies of the valuation lists, as made out by the overseers under the Union Assessment Committee Acts, shall be sent to the Surveyor of Assessed Taxes, and to the various authorities concerned with the county rate, sewer, and other local or general rates, who have powers of appeal, both against the total and the particular assessments of any parish, to Courts of special and general Assessment Sessions to be held by the justices. Each valuation list, when finally approved, is to be in force five years, subject to such alterations as may be necessary. Every fifth year a new list is to be made out and formally approved as before. This list is to be evidence of the gross and rateable value of the hereditaments included therein. The poor-rate, the county-rate, sewer-rate, and all local rates, are to be made on the rateable value, and the house and property tax on the gross value, as set forth in the lists. An attempt has also been made in this Act to define more clearly the terms 'gross and rateable value.' In the Bill as originally drawn, it was proposed to have a 'General Valuation Board,' chosen from the assessment committees of the several unions, who were to settle and approve the valuation lists, with appeal to a Poor Law Commissioner, who was to hold a court at certain times. The whole of this arrangement was struck out on discussion in the House, and the assessment sessions by the justices substituted. It was also proposed that the gross value should not be fixed at any less sum than the rent actually paid. This obvious injustice, and contravention of

acknowledged principles of fair assessment, was also struck out."

A vote of thanks to the president for his address, was moved by Mr. H. A. Hunt, and seconded by Mr. J. H. Lloyd, and carried unanimously. Mr. Menzies and others then addressed the meeting, which was afterwards adjourned to Monday, November 22nd, when Mr. W. Hope, vice-chairman, will read a paper in continuation of that of last session, on the "Distribution and Agricultural Use of Town Sewage."

THE PUBLIC HEALTH IN THE PAST SUMMER.

IT appears inevitable that until sanitary intelligence becomes more generally diffused, and until the people are better educated in the rudiments of physiology, we shall continue the victims of our climate. Each summer and winter the periodical returns of the Registrar-General show with what regularity our death-rate moves in sympathy with the mercury in our thermometers. In summer a few degrees, more or less, of heat are a matter of life or death to thousands of our infant population through diarrhoea. In winter the mortality from diseases of the respiratory organs is directly governed by the temperature, and a week's frost will often double the number of deaths from these diseases at all ages. It is impossible, therefore, satisfactorily to review the death-rates in any summer or winter quarter without fully taking into consideration its meteorological conditions.

Although the past summer was far cooler than that of 1863, its temperature was nearly two degrees above the average of the same quarter in ninety-eight years, according to the calculations of Mr. Glasher, of the Royal Observatory, Greenwich. Throughout July, except the first few days, the weather was warm, and above the average. In August the temperature was below its seasonable average, except during one very hot week between the 21st and 29th. September was generally warm, and the temperature showed a considerable excess throughout the month. Very little rain fell during July or August, and although the fall in September showed a slight excess, the amount measured in the quarter was 24 in. below the average of fifty-four years. The mean temperature of the air in the quarter was 61.4° Fahr., and 2.5° below the mean of the corresponding quarter of 1863.

In England and Wales during last quarter the Registrar-General tells us that the natural increase to the population by excess of births over deaths was 75,478, or more by 13,513 than in the corresponding quarter of 1863. This increase was, however, very materially reduced by emigration, as it appears that during the quarter 70,734 emigrants left the various ports of the United Kingdom. These numbers, we are told, do not include those who sailed from ports where Government emigration agents are not stationed. An increase of 18,109 emigrants was shown upon the return for the same quarter of 1863, the largest part of which increase was of English and Scotch, whose destination was principally to the United States and British North America. The increase of Irish emigrants was only 3,171. The births in England and Wales during last quarter were below the numbers in the summer quarters of either 1867 or 1863, but showed an annual rate of 31.5 per 1,000 against an average of 34.0 in the ten previous corresponding quarters. In the eleven largest cities and boroughs of England, including London, the birth-rate was 35.1, and in forty-six other large English and Welsh towns, 34.3 per 1,000; the town birth-rate therefore was not, generally speaking, much in excess of that in the rural districts.

The deaths registered in England and Wales last quarter showed a decline of 15,848 upon those returned in the summer quarter of 1863, and were 2,000 lower than in the same period of 1866, when cholera was somewhat epidemic; but with those two exceptions the deaths showed a considerable excess upon each of the corresponding quarter, as far back as 1853. The death-rate, however, which is calculated upon the estimated population of each year, was only 20.8 last quarter, against 23.9 in 1865, and an average of 20.6 in the third quarters of the ten years 1853-68. In the third quarters of the ten years 1853-68, the rural districts, including, of course, the small towns and villages. This difference of six per 1,000 in the mortality of the two sections of the population, may almost be taken to

represent the waste of human life which is due to the habitual disregard in towns of the most obvious sanitary laws. Theoretically towns should be quite as healthy, if not healthier, than rural districts, and we may fairly expect to see in the future these relative death-rates practically more nearly assimilated.

In the eleven large English towns furnishing weekly returns, including London, the death-rate last quarter averaged 25.2 per 1,000, which was nearly 2 per 1,000 in excess of the general town death-rate, and so much as 7.8 above the rate in country districts. These towns are estimated to contain a population of about five millions and a half. In forty-six other large English and Welsh towns ranking next in size, the death-rate last quarter averaged only 21.2 per 1,000, which was more than 2 per 1,000 below the general town death-rate. These forty-six towns are estimated to contain a population of nearly three millions. We shall presently have to allude to one or two of these forty-six towns, which form an exception to the generally low death-rate; but as it is evident that the principal excess of deaths last quarter occurred among the eleven largest towns before mentioned, we will first consider severally the rates in those towns.

London, which contains nearly half of the entire population of these eleven towns, showed last quarter a death-rate of 24.3 per 1,000, or 1 per 1,000 above the general town death-rate, which was almost as high as the rate that prevailed during the remarkably hot summer of 1868, and nearly 4 per 1,000 above the rate in 1867. Among the other towns, Birmingham and Bristol enjoyed rates so low as 21.4 and 21.7 respectively; the rates were 23.7 in Newcastle, 24.6 in Bradford, 25.2 in Hull, 25.6 in Sheffield, 25.9 in Salford, 27.2 in Leeds, 29.3 in Manchester, and highest, 30.5, in Liverpool. Newcastle, Manchester, and Leeds showed a satisfactory improvement upon the average of previous corresponding quarters, although, as regards the two latter, much remains still to be done ere they will permanently take higher places in these periodical lists. In all the towns except London and Bristol the rates for the quarter showed a large decline upon the summer quarter of 1868, principally due to a decrease in the deaths from diarrhoea.

Among the forty-six towns in the second list, nine towns showed death-rates exceeding 25 per 1,000, among which Exeter, Leicester, Halifax, and Tynemouth may be especially pointed out as exhibiting in their returns evidence of unsatisfactory conditions. In Exeter the rate has now been excessive for some quarters, and a severe epidemic of measles swelled the returns during the past summer. Leicester has again suffered from infantile diarrhoea, in excess of most other towns. In Tynemouth and Halifax, diarrhoea and scarlatina combined to produce a very high rate of infant mortality.

Considering the far more moderate heat of the past summer, compared with that of 1868, the fatality from diarrhoea in the third quarter of this year was very remarkable. In London, during the quarter the deaths from diarrhoea showed a decline of but 18 per cent. upon the same period of 1868, while in Liverpool it was only 13 per cent. In most of the other towns the decline was much greater; but according to a special return made to the Registrar-General, during the last nine weeks of the quarter, the annual death-rate from the disease averaged in the eleven towns more than 4 per 1,000, and ranged from 2.5, 3.2, and 3.4, the lowest in Bristol, Newcastle, and London, to 5.8 in Leeds, 6.4 in Birmingham, and 6.6 in both Manchester and Liverpool. In Leicester, the death-rate from diarrhoea for the whole quarter was 8.9 per 1,000. The mortality from diarrhoea was greatest during the last week in July, and the first fortnight in August, after which it steadily declined, and, at all events in London and Liverpool, appeared to be scarcely influenced by the remarkably hot week at the end of the latter month. Above 80 per cent. of this mortality from diarrhoea occurs among infants, and it is impossible to tell how large a proportion of these may be directly traced to actual neglect, without taking into consideration the habitual and ignorant disregard of precautions of diet and cleanliness which indirectly help to produce this annual waste of life, varying only with the summer temperature.

In addition to this excessive death-rate from diarrhoea, the country was affording during the latter part of the quarter from what it is fashionable now to call a "wave" of scarlet fever, which has increased in intensity in the month that has

elapsed since the end of the quarter. In London, Liverpool, Hull, Leeds, and Sheffield, the epidemic still rages severely. During last quarter, in addition to these towns, Reading, Shrewsbury, West Bromwich, Dudley, Epsford, Oldham, Rochdale, Haslingden, Blackburn, Scarborough, Durham, Chester-le-Street, Tynemouth, and Monmouth, were all visited by this epidemic with more or less severity. Such visitations are the warnings that town populations from time to time receive of their unsatisfactory sanitary condition. The tendency of the present day is fortunately to pay more attention to these warnings than was usual even in the earlier part of the present century.

RAMSGATE RETOUCHEE.

No reminiscence, historical or topographical, polemical or political,—nothing of the kind. Our purpose is rather suggestive of an architectural, sanitary, or social future, than a memorial past. We went to Ramsgate, not as a fashionable visitor would go to it or its seaside neighbour Margate; we went on business, and in availing ourselves of the occasion we have done a little additional duty, we hope, in opening our eyes and looking right and left. Ramsgate has improved a little of late years on both sides of the town. On the East and West Cliffs the march is observable, but much remains to be accomplished before we can write with truth that its improvements are of a very remarkable or attractive character. The approach to the town from the London, Chatham, and Dover station, is most unsightly, and far behind the time. To use a trite but true expression, you enter the town by a system of "shooting round corners" and angles, to the danger of a break-neck by a personal or vehicular collision. Leaving the gateway of the railway station, you wind round to the left by the pier gates and enter Harbour-street, a dangerous and narrow defile or gut. If you subtract the footways from the street here, you have only the breadth of one carriage-way, and this breadth of roadway continues, with but slight difference as far as convenience is taken into account, for about two hundred yards or more. Correctly speaking, this narrow passage continues the entire length of that part of the street between the upper and lower pier gates. Through this narrow wind-pipe of Harbour-street the traffic between the railway station and the town has to be forced through. To make matters worse a pile of obstructive buildings, called the Harbour-master's Offices and Dock Stores, are back point blank against the roadway, casting a pall of darkness on the row of dwellings and shops opposite, and injuring the trade of those whose fate it is to be located in this spot. As we are improvers and not Vandals, we must persevere, after due inspection, condemn this pile of harbour buildings, which project out into the roadway, and vote at once for their speedy removal. As the young local board is beginning to look alive in general, and as an agitation is at present rife in the town, having for its object the transfer of the powers vested in the Harbour Board itself, we deem it the more opportune to have our say.

From inquiry and examination of the matter in dispute, it strikes us that the harbour interests could be managed better by the local board of the town than by the present body. The obvious improvements required in the Ramsgate harbour of refuge could be carried out simultaneously with the town improvements.

Connected with the harbour management there is one great evil,—the dues levied off small craft or vessels driven in by stress of weather, are altogether too exorbitant for the freight of many of these vessels. Numerous vessels are obliged through necessity to seek the harbour of Ramsgate as a place of safety in times of storm, to escape certain shipwreck and destruction on the Godwin Sands. A new scale of dues, according to the tonnage of the vessels obliged to enter, should be struck; for certain we are that many of the poorer or smaller and weaker craft lie out at sea at the risk of life, from inability to pay the dues at present demanded of them. It is the intention of the local board, we believe, to carry out an accommodating scale of dues suited to all classes of vessels as soon as the powers now possessed by the Harbour Board are vested in other hands. We believe the Board of Trade are in favour of the transfer as soon as certain requirements are proved and conditions agreed to.

Proceeding along the quay, or street facing

the inner basin of the harbour, the traffic is obliged to make a circuit, owing to the circular sweep of the basin that bounds it. Now, on mature consideration, we would go in boldly for cutting off this segment of the harbour simultaneously with the removal of the present harbour-master's offices, thereby widening the whole length of the thoroughfare from the entrance to Harbour-street to the approaches of the West Cliff, or even further. Filling in this cut-off slice of the inner basin and making it into a roadway would not cause the slightest inconvenience, and it would be a very unappreciable loss to the harbour interests compared with the vast benefit that would be conferred on the town, and the inhabitants and shopkeepers along the quay. A glance by those who live upon the spot must convince them that a wonderful improvement to the roadway by which the central portion of the town is reached would be effected. At present the small coal-craft that unload on the quay are in too close proximity to the line of houses and shops that flank the opposite side of the roadway, and in summer time the nuisance of the drifting coal dust obliges the hotel-keepers opposite to shut down their windows to escape the injurious effects on their rooms.

On the East Cliff some easy and ready approach from the town is required, as at present there is no carriage-way except from the more elevated part of the town. The sands are reached from the East Cliff by a long stone stair; but vehicular traffic, or parliamentary locomotion even, exists not from this point. Plans, we believe, have been suggested and discussed, but what they have been like we know not, but this we do know, that we cannot discover any terrible engineering difficulty in the way of creating a tolerably easy approach by a roadway, beginning near the pier-gates and gradually rising to the level of the cliff head at Augusta Stairs. The house property perched up there, and now gradually extending onwards to and beyond St. Lawrence-on-the-Sea, will never become payable or eligible property until an easy line of communication is effected from the lower part of the town direct. The new roadway might commence, as we said, springing from opposite the entrance to the pier-gates, and sweeping up the cliff inside the railway station. If nothing but a solid roadway was intended, the cut away chalk and flinty shingle of the cliff would help in the formation, and would tend to lighten the cost of construction; but if the London, Chatham, and Dover Railway Company, as they evidently would, enter into this desired improvement, which would be to their benefit, a double purpose could be obtained by the outlay of a little more capital. Then, instead of a solid roadway, the structure might be arched, thereby forming underneath a requirement which the present railway company is without,—good stores, or series of stores. We have indicated enough on this point by way of suggestion; and if the matter be taken up with spirit the difficulty of a ready approach from the lower part of the town to the East Cliff will vanish.

On the East Cliff a terrace of new houses of Gothic character was recently built, from the designs of Mr. E. W. Pugin. Four of the houses have been thrown into each other and converted into a hotel, which is called the Granville. The terrace is not yet finished. The buildings are attractive in appearance, and the intention will no doubt be in part realised in the summer months, during the flock of visitors to the seaside. The Granville and the Granville Hall will doubtless get a fair share of patronage. The site chosen is a good one, and it is presumed that the fare and conduct of the establishment will be on a scale commensurate with the respectability it aims at. Some new buildings are and have been erected lately at the head of the town, on the West Cliff side, and some neat and handsome villa residences are to be soon also.

Ramsgate wants a proper market; the present niche in the wall is an ugly patch upon the eye of Ramsgate. This little less than "cobler's stall" ought to disappear, and a proper and commodious market take its place. A few public fountains would be an improvement in the summer time; and if Ramsgate has any pride or commendable ambition, perhaps she can remember some celebrity of Kent or the Isle of Thanet worth erecting a statue to. There are many other things that Ramsgate might do for itself; but we hesitate to hend its back by increasing its burden. Public parks, we suppose, are in the distance, and museums, public

libraries, and workmen's institutes. A great deal of money is expended in Ramsgate by visitors during the summer months. We should like to see a portion of this money practically utilised in the improvement of the town; and if those who reap the richest harvest were to consult with those who desire to improve the town, a greater yearly influx of capital would be the result. Money spent in adorning and improving the town would bring good interest.

In taking our leave at present of Ramsgate, we must note that we have omitted to speak of a few other matters that will "keep," ancient dredging and dredging machines, ship building and repairs; the mud bank in the harbour, and how to obviate it.

To Ramsgate we bid once more adieu. On the score of health command us to it. While its white cliffs are visible, and the ocean winds and waves sweep across the Godwin sands, there will be hope and health for the town, even though no social or sanitary inspector be visible to the naked eye.

ART IN THE NORTH.

On Thursday, the 4th, a *conversazione* was held by the members of the Alnwick Mechanics' Institution, in the Corn Exchange of that town, when the Duke of Northumberland presided, and presented the prizes and certificates of the successful students of the science and art classes recently established in connexion with it. Mr. Adam Robertson, secretary, read the annual report; and the co-secretary, Mr. Heatley, announced the names of the students who had distinguished themselves by winning honours. The Duke addressed the large audience on the advantages of a scientific and artistic education, and also gave a few words of encouragement to each pupil on handing him his prize.

There was an exhibition at the same time of objects of Local, European, and Oriental art and interest, all loans from residents. In the course of the evening four short lectures were delivered, the first being on Palæontology, by Mr. George Tate; the second, on Galvanism and the Electric Telegraph, by Mr. W. J. Carr; the third, on Art, by Mr. F. R. Wilson; and the fourth, on the Chemistry of Respiration, by Dr. MacVail. We subjoin some of Mr. Wilson's remarks on art:—

Overlaying all the surroundings and conditions of our everyday life is a beautiful presence, for which we all feel more or less appreciation. The more cultivated or refined our minds, the more enjoyment comes to us out of this beautiful presence, and the more indispensable it is to us. I need not say, as you have the programme before you, that I allude to art, that mixture of fancy and skill, expressed in graceful forms and harmonious colours, which can make a bare wall as beautiful as a woman's song, a bit of iron-work like a poem, a bit of wood-work like a psalm, a common mug or dish worth a king's ransom. The wall, and the iron, and the wood, and the clay are all good in themselves; but this overlaying with fancy and skill,—in very much the same way as we read the chapters of the Ark of the Covenant were overlaid with silver and the pillars with gold,—makes them infinitely more precious. I must preface the few remarks I am going to make concerning local illustrations of this captivating, elevating, enchanting Art.

Whatever we do for art in the way of cultivation, art does for us tenfold, nay, a hundredfold. It is true man has lived upon earth without art, but only in a dumb and blind kind of way in holes and caves,—a kind of way that we should look upon now as insufferable squalor, not to be thought of after dark without a shudder. Directly he emerged from his cave and resolved upon a better habitation, art came to him, and has aided with him ever since, brightening his days, beautifying his home, decking out the companion of his life, woman, and in nearly every conceivable particular putting a new and pleasant face upon things. Under the auspices of art, the rude weapon of the successors of the cave-dwellers was perfected in form and ornamented; the rude clay urn that was to be buried in the grave of the warrior's child, or wife, or in his own, became graceful and rich in fanciful markings; and step by step, and in the course of one generation after another, the gear of humanity put on an aspect of loveliness. In our own district, to which I wish especially to confine myself, we have remains of this first impulse to art in the sculptured rock-markings which Mr.

Langlands first observed on the Berwick hills, and concerning which Mr. Tate has subsequently told us so much and so well. We have, too, remains of very early habitations, mere circular stone huts, grouped together, sometimes, within circular ramparts; and occasionally we come across stone cists, or places of sepulchre of these ancient people, as, recently, at Forest-gate and on the banks of the Cawlish Burn; indeed, it would be difficult to pick out a district possessing more remains of this period. As century after century left these primitive days farther and farther in the past, nearly everything man took into his hand became a vehicle for the expression of artistic feeling; and at last we find him, in different countries, huddling palaces and filling them with sculpture, paintings, mosaic work, carvings, superb furniture, vessels of silver and gold enriched with enamels and precious stones, and utensils, even when destined for the commonest purposes, treated artistically. I include the meanest utensils of common life in this category advisedly, for there are, at the present day, in the museum of the Hôtel Cluny, in Paris, many examples of the most delicate taste lavished on humble objects. I may mention, as an instance in point, a gridiron of French Medieval workmanship preserved there, which is every bit as dainty and elegant in its design, relatively to its purpose, as a piece of point lace. Goblets, basins, plates and dishes, all the splendid array of vessels that stood upon the dresoir or upon the banquet-table, we might expect would exhibit artistic beauty, as, indeed, they did; but this instance of art adding grace to usefulness is a convincing homely proof, I think, of my assertion that art will do a hundredfold more for us than we can do for it.

In the comparatively early days of humanity, art seems to have figured long with the slant-faced Egyptians on the banks of the Nile, helping them to adorn their slant-faced temples and tombs; and thence to have passed to the banks of the Euphrates. Traces of palace after palace rising terrace upon terrace, and temples and tombs of a colossal size, give us a grand idea of the people who could compass them. Then we find art tarrying on the banks of the Tigris, and on those of the Ganges, receiving a distinctive treatment on each, and ultimately thriving in Europe. The Greeks, Etruscians, and Romans, all courted its bright presence, developed its adaptability, and basked in the beauty they enjoyed under its auspices. In the course of the many centuries in the various lands I have thus lightly touched upon, there were vicissitudes in the fortunes of that portion of mankind that inhabited them, that ever and anon were felt by art,—seasons of depression, "dark ages," if you will; dynasties decayed, desolation ensued; faith and even clime endured some changes; but through good and ill fortune art stood forth or stood by as occasion required, ready at all times to be taken up where it was put down, and to be the same solace and incentive to our race that it was from the beginning. In what we call the middle ages many noble, generous, exalted inspirations were expressed in mosaic work, ivory carvings, wood carvings, goldsmith's work, stained glass miniatures, illuminated missals, enamels, and in ceramic wares, as well as in the grandest of all the arts, architecture, and its most sumptuous decorations, painting and sculpture. Thousands of brains were at work in these various departments; some in the convent cell or cloister, as in the case of Fra Angelico, the sweetest, purest, and most pathetic of Italian painters; some in palaces, as in the case of the Duke de Medici, who spent ten years in perfecting ceramic treasures; others in ordinary studios or ateliers; and others, again, like the indomitable Bernard Palissy, with scarcely a roof over their rough workshops. And in the present day we have this mass of brain-work to look back upon. It is our heritage: left us by those who have gone before, for our guidance, consolation, emulation, and intellectual delight.

Having thus outlined the commencement and progress of art,—having seen how the ancient Egyptians gave one aspect to it, the heeded Assyrians another, the Persians, Hindus, Greeks, Etruscians, Romans, others, all distinctly marked by national characteristics,—we will turn our attention to the existing examples of ancient and modern art in this locality. Just as the annual overflowing of the Nile, Euphrates, Tigris, and Ganges influenced those who lived on their banks, and caused them to build protecting dykes and embankments, and form canals, so the situation of Northumberland, on the borders

of a hostile country, called into requisition buildings that were necessary for the protection of the inhabitants. The great Roman wall was the earliest comprehensive work to effect this object. This great stone barrier stretching right across England from sea to sea, with towers at intervals sufficiently close to admit of easy communication, and garrisoned stations here and there along the line, was as great a work in its way as we need wish to see. It answered its purpose when it was made, and there are fragments still standing, climbing over steep hills and dipping down into narrow dells, to teach us what may be done by courage and determination even in the teeth of hostilities. The Saxons availed themselves of its protection, consequently had no occasion for a similar defensive work; but we have remains of their architecture in this neighbourhood, as in the tower of Whittingham Church, and the chancel arch of Bolam Church, from which we may assure ourselves that art was not lying by in their days. And when we come to the gallant Norman and Edwardian castles, and the stately, I might almost say plucky, pele towers, or stone sentinels, scarcely anywhere across the border country more than three miles distant from each other, and the great grave-looking bastle-houses, we find the necessity for defence from powerful aggressors again giving a distinctive character to the country-side. Just as much as the poem of Chevy Chase stands apart in all literature, and its wailing notes in all minstrelsy, do the buildings of this tract of country stand apart in all architecture. Many of the churches belonging to this old time, as will occur to most of you, partake of this same stately, self-reliant, defensive character, their towers being either veritable pele towers, as at Ancofort, or capable of fortification, as at Warkworth, Egingham, and Long Houghton. Our own old parish church, St. Michael's, you will, doubtless, call to mind before I can do so, has a peculiar turret at the south-east end, for some defensive purpose, that places it at once apart from the open unquestioning edifices of more midland counties. Norman window openings were small everywhere, but here they were smaller still, those in the church at Rock, measuring only a few inches in width. In Plantagenet times the same care, scrupulous, expectation, and preparation, were practised and made evident. In the days of the house of Lancaster, we may see by our grand, stern, rugged gateway into the town, Bondgate tower, every precaution against surprise and assault was still taken; but in Tudor times, we may read on the old sunnily, mullioned, stone façades of houses frequently built in the form of a wing to some of the older peles, the need for constant alertness was passing away. Thus the art of the district tells us its history.

Coming now in my rapid survey to examples of modern art in the district, we approach the great centre of order life, Alnwick Castle. The admirable Duke Algernon, in turning the great fortress into a treasure-house of art, and founding a temporary school of art within its precincts, planted the germ, as it were, of an extended appreciation of the fine arts in this locality, the first fruits of which have called us together this evening. Within the walls of Alnwick Castle, workers in nearly every department of art may now see specimens of their work, executed with a skill and fancy, that will make them impatient of less excellence in themselves, and so spur them on to greater efforts. The paintings,—I am now speaking of the frieze and other decorations, not the pictures,—the sculptured chimney-pieces, the carved ceilings, doors, and window panels, the inlaid dados, the Venetian mosaic pavement of the so-called guard-chamber, the opus Alexandrinum in the chapel, the ivory inlaid fire-place in one of the chief chambers, the smith's work, too, can be either examined usefully as lessons in different branches of art, or studied together as most sumptuous groupings of colour and forms. Those who look upon the interior of Alnwick Castle from a pictorial point of view will be reminded of the brilliant colouring of Titian, and of the soft blending of the delicate hues of his rival, Giorgione; and those whose artistic experience does not enable them to form such associations of ideas cannot but be impressed with its richness, beauty, and harmony. It will be, as I have said, a spur to others, an incentive to some, a consolation to more, and a repression to those who need repressing. Indeed, we can scarcely place a limit to the influence for good of such examples. Even the most simple-minded matron, whose

mind has never considered a question more artistic than the creation of an apple-dumpling or a roley-poley, will go home to her kitchen or parlour, after she has been permitted the privilege of seeing the art-treasures of the castle, less content with her four bare walls, and more ready to welcome the first approach of art. The flatirons and lucifer match-box will no longer appear suitable decorations for her chimney-piece; and she will be brought to think, "Wor Geordie might larn worse things than a bit draing."

SCHOOLS OF SCIENCE AND ART.

Technical Education for London.—A meeting of "Masters, Wardens, and Clerks of the Livery Companies of the City," has been held at the Mansion-house, under the presidency of the Lord Mayor, to discuss the best means of diffusing technical education among the working classes of the metropolis. His lordship stated that he thought their course should be, first, to adopt a resolution declaring the necessity and importance of technical teaching, and then for each company to discuss in its court the money assistance it would be prepared to give. Their grants might spread over three years, and at the end of that time they might severally and collectively review results. Mr. Buckmaster, from the Technical School at Kensington was present, and would give them some practical hints as to the best course to be pursued. It was indispensable that something should be speedily done, as manufacture after manufacture was leaving this country, and being taken up in foreign countries. Mr. Campin corroborated the Lord Mayor as to the rapid improvement which was perceptible in foreign work, but feared that no Government interference would be sufficient to educate the British workman up to the Continental level. It was for the Livery Companies to show themselves fit for their position, by taking the lead in such a movement. He suggested that the day's work should be to appoint a committee to draw up a plan. Mr. Sheriff Vallentin proposed a formal resolution, declaring it expedient that the Livery Companies should forward and prosecute the object of technical education. The proposition was carried unanimously. Mr. Buckmaster said that the proper system of technical education would be to teach theory in the schools, and to have practical application to the workshops. He exhorted the Livery Companies to undertake the good work, promising them that they need fear no injurious rivalry from South Kensington. The real danger to British work lay in the desire to produce it cheap, and the Livery Companies should seek to make it good. Their great object should be to obtain good teachers, and for that purpose examinations should be held and premiums should be given, as was at present done by the School of Science and Art. The proceedings terminated with the appointment of a committee, and a cordial vote of thanks to the Lord Mayor, now Sir J. C. Lawrence, bart., M.P.

The Coventry School of Art.—The annual meeting of this school has been held in St. Mary's Hall, under the presidency of Lord Leigh. There was a large attendance, which included a great number of ladies. The committee report that they are again enabled to show evidence of satisfactory progress,—an equal number of medals, one additional Queen's prize, a larger number of successful candidates in the examinations, a similar recognition of the merit of the master, and a higher general position for the school. An increased number of students have attended, the numbers being 189, against 165 last year. The awards of the Department of Science and Art are about the same as in 1868. The number of students who passed the March examinations in freehand, model, geometrical, perspective, and mechanical drawing was 48, against 35 last year; and the successful papers were 66, against 50 last year. The funds are now in a sufficiently satisfactory condition to allow an expenditure for paving the passages to the school-yard. Among the drawings of the year much good and careful work was pointed to in the report. The ribbon designs are in better taste, and better adapted to the manufacturers' purposes than formerly. The designs for watch-cases were fully up to those of former years.

Scientific Education in Newcastle.—A public meeting, convened by the committee of the Newcastle Mechanics' Institution, has been held in the lecture-hall of the Institute—under the presidency of the mayor—for the purpose of

considering the position of Newcastle with respect to technical education, and the propriety of further developing the Government scheme for scientific teaching, through the means of evening classes, for artisans.

It was unanimously resolved,—

"That the state of general, and more especially scientific, education among our working classes is behind the requirements of the times, which, in order to make progress therein, demand theoretical knowledge as well as manipulative skill."

"That in the opinion of this meeting the Government scheme for scientific education among the artisan class population is well adapted to promote that end."

The Abingdon School of Science.—The third annual public meeting of this school has been held in the County-hall. The attendance was very good, especially in the reserved seats. The mayor occupied the chair. He said it was with great pleasure that he saw the advance science had made in Abingdon. It had been very rapid, and in a short time he hoped to see greater results achieved by the members of the classes.

The third Annual Report of the Abingdon Science Classes" was read. It stated that while the success attained by the students has not been so high a standard as compared with the results of the two previous examinations, still there has been no diminution in the number of pupils, and their labours have been rewarded with a fair share of success, so that the progress has upon the whole been satisfactory. The school commenced its session of instruction in November last, having three classes, viz., animal physiology, inorganic chemistry, and physical geography. No less than fifty students entered their names to study in these subjects, and of those forty-four presented themselves for examination in May last; of this number twenty-six passed, viz., twenty males and six females—but of these only one was entitled to take a Queen's Prize. Twenty passed in animal physiology, five in inorganic chemistry, and one in physical geography.

The Keighley School of Art.—The annual meeting of this school has been held. Advantage was taken of the meeting to present to the students the prizes. A public tea meeting was held in the school-room, at which the pupils and their friends, upwards of 100 in number, were present. After tea, a meeting was held in the Mechanics' Institute, which was presided over, in the unavoidable absence of Mr. Isaac Holden, by Mr. J. Kitson, jun., of Leeds. During the year the school has made considerable advances in every direction in spite of the disadvantage under which it labours, for want of more commodious premises. Some new members have been received, the attendance has been better, and some higher class work has been executed. Mr. A. Stevenson, of Leeds, the master of the Keighley School, read the report of the Keighley Art Night Class for the year to March, 1869. The report spoke of the continued success of the school. There has been a great increase in the number of pupils who had entered the class, and never before had the nightly attendance been so good as during the twelve months since last annual meeting. I find, said the reporter, from the school registers, that 76 pupils entered during the year 1864, 92 in 1865, 67 in 1866, 72 in 1867, and 96 in 1868. The success of the students in the annual examinations has had the effect of popularising the class, and I am glad to state that the great proportion of the new entries consists of young men. The following table is given in the report, showing the successes in the various grades of examination for the last four years:—

	1866.	1867.	1868.	1869.
National awards (exceptional).....	1	1	0	1
Prizes for drawing (3rd grade).....	6	0	6	8
Drawings, "satisfactory" (3rd grade) 10	18	15	14	
2nd grade prizes.....	8	11	12	9
2nd grade passes.....	10	11	15	34
2nd grade "full certificates".....	1	6	5	5
Totals.....	38	60	53	71

"I will now conclude this report," said the master, "by drawing a parallel between what we are and what we confidently hope to be. We are at present a night class, divided possession of little better than a large collar, with no convenience whatever for pursuing the higher branches of art instruction. . . . If we can do so much as a night class with such inadequate premises, what may we not do when, in a new and commodious building, with every requisite apparatus and sole possession, we rejoice in the name and advantages of a school art? That position is awaiting us, we are happy to know. It has been pleasant during the last year to watch the slow and certain ascent of the walls of that building which is to be the future seat of our operations, and I do not think I am trenching on prophetic ground when I say that our next annual meeting will be held within the walls of that fine building. A few weeks ago I went over the building with Mr. Swire Smith, and was highly gratified with my inspection. The school of art portion, in which we are more immediately interested, is admirably adapted for its purposes, it having been the care of the Building Committee that every part of the structure should be exactly

suited for its peculiar uses. The school consists of three large class-rooms and an exhibition-room or picture-gallery, and will accommodate 150 students at one time. It is proposed to fit up these class-rooms with every appliance necessary for art study, so that when finished it will be a model school of art, and will want nothing but an influx of good students into its rooms to make it a successful school of art."

Northampton School of Science and Art.—The public distribution of prizes awarded by the Science and Art Department to the successful students of the science and art classes in connexion with the Northampton Museum has taken place at the town-hall. The certificates awarded to the students by the Society of Arts were also distributed. Sir Henry L. Dryden, bart., presided, and distributed the prizes and certificates. There was a very large attendance of the public. The report of Mr. C. Loes, science teacher, stated that—

"The subjects studied during the past winter were acoustics, light, heat, magnetism, and electricity. The classes were well attended, and the following successes were attained:—

First-class certificates.....	16
Second-class certificates.....	40
Third-class certificates.....	33

In the elementary and advanced papers in acoustics, light, and heat, the average monthly attendance was 45, and in electricity there were two failures in all, out of 70 who sat for examination.

In the elementary paper on magnetism and electricity the number of failures was large. It was a paper of exceptional difficulty, one that required good reasoning power; and this opinion, I have good reason to believe, is shared in by teachers and students of all other classes in that subject in the United Kingdom.

Classes are already formed for the ensuing winter in—Magnetism and Electricity; Acoustics, Light, and Heat; Animal Physiology; Inorganic Chemistry; and Physical Geography.

130 names are enrolled on the registers."

The report of the Art Classes stated that

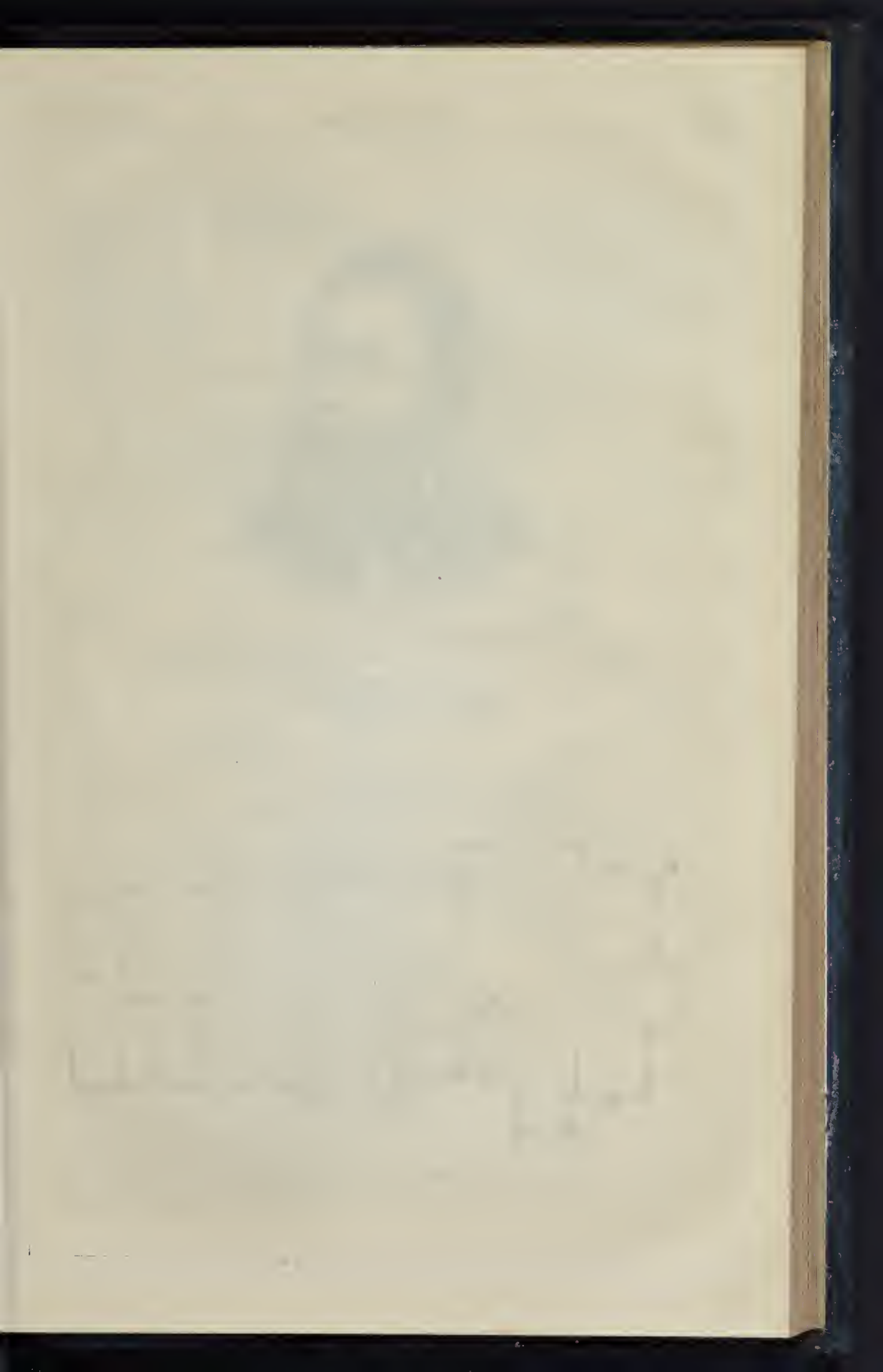
"During the past year 67 students have joined the class—50 males and 17 females, their ages varying from 12 to 16. The average monthly attendance is 42. The greatest number attending during one month was 49 in November last, and the smallest number in one month was 20 in September of the same year. The average attendance for each evening during which the class has been open is 12 males and 10 females, making a total average of 22. The actual number of students who attend at the present time is 45. The favourable progress of the class is attested by the results of the examination held, under the direction of the Science and Art Department, on the 9th and 10th of March last. . . . There is no lack of power or of inclination on the part of the students; but the inconvenience of the present class-rooms, in which a concentration of light, which is essential to the lighting of a cast, cannot be obtained, is a serious prohibition."

The chairman urged attention to the subject of new rooms for the classes, as well as for the museum.

The Sheffield School of Art.—The annual meeting of the subscribers to this school has been held; Mr. F. Thorpe Mappin in the chair. The reports and treasurer's accounts having been read and adopted, a vote of thanks was given to Mr. Soumes, the head master, for the efficient manner in which he had conducted the school. The report of the council stated that the school, both with regard to numbers and proficiency, shows an improvement upon the last year. The statement of assets and liabilities showed a balance of 186l. 1s. 6d. in the hands of the treasurer.

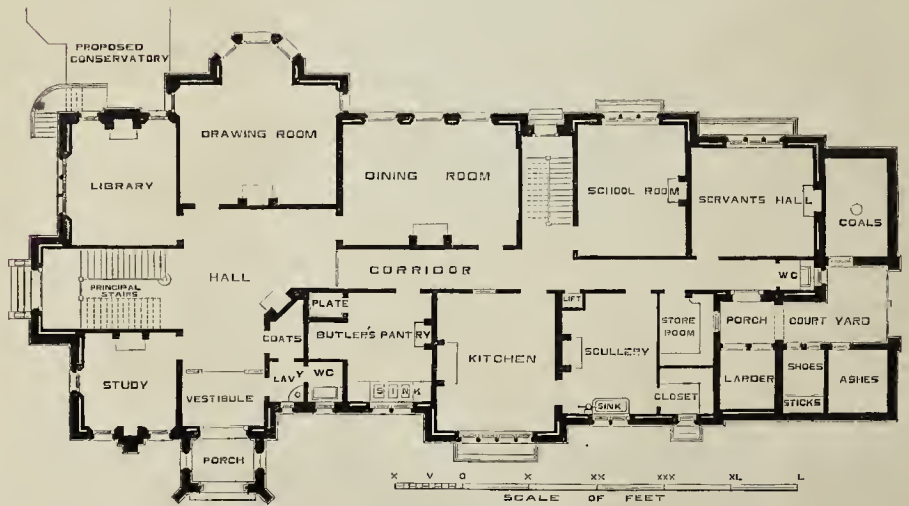
The Cirencester School of Art.—The committee of this institution have just associated with themselves new members to fill up vacancies which had occurred in their number. The school continues to be self-supporting, commencing a new year at Midsummer last with a balance of 2l. 12s. in hand, against 1l. 8s. 6d. brought forward. Some popular lectures in connexion with the school will be given through the aid of Professor Church in the course of the next two months. It appears that the public fails fully to appreciate the advantages offered by the school; and the young artisans are not so alive as they ought to be to their own interests in availing themselves of the benefits to be obtained there at the very small charge of something under 2d. a lesson.

Sea Water in London.—Various schemes have been proposed for supplying London with pure sea water. A company has just been formed, which has for its object to supply the metropolis with pure sea water at so low a rate as to bring it within the reach of all. It is proposed to draw the water from the sea daily by means of a steam-pump; then to filter it, and remove sand and other mechanical impurities. The company undertake to deliver daily, Sundays excepted, one gallon of water, at the rate of 1s. per week, and five gallons for 4s. 6d. For the present the delivery is limited to the western parts of London.





SIR M. DIGBY WYATT,
Architect of the India Office Court, Whitehall.



WOODBURN, NEAR DARLINGTON.
Plan of Ground Floor.



WOODBURN, NEAR DARRINGTON.—MR. G. GORDON HOSENN'S, ARCHITECT.

WOODBURN, NEAR DARLINGTON.

WOODBURN, the residence of Mr. Theodore Fry, is situated close to the town of Darlington. Commenced about two years since, it has just been completed, from the designs of Mr. Geo. Gordon Hoskins, architect. The building occupies a most picturesque site, surrounded by pleasure-grounds of moderate extent, and commanding an excellent view of a beautiful wooded valley banking the river Tees, with the Cleveland Hills in the distance. The external walls and dressings are of stone from the Dannhoushe quarries, near Staindrop, Yorkshire, the former being faced with coursed and gauged pitched blockers, with played beds and vertical joints, and backed with rubble-work to the width of 15 in.; then occurs a cavity of 2½ in., and a half-brick lining walled in cement, the lining being tied into the stonework by means of wrought-iron ties. The shaft to the oriel window is of red polished Aberdeen granite; the slating is of Bangor slates, with every alternate four courses cut to pattern, and it is furnished with iron cresting. The principal corridors and offices on the ground floor are laid in somewhat of the English baronial style, and has a good effect from the entrance-hall. The joiners' work is of wainscot, oak, St. John's pine, and red deal, the latter being stained and varnished.

The contractors for the various works are as follows:—Masonry and brickwork, Mr. Thomas Robson, Darlington; carpenters and joiners' work, Mr. John Windale, Darlington; slating, Messrs. Wharton, Darlington; plastering, Mr. R. M. Ormrod, Carlisle; plumbing and glazing, Messrs. W. Russell & Sons, Darlington; painting, &c., the late Mr. W. Garthwaite, Darlington; carving, Messrs. Farmer & Brindley, of London. The cost may be considered as between 2,000l. and 10,000l.

THE MARQUIS OF BUTE ON ART.

THE Marquis of Bute presented the prizes at the Cardiff art and science classes, and in the course of his speech observed,—"There is an immense quantity of early-woven tapestry, the plunder of private houses at the time of the revolution, to be had in France,—so much so, that, being at Lyons the other day, on the occasion of a great public festival, I found the streets in many places hung all along with old tapestry, sheets, and flowers. This woven tapestry came in about the time of the Renaissance, to fill the place of the embroidered hangings of the Middle Ages, and later we find the place of the simple hangings supplied by stretching stuff, generally silk damask, tight over the walls, as is common in large London houses at the present day. This has a richer effect than paper, but besides the great cost, which must forbid it, as well as woven tapestry, to many, it shares with woven tapestry the great defect of losing the grace and elegance of the older hangings. It is to the old practice of hanging the wall with stuff rather than painting or papering it that I would particularly direct your attention. Pictures can very well be hung upon it. Paper, however, is now come to be the most ordinary covering for our walls. A person whose taste will make careful choice of a paper whose pattern does not offend, as many do; and in this matter Pugin lays down the same rule as regards carpets, viz. the avoidance of anything like an attempt at the representation of shade or perspective. In accordance with this, we shall find that the best patterns are those after the manner of diaper-work, both for effect and for propriety, and a little care will select those whose colours and patterns are most suitable, considering the use to which the room is to be turned, and the colour and kind of the rest of the furniture. Concerning ceilings, the rule of adhering to the useful only, and not of forming structures specially for the purpose of ornament, is fatal to many flat plaster ceilings, which are simple screens to hide the construction. The plainest good ceiling is of wood, and, as in panelling, the natural advantages of the wood should be carefully utilised. The effect of an open wooden ceiling thus produced is very pleasing. If further ornament be required, the wood should be painted in an effective manner, which ought to be light and more brilliant than the objects below. We find that the decoration of old wooden ceilings was frequently, as in nature, a powdering of stars; and heraldic decorations are very well adapted, by their brightness, to occupy this position. In large roofs, where carving has

been added, the effect has been splendid in the extreme. Where convenience has made it desirable to have a flat roof, this has been made the object of some beautiful decoration. I think I am not mistaken in saying that a magnificent specimen of this treatment remains in Peterborough. I am altogether innocent of an extraordinary scheme which has recently been attributed to me for filling the windows of a certain cathedral with plate glass, to be further disfigured by having coats of arms cut on them, like the so-called decorations of some decanters and wine-glasses."

HUNGERFORD BRIDGE AND WELLINGTON-STREET VIADUCT.

THE select committee on this proposed undertaking have issued their second report. In it they say they have come to the following resolutions, which they have agreed to report to the House:—1. That no general control over works and buildings in the metropolis constructed under parliamentary sanction, is at present vested in any government or public officer or department, other than that now exercised by departments of Government over the buildings that are under their superintendence. 2. That the design and execution of unsightly works, such as the Charing Cross Railway Station, and the railway bridges across the streets and roadways of the metropolis, as well as the juxta-position of the London, Chatham, and Dover Railway Bridge, and the New Blackfriars Bridge, across the Thames, may be reasonably attributed to the fact that railway, gas, water, and other public companies, or corporate or chartered bodies, have not been hitherto required to deposit any designs, elevations, or models of projected works or buildings when applying for Parliamentary powers. 3. That having regard to the improvement of the metropolis, and as a security against its further disfigurement, it is desirable that whenever any public company or corporate body applies for Parliamentary powers to enable it to execute any works, or erect any buildings in the metropolis, or to raise money for the execution or erection of such works or buildings, it should, before coming to Parliament, deposit at the office of the Commissioners of her Majesty's Works and Public Buildings plans and elevations, designs or models, in like manner as railway companies are now obliged to deposit plans and sections at the Board of Trade; and the committee recommend that the standing orders be amended, so as to effect this object. 4. That the First Commissioner of Works should report to Parliament on such plans and elevations, designs or models, and that such reports should be referred to the committees on private Bills in the same manner as the reports from the Board of Trade and Admiralty are now referred.

JOHN HOPE, ARCHITECT.

At a meeting of the Liverpool Architectural Society,

Mr. Parslow read the following notes relative to John Hope, an architect formerly practising in Liverpool:—

In a recent copy of the *Builder** the names of the architects are given who competed for the Dublin Exchange, one hundred years ago. Comments are made upon a few of these names, and it is added, some knowledge of others may be possessed by readers of the *Builder*. I possess information with reference to the Liverpool firm whose name appears fifth on the list; my authority is my brother-in-law, who is the great-grandson of Mr. John Hope, the senior member of this firm.

John and Samuel Hope were sons of John Hope, architect and builder, of Millington, Cheshire. John was born in the year 1734, and Samuel in 1737. The father was architect to the Earl of Stamford and Warrington, at his seats, Dunham Massey and Enville; he was also the architect of Knutsford, Cheshire, and of several residences in that county. His sons succeeded to his business, and came to Liverpool about the year 1763. Samuel died shortly after engaging in the competition referred to. John's books, still in existence, which were most elaborately kept, show that he was engaged frequently by the Corporation of Liverpool. He prepared plans for the rebuilding of St. Nicholas' Church, for which he was paid, but there is no record of

his continuing the work. He was also engaged as architect in the erection of St. Paul's Church, though there is no record of his preparing plans for it; some interesting particulars, however, appear. For attending Parliament and conferring upon the Church Bill he charges the Corporation one guinea per day for forty-five days. He also charges an annual salary of 52l. 10s. for his services for several years in building the church. The name of Timothy Lightholler, who prepared the accepted design for this church, is often mentioned by John Hope in his books. He was further engaged in making additions to St. Domingo House, the residence, for a short period, of one of the royal dukes. Among other clients appears the name of her Grace the Dowager Duchess of Athol; also the Leigh family, of High Leigh Hall, Cheshire; the Huddells, of Ince; and the Earles, Stanley, and Booths, of Liverpool. Wavertree Church was also built by him. A most complete diary still exists of his private and business matters, which he kept every day for twenty-eight years. An entry is made in his day-book relative to sending off his drawings for the Dublin Exchange; but his diary does not commence until the year following. A note worth mentioning also appears of an agreement to pay Mr. Byrom, his draughtsman, 40l. per annum for three years. This Mr. Byrom subsequently married his daughter, and succeeded to his business at the beginning of this century. The last entry in his diary was made fourteen days before his death, which took place in his seventy-third year, 1808.

In his diary are notes showing that he was an interested observer of political events, which subjects are also introduced into his business letters from the Earl of Stamford and Warrington; and a poem, expressing gratitude to God for Mr. Hope's recovery from a serious illness, written by one of three orphans whom he took under his care, represents him as remarkably benevolent and kind to the poor.

THE BRIGHTON BOARD RECOVERS ITS REASON.

It is with unusual satisfaction that we greet the official promise that the directors of the Brighton Railway "have determined upon carrying out a revised and reduced scale of fares, together with increased facilities for season tickets on and from the 1st of January next."

We have had, our readers will remember, repeated occasions to contend against the suicidal policy which is thus happily abandoned. The question is one which finds its place in our columns as a thoroughly building matter; in as much as it has directly affected the residential value of the property along the course of the line, and has led, not only to the discontinuance of building, but to the vacating of many residences actually let. The residential effect of a given line of policy, or even of a given system of management (or mismanagement), is a subject eminently interesting to our readers; and it is highly important to remark that it is precisely this aspect of the subject which, as we have ventured to anticipate, has at length proved decisive.

Week after week have those who studied the returns of railway traffic found them to give the same unmistakable indications. Increase of returns have been normal with all the lines running to London termini, with the significant exception of the London and Brighton railway. The opening of the new Midland line, indeed, has caused a division of the northern traffic, which would, without reference to this fact, present an anomaly; but the explanation, in this case, is fully adequate, and no such circumstance has occurred in the South-Eastern district.

We can well believe that the decision of the Board comes not one hour too soon. We do not mean too soon for the dividend to be carried in the first half-year of 1870, but for the sake of those who residentially interested. A suburban region, in every respect equal in its local advantages to the Sydenham and Norwood district, has long been left comparatively virgin, for want of that communication which is now one of the first requisites of civilised life. The swelling and wooded hills to the north of London, the line of eminences outward of our English Montmartres, have only very recently been approached by railway communication. The Great Northern and the Midland Railways are now aiding, or emulating, one another in supplying this missing link. The basin of the Brent, the country about

* See p. 781, ante.

Hornsey, Crouch End, Hendon, Edgware, Stanmore, is the best peopled and most rural district within an equal distance from town. There can be no doubt that, as in all previous cases, the builder will wait upon the engineer, and that the best energies of the Brighton Board, if directed to the encouragement rather than to the destruction of a residential traffic, will not do more than enable the south-eastern suburban district to keep pace with the growth of its diametrically opposite neighbour.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the meeting of this Society on November 3rd, the prize offered by Mr. Pictou for the best sketch-book made by students during the summer, was awarded to Mr. Oakley, a pupil of Mr. H. H. Vale. It was stated by the secretary that Mr. C. E. Smith, of Liverpool, sculptor, had volunteered his assistance for the present in giving instruction to the figure-drawing class in connexion with the Society, and that the class would shortly re-open. Mr. J. A. Pictou exhibited a great number of sketches taken during a recent tour in France, Italy, Switzerland, and Germany, and gave some account of the progress of architecture in the various localities he had visited.

At a special meeting of the Society, held on the 5th ult., a report of the sub-committee appointed to consider a proposed amendment of the Liverpool Building Act was read, and formally sanctioned by the meeting, and ordered to be forwarded to the town authorities. The main object of the report, which dealt only with a portion of the subject, was to recommend the appointment of a competent tribunal, or jury of experts, who should have power to adjudicate upon, and sanction a deviation from, the letter of the Act, as to construction of buildings, whenever such deviation could be shown to be desirable and advantageous to the public.

THE WHITECHAPEL SCANDAL.

SIR.—The newspapers have recently given prominence to the doings of the Metropolitan Board of Works and some of their officers with reference to the new street now being constructed by that Board from the end of the Commercial-road into Whitechapel; and at the meeting of the Metropolitan Board of Works on Friday, the 5th inst., the committee, to whom the inquiry was delegated with reference to the construction of the coal-vaults and sewer (being portions of the contract for the formation of the new street in question), brought up their report. The substance of this report is, "That the concrete over the coal-vaults, although it had been made two months, was not yet hard. That the third ring of brickwork over the same vaults was not built with whole bricks." This is the sum of their fault-finding. Now for their recommendation, which recommendation was adopted by the Board.—"That Mr. Cooper (the assistant engineer) is censurable for having neglected his duties in permitting a portion of the works to be carried out in the defective manner which an examination has disclosed."

Now, sir, I feel certain that the public are not aware that this gentleman, whom the committee have thought fit to thus hold up to public condemnation, is the same Mr. Cooper who carried out the construction of the new road leading to Victoria Park, called the Burdett-road; the Northern High-level sewer, extending from Old Ford, Bow, to Hampstead, nine miles in length; the Northern Outfall sewers extending from Old Ford, Bow, to the Thames, at Barking Creek, and 5½ miles in length, over a difficult district, and nearly 20 ft. above the level of the marshes over which it passes; the Northern reservoirs in the marshes, covering an area of 10 acres, the whole vaulted and groined; the Northern Low-level sewer, from Abbey Mills, Stratford, to Tower-hill; the Abbey Mills Pumping Station and engines, the largest work of the kind in the world; the Isle of Dogs branch of the Northern Low-level sewer, a portion of which is laid in the bed of the Thames, 35 ft. below high water; and the Thames Embankment, between Waterloo Bridge and the Temple Gardens, the cost of the whole of which is over two millions of money, and have been constructed without failure or settlement of any kind.

I fear the enumeration of all these works may be tedious, but as I believe it to be only an act of justice to a badly-treated public servant, I

must ask you to allow me to state the works which were under Mr. Cooper's supervision at the time this so-called neglect of duty is charged to have taken place:—Isle of Dogs and Blackwall sewer in connexion with the Millwall Dock (case of arbitration); construction of siphon under entrance to London Dock; construction of Low-level sewer from Tower-hill to Blackfriars Bridge; new street from the Mansion House to Earl-street; Thames Embankment from the Temple to Blackfriars Bridge; also all the work under contract over the district (the whole of East London), of which he has the general supervision. These works, I am told, when finished will cost over a quarter of a million of money. As I have the above facts from a member of the Board, I think I am justified, with your permission, in laying them before your readers. The moral of the matter is this, that although you, as a public servant, may have for years discharged most important duties in the best possible manner, you may at any moment be held up to public censure over a paltry and contemptible work, such as the construction of an ordinary coal-vault, at the instigation of men who have no scientific or practical knowledge. Should men's reputation be thus frittered away?

T.

COTTAGE HOSPITALS.

Dean Forest.—Lady Danraven has added another institution to the village of Clerwell. She has provided schools for the instruction of its children, a reading-room for its young men, and a church; and now she has erected a cottage hospital. It is completely furnished, and replete with all proper appliances, while it is even architecturally an addition to the appearance of the village. Mr. J. Middleton, of Cheltenham, was the architect. The hospital has been opened by Lady Danraven, in a quiet manner.

Oswestry and Ellesmere.—The chief stone of a cottage hospital has been laid, with Freemasonic ceremonial, at Oswestry. The new building is situated in the Welsh Walls, about 150 yards from Willow-street. It is being erected from the designs of Mr. W. H. Spaul, architect, Oswestry. It is to be built of red bricks relieved by white Ruabon bricks. The windowsills, heads, and other stonework are from the Cefn Quarries Company. The roof overhangs at the eaves and gables, the latter having ornamental large boards. The whole design is of a Gothic character; but from the smallness of the amount to be expended on the building there will of necessity be very little ornament. The internal arrangements comprise, on the ground floor, general dining-room, 21 ft. by 13 ft. 6 in., nurses' sitting-room, surgery, bath-room, kitchen, larder, scullery, wash-house, coal-house, wood-house, ashes-cellar, &c., as also two wards, one to accommodate four beds, and the other two, allowing about 1,400 cubic feet of air to each bed. To these there is a nurses' kitchen attached. The first floor, which is approached by a wide staircase, has the same ward accommodation as the ground floor, a sitting and bed room for the matron, as also a bedroom for the head nurse, and store-rooms. On the upper floor are four large bedrooms for the nurses. Messrs. W. Trow & Sons, of Wednesbury, are the contractors for the whole building.

Melksham.—The Cottage Hospital here having now been in existence for more than a twelve-month, the committee have issued their first report, which is of a gratifying and encouraging character. The hospital is a small house, fitted up with the necessary beds, baths, and appliances. The expenses of fitting up the house and furnishing it, amounted to 621. 17s. 3d., which amount was raised by donations. The year's expenditure has been 841. 18s. 10d., and the number of patients who have benefited by the outlay has been thirty, of whom twenty-two have been discharged cured, four have been relieved, two discharged as incurable, and two remain under treatment.

Mr. W. T. M. Torrens, M.P., lately delivered a lecture on "The Relief of the Sick in the Hospital and the Home," in which he pronounced strongly against hospitals, and in favour of home treatment. The *North Londoner*, in commenting on this, asks how a case of typhus or amputation progresses under a busy wife and rascally children, or in a house packed with inmates from attics to basement? Mr. Torrens, however, also advocated "cottage hospitals" where the sick could be seen by their friends, and

which could be cleaned and disinfected with ease, and closed when unnecessary. The movement to set up such hospitals ought to be more generally encouraged than it is.

THE GREAT AROID.

THE *Builder* was one of the first to record, some six months ago, the discovery of a new and gigantic plant in the Chontales Mountains of Central America. As was then surmised, the plant has proved to be new to science, and in the words of Dr. Berthold Seemann, its discoverer, it is "the largest Aroid, both in leaf and flower, of which we have any knowledge." A few weeks after the paragraph appeared in this journal, two living roots were received in this country, and in a couple of months one of them shot up a leaf-stalk 7 ft. high, and 9 in. in circumference; the plant grows with great rapidity—several inches during a single night. Your readers will remember that it produces but a single leaf; this leaf, however, measures, including the stalk, some 14 ft. in length, with a corresponding spread. After this solitary, gigantic leaf has died down, the single flower (which is 2 ft. in length) appears. A living plant in the possession of a London plant-merchant was recently exhibited at one of the meetings of the Royal Horticultural Society, and was awarded an honorary distinction, and the critical parts of the flower are preserved in spirits at the British Museum. Referring to the leaf-stalk, Dr. Seemann writes, "It looks like a huge snake (beautifully mottled) standing bolt upright at the command of some Eastern charmer."

Dr. Seemann has, in the last number of the *Journal of Botany*, dedicated this giant Aroid to the conductor of this journal, under the name of *Godwinia gigas*, for several reasons which he is polite enough to print, but mainly because of early active support of window gardening in the metropolis, which "has spread amongst even the humbler classes that taste and love for plants without which, after all, the race of botanists would soon become extinct."

How strong this love of flowers now is amongst some of our working classes is well shown by Mr. Turner, the great nurseryman of Slough, who, in recently speaking of potted and carnations (to the growth of which there is very little encouragement given about London), said, he could not supply the demand there is for them, "especially amongst the colliers of Merthyr Tydfil and similar places." W. G. S.

WOODEN RAILWAY VIADUCTS IN YORKSHIRE.

ON some of the early Lancashire and Yorkshire lines of railway the bridges and viaducts are composed of wood, and the company now seem to be in a fair way of knowing the results attending such a state of things. The Huddersfield town council are just now taking an active and determined part, trying to compel the Lancashire and Yorkshire Company to reconstruct or render safe the viaduct on the Huddersfield and Penistone Railway, which was erected in 1848. The structure, which is composed of wood, crosses a deep valley at Denby Dale at a point where it is about 400 yards in length and 109 ft. in height. The timbers of which it is composed are crossed and bolted together, but it is held to be insecure. Several representations have been made to the company and to other parties, and at the last meeting a communication was read from Captain Tyler, who stated that a total weight of 167 tons 17 cwt. had passed over it, and had caused such vibrations as was usual at such a height, and he was of opinion that the speed of trains passing over the structure ought, as a matter of precaution, to be reduced considerably, as he understood that trains passed over it at a rate of from forty to fifty miles per hour. He suggested that a masonry viaduct should be erected, but as this would take between two and three years, he suggested that the utmost attention should be paid in the meantime to the timber-work. The company have just made another great improvement on another part of one of their busy lines where the chief of the bridges were of wood, and had become rickety with use. The North Dean Branch Railway, from Halifax, which was constructed in 1844, has been redoubled, and was opened a fortnight ago. The whole of the wooden bridges which spanned the Calder,

the canal, and the roads along its route, have given place to stone and iron erections. We may also mention the fact that the wooden bridge which crossed the river near Horbury, between Barnsley and Wakefield, has been replaced by a permanent erection.

PROPOSED NEW STREET FROM CHARING CROSS TO TOTTENHAM-COURT ROAD.

At a meeting of the vestry of the parish of St. Anne, Westminster, held on Thursday, the 4th inst., a plan for a proposed new street from Charing-cross to Tottenham-court-road, which had been proposed by Mr. Henry Bilgoad, the St. James's representative of the Metropolitan Board of Works, was taken into consideration, and the vestry unanimously resolved to support the proposed improvement by every means in its power. The suggested improvement would go through an inferior class of property, and would include in its length the roadways on the east side of Leicester-square and the west sides of the New National Gallery and Trafalgar-square, and would be the greatest possible convenience to the inhabitants of the metropolis. The estimate of the cost was stated to be about half a million. We have before now pointed out the necessity there is for a street precisely in this direction.

MEMORIAL TABLETS.

I LATELY observed in your columns a proposal to place tablets, with inscriptions thereon, on the buildings in towns with which some interesting event, or the residence of some celebrated person, or historical suggestiveness is associated. At a late meeting of the Local Board of Health in Leicester, the question was discussed, and by common consent, a small sub-committee was appointed to report thereon. It has occurred to me to ask whether you or any of your readers would inform me what kind of tablet it is desirable to select for the purpose had in view. Should it be of iron, wood, or stone? Should the letters stand in relief, and be painted, or how preserved? What kind of letter should be selected? Any hints on these heads would be acceptable.

MEMORABILIA.

* * * The Society of Arts decided on using terra-cotta tablets; but, up to this time, we have reason to believe a very successful result has not been arrived at by the makers. The question is well worth discussion.

ST. ANDREW'S CHURCH, STEYNING, SUSSEX.

This church, a magnificent fragment of a rich Norman church, has lately received some considerable improvements in parts where modern work had made it bare and out of keeping with the ancient work. The Norman part of the church, of which many illustrations have been published in "Rickman," "Britton," Parker's "Glossary," &c., is the nave of four bays with its aisles, and with the transverse arches at the end of the nave eastward. Originally the Norman nave must have been three or four bays longer westward; but after the suppression of the Alien Priories, of which this was one, early in the fifteenth century, the nave was shortened and closed up at its present length by a wall of Perpendicular architecture, with a large central window of that style, and a two-light window in the end of each aisle. The transverse arches already spoken of at the east end of the nave and aisles originally opened into the transepts, the church being cruciform. This form, however, it lost in the reign of Queen Elizabeth, when the old chancel, transepts, and central tower being pulled down, a small chancel and aisles were built where the central part of the cross had been, and the old material also furnished means to construct a very massive tower at the west end of the nave. This Elizabethan chancel was particularly bare and rude in its architecture, and within a few years much has been done to redeem its incongruous appearance. A fine east window of three lancets, with masonry of good character and internal marble shafts, was inserted about six years ago, and filled with stained glass from Messrs. Hardman. Now, at a cost of near £500., an arcade, also in the Early English style, has been added across the east end under the window, and returning along the sides of the chancel. This work has shafts of polished Ippelen marble carrying arches of Bath stone, the backs of the

panels lined with alabaster. The three central arches at the east end form a reredos, and their panels are filled with painting on tile by Messrs. Simpson, of London, with borders of gold mosaic. The alabaster panels are relieved by incised ornaments and lines, and the whole of this work, with the marble and masonry, has been executed by Mr. Houghton, of Great Portland-street, from the designs of Mr. Gordon M. Hills, architect.

WORKMEN'S INTERNATIONAL EXHIBITION, 1870.

A PUBLIC meeting has been held in the New Quebec Clubhouse, to promote the objects of this Exhibition. The chair was taken by Archbishop Manning. A deputation from the council of the exhibition attended. Letters were read from the Duke of Norfolk, Lord Petre, Hon. A. Herbert, and others, expressing their inability to attend, and their high appreciation of the objects of the Exhibition. The first resolution, "That this meeting approves of the objects of the Workmen's International Exhibition, 1870, and will support the council in carrying them into effect," was proposed by the Rev. W. H. Freemantle, seconded by Mr. Daniel Grant, and carried unanimously. The second resolution was moved by Mr. Paterson, and seconded by Mr. Bullock, "That this meeting considers it of great importance to the success of the Workmen's International Exhibition, 1870, that new inventions exhibited should be protected from piracy, and that all operations under the patent laws should be more simple and less expensive, and this meeting authorises the chairman to sign a petition to Parliament, prepared for the purpose, on behalf of the meeting." This resolution was carried by acclamation.

THE FORTHCOMING INTERNATIONAL EXHIBITION.

The following tenders were sent in for the execution of the works to be erected by her Majesty's Commissioners for the Exhibition of 1851 at South Kensington, for the forthcoming Annual International Exhibitions.

For the main building:—

Cubitt & Co.....	£72,200 0 0
Holland & Hansen	71,800 0 0
Mansfield, Price, & Co.....	70,900 0 0
Smith & Co.....	68,407 0 0
Lucas Brothers	68,335 0 0

For the conservatories over the arcades:—

Holland & Hansen	£5,940 0 0
Smith & Co.....	5,896 0 0
Mansfield, Price, & Co.....	5,550 0 0
Cubitt & Co.....	5,750 0 0
Lucas Brothers	5,698 0 0

Messrs. Lucas's tenders were accepted.

The tenders for the terra-cotta decorations were as follow:—

Pulham	£3,867 0 0
Gibbs & Campling	3,748 0 0
Wilson & Co.....	3,700 0 0
Blanchard, Sons, & Co.....	2,860 0 0

Messrs. Blashfield, Cliff & Son, Lindsay & Anderson, and the Coalbrookdale Company sent in tenders for portions of the terra-cotta. The Messrs. Blanchard will execute the work.

ENGINEERS AND COMMISSIONS.

SIR,—There is a great outcry from the engineers against the insinuations of dishonesty contained in the Governor-General of India's order; and, perhaps, with some reason; though, as I think, the protestations are overdone.

No one doubts that such men as Mr. Hawkshaw and Mr. Gregory are the very soul of honour, and that there are not a few members of the profession worthy to be ranked with them; men of spotless integrity, who would scorn to stoop to the meanness of accepting fee or bribe in any form, and who would resent the offer as the greatest insult that could be done them.

May their tribe increase! But are all engineers, because they are engineers, immaculate? And is there any better ground for believing there are no dishonest engineers, than there is for believing all merchants honourable, all contractors scrupulous, all lawyers disinterested, or all grocers innocent of adulteration? Will Mr. Hawkshaw throw his weight over the entire brotherhood? Unless common talk and rumour be entirely groundless, gifts of money, of pianos, of carriage and pair, of gold watches, and other valuables from contractors to engineers are not

unknown transactions. Matters like these are of all things the most difficult of proof, as it is the interest of both sides to preserve absolute secrecy. I should like utterly to disbelieve such rumours, and believe every man with whom I dealt as engineer or architect to be impregnable to such approaches, or even to *undis personal influence*, and as impartial and upright as those ought to be "whose decision is to be final and binding on all parties." One excuse for contractors, perhaps, is that while the engineer or architect is thus supposed to be a disinterested party and sole arbiter, he is employed or retained by *one only*, and may be supposed to favour that one, except there be some counterbalancing influence.

Every honest man must wish all conditions and customs modified, or done away with, that hinder perfect equity for all parties. "A fair field and no favour" is our motto. Further, engineers should not issue specifications unless all conditions are meant to be insisted on. The reverse is very frequent, and is a great evil, but I cannot now enter into particulars.

IRON-WORREER.

THE INDIAN GOVERNMENT AND THE ENGINEERS.

At the first ordinary general meeting of the Institution of Civil Engineers, held on Tuesday, the 9th inst., Mr. Gregory, the president, on taking the chair, set forth the steps with reference to this matter that had been taken by the council, and with which our readers are acquainted. At the close of his remarks he said:—

"If in the engineering profession, as in others, there may be instances of secret dishonesty, such acts are not recognised as legitimate. The profession has not sought to parade its purity before the world, but the members of this Institution know how carefully any one believed to be unworthy of it has been excluded from this representative body of the profession; and although happily such instances have been very rare, and such practices are from their nature most difficult of detection, yet steps have before now been taken, which have issued in some persons charged with misconduct ceasing to belong to the Institution."

THE FIRST VACCINATOR.

RECENTLY, in company with some friends, I drove from Swanage to the village of Worth (Dorsetshire), to look at the old quaint church which has lately been restored; and, in walking through the churchyard, read the following, which, at this particular time, when vaccination is so much talked of, I thought would not be amiss in your columns:—

"Benjamin Jesty, of Downshay, died April 18th, 1816, aged 78. He was born at Yetminster, in this county, and was an upright, honest man, particularly noted for having been the first person known that introduced the cow-pox by inoculation, and who for his great strength of mind made the experiment from the cow on the wife and two sons in the year 1774."

F. A. B.

CASES UNDER THE METROPOLITAN BUILDING ACT.

HOT-WATER PIPES.

A SUMMONS under the Building Act, issued at the instance of Mr. Edward Power, District Surveyor of the southern division of the city of London, against Mr. H. Watts, of 1, Water-street, Blackfriars, hot-water apparatus manufacturer, was heard at the Guildhall Justice-room before Sir Benjamin Phillips, on the 26th of October.

The infringement of the Act complained of was that the defendant had fixed a system of hot-water pipes at the premises of Messrs. Welch, 44, Gutter-lane, Cheapside, without having given the district surveyor notice of his intention to commence the works, as required by the 38th section of the Act.

The facts of the case were as follow:—

Messrs. Welch employed a builder, Mr. W. Brass, to make certain considerable additions to their warehouse, and the legal notice was given by him before commencing the works. This notice, however, gave no intimation that hot-water apparatus was to be put up in the new additions, nor was Mr. Brass employed to execute the works. Mr. Power surveyed the additions made by Mr. Brass, from time to time, during their progress, and on the last occasion of his visiting the premises he discovered the hot-water apparatus complained of, which was then completed, and consisted of pipes for conveying hot water laid on to or within 4 in. of the wooden flooring, and connected with a system of pipes which warmed the old premises. This work being contrary to the statute, which enacts section 21, rule 4, that "no pipe for conveying hot water shall be placed nearer than 3 in. to any combustible materials," the District Surveyor gave notice to the defendants to amend within forty-eight hours, which he neglected to do.

The District Surveyor proved that but for the accident of his visiting the premises after the completion of Mr. Brass's contract, he would never have known of the pipes having been fixed.

Mr. C. H. Clarke appeared for the District Surveyor, and Mr. Luxmoore, instructed by Messrs. J. & C. Robinson, appeared for the defendant. On behalf of the defendant it was contended, first, that the notice given by Mr. Brass, as it had the effect of making the District Surveyor aware of the fact of the hot-water pipes having been fixed, was a sufficient compliance with the Act; and, secondly, that Mr. Power having served the defendant with a notice to amend, was a waiver of his right to summons for neglect to give notice.

The Alderman, after consulting with Mr. Martin, the chief clerk, decided that the notice given by Mr. Brass was not sufficient, and that the District Surveyor was entitled to a notice from the defendant; and that the notice to amend, served by the District Surveyor upon the defendant did not preclude him from summoning under the 38th section, and fined the defendant 40s. and the costs of the summons.

ARCHITECTS AND CONTRACTORS.

SIR,—Sir W. Tite, M.P., in his opening address at the Royal Institute of British Architects, is reported by you to have said:—

‘The Builders’ Association had brought under their notice the very grave question of the relations between builder and architect, and had referred upon them a great many changes. His own experience supplied him with the fact that engineers never allowed any interference between themselves and their contractors or builders, but kept the whole of the affairs in their own hands, *as well as the settlement of questions of payment.* For his own part, he would say it had always been his own practice that he would not be interfered with *as architect.* If the work was ill done he interposed, or if the materials were bad he sent them away. But he had never, in any of his buildings, interfered with questions of payment to builders, and they would accept of him as the expression of a somewhat long professional life. It appeared to him, when a man had done his work, if any question arose out of the contract, he had the greatest right in the world to represent himself or to be represented in the matter upon a reference to indifferent parties. He was glad to find the Institute had come to the same conclusion, viz., that the architect should be the sole dictator in matters of architecture and building, *without interfering with the agreement between the employer and the builder as to the amount to be paid for the work.*’

This, I, as a contractor, think to be a very important step in the right direction, viz., of emancipating contractors from the oftentimes tyrannical and generally one-sided conditions of contract, which in recent years have become so usual as to leave contractors only Hobson's choice,—work on those conditions or not at all.

All trade transactions ought to be conducted on equal terms as mutual benefits, with no greater obligation on the one side than on the other, and all the degrading, rigorous, and unreasonable conditions with which contractors have been too often shackled done away with. I am convinced better work would be done under a régime where credit and honour were the stimulants than is done under the *in terrorem* system now in vogue, which puts a premium on cunning and craftiness, and discourages conscientious work for honour and credit's sake.

A CONTRACTOR.

COMPETITIONS—ONCE MORE.

So long as there are two cats in Kilkenny, so long will there be feline war. So long as there are two living architects, there will be competition. Disappointment, therefore may fret and fume and complain. The pages of the *Builder* may be, and will be occasionally, the vehicle of their groanings over disappointed hopes; but still they will compete again and again, led on by the *ignis fatuus* Chance, and under the old and tattered banner whose inscription is *divinopro spero.* It is only when the *spero* is extinguished with the *ignis* that they will give in. We have seen the fluttering moth,—poor foolish thing, say we,—again and again since his wings at the alluring flame, forgetting that to him the flame is not all brightness and dazzling joy.

What feature of competitions is there which has not been a hundred times decry'd? Unfairness, meanness, paltry favoritism, unjust weighing of merits, clever chicanery, juggling of picture lore, false estimates, local influence,—what more? Have not these been exposed enough? Yes, verily; and yet, if a gas balloon of competition be sent up, a score of gaping eyes are soon upon it, a couple of scores of eager runners set off in pursuit, whilst all the while the guiding genius who holds the silver strings will drop it down just where he will. The burned child dreads the fire, but the disappointed, wronged competitor is not so warned; and if he be what matter? there are a hundred others willing to try, to them, new experiment, as to whether they really can, Salemadder-like, play with fire and not be burned.

Practically, honourable men of position in the professions by and by will only enter limited competitions; they will mutually agree that the conditions of the race be fair and honourable before they run; it will be considered as vain to be joined in general throngs, and they will shun the ‘all comers.’ Thus, in time it will be found that open competitions exclude acknowledged and experienced worth, and those who desire to have the labours of others for nothing will find that they hardly get the money's worth. I would suggest that it be matter for thought, and thereafter organization, that men of acknowledged standing do not compete, except on the ‘limited’ principle; that the lowest premium shall be adequate to cover the actual cost of the labour performed; and the second shall be a sort of medium reward of merit; and the first shall in every case entitle the winner to the execution of the work on the usual professional terms. If the premium

is to be merged into the commission, be it so; we will not quarrel about this. I wish these men ‘all comers’ were shut to anger. I am not a disappointed competitor. Only once have I competed, and I came in first; therefore I am free from bile; but I have read so much, and heard so much, that I subscribe myself undeviatingly as one who heretofore will only enter a

LIMITED COMPETITION.

THE THAMES EMBANKMENT FOOTWAY.

LAST month a correspondent, through your pages, drew attention to the bad condition of the flagging of the footway of the Thames Embankment. The contractor acknowledged the justness of the remarks, and offered some reasons for the faults complained of. Since then, the footway has got worse and worse, the outer portion, as was pointed out, becoming frightfully broken up by settlement. The Metropolitan Board has been obliged at last to send men to lift and relay the flagging. Last week and this I visited the Embankment, and saw for myself the ‘cause and effect.’ The flagging on that part of the roadway next the river wall is laid on solid foundation, being over the arched subway; but the other half, being laid on a foundation of loose filled-up matter, composed of hard mud, rubbish, and river sewage, has gradually sunk from the commencement.

Added to this, the circumstances of the railway cutting in progress beside is another cause of the breakings and flagging. An inspection convinced me that the work of repair and relaying on the present substratum, is little better than labour in vain. In one month it will be quite as bad as before. Indeed, portions of the repaired work, which were only repaired the day before, had sunk again. The labourers employed, on being spoken to, acknowledged this, and joined in the opinion that what they were doing would have to be done over again. The circular-rim railings that protect the trees here in every instance sunk, and the lower connecting rail, which should stand up 6 in. over the grating, that is supposed to be level with the flagging (but which in no instance is) is in many cases resting on the said grating, having sunk in the general settlement.

It occurs to me that more labouring men, with picks and shovels, are not the class of skilful hands that are required for lifting and relaying the flagging. I should prefer to see a somewhat more masonic touch about the work.

KEEN'S CEMENT AND PAINT.

SIR,—I want some of your readers to tell me what I had better do under the following circumstances:—I have painted one side of a newly-made wall with Keen's cement. The paint was mixed,—red lead, turpentine, and gold size: it peels off. I should be glad to know to prevent it.

A PAINTER.

LOOSE SLATES.

I EXERCISE in the *Builder* that a new patent tile is introduced. Time there was an improvement; the old irregular tiles are without fastenings save the mortar; say, save the mortar! Many come to grief by wind and rain; it is surprising that they last so long as they do. When they slip it often gives us the benefit of a glorious rain. Slates are secured by nailing, but the oxide, slip, slide off, and away. A gentleman told me that he had narrowly escaped from being killed by a slate falling off a high house; it grazed his nose and cut partly through the toe of his boot. A short earthenware screw and a little white lead instead of nails would be a lasting improvement. At present our roofs are insecure; the very pigeons can peck holes in our water-tights. R. T.

HOW MUCH IS A BUSHEL?

SIR,—Replying to a building-man's letter in the *Builder*, twenty-one bushels undoubtedly make a cubic yard; but a load of lime is not necessarily a cubic yard. Lime is sold in London by the yard, but in many parts of the country by the chaldron, which is thirty-six bushels. I never before heard of any specific quantity of lime being called a load, as is the case with timber.

The statement that sixteen bushels of cement make a cubic yard was, as I said in my letter, a copy from Mr. Tall's pamphlet of the proportions of materials to be used in concrete walls; in fact, I find it takes on an average twenty-three bushels (so called) of cement to make a cubic yard, the two-bushel sacks containing from half a gallon to half a bushel less than the pressed quantity. This I have tried repeatedly, and with cement from various manufacturers.

Does cement compress when in sacks with being loaded into carts or railway trucks? if so, what is the essential correct proportion of cement should be used, would there be no diminution of strength as there is of bulk?

The clearing up of this doubt would possibly be of service to others as well as myself. W. W.

ALLEGED INFRINGEMENT OF COPYRIGHT.

At the Westminster Police Court last week, Messrs. Holbrook, of the Manor Ironworks, Chelsea, were summoned for infringement of the Copyright Act in casting some safety iron panels for staircases from the registered design of Messrs. Bates, Hayward, & Co., of London, and Rotherham. Mr. Newman, solicitor for the defendants, pleaded guilty, but said the firm had acted in perfect ignorance of going wrong. The model of the panel, then referred to, was sent to them from Messrs. Trollope's for casting, and had it been marked plainly ‘R. D.’ with the letter and number of the design, as required by law, the firm might have represented would never have been placed in this unprofitable position. Instead of this there was a mark so obscure that it escaped attention altogether, and not knowing it was registered the firm made a casting from the model. When it was discovered an offer was tendered to make the fullest apology and pay costs. Mr. G. H. Hayward produced the registered design of an ornamental panel, to show that the work was properly marked, and Newman also produced the casting stated to have been

sent by Messrs. Trollope to defendants, and did not deny that they had the same stamp, as they were not aware they were registered.—Mr. Arnold, after inspecting both, said that although the statute imposing the penalties for violation of the registered design of a notice was the words ‘with any knowledge,’ it might be implied that he could not punish a man for an infringement of something he was ignorant of. The mark on the casting produced by Mr. Newman was so obscure as to require a very close examination to distinguish it. He therefore did not consider this a case for any penalty, and should only require defendants to enter into their recognisances to appear for judgment to be called upon. If the casting and sale of the copies of the design were discontinued, they would hear no more of the matter.

THE LAMPS IN PALACE YARD.

SIR,—May I be allowed, in your columns, to set the attention of Mr. Barry to a point which has been remarked upon not only by myself? I allude to the unnecessary accumulation of lamps in the neighbourhood of New Palace Yard. Whether seen under the light of the sun, or in reflection from so many glass globes is extremely unpleasant, or by night, when the glories of old Vauxhall (with its thousand additional lights) are recalled, the present arrangement detracts very much from the dignity of the building. Is there any insuperable objection to the whole of the clustered lamps being lighted every night, and so dispensing with at least every other single lamp upon the railing round New Palace Yard, to its great architectural improvement, and to the removal of almost all the lamp-posts here, and about the other enclosures? A. P.

COMPENSATION CASES AT LIVERPOOL.

MR. J. J. ASTON, assessor, and a jury, in the sheriff and jury's room, St. George's Hall, have decided the amount of compensation to be given by the corporation, who seek to acquire some freehold property belonging to Mrs. Ann Pickles, Field-street, Everton. Mr. G. Goffey appeared for the claimant, and Mr. Rayner, town-clerk, for the corporation. The property in question is required by the corporation for improvement purposes, and consists of Nos. 25, 27, 29, and 31, Cazneau-street, being at present occupied as a public-house, a baker's shop, and private dwellings. For the claimant Messrs. Joseph Prattan, Birkenhead, and Messrs. Thomas, White, and Kilpin, Liverpool, all experienced surveyors and valuers, were called, who estimated the value of the property at about 2,355*l.* Mr. W. H. Weightman and Mr. William Cuswath, for the corporation, valued the property at 1,412*l.* and 1,257*l.* 10*s.* respectively, after deducting what they considered the corporation were entitled to as credit for a vestment for 1,500*l.* Another case of compensation for compulsory sale of property for town improvement purposes has been settled. The property belonged to Elizabeth Haughton and others, and is in the same line of improvement as Nos. 73 and 75A, Rose-place, and No. 1, Cazneau-street. The amount claimed as compensation for the portion of the ground actually required by the corporation was, we understand, 1,000*l.*, but the claimants are said to have been content with a sum rather more than half of that amount.

“COMMISSION.”

SIR,—The public press appear to have taken the case from the Government authorities in India in denouncing the engineering profession as corrupt. It will readily be conceded by members of my profession that the system of bribery prevails to some extent in our ranks, and that engineers who are engaged in business relations with contractors, are exposed to strong temptation, and unfortunately sometimes prove frail.

I do not justify the evil complained of on any ground, nor do I say that corruption can be justified by showing that the system of commission, bribery, or whatever it may be called, prevails largely in the transaction of every kind of business. The world knows, and our own members of Parliament have abused the trust reposed in them; and how a Governor General of India that shall be nameless, came to grief for making an improper use of his position. We need only look into the transactions of the commissariat department, and of other departments of the army, to rest satisfied that corruption is not a disease peculiar to engineers.

From that some few engineers are dishonest, it may fairly be asked why Government and the press should display such ignorance as they do in assuming that dishonesty is recognised by the profession, and that it is general. Both statements are grossly false, and have been rightly resented.

I will say that engineers are sometimes subjected to very strong temptation by their intercourse with contractors and the manufacturers of building materials. I have held office as engineer to a Local Board of Health, and have over and over again been offered what agents call *commission* on such orders as I might issue in this way. This is an evil that can only be remedied by engineers themselves, who should refuse to entertain any proposal whatever from firms who do their business in this way. The subtle and pernicious agent used by those people who have their hands in bribery is, that the local engineer is inadequately paid for his services; and thus being generally true, the weakest point in a man's conscience is assailed, and it is not much to be wondered at if he sometimes yields to the attack. A. J.

DISINFECTING OF THE THAMES.

SIR,—Blackfriars Bridge is opened,—a fine work for generations to admire. Some few yards westward is the antiquated and still beautiful and venerated Temple, in remembrance of the civility of past ages. Between the Temple and the bridge is a vast reeking gaswork. How our modern Temples allowed them to squat there is a wonder. Its proximity does not throw additional light on the ancient construction of the Red Cross Knights.

Perhaps it was to prove that they were asilent too, and would not flinch from a *reform*, however foul. Cannot the Colne Company be asked to have any? There is a probability of making gas from water. A.

ABOUT TOWN CLOCKS.

A CORRESPONDENT in a recent impression, who signs himself "Pothecary," has the amusing reason why the Galway Town Commissioners will not vote a farthing to put the town clock of "the City of the Tribes" in repair. It may be, as he states, that they do not want to know what it is. Why not know and mend (mend), not time, are two of the undeveloped resources of Galway, and it has not the least doubt but public spirit would run high enough in the councils of Galway-to-morrow to vote a statue to the man who would succeed in re-establishing a Transatlantic packet station there, although there is not so much corporate spirit alive among the members of the town council as would prompt a majority of them to vote even 5s. to put their wheezy and asthmatic town clock in repair. Galway, however, is not the only city in Great Britain that is careless about its town clock. A pretty extensive acquaintance with the principal towns and cities of the three kingdoms convinces me that there exists the same general reluctance on the part of town councils everywhere to keep their town clocks in repair. Whether the notices of important motions to be moved on a particular day, or the "motion for adjournment," as the clock strikes a certain hour on a Board day, has anything to do with the disarrangement of the time, or whether there is any occult manipulation practised by the finger of "a ghost in the bell" on the clapper for some wise and, I know not, yet I have often noticed that the sundial notices of many a stately church flung its shadows wider a-askance, and gave a far different tangent than the hands of the town clock did on its circle.

From the history of town clocks is written, there will be much valuable information imparted to the public. Many a barefaced lie will be revealed, many a broken promise will be heard of; many a speculohed resolution will be seen amended; many a diseminented fraud from the feild crypts of "the murdered innocents" struggled before and after their time, victims of abortion and miscarriage: each will tell its own tale, and the historian will be enabled to be particular as to dates, and the world shall understand.

I claim no intuitive perception or prophetic foresight in what I am about to state, but I will state my existence that the town clock is to be kept in repair, or to be kept in proper repair, as long as they are under the control of town councils.

Corporations, whether aldermen, town councillors, or mayors, presumptive or de facto (without any disclaimer I say it), are too much interested with the question of the spoils of office to bother their heads about what is merely a matter of time.

What customs and pastimes are there not yet in our midst! The clock is stopped on the wall in Ireland while the peasant corpse is waking; law and order are supposed to rule in our streets.

"While the watchman's loud snore breaks the peace that he keeps,
And the Lord Mayor (like the nightmare) on a full belly sleeps."

This is the age of brass and charitable donations: there could not be a more commendable object than to have a subscription opened to defray the expense of repairing our town-hall clocks throughout the kingdom. It would surely be a work of charity and kindness to relieve our sorely distressed civic magistrates and provincial grand oracles from the great burden they bear on behalf of saucy, undertaxed, and well-to-do bodies of ratepayers.

"Those that think should govern those that toll."

The poet was right, by Jingo, and he would have made the picture complete if he had added that the toiler should be permitted to give the whole of his time on tick, for the purpose of reducing the rates, and keeping the town clocks in repair.

TINKERER.

Milroy, for "Description of Apparatus for Excavating under Water, and for Sinking Cylinders." 11. A Telford premium, in books, to Samuel Foster Bidder, jun., for paper "On Machines employed in Working and Breaking-down Coal, so as to avoid the use of Gunpowder." 12. A Telford premium, in books, to Charles John Chubb, for paper "Coal-getting Machinery as a substitute for the use of Gunpowder." 13. The Manly premium, in books, to David Marr Henderson, for paper "On Lighthouse Apparatus and Lanterns."

RAILWAY MATTERS.

The New City Railway.—Cannon-street, Broad-street, Moorgate-street, Fenchurch-street, Ludgate-hill, and Smithfield, are all well provided for. The Tower is the very district now most in need of a station on the London railways, and the Metropolitan District line was projected as much for the accommodation of the Tower district as any other in the course of its route. Wanting the continuation from Queen-street to the Tower, remarks the *City Press*, the new line is in competition with half a dozen others that have termini in the City. But carry it to its proper destination, and it supplies the last needful link of the inner circle, not only opening the way from west to east, but from north to south also, east of London Bridge. The afterthought of the directors suggests to us that they know nothing of the new Thames Tunnel, or of the Fenchurch-street Station, or of the probable future of the Great Eastern, or of the success of the Metropolitan and North London lines. Public opinion must determine the matter.

The Trim of Trains in Transit.—We are glad to note that the daily press is at last beginning to see the truth of what we have always insisted on, that no system of ropes, wires, or electric or other telegraphing apparatus from one end of a train to the other would ever suffice fully to secure the safety of passengers, and that nothing but a guard's bent along the whole train would do. The *Pull Mall Gazette* says on this subject:—

"A train is a moving street, and it needs a policeman on constant duty. The ridiculous contrivances of which passengers are invited to avail themselves when they want assistance are worthy of a board from Bedlam. What should we say to a municipality which should tell us that if, when we were walking in the streets, we went sudden protection from robbers, all we have to do is to break the window of a house, and pull a handle inside, and then somebody will telegraph to the station to send assistance? Or what should we say of the coffee-room of an inn, in which, if we wanted the waiter, we had to throw open the window, thrust the body half out, and catch hold of a cord stretched along the wall overhead, and then keep signalling till the waiter saw which window he was wanted at, after which he would tell the landlord, and he would speak to the cook, and then the waiter would come to us? The arrangements sanctioned by the Board of Trade as sufficient for railway passengers are no whit more sensible. You are locked up for an hour with unknown strangers; if a lunatic or a robber stuns you with a life-preserver or strangles you with his knuckles, you are requested to break a pane and turn a handle or to open the window and clutch at a cord. If, as in America, or Switzerland, or Austria, the guard could walk down the centre of the train, his functions as a policeman would come into play, and misadventure would be deterred because they could not tell when he might show himself."

ACCIDENTS.

Welbeck.—The roof of a temporary workshop has fallen in at the new works at Welbeck, whereby a joiner was severely crushed, and several others slightly injured.

Brentwood.—An accident has occurred at a new walling in course of erection near the railway station by Mr. Shurmer, builder, London. Two men were at work under an archway, when the brickwork fell, severely injuring a carpenter. It is believed the frost succeeding the previous rains caused the building to give way.

Cirencester.—The Corn Hall has narrowly escaped destruction by fire. For several weeks past plumbers have been engaged in laying down lead on the roof, in the endeavour to prevent rain from coming through. Their work was not far from completion, and, as on previous days, they had a brazier containing fire on the roof. The men left for dinner, and soon after it was discovered that the roof was on fire. A flame of fire a yard long ascended from the top of the building. Water was speedily carried up on to the roof, and the fire extinguished. The fire had melted the solder round the bottom of one of the ventilators, and on it thus becoming loosened at the socket, the ventilator rolled down the roof and fell among the crowd. The origin of the fire may be attributed to the incautious laying of a heated tool, but more probably from the falling of a coal from the fire in the brazier drifted by the wind.

Darlington.—A strong hurricane has blown down a house recently erected in Cobden-street. The building was scarcely completed.

Newcastle-upon-Tyne.—For some time past a church, in the Decorated style, has been in the course of erection for the Primitive Methodist body on the north side of Cambridge-street, and at the junction of that thoroughfare with Maple-street. A strong north-west wind had been blowing all night, and about 10 ft. of the west gable fell with a sudden crash into the interior of the building, carrying away a portion of the joists and a large Derrick crane. At this time, two masons were in the act of getting their tools in the cellars, and they were buried in the falling debris. A few minutes later fifteen joiners or so would have been in the interior of the building engaged in raising the roof timbers. One of those buried was found to be dead, but the other was alive, though severely injured, and has since died. The size of the chapel is 48 ft. by 42 ft., and the height of the ceiling, 42 ft. 6 in. It is calculated to accommodate nearly 700, while the total cost of the erection will be something over 2,000l. Mr. Matthew Thompson, Newcastle, is the architect; and Mr. T. Hodgson, Gateshead, is the contractor for the mason work.

THE PHYSICAL COMMOTIONS THROUGHOUT THE GLOBE.

THESE commotions still continue; but the crisis would appear to have passed, if the diminished force of the various manifestations is to be trusted. There have, however, been recent earthquakes in Germany, as well as in Italy and France, and in Russia and India, as well as in Australia, and South and North America,—in short, over all the globe. Professor J. Phillips, of Oxford, in his recent book on Vesuvius, gives it as his opinion, which accords with our own previously expressed idea, that the earth is now passing through one of its periods of volcanic activity. How long that period may last no one can say. Of late the theory has been advanced that earthquakes are caused by the influence of the sun and moon on the internal waves of the molten sphere. A Mr. Rudolf Falb has lately written in defence of this hypothesis. Our own, as our readers know, is that there is a continued pressure of rotation upon the crust, from the molten mass of the interior, which molten mass we still believe in, with many geologists, notwithstanding recent opinions to the contrary. This pressure from within has crises, during which its centrifugal tendency to expansion rends the crust, and so relieves itself, while the rents are healed, as it were, by intruding molten matter, which solidifies and re-cements the crust. The rendings are greatest in the more equatorial regions, and just because it is there that the centrifugal power of the rotation is greatest; but by reaction of the pressure, earthquakes and volcanic belchings from the interior occur even in such circum-polar regions as Iceland, and in intermediate districts such as Italy.

It was the opinion of Mr. Hopkins, of Cambridge, or rather his demonstrated conclusion from elaborate geological and mathematical investigations, that the power which has produced all the great rendings of the earth's crust must have been a power operative upwards from within; and this conclusion supports our idea that they arise from the rotary pressure of the molten and more mobile interior upon the less mobile or less yielding crust of the sphere. If the power of the rotation tends to increase with the known diminution of the obliquity of the ecliptic, the circumference of the sphere must be expanding; or, in fact, the molten and encrusted sphere must be growing in dimensions; and how far this may go, or what may be its limits in the course of ages, it may be hard to say. We have already spoken of the instructive light which the state of the other planets, as to coincident rapidity of rotation, size, and levity, sheds on this question.

The tidal wave predicted by Lieut. Saxby, as a consequence of the co-ordinate position of both sun and moon, did not occur with us to the anticipated extent, at the time predicted, but there have been tides since 5 ft. higher than the dreaded one, and which have done much damage on the banks of the Thames from not being looked for. The Americans say that the tidal wave on their shores rolled in as big as 18 ft. at Newcastle, New Hampshire, where it ran 125 ft. beyond high-water mark; and elsewhere, as at the Bay of Fundy, there has been an enormous tide, with destructive floodings.

If the angle of the ecliptic was ever of much greater extent than it is, the most tremendous tidal waves of later ages must have been as nothing

PREMIUMS OFFERED BY THE INSTITUTION OF CIVIL ENGINEERS.

The council of the Institution of Civil Engineers invite communications on various subjects, such as, first, authentic details of the progress of any work in civil engineering, as far as absolutely executed (Smeaton's account of the Eddystone Light-house may be taken as an example); second, descriptions of engines and machines of various kinds; or third, practical essays on subjects connected with engineering, as, for instance, metallurgy. For approved original communications, the council will be prepared to award the premiums arising out of special funds devoted for the purpose, and they have published a list of subjects on which they specially invite communication. This, we believe, may be obtained at the Institution. The council have awarded the following premiums:—

1. A Telford medal, and a Telford premium, in books, to M. Jules Gaudard, C.E., Lausanne, for paper "On the Present State of Knowledge as to the Strength and Resistance of Materials." 2. A Telford medal, and a Telford premium, in books, to William Sherriff, for paper "On the Outfall of the River Humber." 3. A Watt medal, and a Telford premium, in books, to Zerah Colburn, for paper "The American Locomotives and Rolling Stock." 4. A Telford medal, and a Telford premium, in books, to Thomas Nesham Kirkham, for paper "On Experiments on the Standards of Comparison employed for Testing the Force of Steam." 5. A Telford medal, and a Telford premium, in books, to John Elliott, for "Description of the Low-water Basin at Birkenhead." 6. A Telford medal, and a Telford premium, in books, to Professor Ansted, for paper "On the Lagoon and Marshes of certain parts of the Shores of the Mediterranean." 7. A Telford premium, in books, to William Henry Wheeler, for "Description of the River Witham and its Estuary, and of the various Works carried out in connexion therewith, for the Drainage of the Fens, and the Improvement of the Navigation." 8. A Telford premium, in books, to James Robert Moss, for paper "On the Mauritius Railways." 9. A Telford premium, in books, to Iurine Bell, for paper "On Sinking Wells for the Foundations of the Piers of the Bridge over the River Junna." 10. A Telford premium, in books, to John

to what probably once occurred, when the world may have "stood out of the water and in the water, so that the world that then was, being overflowed with water, perished," as St. Peter so mysteriously tells us, in regard to the scriptural deluge.

CHURCH-BUILDING NEWS.

Ruswarp.—St. Bartholomew's Church has been consecrated and opened. From the slope of the ground a considerable elevation had to be given to the east end. This point the architect has met by carrying his plain wall up to the sill of the apse windows. The church comprises nave, apsidal chancel, organ-chapel, children's aisle, vestry under tower, and south-west porch. The period of architecture on which the design is framed is the Early Decorated. As the whole of the church has been designed by the architect with the idea of receiving colour decoration, the roofs of both nave and chancel have been boarded to the curves of the principal timbers. The eastern wall of the apse has been painted by Mr. T. H. Rendman, from a design applied by the architect. The carving has been executed from natural types by Mr. Rusby, of Sheffield, though sparingly applied, on the score of expense. The whole cost of the church will be about 2,000l. Amongst the donations are a clustered column, the gift of Mr. Charles Saunders; a font, presented by Mrs. Belchar; and a stained-glass window for the apse, given by Mr. John Corner, the manufacturers of which, Messrs. Mayer & Co., of Munich, could not complete it in time for the consecration. Mr. R. Robinson, of Whitby, has carried out the whole of the works, from the designs and under the superintendence of Mr. C. Noel Armfield, of Whitby, architect. Mr. Deana, of Leeds, was clerk of the works.

Kimcote.—The village church here, after being restored, has been re-opened for Divine service. The work has been executed by Messrs. Law & Sons, builders, Lutetworth, under the direction of Mr. W. Smith, of London, architect. In the works just completed, the old staircase to a roof-loft was discovered in the south portion of the chancel arch, an early piscina in the south wall of the chancel, and a recess in the north wall, which probably contained an early ambrisey. A very small low side window was found in the usual position. The whole of the sixteenth century roof of the nave has been repaired, the western gallery which blocked up the tower removed, and a new roof placed on the chancel and aisle. The side walls of the chancel have been rebuilt, and the old four-light window restored and re-fixed. The south porch has been rebuilt on the old foundations; also the arch in the western end has been opened, showing a fourteenth-century window filled with stained glass. New seats have been provided for a part of the church, but there still remains much to be done, and the tower, which was in a very bad condition, requires rebuilding. A font, pulpit, and other fittings will be supplied as soon as the necessary funds are forthcoming. The cost of the present restoration is about 1,100l.

Shipton-on-Cherwell.—The parish church has been re-opened; the flat whitewashed ceiling having been removed, and the roof cased with timber, the chancel paved with encaustic tiles, and the whole building re-seated, together with other repairs and improvements, under the superintendence of Mr. Buckeridge (the builder being Mr. Selby, of Oxford), at an expense of upwards of 500l., including a small organ by Mr. Bevington, and an east window by Messrs. Heaton, Butler, & Bayne.

Stourbridge.—The memorial stone of a new church has been laid for the accommodation of the district of Stamler Mill, near Stourbridge. The plans were prepared by Mr. Thomas Smith, of Stourbridge, architect, for a church to accommodate 400 people. The cost of the actual building, it is said, will be under 5l. a sitting, but there are many extras, such as leveling the site, building retaining and boundary walls, warming and lighting, &c., which will make the total cost of the undertaking amount to 2,700l. The edifice will be Gothic, of the Early Decorated period. It will be built of brick, with stone dressings. The plan comprises nave and side aisles, chancel, and chapel, organ apparatus, and vestry, with crypt, for warming apparatus. A western and north porch will be the entrances. The chancel will terminate octagonally, and will be lighted by three two-light tracied windows. The nave will have five bays, and will have two trefoil-headed windows in each

bay. There will be one four-light tracied window in the west gable, a single-light trefoil-headed window in the end of each aisle, and four cinquefoil lights in each bay and clearstory. A bell turret will be framed in the roof over the east end of the nave. The aisles, passages, north porch, and chancel, are to be laid with black and red quarries, having ornamental tile borders. The seats, roof, and woodwork generally will be of red deal, varnished. The roofs will be covered with slates, and plastered between the rafters, except the chancel and west end of the nave, which will be boarded to groin ribs. The builder is Mr. Horton, of Brierley Hill. The contract for the church is 1,840l.; but 200l. had to be spent in purchasing a cottage in the middle of the site; the retaining walls will cost 340l.; warming apparatus, 120l.; and other items will bring the total outlay to the 2,700l. mentioned.

Dereham.—The portion of the new cemetery which belongs to the Established Church has been consecrated by the Bishop of Norwich. The site is contiguous to the town, and the chapel is visible from the adjacent highway, or from the railroad. The plans for the chapel and lodge were prepared by Mr. Brown, of Norwich, architect; and the contractor was Mr. W. Hubbard, of Dereham.

Criccieth (North Wales).—The parish church here has been re-opened for divine worship. The church is situated in a quiet and secluded spot in this rising watering-place, with its castle, sea views, and interesting neighbourhood. Those who recollect the unsightly low square pillars which divided the church in the centre, the irregular and inconvenient arrangement of the interior, and the prevailing damp, will feel that the rector did not take the good work of restoration and repair prematurely in hand. He had the professional advice of Messrs. Kennedy & O'Donoghue, of Bangor and London, architects. The church consists of a nave, the east end of which is portioned off for a chancel, these sections measuring 51 ft. from east to west and 17 ft. from north to south, and are separated from the north aisle by a colonnade of four bays, having moulded and segmental arches, and carved corbels, caps, and bases, and slender shafted columns. The stone used is from the neighbourhood of Knahon. The old oak roofs have been divested of their coating of plaster, and oiled. The slating has been partially renewed, and the centre lead of the gutter entirely renewed. There are two windows in the east gable, the one in the chancel partaking of the Decorated, and that in the north aisle of the late Perpendicular style. Seven windows in the north and south walls are to be replaced by others when funds enough are collected. The external appearance of the building is suitable to a rural district. These gables are crowned on the west gable of the nave by a bell-turret, with cross, and on the three others by terminals of various designs. The internal arrangements are now adapted for the accommodation of 350 people, in open seats, made of yellow pine, stained and lightly varnished. The oak altarpieces are adapted from the old church, and the reredos formed of old oak panelling partly carved, from the former fittings. The cost of the work has been nearly 500l. The works have been executed by Mr. Richard Lewis, of Criccieth, builder.

PROVINCIAL NEWS.

Falmouth.—The block of buildings situated on Bowling Green-hill, Falmouth, known as "Earle's Retreat," has been formally opened. The founder of the Retreat, Mr. Geo. Earle, of Philadelphia, in the United States, is a native of Falmouth, and, having realised a large fortune in America, has caused to be built, at his sole expense, a block of buildings, to serve as an asylum for the aged and deserving poor of the town of Falmouth. The site is one of the finest in the town, and commands extensive views. The Retreat, as described by the *Cornish Telegraph*, is in the Gothic style of architecture, and contains 32 rooms, 20 of which are occupied by two persons each, and the remaining 12 are single rooms, so that altogether accommodation is afforded for 52 persons, but it is contemplated, in case of emergency, to make the single rooms answer for two persons. The rooms are ventilated, and in each there is a fireplace, with imitation marble mantelpiece. The large rooms contain one large iron bedstead each, and the smaller ones one small iron bedstead each, and there are cupboards and other conveniences. The principal feature of the Retreat is the chapel, which is in the same

style as the other portions of the Retreat. There is accommodation in it for about 150 persons. The window facing the entrance is of stained glass, in the Geometric style. The Retreat is surrounded by a low wall and railings, between which and the buildings there are grass plots. The object of the Retreat is that a home, free of rent, shall be provided for deserving poor of Falmouth in their declining years, and it is entirely of an unsectarian character. At the present time 32 inmates have been chosen for the Retreat, varying in age from 57 to 84 years.

Gateshead.—The new town-hall is almost finished. The large room will be opened on the 23rd. There are seatings for nearly 1,000 people.

Miscellaneous.

The Derby Volunteer Drill Hall.—This new hall, in Newland-street, Derby, has been formally opened. The site of the building is about half an acre of ground at the corner of Becket-street and Newland-street, with the longest frontage to the latter. Accommodation is provided for a large drill hall, 150 ft. by 75 ft. in the clear. The principal approach to it is under an archway leading from Becket-street to the centre of one end of the hall, over which there is an orchestra; there are also two entrances from Newland-street. Along the sides of the hall recesses are formed for the arms of arms. The roof is constructed under one span with wrought-iron circular ribs carrying boarding and slates, and is about 35 ft. in height to the centre from the floor. The entrance-hall to the headquarters and buildings generally is from Newland-street, to the right of which and adjoining the drill hall is the reading-room, 30 ft. by 20 ft.; to the left, the orderly room; and facing the entrance a stone staircase leads to the sergeants' and officers' rooms, to the band practice and committee-rooms, and to store-rooms over. On the ground floor, to the left of the archway leading to the drill hall, are lavatories, armorer's-room, and kitchen. Within the site area also provided quarters for two sergeants, stables, and barrack yard. The buildings are constructed of red brick, relieved externally by stone dressings and a few coloured bricks and tiles. The outline is broken by a flag tower rising from the centre. The cost is about 5,000l.; Mr. Bridgford, of Derby, was the builder.

A New Velocipede.—Visitors to the Crystal Palace during the last few days have been struck by something novel at last, among the many velocipedes which the present demand has brought forth. For some time past the want of a machine combining speed with comfort, safety with easy recreation, has been felt, and velocipedes have been denied to the invalid and the aged. In this new machine (patented by Messrs. Farrall & Turnor, of Dublin), the old system of working with the feet is dispensed with; the weight of the body, thrown alternately on the saddle and on the footboard, as in horse riding, becomes the moving power, and the machine glides forward with ease, and according to the skill of the rider, with rapidity. Ladies, it is said, can ride on it with the same ease as on horseback.

A Project for Uniting Liverpool and Birkenhead.—Mr. J. F. Smith, of Leicester, has laid before the works committee of the Liverpool Dock Board a plan which he has devised for uniting the two sides of the Mersey. Mr. Smith's plan consists of a wrought-iron tube to be laid in the water, at a depth of 25 ft. below the surface, at a cost of 500,000l. for a mile. The works committee, we understand, while they would not pledge themselves to carry out the scheme, intimated that they would offer no opposition to it as long as the navigation of the river was not interfered with.

Condition of St. Pancras Infirmary.—Some painful disclosures illustrative of the manner in which the poor are housed in the St. Pancras Infirmary were made at an inquest before Dr. Lankester. A man 32 years of age, who had been placed in one of the wards, died from consumption, and the evidence showed that the atmosphere was of the most vitiated nature. The jury found that the man's death had been accelerated by the want of fresh air, and expressed a hope that the guardians would direct their attention to the state of the infirmary.

Clays and China Stone.—The returns stating the production of the more important clays and china stone in this country in the year 1868 show that Cornwall produced 100,000 tons of porcelain clay, of the value of 91,666l.; 29,000 tons of china stone of the value of 23,200l.; and 1,479 tons of fire-clay, of the value of 554l. The first two items show smaller quantities than in 1867. Devonshire produced in 1868, 12,000 tons of porcelain clay, of the value of 9,600l., and 45,000 tons of Teignmouth clay, of the value of 20,250l. The last item shows not quite so large a quantity as in 1867. In Dorsetshire, 150,000 tons of pottery and other clays, of the value of 3,750l., were obtained in 1868. There were also produced in Staffordshire, Yorkshire, Derbyshire, &c., 675,000 tons of fire-clays, of the value of 168,750l. These items amount to 1,012,479 tons of fine and fire-clays, of the value of 317,770l. This is not so large a return as that of 1867. A list of porcelain and other clay works working in 1868, compiled by Mr. Robert Hunt, the keeper of mining records, shows ninety in Cornwall in Devonshire, five producing porcelain clay, and four Teignmouth clay; and there were also eleven producing Poole clay, and sixteen in Staffordshire producing Stourbridge clay.

Well-Digging under Difficulties.—The want of water in Western India beyond reach of the river is the grand impediment to cultivation and civilization; it is accordingly a religious duty to supply it. One evening, says a paper in the *Cornhill Magazine*, a troop of the irregular force on march stopped at a few solitary huts; but they could find no inhabitants, and the well was dry. Seeing a hole with a heap of earth beside it, however, the officer looked down into the darkness, and a little old weak voice called out from the bottom, praying him, for the love of God, to draw up a basketful of the soil to the surface of the earth. He did as he was asked, and then the old man, still out of the depths of the hole, explained how he had vowed to dig a well; that for many years he had spent nearly all of every day picking away the earth with his little scoop; depending upon any passer-by whom he could get to help him for removing the "soil" by spoonfuls as it were, with a string and a basket, which he was too weak to do himself; he went up and down by some wretched bits of stick and cord; he had dug 40 ft. or more, and was expecting to reach water quickly. No hermit was ever more solitary.

The Manchester Free Libraries.—The seventeenth annual report to the City Council for 1868-9 has been printed. From this report it appears that the aggregate annual issues have increased from 807,961 to 893,648; consisting of 477,544 volumes issued to borrowers; 97,511 volumes issued in the news-rooms; 126,243 volumes issued in the reference library; and 192,350 specifications of patents. These issues do not include the periodicals and books which lie on the stands and tables, and are constantly in use, so that by taking into account a minimum rate of one perusal of only a single paper for each reader in the news-rooms, the ultimate account of actual circulation cannot be represented by a less number than 2,501,286! All the reading-rooms together can accommodate 791 persons. The number of readers actually present at one time has very often in the evening exceeded that limit, and amounted to 1,031; being 240 in excess of the number that can be conveniently accommodated.

The Granite of New Blackfriars Bridge. It is fair to mention that the granite used in this work was supplied by Charles Goodyear, the quarrier of the De Lank Quarries, near Bodmin, Cornwall. About 150,000 cubic feet were delivered in blocks of very large size. Upwards of 80 of these stones have been of the enormous weight of from 12 to 20 tons each, and about 200 from 6 to 12 tons, all of the grey granite, and of even colour. Twenty of the largest sizes, of from 12 to 20 tons each, were split out of a single block, detached from the general mass by means of blasting, and machinery on the spot.

Southern Vauxhall Waterworks Company.—The large reservoirs now in course of construction at Battersea are in a fair way of being opened about June next. Two hasins are being made, having an inlet into each other, to contain 24,000,000 gallons of water. The workmen are actively engaged in laying a concrete bottom. Messrs. Aird & Sons are the contractors for these works.

Zinc.—The returns obtained from the zinc mines of the United Kingdom show a production in the year 1868, of 12,782 tons of zinc ores, principally sulphide of zinc (black jack), the value being estimated at about 39,192l. The number of mines was 35,—18 in England, 15 in Wales, 1 in Ireland, 1 in the Isle of Man, 1 in England and Wales the chief production was from three countries—3,350 tons from Denbighshire, 2,858 tons from Flintshire, 2,061 tons from Cornwall; 3,278 tons were produced in the Isle of Man. The production of metallic zinc was about 3,713 tons, of the value of 75,436l. All these figures are lower than those for the preceding year, 1867. Prices were lower in 1868 than in 1867 in the London market, the mean price of spelter falling from 21l. 6s., in 1867, to 20l. 6s. 4d. in 1868, and the mean price of zinc (in sheets) from 27l. 7s. 6d. to 25l. 13s. 4d. per ton.

Telegraphic.—The injured cable of the Anglo-American Telegraph Company has been successfully raised. The defect was about forty miles from the coast of Ireland.—A new line of telegraphic communication with Europe, *via* Russia, was recently opened, and other lines being for awhile interrupted, a good many messages have been sent by it. The *Hambury Gazette* gives the following among other examples:—"London, 17th.—Alderman salomon tins salt haroms crawford refused corranaly another agrilian assassination ireland careoton bnatry catholic archbishop Armach." "22nd.—letter popp Runming Kunning contat all up non.—Catholics autr encomendial Concil for discussion from already contend abitary generally chained hoals ford times braves snppes deserued with drawtoc to presented spot his government saying excepted instructions and Washington government disavowes proedirm, &c., &c."

The Fireproofing of Furniture.—Every now and then, says a writer in *Cassell's Magazine*, loud noisings are heard about the importance of rendering the dresses of ballet-girls incombustible, but why should we not make our house incombustible and our furniture fireproof? It can be easily done, or rather it could be, if there were some sort of compulsion put upon builders and upholsterers. Timber is the material that needs the preservative, and it may be prevented from firing by simply impregnating it with a concentrated solution of rock salt. The fact has just been announced by a German chemist, who was commissioned to solve the question by a fire insurance company. Water-glass will act as well, but it is expensive. The salt renders the wood proof against dry-rot and the ravages of insects. A solution of it pumped out of a fire-engine upon burning matter would be vastly more effective than plain water.

The Open Space Question.—A meeting, presided over by Mr. M'Callagh Torrens, M.P., has been held in the dining-hall of the Holborn Union Workhouse, to consider the means by which an "open space" of three acres in the Gray's-inn-road may be thrown open to the public. The "space" in question is the old burial-ground at Trinity Church, in the thoroughfare named, but beyond the boundaries of St. Andrew's, Holborn, and which is now surrounded by a high wall, which shuts out all view of this comparatively large piece of land. A resolution to the effect that it would be a great advantage to the people at large if the St. Andrew's burial-ground in the Gray's-inn-road were thrown open to the public, was carried unanimously, and also one to co-operate with other authorities in carrying out the purpose of the meeting.

A New Movement.—A petition to the Queen is in course of signature, praying her Majesty to see that measures are taken without delay to enable the large number of persons at present out of employ, and willing to work, to go to those portions of her Majesty's dominions where their labour is required, and where they may prosper and increase the prosperity of the whole empire. So says the *Beehive*. The petitioners also declare that they have heard "with alarm and indignation" that her Majesty has been advised to consent to give up the colonies, "containing millions of acres of unoccupied land, which might be employed profitably both to the colonies and ourselves as a field for emigration." The petitioners ask her Majesty to assemble her Parliament without delay, that they may inquire into the causes of the present distress, and seek a remedy.

Monument to the Late Robert Scott-Lauder, R.S.A.—The students who had attended the classes of the late Robert Scott-Lauder in the Trustees' Academy and in the National Gallery, have resolved, with the sanction of the family, to erect a monument over his grave in the Warriston Cemetery. The monument will be in the form of a slab of grey Sicilian marble, with an alto-relievo head of white marble in medallion, and an appropriate inscription underneath. The subscribers have intrusted the commission to their fellow-student, Mr. John Hutchinson, R.S.A., the sculptor of the bust at present in the library of the Royal Scottish Academy. The influence of Scott-Lauder's teaching seems to have been remarkably favourable on artists, as may be seen by the positions already attained by so many of his pupils, amongst whom may be specially mentioned Herdman, Pettie, Orchardson, Hutchinson, Cameron, Peter Graham, M'Whirter, M'Taggart, Chalmers, the Burrs, and others.

Rattening in Paris.—Forty shopmen belonging to the great hardware establishment of M. Hallex, Rue St. Martin, Paris, struck their work and left. But on reflection fifteen of them returned, whilst the others got employment in the Belle-Mengere, the remainder persisting in the strike. These latter having recruited other malcontents presented themselves, to the number of about forty, at the shop of M. Hallex, and wanted to compel the men there to follow their example. But resistance was made, an altercation ensued, and at last a personal struggle took place. Heaps of merchandise, frying pans, cans, and various culinary utensils were overturned, and some of the shopmen, and even M. Hallex himself, were bruised. In the end the assailants were repulsed. Six persons were arrested, and have been sent to the prefecture.

Sanitary Registration of Cottages.—Professor Acland, of Oxford, has had published, by Parker & Co., of Oxford, a specimen copy of "Forms for Registering the Sanitary Condition of Cottages of Labourers and Artisans for the use of Landowners, Officers of Health, Guardians, and Others." These forms have already been used in some districts ever since 1861; and extended knowledge, says Dr. Acland, has made me more than ever desirous to see the use of such forms more general. The form is composed on a single leaf: it is simple and easily filled up. In connexion with the state of drainage of the surrounding ground, we would suggest that the condition of pavement in yard, if any, should be noted.

Suez Canal.—We learn from the new journal *Nature*, that the President of the Royal Society, Sir R. Sabine, being unable, through pressure of official duty, to accept the Khedive's invitation to be present at the opening of the Suez Canal, was allowed to nominate a gentleman to represent the Royal Society on the memorable occasion. The President's choice, which has been approved by the Council, fell on Mr. J. F. Bateman, C.E. This selection will perhaps gratify the civil engineers as well as the Royal Society; for Mr. Bateman, who is now on his way to Egypt, has made himself known on the Mediterranean, by his land reclamations in Majorca and at the mouth of the Ebro.

Resignation of Assistant-Surveyor, St. Pancras.—Mr. E. Cunningham, assistant-surveyor to the vestry of St. Pancras, has sent in his resignation to the Committee of Works, on account of the state of his health and declining years, and asking for a recognition of his services. Mr. Cunningham has been in the service of the parish for a period of 34 years, and was formerly surveyor to the Southampton Estate Paving Board, and is entitled to a pension of 20l. a year on that account, which will come to him on his ceasing to hold the office of assistant-surveyor.

Proposed Improvement of Euxton.—The Duke of Devonshire says, if the people of that town will form a public company to carry out a number of required improvements, with a capital of 10,000l., he will take half the shares, and give in addition eight or nine acres of land at a nominal rent of 6s. per annum. A committee has been appointed to canvass the town and take other steps. It was stated at a meeting held on Friday that the land offered by the duke was worth 9,000l.; this, with the 5,000l. of capital he offers to provide, making his grace's contribution to the scheme 14,000l.

City Expenditure.—The amount raised by the Corporation in the course of the last few years approaches three millions and three-quarters, distributed in about the following proportions:—The new Meat and Poultry Market, its site and approaches, 1,000,000; purchase of Southwark Bridge, 265,000; rebuilding Blackfriars Bridge, 350,000; and the Holborn-valley Viaduct and approaches, 2,100,000.—In all 3,715,000. Not only has this amount been raised without difficulty during a period of general distrust, which has almost suspended railway enterprise, but it has been so readily obtained that none of the great works have been delayed a single hour for want of funds.

State of Truro.—The correctness of our correspondent "Pro," in his observations on this subject, has been made manifest in various quarters. The *West Briton* of last week says:—

"We regret that we continue to receive repeated complaints of the state of the Truro river, which no longer ought to be neglected as it has been by the Truro Town Council, considering what a large portion of its revenues is derived therefrom. A correspondent writes:—The state of Truro river at and about Quay head is really scandalous. Only a few weeks since the Truro Shipping Company's vessel, the *Mary*, was benesped when close to the Quay head by a bar of ground and mud allowed to accumulate there. The channel is all silted up; it is not so wide as resolved on by the council, and consequently vessels cannot swing as they used to do."

The Corn Exchange, Bristol.—At a meeting of the Bristol town council, on Tuesday last, it was resolved, after long discussion, "That this council, admitting the necessity of protecting the traders and others attending the exchange by a covering, refer the subject back to a committee to be appointed, to take the opinion of one or more skilled architects as to the best mode of accomplishing that object. The committee was appointed as follows:—The mayor, Aldermen Proctor, Baker, Adams, Ford, Abbot; Messrs. T. Pethick, Warren, Mills, G. Wills, and Weston.

Royal Italian Opera.—Lovers of music are thankful for the operatic entertainment now going on at Covent Garden Theatre. The company is a good one, including Mdle. Ilma di Murska, Signor Mongini, Signor Cotogni, Signor Gardoni, Mr. Santley, and Mdle. Titiens. The "Flauto Magico" will be given this (Saturday) night with an admirable cast; and on Tuesday next "Hamlet." Signor Arditi retains his position as conductor. We hear of an English nobleman ready to spend 150,000l. in building another opera house if a proper site can be obtained!

Great Fire in Siberia.—A St. Petersburg correspondent says:—Full particulars have now arrived of the terrible fire at Yeniseisk. A tremendous storm was raging at the time, and as the town consisted mostly of wooden houses, nearly the whole of it perished in the flames. Several hundreds of persons perished either by suffocation in the burning houses or by drowning in the river. The number of houses destroyed was upwards of 1,300, besides four churches, two monasteries, the Government offices, with all the official documents and the principal stores-houses.

Public Baths for Brighton.—At the last council meeting, the Baths and Washhouses Committee presented the following resolution:— "That sixteen public baths be constructed in that part of the building known as the Infantry Barracks, coloured blue on the ground plan submitted. That the surveyor do prepare a specification of the works as shown on the drawings also submitted, and that an advertisement be issued for tenders for the performance of the works by special contract."

The motion was carried without opposition.

The Free Library Movement.—A Free Library was opened by the mayor of Tynemouth at North Shields on Thursday. It is the first that has been started in the Tyneside towns, and consists of a circulating library of over 13,000 volumes, a large reading-room, reference-library, museum, and science and art classes. A rate of 1d. in the pound per annum has been levied on the town by the corporation for the maintenance of the institution. All the speakers connected with trade strongly advocated the compulsory education of children as means to that end.

Social Science Association.—The opening meeting of the session will take place on Monday evening next, the 16th inst., when, by the request of the committee, an introductory address on the business of the session will be delivered by Mr. Edwin Chadwick, C.B.

Randell, Saunders, & Co.—The business of these well-known Bath stone merchants will be conducted henceforth as a Limited Company. The objects they have in view, they state, are to give greater facility for the extension of their business in the Bath stone trade, and to incorporate with it the quarrying and selling of other building stones, and to associate with them in the business some of their staff who have for many years assisted them.

Opening of the Session.—The first meeting of the Royal Society will be held on Thursday, the 18th inst. The Society of Antiquaries also meet for the first time on the 18th. On the previous evening, 17th, the Society of Arts will commence the new session, and an opening address will be delivered by Lord Henry Lennox, M.P., chairman of the Council.

Society of Engineers.—At the next ordinary meeting of the society, to be held on the 15th inst., a paper will be read "On the Need for further Experiments on Strength of Materials," by Mr. Charles J. Light. The annual dinner of the society will take place at the Westminster Palace hotel, on Friday, the 17th of December.

Cemetery at Rochester.—We are informed that the new cemetery mentioned in a paragraph last week, is for the adjoining town, Chatham, and not for Rochester. The sum mentioned, 8,000l., was borrowed, but not wholly expended. The land cost some 2,000l., and the buildings, in round numbers, 3,600l. The architect was Mr. J. Young, of London.

Portraits.—We have pleasure in mentioning that the engraved portrait in our present number was made from an excellent photograph by Mr. John Watkins, of Parliament street. The portrait of Professor Kerr was from a photograph by the same gentleman.

TENDERS.

For the erection of villa residence on the Redlands Estate, Reading, for Mr. Thomas Chancellor. Messrs. Wm. & J. T. Brown, architect. Quantities supplied:—
Wootroffe £1,767 0 0
Mathies 1,414 0 0
Sheppard 1,650 0 0
Searle 1,625 0 0
Baruscat (accepted) 1,570 0 0

For new workhouse for Chorley Union, Chorley, Lancashire (foundations already in). Mr. T. T. Bradshaw, architect. Quantities supplied:—

	£	s	d	
Dawson	£22,288	0	0	Extra for Pitch Pine Boards.
Higham	21,141	8	3	£85 0 0
Cooper Bros.	20,445	5	0	127 18 0
Thompson	19,884	0	0	82 7 0
Richter	19,810	0	0	68 0 0
Bayer	19,770	0	0	174 per sq.
Farrington	19,463	0	0	58 0 0
Collins & Son	19,513	0	0	56 8 0
Warburton Bros.	19,370	0	0	53 0 0
Sud	19,234	19	2	48 17 3
Brown	19,210	0	0	87 0 0
Nightingale	18,323	4	6	
Saville	17,950	0	0	68 0 0
Wade Bros.	17,705	4	9	124 0 0
Pecton (accepted)	17,761	0	0	35 0 0
Gillett	16,685	19	8	18 5 0

For completion of works at vestry-hall, Poplar, for the Poplar Board of Works:—
Capps & Hitchie £6,807 0 0
Shedfield 6,233 0 0
Hearle 5,630 0 0
Nightingale 5,824 0 0
Crabb & Vaughan 5,159 0 0

Accepted for Ware Water Works. Messrs. Russ & Minns, engineers:—

Contract No. 1.—Engines, Boilers, Pumps, &c.	£2,839 0 0
Contract No. 2.—Cast-iron Mains.	
Christie & Co.	1,466 0 0
Contract No. 3.—Buildings, Reservoirs, Well, &c.	
Bugbird	2,500 0 0

For the erection of villa residence, exclusive of grates, chimneys, water-closet apparatus, and other items, Victoria-road, Harborne, near Birmingham, for Mr. Wm. Fitcher:—

Stokes	£798 0 0
Newey	759 0 0
Pugh	753 0 0
Briley (accepted)	700 0 0

For finishing a concrete villa at Wimbledon, fr Mr. William Parsy:—

Gris	£1,004 0 0
Harvey	910 0 0
Mullett & Wimp	879 10 0
Crouch	650 0 0

For cottage hospital at Royston. Mr. Edward Nash, architect:—

	£	s	d	
Savell	£975	0	0	Add if Floors are in Pitch Pine. Waincoat.
Gronson	818	0	0	£12 0 0
Gibbons (accepted)	813	0	0	7 0 0

For cottages at Grove Ferry, Kent. Messrs. W. G. Habershon & Fite, architects. Quantities supplied:—
Harrison £290 0 0
Smith & Swain 26,200 0 0
Pearce Brothers 655 0 0
Haywood 630 0 0
Featherstone 623 0 0
Davis 615 0 0
Wilson 600 0 0
Spencer & Haywood 597 0 0
Hatten 586 0 0
Thompson 577 0 0
Mullett & Wimp 577 0 0
Lidbetter 563 0 0
J. R. & T. Davis 530 0 0
Williams & Son 518 0 0
Cowland 515 10 0

For proposed workhouse to be erected at Flamstead, Kent, for the Woolwich Union. Messrs. Church & Rickwood, architects. Quantities supplied:—

Quinn	£31,976	19	7
Harrison & Edwards	28,280	0	0
Miller	27,900	0	0
Wills	27,700	0	0
Till	27,300	0	0
Pearson	26,999	0	0
Loneragan	26,900	0	0
Higgs	26,200	0	0
Anson	26,000	0	0
Kirk	26,963	0	0
Chappell	25,580	0	0
Tongue	25,400	0	0
Hughesdon	24,380	0	0
Nutt & Company	24,100	0	0
Perry	23,900	0	0
Hart	23,818	0	0
Sliff (accepted)	23,288	0	0

For bank and two shops at Grantism, for the Standard, Spalding, and Boston Banking Company. Mr. William Thompson and Mr. William Eve, joint architects:—

Wartnaby (accepted)	£1,350	0	0
Fittings.			
Lascelles	£345	10	0
Hall (accepted)	348	10	0

For a pair of cottages at Theydon Bois, Essex, for Mr. J. T. Morton. Mr. William Eve, architect:—

Clarke	£260	0	0
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For detached residences at Theydon Bois, Essex, for Mr. J. T. Morton. Mr. William Eve, architect. Quantities supplied:—

	Four Houses.	Eight Houses.	Ten Houses.
Wrench	£2,690		
Warne	2,288	£1,375	£6,415
Frime	2,200	4,450	5,600
Nichols	2,138		
Roberts & Co.	2,099	4,198	6,149
Nightingale	2,038	5,090	6,200
Wire	2,035	4,073	5,000
Moresland	2,000	4,630	5,605
Doverwood & Clark	2,296	4,445	5,590
Lacy	2,200	4,490	5,500
Baxter	2,198	4,378	5,466
Blackmore & Morley	2,188	4,336	5,410
Nash & Jefferson	2,154	4,239	5,278
Bangs	2,118		
Good	2,069	4,180	5,321
Girling	2,141	4,079	5,087
Bush	2,072	4,044	5,040
Bysh	2,109	4,003	5,000
Grove	2,045	4,010	4,960
Harrison & Edwards	2,000	3,990	4,985
Hearle	1,997	3,944	4,867
Turner	1,988	3,880	4,830
Stevens	1,837	3,863	4,569
Parter	1,780	3,500	4,300
Derby	1,695		
Smart	1,589	3,112	3,870

For finishing two houses, Nos. 5 and 6, Crichton Villas, Brentwood-road, near Romford, for Mr. J. M. Drew. Quantities supplied by Mr. James Barnett:—

Newman & Mann	£963	0	0
Baugh	947	0	0
Keyes & Head	926	0	0
Macey	925	0	0
Perkins	918	0	0
Goody	845	0	0
Cheeseman	768	0	0

For residences at Brunelley, Kent. Mr. John M. Hooker, architect. Quantities supplied:—

Turner & Sons	£4,490	0	0
Benshaw	4,397	0	0
Browne & Robinson	4,320	0	0
Foster	4,283	0	0
Macey	4,237	0	0
Dove & Sons	4,225	0	0
Wallis & Clements	4,100	0	0
Longmire & Burge	4,073	0	0
Jackson & Shaw	3,948	0	0
Newman & Mann	3,895	0	0
Vaughan	3,750	0	0

Accepted for building a house at Rottingdean, for Mr. Troubridge. Mr. Pike, architect. Quantities supplied by Mr. G. Tuppen:—

Carpenter and Joiner	£151	0	0
Turner	183	0	0
Burgess	183	0	0
Plumber, Painter, &c.			
Welfare	40	0	0

For finishing three houses, Nos. 14, 15, and 16, Vauxhall-road, High-street, York-road, Battersea, for the London and Westminster Building Society. Messrs. Berriman & Son, architects:—

Tarrant	£233	0	0
Ferking	200	0	0
Cooke & Son	165	0	0
Gibbs & Son	162	0	0
Fisher & Sons	149	0	0

The Builder.

VOL. XXVII.—No. 1398.

The State of Art Education, in Great Britain and on the Continent.



HERE is a class of writing which, partaking of the two distinct qualities of current and of standard literature, appears but rarely to attract the attention due to either, although frequently possessing the merits of both. It is to be found in the large and annually increasing library of "Blue books," in which the results of the most exhaustive research, directed, at times, by the highest literary skill, are to be found side by side with returns of very partial interest, or reports of very moderate excellence. The origin of a volume of this series may be either a royal command, a party vote, an honest desire to bring full information before the world, or the attempt to manufacture

a peg on which to hang a speech, or to frame a motion. The blue cover, then, giving no assurance of the value of the contents of the volume, it not infrequently happens that a work of the highest value issues stillborn from the press of Messrs. George Eyre & William Spottiswoode, and that a brief paragraph of abstract, in the columns of the daily press, forms the only introduction of its contents to the great mass of even the reading public.

Very often, indeed, a subject is overlaid by the actual amount of detail under which it is produced. Thus, although the information which may be derived, as to the actual state of art industry and art education in Great Britain, as compared with that prevalent in foreign countries, from the Reports on the Paris Exhibition of 1867, which have been presented to both Houses of Parliament, by command of her Majesty, and have already been mentioned by us, is of great and readily available value, but few purchasers are likely to be found for the six compact octavos, to the contents of the second of which,—containing 620 pages, and published at the moderate price of 3s. 3d.,—we now bespeak a few moments of attention.

These twenty-eight reports, indeed, exhibit the same absence of unity of conception, and consequent uniformity of treatment, which impart a somewhat hitty and scrappy character to the whole Blue-book library. Side by side with one or two masterly papers, in which the authors, writing not only from clear heads but from sympathetic hearts, raise the discussion of questions of art to the level of philosophical discourse, are mere extracts from catalogues *raisonnés*, of little or no interest to any but the writers, after the collections of which they treat are dispersed; even if they could have served, in the first instance, as a guide to the instructive observation of the classes of articles in question.

The reports of Mr. Redgrave and Professor

Westmacott, with which may be classed those of Sir Digby Wyatt, are productions of a very different order from that of a mere criticism on a given class of exhibits, whether artistic or only personal. Addressing themselves directly to the vital question of art education, these papers afford the basis of a most instructive comparison between what is done and what is attempted, by the exertions of the Science and Art Department in this country, and the state and outlook of the same branches of national culture in the more educating portions of the Continent. They yield glimpses behind the scenes, and show us the views which regulate the course of study which is favoured by the managers of the museums and library at South Kensington. And, rising above the practical questions of educational detail (important as these are), they confront the yet more fundamental problem of the distinction between high art and art which is essentially decorative or ornamental. They indicate the true locality of the most famous schools existing, or that have existed, in either province; and they afford us the basis for something more than a mere guess at the probable and proximate future of each department of artistic culture.

One of the questionable features, in our judgment, of the educational scheme elaborated by the South Kensington School, is that subservience of art proper to decorative purposes which underlies the entire system. That in a national school, supported by public funds, and looking not so much to the elevation of the public taste, as to the encouragement and perfection of manufacture, this tendency may be to a certain extent unavoidable, we are not about to deny. But the need of providing, as far as possible, a counterpoise to a tendency which has always marked the corruption produced by wealth, and the decline of an over-wrought civilisation, becomes all the more urgent. If the ultimate aim of acquiring facility in figure drawing be the decoration of a tea-cup, the result, sooner or later, will be rather the degradation of artistic taste, than the elevation of the tea service into an æsthetic machinery.

It is with a view to this necessity of ennobling the pursuit of art, viewed as a decorative aid to manufacture, by the pursuit of art, viewed as a worthy exponent of noble thought, that the report of Mr. Westmacott possesses unusual value. He speaks with the true ring of the sculptor's tone,—the language of the severest and most lofty style of art. He regards design from the most elevated stand-point. He admits no real beauty that does not to some extent involve the presence of that which is pure and noble in idea. He refuses, as any man who is fired by the true artistic inspiration must do, to acknowledge the possibility of the erection of a realistic school of art as a rival and a counterpart of that which is ideal. Realism is only a part, and by no means the highest part, of the imitative art, whether in sculpture, or painting, or in literature. Realistic truth is one of the requisite qualifications of the artist. It is a gift to be acquired by education and by skill. It is absent from the hieroglyphics of the obid, or of the artist working during the childhood of the race. It is commanded by such masters of the pencil as Titian and Vandyke; but it is only one of their elements of power. To speak of realism in art as a novelty, or as a principle calculated to serve as the basis of a school, is to evince equal ignorance of the history and of the elements of art.

"It is sometimes asserted," says Mr. Westmacott, "that which pleases is beautiful to the person pleased, and that every one has the right to exercise his own fancy in determining what is or what is not beautiful. This is a fallacy. The abstract right to derive pleasure or gratification from any object, or, it may be, work of art, may be conceded; but no amount of satisfaction it may possibly afford, can endow a work with beauty if it has it not. Nor is every one capable of judging, off hand, whether or not this quality is present. In art it is not, as many suppose, merely a question of individual feeling. Certain

qualifications are required to form a sound judgment on so subtle a problem. This is especially the case in estimating what constitutes beauty in the human figure, so full of variety in all the conditions of sex, age, strength, and character. There must be, in the first place, some knowledge of the construction of the figure, and the laws of action; the power to discriminate between various classes of form; and, by practice, and careful education of the eye, to know how to compare Art with Nature, in her best aspects, in living models; and thus to determine what it is that artists and poets mean by *fiéal beauty*."

The highest class of sculpture, we fully agree with Mr. Westmacott, is calculated to interest and excite the loftier feelings by representing sublime and noble subjects under the most perfect forms. The influences which are unfavourable to the development of this severe and elevating form of art in our own country are two-fold,—those which are permanent, as arising, in the main, from those social habits which depend on temperature and on climate; and those which are secular or peculiar to our own time. The noblest subjects for sculpture, since Praxiteles first dared to represent the female form entirely unveiled, are heroic, or nude, and that for two reasons. The first of these is that there is no natural object which is at once more beautiful in form, and more calculated to appeal to the human imagination, than the human figure itself, under its three widely different types of manly, feminine, and infantine grace. The second is, that by this treatment alone are the impressions produced by that change in the character of attire, which we call fashion, and which exert a disturbing influence on the judgment by means of association of ideas, altogether banished. But heroic sculpture is not native to a northern climate. Where the human figure is never seen, as a rule, unclothed, there is a degree of incongruity involved by representing it as nude. It is possible that a sort of barbaric prudery regulates our ordinary views on this subject; but even this is less hostile to the worthy pursuit of art than is the diametrically opposite tendency of French taste, intensified as it is by the action of the rulers of the empire. Where neither the recurrence of public games, nor the irresistible power of a torrid summer, allows the eye to obtain familiarity with the undraped form, its representation will always convey, to the unaccustomed mind, not the true, artistic, idea of the nude, but the very different one of the undressed. Even in the models copied by the artist this sense will be continually present; and the more faithful is the representation of living form, however beautiful, the more fully will the influence of the feeling of shame, which is far from being the feeling of modesty, betray itself in the unconscious language of the entire shrinking physiognomy.

Debarred, then, partly by the drapéd habits of society, and partly by the ridicule which would attach to the representation of a modern king or captain in heroic nudity, from the congenial pursuit of the highest branch of the art of the sculptor, we are beset by a difficulty of no slight importance when we attempt the draped figure. Not only does a sort of commonplace vulgarity attach to the imitation, in marble or in bronze, of the ordinary articles of attire with which we are familiar, but the attire itself has become more mean, ugly, and inartistic than at, perhaps any preceding period of history. We refer not only to the unpicturesque, we might say inhuman, adornments of female attire, but, even more decidedly, to the contempt shown in the male dress for any considerations of what is becoming, or even of what is comfortable, and suitable at once to the habits of life and to the exigencies of climate. A species of archæological value may attach, centuries hence, to the faithful delineation of the English men and women of the present day. But it will be in an archæological sense alone. A period when neither dignity, gravity, nor military simplicity is in any way studied by the constructors of male attire, and when the graceful and winning charm of modesty is as much disregarded in that of the

softer sex, as are any principles of æsthetic harmony or fitness, is not one in which realistic imitation can produce anything worthy of the name of sculpture.

The exertions of the sculptors' art are, therefore, very much confined either to portraiture, chiefly in bust, or to allegorical and conventional representations. There is, indeed, the third category of historic sculpture; but eminence in this branch of the art, which demands, in addition to the other qualifications of a good sculptor, a thorough acquaintance with the history and the details of costume, is not to be acquired at a bound. In the absence of some more distinct encouragement nothing but a rare combination of genius and of circumstance can produce a good historic sculptor in England.

Considerations of a very similar character apply to the English school of painting in oil. "While the English pictures of poetical, episodic, historical, domestic, *genre*, and landscape subjects are," in the opinion of Mr. Cope, R.A., "conspicuous for excellence and variety in aim and treatment, there are no pictures of national importance." "England has no national collection of oil pictures, for the Sheepshanks and Vernon Galleries mostly consist of cabinet gems suited to the dimensions of drawing-rooms, and were collected by private gentlemen, and afterwards bequeathed to the nation." Fresco painting, the noblest branch of the art, is forbidden by the English climate. For oil painting, on the scale familiar to the great masters of Continental art, England has neither school nor encouragement. Thus, while it can no longer be said that there is no English school of art, it must be admitted that but a limited field is open for the highest exertions of the English artist.

In France the case is totally different. The encouragement, and the direction of the course of study, of the student, are there considered a matter of national importance, not undeserving of the systematic care of the Government of the country. From the very commencement of his career, the French student is at once stimulated to exertion, and kept within certain wide and well-understood limits, by the wholesome influence of competition. He does not find the high places of his profession filled up by men whose chief pride seems to be taken in keeping down their juniors. Such an offence against justice—we may almost say against decency,—as the three-repeated refusal of a few square inches of wall-room, in an annual exhibition which is called national, to such a remarkable painting as the "Medea" of Mr. Sandys would have been impossible in France. The student competes for a place in the Academy. Admitted there, he competes for the *Prix de Rome*. He afterwards produces works for exhibition at the annual *Salon*, which may procure the distinction of medals of the first, second, or third classes. Further success in his profession will be acknowledged by the bestowal of the much-prized decoration of the *Legion d'honneur*, that of the simple chevalier, of the officer, or of the commander. The State will purchase any very successful work, and deposit it in galleries or museums, in Paris or in the Provinces. The most distinguished artists are continually commissioned to illustrate the chief events of the day by the exercise of their art; and the thirst for national fame, so characteristic of the French people, thus leads to a constant encouragement of the artist, not by the uncongenial condescension of the patron, but by the open-handed rendering to Art of that which is her due.

Under these circumstances high art in France has a life and a future, even if they are not those of the very noblest stamp. The attempt made by the school of David (as by Flaxman in our own country), to naturalise a sham classicism, in subject, in attire, or in treatment, is almost entirely abandoned. The present movement of art in France is in the direction of the picturesque. The laws of light and shade, harmony of tone, careful completion of the entire picture, are combined with a freedom of touch which would be in danger of degenerating into what is slovenly and vague, but for the correction supplied by the incessant study and reproduction of the *modèle*.

It thus comes to pass, not only that French art commands an unrivalled position on the Continent, but that, whether avowedly or insensibly, it is influencing, not to say devouring, all other national schools. The manner of the Belgian artists is more French than Flemish, "possessing little of the juicy touch and transparent colour of the old school." The works of the Dutch painters "have a greater affinity with the

broad generality of treatment and solid painting of the French school, than with the refined delicacy of execution and rich richness of colour so characteristic of the old Dutchmen." "The productions of Prussia mostly emanate from the school at Dusseldorf. They possess no very special character to distinguish them from French art, to which they are gradually more and more tending." The modern Bavarian school, like most of its Continental contemporaries, "seems founded upon that of France, both in its style of work, its perception of nature and in the subjects it most affects." "The art of Austria is in no way remarkable for any distinct national traits." "The influence of France on the art of Spain is evident." The school of Sweden and Norway, "generally, is in close relationship with that of Dusseldorf, at which place most of the principal painters reside, so that it may be almost considered as a branch of that school." The visitor "looks in vain for anything nationally characteristic of Russian art." Even Muscovite or Finland subjects "are treated in the modern French manner, and seem rather French than Russian." The modern art of Italy "seems to be an offshoot from that of France, and has no distinctive character of its own." Even Greece contributed to the exhibition which furnished the subjects of the report from which we quote, a moonlight picture of Antigone, in the style of the French school; and Turkey "attempts at still life, in the French manner."

While this missionary and conquering influence of French art is so fully asserted by the reporter commissioned by this country, it is painful to read the very judicious remarks of Mr. Horsley on the decadence of that English school of water-colour drawing which attained its highest excellence in the works of Turner, Cox, Dawkins, Hunt, Copley Fielding, and others. This admirable school was properly and exclusively English. Its essential principle was that of making use of the lovely quality of transparency possessed by colour ground in water, when employed on paper, without any opaque mixture. It is, therefore, a serious subject for consideration that scarcely one pure water-colour drawing, unpolluted by opaque colour, is now produced.

In condemnation of this hybrid and makeshift style of what is now called painting in water-colours, Mr. Horsley cites the unquestionable authority of Turner, who not only strongly reprobated the use of opaque colours in water-colour drawing, at the time of its first introduction, but asserted emphatically that, if persisted in, it would "prove the ruin of water-colour drawing." The temptation to produce drawings with rapidly has been the chief cause of the general adoption of this pernicious practice. It is interesting to note Mr. Horsley's remark, that not only is the purity and limpidity of the true water-colour style destroyed by the introduction of opaque dabs, patches, and smears, turning the sky, in some instances, into the resemblance of a stuccoed and whitewashed wall, but that the mongrel pictures are likely to be as short-lived as they are rapid in their production. For while pure water-colour drawings should always be protected from unnecessary exposure to light, opaque mixtures require the very opposite treatment. "Permanent white" becomes permanently black, and other opaque colours have a tendency to crack and peel off, when they are kept covered up, besides being injuriously affected by hygrometric changes in the atmosphere.

It is evident from the comparative view of English and of foreign art which the reports on the Universal Exhibition of 1867 supply, that the impulse which, originating in 1851, is maintained by the exertions of the Science and Art Department, has but a slight and incidental, if any, influence on the highest branches of art. For decorative purposes—for art industry, rather than art proper—we have, indeed, entered upon the Victorian *Renaissance*. It is still to be regretted that painting should be confined to the production of cabinet pictures; that sculpture should be allowed to sink into effigy-making; that water-colour drawing should disappear, in its purity, from our schools. Much as a careful and well-designed education in art-workmanship may effect, much as it has already effected, the best hopes of the originators of the movement will fail of fulfilment so long as a languid pursuit, or a misdirected activity of study of art in its highest branches, allows the energy of the workman to distance the skill of the artist.

LINCOLN AND ITS NEIGHBOURHOOD.

THERE are few more interesting cities in England for the archaeologist, architect, or mere lover of the picturesque, than Lincoln. The position of the more ancient portion of the city on the summit of a lofty ridge that traverses the county from north to south, crowned by the magnificent cathedral, is almost unrivalled, and the view from the valley below strikes the traveller as at once familiar and uncommon. The truth is, that the situation of the minster, and the disposition of the steep narrow streets straggling down into the valley, black with the smoke of many furnaces, and sonorous with the sounds of labour, are frequent enough in Continental towns, and thence the impression of familiarity, although the scene is not so common in England as it is abroad. One misses, however, the usual accompaniment of the foreign landscape, the clear crisp air, the fragrant smell of wood fires and *pôt-au-feu*, the ringing high-pitched voices of the women, and a sense of deeper colour and spaciousness which is never experienced in England.

The people of Lincoln are, as a rule, a handsome, well-developed race, and the women of the lower class are especially remarkable for their regular features, tall stature, and easy carriage. This portion of the country was largely peopled by immigrants from Celtic Gaul, who sought refuge here from the incursions of the Gothic tribes that overran the continent of Europe about 150 years before the Christian era, as well as by the Danes, who seized upon Lindsey Island, or Lindum, a Saxon province, which occupied the same extent of country as Lincolnshire, in the year 833, and again in 993. The inhabitants retain several characteristics of speech, manners, and feature, which may probably be traced to these remote ancestors; their intonation is remarkably pure; and there is an entire absence of the broad accent usual in the adjoining county of Yorkshire. The city is of very great antiquity; the site of the ancient British city having been, according to Ieland, somewhat to the north of the present site, beyond the Roman gateway called Newport, and some of the lines of fortification are still to be discerned. The outline of the Roman city is clearly traceable: the ancient Hermin-street traverses it from north to south; and there are besides the celebrated gateway on the north side several remains of the massive wall which defended the city on four sides, of unmistakable Roman work. The Roman city was remarkably small in extent, forming a parallelogram, about 1,300 feet one way by about 1,200 feet the other way, extending from the western wall of the castle on the west to the smaller transept of the minster on the east. The northern boundary is marked by Newport Gate; and there are some remains of a corresponding gateway on the south side in a wall in the street called Steep-hill. Under the Danish dominion, Lincoln rapidly increased in size and importance, and became one of those cities whose inhabitants intermarrying with the invaders were called *Fiehnburghs*, and were allowed considerable privileges. The erection of the castle and the cathedral under William the Norman still further extended the power and influence of the city, and from that time Lincoln played a prominent part in the history of the country. In the thirteenth century the city rose to a position of considerable eminence on account of its trade in wool, then the staple commodity of England. The river Witham was in the reign of Henry III. navigable for vessels of large burden from Boston to Lincoln. The city ranked as the fourth seaport in England,—London, Boston, and Southampton only ranking as superior. The embankment and proper protection of the river having been neglected, it at length became unnavigable; and in the reign of Charles II. the control of the Witham passed into the hands of a private company, and it is now leased to the Great Northern Railway Company. The principal trade in Lincoln is the manufacture of agricultural implements, which is carried on by a large number of eminent firms employing a considerable body of workmen.

The minster is, as a matter of course, the great object of attraction. Very extensive works of restoration have been carried on of late years, and both the exterior and interior give evidence of a laudable desire on the part of the Dean and Chapter to discharge their duty in the preservation of that remarkable building. Into the question of the propriety of the restoration that has been effected, we do not care here to enter, but those who are interested in the subject will

find it discussed at some length in our pages in a former volume. Some of the flying buttresses of the chapter-house are now being reconstructed. The windows have been, with a few exceptions, filled with stained glass, of varying merit, by various donors. The best windows are those by two amateurs, the Rev. Augustus Sutton and Mr. Frederick Sutton, who have executed several of the windows in the east transept, as well as that at the west end. The east window, by Ward & Hughes, although very nicely drawn and well arranged, is unsatisfactory in colour, being cold and thin.

The new pulpit, from a design by Mr. G. G. Scott, is quite out of character with the building; the base is of the most nondescript character, and the wood carving, although very beautifully executed by Riddle, of Peterborough, does not correspond with the carved woodwork of the stalls.

The prebendal stalls and canopies are unequalled for simplicity of design and richness of effect, and are well worthy of study. The woodwork was unfortunately stained a dark brown colour in 1848, by which much of the grace and lightness of the original work has been destroyed. The stalls of the choir are now in course of reconstruction.

The entrance to the choir from the lesser transepts is closed by two wrought-iron screens of fourteenth-century work of good design, one of which, that on the north side, has been lately restored by Messrs. Hart, of London. The restoration cannot be pronounced satisfactory, and the cresting, which replaces some seventeenth century scrollwork, is extremely coarse in execution, and inappropriate in design. The brass railing enclosing the altar, erected a few years since by Messenger, of Birmingham, is also very defective in an artistic sense; but as the design was furnished by the donor, one of the clergy of the cathedral, it may be thought invidious to complain of the quality of the gift.

The minister suffered severely at the time of the Reformation, and again during the civil wars: the whole of the memorial brasses have been plundered, and the statues and other decorations of the tombs and chapels removed or defaced. On the south side of the presbytery or retrochoir near the altar, is the tomb of Katherine de Swinford, third wife of John of Gaunt, Duke of Lancaster. The tomb is in a very neglected condition, and it has been lately suggested in a local paper that it would be a graceful act on the part of her Majesty to undertake the repair of the tomb, she being herself Duchess of Lancaster, and directly descended from Catherine de Swinford, as shown by the following table:—

- John of Gaunt—Catherine Swinford.
1. John Beaufort, Marquis of Somerset, &c.
 2. John Beaufort, Marquis of Somerset, &c.
 3. Margaret—Edmund Tudor.
 4. Henry VII.
 5. Margaret—James IV. of Scotland.
 6. James V. of Scotland.
 7. Mary, Queen of Scots.
 8. James I. of England.
 9. Princess Elizabeth—The Elector Palatine.
 10. Princess Sophia.
 11. King George I.
 12. King George II.
 13. Frederick Louis, Prince of Wales.
 14. King George III.
 15. Edward, Duke of Kent.
 16. Queen Victoria.

The verges informs the visitors, and the guide-books also assert, that Katherine was the sister of Chancer the poet; but the fact is that Chancer married Katherine's sister, which is a very different relationship.

After the minister the most noticeable objects in Lincoln are the curious pre-Norman towers attached to the churches of St. Mary-le-Wigford, near the railway station, and St. Peter-at-Gowts, in the High-street. These are very much alike in style, and resemble very closely in outline the campanili or bell-towers attached to several of the churches in Rome, and are probably of about the same date. These towers are square, and have what has been termed "long and short work" at the quoins. There is a circular-headed door on the west side next the street; the middle stage of the tower is unperched, and the upper stage has a two-light window, with semicircular arches and a balustrade column. St. Peter-at-Gowts has a bas-relief of St. Peter in good preservation. Pre-Norman remains are extremely rare in England, and it is satisfactory to be able to report that these interesting buildings are quite sound, and are in no need of rebuilding or restoration.

The building called the Jew's House at the foot of Steep-hill (a narrow and excessively difficult ascent from the lower part of the town to

the elevated ridge upon which the minster, castle, and principal part of the ancient town are situated) is a very good specimen of a twelfth-century dwelling of the upper class. It is engraved in Pugin's "Specimens," vol. i., p. 1, and there is a view of it in Knight's "Pictorial History of England," vol. i., p. 626, by which it will be seen that the house has undergone but little alteration, and that of a nonimportant character, since the year 1837, the date of the publication of the history. The corbels to the central doorway are, however, less distinct than they appear in the sketch, and the chevron ornament over the door has also suffered from the effect of time. The interior of the house was rebuilt some forty years since, and the only original part remaining is the front wall towards the street, which is very nearly 3 ft. in thickness.

The name "Jew's House" is said to have been derived from the house having been the residence of one Belesed de Wallingford, a Jewess hanged for coin-clipping in the reign of Edward I., but there is no foundation for the tradition. The expression "Jew's House" seems to have been vulgarly applied to houses built of stone. Stow in his "Survey" mentions a part of a large stone house adjoining the Royal Exchange standing in his time, the other part of which was taken down for enlarging the Royal Exchange. "This stone house," he says, "was said of some to have been a church, whereof it had no proportion; of others a Jew's house, as though" he shrewdly remarks,—

"None but Jews had dwelt in stone houses; but that opinion is without warrant, for beside the strong building of stone houses against the invasion of thieves in the night, when no watches were kept, in the first year of Richard I., to prevent the casualties of fire which often had happened in the city when the houses were built of timber, and covered with reed, Henry Fitz-Aldwin being mayor, it was decreed that no householder should build within the city but of stone, until a certain height, and to cover the same building with slates or burnt tiles; and this was the very cause of such buildings."—*Stow's Survey by Thomas, p. 73.*

Another remarkable building, of nearly the same date as that last referred to, is the building called "John of Gaunt's Stables," situate on the east side of the High-street, and near the southern extremity of the town. The front next the street is remarkably well preserved, the carving of the corbels and the mouldings of the handsome Norman archway being still fresh and clear as when first cut. The stone used is what is called the "ros stone," from the upper oolite bed of the Lincoln quarry, which is of a beautiful cream-colour, and is evidently very durable, and admirably adapted for carved work. The minster is partly built of this same stone, but there are also portions built with stone from some of the higher beds, which abound in shells and corals. As is the case with the Jew's House and some other buildings in Lincoln, John of Gaunt's Stables is a popular misnomer. It appears from Leland's description, that the building was a guild-hall, belonging, he says, to St. Ann's Church; but this is probably a mistake for St. Mary's Guild. The interior presents no features of any interest. It is now used as a mangle-house; and although the structure has not suffered any great injury of late years, with the exception of the addition of a floor, which shows below the entrance archway, it is too much to hope that it can long be used for its present purpose without incurring constant risk of deterioration, or the positive destruction of its architectural character. It is a pure and beautiful specimen of Norman work, and is worthy of being preserved as what is called in France a *monument historique*, at the expense of the state or municipality.

The house of John of Gaunt, the great Duke of Lancaster, stands on the opposite side of the street. It is now converted into two houses, and retains but few evidences of its former magnificence.

The high bridge over the Witham, 1330-1400, is a remarkably complete Medieval work; it is, nevertheless, alleged to be insufficient for the present navigation of the river, and it is suggested it should be rebuilt. Improvements, however, are effected but slowly in Lincoln, on account of the strong political feeling existing in the town. The townhall, which is in the Stone Bow, an archway across the High-street, is quite unworthy of the size and importance of the city, and a new townhall is much needed, public meetings of any importance being now held in the corn exchange. There is no system of drainage in Lincoln except by means of cesspools. The Local Management Act has, however, been adopted by the corporation, and the sanitary condition of the town is as good as can be ex-

pected under the present defective method. The effective sewerage of the low-lying portions of the town will be a matter of some difficulty, but there is no reason why the attempt should not be made.

It is proposed to lay out a plot of ground on the east of the city as a park or arboretum, which is much wanted. The ground, which consists of about 17 acres, and is advantageously situated, belongs to the freemen of the city, who have the right of pasture over it, and an arrangement has been initiated by the mayor and corporation to compensate the freemen by an annuity of 200l. a year, and to sell a portion of the ground for building, for the purpose of raising the funds for laying out and planting the park.

The church of St. Peter, in Eastgate-with-St.-Margaret, is now being rebuilt by Mr. Blomfield. The new church is to the north-east of the town, on the site of a former church, built in 1778. The new building is not sufficiently advanced to enable an opinion to be formed as to its design. The foundation stone was laid a few weeks back with Masonic honours.

A new church is also in progress in the lower part of the town, adjoining the Free School, for the parish of St. Swithin. The new church is built to the eastward of the present church on the Sheep-square, the site of a former market, which was purchased of the corporation at the nominal price of 500l. The style is Early Decorated, and, as far as the work is completed, it is of a satisfactory character, although rather safe than original. There are appearances that it is not intended to proceed with the tower and spire at present. The church will consist of a nave, north and south aisles, tower and spire at the west end, with a porch on the south side, and a vestry to the south-east. The dimensions are,—nave, 106 ft. long; chancel, 40 ft.; total, 146 ft. Breadth across nave and aisles, 61 ft. The church will accommodate about 1,000 persons. The materials used are Branton stone for the exterior, and the interior is faced with ashlar of Ancaster stone. The contractor is Mr. Lovele, of Branton. The architect is Mr. Fowler, of Louth, who obtained the commission in competition with ten others.

The ancient church of St. Swithin, the predecessor of the present church (a mean, uninteresting building, dating only from 1801), was one of the finest in Lincoln. It was unhappily destroyed by an accident during the civil war between the King and the Parliament in the seventeenth century. In 1644 the Earl of Manchester,—the Parliamentary general,—attacked the city from the side of Canwick, and having taken the lower part of the town, was preparing to assault the upper part, when some combustible material intended for the attack took fire, and the burning flakes being carried by the wind, and alighting on St. Swithin's church, caused its destruction.

The church of St. Mary, at Swineshead, near Lincoln, memorable in history as the spot where John of England retired when mortified by the loss of his personal baggage and treasure in crossing the Wash, and where he contracted the illness that terminated in his death, has been restored, and the termination of the work was celebrated on the 14th ult. by a restoration festival, at which upwards of forty of the clergy assisted, with the bishop of the diocese at their head. The church, which is a conspicuous object from the Boston and Sleaford Railway which runs about a mile to the eastward, is Late Decorated, with some admixture of Perpendicular work, and consists of a nave and aisles, a spacious chancel with a chapel opening out of it, south porch, lower, and spire. The restoration included the lowering of the floor to its original level, new open benches, and pulpit and reading desk, the removal of the whitewash and plaster with which the walls were encrusted. The work of restoration has been executed by Mr. Pattinson, of Ruskington, and Mr. Franks, of Swineshead, under the superintendence of Mr. Kirk, of Dewsbury. The cost of the restoration will be about 1,800l., including the new organ by Brindley, of Sheffold, which was presented by Mr. Reddish, the churchwarden.

New Tramways in London.—Notices have been fixed to the lamps on Blackfriars Bridge and in the Blackfriars and Westminster Bridge roads, stating that an application will be made to Parliament in the ensuing session for powers to lay down tramways in these thoroughfares.

THE RAILWAY HOTEL, LIVERPOOL.

The large hotel in course of erection for the London and North Western Railway Company, at their terminus in Lime-street, Liverpool, from the designs of Mr. Waterhouse, and before now described in these pages, is rapidly approaching completion externally, half the roof being already on. The building is in the round-arched Gothic or Semigothic style, which its architect has recently adopted a good deal, and which has the merit of appearing sensible and purpose-like, besides exhibiting a certain novelty and individuality of treatment. A row of lofty round-arched windows, with quasi-classic archivolts, forms the principal feature in the ground-story front, marking the height of the coffee and reading-rooms which occupy the main portion of the front ground-floor: elsewhere the upper part of this story is treated as a mezzanine. Over the first-floor string-course corresponding piers are carried up through three stories; the first and second floors having square-headed windows between the piers, the third floor round-arched windows corresponding with the arcade which connects the main piers. Over all is an attic with rather heavy dormers, the space between the dormers being filled up by a square panel enclosing an inner panel, within which is worked a kind of circular shield, slightly convex in section, and surrounded by a row of small beads or knobs. Unless there is something symbolical in this device, it is difficult to account for it; as mere ornament it certainly is not a successful feature. The main plan of the building is very simple, and looks as if it would work well; a centre entrance hall opens from Lime-street, divided by a lofty arch, supported on groups of four granite columns, from the central staircase beyond, which is lighted from the roof. From this central hall and staircase longitudinal centre corridors run right and left the whole length of the building on every floor, lighted by a two-light window at each end, with a vista right through from end to end. These corridors are fire-proof, formed of Yorkshire landings carried on continuous brick corbels. The architectural effect of the central staircase cannot be judged of yet; but a small detail in the construction of some of the upper landings reminds us what very clumsy methods are sometimes tolerated by architects (or clerks of works) in effecting the joining of iron beams at right angles. In this case, a very large wrought-iron beam carries the main landing connecting the corridors, and a cross-landing is carried by a smaller beam, one end of which is supported by a small piece of T angle-iron riveted against the web of the large beam, and projecting horizontally 2 in. or 3 in. It is probably strong enough for its purpose, but has a very make-shift appearance; and in a similar position in another large hotel (built by an architectural firm in very large practice), we saw, not long since, a system of cast-iron beams of equal section, arranged at right angles, those carrying the cross-landings having their flanges cut short at the point of junction, and the web continued so as to rest on the flanges of the longitudinal beam, the cross-beams thus resting entirely on the end of their web. Considering how frequently the use of iron beams in such a position is called for in large staircases, it might surely be possible to foresee it, and provide a suitable bracket on the main beams to take the ends of the cross-beams, instead of leaving the junction to be effected by the rule of thumb.

The line of elevation at each end of the building is slightly advanced both in front and rear, the projection taking the form of what may be called an angle tower, the tower effect being chiefly produced by the inevitable Mansard roof, which rises far above the cornice. On the ground story of each tower is a large and heavily-moulded *porte-cochère* arch, the flank wall which connects the two towers at back and front having a similar boldly-treated archway, above which several tiers of small windows, with shafts and foliated capitals, have a very elegant effect, and contrast well with the expanse of almost entirely plain masonry on the flank of each tower. It is something nowadays to find any architect recognising the value of breadth of wall-space in an architectural design; and this portion of the building is really treated in a striking and effective manner. For the rest, we can scarcely say so much; and indeed, considering the size and cost of the building, and the splendid and commanding site it occupies, facing, but rather higher than, St. George's Hall, it is impossible not to sympathise with what seems to be the prevalent feeling in

Liverpool, that a very fine opportunity has not been made the most of. The appearance of the disproportionately high roofs at each extremity, with the long tall mass of chimney-stack at each side crowded upon and scarcely separable from the roof, is anything but satisfactory. Almost the only ornament on the principal front, with the exception of the questionable panels in the attic above alluded to, is in the shape of perforated ornamental panels in geometrical patterns, under the windows; those under the first-floor windows being projected slightly forward and forming balconies, the corbels supporting which, by the way, come rather awkwardly close down upon the archivolts of the ground-floor windows. While the general aspect of the building is that of solid durability without show, and while the vulgarity of extravagant ornamentation is entirely avoided, the impression left by it is unsatisfactory on the one hand from a want of real effectiveness and point in the general design (always excepting the end elevations aforesaid), and, on the other hand, from the want of repose in the sky-line formed by the aspiring roofs and chimneys; a defect emphasized by contrast with the well-known sober monumental horizontal lines of St. George's Hall opposite. The masonry, of Sturton stone, with Minera and Cefn stone dressings is, we should add, in every respect admirable.

AN ENGLISH THEORY OF THE ARTS.*

A work has just appeared, on the rise and progress of the arts, which may be considered, in some respects, as the English equivalent of the German work on the same subject by Dr. Lübke, Mr. Bennett's translation of which was reviewed in these columns.† In the latter, the contemplative German thought out his theory, and then applied it to the various nations of the civilised world, in a calm, meditative, though perhaps crotchety, kind of way; whereas in the work before us an English barrister has thought out another, and has smoothly, glibly, and diffusely applied it to the various arts, recognising all nations as only one humanity. The German doctor's leading ideas are that, first, the geographical features of a country, and then the political conditions and general mode of life of its inhabitants, originated its arts, cultivated, or repressed them, as the case might be. Mr. George Harris sets out with the conviction that the origin of art is due to the innate power the mind possesses of combining ideas. He says the faculties with which the soul is endowed are of two kinds, active and passive; and it is the former, or the power to receive ideas, reason upon them, separate and combine them, that gives birth to artistic productions; the latter faculty also taking part in the result, in so far as it renders the mind liable to be affected by sensations of different qualities when excited by the material senses. Last we should obscure the author's meaning by compressing his words, we quote his continuation of this explication. "As the faculties availed of in the pursuit of art are as obvious and as definable as those which are employed in the progress of reasoning, so are the principles of this study as sure and as well established as those of logic. The efforts of this power may be capricious or ill-regulated in some minds, but in all they are capable of being regulated by certain laws, and are controlled by well-established rules. The principles of taste are certain, because the same senses and the same intellectual faculties as regards their nature, although different in extent and quality, exist in every mind." Thus, though both authors write of the rise and progress of art, they look at their subject from points of view so far removed from each other that its identity is almost lost. Dr. Lübke writes of art as though it was a crystal stream flowing through various tracts of land, and that was spread out in one till it formed a broad smooth sheet, and contracted in another to a deep tearing river, and precipitated, cataract-fashion, over rocks in another, according to the geographical features of the district; while Mr. Harris, though he can see it in this light, too, leads us more to think of it as of water in a well to which every individual brings his own cruse, gilet, or bowl, and quaffs his draught after his own fashion. But still the combination of brain-power and mechanical skill we call art is the

same thing all the world over, and in all time, whether men look at it *au dessus* or *au dessous*, from within or from without. We remind our readers of the German survey of the subject, only that they may compare it with the theory advanced in the work now before us.

Mr. Harris has made what he considers a new and correct classification of the arts. They are nine in number; and he ranks them in the following order:—Painting, sculpture, poetry, eloquence, music, architecture, dramatic acting, costume, and gardening. Seeing that architecture is generally conceded to be the grandest of all the arts, we admit the novelty of the scale without pledging ourselves to its correctness. We miss, too, in this catalogue many arts that should have found a place in a list making any pretence to completeness. Under which of these headings could we group the works of the Della Robbias or of Bernard Pailsey? Under which could we place those of Benvenuto Cellini? And where may we rank the works of illustrious goldsmiths, enamellers, and engravers? Ghiberti's famous gates are a work of art, yet can scarcely rank either as sculpture or any of the other arts here mentioned. The art of the *tapisserie* is of as much account as that of the *costurier*, yet it is overlooked. To be plain, notwithstanding a very noticeable inclination on the part of the author to leave not a stone unturned in connection with his labours, and, if possible, to fracture it and show us what was in the centre of it, he has in this particular given us very short measure. Without dwelling further, however, on what he has not said, we will follow him in some of his observations. He first commends art to mankind, and mankind to artists; and after minutely stating the claims of art, how different kinds were invented, their growth, their spheres, the points where they agree and where they separate, he proceeds to declare the leading principles that should regulate design in either of them. These, he avers, are all deducible from nature, yet it is not by a faithful portraiture of nature that success is ensured:—

"The consideration that the excitement of the mind, in an agreeable or gratifying manner, forms the origin and the foundation of each art, ought ever to be kept in view as a leading principle of design in art of either kind, so that every performance may be calculated to delight as well as to excite us. The principles of design, including those of delineation, are to be deduced in each of the arts, the greatest masters in them have pursued. The rules of art are to be drawn from the productions of art, and not the productions of art formed from the rules. Nature herself, as she is seen to exist, first supplied and taught the principles of art, and from her inexhaustible mine, the richest stores may be drawn. God gave these principles to nature, and nature gives them to man."

Thus it would seem rules are only to be ascertained by the study of great masters, which every student undertakes. Moreover, he lays down that they are chiefly negative, and principally of use to avoid defects, not to ensure perfection. No great poet has so frequently broken through rules as Shakespeare; yet none has attained equal perfection. Another rule he would inculcate is not to commence the execution of any design before it is clearly defined in the mind; but the chief one is to unite the freedom and absence of all affectation and formality of nature with grace, energy, and vigour. After this the rules dwindle down to elements of delineation, which are discussed in the following order:—1. Correctness. 2. Perspicuity. 3. Fitness. 4. Consistency. 5. Contrast. 6. Energy.

Mr. Harris applies, somewhat ingeniously, terms and turns of thought belonging to one art to another. Speaking of alliteration, for instance, in reference to poetry and eloquence, he points out its presence in architecture, costume, and gardening. In architecture the use of uniform ornamental terminations he looks upon as alliteration; in costume, corresponding ornaments; and in gardening, the formal arrangements in which each work and corner is but the counterpart of another that balances it, he speaks of as so much alliteration. This is a fanciful thought. Alliteration is not exactly a repetition, or even a balance. And when we come to include the distribution of colour, and the relation of masses of light and shade in painting, as alliteration, the agreement is still more difficult to discover. He would stretch the application to sculptural designs; and beyond these to music and acting, where, however, he confesses it is more faintly indicated and less direct. That he should have made the attempt is, to some extent, an index of his desire to treat every kind of art as one product of the mind, varying only in its fruit with the constitution of the individual who gives it birth. A poet, painter and sculptor, and musi-

* "The Theory of the Arts; or, Art in Relation to Nature, Civilization, and Man." By George Harris, F.S.A. In 2 vols. London: Trübner & Co. 1869.
† Vol. xxvi, p. 923.

oian are all producers of art, which, to him, is identical in kind, except in outward form; and conformable to the same rules, except those of mechanical execution. He even detects a "chemical affinity" in art, which term he explains in the tendency of representations of transactions which vividly and immediately affect the mind, to attach themselves at once to the heart. And, again, he requires of art that it should magnify and purify nature as well as reflect it. He sees, too, resemblances sooner than some people can see them. Gardening possesses, for instance, a close correspondence with painting in his eyes.

In his retrospect of this last-mentioned art, Mr. Harris scarcely goes so far back as he might; for he gives no account of the wonderful terraces upon the banks of a few north-country rivers in hilly districts, which are the remains of pre-historic gardens, when the low lands were too boggy, or wooded, for cultivation. In the valley of the Breanish, Northumberland, in the vale of the Tweed, and in Pembrokeshire, and elsewhere in Scotland, these terraces are distinctly marked, and are regarded with great interest by archaeologists as veritable fragments of ancient Britain. They lie high up on the hill sides, ridge over ridge. The gardens attached to early hermitages, too, are overlooked by him; and those attached to the abbeys, and other ecclesiastical institutions, are equally ignored, although their influences have not yet perished. In the neighbourhood of Jedburgh the monastic pears are still represented; and around Hulme Abbey, again, the monks' plums are now growing wild. His impression is that, though Fitzstephen records that the citizens of London had large gardens in the reign of Henry II., and Hollinshed's Chronicle infers choice gardening in the reign of Edward I., the wars of the white and red roses exterminated all but the roughest kitchen gardens and bare pleasure-grounds; and it was not till the reign of Elizabeth that gardening was treated artistically. He calls the celebrated poem of the Scottish king, James I., to witness that the garden at Windsor, in the reign of Henry V., was but a place thickly planted with trees, with alleys of hawthorn, and an arbour in each corner. The Northumberland Household-book of 1512, too, he quotes, to show, that out of an establishment of 150 persons there was but one gardener "who attended hourly in the garden for the setting of herbs, and clipping of knottes, and sweeping the same garden clean," tasks which are now distributed among something like thirty people. But in more modern times gardening has had advantages over both painting and sculpture, he considers, because ornamental grounds belonging to the wealthy, expense has not been spared in their cultivation, and persons of the highest taste and accomplishments have turned their attention to it.

Reviewing the British position among the arts further, Mr. Harris allows that the modern excels the ancients in landscape painting and in water-colours. He re-arranges, in a rapid fashion as he passes through the array of British painters, their respective ranks. He takes Turner by the shoulder and places him below Martin and West he beckons up to stand close to the great masters of old. There is a sect of artists who would, doubtless, close a book that contained such a passage as the following:—

"The true and fair position which I shall assign to Turner, and which a just and discerning and impartial posterity will, I believe, accord to him, is this. He is not, as has been asserted, the greatest landscape painter who ever lived, or even who has adorned this country; and he is far inferior generally, and in his highest qualities, to either Claude, Salvator Rosa, Wilson, or Gainsborough. To Martin he is superior in mechanical skill, although far his inferior in imagination and mental power generally, as also in perspective effect. Turner's merits consist really and solely in his power, of representing with wonderful truth and vigour certain prismatic results, the appearance of mist and spray, as also of water when agitated, the rays of the sun when it is declining, and the varied appearance of the sky. In many respects he was unrivalled here, especially as a painter of clouds. But beyond this he can only be allowed to rank with other artists."

We would advise the critics in question, though, as we would art-students generally, to read on, for the sake of the prospects of art in this country. He pleads for more patronage. Painting, so far, has scarcely been aided, except to gratify family vanity and affection; and sculpture has only been befriended by the dead in the form of memorials; though poetry has, comparatively speaking, flourished, and elegance has enjoyed a large patronage. Architecture has been still more firmly tied down, because no architect has the power of building a cathedral to show his skill. But given a little more

patronage,—national patronage,—and all will be well. A trinal taste is the only other requisite for our artistic prosperity. Nevertheless, he has a proposition to make, to the effect that more than one mind should be employed upon a work of art. A man might be able to conceive a grand subject in a practical manner, and yet be unable to put it upon canvas; for this secondary process he would employ another hand, cunning and well skilled; and to the works thus produced he would give the name,—*Grapho-pneumata*.

HISTORY OF ARCHITECTURE IN ROME. ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The ordinary general meeting of the Institute took place on Monday evening last, when Messrs. John Edward Cox and Herieth Williams (Associates) were elected Fellows, and Mr. H. Joseph, Williams an Associate.

A memorial to the Metropolitan Board of Works, urging the desirability of maintaining the open space by the side of the Mansion House, and forming the entrance to the new street thence to Blackfriars, was unanimously adopted by the meeting.

A conversation took place with reference to the works at Worth Church, which led to the inquiry whether the council were in a position to give any official information on the subject, to which the chairman replied, that the matter having been referred to the committee for the conservation of ancient monuments, they passed a resolution expressing a hope that this interesting monument of architecture would be preserved. The subject had been again brought before the notice of the council that evening, and they had decided to call the attention of Mr. Salvin, jun., the architect, to the letters on the subject which have appeared in this journal, and also to the resolution of the committee, at the same time expressing their confidence that that gentleman would do all in his power to carry out the views therein expressed.

Mr. J. H. Parker (honorary member) read a paper entitled "A Sketch of the Early History of Architecture in Rome, as connected with the recent Excavations." The first portion of the paper was devoted to a description of the early methods of fortification adopted in Italian cities and villages as border defences against the attacks of hostile tribes. These villages and towns were surrounded by a bank of earth, and a wide deep trench, out of which the earth for the bank had been taken. On the top of the bank a wall of wood with wooden towers was placed, or sometimes a palisade only. In process of time the summits of all the hills became fortified in this manner, and the narrow gorges between them were also placed in a state of defence. These ancient earthworks were on a gigantic scale, the whole population being employed upon them for mutual defence, and they were never destroyed. The bank may be removed in parts, and the trenches filled up in parts, but it was sure to leave plain traces behind. The tops of nearly all the hills in England and in Gaul were fortified in this manner. Sometimes these great earthworks were considered as natural formations; in other instances they were called Caesar's Camps, because they were afterwards occupied by the Romans, but they were often constructed by the natives to oppose the Roman invasion. Such ancient fortresses were found all over the world, in the East as well as in the West. In Palestine they are very remarkable, and Jerusalem itself is built on a strong earthwork.

The lecturer then proceeded to give a description of the ancient walls of Rome, pointing out on a map the directions in which they were carried, further illustrated by numerous photographs of great interest. He then went on to remark that we must not conclude that because the fortifications were faced with stone walls, principally tufa, the inhabitants of Rome in the time of the kings lived in stone houses. On the contrary, it is recorded that the house of Romulus was a wooden hut only. The only stone buildings within the walls were a few temples; the houses were entirely of wood, and most of the temples also. When a great deal of ornament was used in their buildings, the ornament was of wood or bronze, not of stone. In the Temple of Solomon, at Jerusalem, the earliest building of the kind of which we have any record, all the ornamentations were of cedar wood and bronze. The walls were of large

blocks of stone very similar to those of the walls of the kings at Rome, only larger. As a general rule, the older a wall is the larger the stones are, but this must, of course, depend on the building material. In the remains of other fortified cities of the early period, such as Fiesole and other Etruscan cities, we do not find any remains of houses; there are commonly one or two temples, and sometimes a fortified palace, but the houses were mere huts. It was, therefore, no great hardship for people in such a state of civilisation to be removed with their flocks and herds from one city to another, wherever safe fortifications for their families and pasture for their cattle were provided. This accounts for the rapid rise in the population of Rome. The Romans for several centuries adopted the plan of transferring the inhabitants of the conquered cities to Rome; their flocks and herds were added to those of the Romans, and increased the wealth of the city. Many of the original cities have never been inhabited since: the walls are nearly all that remains. Sometimes a Roman colony has been settled within the old walls, probably in part to defend them, and hinder an enemy from making use of them. It was not till after the introduction of lime mortar into general use that houses of stone began to be built, and then public buildings were erected before private houses. Lime mortar is supposed to be a Greek invention, but it was not brought into use in Rome until after the time of Camillus. It was either a Roman invention or was very soon introduced there and brought into use. Brick came into use in Rome very soon after lime mortar. The earliest walls with mortar are of rough stone only, with a profusion of mortar, but they soon began to face these rough walls, called concrete, with brick, to give them a smooth surface. They also at an early period used small blocks of tufa, cut into the shape of bricks, but usually of a rather larger size. We read of bricks at a much earlier period, both sun-dried and kiln-dried; but the bricks of Babylon and other earlier cities were cemented with hitumen only, or sometimes with slime or mud, where hitumen was not to be had. The earliest wall in Rome built with lime mortar is the high concrete wall at the north end of the Palatine supporting the cliff, near the middle of that end of the hill. This has been built of rough stones grouted in with fresh hot lime, and the outer face supported by a wooden frame, which has been suffered to remain until it decayed. The date of this early concrete wall is not recorded; the earliest dated building of this construction is the Emporium on the bank of the Tiber, about two centuries before the Christian era. The celebrated wall called the Murotoro, because it is distorted by the giving way of the foundations, and the Pantheon of Agrippa built a few years before the Christian era, have walls of enormous thickness, the mass of which is concrete faced with brick, and the brick is bound together and fixed to the concrete mass by a number of arches of construction. The buildings of the time of Julius Caesar are generally faced with large blocks of travertine, well out and fitted together, but quite plain. The buildings of the time of Augustus continued to be still frequently quite plain during the early part of his reign—that is, before the Christian era. Instances of this form of construction were given. During the long and peaceful reign of Augustus great progress was made in the fine arts, including architecture and the construction of walls. According to some authorities, the time that Christ was on earth was precisely the period when the arts were in the highest state of perfection in the Roman empire. This view is hardly borne out in strictness; but it is universally agreed that during the first century of the Christian era the arts were in a higher state of perfection than they had ever been before, or have been ever since, unless an exception is made for architecture in the thirteenth century, but that does not apply to Rome. Architecture is generally a guide to the other arts. For the construction of walls, Mr. Parker regarded the brickwork of the time of Nero as the finest in the world. The bricks with which the walls are faced are so thin that we can count ten to the foot, including mortar. In the second century there are eight to the foot; in the third century, six; and in the fourth century, four only, as in modern brick walls. This was regarded as a useful general guide to the age of a building in Rome.

Of the temples and other buildings before the time of Augustus, there are only such remains as serve for historical purposes, but not as models.

Such as remain sufficiently perfect to be considered as models are the Theatre of Marcellus, the Temple of Fortune, near the Tiber, and the Arch of Drusus. The remains in an imperfect state are numerous and important, and some of the buildings are nearly perfect. The beginning of the fourth century, the time of Maxentius, was a great building era, and there are many buildings of that period remaining; but after the accession of Constantine the Senate ordered that all these buildings should be called after his name, and the name of his predecessor obliterated. The removal of the seat of empire by Constantine was fatal to the prosperity of Rome as an imperial city. He gave all the imperial estates in the Campagna to the church, and as these estates had supplied the funds for the buildings of the city of Rome, this transfer completed its ruin. After that time the history of church architecture and of the Middle Ages begins.

On the subject of the durability of Roman walls and the cause of it, Mr. Parker remarked that, after the introduction of lime mortar, the lime in these walls was always used quite fresh and hot. It was pounded and mixed with a large proportion of gritty sand: full advantage was thus taken of the wonderful expansion and crystallisation of lime as it cools. The jagged edges of the crystals combine with the rough sand, or broken stone, or brick reduced to powder, and the mass thus formed is as hard and as durable as a natural concrete rock. English builders frequently have a prejudice against the use of lime quite fresh and hot; they say it bursts the walls, but this is because they do not pound it or grind it before they use it. A large lump of lime when water is poured upon it, will burst through anything, but in a powdered state there is no danger of this. The principle of our modern cements, both that called Roman cement and that called Portland cement, is the same. They consist of fresh lime pounded and mixed with rough sand or pounded stone, and kept in air-tight vessels until it is used. If this precaution is not attended to, lime absorbs moisture from the atmosphere so rapidly that all its binding power is gone before it is used. The more fresh it is the more strongly it will bind.

A few words on the construction of Medieval buildings in Rome might be interesting. It was rather difficult to say when the Middle Ages began. In the west of Europe, we generally mean by that term from the eleventh to the sixteenth century; but in Rome it was usual to begin them at a more early period, and to include what some call the "period of the Decadence," that is from the fourth century to the tenth. For that long space of time, about 600 years, we have scarcely any buildings remaining in England, and very few in France or Germany, because it was the habit of people to live in wooden houses, and to make even the churches and public buildings of wood also. The Anglo-Saxon word for "to build" is "timberen," and in Normandy M. de Caumont sought in vain for any masonry on the sites of the castles of the barons who came over to England with William the Conqueror. He found very fine earthworks, but no stone building of that period. The Norman keep was invented by Gundulph, at Malling, and rapidly adopted by the king in the White Tower of London, and by the Norman barons generally, as so admirably adapted to their wants at that period. A handful of brave men could defend themselves against any number till succour could be obtained from the neighbouring barons.

In Rome the fortifications are much earlier, and of quite a different type. The gateway fortresses consist of a circular wall surrounding the old gate, with inner and outer gates, so that when the fortress is complete three gates have to be passed through. The mass of the wall is generally concrete. The brick facing is quite different from that of the magnificent wall of Aurelianus in the third century. The wall of which there are large remains, was one of the wonders of the world. It was 13 miles long, 50 ft. high, and had a corridor for the sentinels inside the wall, with an open arcade within, and the solid wall without. All the early churches had been halls in houses, which came to be considered the natural form of a church, and the name of Basilica, which originally signified the King's Hall, was adopted as that of a church. That of the Holy Cross at Jerusalem is a curious instance of the adoption of an old hall for a church. The main structure is of the second century, and is oblong, with the original arches

for aisles. An apse at the altar end was added in the time of Constantine, which showed the idea that an apse had at that time come to be considered as necessary to make it a church; but in the fifth century round and polygonal churches were sometimes built, as at Ravenna and St. Stephen.

In conclusion, Mr. Parker remarked that the great abundance, including marble columns by the hundred, which remained in Rome from the time of the Empire, was in reality a misfortune to the Roman architects. In order to make use of these materials, they continued to build in the old forms, not only during the period before the year 1000, but in the thirteenth and fourteenth centuries also, long after the magnificent style, miscalled Gothic, had been brought into general use in the West. The so-called Gothic style scarcely came into use in Italy, until the fifteenth and sixteenth centuries. The arch is the real characteristic of Roman architecture; and from this everything else has been developed. In Medieval walls in Rome the surface is often faced with small stones of a peculiar character, called Opus Saracenicum, said to have been introduced into Italy by the Saracens; but it is really found occasionally in early Roman work, and was probably taken by the Saracens from Byzantium, and only brought back into Italy by them. Generally, perhaps, the buildings of the Renaissance in Rome are the finest that we have anywhere.

A conversation ensued principally with regard to the period when lime mortar was first used, when Professor Donaldson stated that on his first visit to Egypt he extracted a large fragment of mortar from one of the great pyramids, and these were anterior to the Roman remains spoken of by Mr. Parker.

On the motion of Sir M. Digby Wyatt, seconded by Professor Kerr, a vote of thanks was passed to Mr. Parker for his paper.

Descriptions were then given by the respective inventors of Mr. Miller's apocometer for measuring the height of spires, columns, &c.; and of a lock, invented by Mr. Hodgson, a harrister, called the Citadel Lock; and the proceedings terminated.

ON PAINTED ROOFS.*

The comparative lowness of our English churches seems to have called especial attention to the treatment of roofs in this country, and very great pains appear always to have been taken by English architects to produce the most magnificent effect possible in this particular department of their art.

Why it was fashionable to build churches, the roofs of which were not much more than two-thirds the height of those in France and elsewhere, we have no means of ascertaining. But that it was a mere fashion we may feel pretty certain. I think it is Mr. Ferguson who so justly remarks that an architect who could raise one of our great English churches could without difficulty have placed the vaulting at any elevation he thought desirable; indeed, as a matter of mere skill and beauty, our roofs in England (whether of wood or stone) far exceed anything that can be shown on the Continent. Of course, the great height of the cathedrals of Cologne, Amiens, and Metz, produces a most splendid effect, and gives them great dignity; still, our more sumptuous vaultings, by their intricacy and beauty, must have gone a long way towards rivaling, even if they did not excel in dignity, the ceilings of which I have been speaking, when in their glory. Again, the great distance from the eye at which the foreign roofs are placed made actual ornament a matter of secondary importance; and the consequence is that the roofs abroad are very often poor in design and execution, and that coloured decoration upon them is far more rare than it is with us. The well-known examples at Liège, with some others at Treves and elsewhere, afford excellent specimens, no doubt, of the method of treating roofs vaulted with stone, but they are of a late date. One of the most celebrated examples of a painted ceiling on the Continent is that at Hildesheim, which the late Mr. Le Strange took as the model upon which to arrange the remarkable roof-painting on the nave at Ely Cathedral. The barrel vault at St. Sauveur, near Poitiers, in France, is a remarkable, though little known, example, apparently of the same period as the painting at Hildesheim; at least, it seems to be what we

should call Late Norman or very Early English in this country. The entire vault of Alby Cathedral, in the south of France, is most magnificently painted by Italian artists of the sixteenth century; but as this work almost approaches high art, it scarcely comes within our present subject, though, if money were forthcoming for the entire fittings of our churches on the handsomest possible scale, it would be most unwise not to advocate the use of the highest decorative art, even upon roofs, distant as they are from the eye.

Still, as so great an amount of money can seldom be expended in decoration in these days, when mere church accommodation is so urgently needed, we ought to turn our attention to that which lies within the reach of almost every church builder or restorer,—I mean an effective method of roof decoration, produced by few colours, and at a small cost, but which has still some real thought and knowledge of the subject bestowed upon it; for it is impossible not to feel that a well-designed decoration, if it only consists of black and white, is more worth looking at than a far more elaborate painting, where the expenditure has not been guided by taste and skill. Every one would be inclined to allow, no doubt, that ceilings vaulted either in wood or stone add almost more than anything else to the dignified and minister-like appearance of churches; they have, however, one very great drawback,—they diminish the actual height of an interior very much. No one who has ever been between the roofs of Lincoln Minster (for instance) can fail to regret the enormous loss of height which the vaulting causes. Had this space been thrown into the church, it would have allowed the ceiling to have been raised to at least 100 ft. above the pavement, and so given that splendid building the only thing it seems to lack—proper elevation of the roof inside. This very fact, however, seems to be an additional argument in favour of roof colouring, as a carefully thought out scheme of decoration for such ceilings would go a long way towards finding a remedy for their only fault. It is a great pity that we have so few examples left us in a thoroughly trustworthy condition of the method in which these vaults were coloured. Both in England, however, and elsewhere, the ground colour seems most frequently to have been white, slightly tinted to take off its chilliness. Upon this pattern were traced sometimes radiating from the bosses, as at Wells Cathedral, or running alongside the ribs, as may be plainly traced in the transepts of Lincoln Minster; in this instance, additional richness is given by the introduction of an occasional medallion. In many instances, however, the bosses alone were richly coloured, together with a short piece of the rib in each direction from the boss itself, the rest of the roof being left of its natural stone colour: this has a very good effect. Examples of this treatment are to be met with in the cathedrals of Norwich, Ely, and Worcester; and in each case, I believe, the painting we see is an exact reproduction of the original colouring of the ceiling.

When the vault of the angel choir at Lincoln Minster was unfortunately stripped of its original plaster, a great quantity of painted ornament was discovered, and destroyed: thus depriving those who were interested in the subject of colour, as applied to church decoration, of a very valuable example, and, at the same time, doing a serious injury to the beauty of the interior of the church.

It is, perhaps, worth mentioning, that very possibly the painting on the roof of the choir of Westminster Abbey is only a clumsy eighteenth-century reproduction of the original decoration of that most graceful vault.

The wood vaulting of the choir of St. Alban's Abbey Church still retains its colouring in a remarkably good state of preservation. It consists of medallions and leaves boldly executed on a pale blue-green ground. The treatment of the ribs is also especially good.

It is impossible, however, in a short paper to go thoroughly into the various styles of roof-painting; so that the best plan, perhaps, will be to confine these remarks to one portion of the subject. The roofs which are most characteristic of our English phase of Gothic art are the astonishing series of timber roofs which are scattered over every part of the kingdom, displaying a most wonderful knowledge of the capabilities of the material with which the architects had to deal, and an amount of artistic variety of design and ornamentation which it is almost bewildering to think of.

* By the Rev. F. H. Sutton, M.A. Read at the last meeting of the Northamptonshire Architectural Society.

Different districts had, of course, their special types, the Norfolk and Suffolk roofs being (as a rule) entirely different from those of Northamptonshire, Leicestershire, and the Midland Counties; these varying from the Somersetshire, Gloucestershire, and West of England series, and these again giving place to a new style of coved and panelled ceilings in Devonshire and elsewhere. Still in each district, though its own peculiar form of roof is found, of course, most frequently, we are able to discover an extraordinary variety of treatment, execution, and design.

Now, as we have generally in our church restorations to deal with a wooden roof of one of these types, the best way will be to explain what would have been the usual treatment of such ceilings, when it was wished to colour them, and to illustrate the subject by a few specimens of roof-painting, such as we do not frequently find in our old churches. As a rule, as far as I can gather from looking carefully at a very large number of examples, it was not very usual to paint an entire ceiling elaborately. In many churches, indeed, the roofs seem to have been left the natural tint of the oak, with a little painting introduced in a hollow moulding, as at All Saints', Stamford; or with a pattern on the flat of a spandrel, or the more enriched design being reserved for the last bay of the nave eastward, over the screen, or for the panels immediately over a side chapel.

Instances of this arrangement are very common. A very good one occurs at Cransley Church, near Kettering, which I shall have to refer to again, and at Bury St. Edmunds, in St. Mary's Church.

Examples, however, of entire ceilings covered with paintings are to be found, and, when means permit, this plan ought to be adopted, if it is for no other reason than that of showing that the work of decorating our churches has not been undertaken in a niggardly spirit. But, of course, in most instances expense is an object, and where something has to be given up, that which, after all, is an architectural luxury, may well take a less expensive form, in order that the actual instruments of Divine service may be provided for on a more handsome and fitting scale. It is for this reason that the partially-coloured roofs to which I have been referring are so especially valuable, as they show us how much may be done in the way of decoration at a small cost.

An ordinary midland county roof is, as we all know, generally rather flat, and though frequently handsomely carved and moulded, perhaps more than any other kind of ceiling, seems to require the assistance of the decorator's art.

The church roof at North Luffenham, in Rutland, is one of the kind I have been speaking of, &c., it is a partially-coloured one, and is a fair specimen of the manner in which the old Gothic designers treated a plain roof. It may be taken very well as a type of such like simple decoration. It could be executed by any country painter, at a very small outlay beyond the ordinary cost of staining. The roof at North Luffenham has not been selected for illustration on account of its being in any way a remarkable specimen of painting, but to illustrate how small an amount of colour is required to produce a decidedly good effect. It is this which renders it a good model for imitation where a church restoration committee is in the usual chronic state of insolvency.

It will be seen that the principle upon which this roof is decorated is this: the woodwork, as a rule, is left its own natural colour, while the mouldings and bosses are painted in white, red, and black, the colours being everywhere counter-changed. The spandrels of the principals have a flower pattern stencilled on them in black and red; the chamfer is red, and the flat portion on the underside is white, to correspond with the other parts of the roof.

At All Saints', Stamford, if I remember right, much the same arrangement occurs, only in that instance small ornamental flowers are introduced in the hollow mouldings, to enrich the effect. The roof at Cransley Church, already alluded to, gives us some excellent hints to guide us in our roof decorations; the same colours are used as at Luffenham, the ornament being chiefly the usual barber's-pole pattern, as it is called—a twist of black and white. The aisle roofs, however, are more out of the common way, and the colouring of some of the spandrels in the south aisle is still pretty fresh. The pattern is drawn with a free hand on the plain uncoloured wood, in

white, with a red edge; it is dashed off apparently without any formal design being sketched, but it is very graceful, and fits the space remarkably well; in fact, it is not easy to suggest a more appropriate style of ornament for roof painting where time and money do not permit of a more elaborate treatment.

The roof over the nave at Brant Broughton, in Lincolnshire, retains its original colouring; the aisle roofs, however, have either never been painted, or have lost their colouring from being nearer the ground, and, therefore, more easily cleaned. This is a much richer specimen than those already mentioned. It is painted, however, on the same plan, and the same colours are used, with the addition of some gilding on the carved work. There is a very effective chevron pattern on the purlins of this roof. Altogether, this ceiling even now has a remarkably rich effect, and is well worth a visit.

The roof of Northwold Church, in Norfolk, is another fine specimen of one which has been painted entirely. It has been, unfortunately, rather coarsely re-coloured, but it still looks very well.

Perhaps the most beautiful bit of roof painting to be found anywhere is that over the eastern compartment of the south aisle at St. Mary's Church, Bury St. Edmunds. It formed the ceiling decoration over a side chapel. In this instance the roof has been hoarded to receive the painting. Like the others which I have described, the colours used are black and red upon a white ground, the mouldings, as well as the flat parts of the roof, being profusely ornamented with the twisted barber's-pole pattern in black and white, while the hollows are coloured red; the panel itself between the principals is divided diagonally with broad bands, containing inscriptions, which are separated from each other by a beautiful diaper pattern of ivy-leaves on an interwoven stalk, the intervening spaces being filled with the initials of the founder of the chapel, J. B., surrounded by a garb. At the intersections of this diaper little rays of metal gilt are tacked on, to conceal the junction of the stencils, with remarkably good effect; these, again, being connected by a flower, which formed the eye or centre of the gilded rays. The initial letters of the inscriptions are most delicately illuminated in gold, shaded with brown, in a style which is almost worthy of an M.S. The spandrels, too, are very good. This church also supplies us with an unusually good example of a panelled ceiling retaining its original painting. It is a very rich specimen, and more gorgeously coloured than most. In this case the ground of the panels is also white, and the carved ornaments, which are very rich and elaborate, are coloured red, black, and gold, a good deal of gilding being used to bring out the rich carving of the bosses, possibly owing to the darkness of the chancel, which it covers. The lower part of the roof, just above the wall-plate, is formed into oblong-coved panels, each containing an angel holding a scroll: this painting, I need hardly say, would be costly to imitate.

A very simple example of an original panelled roof, with its oil painting, occurs at Caston, in Norfolk. The panels themselves are left the natural colour of the oak, the ribs and bosses alone being painted. The rib is a simple roll moulding, with a hollow on each side; the roll is painted with a twist of black and white; the hollows are red, and the carved bosses at the intersections of the ribs are gilt. This roof looks remarkably well, and might be used with good effect anywhere.

It will be seen from those remarks that roof painting need not necessarily be an expensive undertaking, and I trust we shall see the experiment tried much more frequently than we have hitherto done. If it is, there can be no doubt that our churches will very soon assume a dignified beauty, which at present we can scarcely conceive possible.

Mr. Sutton, being asked by the Chairman, said he should be happy to assist any one who wished him with his advice on the subject of painted ceilings. In reply to Mr. E. F. Law, he recommended roofs being painted in water colours, as they could be done in a very little time. The roof of South Kilworth Church was done in ten days.

Mr. Law advocated roofs being painted in distemper. The colours became dark from absorbing the moisture, but there was no dripping. It would be much better, also, to have stencilling between the rafters: it was much more lively, and had a great advantage, besides which the difference of cost was great.

THAMES BRIDGES.

The traffic over London Bridge was stopped on Monday, and now there is not a single stone of the pavement laid down in 1865 left in its place. The inconvenience thereby occasioned is, of course, great. Southwark Bridge is notoriously an inconvenient one; and there is a disinclination, if not a dislike, on the part of drivers, to cross it. This has thrown the larger portion of the goods traffic between the northern and southern divisions of the metropolis upon the new bridge at Blackfriars. The City authorities, in anticipation of the advent of this pressure, have as yet refrained from taking down the old wooden temporary bridge, but have issued orders that all traffic passing southward should go over it, thus putting the less strain occasioned by the smaller traffic from south to north upon the new structure.

Some short time ago the *Spectator* wrote:—

"London Bridge is choked with traffic on it, and the City council has been considering and rejecting all manner of expensive proposals for widening it. Foot passengers especially suffer. They are often in danger, and, as Mr. M'George pointed out, the balustrades being solid, the bridge is a dust-trap in good weather and a ditch in bad. Will the *Baldier* tell us if there is any final reason why a bridge like London Bridge should not have a second story put on it,—a wooden bridge, like a railway crossing, supported on iron pillars let into the buttresses, and secured for pedestrians? No work in wood would be necessary for that, and cabs would gain the space now occupied by the *tretoirs*. Must such a second story be too ugly for human endurance?"

We will say nothing as to the obstruction to view and the ugliness that might thus be created: sufficient objection to the proposition may be grounded on the fact that the foundation is already as much loaded as it should be.

In a "Report on the Communication between the North and South Sides of the River Thames," by Mr. Henry Carr, G.E., recently published,* the writer shows that the pile and timber foundation of London Bridge is not equal to the work put upon it, and says the piles are, no doubt, either crushed or the piles are driven down.

"It is evident," he says, "that, although London Bridge stands well at present, it would not be desirable to put on additional weight, even if the additional weight were so small as probably to produce no appreciable effect; nevertheless, should additional weight be put on, and any settlement take place at any future time, the committee might regret having increased the load upon a foundation which certainly has no strength to spare."

The writer proposes to widen the footpaths of the bridge, from 9 ft. on each side, to 11 ft. 6 in., by removing the parapet to nearly the extent of the cornice which now projects beyond it. In the same report Mr. Carr proposes, with reference to Southwark Bridge, to lessen the steep incline which at present interferes so much with its usefulness, and to widen it from 42 ft. to 54 ft., without additions to the foundations. He would take down the existing cast-iron arches, and replace them with others of wrought-iron, lowering the soffit to the same level as at Blackfriars. The new street now in progress will give a good approach, and something should certainly be done to enable the bridge to take its fair share of work.

LECTURES ON ARCHITECTURE AT THE LONDON INSTITUTION.

PROFESSOR KERR delivered, on Thursday evening, the 11th instant, the first of "Four original Lectures descriptive of Architecture or the Fine Art of Building," dealing preliminarily with the primitive style of the Egyptians, and others before the Greeks. His object, said the lecturer, was to explain to an audience presumably uninitiated in architectural matters the grounds upon which controversy at present so much rested with reference to this art in what was called "the battle of the styles,"—a discussion now so frequently appearing in the press as to have rendered an otherwise recondite subject of professional study a matter of popular interest; one great class of society holding to Classicism, and another maintaining Medievalism,—and this frequently with considerable, not to say inexplicable, warmth. After defining the question of art and the sense of beauty, and giving an illustration of the way in which plain building becomes artistic by the use of proportion and ornament, the lecturer went on to explain the causes which produce style (given, said he, such and such conditions, the result will be necessarily so and so), and proceeded to examine the style of the Egyptian

* Waterlow & Sons, Parliament-street. 1869.

works, which he thought it convenient to trace to the excavated temples, so as to account for the extreme ponderousness of the columnar arrangements. He had previously, however, presented the following scheme of general artistic chronology in epochs of 500 years.

B.C.	2000 to 1500	... Egyptian, rising.
	1500 to 1000	... Egyptian, declining.
	1000 to 500	... Assyrian and Persian.
	500 to 1	... Greek.
A.D.	1 to 500	... Roman.
	500 to 1000	... Byzantine (the Dark Ages).
	1000 to 1800	... Western Ecclesiastical.
	1800 to 2000	... An antiquarian epoch, apparently now drawing towards a close, to be succeeded by a fresh line of effort.

After pointing out on drawings (most of which were courteously lent by Professors Donaldson and Hayter Lewis) the characteristics of the Egyptian manner of design, the lecturer dwelt upon those points which he considered had so far been accomplished as established architectural data. The cornice was one, but not the stylobate. Sculptural decoration of a mural character, and painting to correspond, and the use of colour decoration, were other points. The structresque had been accepted; proportion, also, as a purely architectresque element, had been fairly exhibited. Symmetry, not necessarily an axiomatic idea, had been established. The introduction of architectural ornament, treated in a perfectly architectresque manner, was accomplished; and symbolism, also, in its simple form of characteristic expressiveness.

The remainder of the lecture glanced at the character of Assyrian and Persian work, Indian and Chinese (ancient and modern alike), and thus stopped at the preparation for the Greek epoch.

THAMES EMBANKMENT, COURTS OF LAW, AND BRIDGES.

As the commencement of a new era for London, our riverine boulevard, although complete only in its quay wall and footway, excites admiration; but the opportunity opened by it for adorning the metropolitan centre, by the erection of ornamental buildings, and by the plantation of intervening spaces, at suitable intervals, whilst at the same time it affords views hitherto occulted except from steam-boats—this is its chief value.

The railway is advancing with great celerity, and is likely to be in action the ensuing spring. The works are continued night and day, so that recollecting the rapidity with which the line from Brompton to Kensington was carried out, together with the stations, we may calculate upon the promise of the contractor to throw it open by the 1st of May.

The opening of New Blackfriars Bridge and the Holborn Viaduct, while it confers wondrous benefits upon the traffic of London, will bring more palpably before the public the inexpediency of placing the Courts of Law upon the lie-by of the Embankment, or on any other site than upon the central, solid, and elevated position which was at first selected, purchased and cleared for them at St. Clement's Danes.

Granting that room could be found by making expensive clearances between Somerset House and the Temple, the site would be neither so convenient for the practitioners nor suitors in the Courts; besides that, it must be at increased cost, and would require two years longer in process of erection, leaving the Temple Bar centre a ruinous waste, to be hereafter disposed of after the fashion of Victoria and Farringdon Streets. The delay and indecision upon all our public works have hitherto been as discreditable as unprofitable.

The sites upon the river embankment are so valuable and beautiful that they will be eagerly sought and turned to good account. It would not contribute to the scenic effect to continue a series of lofty buildings from Somerset House to the Temple—the river would be overshadowed, and the views of monumental London curtailed off from the causeway. In such cases, as in Venice, all structural effect must be sought and studied from a gondola.

There are, however, other and more important considerations,—the first being the professional convenience and aptitude of the Clement's Danes site; the second, the waste and incalculable public loss of further clearances.

It is dismal to behold, in the busiest centre of the metropolis, a hoarding that shuts off for 300 yards all traffic and intercourse between the

Strand and Lincoln's-inn-fields; lawyers' offices, inns of court, and more humble ranges, all levelled in desolation—the population scattered; and that when, after due consideration, all this had been done, the crotchet of a high official should suffice to arrest and stultify so much thought, precaution, and outlay. Surely there must remain some power of action, if not with officials, at least with the recognised architectural authorities.

If the works are to be done, they ought to be carried out at once; there are just now some 40,000 skilled workmen and labourers out of employ, and yet public works are suffered to stagnate! The National Gallery, Piccadilly, the Galleries of Exhibition-road, South Kensington, the meditated bridge from Whitehall-place, with other public structures, have been long in abeyance, and Governmental works ought to be carried on at a season when work and wages are of such vital importance to the community.

The question of bridges across the river, connecting the north three-fourths of the metropolis with the south-east one-fourth, which has been recently treated in the *Builder*, now becomes of more importance, as other great thoroughfares are opened and improved; for the greater the facility of intercommunication, the greater the requirement for its extension. The opening of the toll-bridges by the Corporation is assuredly a step in the right direction; but the rapid growth of the great commercial city, a mile eastward of London Bridge, now absolutely necessitates the erection of another bridge, near the Tower and short of the docks, for the ease and intercourse of the great commercial and shipping centres, which embrace the import and export trade of this mighty city. St. Catherine's Wharf, a little over half a mile from London Bridge, and hereabouts, in the vicinage of the Tower, an open bridge would save an enormous annual outlay of time and money to 400,000 inhabitants of these hitherto disconnected limbs of the metropolis.

The outlay involved in the formation of such a bridge would be far exceeded by that expended on improvements in the busy centres to be benefited by its erection; whilst the anchorage of a constantly increasing mercantile marine lower down stream must essentially improve the further outlying river vicinages of Essex and Kent; and at this season of dearth amongst the working classes nothing could be more opportune than a speedy commencement of the project.

T. H. H.

ANOTHER GRAND HOTEL IN NEW YORK.

THE formal opening has taken place of a grand caravansera, corner of Thirty-first-street and Broadway. The Grand Hotel is built of Winchester marble, in the Romanesque style of architecture. Mr. E. S. Higgins, a successful merchant of New York, devoted 800,000 dollars to the undertaking. Each story of the eight has a distinctive architectural feature in the marble framing of the windows, one set being round, another segmentary, another semicircular, and so on. Each floor is distinguished by a colour. On this the carpets and upholstery are green, on that blue, on the next crimson, and so on through the seven primary shades. Some of the mirrors are superb; all are large and elegantly mounted. They cost 20,000 dollars.

In the principal corridor of each floor, close by the broad area into which the grand double staircase opens, a coil of hose, mounted by a brass pipe, hangs suspended on a hook. 200 ft. lie on each floor, as a provision against fire. A gnest may act the part of fireman, if anything like a conflagration breaks out in his neighbourhood, and he draws upon 10,000 gallons of water over his head in the reservoir top of the roof for assistance.

The elevator is not without its features of novelty. At every floor you approach, the doors of wire netting, by automatic arrangement, fly open, saving the boy a great deal of trouble, and the ascending traveller a trifle of time.

In the subterranean exploration—a matter of easy accomplishment, as there is an abundance of light—the laundry, the wine-cellar, the store-rooms, and the water-closets come successively under observation.

The gentlemen's *café*, on the first floor, is a sumptuous apartment, with heavy panelled ceiling, black walnut furniture, green drapery, and a dazzling glitter of silver ware proceeding from every table. The gentlemen's smoking-room is not yet quite finished, neither is the reading-

room, but both are under way to completion. A restaurant is attached to the hotel, where young men can live at a moderate rate. The whole cost of the furniture was 200,000 dollars.

SOCIAL SCIENCE ASSOCIATION.

THE opening meeting of the session has been held at the Society's rooms, Mr. E. Chadwick delivering the usual introductory lecture. He congratulated the members on the movements now making to press forward elementary education, and on the appearance of the National Education League of Birmingham and the National Education Union of Manchester, both having in view a complete system of national education, embracing the primary instruction of all children in reading, writing, and arithmetic, but seeking to accomplish the object by somewhat different means. The Social Science Association were in favour of an unsectarian system; and, remarking that there were large omissions in both programmes, suggested that the association might well apply to filling them up. He next pointed out the advantages of mind culture in improving not only the moral but the physical condition of the people, and increasing the power of mechanical, agricultural, and other industrial productions. This latter benefit he held fully justified the application of a national rate. The department of Economy and Trade would assemble under conditions of distress and demands for protection against hostile tariffs. He held that hostile tariffs were best met by free trade in its ultimate result; but by all means, he said, let those who demand inquiry be gratified. But to stimulate production and employment it was requisite to stimulate consumption, and to do that we must improve and cheapen art and science and manufacturing to enable us to keep pace with other nations. And how, he asked, was this to be done, but by improvements in primary education, leading to improvements in technical and art and science education? The lessening of the, at present, great loss of life and property by storms, the economising of the means of advancing sanitary science, the reduction of military expenditure by improvement in arms, he also connected indirectly with the spread of education. He touched upon railway reform, advocating the transference of the railways to Government, on the principle adopted in the case of the telegraph companies. The depressing conditions which were within the province of the department of Economy and Trade comprised causes which called for the serious exertions of the department of Jurisprudence, especially in regard to bubble companies, financing frauds, frauds on insurance companies, and analogous crimes; and, as a Commissioner of Police inquiry, he expressed his opinion in favour of a system of public prosecution, suggesting, however, that a great difficulty to overcome would be the opposition of the law officers of the Crown.

On the motion of Mr. G. Hastings, it was resolved that Mr. Chadwick's address be printed, for the use of the several departments.

OUR STATUES AND SCULPTORS.

PERUSAL of Professor Donaldson's observations in your pages as to London Statues* leads me to send you a few remarks written by me some time ago.

Our London statues are the constant butts of satirical authors, who, in novels, burlesques, and comic periodicals of the day, find no easier way of showing their wit than by ridiculing the unfortunate statues. Admitting that they are not satisfactory, I think a fair, impartial judgment would be that in many instances it is not the design and execution, but the material of which they are formed, that renders them so displeasing. On the Continent, even at a few miles' distance from our shores, if the design and execution be no better than in the London statues, the marble or bronze, retaining longer its original colour by the greater light, dryness of atmosphere, or the less consumption of coal, is more pleasing and inviting to the eye. The few white marble statues existing in London prove that, as a material, white marble will not suit, unless our fire brigade are employed with a liberal supply of soap to keep them respectable. The statue of the Queen at the Royal Exchange

* See p. 861, ante.

often requires cleaning, and an attempt is now being made on it to resist further decomposition. Monochromatic marbles of a sufficiently light hue are too few for the purpose, and all polychromatic or variegated marbles are unfit for sculpture or carving. Bronze in London, whatever may be its original colour, whether pale green, brassy yellow, or rich copper hue, soon loses its original agreeable tint, and becomes the most monotonous, melancholy, and disagreeable tone that it is possible to conceive; the statues constantly reminding us of swamps,—not a clear, transparent, lustrous black, like marble, but a dull, heavy hue that will not allow the light and shade, even in our brightest days, to be seen at a very short distance, and obscuring all the details and minor beauties which add so much to a work of art. I believe many persons have passed up Portland-place and round Park-crescent without noticing the statue of the Duke of Kent. There is a statue of the Duke of Cumberland, of Culloden celebrity, in Cavendish-square, that, if my memory does not deceive me, was formerly gilt. Not having remarked it for years, I fancied it had disappeared; but, on looking expressly, found it still there. After the first few months, when the original agreeable hue of the statues has changed to the permanent repulsive tone, few persons are to be noticed examining them; and if the charm of novelty is lost to us, it cannot be the case with provincials or foreigners. The statue of Achilles, copied from one on Monte Cavallo, Rome, in Hyde Park, and those of Marochetti, are equally neglected as those by our own sculptors. The statue of William IV., near London Bridge, erected about twenty years since, has retained its colour longer and better than any other about London; and if expense were not an object, would show that a light unvariegated (or very slightly so) granite would be a good material, and if polished it would better resist the atmosphere. Unfortunately, the material proved so costly that it rined the sculptor. Perhaps by this time cheaper ways can be found of working granite. No method has yet been discovered of using terra-cotta with sufficient accuracy on the scale required; and if that or any artificial stone could be made to resist time, it would be too brittle to stand the attacks of the London Arah, who seem to have a natural antipathy to Grecian or Roman noses. Marble will not, and it is doubtful if granite would if within reach of a stone. Sir Joshua Reynolds said that a painting should challenge attention by its general attractive appearance, or its other beauties would be liable to neglect. This remark is as applicable to sculpture as painting, and if sculptors wish their works to escape the present neglect, and ridicule, and desire greater encouragement, they must follow that advice Sir Joshua offers to painters, and not give the subject up in despair.

Though I am not a sculptor, I feel much interest in the subject; and, believing that no method can be found for preserving in London for any long period the original beautiful colour of bronze; also, that any change almost would be preferable to the dead, dull, chilling effect of the smoked statues,—I have tried experiments with other metals as far as my limited means would permit. If iron after it has acquired the warm tone of rust, could be preserved from further decomposition, its colour would be far more agreeable. The domes of the four courts at Dublin are covered with copper, and, I am told, have become of a beautiful sea-green tint; but it would not answer here. Gilding appears satisfactory on spires, towers, &c., but not near the ground. Sir Charles Barry had gold leaf prepared with very little alloy for the spires of the Palace at Westminster. I was able to obtain some of similar purity; but without alloy it is very difficult to work, and does not appear to succeed near the ground. Mr. Nash tried mosaic gold for the railings at Buckingham Palace, but it soon failed. I thought that the effect of the warmer-toned oxidised silver would be very superior to the dismal permanent bronze colour, and tried to produce it. Vulcanised iron soon became of a dirty hue, and would not be very durable; lead the same. Tin, which it is extremely difficult to get pure, has soon rusted. Nickel is of a too dark grey cold tint, and is very difficult to work. Aluminium, from which I expected much, became of a cold white tint, but I thought was a white frost deposited on it, but it has remained the same. Platina appears to me to promise the most satisfactory result. It remained throughout the winter of 1867 and 1868 exposed to the south-east in my

garden, at about 150 degrees above the Liverpool high-water mark, the datum of the Ordnance survey. It retained its brilliancy, with a slight improvement of warm tarnish. I showed it to an eminent sculptor, who objected to the brilliancy, while at the time he was having his electrolytised bronzed statues painted, those not having been exposed to the outdoor atmosphere, but had changed in his warm, sheltered studio. The platina has remained since in the same situation without, as it seems, any change. I think in London the dust and damp would soon dull it sufficiently. It appears to me to be worth the trial, and I wish I was wealthy enough to make it on a sufficiently large scale. Architects may find the metal worth consideration. Being anxious to obtain the metals as pure as possible, I procured them at Messrs. Johnson & Huntley's, assayists, and give the prices and gravity, for that must be considered in judging of the expense:—

	Per oz.	Water.
Gold.....	£4 7s. 6d.	19 0
Aluminium.....	0 6 6	from 273 to 275 0
Platina.....	1 6 6	21 0

In the same number of the *Builder* I think I noticed that a French decorator was introducing painting on foil. In one of my rooms I was much annoyed by damp, which completely spoilt the paper, and the paperhanger in repairing the room introduced foil over the damper parts. It seems to have succeeded. Would it be worth trying for painting on instead of fresco? I imagine it must be a pure tin foil; for any lead in it would injure the colour, and that I found very difficult to procure. Zinc grounds were tried some years since, but failed entirely.

G. B. MOORE.

I HAVE read the admirable article in the *Builder* by Professor Donaldson, and my excuse for first speaking of myself is to show why I consider myself capable of appreciating the ideas. In early youth I worked as a granite mason, and being looked on as a handy lad, a great many quaint little jobs fell into my hands. I left that occupation, and came to London, and commenced modelling the figure. I gradually worked my way to be sculptor's assistant, and as such, I believe I have the good opinion of the best men of the day.

Working as I must, I generally get my living by finish; but I have always felt that for a public work to be effective it should depend on greater qualities, and it should be large enough to correspond with its surroundings. In points of pedestal, position, and size, the sculptor must defer to the architect. Boldness of outline, depth of shadow, and truth of general form are all that should be looked for in a work to be seen in the open air; and I am sure, from experience, that sufficient detail can be introduced to satisfy the artistic mind if necessary; and in speaking of detail, I do not for a moment refer to those glorious surfaces of some of our best examples,—every line, every half-tint of which assists in its beauty and its truth; but to the buttons, ribbons, and buckles, the pre-Raphaelite texture and touch so much thought of and so easy to do in marble.

I should not advocate granite as a material for work that can be placed in a position where steady shadows and delicate lights could have their full and proper effect; but for the open air, for large and effective work, it possesses the finest properties.

The statues of London and the way they are distributed are felt to be disgraceful and hopeless to us poor assistants. The fact of a man being able to design and model, and being therefore a sculptor, goes for nothing. The chances are that he will have to work for some business man, who will only have his name on the work. Several statues, lately erected to the memory of eminent men, are entirely the work of assistants, and one is by a man who never modelled a statue before. I speak from positive knowledge. Better work could be done at less cost if the men who do the best work had a chance of doing it for themselves, for they would be more interested in it as artists. I doubt that the statues of London will ever be improved under existing circumstances. Most of the commissions given of late have been the result of jobbery or forced popularity. I am not now writing for myself alone, but I am saying what all my class know and talk about. I beg, in conclusion, to submit one suggestion, which I trust may be thought practical, in order to guard against quackery.

Let six men, who have proved themselves accomplished assistants,—men of experience,—

be selected, and let each man be paid a small remuneration for a quarter-sized model, and let them compete, perhaps with any others who may choose to do so. These men can easily be found, and would be certain to be able to work out what they could design; but at the present time they know from experience that it would be waste of time to compete against names and capital.

I believe such great men as Chantrey and Flaxman would, were they living and young now, be scarcely able, by their talent alone, to prevail against the present corrupt system.

A SCULPTOR'S ASSISTANT.

THE NEW HOTEL, CAIRO, EGYPT.

As the opening of the Suez Canal is turning men's minds towards Egypt, our readers may be glad to know something of the Oriental Hotel Company's new hotel at Cairo, in Egypt, which has recently been opened for the convenience of travellers to the Nile, and by the overland route to India, as also for the reception and accommodation of the many invalids who find benefit from a winter residence in Cairo. We give a view of one front of it, and plans of two floors.

The hotel is beautifully situated, facing the gardens of the Ezbekiah and the Rue de Boulaac, and commands a good view of the Pyramids. The foundation-stone was laid with great ceremony by his Excellency Nubar Pasha, Minister of Public Works, on the 18th of January, 1865, being the anniversary of the accession of his Excellency the Viceroy.

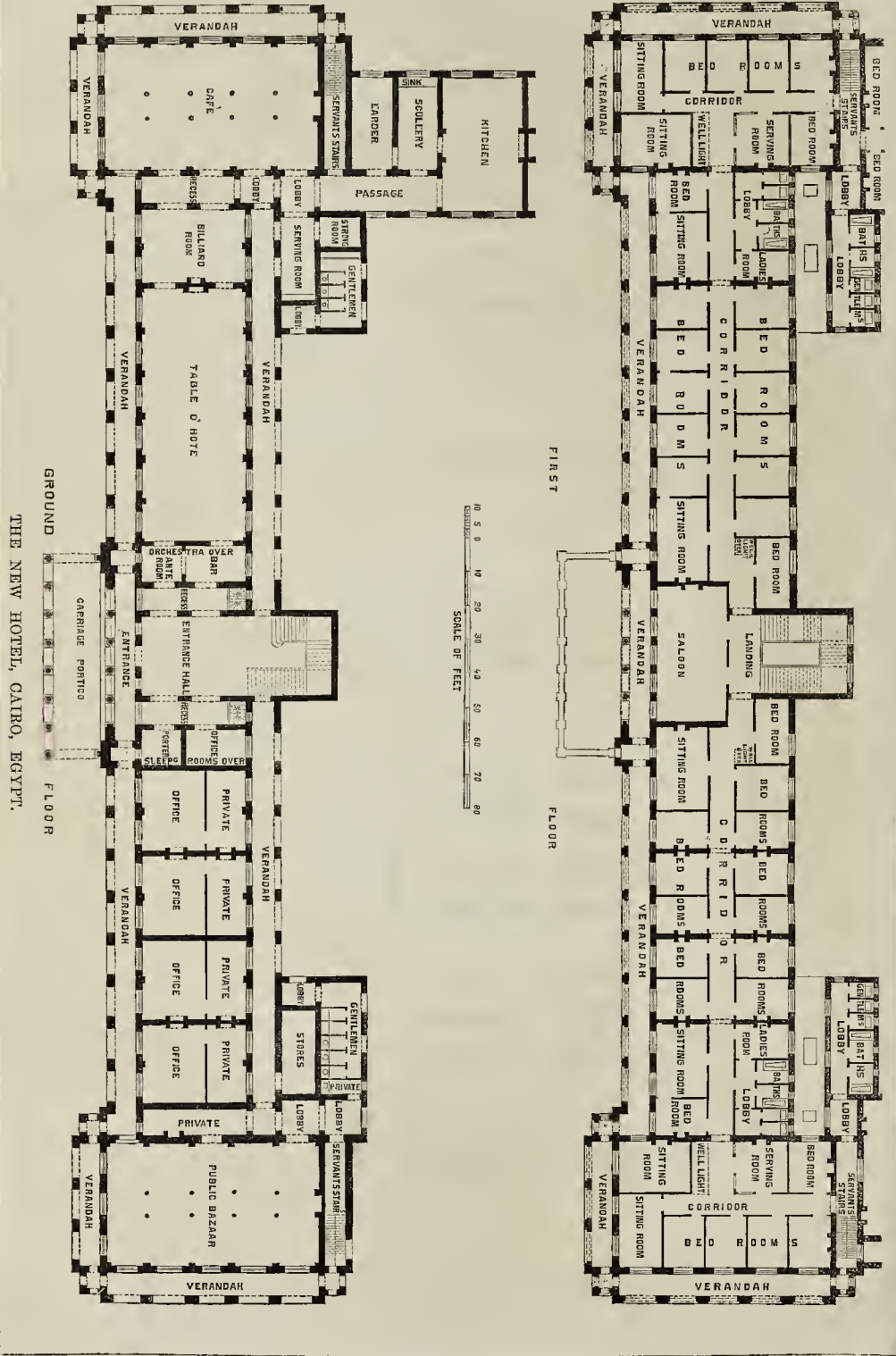
The hotel, when completed, is intended to form a quadrangle (with large open gardens in the centre), of which only the principal front, facing the Boulevard d'Ezbekiah, and a portion of the return fronts facing the Rue de Boulaac and the new street, have been as yet erected. The building is Franco-Italian in style, and has been erected from the designs and under the superintendence of Mr. Christopher G. Wray, of London, who, from a long residence in India as an officer of the Public Works Department, had knowledge that enabled him to arrange an hotel suitable to the requirements of the climate.

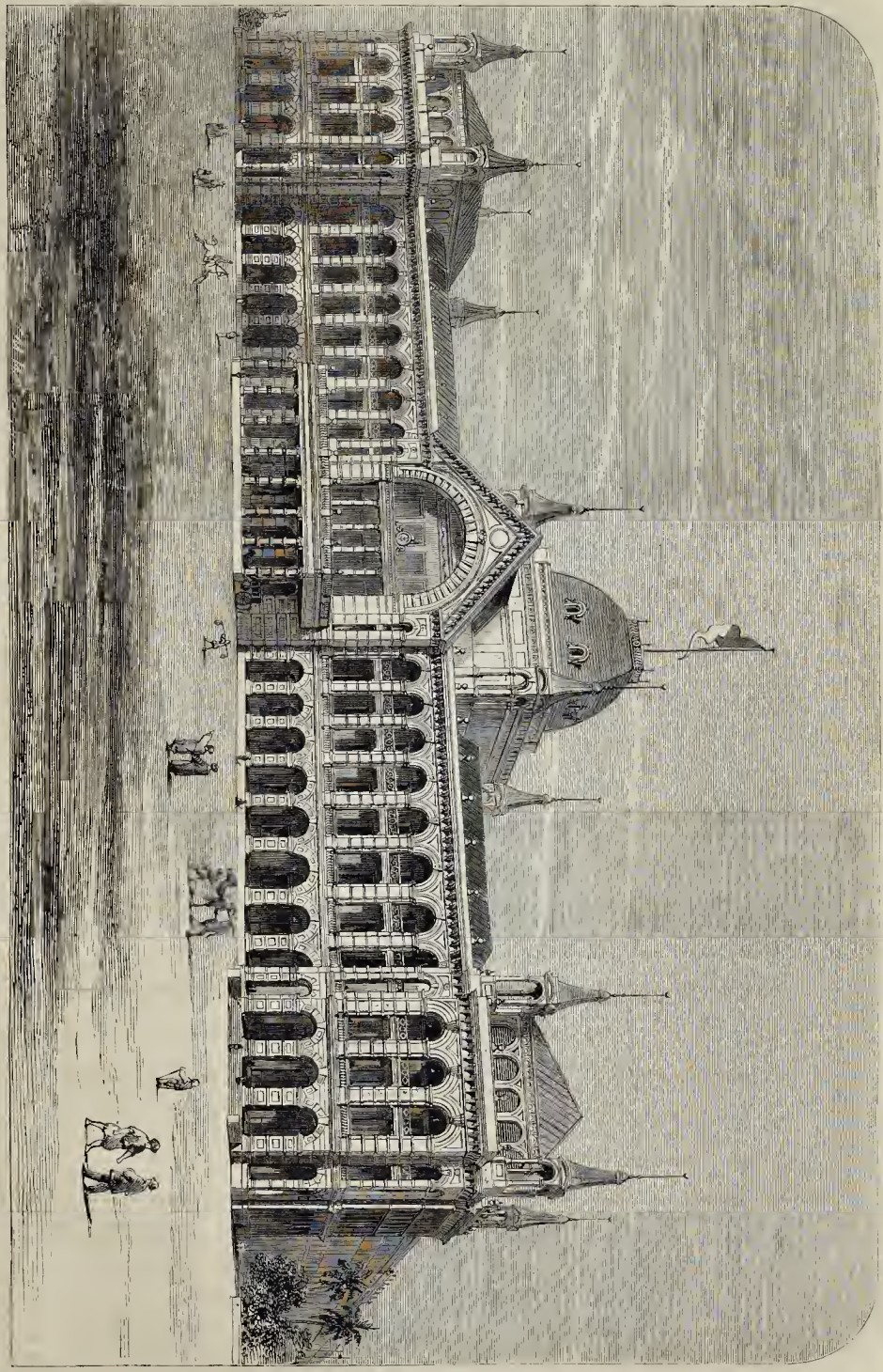
It is constructed with stone from the neighbouring quarries, with terra-cotta enrichments, which were sent from London, as also were all the woodwork and fittings. The portion at present built has a frontage towards the Boulevard d'Ezbekiah of about 400 ft. in length, and returns about 85 ft. towards the Rue de Boulaac, and about 140 ft. facing the new street, and it is about 70 ft. high. It contains upon the ground-floor a *café*, 61 ft. by 36 ft.; *table d'hôte* room, about 80 ft. by 30 ft.; *bar*, 61 ft. by 36 ft.; billiard-room and suites of public offices, all 21 ft. high; as also a grand staircase, 60 ft. by 23 ft.; and at the rear a kitchen department, serving-rooms, and other offices.

The hotel is surrounded on all sides by wide verandahs, affording a passageway around the building, and supplying a comfortable lounge. The *table d'hôte* room is supplied with an orchestra for evening entertainments, and is laid with parquetry, so as to afford a dancing floor.

Upon the first floor are a ladies' *salon*, 41 ft. by 21 ft., and 20 ft. high; nine private sitting-rooms, with bedrooms *en suite*; and forty-two bedrooms, besides various serving-rooms and W.C.s, which are numerous, and conveniently arranged, those for ladies being entirely separate, and approached through their own retiring-rooms. The bath-rooms are fitted with large baths, and shower-baths over all, supplied with hot and cold water, the whole of the apparatus and fittings being of the best London manufacture.

The second floor is somewhat similarly arranged, and contains fifty-nine bedrooms, besides ladies' rooms, serving-rooms, baths, &c., as on floor below, and all 15 ft. high. The floors are variously laid with parquetry, marble, and stone paving, bordered with Maw's encaustic tiles, which give a rich effect. The various apartments throughout are supplied with Bregnet's patent electric bells. The total cost of the portion of the building already erected has exceeded 100,000*l.* The whole of the very arduous contract was undertaken by Messrs. J. Perry & Co., of Broadway, Stratford, London, and has been completed in a very satisfactory manner by their agent upon the works, Mr. T. Sinton, and by the company's clerk of works, Mr. C. Tompson.





THE NEW HOTEL, CAIRO, EGYPT.—MR. CHRISTOPHER G. WYATT, ARCHITECT.

Main body of text, consisting of several lines of faint, illegible characters. The text appears to be arranged in a structured format, possibly a list or a table, but the details are too blurry to discern.

SOME RESULTS OF TRADE UNIONS.

SIR,—All conversant, during the last ten or fifteen years, with building matters are aware of the great increase of cost involved in them. In the provincial district I am most familiar with, an advance of from 60 to 100 per cent. has occurred, which cannot be accounted for by all or any of the changes that have taken place with regard to wages and hours of labour. The increase of wages is from 25 to 30 per cent., say the larger proportion; the reduction in the hours of labour may be taken at 15 per cent., making, with the 30 per cent. on wages, 45 per cent. This still leaves on the average some 35 per cent. to be accounted for. Now, how can this be done? The cost of materials will not explain it; for, notwithstanding occasional fluctuations in price, there is no very appreciable change under this head, since the increased value attending a greater demand from increase of population has been balanced by the greater facilities afforded for carriage, and the consequent equalizing of prices in the country at large.

The great use of machinery should tend to reduce cost of production; and though sometimes charged for at unduly high rates, it, for the most part, does conduce to cheapness.

Some have assumed that larger profits are absorbed by contractors than heretofore; but my own observation leads me to a directly contrary conclusion, and I feel obliged to look for an explanation from some other source.

This, I think, is to be found under two principal heads, both of which are referable to the influence of trade-unions among building workmen. The first cause I instance is the less amount of work performed (though at higher wages) in a given time. The second arises from charges levied on master tradesmen without any compensating profit. Let me illustrate this from facts. A builder put into the hands of a good workman a piece of work of which several exact repetitions were required in a building in hand, and the man completed his task in one day and a quarter. He was given another of the same piece of work, while a third was at the same time placed in the hands of a fellow workman; on these each of the men expended two days and a quarter. The builder asked the man who was first placed on the work how he came to be so much longer on it in the second case than the first. "Oh," said he, "I could have done the second in a day and a quarter, too, but I dared not work faster than the man beside me, and I should have been fined (naming a sum beyond a week's wages) by the 'union'!" Again, a master tradesman entered a nearly completed building where his men were at work, towards evening twilight, and while watching their progress saw a stranger enter, who evidently did not see him. "My lads," said the visitor (a "union" inspector), "you are getting on a little too fast here; you must make your jobs last out a bit better than this or it will never do; so mind what I say or you will hear of it again as you won't like." The master stepped forward to ask the fellow's business there, but he speedily got out of the way.

A freeman, a strong unionist, chosen and placed over some work by the proprietor, prolonged the work on various pretexts, the most usual being the want of masonry details from the architect, by which he accounted for a quantity of stone remaining for weeks unwrought on the site. It was discovered that he kept the details without using them as long as he thought fit, making this excuse for delay, and that he threatened to get one workman discharged for working too well, who was the only one in his branch of work too honest to be controlled by the plausible knave who was put over him.

As to the second head,—senseless cost. A contractor had two considerable buildings in hand in a large town, the distance between the two being some 350 yards. For convenience he arranged to pay the men employed on both works at the building nearest his place of business. The first pay-day after this arrangement the men who were asked to walk the distance named for their wages refused to do so, and, after sulking for an hour and finding that no one came to them, they went to the other building, but demanded a quarter of a day's additional wages on account of their own delay, threatening to strike if this were not acceded to—which it was!

Two buildings, separated by about the breadth of a road, a moderate distance from a large

suburb, were, for some reason, under different arrangements as to "walking time." The workmen left their homes together, walked the half or three-quarters of a mile in company, and then one set began their work while the others smoked their pipes for ten minutes or thereabouts, at the expense of their employers as to time, though I suppose not as to tobacco.

Such instances might be multiplied a hundred-fold, but cannot surely be within the knowledge of those who advocate trade-unions, as at present constituted, as conducing to independence and self-respect among workmen, and as having a wholesome influence on the relations between capital and labour. In the matter of self-respect, the standard of labour for a good workman is lowered, under penalty, to that of the worst or laziest he may be associated with, while the standard of pay for the worst is what can be claimed by the best! Higher wages paid to superior workmen, as out-door foremen, stone-setters, &c., have come in some places to be stigmatised as "blood-money," on the assertion that the remuneration is simply for "driving" the men working at ordinary wages. As to independence, lately passing a large country church in course of building, I saw only the clerk of works on the spot, where shortly before some thirty masons were busy. The "delegates" from the "Union" had been there, ordering the men to strike, not more than one-third of whom did so willingly, the others telling the clerk how they wished they could remain at work, but that they "dared not." A clever, industrious joiner, who had a lathe at home, and was good at cabinet work, not long ago begged the friends who gave him occasional evening employment of this kind to keep the fact private, or he should be fined for earning money out of shop hours.

This system is driving many of our best workmen out of the country, and its evils rarely in directions not always obvious; but in all it tends to diminish the real self-respect and independence of our handicraftsmen, as must be the case where a low maximum of work is combined with a high minimum of pay, which, moreover, one of the union speakers, at a large meeting in the North lately, declared to give a security against "inferior work!" The encouragement is in this country thus constantly decreasing for any man aiming to obtain a high character as a workman. A deputation of union men in the employ of a builder called on him to dismiss a foreman, an excellent and trustworthy man. In answer to the question, "Why?" the reply was, "That is our concern; we don't choose to work under him, and shall strike if he is further employed by you."

The man was dismissed, and has emigrated. One result of these false principles strikes me as bearing directly on a point of political economy, though I cannot remember ever to have found it so treated. It is, that a part of the great social system in Britain is claiming to proceed at a different rate from all the rest. It is often asserted that men generally do not work so hard as they used to do, but the fact is, that they do not generally work so long hours, but do more in a given time than before; but it is also true that many occasional instances occur in which men work much harder than they need. Take a civil engineer and his staff, preparing to bring schemes before Parliament, or a leading barrister with a seat in the House of Commons, and I think cases of hard work will be found which will tend to raise the average for at least the head-workers. But our trade-unionists claim practically to do less work in a given time for higher wages than of old; and as this runs counter to the existing system in all the upper classes of workers, viz., that of harder work in shorter hours, a serious drag is imposed on the great social machine; and I am convinced that much of the grievous derangement from which the trade of England is suffering might be traced to this obvious discrepancy in the relations between employer and employed.

The only sure remedy for the evils I have tried to point out seems to me to rest in stringent positive legislation, making it obligatory on all trade societies to submit their rules for approval, and to be publicly registered, denying such registry or licence to all societies seeking to establish rules in restraint of trade or of individual freedom of action, and finally making it penal to attempt enforcing rules of trade or of fines for their breach, other than such as have been legally sanctioned. Much would, I know, be said on such a proposition, as to interfering

with trade, and so forth; but legislation has in late years so closely touched trading interests, by limiting (and wisely) the hours of labour and the age of those labouring, &c., that it would surely not be unfair to put some such check as I speak of on the licence of labour itself. I have the disadvantage, if indeed it be one, of regarding this subject only as a spectator; were I in the position either of an employer or a workman I might perhaps find my views much modified, but could such modification reach the point of justifying, to any fair or logical apprehension, anomalies such as disgrace this much misunderstood system? QUERY.*

SCHOOLS OF ART AND OF SCIENCE.

St. Pancras.—A lecture on the advantages of Science Classes has been delivered by Mr. Buckmaster, at the School-rooms, Ossulston-street, in support of a new movement originated by Mr. Parton Parry, who almost single-handed, according to the *North Londoner*, is seeking to establish classes in St. Pancras. In a report of what took place at the meeting, the *North Londoner* says Mr. Parry thus explained the plan he proposed to work on.

"The instruction he intended giving would comprise practical, plain, and solid geometry. In commenting upon the ignorance of these subjects which prevailed among our workmen, he said that the man who made the models on the table—and they were excellently turned out—was quite unplaced when asked to make a cube. By dint of questioning, he discovered that the man had joined in a rattle; that he had been the fortunate recipient of a goose, and the instruments employed to determine the important event had been dice. After this illustration of a cube, he proceeded to make one. The number of students on his book was three from a thickly-populated district like Somers-town. The charge amounted to three-pence per week. The prize consisted of books, medals, instruments, &c. The German workmen were coming over and taking Englishmen's places, because employers appreciated intelligent workmen."

Mr. Buckmaster said he could scarcely think that three persons represented the interest felt. In such a district there must be a large number of men ready to avail themselves of the advantages now presented. He wished working men would organise to express their feelings on such matters as readily as on political questions."

At the close of the meeting a number of pupils gave in their names. The class meets on Thursday evenings at the School-room, and we hope that, under the guidance of Mr. Parry, who has proved most successful elsewhere, much good may be effected.

The Macclesfield School of Art.—The annual meeting of the Useful Knowledge Society, with which this school is connected, has been held in the town-hall, and as usual attracted a numerous attendance. The platform was decorated with a large number of drawings and designs, the work of the pupils of the School of Art. In the course of the proceedings the meeting was told that, with one or two exceptions, all the designs for silk-weaving, which formed the most practical feature in the display, were applicable to the manufacture. Mr. W. G. Brocklehurst, M.P., occupied the chair. The report of the council of the School of Art stated that the present circumstances of the school are not satisfactory. Only a small amount of aid was still given by the inhabitants. The council stated that Mr. Cole, C.B., had come to give his advice and suggestions at this critical period of the school's history. If encouraged by the townspeople, the council would gladly arrange for the establishment of one or more science schools that might receive Government sanction and assistance. Other manufacturing towns possessed these schools, and the Government gave much encouragement to their establishment and support. The report of Mr. Ford, the master of the School of Art, stated that this year, in March last, 43 students were successful in 54 exercises, divided thus:—30 in freehand drawing, 6 in geometry, 2 in perspective, and 8 in model drawing; 15 being distinguished by the mark "excellent," gaining guinea boxes of colours, boxes of instruments, and scientific books, and the remaining 33 certificates of merit. Comparison of results for the last four years—1866, 16 successful and 3 prizes; 1867, 50 successful and 15 prizes; 1868, 70 successful and 20 prizes; 1869, 54 successful and 15 prizes. The difference between the success of the above examination of this year and last—a year without a parallel in the school—arose in a measure from his incapacity, through illness, either to instruct or lecture, two months previously to the examination. Mr. Ford complains that the designs for silk fabrics sent in for national competition did not meet with that practical consideration which they merited.

* The writer has sent his name and address as guarantee of the truth of the statements made in the communication.

"In April," he says, "the students' designs and other works were transmitted to the Department of Science and Art for national competition; but when in June the results arrived, great was the students' disappointment. Anticipating a success greater than in previous years from the practicability of the designs and the right application of art principles, the results showed that the impracticable works of former years were more successful. Although on each sheet the words 'original and practical designs for silk fabrics' were written, it would be invidious to inquire whether the honorary examiners of the departments,—Sir F. Grant, F.R.A., Daniel Maclise, R.A., J. C. Horsley, R.A., and others,—considered their specific application to manufacture. If the London examiners are practically acquainted with the subject, they must know that the designer for silk goods has resources, rules, and methods of execution, which, together with considerations of expense, of fashion, of commercial nobilities, and such like, must fetter him to great simplicity of production, but which is, unfortunately, antagonistic to the complication of line and multiplicity of colour required by the Department of Science and Art. It will be difficult for the school to serve a practical town and an impractical Government. It therefore remains for the committee to determine whether the school shall be made practically available in the preparation of useful patterns for fabrics of the loom, or direct its course to the production of an abstract kind of decoration adapted to no particular purpose. It appears to me the Government will pay for, and take cognizance of, the latter, but not the former."

At a recent meeting of the town council, Mr. Wright gave notice that at the next meeting he should call the attention of the council to the position of the Mscoclesfield School of Art. Alderman H. Brocklehurst said, whilst the town was experiencing some benefit from a revival in trade, the school of art continued to languish. He felt convinced that the interests of the silk trade were closely connected with the prosperity of that school, and hoped the views of gentlemen both in the council and out of it had changed since the public meeting held on the subject of the school's condition a few years ago.

UTILISATION OF SEWAGE AT LEICESTER.

At a recent meeting of the town council, Mr. Thompson said, he found that the town had been in possession of the sewage works for ten or eleven years, and during that period they had been the cause of an annual loss. In 1859, the loss was £26l.; in 1860, 1,114l.; in 1861, 1,209l.; in 1862, 1,398l.; in 1863, 1,170l.; in 1864, 926l.; in 1865, 1,264l.; in 1866, 1,028l.; in 1867, 1,200l.; in 1868, 1,412l.; and in the year just closed, 1,130l.; making a total loss of 12,482l. The prospect of avoiding the loss was almost a certainty, for during the last five years many towns had been paying attention to a question which was becoming of daily increasing importance, that of applying sewage, by the process of irrigation, to the adjoining land. This had been done with great success. He moved,—

"That in the opinion of this Council the time has arrived when measures should be taken to render useful to the land in this district, and profitable to the town, the sewage which is now useless, and that it is desirable to engage a competent sanitary engineer to visit the locality and prepare a report and preliminary survey on the subject, to be laid before the Council as early as may be after the conclusion of his inquiries; and that Mr. Baldwin Latham be the engineer appointed."

After some discussion, the motion was carried unanimously. A committee was then formed to carry out the previous resolution.

THE HISTORY OF THE HOLBORN VIADUCT COMPETITION.

SIR,—I was many miles away from London on the occasion of the opening of the Holborn Viaduct, and I did not see the report of the extraordinary statement made by Mr. Haywood at the dinner given by the late Lord Mayor at the Mansion House, on the 6th inst., until the middle of last week. Probably I should not again have reverted to the circumstances of the competition for the best plan for effecting that important improvement, for although I felt that I had been unfairly treated in that competition, I was willing to let bygones be bygones; but upon reading the report in the *Times* of the after-dinner speech of Mr. Haywood, I thought it was but right that the public, and particularly the profession, should know the real facts, and I trust that you will kindly insert the following account of that competition (as far as I was concerned in it) for the entire truth of which I will vouch.

No less than 105 designs were sent in by eighty-four gentlemen, and I was the author of three of those designs, one of them being the same that I had prepared at the instance of the Metropolitan Board of Works in 1859, and which had received considerable notice at the time. I had carefully revised the plan, and it was placed

in Class No. 8 in the report, "For high level streets or viaducts passing north of Holborn-hill and Skinner-street, which thoroughfares are to remain as at present, or hut with trifling modifications." The other two designs came under the definition of Class 1. "For constructing complete viaducts on high level roadways upon the line of Holborn-hill and Skinner-street, involving the entire removal of the present surface and the property on both sides." In the report presented to the Court of Common Council, on Friday, November 6th, 1863, three designs in Class 1 are specially referred to, "No. 4, by Mr. Frederick Marrable; No. 32, by Mr. Thomas Charles Sorby; and No. 68, by Mr. Richard Bell;" but no cognizance whatever is taken of a second design by me which had the No. 81 attached to it, and was, in fact, a revision, and very great improvement and simplification of the same general design as No. 4 (before referred to). My name stood the first, and I received the congratulations of several members of the Corporation, and Mr. Haywood himself told me that the first premium would be awarded to me. I was doomed, however, to disappointment, as the first premium was given to Mr. R. Bell, and the second to Mr. T. C. Sorby! Doubtless there existed some good reasons for throwing me out. The *Builder* of the 21st November, 1863, points out some "discrepancies" in both of these premiated designs; at any rate, they were, although premiated, not adopted, and Mr. Haywood was employed to prepare a plan for Parliamentary deposit for the ensuing session. In the report of the Improvement Committee to the Court of Common Council on November 6, 1863 (which is now before me, and from which I quote), it is stated,—"In the very important duty of examining the several designs, your Committee felt that it was most desirable to secure the assistance of a professional gentleman competent to place before us the varied points of detail necessarily involved in this great public work, and believing that Mr. W. Haywood, the engineer and surveyor to the Commission of Sewers, was peculiarly qualified for this duty, we invited him to undertake the same. Mr. Haywood thereupon, at our request, withdrew a design which, in common with other competitors, he had sent in, and at once acquiesced in the wishes of the Committee."

Whether Mr. Haywood brought out his design which had been withdrawn from the competition, or not, I cannot say, as I never saw it, that I am aware of; but he prepared a plan for Parliamentary deposit (for which he was very handsomely paid), and a bill was obtained during the next session of Parliament, and, strange to say, the plan that he so prepared as being the very best that he could produce, after he had had the advantage of all the other brains from which had emanated 105 designs, is so very like one of the three designs that I sent in for the competition, that it would require a very careful examination by a very professional eye to detect where the difference existed (this is the design bearing the number 81 in the competition, which was entirely set aside, or at least not noticed at all in the report).

Sir, I enclose for your inspection drawings correctly reduced (to a uniform scale for more easy comparison) from Mr. Haywood's deposited plan, and from my plan, No. 81, that was rejected, or rather passed over in the report, and not thought worthy even of a passing word, but which, after being adopted by Mr. Haywood, without the slightest acknowledgment, was thought worthy of being carried out under the sanction of his great name, and with such a flourish of self-blown trumpets as has seldom, if ever, been attempted by any architect or engineer.

If any of your readers or the public care to see the originals of these plans, Mr. Haywood's lithographed deposited plan, with his name and that of the then acting City Remembrancer attached, and the selfsame drawing that I submitted in the competition, and numbered 81, they may be inspected at my office, 21, Whitehall-place.

This is the true history of this competition, from which Mr. Haywood has derived a world-wide fame, and very substantial pecuniary benefit (although a salaried officer of the Corporation), while I stand out in the cold, without a word to throw at a dog. I memorialised the Corporation (before it was too late) for a reconsideration; but although I was invited to attend to support the prayer of my memorial, I was not heard, but was received with cries of "Do you come here to

accuse our officer?" &c., and I was obliged to retire without being able to say a word, and that was the last I had to do with this competition.

According to the report in the *Times* of Monday, the 8th of November, Mr. Haywood, in responding to the Lord Mayor's toast, "The Engineer," made this most extraordinary statement,—"That he was a competitor in a fair and honourable competition, with eighty other professional men, for the execution of the Viaduct, and he won it! He stated most distinctly that no person connected with the Corporation had the remotest idea that he was a competitor until after the award was made." This is at niter variance with the report of the Improvement Committee to the common council on the 6th of November, 1863, before quoted. Mr. Haywood can tell which is right; and if he thinks that "he won it" in a fair and honourable competition, then I have yet to learn the business of my profession over again, and to forget all that I have hitherto thought to be fair and honourable. I should not like to say more, however strongly I may feel, or I should perhaps say too much. Let the public and the profession form their own opinion—they will not form a wrong judgment.

FREDK. MARRABLE.

THE TALKED-OF NEW OPERA HOUSE.

THREE lines in our last number added incidentally to a short notice of Covent Garden Theatre, and stating that we had heard talk of an English nobleman being ready to spend 150,000l. in building another opera-house, if a proper site could be obtained, have brought us a shower of letters, with all sorts of offers, requests, and suggestions. One set of gentlemen say they have plans and estimates all ready; and another, that they contemplate utilizing the Colosseum, in the Regent's Park, as an opera-house, and, indeed, have all their plans ready too. All we desire to add at present is, that we have no doubt of the correctness of the rumour to which we gave currency, and that we will forward to the proper quarter such of the letters as seem to deserve attention. We believe the scheme, if carried out, would include the foundation of a national opera.

THE MYSTERY OF EASTER ISLAND.

ON the surface of this thickly-peopled world of ours there is not to be found a spot more desolate, forlorn, and thoroughly isolated than that known to Englishmen as Easter Island,—nor a spot more suggestive of the most curious and interesting questions relating to the antiquity of man, and a probably submerged continent. The recent arrival at the British Museum, of a gigantic statue from that rock in the Pacific, now to be seen by special application at the British Museum, gives us a good reason for a short discussion on this topic, which we hope may be attractive to many readers.

It is surely a marvel worth looking into as most difficult to explain, how it comes to pass that some of the most gigantic—if rude—statuary of human workmanship should be found on a small island in the middle of the Pacific Ocean, inhabited only by a few wretched savages, without so much as a tradition of the extinct people who must have raised these monuments; and in itself so desolate as to have no trees, no fresh water, no plants but the imported plantains, potatoes, and bananas, and no animals except the as certainly imported poultry and rats! But let us look at this forlorn place more closely.

In latitude about 27° S., and longitude 109° W., some 2,500 miles distant from the nearest continental neighbour, South American Chili, and even from the nearest and that a solitary brother islet, no less than 1,000, is the iron-bound coast known to mariners as Easter Island; because the old buccaneering explorer, Captain Davis, happened to discover it on that sacred day, in the year 1686. It was afterwards touched in 1722, by Admiral Roggewein; and is described as hilly and stony, and about eleven leagues in circuit, of a triangular shape, and a volcanic appearance, the heights being bare and rugged. We will, however, take our fullest description, especially as to the Rook-images, from Captain Cook's second voyage in 1773.

After some nautical details as to the locality and anchorage, the great explorer says:—

"We stretched in for the land, and by the help of a glass discovered people, and some of those colossal statues or idols mentioned in Roggewein's voyage. Near the place where we landed were some of those statues before men-

POOR INVENTORS; OR, RIGHT v. MIGHT.

Sir,—Permit me to plead on behalf of the above unfortunate. Promoters of the world, perceiving wants, they endeavour to supply them; but unless they jump to perfection at once, improvers trip them up, taking all the credit and cash. The man that has laid the foundation will get out; the reward is too often secured by one who crowns the edifice with the pots, or finds the paint. We are called poor fools, while the successful pilferer is esteemed. I can speak feelingly on the subject, being a sufferer—a consumer of many things lost,—a job for a painter, an esq., &c., out in the cold,—have been gazetted once, perhaps shall be again, in another column of hankrupts. Law is against the man that toils a whole lifetime, and then his faints within sight of the goal. He is picked up by his plans by some kind improving creature, who rushes into the Patent Office, and the law protects him for fourteen years from any attack from the rightful owner. I have worked ten months, and walked over 300 miles, to perfect an article which is pronounced good, but no grist for me. We claim to be noblemen; Nature's noblemen, striving to do good, leaving the world better and more advanced than what we found it. A recent piece of legislation was attempted to *down with us*, but public sympathy was with the poor inventor. The fight is to be renewed next session. Aid us in the contest, for with the loud voice of indignant young men we shall prevail. R. T.

P.S.—Honesty begets! never expect grand results from an inventor's career; let the love of the gift prompt you, *pro bono publico* be your motto, and an old cost for your arms.

METROPOLITAN BOARD OF WORKS.

MANSHION HOUSE.—CONSTANT WATER SUPPLY.—DISTRICT RAILWAY, &c.

At the usual meeting a report was brought up from the Works and Improvements Committee, recommending that a communication be addressed to the Improvements Committee of the Corporation, informing them, that having regard to the great value as building land of the ground on the west side of the Mansion House, the Board feel it impossible to entertain the question of preserving it as an open space. The recommendation was put and agreed to.

A report was presented from the Works and General Purposes Committee, stating that they had considered the report of the Royal Commissioners, and it was the opinion of the committee that a constant water supply to the metropolis was most desirable; and they further recommended that the chairman be requested to seek an interview with the Home Secretary, inquiring if it is the intention of the Government to bring in a measure founded upon the report of the Royal Commission, and also to place before him the Board's general approval of the report. This report led to a brief discussion, but it being the general opinion, a day was fixed a fortnight hence to consider the subject.

A report was presented from the Works Committee, recommending that the approval of the Board be given to proposed variation in the construction of the Metropolitan District Railway works, so far as they pass through the Temple land, by the substitution of an arch for girders and arches, as shown on the plans approved by the Board. The recommendation was agreed to.

Mr. Silas Taylor moved that a committee be appointed, to consist of seven members, to be called an inspection committee, with power to view the works of the Board in progress, and report the result of their examinations when necessary. This motion led to a long discussion, in the course of which an amendment was moved, but eventually both motion and amendment were negatived.

RE ANGLE CHIMNEYS.

Sir,—In reply to your correspondent "A. H.," I beg to say that in my opinion an angle chimney is a very objectionable feature, except it be used from sheer expediency in some room where a chimney is necessary, and the form of the room and necessary disposition of doors and windows prevent it being placed, as is most usual, in one single end. In any room of ordinary shape it must be both unsightly and inconvenient, and will not yield many extra feet super, of either floor or wall space; no more than two persons can sit with any comfort by it; and it is the next best thing to being a saving in materials and labour, a little examination will prove the gain to be the merest trifle. To have the chimneys all through a house always in the inner corner of the room would certainly be a novel feature, and one which, I think, would in no way repay the designer or his client, and certainly be no gain to the builder. A. B. C.

CIVIL ENGINEERS AND THE INDIAN GOVERNMENT.

THE Governor-General is a little startled by the indignation his attack on a whole profession evoked, and a circular has been issued from the Works Department, to explain what was meant. The circular says,—

"There is no question the civil engineers in England are at times remunerated by commission on work done or ordered to be done under their supervision, which is, as stated in the notification, regarded to be a part of their legitimate remuneration. No reference was made or implied to any illicit receipt of gratification."

And it ends thus:—

"The Government of India unreservedly declares its complete confidence in the body of civil engineers in its service. It has long been, and continues to be, the desire of the Government of India to recognise their merits and their claims as fully as those of any other class of its officers, and its appreciation of them is sufficiently proved by the large addition to the number of civil engineers employed under Government during the last few years. Further, so far from having at the present time any reason to depreciate the value of the service of the civil engineers, the Government of India has lately had before it proposals, which it is hoped will take early effect, for improving their position generally, and placing them, in respect to their emolument, on precisely the same footing as all other officers employed in the same duties."

BUILDINGS IN LONDON.

OUR attention has been directed to the circumstance that the President of the Institute of British Architects has added the following note to the official report of his address. We willingly print it:—

"I did not advert to the many elegant buildings of a private character in the metropolis; if I had I should have noticed with much satisfaction Mr. Lanson's Bible Society, and also the new clinic recently erected in Pall-mall, by our well-known Mr. Brandon, which is, I think, one of the finest edifices of its class in the metropolis."

BUILDING WOODS.

SIR,—I shall be glad to be informed by any of your correspondents how the various classes and descriptions of pine and fir timber, and deals, are known and distinguished from each other when sawn. E. M.

THE ARCHITECT FOR THE NEW POST OFFICE.

SIR,—I see in the public papers that a design for the "new General Post-office buildings" in St. Martin's-le-Grand has been made by "Mr. Williams, of her Majesty's Office of Works," and that a contract has been accepted for the work. Can you give me any information as to who is this Mr. Williams? I imagined it might be one of the five members of the Royal Institute of British Architects of that name; but such is not the case. Surely such an important edifice should have been entrusted to the care of Mr. Pennington or of Mr. Sydney Smirke, R.A., the architect of the Post-office, whose brother erected the present edifice. P. W.

CHURCH-BUILDING NEWS.

Chorley.—St. Peter's Church has, during the past month, undergone a restoration, the dry rot having been discovered under the pews of the nave. The pews have been lowered 2 in., and the doors removed, so that the chancel is now free and open. The inside walls of the nave are now embellished by a painted dado, surmounted by a stencilled pattern, of conventional design. The chancel, from floor to roof, is diapered. The whole has been carried out under the superintendence of Mr. Thomas H. Myres, of Preston, architect.

Hallinell.—Saint Luke's Church, the foundation stone of which has just been laid, has been in contemplation for some years. The site is by the side of the old road leading to Chorley from Bolton, on rising ground. The architects of the new church are Messrs. Medland & Henry Taylor, of Manchester, and the contractors are Messrs. J. Robinson & Son, of Hyde. The foundations, which had to be unusually deep, owing to the site proving to be a filled-up pit, were put in by Messrs. Isaac Pilling & Son. The ground slopes considerably from the west to the east, so that additional height is given thereby to the eastern end of the building. The church, as may be now seen from the work already executed, departs but little in outline from a simple parallelogram, terminating at the chancel end with three semicircular apses. This parallelogram is divided into three—longitudinally by two rows of arches (thirteen in all), and transversely by three arches. The north aisle is seen to be shortened by the tower porch, which is placed at its western end. The south aisle is lengthened so as to project beyond the nave, and the part thus projecting will contain the font. The building materials are mainly those of the district. The walls are to be of hard rubble stone, pointed, while the angles and window-frames, &c., are principally of red brick. There will be also dressed ashlar stonework in the tracery of the windows and elsewhere. The church will have seventy-six windows, none of them very small, and some of a large size. Internally, the church will be lofty and spacious. 800 persons can be seated without galleries. A bell, vestry fittings, heating apparatus, gas fittings, pulpit, and font, are all provided.

Llywellyn (Breconshire, South Wales).—The parish church here has been restored and reopened for divine service by the Bishop of St. David's. The edifice is in the Perpendicular style. The whole of the dressings have been cleaned from lime-whitening with muriatic acid: none of the old dressings had been chiselled over. The stonework of the windows has been repaired, and they have been fitted in with new glass of two shades, put in promiscuously by Messrs. Burlison & Grylly, of London; that of the chancel has

been fitted with iron saddles and stanchion bars, and Winn & Co.'s patent glass ventilators have been used. The chancel arch stonework has been cleaned, and pointed in Roman cement, as well as the priest's doorway, nave doorway, two doorways in the roof-loft on the north side of the nave, doorway leading to the tower, &c. The wall above the doorway at the west end of the tower has been opened, and a stoop formed on the south side of the jamb; the jamb being bared, and corbels thrown above to receive walling, the stoop and corbels being in a perfect state of preservation. The roofs are all of oak, with longitudinal and transverse moulded ribs, which have been repaired with similar timber. The moulded ribs in the chancel are new, and have been left clear and varnished. All the doors, with the exception of that of the nave, are new, from designs prepared by the architect, and are made of native oak, hung with ornamental hinges, locks, and ironwork. The chancel stalls are of native oak. The whole of the nave sittings are of deal, varnished. The font is of Caen stone, with native stone base. The tower is formed for the use of a vestry, divided from the nave by an old oak screen, which has been restored for the purpose. The floor of the vestry and nave is of red deal. The aisle is of paving stone. The chancel floor is laid with encaustic tiles in patterns supplied by Mr. Godwin, of Hereford. The steps are of native stone, rubbed. The architect employed was Mr. G. G. Scott; and Messrs. Williams & Sons, of Brecon, were the builders.

Castlemorton.—The district in which a new chapel-of-ease has just been erected is part of the parish of Castlemorton, and is situated about five miles from Malvern Wells, and the boundary where meet the three dioceses of Worcester, Hereford, and Gloucester and Bristol. Miss Selwyn, of Glenberrow, the owner of some property in the locality, set herself to the task of raising subscriptions for the erection of a chapel of humble structure, which, according to the estimate of Mr. Preedy, of London, would cost 500*l.* On the project becoming known, a site of half an acre, situated in the centre of the district, and on the edge of a common, was given by the Ecclesiastical Commissioners as lords of the manor, while the London Incorporated Society gave 30*l.* towards the funds. Earl Somers gave the stone, and the farmers of the district their services in hauling it. The chapel is situated at the base of the "Holly Basin." Mr. Smart, of Malvern Wells, is the builder. The style is Early English; the plan a plain parallelogram, with bell-cot at the west end, a south-west porch, and an east window of three lights painted. There is sitting accommodation for ninety persons. The floor of the building is laid with encaustic tiles, and heated by means of hot-water pipes. The roof is of open woodwork stained. The principal portion of the east window is devoted to the illustration of three of the principal incidents of the life of our Lord:—The descent from the Cross, the appearing in the garden after the Resurrection, and the Ascension to Heaven.

Lexden (Colchester).—The newly-erected district church of St. Paul, Lexden, Colchester, has been opened and consecrated, with the burial-ground. The church is situated on a portion of the ground formerly belonging to the Freehold Land Society, a short distance from Essex Hall Asylum and the railway station. The style is Early English, and the edifice is built of stone rubble, with Bath stone dressings. It consists of a simple nave and chancel, with a view to further enlargement by the addition of a north and south aisle. The length of the nave is 55 ft. 6 in.; length of chancel, 25 ft.; and there is sitting accommodation for 214 persons. It is surmounted by a bell-turret at the west end. The bell was cast from the metal of the bells of a number of old Dutch clocks, purchased by the Rev. J. Papillon, rector of Lexden, from a Colchester clockmaker. There is a circular apse at the east end of the chancel. The roof is timbered, and covered with plain tiles. The roof of the nave rests upon two arcades, and are filled in between the arcades with red brick walls temporarily, to be removed when the chancel is enlarged. The gable at the east end of the nave is surmounted by a stone cross, and at the chancel by a wooden cross covered with lead. There is a vestry 10 ft. 6 in. by 11 ft. The church is lighted by tinted cathedral-glass windows, and by gas. The nave is supplied by corona burners suspended from the tie-beams, and the chancel by ornamental standard burners. It is heated by Musset's patent hot

water apparatus, without any furnace or fire, but by means of gas jets applied to small cast-iron boilers connected with the water-pipes. The pulpit is of stone, and there is a carved lectern on the stone wall between the nave and chancel. The font is of Bath stone, with marble columns, carved caps and bases. The aisles of the church are paved with red bricks, the passages of the nave and chancel with Minton's tiles, and inside the apse with Minton's 6-inch tiles, white mosaic tessera squares and border round. The floor under the seats is paved with oak blocks on concrete. The whole of the seats throughout is of pitch pine varnished. The architect was Mr. J. Clarke, of London, diocesan architect; the builder was Mr. Joseph Grimes, of Colchester. The total cost of the church is 2,000*l.*, of which about one-half is subscribed. A school is contemplated in connexion with the church.

Hastings and St. Leonard.—The foundation stone of a new church in St. Andrew's has been laid. Some time since, when the town was extended in this direction, and much land was sold for building purposes, a benevolent lady, Miss Maria Jane Sayer, of Hastings and Challey, set apart, in St. Andrew's-road, not far from the Gasworks, a site upon which, at a fitting time, a church and parochial schools could be erected. Miss Sayer, in addition to the site, gave 1,000*l.* A committee was formed, subscriptions were readily given, and Messrs. E. Habershon & Brook, of London, were instructed to prepare plans and conduct other necessary preliminaries. They produced a design, the carrying out of which was undertaken by Mr. J. Howell, of Hastings, who has contracted to execute the works for 3,235*l.*, of which, we understand, the larger portion has already been raised. The church is in the Early Gothic style, and will be built of local blue stone, with dressings of Bath stone. The building will consist of a nave, a side aisle, chancel ending in an octagonal apse, and a tower and spire at the south-east corner, 103 ft. high to the top of the vane. The church is to be 22 ft. long, and 43 ft. wide, and will accommodate 232 persons. All the windows will have tracery heads, and the capitals of the nave arcade will also be carved. Space has been reserved as a site for the erection of parochial schools at a future period. Mr. Colpoys is the clerk of the works. Several feet of the outward walls have already been raised.

Hadleigh.—The church here has been restored. The principal feature in the instalment of the work of restoration which has just been completed, is the restoration of the roof of the nave, the replastering of the walls, the renewal of the windows, and removal of the west gallery. The roof is a wagon-roof, and was formerly celled, but the plaster has now been removed, and a timber roof following the form of the original substituted. It consists of three segments of circles, the centre one being larger than those at the sides. Moulded rafters rise from the cornice, and meet these beams, and being continued, meet in the centre of the roof, the intersections being ornamented with carved bosses. To resist the lateral thrust there are eleven tie-beams, which have been cased so as to be uniform with the remainder of the woodwork of the roof, all of which is now, and from the tie-beams are braces which meet the extremity of the foil at an acute angle, so as to form with the side segments of circles supporting arches. The tie-beams are further supported by iron brackets, painted bright blue, picked out with gold. The windows of the clearstory and aisles were all filled with slightly tinted glass, with a narrow edging of clear glass, and the stone mullions and tracery have been reprinted and restored. The clearstory walls are supported by moulded perpendicular columns and arches. A stone arch across the centre of the nave which was deemed unnecessary for the purpose for which it was intended—to prevent the collapse of the walls—has been removed, and simply carved corbels from which it sprang remain. The removal of the large west gallery in which the organ was formerly placed, has left a large irregularly paved open space beyond the pews, at the centre of which stands the font. The removal of the organ gallery has opened the whole west wall to view; it is a blank space happily relieved by the doorway (which was formerly blocked up), and a small opening about half way up the wall. The organ, which has been 100 years in the church, has been removed to the north chancel aisle: it has been taken to pieces and re-erected, and two of the stops re-erected by Messrs. Godball, of Ipswich. The

chancel pews have disappeared, and oak benches, with carved poppyheads, and stalls substituted. The east window has been proposed to fill with stained glass, in memory of the late rector. In the lady-chapel window all the old painted glass which was found in the church has been utilized, and in the south chapel is a painted window, the gift of the late Mr. Knox. During the restoration of the roof of the nave, and the other alterations (which cost between 500*l.* and 600*l.*, and were executed by Mr. William Everett, builder, Hadleigh), the church has not been closed.

SCHOOL-BUILDING NEWS.

Manchester.—The Manchester Jews' School's new building in Derby-street, Cheetham Hill-road, has been inaugurated. The building, which is a plain structure, consists of two large rooms, one on the ground floor, and the other on the first floor. The former is to be occupied by the girls, and the latter by the boys. At the end of each of the large rooms there are class-rooms, and accommodation for the younger portion of the scholars. The building has been erected to accommodate 600 children; but in the event of the attendance increasing, that number can be increased to 800. A committee-room is situated on the upper floor. A covered play-ground is provided in the basement, occupying an area of 330 square yards, on which also is provided a care-taker's residence. Accommodation is provided for lavatories, and hat and cloak rooms. The entrances to the boys', girls', and infants' school-rooms, are quite distinct. Large play-grounds, with appliances for gymnastic exercises, are provided in the rear for boys and girls. The architect was Mr. E. Salomons, of Manchester, and the builders were Messrs. Cochrane, Parker, & Co. The whole of the fittings, together with the furniture for the committee-room, were supplied by Messrs. Sidebottom & Co., of Manchester. The cost, including the price of the land, has been about 7,000*l.*

Debenham.—A new building for a school and lecture-room has been raised here by the members of the Congregational Church. Adjoining the chapel is a new parsonage, and the whole (the above-named room being in the rear of the house) forms an addition to the church. The contract for the entire work was taken by Messrs. G. Scopes & Chapman, of Needham, for 410*l.*, but extra brought up the total outlay to about 450*l.* The room is 40 ft. long by 20 ft. wide. The roof is too low. The plans were prepared by Mr. A. Damant, of Debenham.

Books Received.

Notes on the Great Pyramid of Egypt, and the Cubits used in its Design. By COL. SIR HENRY JAMES, R.E., F.R.S., Director-General of the Ordnance Survey. Southampton: Gutch, printer, 1869.

FROM new measurements, of all the four sides of the base of the Great Pyramid, from socket to socket of the corner stones, taken at the suggestion of Sir Henry James, and at the cost of Miss Birdett Counts, by Mr. Inglis, a practical engineer, the conclusion to which Sir Henry has come, in reference to the length of the Egyptian cubit, is, that it was 18.2415 in. long, or the precise length of the ancient Greek cubit, according to Mr. Penrose; thus corroborating Herodotus, so far at least as regards the equal length of the Greek and the Egyptian cubit; and also verifying the conjecture of Sir Isaac Newton, that the base of the pyramid was made a round number of Egyptian cubits. The mean length of the sides obtained by Mr. Inglis was 9,110 in.; that of the Ordnance survey was 9,130 in. The mean of these two results is 9,120 in. One of Mr. Inglis's measures is exactly 9,120 in.; and of one of the Ordnance surveys, 9,121 in. "We may, therefore," says Sir Henry, "confidently regard 9,120 in., or 760 ft., as the true length of the side of the pyramid, when it stood perfect; but 9,120 in. is precisely equal to 500 Egyptian or Greek cubits of 18.2415 in. . . . The side of the base being 500 cubits, or 750 Egyptian feet, and its length 760 English feet, the length of the Egyptian and Greek foot was to the length of the English foot as 75 to 76, or as 1 to 1.013."

Sir Henry James suggests, ingeniously, that the angles of the descending and ascending passages being a little under the angle of rest or quiescence, or a little over 26°, trucks or stones could be made to slide down with great ease

under complete control; and that trucks might have been so counterpoised that a ready way of descent first, and then of re-ascend, through the grand gallery to the king's chamber, might have been arranged, whether for the conveyance of the dead body of the king, or for his convenience during his life; while, after deposit of the body, the stone "porticulis" or plug to the entrance at the bottom of the ascending gallery, might readily be lowered from within into its place by means of tackle, the workmen finally quitting the interior through the "well."

Purchasers of these notes for 1*s.* 6*d.*, have, in addition to the notes, four photo-zincographs, —two of the Great Pyramid and the Sphinx; one of the Sphinx and Second Pyramid; and one of the Nileometer at Cairo; besides diagrams illustrative of the pyramid and the Nileometer.

The Book of Manly Games for Boys. By Captain CRAWLEY. London: William Tegg.

COMMENCING with "Prisoners' Base" and other games without implements, games with tops and with hoops, cricket, tennis, and so forth, the writer proceeds to teach swimming as well as it can be taught out of the water, skating, riding, sailing, and so on, and goes on to chess and games of chance. Captain Crawley, as he chooses to call himself, writes for the most part of what he knows. Now and then he is not quite clear, but this is the exception. Thus, in his chapter on driving he says:—"If anything in front causes you to slacken your pace, raise your whip, so that the driver of the vehicle behind you may have notice also to go less rapidly. Avoid all sharp turnings, and remember the rule of the road,—*Keep to the right!*" The italics are the author's. Now the author must know, just as well as we do, that this is not correct. "The rule of the road is a paradox quite: as you go driving along, if you keep to the left you are sure to go right, and if to the right you are wrong." Nevertheless, this is a capital book for boys. We can cordially recommend it. The illustrations, by Mr. John Proctor and others, are not only spirited, but useful.

A Handy Book of Property Law, in a Series of Letters. By LORD ST. LEONARDS, W. Blackwood & Sons, Edinburgh and London. 1869.

WE have simply to mention that a new edition (the eighth) of Lord St. Leonard's very valuable Handy Book has been published. We learn from a postscript that the author has brought up the law to the present time; and, moreover, that, owing to the many alterations that have been made in the law during the time which has elapsed, he found it a much more laborious task than he anticipated.

A New Tile-Pattern Book.

MESSERS. HARGREAVES & CRAVEN have issued a Trade Book, which includes a number of designs for tile pavements by architects, especially by Mr. John Gibbs, who has exhibited considerable originality in most of his contributions to it. Mr. Goldie, Mr. Waterhouse, Mr. Bentley, and others have also assisted. Directions given for keeping the pavements clean may be usefully quoted:—

"Wash with cold water and soft soap, applied with a scrubbing-brush. This will improve the colours, and remove the saline scum arising from the cement the first few weeks after the tiles are laid. Stains or dirt, from neglect of cleaning, may be removed by dilute muriatic acid (spirit of salt), applied with a pumice stone. The acid must be carefully wiped off, and always, after washing the tiles should be wiped with a clean dry cloth. The water used should be perfectly clean."

VARIORUM.

"EVERYBODY'S YEAR BOOK: a Popular Annual for 1870." Wyman & Sons, Great Queen-street, W.C. This is the third annual issue of a very useful and popular annual, containing a large quantity of varied information of an entertaining as well as a useful order. Besides the usual almanac matter, there are remarks on the philosophy of furniture; on good cookery; on home ferneries; a handful of anecdotes; poetry of the affections; epitaphs; charades; information for everybody, &c. So large an amount of literary matter for 6*d.* has necessitated the reprinting of the two previous annual issues of this periodical. Mr. Tegg is doing good service by his reprints of standard English works, and we commend him especially for his last production,—Robertson's History of Charles V. This is a book which will never go out of fashion, and should never be out of print. There is no more interesting part of it than the exposition given of the traces of ancient wisdom and arts existing

in the East. The volume is well got up, and includes an account of the life and writings of the author condensed from that written by Dugald Stewart.—A pile of new books is before us, and will have notice in due time.

Miscellaneous.

Completion of the County Gaol at Carlisle.—This new prison has been completed and has been certified by the Government inspector. The old gaol has been transformed into one in which the "separate system" can be carried out in accordance with the requirements of the Prisons Act. The male ward was the first completed. The female ward has now been finished. It is almost a counterpart of that set apart for male prisoners; the chief difference being that there are 52 cells instead of 112. These cells are similarly constructed and furnished, except that the gas-light, instead of being enclosed in an aperture of the wall beyond the control of the prisoner, is an ordinary bracket, so placed as to be near the prisoner's work. Part of the alterations of the prison consisted of the erection of a new treadmill and system of waterworks. The greater part of the work thus performed by the men is utilised in supplying the gaol with water, for which the prison is now no longer dependent upon the city supply. The water is pumped, from an artesian well by a set of three-throw pumps, and then forced to a high cistern, whence it gravitates to all parts of the gaol. The old gaol, erected in 1824, cost 42,500*l.* (including 3,600*l.* for the site). The alterations, which have been carried out under the directions and superintendence of Mr. Cory, county surveyor, have cost 16,000*l.*, including the governor's house, the treadmill, and waterworks. The newly-arranged prison provides cells for 180 prisoners; in the old gaol there was only accommodation for 123.

The General Builders' Association, Birmingham.—The sixth annual dinner of the Birmingham branch of this Association has been held at the Great Western Hotel. There were about 100 members of the association present, and amongst the visitors were,—Councillors Perks, Harris, Davis, and Biggs; Messrs. A. B. Phipson (President of the Birmingham Architectural Association), Naden, Ferry, Proude, and Mait. After the repast and the loyal toasts, Mr. Clay, of Manchester, proposed "The General Builders' Association and the Birmingham Branch." The Chairman, in responding, said the Birmingham branch of the Association had done much not only for the benefit of the masters, but also for the benefit of the men, and amongst those systems which it had introduced was that of settling disputes by arbitration. He referred to the unwholesome and extreme competition among the builders, which he thought should not exist, and remarked that while during the past ten or twelve years the wages of the men had risen thirty per cent., the prices obtained by the builders had gone down. The next toast, "The Architects and Surveyors of Birmingham," was proposed by the Chairman, and responded to by Mr. Phipson. Mr. Bloore proposed "The Operatives connected with the Building Trade," and remarked that the earnest desire of the builders of Birmingham was to assist the workmen in every possible way in an endeavour to elevate themselves.

The New General Post-office.—On Tuesday the contract of Mr. W. Brass, of Old-street, St. Luke's, was accepted for building the new General Post-office. The site for the new building is the open space directly facing the present post-office in St. Martin's-le-Grand, and the edifice will be reared after the designs of Mr. Williams, of her Majesty's Office of Works. The facade will be 860 ft. in length, with an elevation of 89 ft. It will be of Classical design, and will present four architectural fronts, with interior arrangements of sufficient capacity to meet, in every particular, the increasing requirements of this important branch of the public service.

The South Shields' Town-hall Question. After obtaining designs and accepting a tender for the erection of a Town-hall, the council have decided, by fifteen for and sixteen against, not to proceed. An architect writes:—"So the competitors have been made fools of, and spent their time and money for nil. Surely they can compel the council to carry out some one design, or else claim compensation."

New Invention for Glass-making.—Mr. Hugh Percival, late of Darlington, the manager of Messrs. Anstin & Co.'s (formerly Messrs. Scott's) Glass Works, at Southwick, has, after years of experiments, brought to a successful issue a new mode of glass-making, which it is said will not only revolutionise the trade, but render unnecessary the erection of huge unsightly cones. Mr. Percival divides his tank into certain compartments. Into the first, or "founding" division, he places the raw material, which undergoes the process of smelting. Instead of having to wait until the contents are infused, and the top part skimmed, the mixture as it becomes molten flows by conduits into a series of other compartments, where the refining process is continued until it reaches the last one, from which the men "gather" and work the glass into bottles. The great advantage in the new plan is the continuance of the work; no skimming of the pots is required, for every scrap of material is melted, that requiring the greatest fusing, instead of having to be removed by the old process, being ultimately converted into glass.

Dowlais Steel Works.—Some few months since a 70-ton block for a steam hammer, by Mr. William Williams, of St. Helen's Works, Swansea, was successfully cast at the steel works now in operation at Landore. Mr. C. W. Siemens, the patentee of the process carried on at these works, is at present erecting similar works at Dowlais, for the Dowlais Iron Company. In addition to other castings a block of like weight to the one at Landore was required, the casting of which was again undertaken by the same firm, and this has been successfully carried out by them at Dowlais. The first charge of iron was tapped at about two a.m., and successive charges followed from two cupolas throughout the day, until three p.m., when the full weight of 70 tons had been poured into the mould, the metal keeping in a state of fusion for over twelve hours, and it would not be cold enough to transverse and fix into position for about twelve or fourteen days.

Roman Pavement in York.—Last week, the men engaged in the restoration of St. Mary's Church, Castlegate, in this city, discovered the remains of a tessellated pavement. It is situated where the south porch stood, and is about 2 ft. under the old floor. The dimensions, we are informed, are about 5 ft. by 2 ft., and are hut a portion of what has been a work of considerable dimensions. Unfortunately, the centre has been destroyed to make way for an interment. The outer portion consists of eight rows of red squares: within are eight rows of white squares, and then two of black. These form the border or outer part of the pavement. The interior is of white squares. In the corner is a diamond of black, with a flower of white, red, and black. There are some remains of a more elaborate combination in the centre, but it has been so much broken and defaced as to be beyond description. Mr. Burditt, the clerk of the works, has had the pavement washed and protected.

The Sheffield Archaeological Society and the London Court of Common Council.—At a special meeting of the Court of Common Council, at the Mansion House, on Friday week, for the despatch of urgent business, the Lord Mayor presiding, a letter was read by the town clerk from the Archaeological and Architectural Society of Sheffield, to the effect that they had arranged to hold a *conversazione* in the School of Art in that town on the 1st of December next, and that they would be extremely indebted to the corporation if the ancient cutlery now in the possession of the library committee, and lodged in the City Museum, and a few other objects of antiquity, could be lent to them for exhibition on that occasion. They pledged themselves to take the greatest care of the curiosities, and to return them in perfect safety free of cost. The requisite permission was unanimously granted, and the Library Committee were instructed to carry it into execution.

The Boys' Home, Regent's Park.—A new wing has been added to the buildings of the Boys' Home, near Primrose-hill. The new wing, which is two stories in height, contains an additional school-room and workshops, and its erection will enable the Home to accommodate eighty boys, instead of the present number (fifty), if the necessary funds for their support are forthcoming. The Bishop of London has inaugurated the new addition to the building.

The Warming of Norwich Cathedral.—A hot-water apparatus for warming the cathedral has been fitted up by Messrs. Barard, Bishop, & Barnards, and brought into use. Four large tubular boilers are fixed in a building on the north side; and from these are taken the main pipes from transept to transept crossing the choir, from which branch between 8,000 ft. and 9,000 ft. of 4-inch pipe are laid beneath the floor, in the nave and choir, and a portion of pipe is also laid in the triforium of both nave and choir, being intended to heat the air in the upper part of the building to prevent cold currents descending. Coils of pipe next the walls are introduced in the transepts. The pipes, which are laid beneath the floor of the nave and choir, are covered with ornamental cast-iron grating of an ecclesiastical design. The temperature, when all the boilers are working, is found to be from 20 to 25 degrees beyond that of the external atmosphere. The heat can be moderated if desired.

A New Movement for the Unemployed.—On the 6th inst. a meeting was held at Liverpool (Mr. Rogers presiding), for the purpose of aiding a movement inaugurated by Mr. Johnson, the object of which is to give employment to the large number of labouring men who at various times are thrown out of work in Liverpool by the fluctuations of trade. The design is to engage these men upon work which will only yield a very moderate rate of wages, seldom exceeding 1*s.* per day, an amount which, it is calculated, will be sufficient to keep them above starvation point, but not large enough to attract impostors, or induce men to forsake their legitimate employment when it presents itself. A rate has been engaged by Mr. Johnson and a few of his friends, and an average of from forty to fifty men are at present being daily employed in making firelighters at the rate of 6*d.* per hundred. The scheme has hitherto been attended with a slight loss.

Co-operation at Dalston.—New co-operative stores at Dalston have been formally opened. The new building, which is the most prominent in the village, has a frontage of 30 ft. by 24 ft. deep, and consists of three stories, to be appropriated as follows, viz.:—The ground floor to the shop, the second to the warehouse, and the top known as the lecture-hall and reading-room. There is also a large wing adjoining the main building appropriated to warehouses, committee and ante rooms, also a hakehouse. The total cost is 600*l.*, viz., 270*l.*, the original cost of the premises, and 330*l.*, the amount of contracts for alterations, &c. Mr. John Bewley, builder, Dalston, had the contract for mason's work, plastering, and slating; Mr. H. Hope, the joiner's work; Messrs. Sles & Morgan, of Carlisle, the painting and glazing; Mr. Irving, the plumber's work; and Mr. Thomas Corbett, the ironmonger's work.

A New Experiment in Working Men's Clubs.—In the midland counties of England these clubs are being established on a broader basis, and, as their promoters believe, with increased chances of success. The Rev. H. Solly has been holding a series of meetings in the iron and coal district around Birmingham, and we are told that he has at length "yielded to the overwhelming evidence in favour of the clubs supplying their members with such articles of refreshment, including beer, wine, &c., as they may desire." The immediate result, it is said has been to "interest the leading artisans especially the officers of the great friendly and trade societies" in the clubs, which they have heretofore rather shunned, deeming them unfitted to meet the wants of the great bulk of the working classes.

Steam Cultivation.—Step by step the movement goes on. The *Farmers' Chronicle* says:—"Mr. James Howard, M.P., has turned his attention to the question of drilling by steam power, and has had a drill, upon the Suffolk principle, constructed with a harrow in the rear. During the past week the machine has been regularly at work upon the farms of Messrs. Howard, Bedford, and upwards of 20 acres per day have been drilled and harrowed; 16 ft. are covered at a haul. A self-propelling engine is employed to haul the drill. The apparatus is moved from field to field without the aid of horses, and is ready for work within the short space of an hour. By a simple device the shock-rod, working on a pulley at either side, turns round the drill and harrows when the end of the field is reached."

Bury.—The Bury Co-operative Society have lately been going in rather heavily for building. Last year they completed the large new central stores in Knowlesy-street, from the designs of Mr. Simkin, besides erecting new branch stores at Moorgate, Pitsoth Moor, and Elton, all of which were built under the superintendance of Messrs. Maxwell & Juke, architects, of Bury. In addition to these stores, the society have built between thirty and forty cottages for their own members, and are now engaged in altering and adding to the old stores in Market-street, in which is now incorporated the Old Sun Inn.

An Art Sale.—Buyers of fine works of art may be glad to have their attention drawn to an advertisement in our present number of an approaching sale by Mr. Fred. Godwin. It includes the well-known life-size group of the "Fishing Girls," by R. Monti, shown at the Great Exhibition of 1851, and a fine work by (Marochi), also in marble. The "Saviour in the Temple." Some pictures and decorative furniture are also out of the common way.

St. Pancras New Infirmary and Schools at Highgate.—The long-standing dispute between the Poor Law Board and the parish of St. Pancras respecting the proposed new infirmary and schools has at length been settled. (The terms of a compromise were agreed upon at a recent meeting of the guardians.

Colour in Signal Lamps.—It is asserted that railway managers have made about the worst selection they could in the colour of their signal-lights. Bright yellow is the colour most easily distinguished, and violet, red, and green are the least readily recognised. After yellow, blue is most quickly seen.

North British Railway.—At a meeting in Edinburgh recently the chairman moved the approval of the Tay Bridge scheme, costing £50,000. An amendment was moved by Mr. Kirkcaldy to delay the work for twelve months, but the chairman's motion was carried by a large majority.

Society of Painters in Water Colours.—The winter exhibition of sketches and studies by the members of this society will be open to the public on the 29th inst. The private view will take place on the 27th.

Tramways.—The Tram-Railway Company of Great Britain (Limited) have now, it is said, before them twenty-eight applications for tramways in various parts of the kingdom, accompanied by offers of considerable local support.

Music Hall, Derby.—Messrs. Harris & Grant, formerly of Worcester, have just erected, in a Princess-street, a music-hall which will accommodate 2,200 persons.

For new stabling and cottage, &c., Friary-street, Guildford, for Messrs. Elkins & Son. Mr. H. Peak, architect.

Foster	£577 0 0
Pollard & Son	569 0 0
Burdett	535 16 0
West	533 0 0
Stradling	530 10 0
Patrick & Son	530 0 0
Loe	523 10 0
Garnett	515 0 0
Lee	515 0 0
Moon	494 15 0
Nye	491 0 0
Peare & Clark (accepted)	459 0 0

For making new roads and gulleys on the Eversfield estate, St. Leonard's-on-Sea. Messrs. F. H. Fowler & Hill, surveyors:—

Homan	£327 0 0
Sadler	324 0 0
Kenwood & Co.	298 0 0
Parks	294 0 0
Dorewood & Co.	287 0 0
Bridgeland	290 0 0
King	280 0 0

For building four cottages for Mr. Partridge, at Pechham, Surrey. Messrs. W. M. Teulon & Cronk, architects. Quantities supplied:—

Cooper	£1,055 0 0
Nightingale	981 0 0
Beckett	975 0 0
Dorewood & Co.	967 0 0
Wrench	985 0 0
Dedman	958 0 0
Jacobs	950 0 0
Shuppe & Birch	925 4 3
Smith	925 0 0
Ward	919 10 0
Wright	895 0 0
Hockley	889 0 0
Stonor	877 0 0
Spearing & Wye	875 9 5
Evans	859 4 0
Hughesdon	850 0 0
Mears	847 0 0
Tarrant	828 0 0
Salter	810 0 0
Busk	799 0 0
T. R. & T. Davis	774 0 0
Martin	758 0 0
Warr	694 0 0
Davis	693 0 0
Wewell	620 0 0
Banks (error)	555 0 0

For concrete sea-wall, Southsea:—

	With Concrete Copings.	With Stone Copings.
Concrete Building Company	£1,961 ..	£2,145 11
Blackmore	1,672 ..	1,823 ..
Vickers	1,127 ..	1,249 ..
Taylor	1,120 ..	1,245 ..
Light, Brothers	1,100 ..	1,259 ..
Barnes	1,078 ..	1,234 ..
Churchill	1,068 ..	1,118 ..
Evans	955 ..	1,065 ..
Neave & Fry	890 ..	1,000 ..
Bald	890 ..	1,113 ..
Mills	849 ..	1,333 ..
Smith	845 ..	1,008 ..
Hayter	799 ..	1,338 ..
Ward	773 ..	1,008 ..
Quinn	720 ..	1,005 ..
Hames	677 ..	957 ..
Dramble, Brothers (accepted)	650 11 ..	1,020 11

Terra Cotta Decorations at South Kensington.—Sir: May I ask you to state that the tender supplied by Messrs. Lindsay & Anderson, for the terra cotta decorations for the new Exhibition buildings, was in amount £2,866, and included the whole of the work? An accidental omission was discovered in taking out the quantities, previous to the delivery of the tenders, which was corrected and included in the above-mentioned sum. JAMES ROBINSON.

Grove Ferry.—To list of tenders for cottages, at Grove Ferry, Kent, in our last, and:—Birley & Son, 61st.

TO CORRESPONDENTS.

G. R. M.—H. P. H.—T. L. D.—H. S.—F. M.—E. C.—Lendwener.—Diamantia.—C. N. A.—J. C.—Mr. L.—Bombay.—New Play.—J. E.—D. & Co.—C. H.—W. H. G.—F. M.—G. J.—C. H.—C. L. R.—Groveend.—A. B.—R. M.—B. G.—P. G.—B. & Son.—O. E.—H. P.—B. C.—R.—J.—E. (will inquire).—N. C. (the columns are of solid blocks of granite).—B. & Co. (send another copy).—W. S. B. (will send)—H. H. B. (next week).—E. A. C. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Notes.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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Wigmore	£5,999 10 0
Birdon	5,451 10 0
Clark	4,993 0 0
Moore	4,982 0 0
Pauline & Duggett	4,991 0 0
Rogers	4,981 5 5
Blackmore	4,920 0 0
Clarke	4,969 0 0
Dickinson & Oliver	4,900 0 0
Hayward	4,900 0 0
Dorewood & Co.	4,900 0 0
Tyler	4,440 0 0
Buckett	4,291 0 0
Pizy	4,090 0 0
Young	4,000 0 0
Coker	3,925 0 0
Haynes	3,980 0 0
Strasler	3,950 0 0
Brasler	3,740 0 0
Cosford	3,679 0 0
Childs	3,610 11 4
Carter	3,344 0 0
Buckland (accepted)	2,980 0 0

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Capps & Histo	£8,000 0 0
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Stinson	5,850 0 0
Heale	5,824 0 0
Nightingale	5,824 0 0
Crabb & Vaughan (accepted)	5,159 0 0

For new school-room, &c., at Mead-row, Godalming. Mr. H. Peak, architect:—

Mitchell	£235 0 0
Stield	315 0 0
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Young	307 10 0
T. & J. Loe	302 0 0
Nye	298 12 0
Pollard & Son (accepted)	292 7 4

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The Builder.

VOL. XXVII.—No. 1399.

Albert Dürer.

XTREMELY pleasant, very quaint, very quick, especially when there was dancing under the linden-trees, Nurnburg, or Nuremberg, must have been in the days of old, when it was a free imperial city. It is very quaint and pleasant still; for few places have endured less structural changes, though there is not so much life in it. But when Albrecht Dürer the elder, after turning his back upon the little Hungarian village in which he was born, and after travelling in Germany and

the Netherlands, in accordance with the custom of other skilled art-workers, at last came to Nurnburg, in 1454, on the day of Philip Pirkheimer's wedding, when there was a great dance under the trees, it must have been a charming place. We know Albrecht doffed his wallet, and we may conclude, since he handed down to his son an account of this festivity, that he donned his guest-garments, and was made welcome by the company. At all events, he travelled no farther, but took service with Joseph Haller, the goldsmith, there.

Probably Nurnburg would have had attractions for most of us if our lines had fallen upon those days; for there were several noble workers there filling the place with beauty. Adam Kraft, the sculptor, was living, busy, breathing life into stone; Peter Vischer, the smith, was working out the poetical thoughts that were in his soul into ironwork; Veit Stoss, the carver, was another producer of work of rare power; Wohlgemuth, the painter, was there; and Sebastian Lidenast, the worker in copper, was earning himself a name. There were mechanicians in the city, too, who were revolving in their minds, and from time to time making known, many inventions and improvements, the result of brainwork. When Albrecht Dürer the elder settled among these men and their fathers he must have been nearing thirty years of age. His master had a fair wife, Cunegund, and a little daughter, then two years old. The successive anniversaries of Philip Pirkheimer's wedding-day found the little maiden growing and prospering, and at last listening to the love-speeches of her father's craftsman; and before the thirteenth had come round Joseph Haller gave her in marriage to him. This child-wife, described by her illustrious son as "a fair and handy maiden of fifteen," bore her husband eighteen children. Most of these little ones simply came into the goldsmith's modest household to pass out of it again immediately. Three only lived to man's estate, Andrew, Hans, and the great painter and engraver, Albrecht.

Those who would know more of the surroundings and life of this gentle, genial artist, we must refer to a work just written by Mr. W. B.

Scott,* who seems to have set himself to his task as a goldsmith would apply himself to the execution of some choice *reliquaire*, bringing out his finest tools and his store of precious stones, with which to enrich it as it progressed under his hands. Twice or thrice he has taken up tools too blunt to produce lines corresponding with the rest of his treatment of the subject. But he seems to have seen his mistake in a moment, and thrown them aside directly. It is Mr. Scott's impression that the art of engraving for the purpose of printing was a German invention. He says, though Vasari has given Florence the credit of having been the first seat of the art, there are many engravings extant, as was first shown by Strutt, that bear dates anterior to the earliest practice of it in that city. Martin Schöner and Israel von Mechin were working at the period of Vasari's date; and their respective masters belong to a still earlier portion of the same century. Germany, at all events, speedily excelled in all kinds of engraving; and foremost among German engravers stands Albert Dürer, painter, carver, and architect. Of his various accomplishments, that of engraving seems to have been the most profitable, for from his earliest manhood to his death, and to his widow after his death, it was a source of income. But we must not be so inartificial as to forestall the story of his life in this abrupt manner.

Happily, Mr. Scott has for the core of his *reliquaire*, several pieces of Albert Dürer's own making. These are, first, an account of his family, which he compiled from his father's papers; secondly, a series of letters written by him, when at Venice, to his friend Pirkheimer, at Nurnburg; thirdly, the diary he kept during his long stay in Antwerp; and lastly, several pieces of rhyme which he appended to his prints. All these Mr. Scott has set in his book, so to speak. He has, furthermore, enriched it with other relics; notably, with six etchings of his own workmanship, which show us Dürer æ. 13, as in the drawing in the Albertine, Vienna; the Hungarian village of Eytas, where his forefathers "occupied themselves with horses and oxen," as given in his print called "The Great Fortune"; his portrait at 28, taken from his picture at Munich; his house at the Thiergartner-Thor, in Nurnburg; the view from one of its millioned windows; and his portrait, again, at 50, as painted by Tommaso Vincidoro during his visit to Antwerp.

Besides these, Mr. Scott gives four woodcuts, showing the statue by Rauch, erected to the painter's memory in the Dürer-platz, Nurnburg; a drawing-pen found in repairing his house; two shields, one charged with a panning device, and

* "Albert Dürer: his Life and Works." Including Auto-biographical Papers and complete Catalogues. By William B. Scott. With Six Etchings by the Author, and other Illustrations. London: Longmans, Green & Co. 1869.

the other with the arms appointed him by the Emperor; and his gravestone; lastly, the cover of the book is ornamented with one of Dürer's interlaced designs for embroidery.

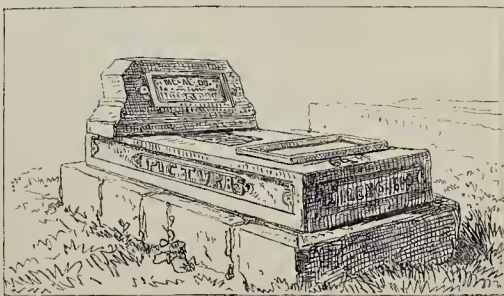
The first-mentioned piece of writing from Dürer's pen is touching, simple, and reverent. It begins:—

"I, Albrecht Dürer, the younger, have sought out from among my father's papers these particulars of him, where he came from, and how he lived and died holily. God rest his soul! Amen."

After describing his father's parentage, and ultimate settlement in Nurnburg, his father and mother's marriage, and transcribing from a book, probably the family Bible, a list of their eighteen children, with the day and hour of the several births (these were held of great importance in an astrological point of view in those days), and the names of their godfathers when sons, and godmothers when daughters, he continues:—

"My father's life was passed in great struggles, and in continuous hard work. With my dear mother bearing so many children he could never become rich, as he had nothing but what his hands brought him. He had thus many troubles, trials, and adverse circumstances. But yet from every one who knew him he received praise, because he led an honourable Christian life, and was patient, giving all men consideration, and thanking God. He indulged himself in few pleasures, spoke little, shunned society, and was in truth a God-fearing man."

Out of the supposed cause of his poverty and obscurity, his family of children, came, however, the source of his fame. We should never have heard of Albert Dürer the elder but for one of these apparently nawelcome little ones. Mr. Scott, momentarily taking up a rough-edged tool, says, "They must have kept his household wretched" forgetful of the benign Presence that said, in the faint days of yore, "of such are the kingdom of heaven." Albert the younger was to have been a goldsmith, like his father; but ultimately prevailed upon him to allow him to turn painter, and was, accordingly, apprenticed to Michael Wohlgemuth for three years. At the end of that time he set out upon the inevitable journey art-workmen spoke of as *wanderjahre*. He travelled for four years, when he was recalled by his father, who, during his absence, had arranged with a friend that he should marry his daughter Agnes, who had a dowry of 200 guildens. With this sum Dürer is thought likely to have purchased the commodious house in which he lived all the days of his life, and which has in our time been purchased to become public property. We would that Mr. Scott had sketched the painter's wife with a softer pencil. He does not allow her a single good quality, except the merit of having been young and handsome. Her piety he alliteratively links with peevishness; her frugality he calls parsimony. We reproduce his ungallant picture by way of warning. "Agnes had no children. She is represented as pious, peevish, urgent for industry, parsimony, and privacy. We seem to recognise her; a woman physically unloving, nongenjoying;



The Grave-stone of Albert Dürer.

such stuff as saints are made of." We do not know whether the saints or the *jung frau* Agnes have the most need to take offence at this piece of rough riding; but we will leave the scorn to their united clemency. It is true Dürer has left no record of her association in his work, as many of our most gifted contemporaries have done of their wives, but he took her with him in his visit, of two years' duration, to Antwerp, when he might have left her at home; coupled her name with his, when he put his money out to interest, which he was scarcely called upon to do, save from choice; and left her at his death well off in worldly circumstances, when one of his brothers, at all events, was living, and a fit recipient of his accumulations. Hence we may conclude, as, indeed, the author seems to think towards the close of his labours, that Agnes was not quite so bad as she has been painted. Pirkheimer is the chief authority from whom her character has been delineated; and in one of his letters to T'cherte, architect to Charles V., at Vienna, we can detect a mutual dislike. He tells of the death of Albert, who he says was the best friend he ever had in his life; and adds, he left many beautiful watches and things, one of which he should have liked to have had, but Agnes removed it out of his reach. Pirkheimer wrote the well-known epitaph upon his friend's grave. Let us hope Agnes relented, and sent him the coveted keepsake.

Albert Dürer was a very comely man to look upon. Mr. Scott says his face resembled the ideal attributed to the founder of Christianity; and in truth the portraits show us the very perfection of manly beauty. No wonder, then, that he found as many friends in Venice after a short stay as he did in Antwerp, and everywhere he went. His was not the hard task of proving he was better than he looked. At Venice he found welcoming outstretched hands on all sides. He wrote to his friend Pirkheimer, "There are many fine fellows among the painters who get more and more friendly with me; it holds one's heart up." Gian Bellini, who has praised me much before many gentlemen, wishes to have something from my hand. He has come himself to me, and asked me to do him something, and he will pay well for it. Several people have told me I am in great favour with him, and I understand he is a pious man; he is very old indeed, but yet the best among them." Titian and Giorgione were in Venice at this time, and were probably among the friendly painters. The Doge offered him 200 ducats a year to live in the city. Again, in the Low Countries the Flemish painters received him with the warmest welcome, inviting him to ceremonial banquets, sometimes including in their invitations his wife, and even Susannah, her maid. At Brussels, Cologne, and Aix-la-Chapelle, he was entertained for many days free of any cost, and the Council of Antwerp offered him 300 florins a year, and a fine mansion to live in if he would remain among them. We select one as a sample of numerous entries in his diary. It relates to the beginning of his stay in Antwerp, 1520:—

"On Sunday, the day of St. Oswald, the painters have invited me into their Guildhall, with my wife and her maid. We ate an excellent dinner on an entire service of silver. All the wives of the painters were there, and, when they conducted me to my place at the feast, the entire assembly, standing up, made a lens for me as if they entertained a great lord. There were at the banquet people of consideration in Antwerp who bowed to me, and made me many compliments, saying they all wished to do what might be agreeable to me. After I was seated, the messenger of the council of the city approached me with two liveries, and made me accept four measures of wine, saying that he did so on the part of the gentlemen to show me honour, and as a sign of esteem. I prayed him to spare it to the gentlemen my thanks, and I offered him my very humble services. After him came Master Peeter, who presented to me two other measures of wine with his respects. We passed a long time at table with very great pleasure, indeed a part of the night, and then they conducted me home with lambs, and made a thousand demonstrations of friendship. I thanked them with fervour, and betook myself to bed."

On turning over the pages of this diary we are somewhat surprised Mr. Scott has not dwelt at greater length on Dürer's work as an architect, and upon his practice of the art of glass painting; especially upon this last, seeing the controversy evoked by Mr. Holt's assignment of the Fairford windows to him, and that the diary shows him to have been in communication with Flemish artists in stained glass. His principal object in going to Antwerp was to see the Lady Marguerite, the sister of his patron lately deceased, and obtain her influence in favour of his application to the new emperor, her nephew, that he might retain his appointment of painter

to the king. Owing to the delay of Charles in making his entry into that portion of his dominions, Dürer's stay was prolonged for two years, during which time he records incessant work, which is quite compatible, though some people do not think so, with the record, also, of incessant visiting, giving and receiving of presents, making of purchases, interviews with celebrated artists, such as Quentin Matsys, or scholars such as Erasmus, and excursions to other places of interest. Portraits seem to have been his principal occupation here, and copies of his engravings, his most frequent complimentary and propitiatory gifts; but here and there are signs of his interest in the class of work to which we refer:—

"I have given to the painter on glass, Honig, four little pieces on copper."
"Master Dietrich, the glass-painter, has given me some red colour, which is found in newly-baked bricks here in Antwerp."

"I have bought a shirt of red linen for thirty-one stivers; some of the red colour they get from newly-burnt bricks two stivers."

"I have offered to Dame Marguerite, sister to King Charles, an example of my engravings. I have also made for her two designs on parchment with the greatest care, which I estimated at thirty florins; and for her physician, the plan of a house he proposes to build; this plan I would not to under ten florins."
"I gave four stivers for kettle-brown [Here Mr. Scott says, in a note, this word is of some importance, as it goes far to connect Dürer with glass-painting. It means halt, a plant, a species of salale, or glasswort, the ashes of which are used in the making of glass]."

"I invite Tommaso Gerhard, his daughter and her husband, the glass-painter Honig Jobsten and his wife, and Felix, which costs me two florins."

"Give an Apocalypse to Master Dietrich, the glass-painter."

"I have made a sketch for Tommaso, partly coloured, after which he may have his house painted."

"Two [books] to the son of Honig, the glass-painter."
"To Master Art, the glass-painter, I give a 'Life of the Virgin.'"

Thus these entries show that the Flemish glass-painters gave him the material for the new red colour they prized, and that he subsequently bought more of it, as well as a stock of kali. His interchange of courtesies and gifts with four glass-painters suggests, too, further business arrangements. A little more research on Mr. Scott's part might have brought forward more conclusive testimony.

Collectors will specially value the *reliquaire* we must now lay aside for the comprehensive and descriptive catalogue it contains of the master's works; a hundred, at least, engravings on copper and etchings; more than two hundred wood engravings; a much larger number of paintings; nearly as many sketches and engravings; many carvings in wood and ivory; besides his literary works on fortification, geometry, and human proportion; his scarce architectural efforts and his models. It tells us all the old story; industry is the only road to excellence and success. But we would have our readers look into it themselves, and realise the fine old house at the Thiergärtner-Thor, with the atelier, in which most of this work was executed, occupying the ground floor, the agreeable, intellectual Nurnburg society, the guild that was so much associated with Dürer, the step gables and cunning dormers of some of the old, tall houses, the great churches with Peter Vischer's ironwork and Adam Kraft's sculptures in them, the fountains, and the linden trees where the great dance was held on Pirkheimer's wedding-day. They will see Mr. Scott has paid a fitting tribute to one of the greatest masters of his craft, in good coin.

POSSIBILITIES OF STREET ARCHITECTURE.

AN architect has been defined as a man whose fate it is continually to be imagining great things and executing little ones. There is, it must be admitted, but too much truth in the definition, as many a hardworking man, drearily chocking "extra" bills, and planning small and uninteresting houses, in an office hunched round with gorgeous architectural dreams in water-colour, could well testify. And there is, we fear, something deeply rooted in the English character, especially in that stratum thereof whence art-patronage most proceeds at present,—the wealthy middle-class, which peculiarly militates against the hopes indulged by young architects and artists, of being permitted the opportunity of realising their brightest aesthetic dreams. The "art-phobia," of which we noticed such a remarkable development not long ago in our legislative assembly, during the Law Courts discussion, exists more or less in the minds of the nation at large: there is a certain "smugness" and stolidity of taste prevalent among our

landed and moneyed, and not wholly absent from our titled, aristocracy, which connects any undue attempt at artistic effect in a residence with they know not what of vulgarity and show, and which finds the acme of respectability in a decent plainness. The best prospect of a modification in this way of thinking, probably lies in the increasing connexion and intercourse between the natives of this *ultima Thule* of ours, and some of their more artistically-minded continental neighbors. Awaiting the good time to come, when every educated and wealthy Englishman shall be as anxious to have his mansion truly artistic in design and detail as he now is to have it comfortable and commodious, let us consider whether there may not be some more ordinary and hitherto rather neglected fields on which to expend our talent in the meantime.

It is too much the habit, both with professional and non-professional men, to rank as "architecture" only the isolated buildings, such as churches, town-halls, and such other structures, which are built under exceptional conditions of size and costliness that render the attainment of a certain degree of architectural effect comparatively easy, or even inevitable; for a very large building strikes and impresses sometimes by its mass, independently of details. And when we speak of the architectural interest or beauty of any special town, we commonly look back mentally to a kind of panorama of the principal buildings, like that which Mr. Verdant Green was troubled with after lionising Oxford. But, in truth, is not this importance of public buildings in giving architectural character to a town somewhat over-estimated? It is true that after visiting the majority of English towns, the only pleasing recollections as to their outward aspect (except it be with regard to site) have reference to a few isolated edifices, while the mass of the streets and buildings only remain in the mind as a kind of dingy background against which to relieve the real works of architecture, few and far between. But is it not in fact more important that what really constitutes the town itself should be pleasing, rather than that all architectural effect should be concentrated in, and confined to, certain favoured spots and individual buildings? These latter, whether sacred or secular, may be glorious ornaments to a town; but the finest cathedral or town-hall will not altogether compensate for miles of street laid out without plan or reason, and flanked by brick walls with rows of square windows of identical size and appearance. It is with the streets and the unavoidable rows of houses that flank them that the inhabitants of a town in their everyday occupations, come most immediately into contact; and the architectural character of the town should impress itself on the spectator through this medium, as well as through that of isolated buildings for special purposes. That this view of the subject should be so much ignored amongst us is partly due to the fact that for long past our town streets have been absolutely destitute of any architectural character or individuality whatever; and a slice of street from most parts of London, for instance, might just as well be a slice from Birmingham, Manchester, Liverpool, or any other large town the main features (if features they can be called), presenting an indistinguishable identity of ugliness. We have got used to this, and accept it as the natural state of things.

It is, however, by no means necessarily so; though it may be admitted that in large towns already built a long period must elapse before any appreciable improvement could be made, by dint of rebuilding, in the general aspect of things. The times are gone by now, in the European world at least, for the deliberate planning and building up at once of new towns, with all the parts duly laid out with relation to requirements of traffic and peculiarities of site. Most of our towns have grown up by degrees from small beginnings, and have (so to speak) laid themselves out, in curves and angles of picturesque but awkward variety; and one troublesome peculiarity of this natural growth is, that the central portion of a town generally, being the oldest, is built in narrower streets than the outlying portions laid out at a later period, when the prospective increase of traffic had become more apparent; consequently, the proper arrangement of the plan is mostly inverted, and the space is least just where the traffic is greatest and most concentrated. So great a nuisance has this crowding of the centre become in London, in addition to the tortuous character of some of the routes, that a well-known daily

contemporary recently expressed a wish for another "fire of London," if so we might have the chance of rebuilding it on a better and more commodious plan. On the other hand, it must be said that much of picturesque and of historical interest is to be found in the traces of the gradual growth of a town, and the old landmarks of property, which are preserved in the irregular line of its streets; and in the old names of streets, too, there is often a store of information and suggestion for the antiquarian, the name itself sometimes giving unmistakable record of the original character of the site on which it was built, or preserving the memory of some incident connected therewith. We cannot altogether be indifferent to associations of this kind; and most of our readers will think that there could scarcely be anything less interesting than to have all towns laid out like New York, in parallels and rectangles, distinguished by numerals in a regular series. The best, and perhaps the only method of dealing with our existing overcrowded and labyrinthine centres of habitation, is to embrace every opportunity of clearing through their dense masses straight lines of wide thoroughfare which will serve not only as conductors of traffic, but in some degree of air and ventilation to the narrow courts and lanes past which they may run; conductors, also, perhaps, it may be said, of civilisation, from the refined to the more heightened districts, which may thus be brought into better knowledge of each other, to the advantage (possibly) of both sides.

And in building such new streets, and in the constant pullings down and re-edifications that go on in old ones, what can we do to give them something of architectural expression and effect, to obviate their degeneration into so many furrows or miles of brick? There are involved in this question considerations of material, of design, and also what may be called the semi-legal question as to how far the owner of each strip of property is to have the option of doing exactly what is right in his own eyes, without regard to general effect or to the design of the contiguous front on each hand. This latter question, indeed, touches on the first principles which are at the ground of street architecture. Should a long array of houses be grouped into one design, or should we openly accept the fact that every man's house is his castle, the abode of his own peculiar Pecunia, and so let our streets appear simply as the agglomeration of a multitude of individual residences, having no connexion with each other except by accidental contiguity of site? The admirers of the wild disorderly picturesque of the gabled North German streets will stand up for the latter principle, as involving not only absolute truth of expression, but variety of sky-line. It is one thing, however, to admire the natural growth of this picturesque outline; it is quite another thing to set to work deliberately to be picturesque, "of malice aforethought." Moreover, this same skyline is not attained without a considerable waste of material and space in the roof, besides the loss of light and air which would certainly result were all our streets roofed in the fashion which has become prevalent in so many new buildings, especially of the hotel class. That which can truly be termed "architectural" effect is to be obtained rather by the regular sequence and balance of parts than by irregular huddling together of perhaps incongruous designs. Not that we would, on any account, recommend a system of formal unity of treatment along a whole line of street. This could not fail to be monotonous; but, when we have heard complaints made, as we sometimes have, of the odium of despotism told by the regularity and unity of some of the Parisian streets, it has seemed to us that a little enlightened despotism in such matters here might not be altogether amiss. The aspect even of our common streets is rendered worse than it might be by the independent manner in which owners go to work in rebuilding and painting or cementing; leaving us, here a strip of brick, there a strip of cement new and white, there another strip old and dirty, and another of a different tint, and so on; and in those streets where rebuilding goes on in more ornate and architectural forms, the singular and defiant opposition of character and design in adjoining fronts often seems almost the result of a deliberate feud between the respective architects or their clients. It might surely be possible, without tying yourself to follow the style of your neighbour's building altogether, at least to give some consideration to making the principal heights and lines of the fronts correspond in some degree, to effect something like an

artistic function between the designs of the two properties, instead of carrying over the face of your own elevation strongly-marked strings and cornices wherever there are none on the adjoining building, and emphasising the divisions between the properties by outlining the mouldings off square at the end. These remarks would of course apply mainly to streets of shops and other buildings which are diverse in their objects and require to a great variety of treatment. But between the Scylla of howideneing variety and the Charybdis of dull monotonous uniformity there scarcely seems to be any middle course recognised, so far as street architecture is concerned. Some degree of judicious official supervision of the design, as well as the construction, of the buildings which line our streets, might perhaps avail to counteract the extreme of either evil, that of having no street architecture at all, or of having what may be called street architecture run wild. It might be possible to compel uniformity in the main features of buildings through a certain extent of street, without too despotically interfering in details; to demand continuity of main cornice lines, for instance, and a certain balance in the respective heights of buildings, so as to give something of the general appearance of design to a street, leaving such matters as ornamental detail, spacing of windows, &c., to individual taste. Conversely, the riles of builders at whose bidding spring up miles of brick screens pierced with square holes, without break or variation, might be compelled either to employ an architect to arrange their rows of dwellings with a little attention to grouping and variety of effect, or to submit to the attentions and directions on this head of an official supervising architect. We know, of course, how dangerous a thing is hueracratic intervention in matters of art generally; but it is clear that nothing can be worse, nothing more un-architectural, than the majority of our street buildings at present, and it is difficult to imagine any change in the present system which would not in all probability be a change for the better.

The question as to the degree of variation of design desirable in a row of street dwelling-houses, without going to the extent of producing a motley variety, has not been paid much attention to. Even when an architect takes the trouble to design a terrace, it seems to be practically admitted that each house should be a fac-simile of its neighbour; a slight variation, perhaps, being made in the end houses of the block. This is scarcely a necessary rule, however, and we fully think that a man should know his house by some other means than by merely remembering that it is No. 5 or No. 7 in the row; it should have an individuality, a character of its own. It is possible to attain this without sacrificing general uniformity of aspect. A few slight breaks in the line of frontage, a variation in the form of window-heads, or in the spacing of the windows, a diversity in small ornamental details, sufficient to be evident on close inspection, without appearing in violent contrast when viewed *en masse*; by such devices it may be quite possible to attain variety of expression in each residence without interfering with the combined architectural effect of the whole. A more difficult question, perhaps, is how to give anything that can be termed architectural effect to the more ordinary of our streets, flanked by houses of a necessarily low or moderate rental. It is possible, however, even here to give at least the expression of solidity and durability, in contradistinction to that miserable appearance of weakness and meanness which has been so grotesquely commented upon by Mr. Garbett in some parts of his little work on the "Principles of Design." The mere change from a 4½-in. to a 9-in. reveal in the windows would do a great deal; the abolition of such bastard construction as the flat arch in brickwork, the renouncing of sham Greek columns and architraves from before our front doors, and the substitution of even a plain brick opening with a little characteristic treatment in moulded brickwork, would do a good deal more. The abolition of parapet walls (constructive absurdities in theory and, on brick walls of ordinary thickness, worse than absurd in practice), and of the wretched pieces of cradling which are hung on to street houses and called "cornices," is a thing devoutly to be wished; and perhaps nothing would more tend to give something like a solid and satisfactory character to our street houses than the employment of a genuine, honest cornice either (if of stone) to form the eaves gutter, or of brick corbeling or oak to carry an iron gutter. There

is much to be done, too, with regard to the architectural treatment of shops: we have at present for the most part only arrived at making them stand on plate-glass; and it is to be feared that this flimsy system of building so as to make the greatest possible show of the goods on the ground story without providing any apparent foundation for the superstructure, is only too truthful and suitable an exponent of the spirit of show and plausible profession and competition which is so characteristic of modern trade. When shopkeepers come to think that it is more respectable and dignified to succeed by dint of thorough honesty and fair dealing, and by respectable connexion and reputation, than by outvying each other in dazzling shows behind plate-glass windows, and between multiplying mirrors, we may have a more honest and solid style of shop architecture, in which the ground story might be a remarkable and characteristic feature, capable of great variety of treatment in a thoroughly architectural manner, instead of being merely an expanse of plate-glass. In designing street buildings of a more ornamental and architectural character, the oversight seems to be constantly committed of not taking into consideration the width of the street in which they are to stand, and the consequent distance from which they are likely to be viewed. Designs are made sometimes with story upon story of ornamental features, crowned by a projecting cornice of 3 ft. or so, which look very well in a drawing, but which are usually to be built in some street so narrow that only the ground floor comes within the immediate notice of passers by, while the cornice shuts out a great deal of the scanty light from the windows below. A building to stand in a narrow street should be designed accordingly; the ornament should be mostly in the lower story, where it can be seen, not (as is sometimes the case) all crowded up near the cornice, for the benefit of an occasional workman repairing slates on the opposite roof; and projections should be reduced to a minimum. It may be said, indeed, that the consideration of the design of a building with reference to all the circumstances of its site, so as to render it as effective as possible in those circumstances, to avoid throwing away work which will not be seen, and to turn even what may at first sight seem disadvantages of site into a source or suggestion of novelty of treatment, is a matter more important than is commonly acknowledged in practice; the neglect of it being, perhaps, often fostered by the habit of getting up competition drawings, where the only object is to make as much show as possible, independent of all possibilities or impossibilities as to the realisation of the effect depicted. And we would have no architect, however gifted and successful, think it beneath him to give every consideration, when he has the opportunity, even to so commonplace a commission as one for ordinary street houses. Bits of pleasing effect in detail and general treatment may with care be realised even in very plain work, and make all the difference between an architect's treatment (however simple) of a street front and a builder's ill-treatment of the same. And street architecture is its richer and more ornate forms, when treated in large masses with true architectural feeling, has sources of effect in its long perspective which can hardly be realised otherwise. Were the buildings forming Regent's-quadrant, for instance, of a higher and more architectural class, and so treated as to make the most of the long curvilinear perspective, there might be few things in the shape of town architecture more effective or better worth seeing.

PUBLIC STATUTES.

SOME judicious remarks by Professor Donaldson, which appeared in the *Builder*, on Public Statutes and Sculpture, have excited much attention, and they seem to offer an opportunity for discussing a question of no small importance to art, and it should be, of no slight interest to the public. I would, therefore, ask permission to endeavour to improve the occasion opened by the letter of your intelligent correspondent, and, as shortly as possible, express my views as to what appear to be the prominent causes of the unsatisfactory state of things referred to in that paper. The question is a much larger one than at first appears, and deserves to be treated extensively. It is not my intention to do so now: it will only be convenient, at this time, to touch upon one or two points which have a special application to the subject.

It seems to be assumed, in the first place, that, with exceptions, "few and far between," our public statues are not works of art of which the country has much reason to be proud; and, secondly, that they are not, as a rule, the productions of sculptors who are believed to be the most competent, and, therefore, who would be the most likely to do any work intrusted to them satisfactorily. Here are two distinct propositions, yet they are by no means altogether unconnected in their relations to each other. It is not necessary that they should be discussed by themselves. It will be better to consider the subject generally than in its parts, and thus to avoid all reference to particular or individual merit.

In order to limit the present inquiry to an examination of the causes that affect the more satisfactory progress of art in this country, it may be useful to consider what is the class or character of sculpture which receives the greatest amount of support and patronage in England; and what are the means usually taken to procure works from artists. There can be no doubt that Portrait is the most popular exercise of the sculptor's art at the present time, and the class for which there is the most frequent demand among us; and, possibly, we may here find the whole secret of the inferior character of this art, which is, by some critics, said to prevail. An unprejudiced examination of the peculiar conditions attending this exercise of sculpture will supply abundant reasons for works of this class not being of a very high art-quality, even under the most favourable circumstances. But, practised as it is, ordinarily, in these days, it would not be difficult to show that the artist's best efforts never can rise to any very remarkable degree of excellence. We derive our knowledge of sculpture, as a fine art, from the traditions and examples that have reached us of the greatest masters of Greece; and subsequent sculptors have been content to follow these as the noblest guides in their own practice. Now, it may be permitted to remind the reader that the practice of the ancient Greek sculptors was founded on the study—broad and comprehensive—of the most perfect examples of form, the normal beauty of nature being the standard which the artist essayed to reach. The universal, not the individual, type was the aim of his imitative power. Portrait was unknown in the time of the nobler Greek schools; its introduction was comparatively late in the history of Greek sculpture; and, as its principle was to substitute the particular or exceptional for the general, to represent the individual and not the class, the innovation had an almost immediate deteriorating effect upon art; and, as a necessary consequence, its decline soon followed—a decline from which sculpture has never recovered. It followed, of course, that for a lower class of art a lower class of artists sufficed. A profound knowledge of the human form, the study of beauty as an essential element in fine art, nobility of expression, an acquaintance with the mechanism and capability of action of the human figure, may be almost wholly dispensed with when a sculptor is called to represent little more, of nature, than a face, and that individualized into a personal likeness. The consequences are not far to seek. There have been, since the Greeks, sculptors of exceptional excellence. So there may indeed be room, in a portrait, for character, and for skillful composition; and, no doubt, according to the degree of ability in the sculptors, these qualities may be found more or less in public portrait statues. But, as a rule, where this standard is not, and never has been, a high one, namely, the representation of the greatest perfection of form, we must be prepared, in these times especially, to accept a lower grade of art excellence. The inferiority is not denied, but it has been attempted to be shown how it may, in a great measure, be accounted for.

There is, however, another phase of the subject, which may very properly be adverted to, although it must be done in a very few concluding words. It is not altogether or entirely owing to any natural inferiority in the modern sculptor that he exercises his art inadequately. The artist in these days usually has to live by his profession; and to do this he must produce what will please those from whom he has to look for his reward. The public, then, and the self-constituted arbiters of taste, judges of designs, in committees and competitions, must bear their part in the reflections that are so readily made on works, he it remembered, of their choosing, and on the shortcomings of public monuments they have selected for execution. If an artist

who has had some teaching and practice, however deficient, fails, how shall those who have had no teaching, no education whatever in the principles of art, but who, notwithstanding, unhesitatingly pronounce upon it, succeed in deciding what is good or what is bad? *Quis custodiet ipsos custodes?* If the art that is produced is inferior, are not the ignorance and the want of taste in the public to bear some part of the responsibility? If the patrons of art, for want of refinement and of education in its principles, are incompetent to judge of better things, and are satisfied with commonplace, why should the artists, even if competent, be expected to provide what would neither be understood nor appreciated? The fact is, speaking generally, the art-tone of the country is a low one; and this, of course, in spite of some few exceptions, acts upon the producers of art.

But it is time to close. This is a part of the subject that requires delicate handling, and much more consideration than can now be given it.

RICH. WESTMACOTT.

THE DISTRIBUTION AND AGRICULTURAL USE OF TOWN SEWAGE.*

I HAVE been asked to re-open the adjourned discussion on the utilisation of town sewage, by furnishing a short account of some of our successes and some of our disappointments at Barking during the past season. And to this I will add such general observations as further experience has enabled me to make.

I will commence with my disappointments, or rather with a few of them, because, as they belong to the order of mischances termed by the Registrar-General "preventable," were I to finish with them I should leave an erroneous impression on your minds.

With regard, then, to the best known sewage crop, namely, Italian rye grass, I stated in the spring that, under proper cultivation, ten crops, averaging nine or ten tons each per acre, would always be obtained in one season by the application of a sufficient quantity of sewage, if the grass were sown at the right time of the year; namely, in the month of August. This statement I repeat now, and further experience has only confirmed me in this view; yet I am sorry to say that in actual production I can only bring you one ton nearer the promised hundred than before. On my own land I have, as yet, no rye grass under sewage, but on the Metropolitan Sewage Company's farm one piece of ground has been sown in the month which I had so frequently recommended, and I was in great hopes, even although it had been somewhat starved in the winter, yet that it would have been efficiently liberally dealt with during the growing season to have given a result approaching, at all events, to the standard of 100 tons. If you consider that it is now upwards of eight years since I first began to labour towards the utilisation of the sewage of London, you will better understand the disappointment that it was to me on finding that when there seemed at last to be a chance of a fair experiment, this chance should have been thrown away, and the desired result postponed until the end of the ninth or perhaps tenth year. I say, or perhaps tenth year, because, as I shall presently explain, it is now fortunately in my power to make reliable quantitative experiments, independently of the Metropolitan Sewage Company, who have for so long stopped the way. But as a full result can only be looked for from grass sown in the month of August, I cannot obtain that full result next year. I must wait for the year following, which will be the tenth of my labours. Let us hope that there may be something lucky and auspicious in that figure, and that the tenth crop of grass cut at the close of the tenth year of work will complete the last 10 tons required to make up the promised 100.

I have to record another disappointment, with regard to maize. I had, and still have, great hopes of this as the cereal pre-eminently adapted to utilise large quantities of sewage, and to yield maximum quantities of food per acre, whether for man or beast. I stated that so forcing was the effect of liquid food upon this crop, that I had every expectation that I should be able to ripen it in any year in the climate of Essex, because the growth of the plant in its early stages would be so hastened that it would

be able to avail itself, for ripening, of the heat which we always have in August and September. This expectation I still entertain, but with one modification, and that is, that to guard against the effect of a cold spring followed by a cold early summer, such as we had this year, it is absolutely essential that the seed should be sown in an open porous soil; so that when the sun does come, it may penetrate and warm the soil and roots of the plants in the shortest possible time. The soil in which I ripened the maize last year, and in which I have failed to ripen it this year, was a cold dense brick-earth, which was never thoroughly warmed this year at all. The 3 in. a day, or one-eighth of an inch an hour, as Mr. Bramwell forcibly put it, which the sewage enabled the Indian corn to grow last year for a month continuously, was never attained this year for a single day. No sooner had it struggled above the surface of the stiff earth than the cold north winds in June nipped it, and, in fact, it was frost-killed; so much so, that down to the middle of July it was completely white and blanched like celery or sea-kale, and appeared to be all but dead. However, having entire confidence in the stimulating powers of sewage, I then commenced applying it with an obstinacy in proportion to the strength of the previous north wind, and the result was that the colour rapidly reappeared; towards the end of July it began to grow; and, at last, in the middle of October, it attained the proportions you see in this plant, the cobs being about two-thirds formed.

Among the successes of the season, either at the Lodge Farm or on my own ground, may be mentioned the following:—

A crop of wheat on 4½ acres, the land being a poor gravel, and the crop being the third crop of wheat in succession, gave just under 4 quarters to the acre of grain, weighing 61 pounds to the bushel, from an application of about 700 tons of sewage per acre; however, in the judgment of Professor Voelcker as well as in my own, this crop was starved and mismanaged at a critical period of its growth.

Two acres of oats, following two successive white crops, with green catch crops in between, received, on a poor yellow gravel, some 600 tons of sewage per acre, and yielded 10½ quarters of grain to the acre, weighing 41 pounds to the bushel.

Six acres of barley, following two successive white crops, on a poor gravel, and said to have received rather more sewage, yielded 4 quarters and two-thirds to the acre, weighing 52 pounds to the bushel.

An acre of beans received 800 tons of sewage, and yielded 5 quarters of grain.

Four acres, one rood, and twelve poles of mangold received a more uncertain quantity of sewage, and produced altogether 201 tons of roots, or not far short of 50 tons per acre; but this was starved for many weeks together.

Three rods, ten poles of potatoes realised nearly 26l. in the Borough Market; the quantity of sewage uncertain.

An acre of carrots, which received about 1,000 tons of sewage, realised 36l. 10s.

An acre and three-quarters of onions, which received one light dressing and two heavy ones, sold for 80l. 12s. 11d., or about 46l. an acre.

An acre of sugar beetroot, grown experimentally according to the directions, as regards distance apart between the roots, of some eminent Belgian sugar manufacturers, yielded 22½ tons from the application of about 1,000 tons of sewage; but the seed was not very good, and the amount of top was enormous, and out of all proportion to the roots, partly, as Mr. Duncanson believes, owing to the inferior seed, and partly, I have no doubt, owing to their being too close together.

For the future I shall be able to record accurate quantitative experiments in the application of town sewage. This is because I have recently taken a lease of another farm about three miles farther from London, together with a lease of the sewage of the town of Romford. I am informed that Romford contains a population of about 8,000, of whom 6,000 or 6,500 are believed to be "sewered," as the phrase is, at the present time. However, correct information will be obtained in the course of the coming year as to the actual amount of population drained by the sewers.

The farm consists of about 120 acres, of which the greater part is a light sandy and gravelly loam, admirably adapted for sewage irrigation; but, in itself, exceedingly poor land. For the land, with commodious buildings, I pay a rent of

* From a paper by Mr. William Hope, read at the ordinary general meeting of the Institution of Surveyors, 12, Great George-street, on November 22, 1869; Mr. John Clutton, president, in the chair.

300l. a year. For the sewage, delivered upon the farm, I pay a rent which is, I believe, the largest dead rent paid for the sewage of any town, no matter what the population, up to the present time, namely, 600l. a year. For instance, the Local Board of Croydon only gets about 300l. a year, or half of what I pay, for the sewage of a population nearly seven times as great as that at present drained by the Romford sewers. Nevertheless, I believe that I have got an exceedingly good bargain, as I have got the sewage for something like 2s. per head of the present population. It is my intention, so soon as I have got the land laid out, and ready for the proper distribution of the sewage, and so soon as I can procure a self-recording meter which will not become clogged with the dirt of the sewage, to commence a series of quantitative experiments, of which a correct and rigid account shall be kept for the benefit of the public.

I desire to state my very strong conviction that every surveyor or farmer laying out land for sewage irrigation, ought to stir the subsoil and break through the hard pan formed by centuries of shallow cultivation; in order, first, to prevent water stagnating and becoming sour and rotting the roots of the crops; and, secondly, to permit of the roots of rapidly growing plants penetrating as deeply into the soil and with as great facility as possible. The ordinary subsoil plough, or any variety of it, I look upon as very objectionable, because the long base or sledge grinds along on the lower subsoil, and hardens and polishes it, or puddles it, as the case may be, and moreover it makes one deep score or rut, and that is all. I have accordingly, during the past year, made several experiments in order to produce what I may term a subsoil stirrer; that is, an implement which should effectually break through the hard pan, and loosen and move the subsoil without turning it up, following the plough after the fashion of an ordinary subsoil plough; and my final pattern is, I think, as nearly perfect for the purpose as possible. It is exceedingly simple, very light, and very strong, being in the nature of a cultivator, or grubber, and not of a plough.

There is no sledge to produce the harmful effect upon the subsoil above described, but the "lines" or "fingers" tear the ground up and leave it loose and rough at the bottom. One of the difficulties to be encountered was the necessity to have, for any description of grubber following a plough, a wheel in front to regulate the depth of cultivation, and it was manifest that a wheel could not revolve in a loose furrow without becoming hopelessly clogged; so I devised the simple wheel that you see here, having no spokes, but a solid or flush side, with an axle protruding beyond the other edge, and having a shoulder upon the axle, which fits inside a sort of rectangular cup, which is then bolted to the inside of the other and solid side of the wheel. The wheel then goes in the furrow after the ordinary plough, and the flush side being turned next the perpendicular side of the furrow, prevents the earth, no matter how loose the top soil may be, from crumbling in and clogging up the wheel. With this implement, and three horses, following the ordinary plough, I can cultivate from 18 in. to 20 in. deep with the greatest ease, even where the subsoil is a hard pan of gravel resembling concrete; and I look upon this implement, or one of a similar character, as essential upon a sewage farm where steam power is not regularly employed. In my experiments with it, I was very ably and kindly assisted by Mr. Wedlake, of Hornchurch, who devoted an amount of personal attention to it which few manufacturers would have given to so small an affair.

For the distribution of the sewage over the farm, wherever to obtain a sufficient fall a height has to be given to the carrier of over 30 in., I am making use of the description of sheet-iron trough which I alluded to in my former Paper, with a slight improvement. In addition to the prolongation of the sides, to give vertical stiffness, and so to admit of a greater distance between the supports, the top of the sides will be turned over as a flange, to give lateral strength. The sides will further be tied together every 3 ft. by iron straps. The supports will be cut out of yellow deals, and will consist of a pair of uprights to take the sides of the trough, with a cross-piece to take the bottom of the trough. The uprights will spread slightly towards the base, and will be mortised into a sleeper placed about 1 ft. below the surface. There will be openings at every 30 ft., with a simple water-tight valve and down pipe, and a shutter in the

main trough, by which the further flow of the sewage can be regulated or stopped altogether at pleasure. The sectional area of the main trough will be equal to that of an 18-in. pipe; and the contract price of the trough with supports and shutters, with two coats of paint, fixed in position, ready for work, is 6s. 8d. per yard forward, with an extra 5s. for each opening with valve and down-pipe, making a total, including these openings, of 7s. 2d. per yard forward, which is a triumph of economy. The contractor is Mr. Edwin Maw, the well-known manufacturer of sugar and gas machinery. The simple water-tight valve to which I have alluded is his invention, and is so ingenious that a short description of it may be useful. A circular opening having been made in the side of the trough, a light iron casting is riveted to the edges. This casting is in the nature of a three-way piece, and in form resembles the little cistern at the head of a common rain-water down-pipe on the side of a house, except that from one side projects the third way, so to say, which is the part that is riveted to the edges of the opening in the side of the trough. The bottom of this casting fits and delivers into the down-pipe, and is slightly conical, and the water-tight valve is simply a wooden plug which jams into the conical part, a pin with bores at the top keeping it either partially or wholly open. These openings discharge 200 gallons a minute; and those who have had to deal with water, and know the difficulty and cost of making water-tight valves or sluices, will the better appreciate the ingenuity which has enabled Mr. Maw to produce so complete an opening, valve, and down-pipe, for the trifling sum of 5s.

My lease of the sewage of the town of Romford has given me some little insight into the general conditions in which the sewage of an ordinary country town is likely to be presented; and I find that the dilution is so much less than that of the sewage of London, that one of my first stipulations in treating for the sewage was, that the dilution should be largely increased; not because I believe that the strong black stuff which I saw on my first examination would have been too strong, chemically, for any crop to which it might have been applied, but because it deposited a black sediment, which, as it dried, formed a cake upon the surface of the ground, through which no seeds could have burst, and which must have greatly injured all young crops by stopping the healthy ventilation of the soil, and, possibly, even by mechanical pressure round the stems of the young plants. This pressure is an injurious action, which the sticky brick-earth of my experimental field at Parsloes exercised largely on my unfortunate young plants, struggling for existence in the cold north wind of June last. The wind dried up the surface, and formed a coating analogous to the black cake formed by the Romford sewage, and I observed many thousands of young plants, of all kinds, mechanically squeezed to death by this action. In fact, in sewage farming, where at least the supply of sewage is abundant, the only thing that has to be attended to is the physical condition of the soil. Its chemical condition may be totally disregarded, provided it does not contain matter actually poisonous to vegetation.

Having stated that I have endeavoured to tone down the Romford sewage to the same strength as that of London, I may mention one of the means that I have taken to do so, as it is a means that may often be in the powers of others to apply. It is simply draining all the upper part of the farm into the tank from which the sewage is pumped to the highest level. There, of course, is (or rather will be) the necessary arrangement for diverting the pure drainage water into the river, if and when it is not wanted, but, at other times, it will go back upon the land along with the fresh sewage coming down.

I should here remark that, from a farmer's point of view, the dilution of the sewage of a town should, if possible, be not less than twenty-five to thirty gallons of liquid per head of the population.

I am continually asked what I propose to do with so large a volume of liquid in the winter months. I answer there is no difficulty whatever in disposing of it. Winter is the time when the greater part of the farm-yard manure all over the country is applied, and instead of carting heavy loads of solid manure, with struggling horses, over muddy roads and sticky fields, it is simpler and cheaper to open a few sluices, and put in a few stops, and let the manure distribute itself. This necessitates good drainage, that is all.

BRISTOL THOROUGHFARES.

On Monday the Mayor of Bristol is to open one of the new roadways now being formed at great cost by the city. It is called the Deanery-road, and forms an easy route to Clifton, viz Jacob's Wells and Berkeley-place; also to the Howells, viz St. George's-road and Hotwell-road; thus avoiding the ascent or descent of Cow-street and Park-street.

The new road commences on the south side of College-green, at the west end, near the Norman archway leading to the Lower-green, and passes in nearly a direct line over the site of the old Deanery premises and garden, which circumstance has suggested the future name of the road. It is then carried on an embankment sustained by retaining walls to Lamb-street, which is spanned by a girder bridge; a short length of embankment then carries the road to College-street, which it crosses exactly at the intersection of that street with Brandon-street, the road being here carried by another, but much more extensive, girder bridge, and from thence to its junction with St. George's-road on an embankment 20 ft. high. The principal works in the roadway have been the construction of the two bridges, especially that spanning the intersection of College-street and Brandon-street, crossing each at an angle of 45 degrees, which the *Daily Post* describes as a novelty in engineering. The two outside girders are each upwards of 100 ft. in length, to which are riveted transverse girders carrying Mallett's patent buckled plates, which support the roadway; the footways on either side are carried on cast-iron cantilevers fastened to the main girders, and finished with ornamental cornice and balustrade.

The whole length of the new road is about 700 ft., and the width 50 ft., including footways 9 ft. wide on each side, and it is of an easy gradient throughout, the highest point being at Lamb-street Bridge. The carriage-way over the two bridges is composed of "rock asphalt" from the Val de Travers, in Switzerland, laid by Messrs. Callender & Amos, of London, the English agents for the Société des Asphaltes de Paris. This material has been extensively used in Paris for some years in the best thoroughfares, but this is only the second instance of its adaptation in this country, the first being in Threadneedle-street, London. We must express a hope that some improvement has been effected in the surface of it over that in London, which affords no foothold and is very dangerous.

The actual cost of the foregoing works of construction has been 6,700l., to which must be added the amount for the purchase of the several properties. The whole of the works have been executed in about fourteen months by the following contractors:—The masonry of the bridges and retaining walls by Mr. W. Baker, of Canon's-mare, Bristol; the wrought-iron work of the bridges by Messrs. Lloyd, Foster, & Co.; and the cast-iron work by Messrs. Trow & Sons, both of Wednesday.

The works have been carried out by order of the Streets Improvement Committee of the Local Board of Health, of which Mr. John Perry is chairman; Mr. Alderman Proctor, sheriff, vice-chairman; and Mr. J. G. Heaven, clerk. The several properties required have been purchased, at a cost of 13,703l., by Messrs. R. S. Pope, S. C. Frupp, and Josiah Thomas, district surveyors to the corporation. The engineering works of the roadway have been designed and carried out under the direction of Mr. Frederick Ashmead, engineer and surveyor to the Local Board; Mr. F. H. Yabbion, assistant engineer; and Mr. Henry Jones, clerk of the works.

Sheffield Architectural Society.

— On Monday last the annual general meeting of this society was held in the School of Art. The Rev. J. Stacey, president, occupied the chair. Mr. Fawcett, one of the secretaries, read the report of the committee, which congratulated the members on the continued and increasing prosperity of the society. Mr. J. D. Leader, the treasurer, presented a statement of accounts, which showed that the society had funds in hand to meet all anticipated demands, although there were a number of subscriptions still in arrear. The *Conversation* of the society, which is to be held on the 1st of December, and for which the Corporation of London has granted the loan of its curious collection of ancient cutlery, promises to be a very interesting gathering.

THE DRAINAGE OF HITCHIN.

A LARGELY attended public meeting has been held in the Town-hall, Hitchin, to consider the question of the condition of the sewerage in the town of Hitchin, and to hear an address on the subject by Mr. J. Bailey Denton, of Stevenage, the well-known hydraulic engineer and surveyor. Mr. John Hawkins occupied the chair.

Mr. Bailey Denton commenced by tracing the history of the sewerage of the town during the last twenty years, giving the state of the health of Hitchin before and after the adoption of the Public Health Act, and quoting statistics to show what certainly is not the case in numerous other instances, that the number of deaths, having due regard to the increase of population, had not been decreased to any noticeable extent by the adoption of the present system of drainage.

The state of the sewers in the town at present it was commented on as not being satisfactory, and this may help to account for the statistics. Mr. Denton pointed out some of the parts of the town which were most affected by the inefficient state of the pipes. After expressing his surprise that the surveyor who managed the laying down of the pipes should have allowed them to pass under, and, in some places, just above the bed of the river (though doubtless he was led to place them so from reasons which he (Mr. Denton) did not know), the speaker proceeded to explain a special scheme for depositing and utilising the sewage in the soil instead of carrying it into the river. He mentioned a piece of ground lying between Hyde and Grove Mills, in the hamlet of Walsworth, which, he said, would be exactly suited for the purpose, though open to the objection of being within a mile of the town. By proper management of the pipes, Mr. Denton argued that 90 or 100 acres of land would not only act as a sufficient bed to take in the sewage, but would yield a large profit to the town, if so used. He quoted as instances the large number of towns in England in which, under the system he advocated, large pecuniary as well as other profit was obtained, and he reckoned that, in the case of Hitchin, if the townpeople acted as their own sewage farmers, a profit of 600*l.* a year might be made, if the ground were let to a sewage farmer for 300*l.* a year, and if they contracted with a private person who would pay them for the benefit of the sewage 150*l.* a year. He also advised the buying of Grove Mill, and using the water-power as a means of raising the sewage to the level of the land.

THE SAXON CHURCH IN WORTH, SUSSEX.

As my former letters on the "restoration" (?) of the above church appeared originally in the *Builder*, I think it only right to continue the discussion through the same channel, if you will allow me to do so.

By accident, I omitted seeing the following letter in the *Sussex Express* for November 13th until too late to reply to it in your current number:—

"Worth.—The Church Restoration.—We are glad to find that the letter in our last Tuesday's paper has elicited the following satisfactory reply:—

"Worth, Sussex, November 10th, 1869.
Sir,—Having in your last number expressly called the attention of your readers to some remarks of a Sussex correspondent on the subject of Worth Church Restoration, you will, I am sure, be glad to receive some intelligence from persons belonging to the parish, and more or less responsible for what is being done. I shall not attempt to go into the past history of our very ancient and venerable church,—it being sufficiently agreed on all hands, that it dates from the Anglo-Saxon period. Unmistakable proofs of this exist, in the form of the arches, in the massive rough-hewn shapes of the stones which form the capitals and impostes, in the singular structure of the long and short work (as it is technically called), in the bold rough footing to the walls all round, marking perfectly the original cruciform shape of the building. It would be well if we could say more. But past ideas of restoration, strange to say, seem altogether to have disregarded the principle of architectural uniformity, and to have been contented to bury under relentless heaps of plaster and whitewash some of the most interesting features of the original building; and, before the work of thorough restoration, which is now being attempted, was begun, not a window remained that was at all in character with the original design; while all proper lighting of the church, strange to say, seem altogether to have been regarded as the eastern end was rendered impossible by the erection of some four or five huge buttresses of solid masonry, which were deemed necessary for the support of the chancel walls. A comparatively modern belfry occupied the entire of one transept, to the exclusion of a large portion of the congregation; and was supported on timbers called "trees," because the walls themselves were never intended to support such an appendage. The interior was further defaced by the erection of a modern gallery, running the whole length of the nave on the north side of it; which, however suited to accommodate more persons

in the church, was a sad disfigurement to the ancient proportions of the building.

It became at last a question, not of "keeping the old church intact" (which would have been simply impossible, without undoing everything that had been recently done), but of keeping the old fabric from utter demolition and decay; and up to the present time, as the work of examination (chiefly by removing the comparatively modern coating of plaster) has proceeded, the dangerous condition of the walls has been more and more exhibited, and, to our great satisfaction, many of the ancient windows brought to light. We cannot but rejoice that the evil has been detected in time, and that without destroying the old walls we shall be able to point them afresh, and to restore to them something of the harmony of the original windows by which they were pierced. I think I may assure your correspondent, and all who take an interest in the subject, that the inhabitants of Worth parish cherish the old church far too deeply to countenance any scheme which, under the name of restoration, might have exposed it to "ruin."—I am, Sir, your obedient servant,
A MEMBER OF THE COMMITTEE FOR THE RESTORATION OF WORTH CHURCH."

It is a very calm, gentlemanly letter; but, as you see, does not venture to touch the main charge, that "the chancel has vanished clean away." If removing the supporting buttresses, which, as you said last week, "had been built up at the east end by more recent bands," and thus allowing the chancel to slip down, be called "keeping the old fabric from demolition," and "without destroying the old walls," words certainly must convey a very different meaning to the "Member of the Committee" than they do to myself. I beg your readers to peruse your notes, under date November 13th, headed "Outrage at Worth Church," and then ask themselves if the editor of the *Sussex Express* has any cause to say, "We are glad to find that the letter in our last Tuesday's paper has elicited the following satisfactory (?) reply."

A SUSSEX CORRESPONDENT.

** Our correspondent treats the writer of this letter with too much consideration; it may be "a very calm," but it certainly is not a "gentlemanly letter," because it is untruthful,—untruthful by suppression. A more jesuitical statement was never penned. Who could possibly suppose that "the bold rough footing to the walls all round" no longer marks "perfectly the original cruciform shape of the building;" that "the curious apex at the east end," to which he refers with an affectation of interest, had been ruthlessly swept away; that instead of keeping the old fabric from demolition and repairing "without destroying the old walls," they had positively cleared away the whole of the chancel! A more flagrant attempt to deceive was never made.

British Archaeological Association.—At the first ordinary meeting of the season, held November 24, the subject of the restoration of Worth Church, Sussex, was again under consideration. In January last the council had directed a protest against unnecessary interference with the structure, to be sent to the building committee; and their secretary, Mr. E. Roberts, reported the steps he had taken, down to the present time. It is to be lamented that an irreparable mischief has been done in the total destruction of the chancel, so that the church has now lost the characteristic it possessed of being a singularly perfect Anglo-Saxon structure. In the face of the contradictory reports which have appeared in the *Builder* on the one hand, and the local prints on the other, as to the extent of the mischief, it might have been hard to believe that so destructive an act had been committed; but the council were assured of the fact on the evidence of one of their body who had seen the chancel levelled to the ground, and its foundations uprooted. A letter in justification of the act, from the Rev. G. Banks, was read, which declared that the destruction was approved by Archbishop Otter, and under the complete sanction of the architect, Mr. Salvin. The attention of the council was called to a singular letter of justification, published on Saturday last, by "A Member of the Committee for the Restoration of Worth Church," in which the writer plainly relates his story of the doings of the committee, and misleads by entirely concealing the fact that the chancel has been destroyed. "We cannot but rejoice," he says, "that the evil has been detected in time, and that without destroying the old walls, we shall be able to point them afresh, and to restore to them something of the harmony of the original windows by which they were pierced." The council could only express their deep regret that their remonstrances, with those of the Society of Antiquaries, had been so ineffectual in this case. The Rev. Mr. Banks sent to Mr. Roberts a sketch of one of the early windows now just discovered in the nave of the church.

THE ROYAL THEATRE AND WINTER GARDEN, LEICESTER-SQUARE.

SOME incorrect allusions to this undertaking having appeared, our readers may be glad to know exactly what is the state of the case.

A company has been formed with the object of purchasing the freehold known as Saville House, situated on the north side of Leicester-square, with the houses in Lisle-street abutting on the same: which has been done. The property comprises about half an acre of land, and has a total frontage of 149 ft. in Leicester-square, Lisle-street, and Leicester-place. Upon this site a large theatre, winter garden, and restaurant will be erected. It is proposed to be carried out in a very complete manner, in accordance with the design of the architect, Mr. E. C. Robins, of Southampton-street, Strand.

The auditorium will enable about 6,000 people to see and hear dramatic and lyric performances and grand spectacular effects, which will be represented on a stage 10 ft. deeper than that of Drury Lane Theatre, and fitted with the most recent appliances.

Separate staircases will be provided for each of the four tiers, and numerous wide doors for free ingress and egress to them, and to the winter garden and promenade on the ground-floor, which will be stocked with plants and flowers, and adorned with fountains and statuary. The dress circles and private boxes are to be entered from Leicester-place.

Spacious saloons will be formed at the level of each tier, and recesses for bazaars and refreshment-stalls.

Towards Leicester-square there is to be a restaurant, and billiard and mercantile club-rooms; and an open piazza will extend along the front towards Leicester-square, affording shelter for several hundred people.

MATTERS THEATRICAL.

The proposed New Opera House.—The stir in the public mind on the subject of a new opera-house, made evident by our announcement that money was ready for such an undertaking in one particular quarter, has continued to manifest itself during the past week. We have received letters recommending sites, recommending a conductor, recommending a mode of obtaining singers for the English department, and from two architects recommending themselves as designers of the fabric. We do not know any reason why we should not at once say that Mr. Gruneisen represents the gentleman who has the object in question in view. Above, we have mentioned an authority what one set of gentlemen intend doing in Leicester-square. By another body it is proposed, as we have already mentioned, to convert the great building of the Royal Colosseum, in the Regent's Park, into a grand opera-house, "the most spacious and magnificent in Europe, where the representations—operatic, dramatic, scenic, and scientific—will be on a scale of excellence and variety unsurpassed." They urge that a circle one mile and a half in diameter, struck from the Colosseum as a centre, includes the richest districts in the west and north-west of London, and a two-mile radius includes Belgravia; that all the approaches to the building are spacious and free from heavy traffic, and it can thus be reached without interruption; that the arrangement for the entrances to the opera-house are such that five carriages can set down at one time, which will prevent delay and exposure to cold to the visitors; and that the corridors of the boxes will be sufficiently spacious for picture galleries and sculpture enjoyable during the promenade in the *entracte*, and profitable by an income from their exhibition and sale on a percentage. They hint that a branch line 330 yards in length would connect the premises with the Portland-road Station of the Metropolitan Railway, and that the opera-house would thus be connected with every railway running out of London; and see an element of success for their venture in the contiguity of the principal station hotels to the Colosseum; the Great Western, North Western, Great Northern, and Charing-cross hotels being within ten minutes' drive of the building, the Grosvenor within a quarter of an hour, and the Langham within five minutes' walk. In Paris four opera-houses have long been established, viz., the Grand Opéra, the Opéra Italien, the Opéra Comique, and the Théâtre Lyrique. As the population of London exceeds that of Paris by

more than a million, the proposed new opera-house, say they, will surely not be thought one too many. In this proposition, Mr. Thomas Page, the engineer, is the chief mover.

Royal Italian Opera House, Covent Garden.—An excellent performance of Meyerbeer's "Robert le Diable," was given last week; the *Robert* of Signor Mingini, and the *Isabella* of Mlle. Emma de Marska, being especially good. The activity of the management is extraordinary. The "Nozze di Figaro," the "Sonnamhala," the "Flauto Magico," and the "Huguenots," succeeding each other without pause.

The *Lyceum* has been taken for a period of some length by the Messrs. Maitland, gentlemen heretofore known only amongst amateur actors. They contemplate, we are told, the novel expedient of a double company, French and English.

The Gallery of Illustration.—Mr. and Mrs. German Reed produced on Monday night a new operetta, written by Mr. W. S. Gilbert, the music composed by Mr. Frederick Clay, in which they were well supported by Mr. Arthur Cecil, a very promising singing actor, Miss Fanny Holland, and Mr. E. Connell. It was completely successful, and with good reason: the little plot is ingenious, and the music very agreeable. The scene, a Tudor gallery, in which the pictures become animated, is cleverly contrived by Mr. J. O'Connor. Mrs. Reed's old Scotchwoman is an admirable piece of acting. The esteemed managers of this place of amusement, to whom the public owe so much innocent enjoyment, are fast changing the character of their entertainment, and are probably laying the foundation of an English Opera Comique. "Cox and Box," with Mr. Sullivan's most charming music, still keeps its place in their bill.

A Belgravia Theatre.—A paragraph in the daily papers, afterwards partially contradicted, to the effect that a theatre was in course of erection near Sloane-square, Chelsea, sent us there on a voyage of discovery, to learn if the mania for theatre-building had really spread so far south-west. We found it to be so. The Ranelagh Presbyterian Church, situated in Lower George-street, and close to the station of the Metropolitan District Railway, is being converted into a theatre for Mr. H. Grant. The works are far advanced. It is a small affair, but there will be dress-boxes, four private boxes, two omnibus boxes, and six others in the proscenium, stalls, pit, and gallery. The house is estimated to be capable of holding from 900 to 1,000 persons. There is no contract, but the works are superintended by Mr. Smithers, late of Drury-lane; Mr. R. Blackmore, we were informed, being the architect. The dimensions of the building in the clear are 80 ft. long by 40 ft. broad, but 6 ft. are to be added to the length, which will make the stage 31 ft. deep. The decoration of the proscenium and ceiling is commenced: we presume, if the management did the undertaking succeeds, that something better will be attempted hereafter. The house is to be opened at Christmas. There is a sun-light by Pottford, of Shoreditch. The works, such as they are, have now been in hand six months.

MURAL PAINTING, UNIVERSITY HALL, GORDON-SQUARE.

THE late Mr. Henry Crabb Robinson, largely known and well esteemed, was one of the founders and endowers of University Hall. In memory of him, Mr. Edward Armitage, A.R.A., has painted one end and part of each side of the dining-room there, above the dado, with representations of his most distinguished friends, thirty-four in number, as gathered together in a sort of *conversazione*; and a very remarkable assemblage it is. Over the door, in the centre of the end, is a seated figure of Mr. Crabb Robinson. At the extreme left, and on the side of the room, is seen Mr. Barbanid in talk with Mr. Wakefield; Godwin, Hazlitt, Clarkson, and Walter Savage Landor stand by. Next come his German and French friends, including Wilhelm von Schlegel, M^{de}. de Stael, Herder, Goethe, and Schiller. On the other side of the door are Wordsworth, Southey, Blake, and Flaxman. Then comes Edward Irving; beneath, Samuel Rogers has taken his seat. On a sofa are Mary and Charles Lamb; near at hand Lady Byron is listening to the Rev. F. W. Robertson. Dr. Arnold, Talfourd, Bunsen, and others, are near. The figures are somewhat over life-size, and are painted in monochrome, white being used for the high lights. The background represents tapestry against the wall. When we say that

there is a want of elevation about the picture, and that it is somewhat "dowdy," so to speak, we have no intention of disparaging it, but of showing the system that has been worked on. The amount raised by subscription was very small comparatively (some 300*l.*, we hear), and Mr. Armitage in return has given them a work of very great interest, which will long attract visitors to University Hall. We shall be glad to find the example followed.

HOLBORN VALLEY IMPROVEMENT.

SIR,—After six years' incubation, Mr. Marrable appears in print to accuse me of having stolen and executed his plans for the Holborn Valley Improvement.

The facts which he misrepresents are these:—In 1863, in reply to the advertisement of the Corporation, I sent in plans marked "Test me well," accompanied by a sealed envelope enclosing my name, on the outside of which was written "Not to be opened until the Committee's selection is made."

These plans included a complete viaduct, the eastern and western approach streets with gradients of 1 in 45, the widening and raising Farringdon-road to a gradient of 1 in 45, the improving the gradient of the street to the Meat Market from 1 in 33 to 1 in 45, and prolonging Shoe-lane beneath the viaduct. The plans of other competitors may have included one or other of these; but none comprehended them in one design as mine did.

What passed in committee it is not for me to say; but, after opening my envelope, they requested me to withdraw my design from the competition for premiums, and give them assistance in classifying the other plans.

It is now no secret that the committee had already considered the plans marked "Test me well," the best amongst the small number that really met the first indispensable condition of raising Holborn Valley.

The premiums were awarded to Mr. Bell and to Mr. Sorby; but on this part of the committee's duty I was not consulted, and had nothing whatever to do with it.

Mr. Marrable states that I told him he was to be premiated. If I had known it, and told him, I should have committed a gross breach of trust; but I never told him anything of the kind, and have already, some years since, contradicted this assertion to Mr. Marrable himself. Moreover, he has held an appointment cognate to my own, and must know that it would be impossible for me to predicate what a numerous committee would do in the way of selection.

But this is not the only example of Mr. Marrable's defective memory: he says he never saw my design. It hung for more than a year, in 1863-4, in my office, and I have shown it to him myself.

On the 21st of November, 1863, an account of this design was given in your journal from the particulars which accompanied it when it was sent in anonymously, which design you, Mr. Editor, to the best of my belief, had personally examined at my office.

In the same month, in answer to a letter from Mr. Marrable, dated the 24th of November, he had an interview with the Corporation, and protested against his own defeat, and the award of the prizes to Messrs. Bell and Sorby; neither on that occasion, nor in any other public manner, did he venture upon the charge against me which he now makes.

As to the mysterious third plan of his, No. 81, I never heard of it before, and there is no record of it in the Corporation documents; the plan No. 81 was of an entirely different character, and by another person.

Mr. Marrable's name certainly headed the first list of selected designs, for the simple reason that the arrangement of the plans (made by the Corporation officers, and not by me) was a numerical one, and Mr. Marrable's number being 4, came naturally before Nos. 32 and 68.

As to my speech, I am not a self-possessed speaker, and the dinner was after an exciting day, and a fortnight of intense labour and anxiety previously. It is absurd to suppose that speaking in the presence of a body, the larger number of whom must have known the facts as well as myself, I should state anything not substantially true; but as a matter of fact my designs were selected as the best before any member of the Corporation knew that they were mine; and that is what I call gaining the work in competition.

In conclusion, I say that I never borrowed a thought or an idea from Mr. Marrable; that my competition plans were sent in when his were, and that I could not, therefore, have stolen them from him; that my plans are intact, and shall be publicly shown at the Royal Institute of British Architects, and I invite Mr. Marrable, if his original plans are intact also, to exhibit them likewise. I say that the plans now being executed by the Corporation are the same as my competition plans (with an additional line of street only to Ludgate-hill, determined upon years afterwards); that I should never have had this work had I not entered into competition with the others; and this, I again repeat, is what I call gaining the work in competition, and, as I hope and believe, honourably.

WILLIAM HAYWOOD.

** It may as well be mentioned that Mr. Marrable has brought this matter before the "Professional Practice Committee" of the Royal Institute of British Architects.

THE HISTORY OF THE HOLBORN VIADUCT COMPETITION.

SIR,—In your last issue Mr. Marrable comments upon Mr. Haywood's speech at the dinner given by the late Lord Mayor. I should not have taken notice of the matter had no public attention been thus called to circumstances in which I was also concerned.

Why Mr. Bell obtained a premium at all (and I do not see that any portion of his plan has been carried into execution), or why Mr. Marrable was left out in the cold, I never could quite understand; but, in asserting his claim to originality, Mr. Marrable must recollect that your columns, for months previous to November, last, sounded the rival claims of others still earlier in the field.

With regard to my share in the matter, I may state that the High Level road, as proposed in my plans, is, I believe, substantially the same as carried out, the new streets from Hatton-garden to the Meat Market, and from Saracen's Head-yard to Farringdon-road, are, I believe, as near as possible, as I proposed them.

My design contemplated spanning the Farringdon-road by a single arch of 90 ft., with a roadway of 27 ft. 6 in., and I entirely fail to see the advantage of the costly pier occupying most important space in the present roadway, utterly destroying the simplicity, dignity, and monumental character of the bridge, besides introducing a most needless element of difficult and uncertain construction.

I also provided, as executed, staircases at two corners of the bridge for communication between the high and low levels.

It is unfortunate that Mr. Haywood occupied the double position of competitor and adviser to the committee. I carefully examined Mr. Haywood's plan after the question was settled, and felt no doubt at the time that Mr. Haywood would have had a greater claim to the first or second premium than any other competitor, had his design not been withdrawn.

I set up no competitive claim for originality, but simply asserted, without fear of contradiction, that my plans (Mr. Haywood's being withdrawn) met the ascertained requirements of the case more completely than any other plans submitted.

THOS. CHAS. SOBRY.

THE HOLBORN VIADUCT.

SIR,—The architectural and engineering design of this viaduct is pleasing to every one that looks upon it; and, as we examine it, the more is one convinced of the thought, care, and pains that have been bestowed upon it by Mr. Haywood.

* * * * *

Permit me, Mr. Editor, to offer a few remarks upon granite columns in general. Perhaps some of those gentlemen who have passed their opinions upon the columns of the viaduct are not aware that most of the granite columns that are brought to London have a hole drilled through them from end to end. I cannot say if those at them from end to end, or not. If they are, a great portion of the strength of the columns is withdrawn by this hole running through them.

Columns in all cases should be solid in themselves. It will also be noticed in the columns that are brought to London, that the beds are generally rough and hollow. This should not be the case; they ought to be perfectly smooth and true, because, if the bed of each column is $\frac{1}{2}$ in. hollow, when the two are fixed together there will be $\frac{1}{2}$ in. space between them, and, as a natural consequence, the weight or pressure is at once withdrawn from the axis, and thrown to the outside of the column. In like manner, if the beds are rough, when the weight rests upon the column it will cut through the lead that is placed between the joints, and cause the two faces of granite to meet each other, and the pressure necessarily being greater on those points that are raised than on any other portion, it will burst or split the granite column,—and not only granite columns, but, in like manner, columns of any stone. For instance, some years ago, a large Portland column, 5 ft. diameter, was fixed at one of our public buildings; all the weight resting upon the centre portion of the beds or joints, they being round, caused it to split like a pane

of glass; and the same result would follow by the beds or joints being hollow, as mentioned above. The safe way, the proper way, and the only way, I will venture to say, in fixing granite columns, or any other columns that are required to support great weights, is to place between the joints, within 1½ in. from the outside of the column, a piece of lead, with the centre cut out, and to fill the whole of the inner portion with cement or fine mortar, so that when the upper portion of the column is lowered on to the bed, it will have an equal bearing throughout, provided the beds are worked true. The Ross of Mull granite is used for columns at the Prince Consort Memorial, which are fixed in the aforesaid manner, great care having been taken that the beds or joints were smooth and true (these columns were worked and polished on the ground). The pressure upon them is twenty-one tons on each superficial foot, thus bearing some thirteen tons more on the superficial foot than the columns at the Holborn Viaduct; and not one of these columns referred to shows any symptoms of splitting, notwithstanding the great weight they support. If all columns were fixed on this principle, we probably should be spared the pain of seeing such disastrous results as are too often witnessed. As regards the Ross of Mull granite, I will merely state that it may be classed among the finest in Europe; I have seen some of the beds running 20 ft. in height. It thus possesses advantages over most other granites by the mason generally being able to fix it on its natural bed.

WILLIAM CROSS.

SCHOOLS OF ART AND OF SCIENCE.

Thrapston Science Classes.—Thrapston has made a start in forming a science class. Several attempts have been made on former occasions to induce the young people of Thrapston to enter the lists of competition for the honours of the Science and Art Department, and Mr. Buckmaster came down to explain the action of the Department; but nothing but failure seems to have come of it. Now, however, a small beginning is made. A few schoolmasters of the East Midland Association have banded together, and these, with some of the more intelligent of the boys of the National School of Thrapston, form a fair class for a start. The subjects taught are Animal Physiology, Magnetism, and Electricity. They are all under the instruction of Mr. John J. Graves, of Landport, who has undertaken them at the invitation of the schoolmasters of the class; and the secretary of the committee is the Rev. J. P. Goodman, of Keystone, the Rev. J. Bagshaw being the chairman. These classes are open to any person, male or female, who may be disposed to join.

The Nottingham Mechanics' Institution Science Classes.—The prizes gained by the students in these classes have been distributed by the Rev. F. Morse, in the lecture-room of the Mechanics' Institution. There was not a very large attendance. Mr. Morse, on opening the meeting, observed that there seemed to be a progressive interest taken in the science classes in Nottingham. Last year the students of geology were 8, this year they were 13; last year the students of physical geography were 40, now they were 60; the students of physics last year were 30, this year they were 20, for they had lost a teacher to whom they were much attached. In magnetism last year there were 11 students, this year 25; in inorganic chemistry there were 38, and this year 30, making a total last year of 127, and this year of 148 students. With reference to the results, he found that in May, 1869, 61 students were examined in physiology; 5 passed in the advanced grade, and 11 in the elementary grade. Twenty students were examined in inorganic chemistry, three of whom passed in the advanced grade and four in the elementary; in physical geography 30 students were examined; 20 passed in the elementary stage, and Mr. Major, the teacher, took the first place in the examination in honours. In acoustics, light, and heat, three students were examined; three passed in the elementary stage. In magnetism and electricity 14 students were examined; three passed in the advanced and nine in the elementary grade. In geology 10 were examined; two passed in advanced and five in the elementary grade. Having referred to the advantage of a knowledge of scientific subjects, Mr. Morse went on to say that he thought many artisans had now sufficient time to study them. They did not leave work very late, and it must be interesting to attend a class. The prizes were then distributed.

Technical Education at Portsmouth.—An influentially-signed requisition was presented to the Mayor of Portsmouth, requesting him to convene a public meeting of the inhabitants, in the Guildhall, to hear an address from Mr. Buckmaster respecting the establishment of a school of science and art in the borough. The Mayor convened the meeting, and it was numerously and influentially attended. The Mayor presided, and on the platform were the Right Hon. W. Cowper, and other members of Parliament and other gentlemen. Mr. Buckmaster addressed the meeting at considerable length. After the address it was resolved:—"That it is desirable to establish a School of Science and Art for Portsmouth." Mr. Cowper, M.P., said it was a matter of astonishment and surprise that a town like Portsmouth, and a neighbouring town like Gosport, should have been so long without any school of the kind they proposed to establish. The large number of skilled workmen in the place made such a school a great industrial and educational necessity. Mr. Bonham Carter, M.P., and other gentlemen, having addressed the meeting, the hon. secretary (Mr. Holt) said a subscription-list had been opened, and amounts approaching to 100l. were promised in the room.

The Cardiff Science and Art Schools.—The report of Mr. James Bush, the headmaster of these schools, says:—

"The schools have been well attended during the year, especially during the winter months. The school of art still continues the source of chief attraction to pupils. Of course, with our present accommodation and large number of students, there are no vacancies for new pupils, though there are many applicants. . . . The number of prizes in the art school is less this year than last. Pupils generally join the class to learn freehand, model, crayon drawing, and similar subjects; and having passed in the first two, have no further examinations to undergo. Consequently they remain in the school, pursuing studies in which there are no examinations, and the number of prizes must, therefore, decrease each year until we have accommodation for new pupils, who will take the places of the old ones on the prize lists.

The condition of the science school is very satisfactory. There is an increase of three on the science prize list this year. The mathematical class is now well attended by pupils, who seem determined to master the subject."

The seventh annual report of the Cardiff Free Library Museum and Schools of Science and Art states that:—

"It is daily becoming more manifest that greater accommodation is absolutely necessary. This consideration led the honorary secretary to prepare and submit to the committee a scheme for a new building, and with a view to eliciting public opinion on the subject the plans and report were ordered to be printed and circulated. The committee has as yet taken no further step in this matter, being deterred by the consideration of the very great outlay which would be required adequately to meet the wants of the institution. They, however, strongly commend the question to the serious consideration of the council."

It is to be hoped the all-powerful Marquis of Bute will lend a hand in this emergency.

Instruction for Women in Natural Science at South Kensington.—An interesting scientific experiment, to which we have already alluded, in connexion with one of the educational developments of the day is now in progress at South Kensington, with the permission of the lord president of the council, in the Science and Art Department, and under eminent scientific and social conduct. It is a regular course of bi-weekly lectures for ladies, on the Elements of Physical Science, delivered in the lecture-theatre of the South Kensington Museum by Professor Huxley, assisted by Professors Guthrie and Oliver. The lectures are quite academic in the thoroughly scientific character of exposition and demonstration; and academic, too, in the length to which it is proposed to carry out this course of elementary instruction. The inaugural discourse was delivered by Professor Huxley. There are large attendances, and very close attention is given by the fair students, so that it is safe to predict a success for this interesting experiment in academic teaching.

BURLINGTON HOUSE, LONDON.

The works here, long inexhaustibly delayed, are now recommenced in earnest.

Burlington House was originally built for Lord Burlington, by Sir John Denham, surveyor of the works to Charles II., immediately before Wren. His lordship was asked, according to Horace Walpole, why he built so far out of town, and replied, "because he was determined to have no building beyond him." But according to Pepys's Diary, that wonderful seventeenth-century record of seventeenth-century customs and gossip, Clarendon House and Berkeley House were being built to the west of it at the very same time:—

"Feb. 20, 1664-5.—Next that (Lord Clarendon's) is my Lord Berkeley beginning another on one side, and Sir J. Denham on the other.

Sept. 23, 1668.—Thence to my Lord Burlington's house, the first time I ever was there, it being the house built by Sir John Denham, next to Clarendon House."

The site was previously occupied by a farmstead; a print by Kipp, shows the house in 1700, with its gardens, and beyond them where Regent-street, and Portland-place now are, was the country. At this time London contained only about half a million inhabitants, but it was seventeen and a half times greater than the second town in the kingdom. Chelsea was a quiet village, with 1,000 inhabitants. Sportsmen wandered with dogs and guns over the site of the boroughs of Marylebone, Finchbury, and the Tower Hamlets. A single crazy bridge spanned the Thames. The great merchants resided in the City, in rich mansions, richly decorated. Roger North tells us that Sir Dudley North expended 4,000l. (a large sum in those days) in the furniture of his reception-rooms, in Basinghall-street. Macaulay says that the fashionable spots of London then were the south and west of Lincoln's-inn-fields, the Piazza of Covent Garden, Bloomsbury-square (then Southampton-square), and Soho-square. Foreign princes were taken to see Bloomsbury-square as one of the wonders of England. A few great men still retained their hereditary hotels in the Strand. The area north of Holborn was renowned for snipes and peaches; and St. James's-square, near the court, had just been built. Where Regent-street now stands was a solitude, where a sportsman might get a shot at a woodcock. Old General Oglethorpe (who died in 1755), used to boast that he had shot them there in Queen Anne's reign. Where Conduit-street now stands was a meadow renowned for its spring, and on the east was the *pest field*, in which a pit was dug to bury the corpses at the time of the plague. This field is seen marked on maps as late as the end of the reign of George I. At the end of the seventeenth century Covent Garden was surrounded by the houses of the great, but a filthy and noisy market was held in front of them. We who are accustomed to gas may smile on hearing that about this time the lighting of London was so had that Edward Heming obtained letters patent to place a light before every tenth door on moonless nights, from Michaelmas to Lady-day, from six o'clock to twelve. He was extolled as the greatest of all the benefactors of the city. We have digressed thus to give our readers an idea of the great metropolis at the time when Burlington House was built.

Richard Boyle, Earl of Burlington (born 1695, died 1753), put a new south front to the house and added the colonnade in 1718. He was the protector of Kent, the architect, and was himself much skilled in architecture. Walpole attributes the design to the Earl himself; but Colin Campbell, in the "Vitruvius Britannicus," claims the merit of the design, including the gateway. Horace Walpole was in Italy when these additions were made, and when he returned was invited to a hall at the mansion. He says:—"When I passed under the gate by night it could not strike me. At daybreak, looking out of the window to see the sun rise, I was surprised with the vision of the colonnade that fronted me. It seemed one of those edifices in fairy tales that are raised by geni in a night-time." This colonnade was borrowed from a palace, by Palladio, at Vicenza. Whether the Earl designed the gateway or not, it is certain that later in life he designed many architectural works. Pope, in his fourth "Moral Essay," addresses the Earl thus:—

"You, too, proceed! make falling arts your care;
Erect new wonders, and the old repair;
Jones and Palladio to themselves restore,
And be whate'er Vitruvius was before."

When his lordship was travelling in Italy he was shown by a nobleman a church which he greatly admired for the elegance of its structure, and requested that he might sketch it next day. The nobleman said there was no occasion for this, as the model from which it was taken was St. Stephen's, Walbrook, near the Royal Exchange. When his lordship arrived in London, he visited the church before he saw any of his friends, or returned to his own house. The church was built by Sir Christopher Wren, in 1762-79.

Mr. Gwilt says, "compared with any other church of nearly the same magnitude, Italy cannot exhibit its equal; elsewhere its rival is not to be found. Had its materials and volume been as

durable and extensive as those of St. Paul's Cathedral, Sir Christopher Wren had consumed (in St. Stephen's) a more efficient monument to his well-earned fame than that fabric affords." Peniston, the celebrated Vicar of Bray, subsequently became rector of St. Stephen's, Walbrook.

But, to return to Burlington House. The walls and ceilings were painted by Marco Ricci, and the whole was considered the finest mansion in London.* Gay, in his *Trivia*, observes:—

"—Burlington's fair palace still remains,
Beauty within—without, proportion reigns;
Beneath his eye declining art revives,
The wall with animated pictures lives.
There Handel strikes the strings, the melting strain
Transports the soul, and thrills through every vein;
There of I enter—but with clearer show,
For Burlington's beloved by every Muse."

Hogarth, in a caricature dated 1731, called "The Man of Taste," gives us a view of Burlington-house, representing Kent on the summit as painter, sculptor, and architect (for he was all three), donning his palette and pencils over the heads of Michelangelo and Raffaello. Pope stands a little lower down whitewashing the front, and bestropping the Duke of Chandos in the street. Though the gate and colonnade looked to our more enlightened taste debased in style, Ralph refers to it as the most expensive wall in England; the height wonderfully proportioned to the length, and the decorations both simple and magnificent: the grand entrance elegant and beautiful; and by covering the house entirely from the eye, gives pleasure and surprise, at the opening of the whole front with the area before it at once. Handel lived three years in the house: it was the delight of the earl to assemble poets and philosophers within its walls.

Burlington House passed to the Duke of Devonshire in 1753, for in that year Lord Burlington died, and the title became extinct. Lord George Cavendish (son of William, fourth Duke of Devonshire) completed the earl's design for the façade, and Ware (author of a scientific volume on vaults and bridges, and architect to the alterations at Chatsworth, Northumberland House, and other places for the Dukes of Devonshire and Northumberland) made some alterations. In 1819, he built the Burlington Arcade on a narrow strip of ground on the west side of the house, which produced the Cavendish family 4,000*l.* a year, though sub-let for 8,000*l.*

The Duke of Portland, Prime Minister to George III., resided in the mansion, and died there in 1809. The Elgin Marbles, brought from the Parthenon at Athens by the Earl of Elgin, some the works of Phidias himself, were deposited here before being removed to the British Museum. White's Club, in 1814, gave a grand ball to the Allied Sovereigns then in England, which cost 9,849*l.*

Burlington House and Garden (area 143,000 square feet) was purchased by Government for 140,000*l.*; and the Royal, Geographical, Linnean, and Chemical Societies were allowed to hold their meetings there.

In the *Times*, May 29, 1866, Mr. Beresford Hope published the opinion of the Council of the Institute of British Architects, viz.—"That Burlington House, with its colonnades, possesses considerable merit, and that it would be a subject of regret if such building should be wantonly interfered with, or needlessly destroyed." But he suggested adding another story, altering the colonnades, and perforating the screen wall, thus entirely altering Lord Burlington's design, though he professed to care for it. In 1867, 20,000*l.* were voted for the alterations, and Government proposed to build apartments for the learned societies located in the wings of the mansion, to form the Piccadilly frontage. In the rear is the edifice for the London University; so that there will be three distinct buildings. Mr. Pennetborne is entrusted with the London University structure, and Messrs. Banks & Barry superintend the buildings for the learned societies. Mr. S. Smirke, R.A., has satisfactorily erected the rooms for the Royal Academy exhibitions. The sculptors-room is on the north side of the building, and communicates towards with the central octagonal hall. A great deal will doubtless be done by future Academicians as regards exterior embellishment. We will conclude this, in many respects imperfect, sketch of Burlington House, by quoting part of

* Sir William Chambers observes, "few in this vast city surpass, I believe, that behind an old brick wall in Piccadilly there is one of the finest pieces of architecture in Europe."

the speech of Sir Francis Grant, P.R.A., at the banquet held there on Saturday, May 1st:—

"The Royal Academy commenced its career under the auspices of a great king and a great painter—George III., and Sir Joshua Reynolds. For the first thirty years of its existence it occupied very humble apartments at Pall-mall, originally built for an auctioneer. Afterwards, when one constant friend and patron, George III., made over to the nation his own royal palace, Somerset House, he expressly reserved to himself the right of appropriating apartments in that building to the Royal Academy. Hence, after fifty-seven years of occupation, at the request of Government, the Royal Academy transferred its abode to Trafalgar-square; and now, in lieu of the accommodation provided for the Royal Academy by George III., the Government have granted to us a site eminently adapted for the purposes of a college of art, on which, from our own funds, we have erected those noble galleries and schools of art, where, with greater advantages, we hope gratuitously to maintain, as we have done for the last century, the chief art-education of this country. For we are proud to reflect that the Royal Academy can say what can be said by no other academy in Europe, that we have never applied for or received any grant of public money. On reviewing the efforts of the past century, although we might possibly have hoped to produce still greater results, I think, when we recall the names of those eminent artists who have been students at this Academy, who derived all their inspiration and knowledge of art within its walls, that it cannot be said we have failed altogether. Such names as Scolding, James Barry, Copy, Banks (the sculptor), Smirke, Stothard, Lawrence, Hopper, Flaxman, Joseph Mallard Turner—a name alone sufficient to glorify a century—Caird, Willie, McInerney, Leslie, Eddy, Newton, Constable, are sufficient to quote. When I recall to memory these illustrious pupils of the Royal Academy, who have brought glory and fame to their country, I feel we have no occasion to blush for the past or the present."

J. P.

DOBROYD CASTLE, TODMORDEN.

We have elsewhere mentioned this large residence, which has been erected for Mr. John Fielden, from the designs and under the direction of Mr. John Gibson, of Westminster.* It is situated on the Dobroyd heights, commands extensive views of the Halifax, Rochdale, and Burnley valleys, and forms a prominent feature in the landscape as seen from the Lancashire and Yorkshire railway and other points. In its construction the most durable materials, such as hard native stone and oak have been used, and in its internal decorations inlaid woods and marbles of various hues have been carefully wrought. The furniture has been made to match in all respects.

The plan and view show the general arrangement and character of the structure, but our readers will be glad to have a portion of the previous more detailed description repeated. As will be seen, it is in the castellated style of the Tudor period, with angle hattering turrets, surmounted by a main tower, having a flag-turret at the north-west angle. Besides the native stone, about 1,500,000 bricks, made of native clay, have also been used on the works. The height of the flag-tower from the floor line is 82 ft.; the top of the main tower is 27 ft. square. Entering at the tower (or principal entrance, we are in the vestibule. The walls of the vestibule are carried up in Bath stone, with oak-paneled ceiling; the floor is of red and white Mansfield stone, and the dado round is of Riga and Pollard oak. Passing forward we find ourselves in the saloon. The columns and pilasters are of Devonshire marble, the capitals of the columns being carved with representations of English national sports. The panels over the doorways are of Caen stone, with representations—(1st) Ploking Cotton; (2nd) Packing Cotton; (3rd) Arkwright, represented with a lathe, wheels, and mechanical instruments near him, in his father's harber's shop, apparently in deep thought upon some invention; (4th) Working the Cotton—girls in a mill. There are several carved shields in the saloon, each bearing the monogram of the founder and his wife, J. R. F. From the floor line to the top of the saloon is 34 ft.; the floor dimensions are 27 ft. by 44 ft.; the grand staircase rising from the saloon to the upper corridors. The billiard-room is to the right; it is fitted up with oak. The centre tower over the gaslight is emblematical, being composed of figures representing energy. All the chimney-pieces and fenders are of choice marble of different hues, the stoves all bearing the monogram of the founder and his lady. All the floors are of oak; there is no painted wood nor paper-hanging in the building; all the walls are painted. The principal windows are fitted with Clark's patent revolving shutters, and Meakin's self-acting sash-fastener, which is applied to 130 windows. The total number of rooms is 61.

The hot-water arrangements and stoves have been supplied by Mr. D. O. Boyd. The gas arrangements are by Strode & Co. The whole

of the plaster work is done in Parian cement. Every room in the castle is ventilated by a distinct ventilating-shaft, and all the rooms have pure air thrown into them. The grates are also so arranged that hot air is thrown into the rooms in winter, and cold in summer. The breakfast-room frieze is ornamented with rose enrichment. The whole of the woodwork in the drawing-room is inlaid in designs with the following kinds of wood—Walnut, with satin-wood, ambona, Hungarian ash, purple-wood, and ebony. The drawing-room is lighted from the sides by gaslights opposite to mirrors. The frieze is worked with passion-flower enrichment. The chimney-piece is of statuary marble, inlaid with onyx. Between the drawing and dining rooms is the entrance from the castle to the east terrace. The frieze in the dining-room and centre tower are emblematical of the room, with vine enrichment. In the staircase from the saloon to the corridors the banisters are gilt; the steps and landings are Spinkswell stone; the handrails is of Riga and pollard oak. Two Devonshire marble columns form the novel. The columns of the corridors are of Devonshire and Greek green marble, with carved capitals representing floral and animal life. The base of the saloon and the staircase is a square; it then forms into an octagon, and culminates in a circle. It is lighted by a glass lantern-light by day, and at night by two magnificent sun-lights, by Strode.

All the work here, inside, is carried up in Bath stone, and the top of the banisters round the corridor is covered with crimson velvet. In the sections between the columns, at the top of the staircase, are mirrors. In Mrs. Fielden's boudoir most of the woodwork is of Hungarian ash, the door is inlaid with purple-wood, birch, ambona, and ebony; the wardrobe adjoining is furnished with fittings of pencil-wood. The stables fitted up by Messrs. Magraw & Brothers, Belfast, have accommodation for seventeen horses, with coach-houses, harness-room, &c., and a dog-kennel large enough to hold a pack of hounds. The stables are floored with bricks inside the stalls, and with Loh quarry stone in the passage; the walls are done with Minton tiles, and oak. The stables, &c., are 100 ft. by 90 ft. The area of the greenhouses and vineries is 120 ft. square; the area of the walled-in kitchen garden, 150 ft. by 120 ft. Mr. W. Glover was clerk of the works. Mr. Kemp laid out the grounds.*

* At the dinner which Mr. Fielden, on taking possession of the building, gave the workmen who had been engaged there, a song written for the occasion by one of the joiners, Mr. Morgan, was sung by the whole company. We are tempted to print it less by its poetical merits than by the good feeling it displays:—

Tune—"The Lass o' Gowrie."

When gratitude commands the tongue,
It may as well break forth in song;
My happiness continue long
With our sterling friend, JOHN FIELDEN.

At Dobroyd Castle, may he prove
Through lengthen'd years the joys of love;
Pure as angels from above,
The love of Mrs. FIELDEN.

His splendid Castle, well design'd,
Peerless, methinks, is of its kind—
The product of the master mind
Of the Architect, JOHN GIBSON.

To carry out a plan so vast
Required a man of no mean cast;
He has done it well from first to last,
Respected WILLIAM GLOVER.

An honest British workman here,
The Builder of this Castle fair,
There is no man, nor far or near,
Deserves success like DAVIS.

I feel a meed of praise is due
To all good masons, stanch and true;
Who, led by LONG, have brought to view
This splendid Dobroyd Castle.

The carpenters and joiners too,
We know their work will bear review;
Led on by JENKINS, firm and true,
They've finish'd Dobroyd Castle.

The carvers, too, have play'd their part:
Their truly is a work of art,
Almost enough to make you start,
On viewing Dobroyd Castle.

The decorations, rich and rare,—
You seldom see a scene so fair
As Burlington & Sons could show you there,
Inside fair Dobroyd Castle.

The gardeners, too, a sturdy band,
With KEMP's good taste and CRAIG's command,
Have made it seem a fairy land,
Around fair Dobroyd Castle.

With gladness did we hail the day,
We saw JOHN FIELDEN wend his way,
To take, possess, and make his stay
At his fair Dobroyd Castle.

Now I must conclude my song,
For I fear 'tis rather long,
Wishing nothing bad or wrong
May come near Dobroyd Castle.

* See p. 532, ante.



DOXROYD CASTLE, TODMORDEN, LANCASHIRE.—MR. JOHN GIBSON, ARCHITECT.

THE SOCIETY OF ARTS' PROGRAMME.

THE address at the opening of the session of the Society of Arts was read by the chairman of the council, Lord Henry Gordon Lennox, M.P., late secretary to the Admiralty. His lordship enumerated the various committees appointed, and the purposes in view, or more or less accomplished. Among them were the food committee, and what it was doing in regard to the supply of meat, fish, poultry, milk, grain, &c., and the preservation of meat, as by ice; the committee on India, and the subjects of tea, silk, cotton, and other fibres, waste land, hill settlements and sanitarium, and trade with Tibet and Central Asia; the committee on mechanical inventions and the patent laws; the proceedings of the council as to education, &c.

The council propose to appoint committees to act in different localities, for the purpose of promoting the establishment of scientific and technical colleges, such as Owen's College, Manchester.

The committee on free libraries and museums throughout the kingdom will continue its labours, by collecting such information as may stimulate and aid the formation of these useful adjuncts to education.

For the present session, the society offers a large number of prizes for productions in most branches of art-workmanship, and additional prizes are offered for specimens of the applications to industry of prescribed art-processes.

A committee has been for some time sitting with the object of marking the houses in which the great and good of former days were born, lived, or died. For this purpose tablets were required, which, while they should not disfigure the buildings on which they were placed, should be easily affixed, and should be rendered, as far as possible, not only imperishable, but easily cleaned when grimed by the smoke and dirt of our great towns. With such an object, the leading makers of encaustic tiles were applied to. Some refused even to attempt so difficult a task, but, after very many failures, the council announced that Messrs. Minton, Hollins, & Co. have at length overcome all difficulties, and specimens on the wall were pointed to as the result of their skill and ingenuity.

Tablets have been already affixed to commemorate Lord Byron and the Emperor of the French; and leave has been obtained from the owners of the houses to commemorate in a similar manner Sir Joshua Reynolds and Benjamin Franklin. Tablets are also proposed to Flaxman, Barry, R.A., Handel, Garrick, Dryden, Goldsmith, Sir W. Blackstone, Sir Humphrey Davy, and Dr. Jenner, and other names will doubtless follow.

The committee on musical education is to be re-appointed. The cab question and the premiums offered for improved vehicles, the Channel passage and the projects for tunnels and bridges or viaducts, and other subjects were all brought under review; and the re-arrangement of the society's library, with new catalogue, librarian, and reading-room, was announced.

METROPOLITAN AND OTHER NEW SCHEMES.

MANY columns of the daily press are filled with advertisements as to new schemes affecting the several localities in which the papers are published. Those in the Metropolitan papers are mainly as to tramways. One advertisement alone fills nearly a whole page of small type with a mere enumeration of the routes of a multitude of tramways, north and south, east and west. There seems to be scarcely any great thoroughfare unconnected with them, and of course it is quite beyond our limits to attempt to describe them. Highgate and Islington, Pimlico, Peckham and Greenwich, Shoreditch and Paddington, Camden-road and Westminster-Bridge-road, Tottenham Court-road, Oxford-street, Holborn, are all to be connected with a network of tramways if we are to believe these voluminous advertisements; but doubtless a greedy appropriation of the whole ground is the first thing thought of; and there will be picking and choosing where and when to lay a few of the innumerable tramways, should the projectors succeed in obtaining their Acts of Parliament. Manchester and Birmingham are also to have their tramways. A Bill will be brought in for a Southwark and City subway, under the Thames from near St. George's Church, Southwark, to or near Arthur-street, in the city of London.

There is a Bill for the "extension of the limits of the county of the city of London to the limits of the metropolis, the area within such extended limits to be called the county of London, or by some other name; alteration and consolidation of the institutions within the metropolis, enlargement and alteration of the powers of the Corporation of London, exclusion of the borough of Southwark from the Corporation of London, and repeal, alteration, and extinguishment of certain powers, rights, and privileges within the borough of Southwark; incorporation of a governing body for the metropolis, dissolution or alteration of the constitution and name of existing public bodies; regulation of duties and appointment, superannuation, and displacement of officers; powers with reference to the appointment of justices and the administration of the law within the metropolis; rating powers, by-laws, amendment of Acts, and other purposes."

ST. DAVID'S CATHEDRAL.

MR. SCOTT has just given his second report on the fabric of this cathedral. In the spring of 1858 he made a report to the Dean and Chapter of St. David's, bringing forcibly before them its forlorn condition: roofs much decayed, the walls, pillars, and floors of the nave in a terrible state from damp; the bad condition of the tower, which presses heavily on the walls of the nave and transepts; and a frightful crack in the north and south sides of the tower. No attempt could be made to repair other parts of the cathedral until the foundations of the tower were restored to a state of security, and this one item could only be accomplished by the exercise of great skill, and at a heavy cost. Mr. Scott estimated the cost of the necessary repairs to the whole cathedral at from 27,500*l.* to 30,000*l.* This report seems to have frightened the Dean and Chapter, who felt the sum as quite beyond any fund they could command, and the subject seemed to have been laid aside until October, 1863, when the bishop presided at a public meeting at Garmarthen, and put down his name for 1,000*l.* towards the repairs, the Dean and Chapter adding another 1,000*l.*, Lord Dynevor 500*l.*, Lord Cawdor 200*l.*, Mr. Phillips, of Pictou, 200*l.*, some of the landed proprietors 100*l.* each, and other smaller sums. Afterwards the Ecclesiastical Commissioners gave 10,000*l.*, and since that time a great deal has been done towards the restoration of the cathedral. The tower, which was the most serious work, has been restored, and the foundations made secure. The other chief repairs were the completion of the choir with its fittings, and of the eastern arm with its aisles. The eastern chapel of the south transept, which was most ruinous, has also been seen to, and a system of drainage has been carried out. There is still much to be done in the repair of the roofs of the nave, and of the two transepts, and with the repair of the porch this will require 5,750*l.* There are other repairs in windows and new flooring; and also the repair of the aisles, which, with the repair of the Chapter-house, parapet, and pinnacles, will require about 5,000*l.*, so that with warming, lighting, contingent expenses, and professional charges, the total amount required will be about 12,500*l.* As so much has been done, it is supposed that there will not be any difficulty in finding funds to finish the work.

THE BUILDINGS NEXT THE THAMES.

SIR,—A stranger in London is much struck with the grandeur of the Embankment, and the facilities it offers for effective ornamentation, but the neglected state of the old wharfs and warehouses still preserve, along the South Bank and between Blackfriars and London Bridge on the northern side, ample evidences of squalor and mean buildings. On the former we find only two objects worthy of the position,—the Lion Brewery and Alderman Humphreys's Store; on the latter, all remains to be accomplished, save only Somerset House and the Temple. The inquiry now is,—what is to be done with the large spaces saved by the Embankment from the river slime? To make public gardens of these spaces would be useless, beyond the adornment of the causeway on both sides by trees and shrubs. Those reserves could be neither useful nor ornamental as places of recreation for the denizens of pent-up London courts. Closed in by lofty ranges, there could be no space for effect, and at two points of the line the gigantic

and hideous deformities of Charing-cross and Blackfriars Railway Stations give a death-blow to all taste of design, or consecutive architectural finish; these aisles towering to the height of 150 ft., with lateral ranges of heavy and overshadowing brick wall, would dwarf and overshadow the finest structural designs that could be devised by professional skill, and some of the modern performances of the profession of architecture fully evidence that taste and skill have not become enfeebled, at least in England: on all sides we meet with improved and even splendid architectural designs.

Now, sir, as one who rarely animadverts on structural deformities, will you allow me to ask, would it be possible to make some change in the elevation of the two fatal blemishes upon the noblest aspect of your beautifully placed city? Could not the two stations referred to be reduced in their lateral walls by about 15 ft. to 20 ft.; and then, by dividing the glazed roof, after the fashion of the Metropolitan Railway stations, and thus reducing the altitude of the semicircular single-span roof by as much more? Such a change would give light and animation to the line of embankment, and in some degree qualify an approach to continuity of design and effect.

It may not be out of place to observe that the portion of the footway on which the trees are planted (about 3 ft. wide), and which has sunk through the subsidence of the newly-made ground, might as well be left unflagged. The trees would grow better, and in fact the intervening spaces are useless as a thoroughfare, the remaining width of 17 ft. being quite sufficient; besides that on the other side north of the driftway, there will be also another flagged footway, and, it is to be hoped also, another, or perhaps a double range of trees.

I will conclude with one more observation as to the reasonable and unobstructive elevation of buildings, railway stations, or others. Can any man build his house as high as the Cross of St. Paul's? or has your district surveyor no power to prohibit an unsafe or obnoxious height of elevation? UN VOYAGEUR.

ANGLE CHIMNEYS.

SIR,—The following extract from the diary of the well-known John Evelyn, of Sayes Court, Deptford, on the above subject, may not be uninteresting to your readers:—

"1670—July 22nd.

So, passing through Newmarket, we alighted to see his Majesty's house there, now new-building: the arches of the cellars beneath are well turned by Mr. Sammel, the architect; the rest mean enough, and hardly fit for a hunting-house; many of the rooms above had the chimneys in the angles and corners, a mode now introduced by his Majesty, which I do at no hand approve of. I predict it will spoil many noble houses and rooms, if followed. It does only well in very small and trifling rooms, but takes from the state of greater."—(Evelyn's Diary, by W. Bray. London: Colburn. 1850.)

E. A. C.

NEW BUILDINGS, EDMONION MARSH.

SOME large Varnish and Colour Works have been erected for Messrs. James, Price, & Co., between the Angel-road and Ponder's-station of the Great Eastern Railway. The works consist of five blocks of buildings. The factory, boiler-house, and coal-stores are covered with galvanized iron roofs. The engine, machine, and drying houses are covered with timber roofs and slates; the floors paved with York paving on concrete bed. The drying-houses are two stories in height, and are divided by wrought-iron floors and joists. The warehouses are also two stories in height, with deal floors and joists, and divided into sections by brick walls. The shaft is 100 ft. high, has a square pannelled base to about 3 ft. above the factory roof, and is continued its height circular with Portland stone moulded cap. The machinery consists of a powerful horizontal engine, and two rollers, and is connected with bright driving shafts and cranks, with the whole of the machinery, including drums, pumps, and cranes. The water-tank, which contains about 5,000 gallons, forms the roof of tank stand, under which are fixed the varnish tanks and drums, and is supported on cast columns and wrought girders, approached by an iron staircase. The drying-houses are heated by the boilers partially by direct communication, and partially by the exhaust steam.

At the entrance of the works are situated the counting-house, with clerk's office, lavatory, and W.C., fitted up with the necessary conveniences, adjacent to which is the engineer's residence. Upon the opposite side of the entrance are situated the stables and coach-houses.

The contractors for the buildings were Messrs. Eaton & Chapman, of Kingsland; and the engineer was Mr. Best, of Bermudaese. Mr. James Wesley Reed was the architect.

NEWGATE MARKET AND ITS OWNERS.

The following letter states what certainly seems a hard case:—

"I send you a circular we have issued. The City have treated us badly; they have not fulfilled their promises nor done what is just. Our market has been established thirty-eight years, and supplied a great public want. It has only averaged a fraction over 5 per cent. for rent, and now we have a loss of more than 20,000l. for money we have laid out on alterations and fittings for market purposes. These latter have been copied without acknowledgment in the new market quite closely, as any one may see. As many as 75,000 persons have passed through our market in a week, the greater part going to the City portion of Newgate Market. We have provided paved, lighted, and watched passages one-tenth of a mile in length for these passengers for thirty-eight years, at our own cost. The City stalls were only temporary shanties, while a great part of our market was made with every convenience for air and shade. The City market was leasehold, under the Dean and Chapter, and they only paid 4l. a year, and 2d. per foot superficial to their landlords, and let it out as high as 3l. per foot per annum; so that they paid the landlord 48l., and received 4,810l. clear themselves as profit. They never widened a thoroughfare or laid out anything on improvements for nearly 200 years. When they got an Act for dismarketing Newgate Market they took powers for widening the thoroughfares and improving the neighbourhood, but they have never spent a shilling on them, and propose to widen Long-lane and leave our neighbourhood in its present forlorn state.

ALFRED TYLOR."

THE ST. PANCRAS INFIRMARY QUESTION.

VERDICT after verdict of the coroner's inquests on deaths which are occurring in the infirmary of St. Pancras Workhouse leave little doubt about the unhealthfulness and overcrowding of the infirmary, and the imminent peril of death to poor persons placed within its walls.

There are gentlemen who, conscientiously, no doubt, desiring to uphold the sanitary merits of this workhouse infirmary, appear to imagine that they have discovered, for the first time, that cubic space is not the only or even the chief consideration as regards the healthfulness of sick-wards in an infirmary. Were they "constant readers" of the *Builder*, they would be well aware that this is no new question at all. Every sanitarian is well aware that even where the utmost requirements of cubic space are fulfilled, there may be still great unhealthfulness in the inclosed space, unless it be well ventilated. But ventilation is not everything itself, as such, any more than cubic space. Patients may be killed by "ventilation," no less than by want of cubic space. The utmost care and discretion are requisite in the ventilation of even the most spacious infirmary: otherwise the sick, who are, on account of their very want of healthful vigour, more susceptible and more liable than usual to the serious evils arising from draughts, may be killed by ventilation, no less than by want of ventilation. Where there is a want of adequate cubic space, moreover, ventilation becomes so urgently requisite that there is little or no chance of patients escaping the evils of draughts; and an aggravation of their disease may be just an accession of inflammation from too much ventilation, in too little space. It is even doubtful whether the best possible ventilation, in the best possible ward, be in itself sufficient, without artificial defecation and disinfection by proper chemical means,—by such means as will give oxygen, as the alkaline permanganates do, instead of taking it, as some accredited defecating or disinfecting agents are said to do.

It is all nonsense, then, to talk of cubic space being a myth, and ventilating everything: neither the one nor the other of these proposi-

tions or assertions is true. Both are of very great importance; but proper ventilation in very small cubic space is not possible; and it is they who maintain that all depends on ventilation that are mystified by their own "myth."

Under the circumstances, we are not surprised to find, not only that the Poor Law Board insist on the removal of the sick in the St. Pancras Infirmary to the new Infirmary at Highgate, which the St. Pancras guardians actually have already almost waiting for them, although they have hitherto tried to avoid using it; but that these heretofore obstructive guardians have at last, themselves, seen the necessity of adopting the Poor Law Board's decision, and of "cordially concurring" in the carrying of it out.

The Poor Law Board have also announced their determination to institute a public inquiry into the state of the wards of the old infirmary, and the charges preferred by the guardians against their medical officers. That the wards are not only ill-ventilated and far too small for the number of poor people crowded into them, but that the foul air is intensified by contributions from the sewers, would appear to be but too probable.

We are glad to hear it said that Miss Nightingale has offered her services in the nurse department at Highgate.

FOREIGN JOINERS' WORKS FOR ENGLAND.

A CORRESPONDENT wrote last week:—

"It was reported some time ago that the joiners' work at St. Thomas's Hospital was made in Sweden. Is this true? If so, they must have vastly improved in their style of finish. I should much like to know, as I am in the habit of having a large quantity of joinery made from home; and if they can compete, and be sufficiently below our British manufacturers to induce an English firm to put their work in foreign hands, and do the work as that is done, it seems to me to be worth looking after."

We find, on inquiry, that the statement that some of the wood-work for the hospital comes from Sweden, is quite correct. It is understood to be perfectly satisfactory to the architect, and we are able to add, without seeking to pry into the contractors' secrets, that it is obtained at less cost than they could produce it for at home.

LECTURES ON ARCHITECTURE, LONDON INSTITUTION.

PROFESSOR KEAR'S third lecture was delivered on Thursday, the 25th inst. We may give some particulars of it in our next number, and of that which preceded it. The concluding lecture, Thursday, December 2nd, will treat of the Modern Manner, and the Future; exhibiting the revivals of the Classical and Mediæval styles, together with the more original efforts of Modern European art: corresponding with a fourth epoch of Civilisation.

OPENING OF THE NIGHTINGALE WING OF THE DERBYSHIRE GENERAL INFIRMARY.

On the 11th instant the new wing of this infirmary, which derives its name from Miss Florence Nightingale, was opened before a large assemblage, by the president, Lord Vernon.

On the north side of the new wing has been built a chapel of some architectural pretensions. The dimensions are 40 ft. long, by 20 ft. wide. The new wards, situated on the south side, are reached by an open staircase, the wards for males being on the first floor, and those for females on the second. The wards themselves are large; 108 ft. long, by 26 ft. wide, and upwards of 16 ft. high; each contains 32 beds. A balcony is placed at the end, to enable the patient, when sufficiently recovered, to enjoy the benefit of fresh air. The head nurses' apartments are so situated as to command a view of the whole. Arrangements have been made for the reception of the many accident cases which occur in these districts. The patient is placed in an accident carriage, and taken to the receiving ward, where he is examined by the surgeons; he is then, without being removed from the carriage, raised in the hydraulic lift, which has been designed and erected by Mr. Alfred Davis, Old Jewry, London, and conveyed to the floor upon which the ward is situated. The accident carriage is

the gift of Messrs. Holmes, of Derby. The new kitchen, a lofty building, 30 ft. by 20 ft., is fitted with a range, and with copper heated by steam, supplied by Messrs. Rosser & Russel, London. The arrangements for warming, and for the supply of hot and cold water, are also by this firm. The food is passed from the kitchen into an hydraulic lift by the same engineer as the larger one, and so raised to any floor that may be required. This lift is also connected with the corridors, and is so arranged that it may be employed for other household purposes.

The carrying out of these important works, which have cost upwards of 17,000l., has been facilitated by the attention of Mr. Wright, of Osmaston Manor, who has devoted to them a large amount of time and pains, and whose name appears in the list of contributors for no less a sum than 3,500l.

The architects were Messrs. Stevens & Robinson, of Derby, and the contractor was Mr. Edwin Thompson, also of that town.

WAREHAM NEW TOWN HALL.

THE foundation-stone of this new town-hall has been laid. It is to be constructed on the site of the old one, which has been razed to the ground. Connected with it will be a corn exchange, which forms a prominent feature of the undertaking. The corn exchange is to be on the ground-floor, having a separate entrance from North-street. Its dimensions will be 39 ft. in length and 36 ft. wide. There will, of course, be the usual fittings required for the corn trade. In addition to the entrance from North-street there will be a door leading to the main entrance of the town-hall. The entrance to the town-hall proper will be from East-street. Here there will be double folding doors. A flight of stone steps will lead to the council-chamber, the magisterial-room, and the reading-room. The respective dimensions of these rooms will be 37 ft. by 22 ft., 16 ft. by 14 ft., and 19 ft. by 17 ft. The corn exchange will have four windows on the eastern side, and two on the western side. The town-hall will be lighted by five windows in the eastern wall and three in the western. There will be a large and ornamental fanlight in the main entrance. The style of architecture chosen is Gothic.

Messrs. Beer, Hobbs, & Best, of Wareham, have taken the contract, the precise figures being 1,332l. for the completion of the work according to the plans and specifications drawn up by the architect, Mr. G. R. Crickmay, of Weymouth. But there will be many extras, such as gas-fittings and commission, and altogether the cost of the building has been estimated at 1,700l. Towards this about 1,200l. have been raised.

ARCHITECTURAL UNION COMPANY.

THE annual meeting of this company will take place on the 1st of December to declare a dividend and transact the ordinary business of the company. The balance-sheet shows considerable arrears of rent due to the company, and the report contains this paragraph:—

"The unexpected and sudden death of Mr. Lamb, who was treasurer of the Architectural Exhibition Society, unfortunately rendered it impossible for that body to discharge the rent due from them to the company, before the accounts were audited, which causes the large arrear shown in the balance-sheet, and prevents the usual dividend being paid."

The directors recommend a dividend of 6s. 9d. a share, instead of the usual 10s.

SIR JAMES CLARKE LAWRENCE, BART.

THE admirable manner in which the late Lord Mayor discharged the duties of his office, and the applause which he has won from his condutors, must interest strongly so large a section of our readers, acquainted, if not connected, with the firm of Messrs. William Lawrence & Co., that we think it right to record in our pages the terms in which the Court of Common Council has expressed its appreciation of his services:—

"That the best thanks of this Court be presented to the Right Hon. James Clarke Lawrence, M.P., late Lord Mayor of this city, for the valuable services so efficiently rendered during his year of office. The Court has witnessed with the highest satisfaction the manner in which in the discharge of the important duties of his office his Lordship exercised those qualities by which the character and dignity of the position of Chief Magistrate of the city of London have been maintained. This Court especially recognises the judgment his Lordship displayed when presiding over its deliberations, and is of opinion that in com-

binning firmness with consideration he greatly contributed to the successful conduct of business, and advanced the important interests connected with the Corporation. This Court also desires to express its high approval of his great ability in the administration of the Masonic-house, for which in his able advocacy of works of general philanthropy; and would record his generous liberality in dispensing the hospitalities of the Masonic-house, for which in every respect he is entitled to the warm and sincere acknowledgments of this Court, hereby presented to him. While with pleasure recognizing the gracious act of her Majesty the Queen in visiting this city to open Blackfriars Bridge and the Hothorn Valley Viaduct, this Court sincerely congratulates the late Lord Mayor upon the intimation of her Majesty's intention to confer upon him the dignity of a baronet—an honour personal to himself, but fully appreciated by the Corporation of London."

OPENING OF THE SUEZ CANAL.

THE procession of ships headed by the French Imperial yacht, *Aigle*, with the Empress of the French, has successfully opened the Suez Canal, by passing through it from the Mediterranean to the Red Sea and back. Thus a long-talked-of work, of cosmical importance, has been at last so far accomplished by the cutting through of a narrow neck of land heretofore separating more than one-half of the whole habitable world into two parts, and dividing the ocean on either side of it, so that till now no ship could pass from the Mediterranean arm of the Atlantic ocean to the Red Sea arm of the Pacific ocean, without almost circumnavigating the world, whether via the Cape of Good Hope eastward, or Cape Horn westward. The only other engineering work likely ever to excel it in importance would be the cutting asunder of North and South America, just as Africa and the continental land of Asia and Europe have been by the Suez Canal. The canalisation of the Isthmus of Panama, however, would be, probably, a more difficult work than that of the Isthmus of Suez, although there might be less fear of the canal being silted up with sand, as Mr. Stephenson anticipated.

Whether the present shareholders of the Suez Canal will really benefit by the work is a secondary consideration altogether by comparison with the vast importance of the canal to the commerce of the world. The rates are believed to be as yet too high; but that is likely to rectify itself in the long run. A rush upon the canal all at once, perhaps, is not to be anticipated. And, indeed, whether the great ships usually called "East Indiamen" can traverse it we do not know; but, no doubt, ships will be adapted to the canal, as well as the canal to ships.

CONDITION OF THE THAMES EMBANKMENT.

At a meeting of the Metropolitan Board of Works, held on the 19th inst., Mr. John Grant, the assistant-engineer, made the following statement with respect to the Thames Embankment (North), between the Temple and Westminster Bridge:—

"As during the past week various paragraphs have appeared in the *Builder*, *Morning Advertiser*, and other papers, to the effect that recent symptoms of settlement and failure had shown themselves in this important work, it may be satisfactory to the public, though unnecessary for the board, to be informed that there is not the slightest ground for alarm as to the safety or soundness of the Embankment, which goes down about 14 ft. below low water, and would stand by itself, independently of any backing of earth or other material. Foreseeing that the works of the Metropolitan District Railway would inevitably disturb the recently laid pavement, the board will recollect that, by advice of their engineer and solicitor, an agreement was entered into between the board and the railway company that the latter should pay the board for all injury and damage of every description occasioned to the footpath by the railway operations. Inasmuch as these must necessarily cause disturbance of the adjoining ground during their progress, it would obviously be wasteful and unwise to do more than is absolutely necessary to the railway, now in rapid progress, completed. When the railway works are finished the paving will be relaid, and, in accordance with the agreement, charged to the company."

If Mr. John Grant had taken the trouble to refer to the *Builder*, he would not have made such an erroneous and improper statement as we find here. No single word has appeared in our pages impeaching for an instant "the safety or soundness of the Embankment." The letter we printed from "A Stranger" simply pointed out the very bad condition into which part of the pavement had fallen, the correctness of which was shown by the letter from the contractor, which we printed, setting forth his view of the cause of it, and by the fact that men were forthwith sent to repair and set right the pavement in question. With what may have been said in other papers we have no concern, and the least Mr. John Grant can do is to express

his regret that he had made so unfounded a statement. The fact is, that being anxious at all times to support men in authority (the tendency of the day is unfortunately quite the other way), we deal much too leniently with the shortcomings of officials—too often condone their failures and errors—so that they begin to think they may take what liberties they please. If we turn over a new leaf, which is more than likely, some of these gentlemen may have cause to regret that they were not a little more careful and precise.

WELLS CATHEDRAL.

SOME months since a report was made by Mr. Ferrey, the diocesan architect, to the Dean and Chapter of Wells, describing the dilapidated condition of the west front of the cathedral, and urging that some immediate steps should be taken for its conservation, on account of the fabric having sustained great injury during the last few winters. As the estimated cost of the work was considerably more than could be encountered by the cathedral authorities, the dean issued an appeal to the county, which, after being succeeded by a public meeting, met with a fair response, and a building committee was appointed to carry out the objects proposed.

The committee thinking it desirable to ask for a report also from Mr. Scott, that gentleman, together with Mr. Ferrey, made a careful examination of the cathedral last week. The result was an entire confirmation of Mr. Ferrey's previous report and the recommendations therein made by him.

The cost of the restorations is estimated at about 8,000*l.*; but the sum as yet subscribed is insufficient. As soon as the adequate amount is obtained, the requisite reparations of the west front, as also of the interior of the chapter-house, will be proceeded with.

EMBANKMENT OF THE COAST.

In this and the reclamation of waste lands, the improvement of the drainage and embankment of rivers, the surplus labour of this country might be most properly and beneficially employed for many years to come; there would be then no necessity of depriving this country of its skilled labour in the very questionable and expensive expedient of sending abroad one of its principal supports. Much of the depressed condition of matters generally is to be attributed to the excessive taxation consequent on the extravagant wars in which this country has been engaged,—in the case of the Russian war alone of upwards of a hundred millions—rates and taxes come now to nearly 50 per cent. of rental.

The attention of Government might be most beneficially given to the schemes enumerated.

R. L. S.

BUILDING WOODS.

In answer to "E. M.," it were almost impossible to become practically competent to distinguish one kind of deal from another without having had some experience: there are, however, four principal kinds known to builders, viz., "yellow deal," "white deal," "spruce," and "pine." It may be well, in the first place, to observe that the *yellow deal* is not necessarily more yellow in colour than the other kinds, but may be known by its knots being generally of a reddish yellow or brown colour, and firmly nuted to the boards, so that they cannot be forced out or through a board; and *yellow deal* is not so shining and silky in appearance as white, and does not, to the experienced eye, look so hard on the surface as the white; but it bears the appearance of containing much resin in its grain, and when cut crosswise, it will present a smoother and closer grain than the white, and its annular rings will not be nearly so strongly marked and prominent.

White deal may be known by its knots being much darker in colour than those of yellow, and very liable to come out, through being loose; and it frequently has much turpentine, which, though thick, will yet run over the newly-cut boards. When rough, but more especially when planed, it will present a beautifully glossy surface.

That called *spruce* differs from that commonly called "white," by its being harder, and its grain is likely to wear unevenly on the surface, the annular rings standing up

prominently on the surface, and presenting an unsightly appearance. Its knots are frequently very small, numerous, and dotted over its surface; its end also shows the annular rings with great distinctness.

Pine is neither so glossy as "white" deal, nor so reasonably dull as "yellow." Its knots, too, are generally more or less loose, which will form a criterion whereby to know it from yellow; and when cut across the grain, its end will be close and woody in appearance, not having the annular rings prominent as in "white" and "spruce," whereby it may also be known from those woods. It does not contain resin like "yellow," and consequently has not the strong resinous colour that yellow deal has; but it contains turpentine, which may be seen running over the boards, as in "white deal." Its surface, when nicely prepared, is very smooth, the grain not having much tendency to wear unevenly, and although not so glossy as "white," yet its grain presents a sparkling kind of appearance not seen in "yellow."

A fifth kind, called "timber," although of various kinds, generally is similar to "yellow," excepting that it is coarser, has larger knots, which seriously weaken it, and for which reason it is advisable to saw and reverse girders, &c., in order that knots or faulty places (not occurring in the centre of their length) may be distributed; its being coarse renders it difficult to execute good joiners' work with it, as it works so badly.

HENRY AMBROS.

SIR,—Your correspondent "E. M." in last week's *Builder* inquires how fir timber and dealers distinguished in their various classes when sawn; and, as an importer and proprietor of saw mills, I will give him as clear and brief an answer as the subject admits of.

Yellow and white deals from the various Russian ports are usually unmarked, whilst those from Sweden and Norway are generally painted or stenciled on the ends, according to the fancy of each shipper; but as these marks number some thousands it is impossible for any person not in the trade to remember a tenth of them. When these deals are sawn into boards the marks are rendered unintelligible, and no one either in or out of the trade can say from what port they have come, or whether they have originally been classed as first, second, or third quality.

J. A.

THE ARCHITECTURAL LIBRARY OF THE INSTITUTE.

THE Library of the Institute of British Architects is now of considerable extent and value. Several handsome donations in its aid have been lately made, but it is still far from complete, and the council have just now issued a list of publications, about 1,000 in number, which they consider wanting in such an Architectural Library of Reference as should be possessed by the Institute, with the view of obtaining them from the members and others. This is a very good step, and we shall be glad to find it attended by the desired results.

SIR,—The Library now embraces a collection of books of great value, and to some extent unique. Is it not fitting that so valuable a collection should be placed in a *fire-proof* apartment?—that is, should not be liable to be reduced to ashes in a brief half-hour. The floors, walls, and roof might readily enough be constructed *fire-proof*—solid vaultings, brick arches, and ironwork; and iron fittings, shelves, &c., and slate desks. The rooms on the ground floor at Conduit-street, at present let off in a most incongruous occupation, would be best suited with the basement below for the library, or the galleries in the rear, if these were brought up to the proper ground level, in place of being in a species of cellar.

The present library would form a good tea and conversation room.

VALUE OF PROPERTY.

At Worcester part of the Brickfields Building Estate, containing 877 square yards, and freehold, with land tax redeemed, was sold for 1*l.* 2*d.* per yard, to Mr. Wainwright, for Mr. J. Booth. A piece of building land, with a plantation of trees growing thereon, situated at the south side of the entrance to St. George's-square, Worcester, having a frontage to the turnpike-road, has been sold. The land contained 1,330 square yards, and was the property of the late Vice-Admiral F. D. Hastings. It was sold to Mr. W. Johnson for 300*l.*—In Liverpool thirteen consecutive lots of property, situate in Everton, Edge-hill, and other parts of the town, were sold the other day. The following prices will convey an idea of the value of houses in the respective localities. The tenure of the property is freehold.—Lot 1. Twelve dwelling-houses in Adelaide-street, Everton, annual rental 148*l.* 4*s.*, realised 1,400*l.* Lot 2. Thirteen houses in Adelaide-street, rental 182*l.* 1*s.* 4*d.*, sold for 1,790*l.* Lot 3. Seven houses in Adelaide-street and St. Domingo-road, rental 158*l.* 16*s.* 4*d.*, brought 1,650*l.* Lot 4.

Two dwelling-houses in Adelaide-street, rental 24*l.* 1*s.*, sold for 360*l.* Lot 5. Eighteen houses in Jane-terrace, Kinglake-street, and Derby-place, Edge-hill, rental 240*l.* 9*s.*, sold for 2,490*l.* Lot 10. Ten Dwelling-houses in Canterbury-street, rental 195*l.*, sold for 2,310*l.* Lot 11. Eight houses in Canterbury-street, rental 156*l.*, sold for 1,830*l.* Lot 12. Thirty houses in Field-street, rental 429*l.*, sold for 4,070*l.*—*Hampstead, London.*—Mr. F. J. Clark, writing of the value of land at Hampstead, says last year a considerable area which had just been enfranchised was sold by auction at prices varying from 1,500*l.* to 2,500*l.*, and some frontage land, within a quarter of a mile of this property, at upwards of 4,000*l.* per acre.

SHELTER FOR CABBIE.

UNDER the title of "The Builder's Plea for Cabbie," in our volume for last year (p. 687), we urged the desirability of providing shelter for cabmen and their horses. It is therefore pleasing to us to note that the suggestion is being carried out at Edinburgh, so far as regards the cabmen themselves. Through the exertions of Mr. A. B. Fleming, a neat wooden building, designed by Mr. Pilkington, and provided by subscriptions from inhabitants in the neighbourhood and the cabmen themselves, has been erected at the stand at Randolph-crescent. Large side-windows are provided in it, by which a full view of the road in each direction can be commanded; and it is entered by a door from the street-side immediately facing the stand. A gas stove is to be provided for it, along with which there will be a small boiler for the supply of hot water.

The movement is, on the face of it, so admirable, remarks the *Medical Journal*, that we think there would be little difficulty in raising the funds necessary to provide similar shelter in London and other large towns. The nature of their employment exposes the cabmen to all the influences of cold and wet, and accordingly they are great sufferers from consumption and acute chronic rheumatism, but more especially from bronchitis; and they are rendered the more liable to these from their intemperate habits, which are, under the circumstances, easily understood, as they find that stimulants "keep out the cold" for the time. If shelter, such as has been provided in Edinburgh, were procured for the cabmen in every town, there would be less encouragement to intemperance, and their calling would be rendered in every respect a more healthy, profitable, and respectable one. If, in addition, these stands were each provided with a restaurant, where good food was sold cheap, the movement would prove a still greater boon to poor cabbie.

DONEGAL GRANITES.

At the last meeting of the Royal Geological Society of Ireland, Dr. Haughton called the attention of the meeting to specimens exhibited of polished granite from the county of Donegal. They were brought there by Mr. Harte, the county surveyor of Donegal, and he (Professor Haughton) had examined them attentively, and could bear testimony to their rich lustre and brilliancy of colour, which was of so much importance. At present they got their red granite from Peterhead, near Aberdeen, and where, in spite of the want of any natural advantage, the industry of the Scotch had created a large and thriving trade, upon a mere barren rock. He knew the locality where Mr. Harte got this granite, and had examined it for scientific purposes himself, and he had no hesitation whatever in saying that this fine granite would bear the most favourable comparison with that of Peterhead, commonly called Aberdeen granite; for the granite of Aberdeen itself was grey, like the Dublin granite. Why should they, then, go out of their own country to get granites, when they had such fine materials as these beautiful specimens now exhibited?

Mr. Harte said the largest specimen before them had received its polish in the marble mills of the Messrs. Sibthorpe, of Corkhill, gentlemen who had already done much to develop the use of Irish marbles, and who, he had no doubt, would do the same as regards these granites. They had no granite in Scotland like this of Donegal. He had compared this granite with all the best Peterhead specimens he could get, and it was several shades higher and richer in colour than the latter; in fact, it was very brilliant, and took, as they could see, a beautiful polish. He

was glad to say that the matter was in a fair way to success, and he had every expectation would prove highly remunerative. He was now commencing to quarry this granite.

ROOF DECORATION.

IN the paper upon church roofs which appeared in your last issue, the author imperfectly describes the "star" decoration upon the roof at the east end of the south aisle of St. Mary's Church, Bury St. Edmunds. He says that it is of metal with gilded rays, and has a flower in the centre. During the restoration of the church nearly twenty-five years ago, I had an opportunity, as a pupil of the late Mr. Cottingham, the architect employed, of taking a cast of this unique ornament, and I send you a *fac-simile* drawing. The stars are of cast lead; the centre is not a flower, but the singular feature of a convex piece of glass blackened on the back-side, giving it the appearance of a mirror. From this eye, or centre, the star is surrounded by wavy clouds, which are silvered, and from these proceed from each of the four sides a group of seven straight rays of various lengths, which are gilded. The diameter of the mirror, representing the star, is 24 in.; the same across the clouds, 5 in.; and the total width from point to point of the gilded rays is 1 ft. I think this a very rare instance where looking-glass was employed in Medieval times as a decoration; and the appearance of these mirrored stars, several in number, on the church roof in question, must have been very singular when they were new and fresh.

F. R. WILSON.

PORTS OF THE BAL TIC.

SIR.—Can any of your readers inform me where I can purchase a work fully explaining the various timber ports in the Baltic, and their respective qualities of timber? A SUBSCRIBER.

VENTNOR CEMETERY COMPETITION.

SIR.—Although loth to trouble you on the never-ending subject of dissemination implied in a "competition," I cannot refrain from writing a few words on the late competition at Ventnor. The sum to be spent mentioned in the particulars was 1,400*l.*, and the design chosen by the Burial Board would cost, on the authority of our architects of some standing, over 2,200*l.* This has not the appearance of justice; but, if I mistake not, these same drawings were sent in some years since for the Carisbrooke Cemetery, where the sum limited to be spent was 3,000*l.* I forgot to mention that the estimate of the author of the selected designs in this instance is under 1,400*l.*

HONESTY.

CAIRO HOTEL: TERRA COTTA.

WILL you be good enough to name in your next issue that the large columns, together with the whole of the terra-cotta embellishments to the Cairo Hotel, were executed by us for Messrs. J. Perry & Co., and under the immediate direction of Mr. C. H. Wray, the architect, and oblige M. H. BLANCHARD & CO.

THE NEW WORKS AT THE POST OFFICE.

SIR.—A correspondent, "P. W.," in your last issue inquires, "Who is this Mr. Williams, of her Majesty's Office of Works?" I have the pleasure of knowing Mr. Williams personally, and being well acquainted with his works. He is the architect and surveyor to the Post-office. Many years of special experience and great activity have thoroughly qualified him for rising to the exigencies of the present case, and his executed works, such as those at Edinburgh, Cardiff, &c., testify to his ability to appear well before the public, and rightly administer the funds placed at his disposal. T. S.

KEEN'S AND PARIAN CEMENTS.

SIR.—A "Clerk of Works," in your last number, wishes information respecting the painting of a wall newly plastered with Keen's cement, attributes the peeling off to dampness, and assumes that a similar result occurs with Parian. This is not so. The known characteristic of Parian is non-dilutescence. The loosening of paint from the surface of Keen's cement arises from other antagonistic causes than dampness. FRANCIS & CO.

DRILL HALL AND GYMNASIUM IN NEWCASTLE.

LIEUT.-COL. POTTER, of Heaton Hall, Newcastle, has, at his own cost, erected a large building, in this town, to be used as a drill-hall and gymnasium. The building is in Locke-street. The site has been purchased from the corporation. The building, which is of brick, and of an unpretending architectural character, is about 130 ft. long. At the east end is a house, where the drill-sergeant will reside; and the house also contains board, orderly, dressing, smoking and secretary's rooms. The drill-hall and gymnasium, which is about 105 ft. long by 60 ft. wide, is open from the ground to the roof, and is divided into five bays by cast-iron pillars, which support the roof, and also to the timber work of the gymnasium. All the necessary apparatus for a gymnasium will be erected in the

hall. At the west end of the hall is a gunnery, in which will be kept the large guns; and over the gunnery is a gallery for the accommodation of spectators. On the north side of the building are an armory and store-room, and also the usual out-offices. There is an open courtyard, 70 ft. long by 25 ft. wide, at the west end of the building; and most probably at some future time a tennis court will be formed in this yard. The cost of the building, which will soon be completed, and the fitting up of the interior, will be about 2,000*l.*; and, besides this, there is the cost of the land, Mr. Thomas Oliver is the architect. The contract was let to Mr. Kennedy, of Jarrold; and the work has been superintended by Mr. Henry Andrews, clerk of the works.

DRAWING AND DESIGN IN THE SCIENCE AND THE ART SCHOOLS.

WITH your permission I will call attention to a few anomalies in the existing regulations of the Department of Science and Art, for the working of the schools, which are causing inconvenience in many localities, and bringing the two divisions (science and art) into apparent rivalry with each other, when, by some modification of those regulations, each might, without interfering with the other, be made to work more efficiently and in accordance with the altered circumstances of the present time.

Amongst the twenty-three subjects taught in the science classes are practical, plane, and solid geometry; machine construction and drawing; and building construction. Forming part of the twenty-three stages taught in art schools, are linear geometry, mechanical and machine drawing, and details of architecture. Although there is some apparent difference in these subjects, it is really only a distinction, and not a difference, as they are substantially the same. The effect of these subjects being thus separately taught by each division is that in towns where (as is mostly the case) separate science and art classes are in existence, the above subjects are taught in two places having no connexion or arrangement with each other. If a building artisan wishes to learn the branches of drawing bearing especially on his trade, he is in doubt whether to go to the Science or Art school, for each advertises that it teaches exactly what he wants.

In the science schools examinations are yearly held in the whole of the twenty-three subjects taught; but in the art schools examinations are only held in five subjects, viz., practical geometry, perspective, free-hand drawing from the flat-drawing from models, and mechanical drawing. It will thus be seen that in two out of the five subjects of examination it has a direct rival in the sister division. In another way the scale of payments on results is very disproportionate. In the science classes payments of from 1*l.* to 3*l.* are made on each satisfactory examination paper, whilst on a similar paper worked in an art school only 10*s.* are paid. I think it unnecessary to go through the whole list of inconveniences and discrepancies which arise from this state of things; for I think it must be apparent to every one that some modification of the existing arrangements is necessary. I should not enter upon this matter if I were not prepared to suggest a remedy, which is briefly as follows: To take away the geometry and mechanical drawing entirely from the art division and transfer it to the science; although at the first institution of art schools it was perhaps necessary to attach those subjects, though not exactly related to the objects for which the schools were founded, yet required as an additional support; but now that they are fulfilling their immediate object in a more marked degree, and science classes are instituted in most parts of the kingdom, it would be a decided advantage if the whole machinery were remodelled to suit the altered circumstances. But what must the art schools do when deprived of these supports? Instead of the second-grade examinations in geometry and mechanical drawing, examinations should be held in the principles of elementary design, historical analysis with reference to design, and historic ornament. I need scarcely enlarge on the advantages which would ensue if the general students of the schools were thus encouraged to acquire at least an elementary acquaintance with these subjects; if good textbooks were prepared for the guidance of the students, class lectures were given, and the instruction generally tended to a good grounding in the principles which lead to true taste in design and ornament; if examinations were then held annually to test the progress gained, I believe that the best results would be obtained. In the school to which I belong there is carried out at present a system of general instruction in

the above subjects, but I believe that in most schools, unless a student is intended to be a designer or art workman of some kind, he has no instruction of this kind, for the reason that it pays better to keep him to "drawing" pure and simple.

My apology for troubling you with these remarks must be that, while so many vague generalities have lately been indulged in a neglect of technical education, few practical details have been set forth for the improvement of the present means at our disposal. I am a believer in the Department of Science and Art as a means to the end, if the machinery be improved to suit the altered requirements of the time.

CHARLES J. FOX, Hon. Sec.,
School of Art, Halifax.

P.S.—Since the above was in type, the Department have issued some amended regulations, which bear on the subjects embraced in this letter. They are to the effect that "science drawing" may now be taught in schools of art, and examinations held as science classes. I will not criticise these alterations, but simply wish to notice that such alterations have been made.

C. J. F.

CHURCH-BUILDING NEWS.

Hellingly.—The completion of the restoration of the parish church has been celebrated by the performance of divine service. The restoration was commenced on the 1st of May, the alterations being effected by Messrs. Aris & Roe, builders, Hastings, from designs and plans prepared by Mr. E. Christian, of London. The whole of the tiling was at once removed, together with the plastering which formerly hid the timber roof, thus giving an additional height to the nave. The roof has been re-tiled and plastered; the whole of the timbers being now exposed to view. The old groined roof, with its carved bosses over the chapel, and the timbers over the aisles, were found to be in such a ruinous and dilapidated state as to be unsafe; they are, consequently, replaced by new work; the chapel roof has been considerably raised, in order that the whole of the window on the north side might be visible from the interior. On the removal of the pewing, it was found that the bases of the columns running along the aisle had been mutilated, and in some instances undermined to a dangerous extent. Nearly all of the bases had to be renewed in Godstone stone, as the sbsides for the Eastbourne stone, of which a considerable portion of the edifice has been built. The old plastering on the north aisle was removed and replaced by new, disclosing on the north aisle a series of Norman dressed stones, in many instances showing the characteristic ornament of the Norman period, and being the remains of a building considerably more ornate than the present. Three fragments of a Norman font were found under the plate. They are now visible in the chapel, being built in the wall. The floor of the church has been raised 6 in., upon a foundation of concrete. The aisles are re-paved with black and red Poole tiles. The seating is of varnished deal. The two arches in the chapel, communicating with the church, and which were formerly blocked up, are now thrown open. The gallery being removed, the organ and choir are located here. New oak doors have replaced the old ones. The stonework in the exterior wall has been restored, and the north gable of the chapel re-built, care being taken to disturb the appearance of the building as little as possible. A new window was found to be absolutely necessary in the south aisle; it has accordingly been added.

Marston.—The parish church has been restored and re-opened for divine service. Early in the present year a restoration of the edifice was determined upon, and Lord Wenlock, the patron, and the Hon. R. Lawley and the Hon. and Rev. S. W. Lawley, his lordship's brother, contrived largely to the restoration fund. Mr. Scott was consulted, and under his direction Mr. H. Brumby, builder, was employed as the contractor for the work. The plastering on the outer walls was entirely removed, and the original surface exposed to view, such repairs as were required being made, and the whole pointed. Two old Norman windows, which had been filled up, were re-opened and glazed; and, with a view to give increased accommodation, a new transept was erected on the north side. In the interior the work has been extensive. The old roofs and flat-plastered ceilings were all taken down. New roofs were constructed, of high pitch, with open timbers, and varnished, and the

exterior covered with grey slates. The floors have been relaid with tiles, preserving the monumental slabs, some of which are very old. The chancel is paved with encaustic tiles by Mr. Godwin, of Hereford. New seats of pine have been erected throughout the nave, aisle, and transept. The chancel is fitted with oak stalls. The pulpit is of alabaster, carved. The east window is of three lights, and is filled in with stained glass by Hardman, of Birmingham. The subject is in connexion with All Saints, to which the church is dedicated; and the centre figure represents our Saviour in glory, surrounded by saints and angels. The window is the gift of Col. Akroyd, M.P. for Halifax, whose ancestor was a priest of Marston in the fifteenth century. The interior walls have been cleaned throughout, the arches and pillars forming the arcade have been restored and pointed, and the new transept is built in accordance with the style of the original fabric. The cost of the restoration may be stated at 1,500*l.*

Oshtam.—Hartley Westpall Church has lately been re-opened, after having been restored by Mr. G. G. Scott, jun. The church is a timber building of the latter part of the thirteenth century. The old oak roof, with its tie-beams and crossed rafters, has been preserved, the wooden pillars which support it being repaired and strengthened where necessary. The modern casing of brick has been taken away, and the walls rebuilt with flint and stone. The west end remains in its original condition of wood and rubble. The belfry, built many years after the nave, has been taken from the west end, and raised on flint walls the same height as the church, and placed on the north side of the chancel. The nave is newly seated with plain benches of elm, and an oak screen with decorated tracery separates the nave from the chancel, which has been restored, in memory of the late rector (the Rev. Dr. Keate) and Mrs. Keate, who rest in it, and an altar-tomb with a monumental brass has been raised to Dr. Keate's memory. The church contains several stained-glass windows by Buckson & Crylls. One on the south of the nave, with figures of Zachariah and Elizabeth, is placed by parishioners and others to the memory of Dr. and Mrs. Keate. There is also one on the north side in remembrance of Dr. Broughton, late Bishop of Sydney. Opposite it is a window, representing Faith, Hope, and Charity, in remembrance of a sister of the wife of the present rector.

Bleasby.—The parish church of Bleasby has been re-opened, after having undergone a restoration, and been made better adapted to the requirements of the parish. New high-pitched roofs have been erected for the nave and transepts; a new north aisle has been built; and four new arches constructed. The internal fittings of the church are all new. Five new windows have been opened. Mr. Christian, of London, was the architect, and Mr. Clipham, of Norwell, the builder. The total cost of the improvements so far has been 800*l.*

Westwell (Oxon).—This parish church has lately been re-opened, after undergoing repairs and additions. It is a very small and simple building, consisting of nave, chancel, and south porch. The walls are probably of Norman or very Early English date throughout, with the exception of the porch, which is Decorated. The south door, which has a solid tympanum, is Norman, and has detached shafts to the jambs, a treatment which has been repeated in the chancel arch. The chancel, which was restored by a former rector, inclines more to the north than is usual. There are small lancet windows in the north and south walls; but the east window is circular, enclosing a cinquefoil. The modern ceiling of the nave has been removed, thus exposing to view an oak roof of good design. At the west end stood a rickety gallery, rising through which four posts supported a bell-cot. The works just completed consist chiefly of a slight extension of the nave westwards, it having been necessary to take down and rebuild the end wall. A few more sittings have thus been gained. The works have been executed by Mr. Alfred Grover, of Milton; and the seats supplied by Mr. Wm. Hollowell, of Burford; and an oak altar by Mr. Frank Smith, of London; under the direction of the architect, Mr. Edward J. Tarver.

Farmborough.—The parish church of the ancient village of Farmborough having been restored and considerably enlarged, was recently re-opened for divine service. The alterations were commenced in the spring of the present year, and although, from lack of funds, the

entire plan has not been carried out, the work that has been done is complete in itself. The north wall of the nave was taken down, and an arcade has been erected which separates it from the north aisle, nearly as wide as the nave itself. The galleries have been removed, and a small organ-chamber has been formed at the east end of the north aisle. The chancel is separated from the nave by a new screen with wrought iron gates, and the space within the altar-rails is paved with encaustic tiles. The pavement of the rest of the chancel sadly requires renewing. There is a stained-glass window by Mr. Wallis, but this, we were informed, was not new. The tower, which is a specimen of Somersetshire Perpendicular work, remains intact, but improvement has been made in the interior arrangements. The partition which formerly separated the tower from the nave has been entirely removed; the tower, which is thus thrown into the body of the church, is used as a belfry. The old pews have been supplanted by open benches, capable of seating nearly 300 persons, being an increase in the accommodation previously provided. In pulling down the walls a few remains of the original church were found, and these have been preserved by being let into the old wall.

Brimpton.—St. Peter's Church, Brimpton, which has been entirely rebuilt, has been re-opened for divine worship by the Bishop of Oxford. This is the second church erected by Mr. James Blyth, of Woolthampton House. Four polished granite pillars, the roof, and the stained glass windows are the principal features. The former church, except the tower, was razed to the ground and rebuilt on the same site. The new edifice comprises a nave, with north and south gabled aisles and porch of oak, chapel on the east end of the south aisle, and a transept at the east end of the north aisle, with a recess for the organ. The chancel is fitted up with stall fittings of carved oak, and is paved with encaustic tiles. All the other fittings in the church are of oak, chestnut, and walnut-wood, grown on the Woolthampton estate. The pulpit and stand are of Caen stone carved. The roofs are of Baltic timber varnished. The church internally is entirely faced with Bath stone, and all the capitals to the columns of the arcade on both sides are carved in imitation of foliage and flowers, the columns being of red granite polished. Externally the church is faced with flint, and Bath stone dressings. The old tower of red brick was cased over externally with flint and stone, with windows, doorways, and buttresses to correspond in style with the other portions of the church, which is of Pointed architecture of the fourteenth century. A timber-framed spire, covered with oak shingle surmounts the tower. The belfry contains a peal of four bells, which have been tuned and refixed by Messrs. Mears & Co., of Whitechapel, on new oak frames complete, and a clock has been added. The present height of the tower and spire to the top of the nave from the ground is 132 ft. The present church has accommodation for 205 adults and 55 children. The two west windows in the aisles, and the east and south windows in the chancel, are filled with stained glass by Messrs. Ward & Co., of London, in memory of departed members of Mr. Blyth's family. The carving of the stone and wood work was executed by Messrs. Farmer & Brindley, of London; the encaustic tiles in the chancel (by Maw) were provided and laid by Messrs. Simpson & Son, of London; and the heating apparatus by Messrs. Haden, of Trowbridge. The church was contracted for and built by Mr. W. Alloway, of Wokingham, builder, at a cost of 3,700*l.*, exclusive of stained glass, warming, and the timber supplied from the estate. The works were carried out under the superintendence of Mr. John Wheeler, clerk of the works, from the designs of the architect, Mr. John Johnson, of London.

Milgham.—The new parish church of St. Matthew, erected through the liberality of Mr. Benjamin Back Greene, of Milgham House (a near relative to Mr. Blyth), has been consecrated by the Bishop of Oxford. The site of the new edifice is as near as possible in the centre of the parish. It adjoins Mr. Greene's park, on the hill within a short distance of the Bath-road. The edifice is capable of accommodating a congregation of 250 persons. It consists of nave, south aisle, north chapel, chancel, and porch. The pillars of the arches dividing the nave from the aisle are of red Mill polished granite. All the walls are faced internally with Bath stone, and externally with Bath stone and flint. The whole of the sittings are of oak, also

the reading-desk. The pulpit and font are of Caen stone, carved. The roofs are of Baltic timber, varnished, hoarded, and covered with Staffordshire tiles. The chancel is paved with Maw's encaustic tiles to an ornamental pattern. All the corbels are carved, and Messrs. Farmer & Brindley, of London, executed the carving. The tower is at the south-west corner of the nave, and is finished with a stone spire, which rises to a height of 105 ft. from the ground. The windows generally of the church are glazed with cathedral glass. The east window is filled with painted glass, by Messrs. Hughes & Ward, of London, at the sole cost of Mr. Greena. The window consists of three lights, representing respectively the Birth, Crucifixion, and Ascension of our Lord. The lancet window in the south aisle of the chancel, representing the Parable of the Talents (by Messrs. Heaton & Butler, of London), was the gift of the parishioners. The church is heated by warm-air apparatus, supplied by Messrs. Haden, of Trowbridge. The architect was Mr. John Johnson, of London; Mr. Allaway was the contractor; Mr. Roberts was foreman; and Mr. Wheeler clerk of the works. The iron-work was executed by Messrs. Hart & Son. The old bells have been re-hung, with the addition of one cast by Messrs. Mears & Stainbank, of London.

Harston (Cambs).—The church here has been restored and re-opened. The edifice has been entirely re-seated with open deal benches. The roof has been repaired, stained, and varnished; the old oak pulpit removed from the west arch, and renovated and placed on the north side of the chancel arch. On the opposite side a new reading-desk has been fixed, with carved oak bench at the back. The windows have been reglazed with plain glass (for the most part), and the walls cleaned and fresh plastered; the stone work wherever prominent having been refaced where requisite. Repairs by way of new wheels, &c., have been executed in the bell chamber. New doors have also been placed on either side of the church. On the outer side of the south door there is a furnace for heating the edifice, the heat being conveyed by pipes a short distance in the cross aisle, when it is carried up the centre aisle to the chancel steps, passing out at the well staircase on the north. Coming to the chancel, we find a new carved oak rood screen, and then our attention is drawn to the reredos: it consists of the Ten Commandments, the Lord's Prayer, and the Apostles' Creed, executed in the Elizabethan character, with illuminated capitals; more immediately over the altar appearing (in the same style of execution) the following text: "Then Jesus said unto them, Verily, verily, I say unto you, except ye eat the flesh of the Son of Man, and drink his blood, ye have no life in you." This inscription is the work of Mrs. Durbin, the vicar's wife. The woodwork, carving, and general fitting up, were done by Mr. Joseph Stubblefield, of Newton; the stone work and glazing by Mr. Clayton, of Cambridge; and the plastering, heating apparatus, and other extra work by Mr. Jude, of Harston. The work has cost about 500*l.*,—roughly estimated.

Worsop.—St. John's Church, Worsop, was consecrated and opened for divine service several weeks past, but the scaffolding around the tower has only been partially removed, and the interior of the edifice is gradually approaching towards completion. The font is an irregular octagon, the sub-base is of red Mansfield stone, moulded with an inscription engraved around it. The upper base (and the other portion of the font) is of Caen stone, moulded with carved spurs. On this rest a column of polished granite, and four smaller ones of serpentine marble. These are furnished with carved capitals clustered, which support the bowl, on the lower sides of which are carved medallions representing the baptism of Christ.—"John the Baptist preaching in the Wilderness," "Christ blessing little Children," and "Christ's last Charge to his Disciples." The spandrels over each medallion are filled with polished bosses of Derbyshire spar; on the smaller sides are carved corbels springing out from immediately above the carved capitals. These support moulded bases with polished marble shafts and carved caps. The whole is surmounted with a moulded cornice enriched with scale pyramid ornaments. The font is from the design of Messrs. Hine & Son, architects, Nottingham, and the whole of the work has been carried out by Mr. J. M. Thompson, of Ollerton and Nottingham, by whom also the carving and sculpture have been executed.

Annsroft.—The foundation-stone of a new church has been laid at Annsroft, for the districts of Annsroft, Hookgate, Exford's Green, and Lyth Bank, all of which localities are within one mile of the site, which has been given by Mr. John Rutter, of Wolverhampton. The estimated cost of the church, parsonage-house (which it is also proposed to erect), and the endowment is about 3,000*l.* The plans for the new edifice have been prepared by Mr. Randal, of Shrewsbury. The work will be carried out by Messrs. Bowdler & Darlington, of Shrewsbury, the builders of the neighbouring church at Meole. The building will be a modification of the Early French style, and will consist of nave, north aisle, chancel, and narthex or western porch. The length, including the chancel, will be 75 ft. and the width 27 ft. The aisle will be 33 ft. long and 12 ft. wide. The roof will be an open one, of stained deal, covered with Staffordshire tiles. The seats will be constructed of deal and elm, stained and varnished. When complete the church will accommodate 220 persons, and all the seats will be free and unappropriated. At the west end of the nave will be a bell-turret, 50 ft. high: this will be of wood, covered with lead. In the chancel will be three lancet windows, and a circular window at the west end. The church will be built of Red-hill stone, with Shelvoka stone dressings. The estimated cost of the building itself is about 1,100*l.* At present only sufficient funds are in hand to guarantee the promoters in proceeding with the nave and north aisle, and it is intended to defer for a time the erection of the chancel and parsonage-house.

Brentwood.—The old church of Childeritch was pulled down in May last, and since that time a new edifice has been erected on its site, and was recently opened for divine service. The church has been built from designs furnished by Messrs. Nichols & Johnstone, architects, London, and under their superintendence the work has been executed by Mr. W. C. Middleton, of Gravesend. The style is late Early English, the material Kentish rag and Bath stone. The church consists of chancel and nave, surmounted by bell gable. Internally the only visible relic of the old church is the font, of the time of Henry VIII., as the old characteristic timber was found upon examination to be thoroughly decayed.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Southend.—A new Roman Catholic Church has been erected here, and opened by Archbishop Manning. The new church is situated in Cliff-town. It is in the Early English style. The material is brick and stone mixed, and there is some carving in the workmanship. It is 85 ft. long by about 30 ft. wide, and it is so arranged that the church can, if required, be enlarged. The architect was Mr. Goodman, of Southend.

Leadgate.—Dr. Chadwick, Roman Catholic Bishop of Hexham and Newcastle, has opened a new church, dedicated to "Our Lady and St. Joseph," at The Brooms, near Leadgate. This church, which commands a view of Lancaster valley, is built in the Gothic style of architecture. The architect was Mr. Welby Pugin. The nave is 79 ft. long by 32 ft. broad; the aisles on each side are 8 ft. each in addition; and the chancel is 32 ft. by 25 ft. inside, the form being octagonal. The height of the building is 68 ft. to the apex. There are to be a confessional and a font, which are not yet completed; and accommodation is afforded for 700 persons. The church, when completed, will cost between 4,000*l.* and 5,000*l.*, a large portion of which has been subscribed by the workmen employed by the Consett Iron Company in the ironworks and at their collieries.

Harwich.—The newly-erected church of St. Mary of Mount Carmel, at Harwich, has been opened. Up to the present time the chapel of the Roman Catholics at Harwich has been at the house of the Rev. Thomas Parkinson, the official acting Roman Catholic chaplain to the troops stationed at Landguard and Harwich. The site closely adjoins the railway station. The church stands slightly recessed from the road leading to Dovercourt, and is an unpretentious little building of Suffolk brick, with a roof of Taylor's patent tiles. The design of the architect (Mr. Pugin, of Ramsgate) has not yet been entirely carried out, and it is contemplated that at some future time, should it be found necessary, the building should be extended to the westward, so as to be nearly double its pre-

sent length, and then a bell-turret will give a finish to the west end. The chancel consists of nave, with north and south aisles, sanctuary and vestry or sacristy. In both aisles are one two-light and two three-light windows, the south aisle also having at the east end a small circular window, and in the east wall of the sanctuary (between which and the nave is a plain arch) is a circular window with geometrical tracery; and there is also a three-light window of a somewhat more ornate character than those of the aisles in the south wall of the sanctuary. The roof of the nave is supported by timber uprights, from which spring the arches of the roof, which is open, and, as well as the remainder of the woodwork of the church, of stained deal. The roof of the sanctuary is a plain wagon-roof. The nave and aisles are 30 ft. in length, and the width of the building from wall to wall is also 30 ft., sitting accommodation being afforded for some 200 persons. The walls are double, to ensure warmth and dryness; and the work has been carried out by Mr. J. W. C. Butcher, of Harwich. The total cost was 730*l.*

Books Received.

The Architect and Monetarist: a Brief Memoir of Thomas Alexander Tefft; including his Labours in Europe to establish a Universal Currency. By EDWIN MARTIN STONE. Providence: State of Rhode Island, U.S.A., 1869.

This is a memoir of a promising young architect, of Providence city, who, as some of our professional readers will remember, spent some time in London perfecting his studies in his chosen profession. He cherished to the close of life appreciative memories of the many courtesies received from distinguished men of our metropolis, who highly rated his ability. A monument to the wife of Mr. Benjamin Moran, of the American Legation in London, from a design by Mr. Tefft, is standing in Norwood Cemetery, where it has attracted some notice. Perhaps the most important event in Mr. Tefft's life was the working out of a practicable plan for uniting the currencies of all nations,—a subject that engages special consideration with statesmen and scientists on both sides of the Atlantic. To this feature Mr. Stone gives special attention in the memoir. Mr. Tefft completed his architectural education under Mr. James T. Bucklin, of Providence, one of the leading architects of Rhode Island. Mr. Tefft was born about the year 1825, and died at Florence in 1869. The memoir is an interesting one.

The German Working Man: his Institutions for Self-culture, and his Unions for Material Progress. By JAMES SAMUELSON, Editor of *Quarterly Journal of Science, &c.* London: Longmans, Green, & Co.

THESE instructive particulars as to German workmen do not seem to have been written with the exclusive view of running down the British workman and running up the foreigner; but they show wherein our own workmen may well take a lesson from them, both by following and by avoiding their example. The author, however, who is the president of the Liverpool Operatives' Trades' Hall, has had mainly in view a description of a few of the combinations of German working men for self-help, education, and art-culture, as well as two co-operative associations for trade purposes; and to afford to our own operatives such information concerning their German fellow-workmen as appeared likely to be of service in the establishment of trade institutions of an improved kind in England.

We shall quote a passage from the summary to show the nature of the author's conclusions:—

"There was long an impression in England that Continental artisans are, on the whole, inferior to ours, and that idea was fostered by the fact that, where English machinery was sent abroad, it was considered necessary for one or more English mechanics to accompany and superintend its erection and use. Moreover, our own countrymen undeniably possess greater endurance, and their activity during working hours is greater than it is in foreigners, consequently it was not unusual in great engineering works to employ gangs of English navvies, and it is a not unfrequent matter of amusing comment, even now, that the German workman often performs half his duties with a long pipe in his mouth. But this is the superficial aspect of the case. What the German workman lacks physically is, on the whole, well compensated for by his superior intelligence and sobriety, and it is just there where our artisans have to fear his competition; there it is that they may find in him an example worthy of imitation. We have seen that during his whole life his mental powers are successfully cultivated, and he has been

bettering his condition by this means, whilst the English artisan has been employing physical force to the same end. Which would be the permanent gainer in the long run, if the same line of action should continue at home and abroad, it needs little foresight to discover.

I fear that few of our English artisans fully appreciate, even now, the value of a theoretical knowledge; that being, really, in a multitude of instances, the only advantage, and perhaps a very slight one in degree, which their employers possess over them.

That the mental training of adults abroad is not a system of yesterday is obvious from the length of time some of their 'Culture-Unions'—as, for example, that at Elberfeld—have been in existence; and these have not alone trained the working man himself, but, by showing him his own defects, have made him all the more anxious that his children should be early reared in useful knowledge."

The Art of Garnishing Churches at Christmas and other Festivals. By EDWARD YOUNG COX, Southampton-street, Strand. Second edition.

Mr. Cox has added a number of illustrations which increase the value of his book to those who need it. This sort of thing may be carried much too far,—in fact, is often carried much too far. Still, when it is done it may as well be done tastefully as not, and this book supplies many useful suggestions.

Cassell's Magazine, vol. iv.; *The Popular Educator*, vol. iv.; *Cassell's Book of Birds*.

The bound numbers for the year of *Cassell's Magazine* make a very entertaining and handsomely illustrated volume. It includes two complete novels, "For Her Sake," and "Baffled, or Michael Brand's Wrong." Part I. of the new series contains the opening chapters of a novel by Mr. Wilkie Collins, "Man and Wife," besides a considerable amount of other amusing reading. "The Book of Birds" just now commenced by the same publishers, is an adaptation from the German of Dr. Brehm, by Mr. T. Ryder Jones, F.R.S., and promises to be a complete work on ornithology. It is fully illustrated, and has good coloured plates.

The Timber Trades Price Book. By W. RICHARDSON, Accountant. London: Longmans. 1869.

The author of this volume is an experienced calculator, and has prepared other little works of a similar kind. The present one comprises eight useful tables, with a very few illustrations by way of explanation.

VARIORUM.

"The Parks, Open Spaces, and Thoroughfares of London." By Alexander M'Kenzie, Landscapist Gardener. London: Waterlow, printers, London-wall. The author, in the course of his remarks, points out various desirable improvements, such as we have ourselves occasionally brought under notice. To illustrate the wealth of London in open spaces, Mr. M'Kenzie thus shows their collective extent, as regards the parks and commons, also not forgetting the squares and gardens, disused burial-grounds, &c.

"The parks may be enumerated as follows:—

	Acres.
Hyde Park, containing.....	380
Kenington Gardens	290
St. James's Park }	154
Green Park }	154
Regent's Park	493
Victoria Park	293
Battersea Park	336
Greenwich Park	174
Finsbury Park	100
Southwark Park	50
Total.....	2,061

[Then there are Bushy Park and the gardens of Hampton Court Palace, as well as the great extent of Richmond Park.]

Next to the parks, the commons in the suburbs of London require attention; and it is satisfactory to feel that the necessity of restoring these has been so strongly manifested, especially with reference to the threatened invasion of Wimbledon Common, that there is little reason to apprehend any serious interference with them. The principal of these are,—Clapham Common, Tooting Common, Wandsworth Common, Wimbledon Common, Barnes Common, Peckham Eye, Blackheath, Hampstead Heath, Hackney Common and Downs, London Fields, Epping Forest. If proper steps are taken to ensure the preservation of these for public use, a benefit will be conferred upon the future generation, which it would be difficult to over-estimate."

—"Five Hundred and Seven Mechanical Movements." By Henry T. Brown. London: Tribbun & Co., 1870. The author, of this curious and interesting volume is the editor of the "American Artisan." He shows, by engraved illustrations, and very brief descriptions, all those mechanical movements which are most important in dynamics, hydraulics, hydrostatics, pneumatics, steam engines, mill and

other gearing, presses, horology, and miscellaneous machinery. The examples are said to include many movements never before published, and several which have only recently come into use.—"Self-Government for London." By Charles Buxton, M.A., M.P. Published by the Metropolitan Municipal Association, 209, Piccadilly. Mr. Buxton here gives, in the form of a letter to the Home Secretary, the leading ideas on which he conceives a constitution for London should be based. He wishes to stimulate, so far as he can, the action of the Government in preparing, without needless delay, for the creation of a constitution for the metropolis; to enforce what he is persuaded are the two leading ideas upon which any such Constitution should be shaped, viz, that,—

"I. For the administration of all her great metropolitan affairs, the whole of London should be formed into a corporation, on the usual model, with a lord mayor at its head.

II. For all minor local purposes, the ten Parliamentary boroughs already existing should be raised to the condition of municipal boroughs, each of them with an organization of whatever kind may be thought most appropriate, but complete for the management of its separate affairs."

Miscellaneous.

The Inventors' Institute.—The first meeting of the eighth session of this society has been held at the rooms of the Institute in St. Martin's-place. In the absence of the president, Lord R. Grosvenor, M.P., the chair was taken by Mr. Hume Williams, who briefly opened the proceedings. The inaugural address was delivered by Mr. John Inray, C.E., and had special reference to the contemplated reform of the patent law, and the action to be taken by the Inventors' Institute with reference to the subject during the forthcoming session of Parliament. The paper opened with a review of the work which had been performed by the Institute during the last session. Mr. Inray did not for a moment attempt to deny that the existing patent laws are full of faults and injustices. The mission of the Institute he represented to be to promote a root-and-branch reform of those laws, and he maintained that the rights of invention ought to be as clearly defined and as firmly established as those of property, capital, or authorship. The council, he announced, has ready a Bill for the attainment of these objects; and unless their action is anticipated by the appointment of a committee of the House of Commons, they will present it to Parliament next year. At the close of his address Mr. Inray dwelt emphatically upon the importance of this question to the working classes, among whom were to be found many inventors; and the same topic was raised in the remarks with which the chairman opened the discussion which followed the reading of the inaugural address. Mr. F. W. Campion moved a resolution approving of the Bill prepared by the council, and requesting them to take steps to introduce it into Parliament next session. This was seconded by Sir W. Pothergill Cooke, and after some conversation was unanimously agreed to.

Destruction of a Cathedral by Fire.—On October 1, Christ Church Cathedral, Victoria, British Columbia, was totally destroyed by fire. The fire was discovered at the south-east corner, near the chancel, and the entire building was wrapped in flames in an incredibly short space of time. The font, iron safe (containing the church plate), and chancel furniture, were rescued. The organ was carried out in sections, and piled on the rocks, but the damage caused in this operation has made its value now but nominal. The whole of the interior of the edifice became a mass of seething flames, which soon burst through the roof. The bell, in falling, crashed through the building to the ground. Shortly after, the roof of the main building fell in, and that of the aisles soon followed. The walls next gave way. The construction of Christ Church was begun in 1856, and the building was completed in 1856. In February, 1861, a fire broke out in the roof, which was extinguished with slight loss. In 1862 and 1863 important additions were made to the building. No light had been used in the church for several days, and no fires had been lighted in the stoves since April last. Incendiarism is suspected. Unfortunately the insurance was only for 500l. It has been resolved to endeavour to build a permanent edifice, worthy of being the cathedral of one of the most promising of the British colonies.

Stoke Town-hall.—The assembly-room at the Town-hall, Stoke-upon-Trent, has been reopened, after undergoing a transformation. The expense amounted in all to about 150l. The decoration of the hall was done by Mr. Gee, of Stoke, and the alterations and enrichments were carried out under the superintendence of Mr. C. Lynam, architect. The entrance to the hall have been improved, a stage with footlights has been substituted for the former heavy orchestra, all draughts have been cut off, and a warming apparatus has been introduced. The style of the decorations is Neo-Grec, combining the severity of ancient Greek art, with the varied colouring and richer detail of the Renaissance. Round the room runs a coloured dado of a somewhat Pompeian character, forming a broad basal band, which unites the several portions of the architecture. The pilasters which support the cornice have their lower portions decorated with Greek ornament, whilst the upper are picked out in vermilion. The cornice bears upon its frieze diaper panels in gold. Above this is a deep Cove, whose concave surface carries the eye upward to the designs adopted for the ceiling. The principal staircase has been coloured, and the gaslights are supported by bronzed figures manufactured by the Coalbrookdale Company, whilst copies of Copeland's Parian busts of Juno and Adrians have been introduced on the landing.

Leavesden Woodside.—The Poor-law Board propose to relieve the guardians of St. Pancras from the new school buildings and land at this place, to annex the parish of St. Pancras to the Central London School District, having its school at Hanwell, and to arrange with some other parish in want of school buildings to take the property. The guardians of St. Pancras have expressed their concurrence in this proposal. Mr. Mann, the contractor for the building, having barricaded that part of the ground where the drainage works were to be executed, the guardians have directed Messrs. Killingback & Radley to suspend the execution of the drainage works for the present. Mr. Mann has offered to the guardians to allow the drainage works to be proceeded with on condition of their granting him an extension of time of three months to complete the buildings, and to indemnify him against any damage done to the building in the execution of the drainage works. The guardians have given Mr. Mann notice to complete the works by the 3rd of April next, according to the terms of the contract. The guardians have expressed their determination to push on the completion of the buildings with the utmost expedition.

The Oratory of St. Gwithian.—A word for the preservation of this very ancient relic is given by the *Cornish Telegraph*. It lies on the right side of the road leading from Gwithian to Codrevy, and about 200 yards in from the road. It seems, from the road, just like an ordinary mound of sand, overgrown by grass; but the four walls of this ancient building still exist. It stands east and west, and the form of the chancel is quite preserved. The walls of this ancient place, which carries us back, it is believed, to the fifth century after Christ (having been built by the British long before the conquest of this part of England by the Saxons), are constructed in the same way as those of St. Piran in the sands (Perranzabubo), with rough stones of all sorts and sizes, put together without mortar. The whole of the interior of the building was at one time excavated, showing the inside of the building, of course without roof. A recent visitor to the spot found one part of the northern wall fallen in, as he thought from the pressure of the sand from outside. He found the whole spot in a very unprotected and desecrated condition. If it were railed in it would be secured from cattle, &c. If something be not done soon it will be too late, and the loss, like that of Trewhella Crose and other old relics of Cornwall, may be regretted, but never replaced.

The National Education League.—A public meeting in favour of the National Education League was held in the hall of the Hartley Institution, at Southampton, on Friday, the 19th, when the following resolution was passed, viz.:—"That this meeting desire to express its hearty approval of the general objects of the National Education League and all the means by which it is proposed to attain them; and the friends of education here present hereby pledge themselves to use their best endeavours to promote the success of the League in this town and neighbourhood."

Mechanico-Chemical Ventilation of Hospitals, &c.—Can a circumscribed atmosphere, vitiated by the respiration of an animal confined in it, be rendered normally pure? Chemistry furnishes a certain reply—it can. That is to say, the generated carbonic acid being absorbed, and an amount of oxygen added proportionate to the quantity existing in the carbonic acid. The *Engineer*, in writing on this subject, says:—"We have no hope that the scheme of mechanico-chemical ventilation can, or at least will, be applied to ordinary dwellings. Not only would the cost be too great, but the necessary mechanical and chemical conditions would be wanting. We can see no reason, however, that should debar its application to hospitals and sanitariums, and possibly to barracks and prisons. [Surely workhouses would be as readily ventilated on this principle as prisons? Why should prisons be preferentially suggested?] To take an extreme case. Let the proposition be to ventilate a fever ward, in a situation where fever is endemic, to ventilate it with pure normal air. Surely there should be no difficulty in pumping the necessary supply of air through cream of lime, to effect separation of carbonic acid, sulphurous acid, hydrochloric acid and aqueous vapour; then through oil of vitriol to effect separation of ammonia. The result would be air almost chemically pure, so far as the chemical agents specified are concerned; and probably the fever miasm would also have been eliminated. In certain cases, it might be thought desirable to medicate the injected air—to charge it with ozone, for example. This, again, could readily be done in a way we need not stop to particularise.

Proposed Bridge over the Ouse.—A public meeting has been held at Calwood to consider the projected bridge over the river Ouse, at this place. The chairman said Mr. Hodgson, the engineer, had surveyed the site of the proposed bridge, and had prepared an estimate of the probable expense, which was 6,339r. 8s. Messrs. Pease & Hutchinson, Darlington, had also furnished an estimate of the cost, which was below that of Mr. Hodgson's, but this did not include sundry expenses connected with the scheme, which were embraced in Mr. Hodgson's calculations. It was resolved that three gentlemen should be chosen as trustees. Mr. Noble explained that the 6,000l. capital was proposed to be raised by 600 shares of 10l. each; 1l. to be paid on allotment, and 2l. on the 1st of January next. It was arranged that the tolls should not exceed those charged at Selby Bridge. Upwards of 2,000l., representing 200 shares, were subscribed at the close of the meeting.

Relapsing, or Famine Fever.—At a meeting of the managers of the Metropolitan Asylums Board at Spring-gardens, on Saturday, November 20th, Dr. Brewer, M.P., in the chair. After the disposal of the ordinary business of committees, the especial attention of the managers was called by the chairman to a report from the special committee on the subject of the provisions to be made for the outbreak of relapsing fever in and around the metropolis. The result is that the recommendations of the report have been adopted; and the Fever Hospital authorities will accordingly erect a temporary hospital in their grounds, to be rented by the Asylums Board, and to be ready almost immediately for 60 patients. The rate at which the fever increases, however, forbade the managers to rest there, and a temporary hospital will be erected at Hampstead, which can be extended and fitted up for 60, 120, or 180 patients, if requisite. The Hampstead hospital can be erected in thirty days.

A Bridge Washed Away at Carlisle.—Recently a violent storm of wind and rain prevailed in the neighbourhood of Carlisle. This continued downfall of rain soon told on the rivers Eden and Caldew, and both rivers overflowed their banks, and hundreds of acres of land near both rivers were submerged to a great depth. At Cummersdale, a strong wooden bridge spans the Caldew, and during the night this bridge gave way under the force of the torrent, and was carried off bodily.

Social Science Association.—At a meeting of this Association, held at the Board-room, Adam-street, Adelphi, Mr. G. W. Hastings, president of the Jurisprudence Department, delivered an able address, in which he reviewed the discussion at the Bristol Congress "On the Relation between England and her Colonies." A discussion ensued, which was adjourned.

Plumbing for Calcutta.—The Justices of the Peace for the town of Calcutta are inviting the attention of manufacturers and others interested in the supply and erection of house-fittings for a supply of water on the constant-service system to the large field for the sale of which the Calcutta Water Works will afford at the commencement of next year, when the new water supply, under pressure, will come into practical operation throughout the whole town. The drainage works, in an important portion of the town, are also so far advanced as to admit of the introduction of water-closets and sinks in connexion with the new water supply. The Justices' agent in England is Mr. Philip Wall, of Victoria-chambers, Westminster.

Paddington Almshouses.—It may be worth noting, for the use of future topographers, that these almshouses were commenced to be pulled down on July 4, 1869, to give place to five shops which are to be built on their site. They consisted of eighteen rooms, being intended originally for eighteen inhabitants. Latterly, however, each occupant had two rooms. On the front of these houses was a large stone with the following inscription on it:—"These Almshouses were built A.D. 1714, at the expense of the Inhabitants for the Poor of this Parish past their Labour. Robert Cromwell, George Clackie, Churchwardens."

Exhibition of Old Masters.—It is very satisfactory to know that the Royal Academy intends to hold an Exhibition of Ancient Masters, together with a selection of the works of Stanfield and C. B. Leslie, during the months of January and February; prompted by a feeling of the loss to art in consequence of the abandonment of the Exhibition of Ancient Art formerly held under the auspices of the British Institution. But this in no degree excuses the managers of the Institution for what must be considered little less than the betrayal of a public trust. What do they intend to do with the large sum of money they have in hand?

Proposed Mechanics' Institute and Public Rooms for Manningham.—At a recent local public meeting arrangements were made for the appropriation of the site of the building now in trustees' hands, and heretofore occupied by several religious bodies for places of worship and schools. The site and buildings will be sold to the promoters of a Mechanics' Institute, who propose erecting a large room for public meetings, religious services, &c., and a news-room, library, class and other rooms.

Westminster Abbey.—A correspondent says that some recent excavations at Westminster Abbey have revealed the ground-plan of an old building that formerly stood just within the angle formed by the junction of the north transept with the nave, externally. The outline of the stone walls thus laid bare runs due east and west for about 60 ft. There are steps leading apparently down to a vault, and smaller steps that led apparently up an octagonal stair-turret. Amongst other remains is a stone sarcophagus, with a leaden coffin within, which has not yet been opened.

Opening of the Southern Thames Embankment.—The southern portion of the Thames Embankment was formally opened on Wednesday last by the Metropolitan Board of Works. The members of the Board assembled at the office in Spring-gardens, and thence proceeded to the Surrey side of Westminster Bridge. They then passed along the embankment, headed by Sir John Thwaites, chairman of the Board, to Lambeth Church, where they were joined by the members of the Lambeth vestry.

Lime-street Hotel, Liverpool.—In our remarks last week on this building, wherein we state the masonry is in every respect admirable, we might have added (we are told) that Messrs. Roberts & Robertson were the builders, Messrs. Howarth & Clydesdale their foremen; and that it was done under the superintendence of Mr. C. Tate, clerk of works. This information had been already given, we believe, in our pages, but we will not object to repeat it.

Statues.—A statue of the late Mr. Peabody is to be erected at Baltimore at a cost of 150,000 dollars.—It is intended to place a statue of the late Earl of Derby in the Carlton Club.—Hiram Powers, the well-known American sculptor, has nearly finished an "Eve," which some connoisseurs think the best thing he has yet done.

Opening of New Music Hall, Derby.—The new music-hall, erected in Princess-street by Messrs. Harris & Cant, has been opened. At present the building is in an unfinished state, but when completed it will be capable of accommodating upwards of 2,000 persons. The foundations consist of brick and stone, carried upward by woodwork, and covered by a roof of corrugated iron. The entire length is 120 ft.; width, 66½ ft., and the height between 59 ft. and 60 ft. The stage is 46 ft. long by about 32 ft. wide, and is fitted with every requisite appliance, retiring and dressing rooms lying to the side. The proscenium is lofty; and the act drop and scenery were painted by Mr. D. Bosco Hughes, of Birmingham, and Mr. Thos. Cbinn, of Manchester.

Ship Ventilators.—A plan, invented by Mr. William Chambers, has been published, with illustrative diagrams, in *Scientific Opinion*. It is called a self-acting ventilator, and is said to be applicable in every case where a current of air exists or can be created; and the same effect is produced whether the air blows at the rate of twenty miles an hour into the mouth of the ventilator when it is standing still, or whether the ventilator passes, as the ship moves, through the still air at twenty miles an hour. The air enters the large mouth of a pipe, and can only escape through the small end with great force into a larger pipe; there it drives out the foul air escaping from the chamber, to be constantly filled from below, at a rate proportionate to the quantity of air received into the month.

Trade Fixtures.—The Court of Exchequer Chamber has affirmed the decision of the Court of Exchequer, in the case of *Climie v. Wood*, holding that trade fixtures annexed to the freehold for the more convenient use of them, and not to improve the inheritance, and capable of being removed without any appreciable damage to the freehold, pass under a mortgage of the freehold to the mortgagee. The decisions which establish that a tenant may remove trade fixtures are inapplicable as between mortgagor and mortgagee.

The German Gallery, Bond-street.—This gallery is at present occupied with 283 sketches in oil, by Mr. W. W. Warren, recently taken in Rome, Naples, Venice, Corsica, and elsewhere. They show great facility and much skill in seizing salient points so as to convey similitude, but they are over slight, as it seems to us, for public exhibition. The artist revels greatly in beds of flowers, which he represents with considerable effect.

Novelties in America.—A loom is now on exhibition in New York, which is capable of weaving cloth 6½ yards in width; also a centrifugal pump, which has the power of raising in one minute not less than 25,000 gallons of water. From the granite quarries of Mouson, in Massachusetts, there was recently taken a slab 350 ft. in length, 11 ft. wide, and 4 ft. thick, measuring altogether 15,440 cubic feet, and weighing 1,283½ tons.

Gloucester.—A new school in Milbrook-street, a remote part of the St. James' district, in the rapidly-growing neighbourhood of the new Wagon Works, has been opened. It is a brick building, internally whitewashed, and having a class-room above and one below, with all the usual offices, and capable of holding considerably more than a hundred children. The cost was 450l. Mr. Ashbee prepared the plans, and Mr. Mann was the builder.

Landowners' Progress.—It is stated that the late Earl of Derby has left behind a fortune of 190,000l. a year. When his lordship succeeded to the estates they were said to be worth 60,000l. a year; and the great increase is attributed to the wonderful extension of factories in Lancashire, and the consequent enormous increase of buildings.

TENDERS.

For additions to the Maidstone Union House, Mr. Martin Bulmer, architect. Quantities by Mr. G. Rack—	
Herding	£4,500 0 0
Stumps (executors)	3,000 0 0
Hayward	2,946 0 0
Vaughan	2,300 0 0
Davis	2,815 0 0
Chubb	2,739 0 0
Poole	2,723 0 0
Ansell	2,683 0 0
Wood	2,658 0 0
Miler	2,635 0 0
Solitt & Abbott	2,625 0 0
Martley	2,619 10 0
Wallis & Clements (accepted) ..	2,537 10 0

The Builder.

VOL. XXVII.—No. 1400.

Researches upon the Strength of Materials employed in Modern Systems of Building.



are in receipt of the second and concluding volume of Mr. Bindon Stoney's work on strains in girders and similar structures.* The publication of the first part of this treatise some three years since, it may be remembered by some of our readers, received at the time a passing notice in our columns.

The work in its complete form appears likely to prove so important a contribution towards the elucidation of the science and practice of construction that we are inclined to consider that the present volume, from the elements of which

it treats, puts forward claims to somewhat fuller notice.

Although so long an interval may be regarded by some to have elapsed before the appearance of the concluding portion of the work, when the wide range of authorities to which the author has had occasion to make reference is noted, and the nature of the inquiries incident to such a work is borne in mind, it will no doubt be admitted that time would be necessarily occupied in the production of such a volume as that which is now before us.

It appears at an opportune moment, as a want has long been asserting itself, not less on the part of the general public than in professional circles, with reference to the comparative safety and durability, as well as cost of modern engineering and architectural erections. More particularly may this, perhaps, be said to be the case in regard to compound structures in which iron and other materials may have been extensively employed.

A theory has sprung up of late years which has been by many considered favourable to the application of iron to building purposes largely in conjunction with the ordinary practices of architecture. Since the introduction of this system, however, the theory of construction itself would appear to have become so widened by successive changes in the manufacture and preparation of building materials, more especially of lately added elements, that former investigations into the strength and properties of materials, have in some instances become more or less valueless and inapplicable. Unlike a somewhat similar treatise to that which is now under consideration, which was issued by Mr. Clark, and founded upon the construction of the Conway and Britannia tubular bridges,

the conclusions which have been arrived at by the author of the present volumes are not alone based upon such features as might have been observable during the erection of any particular undertaking, but in addition embrace the opinions of many well-known authorities who have treated of some of the questions which are involved. The treatise upon the Anglesea and Carnarvon Bridges has long been regarded as an authority of rank, owing to the circumstance that many of the assertions which it embodies could be referred to actual experiments which were necessitated in carrying out the undertakings of which the work treats. The value of Mr. Stoney's work, independently considered, may be inferred, when it is remembered that in a single span of 460 ft. of the Tubular Girder Bridge, between Holyhead and Anglesea, no less a quantity than three thousand tons of material is employed, while in other structures which serve a like purpose the desired objects have been accomplished with less. Notably we would refer to the late Mr. Roebling's bridge over the Niagara Falls, in America, a structure which is, as well known, used for purposes of locomotive passenger and goods traffic, and yet comprises within a single span of 820 ft. only one thousand tons of materials, and of this quantity more than one half is timber. The scope which, by such a contrast alone, would seem to be afforded for a more economical adaptation of material than that which obtains in English practice, might be considered to justify the researches into which Mr. Stoney has been led in these volumes, and we would have been far from displeased to have observed a reference to the comparative cost, style, and weight of such undertakings as executed in England and elsewhere, notwithstanding the prejudicial reflections to which such an inquiry might be calculated to give rise.

The question of the weight of materials demanded in the erection of bridges was, we believe, first sought to be experimentally realised in this country by Mr. Peter Barlow, whose standard investigations upon the strength of materials are frequently referred to in the present volumes. Although, contrary to the predictions of the moment, considerable success has attended the erection of the Niagara Railway Suspension Bridge, the system upon which it is constructed would not appear to have largely recommended itself for adoption. Numerous cast-iron railway bridges have recently been erected over the river Thames, and in some instances the question of level has, at great additional cost, been seen to have been subordinated to the requirements of an arched structure. A more extensive application of the Niagara Bridge system has been lately employed in the designs of a grand bridge over one of the American rivers, and we believe that it has long been an object, on the part of Mr. Peter Barlow, to introduce a somewhat similar class of suspension bridge into the domain of engineering science in this country. It is well known that the present Lambeth Bridge embodies a most important series of investigations as to the cost and stability of bridge accommodation, and that Mr. Barlow made a special journey to inspect the Niagara structure before this experiment was attempted. The longitudinal stiffening of the Lambeth Bridge is of iron, while in Mr. Roebling's design it is of wood. The question as to the desired rigidity in such structures mainly resolves itself into the dependence which may be placed upon the nature of the materials to be employed. Prior to the application of iron in the form of wire cables in suspension structures, it is well known that English engineers regarded with much diffidence the continuity of certain qualities in iron throughout great lengths, either in the form of girders, suspension links, or laminated bands. This doubt yet largely prevails, and some important

evidence is adduced in reference to these points by Mr. Stoney, which is likely to engage considerable attention in the professions of engineering and architecture.

We are led to infer that the author is in accord in a certain measure with Mr. Barlow as to the magnitude of practicable spans upon the suspension principle, and that this object would be chiefly likely to be attained where the inherent defects attending the application of iron in ordinary forms may be avoided. So far, up to the present moment the economical appliances of iron in the erection of bridges of large span would appear to be discovered in cases where that material has been employed in the form of continuous twisted wire ropes. In view of the future erection of any large railway bridge, say for instance, over the Mersey, uniting Liverpool and Birkenhead, a project which has been long contemplated; or, in the event of the necessity arising for the maintenance of the connexion between Holyhead and Anglesea, should the existing means fail, the practicability of the suspension system as seen to be successfully carried out in America will necessarily claim further attention and research.

Mr. Stoney's references to the experiments of Mr. Kirkaldy, which are given in a valuable tabulated form in the body of the work, are in no way calculated to reassure us as to the advantages which would be likely to attend a too unguarded employment of iron and cognate materials in architecture. It has been demonstrated that regard must be paid to architectural requirements in cases where iron may be proposed to be employed as an auxiliary material, and many results tend to prove that in this respect the tentative science of engineering must be held subordinate to the better founded and established laws of architecture.

Mr. Stoney observes that when an imperfectly elastic material has received a permanent set from the application of any weight, which is subsequently removed, the material becomes more perfectly elastic than before within the range of strain which first produced the set, and its alteration of length per unit of strain is less than at first. For practical purposes the author asserts that the limits of elasticity in wrought-iron does not exceed twelve tons per square inch; and though higher strains than this may not in the least diminish its ultimate strength, yet they will take the stretch out of it, and this may render iron which was originally tough and ductile so hard and brittle as to be seriously injured for many purposes. It is, in our opinion, to the injudicious tests to which iron is occasionally subjected, that many cases of rupture may be attributed in that material, and possibly many instances of disastrous boiler explosion. The extreme facility with which the tensile strain and compressive resistance of iron may be regulated has almost rendered the employment of that material at length dangerous, especially in conjunction with materials of dissimilar properties.

Iron may be made to pass through so many grades of deterioration in its manufacture without readily indicating the processes to which it may have been subjected without actual strain or fracture, that the tendency of home and foreign competition, coupled with the facilities to which we have referred, has resulted in bringing the production of that article in England in some directions to a discreditable level. It would appear that the tensile properties of iron may be retained over a wider range of cheap contamination than some of its other properties, and many of the qualities of iron now usefully employed in building are imported from abroad.

We notice with interest that in connexion with the theory of strains in girders and similar structures the imperfections which are most commonly to be met with in the materials which are adverted to, are viewed with that importance

* The Theory of Strains in Girders and similar Structures; with Observations on the Application of Theory to Practice, and Tables of the Strength and other Properties of Materials. By Bindon B. Stoney, B.A., Member of the Institution of Civil Engineers, and Engineer to the Dublin Port and Docks Board. In Two Volumes, with Illustrations. London: Longmans, Green, & Co. 1869.

which this branch of the subject deserves. There could not, perhaps it may be said, be found in any publication extant a more masterly exposition of the general properties of iron than is to be met with in this volume. No review of a work of this kind could probably do full justice to its contents, for, being mainly intended for the instruction of engineering students, and for guidance in the varied elements of constructive science, it would be attended with difficulty to single out for especial remark any particular branch of which it treats. We do not remember, however, in any similar work which has come under our notice to have observed the question of connexions in iron so treated of as in some portions of the later volume, more particularly under the heading of appliances for connecting ironwork, pages 351 to 370. A perusal of the first 265 pages of vol. II. would well repay the attention of architects and builders, being composed more particularly of a treatise on compressive resistances in bodies of brickwork, stone, iron, and various classes of cements, as well as including the action of cements and binders' materials under tensile and lateral strains. This feature of the work, in view of the recent incident at the Holborn Valley Viaduct, is entitled to especial attention.

Quoting some experiments of Mr. Clark, in relation to the action of stone under compression, the author says that in the instance which he refers to, "the sandstones gave way very suddenly, and without any previous cracking or warning. After fracture, the upper portion generally retained the form of an inverted square pyramid, very symmetrical, the sides hulging away in pieces all round. The limestone formed perpendicular cracks and splinters a considerable time before they crumbled."

It will be borne in mind by many that this description represents nearly the order in which the fractures in the Farringdon-street columns would seem to have been generated. We hope, however, these are not so extensive in the mass as might be inferred from the external appearance of the columns. Continuing from this portion of the work, Mr. Rennie observes, "it is a curious fact, in the rupture of amorphous stones, that pyramids are formed, having for their base the upper side of the cube next the lever, the action of which displaces the sides of the cube precisely as if a wedge had operated between."

The features which have presented themselves in the visible lines of fracture upon the polished facets of the Holborn Viaduct columns, appear so to approximate to what might have been anticipated from the experiments which are described in this portion of Mr. Stoney's work on the theory of strains, that we view the occurrence with a regret which no assurance with which we have yet been inspired has diminished to the extent that could be wished.

The importance of such a treatise as that which Mr. Stoney has at length produced in the hands of the pupils of modern engineering and architectural establishments cannot well be overrated.

In concluding the observations which we have been led to make upon the perusal of the work, we would note the singular lucidity of the arrangement of the letter-press and the novelty of the illustrations which is displayed. As an example of the clearness and simplicity for immediate reference with which works of a similar character may be contrived, it may claim to possess several features well worthy of imitation.

In the absence of that special education which is supplied in engineering schools and colleges on the Continent, many of our apprenticed students are left to acquire the elements of their profession at *par-bazard*. It is impracticable that any engineer or architect of reputation could advance by personal instruction the number of pupils which may be found in the leading offices, and the progress of younger members of the profession is consequently narrowed, and mainly dependent upon such facilities of observation and imitation that they may chance to possess.

Mr. Stoney's work lends a ready key to the more abstruse elements and problems of constructive science; and it is sufficient to bear in mind the length of time over which the author's labours have extended in his prodigious reach to the conclusion that the work may have been written with other objects than those of pecuniary gain or contemporary praise.

It cannot fail to be regarded as a valuable accession to the literature of applied arts and sciences, and in its more especial direction should take a foremost rank.

THE LIGHTHOUSES OF THE BRITISH ISLES.

The Trinity Board.

SCATTERED notices have appeared from time to time, in the periodicals of the day, of some interesting particulars as to engineering and other works in connexion with our lighthouse system; but the topic is so peculiarly attractive to the "gentlemen of England who sit at home at ease," that we propose to lay before our readers a general sketch of the whole arrangements for the illumination, if we may so call it, of our British coasts.

The genius of the nation is prominently distinguished for its voluntary enterprise, as distinct from Government control: witness the Lifeboat Institution; up to the present time a private society supported by the liberality of the public. The lifeboat is the last hope of the wrecked sailor, when the winds and waves are doing their worst; and surely one of the sublimest forms of charity is that which saves our mariners from the last danger of the vasty deep.

With this, however, at the moment, we have not to do; our subject is what may be called the previous question. The lights that show the dangers of our rock-bound coasts are the most important agents in carrying out the wish that used to be expressed in homely terms upon our bills of lading, and so God send the good ship to her port in safety.

Who builds our lighthouses, and how are they maintained? Whence come the requisite funds? What is the construction of the lighthouses? and what are the lights themselves? are questions in which we, as the first maritime nation in the world, should, and do, feel the deepest interest.

Pharosology, the modern term for the science of lighthouse building and lighting, remained, up to the commencement of the present century, nearly in the same state as it had been left by the Romans a thousand years ago; but since then it has made rapid strides. The celebrated Cordouan tower in the Bay of Biscay, completed in 1611, may be called the first of modern lighthouses, as indeed modified by successive improvements it probably still remains.

The Eddystone, off Plymouth, familiar to us by Smeaton's celebrated work, was perhaps the next of note. It was completed in 1759.

The next great rock lighthouse of modern times was the Bell Rock, on the east coast of Scotland, built by Robert Stevenson in 1810, from which date improvement and development have been rapid and various, both in the erection of the towers and the method of lighting.

And first, as to the question of who builds our lighthouses, we answer, the Trinity Board of Deptford Strand; and a few words as to their constitution and functions may not be out of place. They are a chartered corporation, dating back from Medieval times, their various charters, of which we have record, having been granted successively by Henry VII., Henry VIII., Edward VI., Elizabeth, James I., and Charles II., and under these charters their powers were exercised, and their sphere of action developed, until, by the Mercantile Marine Act of 1854, a certain jurisdiction was given to the Board of Trade, and some important alterations took place in the financial arrangements.

The powers of the Board extend to buoys, beacons, and sea-marks, as well as lighthouses, though probably the last exceeds all their other functions in interest and importance. Charters, from Magna Charta downwards, have been granted by the Crown for various objects of public weight or private interest as long ago as any record has been kept in any archives; but probably this is the sole instance of a private chartered corporation, for that was its original character, still at the present moment discharging, and that efficiently, though subjected to the most searching investigation, the very duties for which it was originally constituted in the dark ages of our history.

One of the records of the early renewals of the charter, date of Charles I., contains a characteristic comment as to what may be called the popular element in its earlier constitution, in the following remark from the well-known pen of Pepys, of the "Diary," the first master of the corporation,—"That the number of younger brethren could not be too great, that mariners are the strength of the nation, that every one has a right to be a brother, and that if there were 4,000, it would be more for the king's service than 400."

Our City companies, chartered as they are, have now entirely lapsed from their original

vocations, and remain still noble institutions but confined in their daily work to social, charitable, and, in a minor and indirect way, political objects.

The greatest, probably, of chartered companies, the old East India Company, has only lately, as we may say, been absorbed into the Government of the country; but the Trinity Board, earlier in its institution than most of these, has survived them all, and is still doing its legitimate work, and doing it well.

In its present form the Board is self-selective, and pre-eminently nautical in its character. The younger brethren correspond to the livery of an ordinary company, and the elder brethren represent the court, consisting almost entirely of captains who have had the command of vessels for a number of years.

It will be readily seen that a vast mass of actual practical knowledge of the special requirements for lighting our coasts must be at the command of a body of men thus constituted.

The whole of the executive business is transacted by the elder brethren, subdivided into various committees, though certain special matters must be submitted to the approval of the whole body, e.g., the erection of a new lighthouse. Some few years ago, this particular point was made a subject of popular investigation, or, we might almost say, suffrage. The inhabitants of the district were carefully canvassed, and it was only on presentation of petitions, signed by what was deemed a competent and sufficient majority, that the erection of a lighthouse, and, of course, the imposition of the consequent dues, was determined upon. The predominant authority of the Board of Trade, however, has much modified this course during the last few years, and the matter now rests much more entirely with the central authority.

The Trinity Board are the authorities in England, subject to the Board of Trade. In Scotland, there is a separate Board, "The Commissioners of Northern Lighthouses," always to a certain extent in union with the Trinity Board, though not incorporated with it. The same duties are discharged in Ireland by the "Commissioners for Irish Lights."

Local and harbour lights are also under the particular superintendence of the authorities of the port or harbour where they are situated, under the general superintendence of the Trinity Board, and these different authorities throughout the United Kingdom exceed 150 in number.

As in the case of most original charters, a sort of monopoly was the foundation of the grant, i.e., a right granted by the crown to erect lighthouses, with power to charge upon the vessels using those lights a regulated toll. For many years this right was conceded to private individuals, as well as to the corporation; and there were many private lighthouses, each with its special radius and particular dues, thus erected,—much of the nature of a toll levied upon a road for improvement or otherwise.

In 1836, however, an Act of Parliament was passed, in view of concentrating and consolidating our lighthouse system, which gave the Board the power of buying up these lights for a compensation awarded by juries, in the way with which our late railway experience has made us familiar; and the sum thus expended by the Trinity Board was considerably over one million sterling. For the Smalls Lighthouse, at the entrance of the Bristol Channel, of which we shall give a further description, was paid the sum of 170,186l. 7s., and for the Skerries, 441,984l. 11s. 3d.

So time ran on; the lights originally granted, and subsequently purchased, were maintained by the Board, and the dues collected by tolls in the earlier portion of the period, and more lately by a carefully compiled and minutely subdivided table of tonnage, until in 1853—the last year under the old system—the outgoings of all descriptions, buildings, lights, repairs, maintenance, &c., were, in round numbers, 136,000l., and the income, 423,000l.; the enormous balance being expended partly in liquidation of the debt incurred in purchasing the lights, and partly in charitable purposes.

It was felt, when the general arrangements were revised, that the maritime community were being unfairly taxed for the benefit of the general public; and the result is, that the tonnage dues alluded to above have, within a period well within the memory of the present executive, been reduced by 50 per cent.; the object being to render the corporation self-supporting, without surplus or deficiency.

The Board has a good character. The Master (the Duke of Edinburgh) receives as nothing, and the fees of the elder brethren are little more than nominal, when their duties and responsibilities are fairly regarded.

The Lighthouses.

The total number of lighthouses in Great Britain and Ireland exceeds 400; of these, something less in number than one-half are under the direct control of the Trinity Board, the remainder being under the same general superintendence, but managed by district local authorities, under different Acts of Parliament. All the more important stations and great rock lighthouses are included in the former section; while they vary in dimensions from a simple column bearing a gas-lamp, to the famous erection of the Skerryvore, a granite tower 153 ft. in height.

The cost of three of these is as under:—

	Cost.	Height.
The Bishop Rock Lighthouse, near the Land's-end.....	36,000l.	145 ft.
The Bell Rock.....	61,000l.	117 ft.
The Skerryvore, on the west coast of Scotland.....	85,000l.	158 ft.

When a lighthouse has to be erected on an ordinary foundation, the common principles of building, of course, apply,—the weights to be carried, the height of the structure, and the accommodation to be provided, are mere matters of ordinary professional calculation. But the peculiar difficulty of constructing many of our lighthouses is derived from the fact that they are erected under circumstances of the most exceptional danger, and that the most powerful resources of engineering science have to be brought to bear to cope with unusual characteristics, either of the forces to which they are exposed or the character of the foundations upon which they are to be erected. And first, as to the forces to which they are exposed, taking the Great Rock Lighthouses as our example, the vanguards, as we may call them, of our shores, which have been gradually pushed further and further from land in the face of the enemy, the sea. The force of the impact possessed by the waves of the sea in a stormy weather is something terrific.

Mr. Thomas Stevenson constructed a self-registering instrument, which recorded the power of the waves that struck it, with the following result:—The average pressure at Skerryvore, for five of the summer months of 1843-4, was 111 lb. per square foot. The highest pressure registered during the height of winter storm was 6,083 lb. per square foot, and to this extreme power the lighthouse in question opposed a successful resistance. It may probably be regarded as the maximum pressure of the sweep of an Atlantic wave. In less exposed situations the pressure is much diminished. At the Bell Rock, in the North Sea, the highest registered pressure was 3,013 lb. per square foot.

The most exposed lighthouse in the world is probably the Bishop Rock. On the 30th January, 1860, the following incident occurred. We may say that there is a bell provided as a fog signal, which is hung more than 100 ft. above the sea-level. It weighed 3 cwt., and was hung with unusually strong iron fittings and gudgeons. On the date above named a storm wave actually wrenched the bell from its fixing; it was dashed to pieces on the rock, and a fragment was found some days afterwards firmly imbedded by the force of the storm in a crevice of the rocks.

Such are the forces that have to be overcome. We shall now proceed to give some further detail of the erections which are found efficient in resisting these influences from year to year, and their cost.

The ordinary land-towers throughout the United Kingdom generally approach 100 ft. in height, and cost from 10,000l. to 11,000l.; but there are many much less in size. The cost may be taken at an average of 8,000l.

There are forty-seven light-vessels under the control of the Board; their average cost, with the moorings complete, may be taken at 7,000l.; but their maintenance is very expensive, owing to the crew required. It may be taken at 1,100l. per annum, or about four times that of a first class fixed light. And here we may notice the introduction of pile lighthouses on shifting sands as substitutes for floating lights.

Proverbially the worst foundation for an erection is the sand. "The house that was built upon the sand" is the type of all unstable erections. How much more when that sand is a quicksand in a waterway covered at high water, and shifting with the currents.

The pile lighthouses have to be erected under

these difficult conditions, and we shall proceed to give a detail of one or more of the successful ones, as there have been instances in which they have had to be taken down, owing to the shifting or failure of the foundations. The first was erected upon the Maplin sand, off the Essex coast, from the design of Messrs. Walker & Burgess.

It is a curious fact that sand-banks, although so treacherous at their surface under the peculiar action of the water that they will gradually absorb and bury whatever solid matter is left exposed to the action of the tide, yet when the immediate surface is passed through they afford a sufficiently solid foundation for the erection of heavy structures upon piles. Indeed, of such a stubborn and solid nature is the interior of the bank that it is impossible to penetrate it with an iron har, although driven by a pile-engine beyond a certain depth; and it is in reliance upon this peculiarity that pile lighthouses are constructed.

The Maplin Lighthouse is erected upon nine piles of wrought iron, 6 in. in diameter, furnished with screws at the bottom 3 ft. across (ordinary screw pile) driven, or rather screwed, down into the sand; and this is the only foundation.

From these piles spring strong cross-braced timbers in cast-iron sockets, starting from about 2 ft. above high-water mark. The total height of the building is 36 ft. above the same level; and the upper portion consists of an octagon room 6 ft. high and 27 ft. in diameter, entirely framed in wood, tied together with iron, and encased with wood boarding; the lantern rises high above it in the centre.

The room is divided into two sleeping-berths, a dwelling-room, and store-room; and below the floor, in the angular space left by the intersection of the cross braces, are coal-cellars, water-tanks, and other necessary conveniences.

The cost of the whole was about 5,000l.; and we may here notice a peculiar instance of the action of the sea on quicksands.

When the lighthouse was built, a strong timber-framed raft was first laid upon the surface of the sand, upon which the men worked, and through openings in which the piles were driven. When the work was done, it was suggested that the raft should be left as it was, with the object of acting as a tie, and strengthening the foundation, but a curious result followed: the scour of the water lifting and dropping the raft with every wave, had precisely the same effect upon the raft as it has upon a vessel, and it gradually began to work its way down into the sand, slipping over the piles, but with this difference, however, that, being held fast in its place by the piles, the sand would not cover it, but was washed away from its upper surface. It thus gradually sank for some years, lower on the one side than on the other, until there was an open pit in the sand several feet deep, and the whole size of the foundation, raising grave apprehensions as to the security of the building.

Many hundreds of heavy faggots, with tons of chalk attached, were put in in the hope of filling the opening, but the next storm invariably swept them away.

This went on for some years, until one season the pit was so deep that a sufficient accumulation of sand gathered on the upper surface of the raft, to prevent its being again moved by the water. Once at rest, the same agent that had occasioned the damage repaired it: the wash of water filled up the pit with sand, and the top is now a level surface with the rest of the bank. The house was erected in 1840.

We must reserve the remainder of our statement for another number.

ON SOME OF THE DIFFERENCES OF STYLE IN OLD BUILDINGS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary meeting of the Institute held on Monday evening last, Sir W. Tite, M.P., president, in the chair, Mr. G. E. Street, A.R.A., read a paper "On some of the Differences of Style in Old Buildings." Mr. Street commenced by remarking that he should confine himself on this occasion to bringing before his audience some considerations as to the causes which produced the differences of style observable in

Medieval buildings throughout Europe. It was, he said, the especial glory of our national architecture that its developments are so many, so various, and so true that no one who has both zeal and brains can avoid having his enthusiasm awakened in the course of his study. The differences in style in old buildings are very great, and the result of various causes. The work of old architects owed not a little of its vigour to its variety. Each man who had any inspiration did the best he was of, and of course produced his school of followers, and the fact that so many men did this showed how infinite is the life and variety of which Gothic architecture is susceptible, always in strict obedience to the true principles upon which it was founded. Among the causes of variety the following were mentioned:—

1st. The requirements of materials, which are obviously different in districts which allowed of the use of only stone, or brick, or timber.

2nd. The influence exercised in certain districts by exceptionally gifted architects.

3rd. The spread of art-knowledge by orders of men such as Freemasons, and religious orders whose habits gave them knowledge of countries other than those in which they were for the time working, and in the course of conquest or colonisation of one country by another; and, lastly, the employment (not at all uncommon in the Middle Ages) of foreign architects.

4th. Attempts in one age to copy work done in a previous age.

The requirements of the most available material certainly played no small part in the history of architectural development. We must remember that of old an architect was almost compelled to use the material nearest to his hand; water conveyance being the only chance he had of importing the material of one district into another, and of this ample use was made, but, of course, the opportunities were rare; but in thus working in the material nearest to hand, the architect dignified his art by proving that no material which God had provided was unworthy of it. Thus it was, in the Middle Ages, a good stone country produced good masons. The country about thus became proud of their work, and gave them plenty to do; and so from age to age they produced a succession of buildings, all worthy of our admiration. It was difficult to build badly with plenty of good stone to build with. The dignity of the material was a safeguard against utter badness of workmanship, and so the best art in England and elsewhere is found nearest to the best stone quarries. Wherever stone could not be procured in the neighbourhood, there the artists did their best at once to make the most of the other materials which were available. Throughout Europe, the early architecture was the work of stonemasons, and the carpenter and bricklayer were but little esteemed; but when in the Middle Ages other materials had to be used, there arose the first opening for a difference of style, caused by a change of material. Take the case of a granite country. Go to Guernsey, where granite was plentiful, and where there was no timber to be had, and we find buildings expressly contrived to meet this state of things; and this was especially noticeable in the churches. With all their rudeness of construction in an intractable material, these Guernsey churches are full of interest and character. Having cited other examples of this kind of construction, in this country and on the Continent, where it would seem the attempt was made to construct buildings which should be as imperishable as the materials of which they were built would allow, Mr. Street passed on to the use of flint in various parts of the kingdom, by which the style of design was also affected. In flint districts, stone was also frequent, and builders who had to import their stone from the quarries at Gaen, or from some far-off part of their own country, were obviously likely to be very economical in its use, and hence those buildings were erected with as few quoins as possible.

Those whom he addressed were all aware how much the use of brick had affected the art of design wherein it had been adopted. The great fields of brick architecture were the north of Italy, the north-east of Germany, the west of France, and various parts of Spain. The development of each was different, but they all agreed in the discovery of certain properties in bricks; but they, it seemed, all agreed, that if brickwork is to be strong, it must be built with an enormous quantity of mortar; and so, instead of specifying, as enlightened nineteenth-century architects do, that "no mortar joint is to be more

The following gentlemen were elected Associates, viz., D. Robert Dale, Anglet-court, E.C.; Thomas Hill, 14, Bedford-row, W.C.; Robert Lamb, Darlington; William Smith, 1, Moorgate-street; Alex. R. Stanning, 187, Fenchurch-street; and Frederick Strauts, Christchurch, New Zealand.

than $\frac{1}{2}$ in. thick," he thought, if we could find a Medieval specification, we should find it ran in this form,—"No mortar joint to be less than $\frac{1}{2}$ in. thick." Then it came to be found that bricks might be moulded, and that if the earth were well tempered and fine, any delicate pattern might be reproduced in a hard material, which would almost defy weather. The result of this was that in most brick districts we see moulded brick traceries used and repeated all over a building, not because they were very beautiful, or because they were required, but because they existed, and had to be used. Examples of these repetitions of tracery were found all over the transepts of St. Katharine, at Brandenburg; while it was a curious fact that in Italy, France, and in Germany the use of brick led to the erection of sham fronts in front of the roof gables, the main or only use of which was to show off the variety of moulded bricks. A close affinity in cause and principle would be seen between such fronts as those of the town-hall at Lunck, the gables of the churches in and near Toulouse, and the transepts of Cremona Cathedral, whilst each was entirely independent of the other in style; and evidently their architects knew nothing of each other's work. Having referred to the curious effect of this brickwork upon stonework in the same districts, which was particularly noticeable in the buildings of Venice, the author proceeded to comment upon the change which was effected in architectural design where wood only was available for building. In the districts of Hampshire, Worcestershire, Montgomeryshire, Cheshire, and Lancashire oak timber was wonderfully plentiful in the middle ages; but in all parts of the country wooden buildings were very common, and at the present day there are a vastly larger number of Medieval domestic buildings of this material than of stone. It was worthy of notice that where oak was very plentiful, it led to important developments of design, as was instanced in the magnificent roofs of Worcestershire and Montgomeryshire, where timber of enormous scantling was available, as compared with those of Sussex and Kent, where the timber seems to have been much smaller.

On the next head of the subject, viz., "The Influence exercised in certain Districts by exceptionally gifted Architects," the author remarked that of course in the Middle Ages, just as now, there was great difference of style, and great diversity of power, in the works of various architects. As a rule, each man's work will be found in one district. Sometimes it is the cathedral which sets an example to the diocese; sometimes it is the hand of an architect brought specially for the work from a distance; but a careful examination of various works will show such evidence of unity of design and similarity of system as would enable us to classify them with the same sort of ease as we are at this day able to detect the hand of all our better architects in their various works. In support of this position the author mentioned the instance of Westminster Abbey and a small parish church at Stone, near Dartford, as affording evidence in some of the details of the architecture that the architect was the same in both structures. The same observation applied to the churches of Merstham, Chipstead, Cliffe-at-Hoo, Brasted, and Merton. Another curious case is that of Bristol Cathedral and Yatton Church. The lecturer pointed out the evidences of similar origin in the cases he mentioned, to which many others in various parts of the country were added.

Having dwelt on these points at considerable length, the lecturer passed on to remark that there remained only one other head on which he would detain the meeting, and that was the influence on style which is caused by attempts to copy in one age what had been done in some previous time. The old Rhenish architects of the thirteenth century must have purposely slant their eyes to what was going on in the Domine Royale in the first half of that century, and would not, without a struggle, give up the main features of their churches. So in such a church as that noble one at Münster Maifeld, they deliberately relieved many of the characteristics of a Romanesque church along with parts and details which showed an acquaintance with thirteenth-century Gothic. In somewhat the same way architects in Spain were building completely Romanesque churches at the very same time that, at Leon, Burgos, and Toledo, French architects, brought there for the purpose, were building magnificent churches under their very eyes of the purest and most advanced Gothic.

Then there were many cases in which we find an architect of one period trying to conform his work to that of an earlier building to which he has to add. An instance of this, he said, was to be found at St. Eluc, on the Mediterranean, near Perpignan, where there existed a cloister which at first sight one would suppose to be purely Romanesque; but, upon inspection, it was quite clear that whilst the west and south sides are of the twelfth century, the east and north aisles are of thirteenth or early fourteenth century work, copied in general outline and design from the earlier work, though natural foliage is freely introduced in place of conventional. They all knew the case of Westminster Abbey, where, with what appeared to be excellent judgment, the noble design of the earlier church was continued in the fifteenth century with so much general similarity that uneducated eyes would not detect the difference. Worcester Cathedral affords another case of the same kind, for there evidently the architect of the nave tried to make his work harmonise entirely in its lines and general design with the thirteenth-century work of the choir. The results, both at Westminster and Worcester, were not encouraging; but both designs being really full of life, and fire, and poetry, the eye feels no pain at the extraordinary discrepancies of detail where all is beautiful. But there is, perhaps, in England no example of copying so well worth study as that of the grand old Devonshire church of Ottery St. Mary, which, though evidently built late in the fourteenth century, in imitation of the neighbouring cathedral of Exeter, was, nevertheless, designed with a clear intention to hark back to still earlier examples, and to imitate many of the features of the thirteenth century. The work is so well imitated as to give the impression, until their detail is examined, that it is really the work of the thirteenth century. Their detail, however, is so pronounced as to leave no doubt whatever as to the age of the work; and this led to the observation that had often been made before, that our forefathers never knew how to copy what they saw. Some men would tell us that because they knew not how to copy what they saw, we ought not to do so either; and that every one, giving reins to his imagination, should design just what liketh him best, without reference to antiquity or precedent; in a word, that we should all take courage by the example of that wonderful Strand Music-hall. He ventured to dispute any such suggestion most energetically. We saw enough of other men's works, and knew enough of other men's studies, to know that the most original and most admirable work is that of the men who studied old buildings the most thoroughly; and he was amused to see every now and then attacks made upon their originality and honesty as architects by men who told them their works were mere compilations, whilst if they saw any of the designs of those very men in what they were pleased to call the Gothic style, they would find that they were indeed simple leaves taken out of the vulgarest book of specimens, without the slightest power even of copying accurately the work before their eyes, and still less of assimilating or fusing together with any kind of harmony the various pages from which they got their designs. The more they studied old art, the less they would want to copy it; and the only way to escape from the necessity of simply copying was to devote themselves with enthusiasm to its accurate study.

At the close of the paper, a conversation took place on subjects mooted in it, in which Mr. Seddon, Sir Digby Wyatt, Mr. C. Fowler, Mr. C. F. Hayward, and Mr. P. Anson took part.

THE SOCIETY OF PAINTERS IN WATER COLOURS: WINTER EXHIBITION.

Last Saturday, the sketches and studies contributed by the several members of the Old Society of Painters in Water Colours were privately viewed, as is customary, before the public were invited to see the display. The present exhibition is the eighth and the least interesting of the series; for, any difference that may be observable to distinguish it at all, is of a somewhat unfavourable nature. Too constant a complacent reiteration of claims to be considered, even superlatively clever, becomes fatiguing at last, let them be ever so undonible. The weather was bad; just such as must have persuaded the poorest of us, that an omnibus was one of the cheapest and dearest of blessings, for it rained with cool, dogged determina-

tion to rain as disagreeably as possible, and as if to wash out all recollection of finer days. At such a season the ideas to be associated with those more delightful natural aspects likely to be selected for an artist's sketch or study are very welcome; and it is disappointing to find so often a revised edition, in lieu of a direct transcript, that conveys more of the reality than he who instinctively apprehended it at the time can ever afterwards imitate.

However, there are many very beautiful drawings, none more so than Mr. E. Duncan's (182) "Waterfall on the River Broom, Rossire," that in spite of its exquisite workmanship bears every appearance of having been "done on the spot," like the two studies of "Whitby Scarr," by Mr. G. Dodgson (190, 198), for it would appear to be difficult indeed to represent such truth from memory. The figure subjects are either fewer than usual, even compared with the landscapes, or much less attractive. There are no chalk drawings, by Mr. F. W. Burton, whose absence is much felt in viewing the collection. Mr. F. Taylor is not so conspicuous as on some former occasions, though his heroine on horseback, petting her dogs, "Favourites," a Study for a "Hawking Picture" (170), shows more symptoms of falling off than he himself does; the horse leans dangerously forward of the centre of gravity, as sometimes horses do; neither is Mr. Carl Haag, though his contributions are numerous and he is still one of the most important contributors. "The Sheikh" (177) is an admirable study of a head, brilliantly painted and life-like; and "The Temple of Jupiter at Athens" (131), with the Acropolis in the distance, is scarcely less emphatic for colour, perspective, and effect than "The Interior of the Odeon of Herodius Atticus at Athens" (103). Mr. John Gilbert is best to be identified with two of his smaller emanations, "William III. in Battle" (391), and another capital composition of martial men and horses doing duty as "Outpost" (398) that exhibit most forcibly his great command over colour and effect. Unlike these, Mr. Walker's drawing of "A Lady in a Garden, Perthshire" (336), derives its great value from subdued colouring and a breadth of effect that never interferes with an appearance of elaborate finish, but gives a charming completeness to it; this constitutes its worth, for the lady is a perfect lady and no story-teller. Mr. G. J. Pinwell evidently has great admiration for the qualities that distinguish Mr. Walker's interpretations of natural appearances, but he will lose himself with his outlines if he follows him blindly; similar amenity of colour belongs to the description of "The Last Load" (356), but making every allowance for the diffused and confusing twilight of a warm summer evening, the many figures melting into flatness with the background are more suggestive of a fading tinted photograph than of probable reality; and these many figures are rather rapid representations of a happy peasantry, and seem to share depression by common consent. The screens usually supply the index to what the voluminous works may promise; they are rather empty on this occasion.

Mr. A. D. Fripp loves sunshine evidently, for his fisher-folks are indicative of this. The "Finished Study for a larger Work" (14) is very careful and cleverly done. His study of Venetian buildings (91) revives old notions, for they are very gem-like in colour, as well as conscientiously drawn.

Mr. T. R. Lamont has two very pretty drawings finished with close reference to Nature: one of a delicate child talking to a gardener who has been mowing like old Time, and cutting down the daisies with the rank grass; "There are no Birds in last Year's Nest" (74), may be a premonition. "Green Corn and Poppies" (82) afford a more lively theme for conjecture. "Sacharissa" (95), and "A Youth carrying a Name on a Cherry-tree" (303), by Mr. E. K. Johnson, advance us yet another stage in finish—more ways than one; and "The Brook" (149) was chosen by the Poet Laureate for an illustration, as well as by Mr. J. D. Watson, who is mistaking blackness for power. A Paritan maiden "At Prayer" (202), and, with the same objection, a "Northumbrian Fisher Girl" (275), are the best of the ten items exhibited by him, excepting "A Study" (161) for a portrait, which should be the very first and best. Mr. F. W. Topham's "Flower Still, Venice" (194), is delightful for colour. It is to be wished he had more liberally assisted the collection; for the landscapes predominate to such an extent as to leave figure representation for small consideration.

"Fruithoe Castle, from the Moat, Northhamerland" (10), by Mr. F. M. Richardson; "The Vale of Nant Gwynant" (62), by Mr. T. Danby; "The Rocky Valley, near Tintagel" (87), by Mr. S. P. Jackson, who has overcome his tendency to dingy neutral colours and cold greens, as "The Weir Pool" (92), will leave just a dim recollection of; "Going on the Thames" (138), by Mr. J. J. Jenkins, and "Skirting Knole Park" (148), as good as any of the nine that repeat the same name; "On the Hills, Loch Houra" (144), by Mr. Francis Powell; "Pangbourne" (174), by Mr. Birket Foster; "A Rough Sea" (187), by Mr. C. Davidson; "An Autumnal Evening" (242); and "Loch Cornishk" (368), by Mr. Alfred W. Hunt,—whose works all betoken a keen observation and an admirably honest method of recording it,—are but a few of the better works exhibited.

Mr. H. B. Willis has depictions of calves and cows that appear ignorant of all cattle diseases, so nice and clean and well combed are they.

We wish we could say more of the drawings, the works of the leading professors of water-colour painting; for with the shoals of such productions as are now in the flood of a mercantile prosperity it would be well to have some thought for the future and the medium. It may surely be prognosticated that such an issue of a manifold form of its minor application will lessen the value of its more important use, and all water-colour drawings he heretofore designated sketches and studies, with so little to distinguish them from finished performances as at present exists.

MISSION HOUSE, SEACOMBE.

We have already published particulars of the Mission House at Seacombe, a village on the Mersey, opposite Liverpool.* With this we give a small view of the building. The people hanging chiefly to the poorer and more neglected classes. "The state of education is very defective; home-training is had; drunkenness is common; a low moral tone prevails." For some years the Egremont congregation have been engaged in mission work in the village. An old Wesleyan chapel was first acquired on lease, and fitted up for the use of the mission; and, about a year after, an adjoining building was also taken, to meet the growing requirements of the work. But all the available accommodation in these buildings be-

* See p. 832, ante.

came too strait for the operations of the mission. It was therefore resolved to erect new premises, with suitable mission-house and class-rooms; and on the 20th of July last the new building was opened. The cost of the building, including the site, has been about 2,300*l.*; of which sum a balance of 750*l.* remains to be collected.

The first gathering in the old mission-house was the Sunday School, which still continues to prosper, and now numbers about 30 teachers and more than 300 scholars.

Among other agencies, a day-school was commenced in 1863. In the new rooms, and in the hands of the three teachers at present on the staff of mission workers, it is confidently hoped that this school will prove a great success. Working lads beginning to earn wages have also been cared for; and an endeavour has been made to fill up their evenings by the attractions of instrumental music, and the more profitable employments of the night-school and Bible classes. Beginning with one, there are now fifty workers, and not less than 800 persons are under direct and constant influence. The builders were Messrs. J. & T. Mason. Mr. H. H. Vale was the architect.

LECTURES ON ARCHITECTURE AT THE LONDON INSTITUTION.

In the second lecture of the course, Professor Kerr took up the subject of classical architecture. Starting at the point B.C. 500, he considered the position of Persia, which had overthrown the venerable empire of Egypt, and was now jealous of the rising importance of Greece, a new nationality founded, not on conquest or tradition, but on commerce, enterprise, and unprecedented intelligence, and destined before long to initiate a new civilisation. Accordingly, remembering the principle that architecture is history in stone, it would be certain that a novel system of the art was about to arise. Then tracing the order of origin of the arts, sculpture first, then poetry, then architecture, and a long way in the rear painting and music, and touching again upon the question of religious influence as a prime mover in all, and most notably in architecture, he rested at length upon the examination of the Doric Temple and the Parthenon. Explaining the theory of the timber-work type, he passed on to critical observations upon the new architectural features now established, such as the advanced design of the column, and of the entablature, the portico, the peristyle, the

stylobate, the cornice of ntility, the pediment the exquisite use of sculpture, the more defined arithmetical proportions (repudiating, for his own part, all geometrical theories, the conic-section mouldings, and the fastidious optical corrections); remarking also upon the effect of precision of workmanship, which, however refined and extreme, was always to the advantage of classical design, whereas in Gothic the effect of mastery and sometimes rude work was as essentially a vital element of success. The Ionic and the Corinthian columns being next considered, the lecturer pointed to the fact, almost more remarkable than all, that a complete system of columnar design, in three distinct and artistically perfect "orders," had now been accomplished; besides which an equally complete system of mouldings—the ovolo, the ogee, cyma, torus, head, hollow, and scotia, the fillet, and fascia—had been unalterably established. After a few words on polychromatic decoration, the transfer of the style to Rome was arrived at, and the career of the art pursued from the age of Augustus to that of Constantine. Although religious edifices still led the way, there was now a vastly expanded field of operation; embracing villas, baths, theatres, bridges, and aqueducts, triumphal columns, and archways, and notably basilicas. The same epoch of civilisation was still in progress, but the luxury, wealth, pomp, pride, and private patronage of the Roman Empire were altogether peculiar in their influence upon the art. New features also were still coming into view. Such were the pedestal, the pilaster, the arch, the dome, and the use of storied orders. The application of the arch structurally was dwelt upon, and its limited use artistically. The altered system of mouldings was also described, crude circular curves being substituted for the refined elegance of the Greek contours. On the whole, concluded the lecturer, the philosophical and fastidious grace of the Greeks, to this day unequalled in the world, had given place to more grandeur and luxury under the Romans, which in course of time led the art more and more into decadence, to be with all other products of Classic intellect in the fulness of time entirely overwhelmed and lost, until a thousand years afterwards their remains, and even their ruins, should be searched for and exhumed to form the basis of modern civilisation.

In the third lecture, the subject was the Architecture of the Middle Ages, and the point of departure was A.D. 500. Nearly a century and a half ago, the Roman emperors had taken refuge from the barbarians in the new metropolis of Constantinople, established at the extreme east of Europe. Only a few years ago the ancient capital, Rome, had at length been captured by the Goths. A few years more and it was to be finally pillaged, and the remnants of ancient magnificence and taste swallowed up. Two great forces had been at work in this: the pressure of barbarism from the West, and that of Christianity from the East. If architecture were history in stone, here, again, must be the origin of an entirely new system. But, in the scheme of the Dark Ages there was to be another element. While Christianity was to govern East and West, a similar new religion was to possess a Southern field. The Western nations, seeking a hotter faith, and adapting the Christian principles to their own habits of thought, founded the Latin or Roman Church; the Eastern nations, in like manner, formed the Greek or Byzantine Church; and Mohammed, animated by the same purpose, but rejecting Christianity because of image-worship, established the creed of Islam. And, accordingly, there arose three corresponding modes of architectural art: the Romanesque of the Latin Church, the Byzantine of the Greek Church, and the Saracenic of the Moslems. Turning now to the Basilica, or Hall of Justice of the Romans, this was described as the type for future Christian churches; the plain rectangular house, with longitudinal ranges of columns supporting the roof, the entrance at one end generally, and the seat of justice in a recess at the other, obviously serving the precise purpose of the primitive Christians, whether of the Latin or of the Byzantine sect. The sixth century, however, did not accomplish much of permanent durability: it was notable only for the name of the Emperor Justinian, under whom, for the moment, many great public works were carried out. Amongst the rest, there were certain basilicas or churches; although the greatest of all, St. Sophia, at Constantinople, was an exceptional design scarcely to be dwelt upon. The seventh century being



MISSION-HOUSE AT SEACOMBE.

of little mark, the eighth brought the age of Charlemagne, under whom great exertions were made to advance learning and art, but again with little effect. Many churches, however, are dated from that period, still keeping more or less to the old basilican form. The Saracens, by the way, had by this time attained to considerable knowledge and taste, for Bagdad was now flourishing in the East, while Cordova was being built in the West.

The ninth century exhibited great disorder, consequent upon the disruption of the empire of Charlemagne. In architecture, St. Mark's, at Venice, almost alone seemed worthy of notice, although still an exceptional work. Arab art during this century continued at its best, as well as in the next; in the course of which, on the European continent at large, the nationalities were acquiring form and character, as exhibited in architecture by a variety of German and French churches of much antiquarian interest. But it was not until the ensuing eleventh century that we could be said to reach firm ground. Various cathedrals throughout Europe marked the age of the growing authority of the Popedom, the First Crusade, and our own Norman Conquest. In a word, the Romanesque in Western Europe had become, by the process called in science degradation, either Norman or its equivalent. The Byzantine in the mean time might be said to have passed eastward, following indeed its Oriental character, into the Saracenic and the style of the Russian Church. The critic would perceive up to this stage the following innovations. Whereas the Greek mode had established the colonnade, the entablature, the moldings, and the portico, and pediment, with very little of "wall design," and the Roman mode had added arching, arcading in colonnade, pilastering, and a good deal of wall work, the Romanesque had established aisle plan, croiform, and round plan, arcading proper (not in colonnade), simple vaulting and domes, elaborated wall work (as at Pisa), roof design, gable design, tower design, and sky line. Attention being now confined to England, as furnishing a local history of Gothic architecture sufficiently illustrative of the whole field, the lecturer proceeded to explain from the drawings on the wall the well-known characteristics of Norman design, describing its details as being crude and its ornamentation clumsy, although picturesque enough in their way. But the following age of the thirteenth century, he said, brought out a very different state of the art, under new social influences. The Papacy was in its full ascendancy, and the clergy controlled society. The monastic orders added their special local influence over the people at large. The building fraternity, no matter in what particular form, had acquired organization and knowledge. Finally, the introduction of the pointed arch afforded a specific basis for a complete revolution in architecture. Whatever difficulties of an archaeological kind might surround this last question, the structural solution was enough for architectural criticism. The art had accepted arcuation, pure and simple, with all its indefinite conditions to follow. Arcuation was the architecture of small stones (the Classic mode being that of large stones), and a little examination would satisfy any one that the pointed arch was at once a condition of complete arcuation, and that the first attempts at its use would be the most sharply pointed in character, as was the fact. The lecturer proceeded to explain the progress of design through the thirteenth, fourteenth, and fifteenth centuries, dwelling more emphatically upon the averse elegance of the earlier work, the graceful tracery and foliage of the middle period, and the fan-groining, carpentry, and flying buttresses of the later time. The exquisite development of plan he also described in warm terms, especially in Continental cathedrals. Metal work, colour decoration, proportion, and symbolism were also mentioned. Finally, the great critical merits of Gothic architecture were two,—arcuation carried to every possible limit, and articulation exhibited in most instances with a truthfulness or guilelessness which of itself was one of the most exquisite elements of art.

Working Men's Club, Great Quebec-street, Marylebone.—Classes for practical, plane, and descriptive geometry, mechanical and machine drawing and building construction, have been established at this club, under the direction of a certificated science teacher, thus affording to artisans an opportunity of acquiring a scientific training in connexion with the recreative advantages afforded by institutions of this nature.

NEW INFANTRY BARRACKS FOR GLASGOW.

OUR friends on the Clyde are in fortune's way just now, and may congratulate themselves accordingly. Not only has their new Court-house "presently," as they say, been opened, and many other improvements of various kinds projected, but a new infantry barracks has actually been begun. The old military quarters in the Gallowgate, in the very centre of this very populous town, were long ago condemned for various reasons, any one of which was sufficient for the purpose. First of all, they were very unsuitable, inadequate, and badly arranged, not only according to hygienic principles, but to the comfort and convenience which we deem necessary to the life and character of the improved soldier of the present day. Then, again, the numerous whiskey-shops, and their ever-attendant evil companionships, not only seriously interfere with the soldier's physical status, apart from his moral one, but, what is equally bad, are standing impediments to military discipline. It has been long lamented that, even under the most favourable circumstances, drunkenness is the gigantic standing crime in the army; whilst that other evil, which must not be mentioned to ears polite, is its standing disease. With respect to the first, nothing but improved quarters, both physical and educational, sufficiently far removed from towns,—especially garrison towns,—to render street temptation difficult, will answer.

Thirty acres of undulating ground have been purchased, situated about two miles and a half from the city of Glasgow, in a north-westerly direction, near Maryhill, and able to command communications by rail, railway, and canal. The widely-known "Kelvin Grove,"—although grove no longer, but villa-terraces, and wealthy suburban nestlings,—rendered classic by the poetry of Burns, is in the immediate vicinity. The scenery is of the most lovely kind; and if the future regiments to be quartered there have but a corresponding happiness within, then, indeed, may they enjoy themselves, and sing aloud that "We are in a military paradise." The name of the particular locality is Garioch, and the immediate plot of ground upon which the buildings are to be erected is opposite Jeffrey's weaving factory, on the Glasgow and Maryhill road.

Of the whole quantity of land which has been purchased, about eight acres will be built upon, and otherwise appropriated to military purposes. The main entrance will be by iron gates in the Maryhill-road, with a second gate in the Garioch-road. On the right hand of the main entrance will be a guard-room and temporary lock-up cells; whilst on the left-hand side will be the regimental offices, orderly-room, court-martial room, prisoners' room, &c. Taking the main entrance to be approached from the east, away on the north side, having a southern aspect, will be the officers' quarters, in the rear of which will be all the necessary domestic offices, out-houses, &c., and stabling for seven horses. These quarters will front directly across the barrack-square, and face the men's block. The disposition of the officers' rooms will be in this way:—The commanding officer, as befits his position, will have separate accommodation to himself; not only that, but, on the well-founded conclusion that he will generally be a married man with a family. His servants will, also, be provided for, away from the servants of the other officers.

The next arrangement is for three field officers with two rooms each, and thirty-four officers with one room each; such room being so planned that there will be a recess sufficient for a bed and bed-screen, so as to enable the occupant to convert his "bungalow" into a snug sitting-room at pleasure. In addition to these rooms, there will be nineteen others adjoining for officers' servants. So much for the private portions, if they may be so termed. A second portion of these quarters will comprise a complete officers' mess establishment, including ante-rooms, billiard-rooms, smoking-rooms, and such similar accommodation as the social rank of gentlemen of whom officers are composed may require.

We now cross the parade-ground, or "barrack square," as the soldiers call it, and we come to the bones of the rank and file. The square will be the enclosed quadrangular space, formed by the three sides of the projected buildings, and the western section of the barrack boundary wall. This parade-ground will be 580 ft. by 486 ft. As the contour of the land is of a very

wavy nature, and as it will have to be made perfectly level, a good many hills will have to be placed in the bosom of a good deal of what in other words, there will be a good deal of what Scottish builders call "getting and filling." The men's quarters are in two divisions, each division being in parallel blocks behind one another, the dividing buildings being the school-chapel, gymnasium, &c., at right angles. The division on the left-hand side, from the barrack-gate will be exclusively for the married "department" of the regiment. The married private soldiers will have rooms to accommodate forty men, their wives, and children. In addition to these will be the necessary accompaniments of school, laundry, hot-air drying-closets, lavatories, &c. Away in the corner, to the rear right, will be the infant schools; so that the married people and their families will be entirely to themselves. On the same side of the square, but by themselves, there will be quarters for five staff-sergeants, having two rooms each; sixteen staff-sergeants, with one room each; twenty married sergeants, one room each; twelve single sergeants, one room each; and eight other non-commissioned officers' rooms.

There will, also, on a plan similar to that for the officers, be a complete sergeants' mess establishment, with mess-room, billiard-room, cooking house, stores, &c. The staff-sergeants and sergeants' quarters will be to the west of the single men's division, with ample space, isolating them, in accordance with their rank.

It will thus be seen that the non-commissioned officers of a regiment need never, if desirable, come in contact with the men when off duty for any purpose whatever. To the rear of the staff buildings will be the military provost's establishment, small, but very handy and compact. There will be quarters for the provost sergeant and assistants, an office for the counting-house, part of his unpleasant business, a detention-room, hard-labour yard, and twelve quiet, unobtrusive cells. In fact, from what we can learn of this part of the general plan, a year or so's "moonlight furlough" may be passed here very "comfortably" by the chastised and humbled penitent of the court-martial. Let us hope, however, in all seriousness, that there will be little or nothing to do for the iron-hearted "provo."

There will be four blocks for the single men; two of two stories high, and two of three stories. There will be 240 men in the two-story blocks, and 360 men in the three-story blocks. There will also be two cook-houses, each capable of cooking for more than 300 men; whilst a library and reading-room will supplement the culinary department by providing ample food for the mind. In order to have cleanliness made easy, there will be lavatories immediately adjoining each room; in addition to which there will be the inestimable benefit of a bath-house, and recreation facilities of every kind.

Having provided for cleanliness, the authorities show that they are not unmindful of the next and higher virtue in a manner that must be pleasing to many a heart that beats under a red coat. Hence, in the chapel-school the accommodation for divine worship will be enough, or more than enough for the English church portion of any regiment.

The chapel-school will seat 330 rank and file, 60 women and children, and 40 officers and ladies for divine service; whilst for educational purposes, there will be room for the instruction of 100 adults. The seats in the central part of the floor will be movable, so as to convert the chapel into the school, and vice versa. There will be both schoolmaster's and school-mistress's quarters attached in close proximity to the scene of their labours. The gymnasium will contain every appliance of the modern system, including bars, climbing poles, ropes, &c., and will comprise in addition a racquet-court, a five-court, and a skittle-alley.

Behind the single men's block will be the canteen, which, it has been said, will be under such personal supervision of the officers' committee as to prevent the adulteration of liquors on the one hand, and drunkenness on the other. The question of canteens has long been under the earnest consideration of competent military reformers, with the view of making the most of them for the soldier and the soldier's family. They have hitherto been too much left in the hands of the landlords or contractors, who have sold bad articles at dear prices. How to manage them efficiently for marching regiments has presented some difficulty, on account of the officers of such regiments having little knowledge of, and

less inclination towards, business matters. Besides, such officers are, comparatively, so short a time in each town that there can hardly be sufficient inducement for them to trouble their heads with canteen affairs. At Woolwich and Chatham the difficulty disappears, because there is always a staff long enough in the place to deal with canteen abuses if it has the will and the power. On the other hand, in the case of line regiments, who generally enter towns knowing as little what the day's pay will buy as if the men dropped from the clouds, it would be well and wisely done to have canteens and their doings placed under the supervision of the civil branch of the Royal Engineer staff of the district; or, should there be no civil branch, then the Engineer staff itself. In the building under notice, the canteen will virtually comprise a shop-store, where the soldier or his wife may purchase every article required in the sphere of their daily existence.

The canteen will be divided into two distinct portions—the family shop on one side and the public-house part on the other; each will have separate entrances away from one another.

Behind the staff-sergeants' quarters, on the southern side, there will be a new feature, namely, a pensioners' department. This will be very advantageous, because it will enable the pensioners to be mustered, instructed, or dealt with in a military atmosphere, and upon military ground. The regimental band, too, will have a specially adapted room for itself. A powder-magazine will be constructed in a part of the ground that may be deemed to be the best suited for the purpose; whilst a very convenient armoury is among the arrangements. Referring to the hospital for one moment, it has to be stated that there will be a suitable mortuary, with all the requisite appliances for surgical operations, *post-mortem* examinations, &c. The whole of the external walls of the buildings will be of stone; brickwork being used in the interior. Ventilation will be by both shaft and piercings, when necessary. The lighting will be by gas; the filthy room-fans will be superseded by night urnals, kept at a temperature, so as not to chill the men frequenting them in winter, and open only during the night. Each floor, too, will have its own corridor in the rear, so that men may pass from one floor to another without being wet, or having to dress themselves, beyond barrack-room costume. There will be a supply of hot water for all purposes at all hours. In all the rooms for the single men the windows have been so planned that two beds will stand between each pair of windows. The whole of the buildings will be inclosed by a rubble stone wall, with rustic copings, 10 ft. high, and 20 in. thick. This wall has at the angles projecting turrets loopholed for musketry, so as to sweep the entire face of whatever line the fire may be directed upon. The particular style of walling has not, we believe, been determined on, but it is supposed that it will be either rubble or coursed work, with mullions and dressings.

The walling is to be of sandstone from the quarries of Stockenfield or Kelvindale, and the other stone used for dressings to quoins, windows, staircases, chimney-caps, &c., to be freestone from the Hunter's-hill or Gifnock quarries. In the draining of the ground, 2-in. agricultural pipes will be used, whilst for the buildings glazed stoneware pipes will be laid down. In the external walls, the ventilating inlets will be of terra-cotta air-bricks for the floors, and galvanized iron ventilators overhead. There will, also, be extracting flues for the foul air, of glazed stoneware piping, and air-ducts to supply the fire-grates.

The ground floors of the lower part will be laid with 3-in. Arbroath dressed flagging; but the corridor floors of the upper stories will be freestone landings 4 in. thick, supported on wrought-iron bearers and girders. The floors to the hospital wards, lavatories, mess-kitchens, &c., to be on Fox & Barrett's fire-proofing principle, resting on rolled iron joists. Asphalt, too, is to be used wherever it may be requisite to prevent damp and noise. Wherever it is practicable the chimney-flues will be constructed so as to be swept from the outside. The lavatories, closets, and urinals will be exclusively supplied from cisterns of their own, and no other pipe will be attached to them. The hospital will be warmed both by open fire-places and hot water. The heat will be delivered from a cylindrical wrought-iron boiler, 4 ft. by 2 ft., cased in fire-brick, with a recess-furnace front, and set in the hospital kitchen. The hot water will start through a

2-inch flow-pipe, passing under the roof of the covered way into the principal staircase. On the entrance to the wards the dimension is reduced to a 1½-in. pipe, with the requisite stop-cocks on the landings. The circulation will return to a galvanized wrought-iron cistern of 150 gallons capacity fixed in the centre of the building, and so back again to the boiler. From the hot-water cistern a 2-in. escape-pipe will pass through the roof, turning down towards the gutter. Gas will be laid on in every part of the establishment where gas can possibly be useful.

The Glasgow people have been long complaining that the vast property of the third great scaport of the empire should be left in so comparatively an unprotected state. It is now many years,—more than twenty,—since the cavalry were removed from the old barracks in Eglinton-street, and what is the result? Why, that on any emergency troopers must be sent for all the way to Hamilton, ten miles off! This was actually the case during the late Sunday Fionian demonstrations.

These barracks have been designed by the Civil Professional Branch of the War Department, under the direction of Lieut.-Col. Murray, R.E. The warming and ventilating arrangements were supervised by the Army Sanitary Committee. The designs have been submitted in detail to the Queen, and have received her Majesty's approval and signature. The contractor for the whole of the work is Mr. John Kirk, of Woolwich, who has just completed the fortifications of Newhaven. Although no special time has been fixed, it is expected that the barracks will be ready for occupation in the latter part of the autumn of 1872.

THE MANAGEMENT OF COMPETITIONS.

I venture to suggest, that the time has arrived when the Institute (with every advantage both to the public and our profession) might take up the general regulation of competitions. If it were once understood that we declined as a body to compete unless the conditions issued were those framed by the Institute, much of the existing evil would be removed.

I propose that a list of architects willing to act as competition judges be kept at the Institute. They would serve in rotation, or if business prevented one of them, the next on the list would be requested to attend.

Ample advertisement should suggest reference (by any promoters of competitions) to the Institute, and on application being made the first architect on the list should proceed to the site of the proposed work, there confer with the committee, and prepare the requisite conditions, signing the names of the intended judge or judges. The conditions would, of course, be carefully framed in "schedule" form, the details of which need not at present be discussed; but I foresee a great saving of labour from this source alone, as a mere glance at the schedule would suffice to show competitors the nature and extent of the work.

Everything should be done to insure absolute uniformity, in the scale, the sizes, and the colour of all drawings. The perspectives, perhaps, may be unrestricted (except as to size), as they will not mislead a professional adviser.

The memoranda issued to architects should be divided into "Instructions" and "Suggestions," the former to be absolutely binding, the latter not so; then if the cost were stated under the "Instructions," any palpable excess would absolutely exclude a competitor; but if it appeared as a "Suggestion," then the designs should range in their order of merit; the authors of the first and the second designs thus selected receiving a fee previously decided upon, but any other design which would come within the limits of cost, and was most in accordance with other requirements, ought to be chosen for execution.

Rules for measuring the work would be supplied, and the price be founded on the cubic contents of the building and the superficial area of external walls.

A printed form for the report to accompany each design would be issued for the competitors to fill up. This would greatly facilitate examination, whilst additional matter (to a limited extent) would be permitted.

Half the designs sent in should be numbered in their order of merit (unless utterly worthless), the numbers to be affixed and a list of the authors' names to be registered at the Institute and published.

All drawing should be exhibited to the public, unless individuals express a desire to the contrary with reference to their own. I have seen many instances of injustice which could scarcely have occurred had the public been admitted to see the drawings; and I think, moreover, that if we consent to exercise our hands, heads, and hearts in such work as this, we might at least allow our productions to do some little good to others. Our drawings would thus help to elevate the public taste and improve the daily increasing feeling for architecture. To us they are of little value; our time, labour, and materials have been well-nigh wasted.

I many years since elaborated a scheme, of which this is a bare outline, and I think the matter of such importance, of such absolute value to the profession, that if there be any difficulty at first in placing it before the public we should find it well worth our while to subscribe amongst ourselves, and form a fund to carry out the scheme.

I should be happy to say to confer with any of my brethren upon the subject, and to add my contribution. The time seems to have arrived when a little united action would carry us safely through the worst of the evils attending our unavoidable competition.

AUGUSTUS FREEE.

SCHOOLS OF SCIENCE AND ART.

The Wolverton Science and Art Institute.—The anniversary of the opening of the science classes in connexion with this institute has been celebrated by a public tea, to which between four and five hundred sat down. The tea was followed by a musical entertainment and the distribution of prizes to the successful students for the past year. Mr. J. B. Bickersteth, a director of the London and North-Western Railway Company, occupied the chair.

Technical Education in Bedford.—A lecture in connexion with the local class in technical science has been delivered at the Working Men's Institute, Harpur-street, by Mr. Buckmaster. The chair was taken by Mr. James Howard, M.P. Mr. Fry read the report, showing that out of fifteen who presented themselves for examination twelve had been successful. These had been classed as follows:—First class, three; second class, three; third class, six. Those who obtained certificates in Class 1 were entitled to Queen's prizes. The books were presented in course of the meeting.

The Torquay School of Science and Art.—The presentation of prizes to the students of this school who have successfully passed the recent examinations, has taken place at the school. The duty of presenting the prizes was undertaken by Lord Talbot de Malahide, in the absence of Lady Palk. The chair was taken by the president, Mr. E. Vivian; and the room was crowded with a large, interested, and sympathetic audience. Mr. Luxmoore, the hon. secretary, said, it was satisfactory to know that the school during the past year had done a great deal more than any school almost in England,—certainly better than any school in the West of England. The Art School had 85 evening pupils, and 75 day pupils; the former were mainly of the artisan class, to whom the Government gave most of the prizes now on the table. Of these 85, the majority went in for the examination in May last, and 31 took prizes; one pupil in particular, Mr. Eastbrook, gained the Queen's prize and bronze medal. Mr. S. Youlden was also specially mentioned. In the Science classes Torquay held a high position; during the past year 90 students went in for examination,—70 in electricity, and magnetism, of whom 54 passed successfully, 18 gaining first-class Queen's prizes; 18 second-class, and 13 third. Here, again, Mr. Eastbrook had come forward, and in magnetism and electricity he stood the highest of all the students in the kingdom; for this he should have received the gold medal, but, owing to a mistake in the regulations, he was debarred from taking it. He also stood third in physiology in the kingdom, and having gained those two prizes, he would now go to London, it was to be hoped, to win more. At present there was in the school a physiological class, with 20 students; a class for acoustics and heat, with 32; and a class for electricity and magnetism, with 70 students. There were also, on Saturday afternoons, classes for ladies and gentlemen, which had not long been started. The Chairman, in course of the meeting, called upon Mr. H. Bridgman, who was the means of bringing about the establishment of these schools,

to say a few words. Mr. H. Bridgman, who was very heartily applauded, made an interesting speech of considerable length. He alluded to the progress the school had made since the first preliminary meeting, held in a small room, in Lower Union-street, in 1866: it had gone on and prospered, and no doubt it would continue to do so, for, during the last two years, he found that no less than 180 pupils had passed their examinations.

Exeter Science Classes.—The annual meeting of the friends of the Exeter Science Classes, held at the Athenæum, was remarkably well attended. A lecture "On Technical Education" was delivered by the indefatigable Mr. Buckmaster. The Rev. W. David said the science classes could be made of great value to the citizens. He had been a member of one of the first classes that had been formed in Exeter, and had a very lively recollection of the pleasure and instruction he derived from the teaching of Mr. D'Urban in the geology class. Mr. D'Urban's pupils certainly were few. Beginning with convenient pupils they had dwindled down to three, but he hoped to see the classes well attended in the future. He regarded those schools as filling a present void in the course of education in England. On the proposal of Mr. Cotton, a vote of thanks was unanimously accorded to Mr. Buckmaster.

Carlisle School of Art.—The annual meeting of the subscribers to this school has been held in the school-room, in Finkle-street, the mayor (Mr. W. I. R. Crowder) presiding. A large number of pupils and their friends were also present. The secretary (Mr. T. H. Hannah) read the report, which stated that the duties of the school had been performed to the entire satisfaction of the committee by the master, Mr. Lees, and the pupil teacher, Mr. Parker. Owing to the examination of those subjects of the Science and Art Department which have been regularly taught in Schools of Art, such as mechanical and geometrical drawing, building, construction, &c., having been placed under the Science branch of the Department, the examination of those subjects, which was formerly held along with the art subjects proper in March, would now take place in May. At the examination of the school in March last, 43 students were successful, of whom 9 gained prizes. Last year the numbers were respectively 27 and 7. During the year 75 students had sent 316 drawings for examination in London. Of those Mr. Edward Parker, the pupil teacher, gained a silver medal in the national competition for a study from the antique; 3 obtained third grade prizes, and payments were made on the work of 61 others. Last year, 58 students presented 108 works for examination. The committee had great pleasure in stating that the master, Mr. Lees, had obtained one of the prizes offered by their lordship to the "head masters of those schools in which the result of instruction, as tested by the Department examination, was most satisfactory." Owing to the number of artisans in the evening class being so large that there was scarcely accommodation for them if they were all present, the committee had made arrangements with the committee of the Mechanics' Institute for occupying their large hall in Fisher-street. The financial statement showed that the income of the school during the past year, including a balance of 24*l.* 14*s.* due by treasurer per last account, and after making certain reductions, had amounted to 90*l.* 5*s.* 6*d.*, of which sum 27*l.* 18*s.* 6*d.* were derived from annual subscription, and 64*l.* 17*s.* from school fees. The expenditure had amounted to 62*l.* 18*s.* 3*d.*, so that there remained a balance in the hands of the treasurer of 28*l.* 7*s.* 3*d.* Mr. Edmund Potter, M.P., distributed the special prizes, and addressed the meeting on the subject of art schools.

CROWN POINT, NEAR NORWICH.

The mansion that Sir Robert Harvey, bart., is erecting on his estate at Crown Point, near Norwich, is approaching completion. The new hall is situated on gently rising ground in the freshly-made park at the rear of old Crown Point House, and is visible from the Kirby and Bungay roads, the main approach being from the latter, from whence an open drive, skirted on each side by plantations, leads across the Kirby-road to the hall. There are two lodges, one at the Bungay-road entrance, and the other at the Kirby crossing, both in the style of Swiss architecture that characterises the water-side lodges, gamekeepers' cottages, and other minor buildings on the estate. The mansion is in the Elizabethan style, and the chief entrance is

covered by a portico of iron-work, with cupola roof. The ground floor comprises a saloon, separated from the hall by a screen; a dining-room and two drawing-rooms, *en suite*, with conservatory beyond, breakfast-room, library, billiard-room, &c. On the upper floor are bed-rooms, with double dressing-rooms, &c. These rooms have bay windows, from which view of the park and surrounding country are obtained, comprising the Lakenhem Viaduct, the Castle and Cathedral, Mcnsehold House (the seat of the late General Sir R. J. H. Harvey), Thorpe, &c. On the third floor are more bed-rooms, the total number in the mansion proper being twenty-four, and there are thirteen others over the servants' apartments and offices. The hall will be lighted with gas. At the rear are a range of stables, with carriage-yard and riding-school, the whole enclosed under a covered glass roof, 180 ft. long and 40 ft. wide. These will, in a year or two, be concealed from sight, by plantations of choice shrubs and evergreen trees, by which they have been flanked. The transformation of what but little more than a year ago was an open field into an ornamental park, has been accomplished with great success. A terrace walk will extend in front of the house, which faces the south. Beneath it will be a summer garden, and other gardens stretch away to the east, and are now in course of formation; a rosary, and some picturesque rockwork overhanging an artificial cave, from the mouth of which a lion is peeping (the work of Mr. Barrett, of Norwich), being the most recent work of Sir Robert's gardener. The mansion has been built from the designs of Messrs. Coe & Peake, of London, architects. The contract for the office was undertaken by Mr. D. Balls, of Norwich, and the work being divided into two contracts, Mr. J. W. Lacey was the successful competitor for the hall—at least, with the exception of the fittings and decorations of the lower rooms, which, being of an unusually elaborate and ornate character, will probably be confided to a London firm.

A NEW CHAPEL IN PLYMOUTH.

A LARGE Baptist Chapel, which has been in course of erection for the last sixteen months, upon Matley Plain, has just been opened. In style it is of the Palladian type, and the façade contains a considerable amount of ornamental as well as constructive detail. The chief feature is a central arch opening into a covered recess, and extending from the ground to the pediment. This is flanked on either side by towers, which rise to the height of 90 odd feet from the foundation. The main doorway is in the recess, and there are side entrances in each tower, which also afford access to the gallery. The sides of the recess are carried up by columns, which in the lower story are Doric, and in the upper Corinthian, surmounted by carved capitals. There is a three-light window, with Corinthian pilasters, over the chief entrance, and smaller windows over the others to accommodate the gallery stairs. The entablature, and the mouldings generally, are bold. The towers are surmounted by truncated pyramidal slated roofs, with crests of iron-work, painted and gilt. The material of the building throughout is of limestone, and the columns and dressings generally of Portland, while the steps are of granite. The pulpit is of wood, and octagonal. The seats are all open benches, and together with all the woodwork, of pitch pine. The chapel is lighted at night principally by two en-barrere in the centre of the ceiling. There is a school-room in the basement, to accommodate 500 children. The building is close to the Matley tunnel of the South Devon Railway, and, including the site, has cost 8,000*l.* Mr. Ambrose, of Plymouth, was the architect employed, and Mr. J. Finch the general contractor. Mr. Harry Hiers, of Exeter, has executed the stone-carving; Messrs. Plimsaul put up the heating apparatus; and Messrs. Monk & Westlake the gas-fittings.

Olney Church.—This church, interesting from its association with Cowper and Newton, has for some time past been sadly in need of repairs, but we are glad to learn that an effort is now likely to be made to restore it to its proper condition. The lord of the manor (the Earl of Dartmouth) has undertaken the restoration of the chancel, according to the *Rock*, and it is to be hoped that other friends will be found to help the vicar in his greatly needed work.

ART IN COMMON LIFE.*

I MUST clear the way for what I have to say on art by limiting my subject. I shall not have time, and I have not the power, to speak at all of the so-called fine arts—of painting, of sculpture, or even of architecture. A picture, or a statue, or a fine building is indeed an ornament, in one sense of the word. It adorns a room, or a public building, or a town; but the principles which regulate the work of the successful painter, sculptor, or architect are far more complex than, though not really different in kind from, those which are concerned in making beautiful, adorning, decorating objects of daily or occasional use. In considering ornament, then, I confine myself to a study of the principles which should guide us in determining the true nature of ornament, and its proper employment. Moreover, I exclude painting and sculpture now, because, when good, they are and must be always costly, and therefore not within the general reach,—the painting, and etching, and carving, are often the treasures of the cabinet of an individual. Even if public taste were educated sufficiently to understand such works, they are usually inaccessible; and it should be added, that the real merit of works of fine art does not come out when they are small and apart from each. A large painting on a wall of a public building, boldly treated, illustrating some instance of bravery, charity, or devotion, and surrounded by proper architecture, of which it indeed forms an essential part, is not only of general instead of special use, but produces in the spectator a sense of the sublime, which a small picture that can be looked at by one person only at a time, which must be pored over in the hand, cannot ever achieve.

The question may be asked—Why ornament at all? We know that the earth itself is adorned, and that the so-called savage, half-civilised, and highly-civilised nations have invariably led them to colour their various war-clubs, paddles and canoes, and that the colours and curves of these Fijians, Sandwich Islanders, and others may be called ornamental. Instinct so called of man, savage and half-civilised, as well as most cultivated. In ancient pre-historic times the cave-dwellers scratched on bone or pottery rude outlines of the animals they slew or tamed; the palaces of Nineveh are lined with sculptured reliefs where palms and various forms of plants are drawn, with warriors, captives, and kings, and the spoils of battle; the seals and many ornamental objects of the Babylonians survive to our time, beautiful with minute and laboured devices. The architecture of Egypt has furnished models of excellent colour and of quaint form to our artists of the present day. The palm of the deserts and the water-lily and rush of the Nile were pressed into the service of decorating their temples by the ancient people. If we go further east we shall find in China and in India an excellent taste for colour, and some notions of form, handed down from age, the exact distance of which from our own day, though great, is not exactly known. Time would fail me were I to endeavour to allude even to the chief styles of ornament prevailing in Greece and subsequently in Rome; of the ware of Etruria; of the metal, stone, wood, and ivory work of the Middle Ages; of the early Irish illuminated missals before the tenth century of the Christian era; of the works in carved wood of early Norwegian carvers; of Medieval Arabic ivory; and of the period of the Renaissance or Revival of Classic Art. But the principles of true ornament may be deduced from nearly every kind of decoration, whether Greek, Italian, Egyptian, or Chinese. What these principles are I will endeavour to state.

An ornament as to its nature should be human; that is, should appeal to the eye, the thought, the affections of man. It must have a meaning, and the more meaning the better. Where possible it should possess as many as possible of the following properties or characteristics; it should be:—

1. (a) Local, (b) Historical, (c) Public, (d) Fixed, (e) Large.

It should also be:—

2. Informative and truthful. If it seems to represent anything it should represent it truthfully as far as it goes. More rich and beautiful the more extensive the knowledge which contrived it and the knowledge which it imparts. Study necessary both on the part of the artisan and the public.

* By Professor Church. Read at the Cirencester School of Art.

B. Ornament in its application should be appropriate.

(a) Adapted to the use of the object decorated.

(b) Adapted to the material to be decorated.

(c) Capable of sufficiently good execution by trained ordinary workmen.

A. Human character of true ornament.

1. Local, Historical, Public, Fixed, and Large.

2. Informative, Real, Ideal, Conventional, contrasted.

B. Appropriate,—as to material and colour; as to use; as to nature of the executant or artificer.

From these, the conditions of ornamentation, we may trace the origin and real character of conventionalism. The great colourist of Venice, the great sculptor of Greece would convey the greatest amount of truth, produce the best ornament. But we have to limit ourselves in various ways. Titian's colour and the statues of Phidias are not for every day's use. We lack the men—the genius—the skill for work like theirs, we also want to turn our ornamented objects to the purposes of common life. We cannot copy nature perfectly to begin with in her full spirit, her full variety, her force, her tenderness: we must learn what we can keep, what we must omit.

Then we come to the second reason for conventionalism, the use of the objects to which ornament is to be applied. Ornament must never interfere with use: it ought not to hinder, but to aid the proper employment of any article of common employment, and it should be appropriate to the object. Do not put wreaths of May blossoms or gaudily-painted pictures or photographs under glass on your coal-stoves.

A third limitation is imposed by the material. Bits of rich glass for a coloured window; of marble and stone for a pavement; a wavy line for the border of a dress; abstract forms of flowers and birds for paper on your walls; lumps and bosses and slings of molten glass on the tumbler and the vase; sharp, clean-cut patterns reminding you of material forms of beauty, cut out in brass or hammered out in iron, or engraved in silver.

But although all ornament must be suitable to the material and adapted to the use of the object decorated, and to the skill of the workman, the conditions thus imposed upon the direct copying of nature for purposes of ornament must not lead us to forget the first principle laid down: that ornament must be human, it must appeal to man. It must not be senseless—meaningless.

Let us study the several necessary conditions of deriving ornament from nature by a fair example.

Plants lend themselves readily to the decorator. Where nine workmen can carve some semblance of a flower, one only can represent anything like an animal form.

Ivy: its freedom, its variety, its curves.

Periwinkle. Bramble. Rose calyx. Clover.

A more severe treatment is required the less tractable your material.

But severe as the treatment may be, do not let it bind you down to a fixed bondage,—the bondage of the east-iron schools,—a bondage which brought Gothic early in the nineteenth century into disrepute. Bring the freedom and variety of nature into your work, but discipline your abundant resources. Do not let stiffness on the one hand, nor extravagant curves on the other, interfere with the *unity* of your decoration.

Fourteenth-century windows, their details varied, on the same position influenced not by appearance primarily, but by use.

Some people may think or may say that my subject is a trivial one—not worthy of the attention of sensible men. There are some men who care nothing for a poem unless it conveys a satire or a jest, who do not care for any form of art, and I had almost said for nature itself, for nature is, as has been well said by an English writer, the *Art of God*. I ask you, then, consider whether or no my reasons for forcing ornamental art on your attention are good. We have our work in this world; we have power wherewith to perform it. Those powers must be trained if our work is to be well done. Are we to train all our powers, or only some?—put out some talents to weary; others lay up in a napkin, and bury in the earth? Shall we not work better in all directions if we add day by day fresh facts to our knowledge, accumulating power and the wisdom to it? Let the worker in iron learn first of all how to work the metal with skill and ease and certainty. Let him then learn how to make it into forms which shall, at least, not be ugly if not absolutely ornamental; but will it be of no service to him if he finds out in addition to all this how

the iron was got out of the earth, and out of its ores; what are its properties and its components, and so forth? And he may gain advantage beyond his special handicraft by getting knowledge and hints from other arts. A man comes to the School of Art because he wants to "letter;" he learns this in a few weeks, and goes away content; but might he not have learnt more, and improved himself greatly had he looked a little further? A plain letter may easily be painted; what if he had got to learn to illuminate and design, and become known as an artistic and tasteful as well as a skillful workman? Thus I appeal to come to you on grounds of personal advantage. But I may do more. I may urge upon you the importance of developing new industries for the populations of the country, and improving those that exist on national, or social, or patriotic grounds. Honest materials, honest work, manual skill, artistic taste, and that wide and varied cultivation of the mind and hand which, applied to one's daily work, leads to invention and discovery, and the advancement of the handicraft and the country of the workman.

Ornament and the study of its principles is a noble one; ornament may minister to a mere love of finery, unreasonable and indeed ridiculous, but this is merely one of the many ways in which anything excellent in itself may be abused. But the rich abundance and the curious variety of natural decoration at once provide us with material for our ornamental designs, and at the same time teach us the appropriateness of forms and colours to special offices. Dazzling sunlight and moonlight cold; the earth adorned with light, rolling on its course; the canopy of the sky variegated with stars and flashing with thousands of meteoric lights; the sunrise awakening the light of the world; the sunset, like the golden throne of the majesty of heaven, invested north and south by dark clouds like shadowing cherubim; the rooted mountains grand; the ocean, ceaseless in movement, varying in colour, lashed in fury of foaming wrath by the storms, or smiling with its innumerable ripples of light; the hiding of the loaf; the blossoming and tender or rich colouring of the flower; the pencilling of the insect's wing; the special glory of the nature and form made in the divine image,—all these may speak to us of beauty and ornament, if we will listen and will learn.

A PLAN FOR WIDENING THE STREETS.

Of all the questions occupying public attention at the present time with regard to the improvement and well-being of the metropolis, there is not one so much important as that of making due provision for street traffic. The utter incompetency of the present width of street to the demands of public convenience has been long acknowledged, but little has been done to improve matters. The metropolitan railways, though they relieve the streets of a vast amount of passenger traffic, will never provide a remedy for the existing evil,—an evil which is daily increasing. The right thing to do is to widen the present thoroughfares; but the enormous cost of this, in the usual way of going to work, has been an almost insurmountable obstacle hitherto. A scheme, however, for doing this readily, conveniently, and economically, I now beg to submit to you, with diagrams.

In your Journal a few weeks back a suggestion was made to have an upper pathway in a line with the first floor of the houses; but the trouble, danger, and difficulty entailed by this scheme would be very great. I have long thought over the subject, and think the proposition I am about to make must, on consideration, meet with general approval and acceptance. It is this.

To set back the present line of shops on ground floor 8 ft. or 10 ft., making the space so gained the public pavement. The upper and outer line of houses being supported by columns or an arcade. The advantages of this plan would be that it is easy of execution and comparatively inexpensive. Instead of purchasing the property outright, with costly outlay for leases, compensations, &c., as heretofore, only a limited portion of the ground-floor would have to be bought at the first; and when the term of lease was expired the whole of the house should then be set back, and only a limited indemnification would be necessary. The colonnade might be removed or not as thought most advisable. The gain to the roadway by this means would in many cases of city streets double their capacity. Leadenhall-street at one part is

only 29 ft. 6 in. wide, including pavements, at present; but, on the realization of my plan, with set-back pavements, he, say 50 ft. In Fleet-street, Ludgate-hill, and the Poultry, there are parts respectively 44 ft., 41 ft., and 37 ft. 3 in. All these I would make 20 ft. wider. In Newgate-street, where the narrow parts almost prevent the benefit of the wider portions being felt, my system might readily be applied, and the full width of street be obtained in a few weeks. In some cases I should only propose to treat one side of the street in this way.

Certain it is the exigencies of the public service are so pressing that something should be done to effect a radical improvement on the present state of things, and it is to be hoped that the *élan* attending the opening of the new street and viaduct may result in the matter being taken actively and immediately in hand.

FRED. TAYLOR.

THE HOUSE OF NEWCOMEN, THE INVENTOR OF THE STEAM-ENGINE.

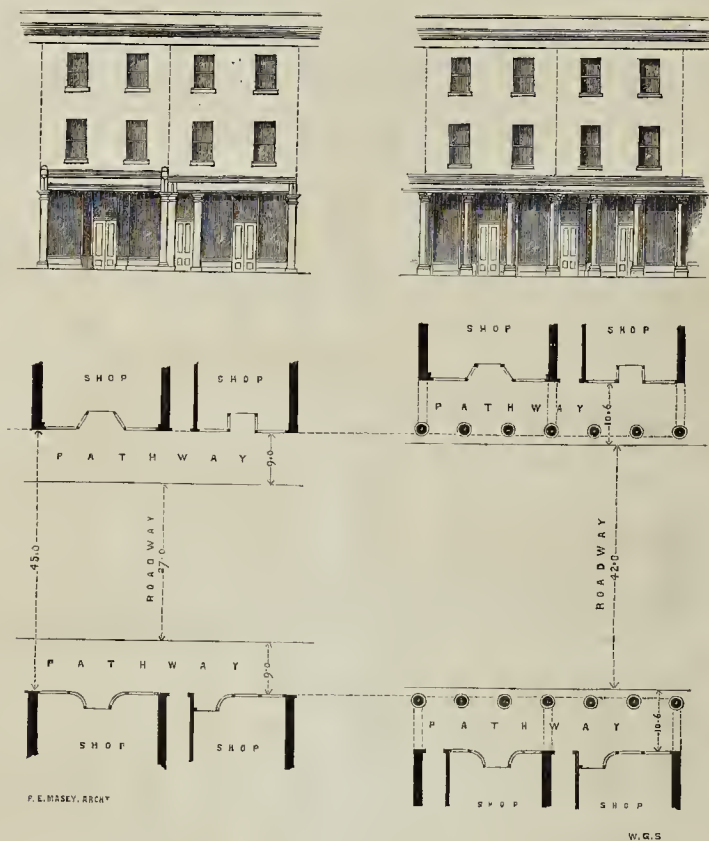
THOMAS NEWCOMEN, the locksmith, of Dartmouth, South Devonshire, first applied steam usefully as a motive power, and his was the chief hydraulic machine for about two-thirds of a century, and was found most valuable in the development of our mining system. Upon this Watt worked, and though Newcomen was thus superseded, his name should always be held in honour amongst us. The story since told of Watt, that he conceived the idea of the motive power to be obtained by steam by watching his tea-kettle, the cover of which would frequently rise and fall when boiling, has long been told in Dartmouth as relating to Newcomen.

The house in which Newcomen lived when he invented his engine was situated in Lower-street, in Dartmouth. In 1834 it was sold and taken down, by order of the local Board of Health, when Mr. Thomas Lidstone, one of a family of builders, of a hundred years' standing in that place, purchased the ancient carved and moulded woodwork of its street frontage and interior, which he rebuilt (1838) in Ridge-hill, in the parish of Towstall, in Dartmouth, carefully replacing in the sitting-room the clavel (*Devonian* for the wooden mantle) of the fireplace at which Newcomen, according to popular tradition, sat when he first noticed the action of the tea-kettle to which we have referred. With the view of preserving a knowledge of the old house, Mr. Lidstone has published a tract containing these particulars, with several illustrations drawn on the wood by himself,* especially a sketch of the house as it stood in Lower-street before it was demolished, and one of the building he erected to work in the remains,—“Newcomen Cottage,” as he calls it. The latter, as well for the cleverness as for the good feeling it shows, we reproduce. The grounds he has for altering the usual spelling of the name we do not know, and have therefore followed the ordinary mode, though we shall not be surprised to find him right. The cottage contains old woodwork and plaster-work saved from other houses and buildings in the neighbourhood during the last quarter of a century. In 1851 the author endeavoured to obtain funds to raise a monument to Newcomen, but did not succeed. It was a worthy attempt, and should be revived. Money so spent would bring back a good pecuniary return to the town, to say nothing of its moral effect.

OFFICES AND WAREHOUSES, MANCHESTER.

THIS building is situated at the corner of Brown and Marden streets, and was erected for Mr. M. Olive, of the firm of Olive & Spartali, Greek merchants, of Manchester, from designs, and under the superintendence of Messrs. Clegg & Knowles, of Manchester. It has four stories and basement, the front part consisting of suites of offices, and the back part and basement of warehouses; the front part to Brown-street being occupied by the British Imperial Insurance Corporation. It is executed externally in Darley Dale stone, with a liberal use of red and blue granite. The contractors are Messrs. Bowden & Edwards, the carving being done by Messrs. Williams & Mooney.

* “Some Account of the Residence of the Inventor of the Steam-engine. A Note to be appended to any future History of Steam-power.” Longmans, Green, & Co. 1859.



PLAN FOR WIDENING THE STREETS OF LONDON, BY MR. FREDERICK TAYLOR.



"NEWCOMIN COTTAGE," DARTMOUTH.



OFFICES AND WAREHOUSES, MANCHESTER.—MESSRS. CLEGG & KNOWLES, ARCHITECTS.

ARCHITECTS' ACTIONS.

PEACHEY v. GIRDLESTONE.

We adopt the *Times*' report of this action, tried November 29th, in the Court of Queen's Bench, Westminster, before the Lord Chief Justice. Some further explanation seems necessary, particularly as to the course taken by the Church Building Society—

This was an action by an architect against a clergyman and other gentlemen to recover compensation for plans and estimates for an intended church. The sum of 321s. 10s. was paid into court, and the question was as to the validity of the plaintiff's claim, which amounted to 432. 17s. 6d.

Mr. Digby Seymour and Mr. Row were for the plaintiff; the Solicitor-General and Mr. Macnamara were for the defendants.

The defendants were a committee appointed to raise funds for the building of a new church at Elye, and to superintend the building. They agreed by advertisement to pay 100*l.* for designs they selected, not engaging to employ the architect who was the author of them to superintend the erection of the church. The advertisement referred the architects competing to a paper of instructions containing this clause—"The total cost, including fittings, &c. must not exceed 5,000*l.* and the architect to accompany the designs, and a responsible contractor must be named who will undertake to complete the works for that sum."

The plaintiff was a competing architect, and the committee were disposed to accept his design, but he desired to show by estimates that his design could be carried out for the specified sum, although he named a firm of builders as proposed contractors. The committee, therefore, only accepted his design conditionally on his satisfying them that the church could be completed for 5,000*l.* They therefore wrote to him accordingly, desiring specific calculations, and he wrote in reply, enclosing his designs, and apologising for defective details. He met a sub-committee, and explained his designs, and, according to his statement, they suggested advertising for tenders. At all events, it was proposed that the committee should advertise for a building to public competition, provided it could be done for 5,000*l.*; and if that was found impracticable, they held themselves at liberty to decline the plaintiff's design. The general committee, however, did not agree to this proposed course, and overruled it. Upon this the plaintiff, nevertheless, proceeded to advertise for tenders, and to draw out a large quantity of estimates, of which he afterwards claimed to recover. The general committee, however, had immediately communicated their resolution to him, overruling the proposed course, and distinctly stating that they did not authorize him to take out the quantities, and make the detailed estimate, although they were still willing, if he could find a builder to do the work for the specified sum, to employ him. The builders he had mentioned had said that, looking at his drawings, the work could be done for that sum; but in the result they found that they could not do so, and that it would cost 11,000*l.*

The plaintiff thereupon wrote to the committee, in effect, complaining of them, and asking for further time. They answered that they were afraid of this result, and that the delay threw them into great difficulty, adding, "The committee should not allow us to go further in expense." Here, however, "I don't want the committee to be at the expense of my designs; but only to give me further time to obtain tenders." Thereupon the committee agreed to these terms, and while they adhered to their former terms, they were willing to allow him a little further time, and also to let him employ his plans in the neighbourhood, in the hope that they might be able to take the work. In this way some further expense was incurred, and this formed another item of his present claim. Thirteen copies of the designs were made in different parts, and one of them was for 5,500*l.* The committee thereupon adopted his tender, on condition of his getting two surveys made accordingly obtained, and the plaintiff's design was then accepted, and it was concluded that he became entitled to the 100*l.*, which was therefore paid into court. The committee, however, had intended that the successful applicant should execute the work, although, as they contended, they had not bound themselves to do so, and it was only on condition that the plans should be approved by the Incorporated Church Building Society; and this was the great matter in dispute. The plaintiff was silent about it in his examination in chief, but in cross-examination he was pressed as to whether he was not told that his employment was to depend upon his plans being approved by the Church Building Society; and though he said he "could not remember it," he did not venture to deny it, and, on the other hand, there was the most positive evidence of it. Two gentlemen (Mr. Girdlestone one of them) distinctly swore that it appeared probable from the admitted facts that a grant was expected from the society, and that its approval of the designs was a condition. Moreover, the plans were to be laid before the Board, and submitted to their architect; and these gentlemen distinctly stated that the plaintiff was told of this. However, the society disapproved the designs, and the plaintiff was told of this, and that no contract could be signed until the designs were so altered as to be approved by the society. The committee applied to the society to put the designs in objection to the design and the details, and they replied that it was difficult to do so, as they were disapproved *in toto*, and Mr. Brandon, their architect, being now examined as a witness, so stated to the effect.

Thereupon the committee proposed to settle with the plaintiff, paying him his 100*l.* This he declined, but proposed to send in new designs and plans in a month, and that, if they were not approved, he proposed to have another month to send in new designs. They declined that counter proposal, and hence the present action, in which the plaintiff claimed not only the 100*l.*, but all his expenses, and all the compensation for taking out quantities and making detailed estimates, and also compensation for loss of his commission on the work. He calculated that if the work had been superintended by him he would have gained 100*l.* out of the 5,000*l.* that was offered; but he, however, in that event the 100*l.* for the designs. He, however, claimed only 3 per cent., as the matter had fallen through. But he charged his expenses in addition; not only the 100*l.* for the designs, but the 100*l.* which were paid, but the cost of advertisements. The total claim was 661*l.*, out of which 126*l.* 10s. was paid into court.

The case lasted two days. At the close of the first day, the Lord Chief Justice summed up the case to the jury at some length, and with manifest care. The great point in the case, he said, was, whether the employment of the plaintiff was to be subject to the approval of the plans by

the Incorporated Church Building Society. The evidence of it, he observed, was distinct and decisive, and it was not denied by the plaintiff. It appeared, moreover, he added, probable, as a grant was expected from the society, and their approval of the plans would be a condition, and if this condition was originally imposed upon the plaintiff, there was no hardship in enforcing it. The Church Society was not bound to grant money unless they were satisfied, and the committee were obliged to submit to their resolution. And if they imposed the condition on the plaintiff, he could not complain of it. The vital question in the case upon which it must turn was, whether that condition was imposed upon him. If it were so, then came the question whether an opportunity should have been allowed to him of altering his plans. The committee did the best they could for him, and applied to the society to point out their objections to the design. The reply was, that it was not easy to do so, but that the details were wrong. At all events, they declined to adopt the plans; and the committee were not bound to allow him the time they required for furnishing new plans again and again. The great point was the original proposal. The jury, after some consideration, retired to consider, and eventually found a verdict for the defendants.

THE BELLS AND QUARTER CHIMES OF GREAT ST. MARY'S, CAMBRIDGE.

The tower of the church of St. Mary the Great, Cambridge,—the church appropriated to the University,—has a fine peal of twelve bells in the key of D, the weight of the tenor, or largest bell, being 30 cwt. There is also a clock, and * one other bell, which is used to give notice of congregations and exercises." This bell, it is said, was, prior to 1545, "placed in Benet's Church, which was the original church belonging to the University."

It appears that a peal of ten bells was cast and hung in the tower by Richard Phelps, of Whitechapel, London, in 1724. But the tenor bell having at length been cracked, was re-cast in 1770, by Puck and Chapman, also of Whitechapel, who at the same time added two tenor bells, thus making a peal of twelve bells, which were opened by a hand of "Cambridge Youths" on Christmas-eve in the same year.

The eleventh bell was subsequently re-cast by William Dobson, of Downham, Norfolk.

Robert Southey tells us, that in the year 1795, the Society of Cambridge Youths rang at this church a true and complete peal of Bob Maxims in five hours and five minutes. This consisted of 6,000 changes, and for regularity of striking and harmony throughout the peal was allowed by competent judges to be a very masterly performance. In point of time the striking was to such a nicety, that in each thousand changes the time did not vary one-sixteenth of a minute, and the compass of the last thousand was exactly equal to the first.

And here let me observe that the present members of the Society of Cambridge Youths are also said to be excellent ringers.

I now come to the clock which chimes the quarters on the 3rd, 4th, 5th, and 8th bells,—counting from the treble downward,—thus:—

- First quarter } 3, 4, 5, 8.
- Second } 5, 3, 4, 8; 5, 4, 3, 5.
- Third } 3, 5, 4, 8; 4, 3, 5; 3, 4, 5, 8.
- Fourth } 5, 3, 4, 8; 5, 4, 3, 5; 3, 5, 4, 8; 8, 4, 3, 5.

The hour being struck on the tenor, or largest bell.

These quarter chimes have been copied for some other public clocks, including the great clock of the New Palace at Westminster.

I may remark, by the way, that if you have a peal of ten, the 1st, 2nd, 3rd, and 6th bells must be used for these chimes.

Permit me now to say, that I have in my possession a paper,—repeated at Cambridge in 1838, the contents of which will, I think, be found interesting to change ringers in general. Here is a copy of it:—

"REGISTERS OF A SOCIETY DENOMINATED THE CAMBRIDGE YOUTHS, ESTABLISHED ON THE 3RD OF AUGUST, 1734.

This Register is extracted (so far as the entries could be obtained) from a regular series of Books still remaining in six compartments of a chest. The former records of the Old Society, which began in the reign of Queen Elizabeth, are not to be found; neither are there any memoranda of the original institution now remaining, except a few accidental occurrences in the mousing pages of a few local Manuscripts, by which it appears the Society then consisted chiefly of the *Youthful* Members of the University.

EXPERIENCE has, however, usually demonstrated the salutary advantages derived from the practice of Ringing, whilst Harmony, by her enrapturing powers, hath been allowed to exhilarate the mind, and even to dissipate the gloomy aspect of melancholy. That the theory of Ringing hath been improved by the investigations of the most learned in figures, and that the moderate practice of it hath been beneficial to the constitution, have past ages abundantly proved in the course of the two last centuries. It may, consequently, be a surprise to many, that some account of the primeval state of this Society, with its discovery and improvements of Ringing, which is so innocent and

recreative an employ, should, for so long a series of years, have escaped the attention of its several ingenious members; but be it remembered, few of our ancestors were stimulated to preserve the transactions of their own times which frequently render historical relations involved in the remotest obscurity. But now, *temporantur*, every industrious friend to literature hath a propensity to record the events of his time for the instruction of posterity; in which view the following concise, yet authentic and accurate remains, which have casually escaped the wreck of time, are selected for those who may then be the spectators of this Society.

In the year 1377, the old church of St. Mary, containing six Bells, was taken down, and the first stone of the present structure, laid 19th May, 1378, and was finished in 1383; but the tower was not completed till 1408, which was 130 years after its foundation, and a peal of eight bells was hung therein by contribution, the tenor weighing 18 hundred and a half. A diligent and long attention to this sublime art rendered those who had a sagacity in discovering and judgment in admiring its beauties, at length proficient; but so far from satiating their desires, they became more and more ambitious of higher attainments; and in the year 1724, to satisfy their enlarged ideas, a new peal of ten Bells was completed by the ingenious Mr. Richard Phelps, who died 18th August, 1738. From that event originated a new system of laws, by which the society have since been governed; but, through the corrosive influence of time, no memorials are now extant of the original society, except the bare names of those who coincided with the laws respecting the new establishment, their records *tenepa edax verum*, have long since been consigned to oblivion. In Sept. 1769 the tenor bell being accidentally broken, a laudable plan was immediately formed and successfully put in execution by Mr. Dax and Mr. Paris, who will be respectfully remembered by this society, not only for their indefatigable pains in procuring a new tenor of about 30 hundred weight (cast 14th Feb. 1770), but for their own contributions in a subscription which they, with great diligence raised, to purchase the additional trebles for the completion of the present melodious peal of TWELVE.

Here follow the names of 110 members and 8 "representatives." Amongst the former I find:—

Charles Mason, D.D. Fellow of Trinity College, 1725	Elected.
Robert Heath, Esq. of Christ College, 1726	
Richard Dawes, M.A. of Emanuel College, his celebrated critic, 1731	
Samuel Roe, M.A. Fellow of Trinity College, &c. 1738	
James Benett, Organist of St. Michael's Church 1738	
James Gifford, Esq. Mayor of Cambridge in 1757 1758	
Charles Day, Esq. Surveyor of Taxes 1750	
John Paris, Esq. Bookseller 1758	
John Innesdale (although totally blind, remarkable for his extensive knowledge in the art of ringing, and other musical profession) 1767	
William Robson, Organist of St. Neil's Church 1768	
John Bostell, Bookseller 1768	
Humphrey Argent, Organ Builder 1767	
Thomas Steere, an ingenious Mathematician 1767	
Leonard Procter, Esq. B.A. of Trinity College 1835	

I should mention that the last member in the above list, Mr. Leonard Procter, is still an able performer, and—like Messrs. Cattle, Denison, Elicombe, Troyte, and many other country gentlemen—often joins in the manly and healthy recreation of scientific change ringing.

THOMAS WALESBY.

PREMISES v. PREMISSES.

SIR,—An alteration of orthography in a familiar word is gradually creeping into use, which alteration I strongly deprecate, on the ground of its being not sensibly correct. Technically correct it may be: that point I must leave to scholars to decide; as also the question of "root" and "derivation." I can merely regard the matter from the stand-point of utility and common sense.

The alteration to which I allude is the substitution of the word "premisses" for "pre-mises." No doubt, it is absurd to employ the one word "premisses" in two entirely different senses, as we now do. We say, speaking of our homestead, "on my premisses" and when referring to some prelatory proposition as to any matter under consideration, we say "judging from the premisses."

Now, surely the word as it stands is more necessary in the latter case than in the former. What has been pre-misssed make the pre-misssed, and to double the s, and make the word pre-missses, seems palpably wrong; for then it reads as if the foregoing reasoning had all been pre-missses: former failures, in fact. Why should we not retain "premisses" with one s when used in the sense of prior statements? And, if necessary, let the word be pronounced pre-misssed, to agree with the verb to *premiss*; and write "premisses" when applied to an estate. To double the s, or even to omit it, is a mistake, for the sound and sense would not be altered; and no particular meaning, so far as I know, attaches to the term that makes it, as now spelled, peculiarly applicable to one's house and grounds: one's premisses, in fact, or premisses, if you will.

I am aware there is a noun "premiss," a pre-misssed, or antecedent proposition; but this is

obsolete, and when I read the other day in a well-known publication "granting the truth of the premises, the claim is a strong one," the phrase struck me as being not only awkward, but also as opposed to common sense.

I therefore, for one, vote for "pre-mises," our prior explanations; and "premisses," or "pre-mises," our house and grounds. R.

BROADWAY ARCADE RAILWAY, NEW YORK.

THE New York papers are very much taken up with a new project, which they regard as preferable to the tunnel railways, such as our own Metropolitan, one of which it has been proposed to form in New York. The Arcade Railway would run along Broadway, the line of ordinary traffic above and the railway traffic beneath. The street would be sunk from the present level to a sufficient depth to form an arcade with groined roof of masonry supported by iron columns. The area space in front of the buildings would give light and air to the under roadway; but whether it is proposed to sink the level of that roadway lower than the foundations of the houses, or, if so, how that is to be done, does not appear to be clearly pointed out. The upper roadway would be substantially paved, and of course would need no lifting for gas, water, or other purposes, the subway providing for these. The surface water would descend through the columns. The groined roof would be made water-tight by means of asphalt. There would be footways at each side below, the same as above, and staircases to ascend and descend.

The high-level railroad projects, as well as the tunnel ones, have been cast altogether into the shade by the arcade plan. The time seems to have come when one or another of these projects must be adopted.

The New York traffic has immensely increased of late years. From the reports of the State Engineer, it appears that the number of passengers carried by horse-cars increased, within the nine years from 1859 to 1868, from 43 to 1 to 104 to 1, and it is now estimated at 115 to 1 by the city railroads alone; the number of passengers carried being set down at 118,000,000, by contrast with 32,889,080 in 1859.

GRANITE COLUMNS.

SIR,—I hope you will pardon my troubling you with a few observations in reference to your correspondent's remarks on this matter in your last impression. I am an old mason, and have carried out many heavy and important works, and cannot agree with him, that "most of the granite columns that are brought to London have a hole drilled through them from end to end." I beg to say that in all my practice I am not aware of such being the case, excepting where provision for gas-pipes is necessary; but all columns, caps, and bases, as well as heavy pilasters, have "Lewis-holes" in top of them, for the purpose of hoisting and fixing, which holes do not generally exceed 8 in., or 10 in. deep. Neither do I quite agree with your correspondent as regards the beds being "perfectly smooth." Most assuredly they should be perfectly straight and closely axed. In fixing steel-lead between the joints, it should not be less than 9 in. or 10 in. wide, and not within 1½ in. of the outer edge of the column, and of not less substance than six pounds weight to the superficial foot. J. S.

DOES IRRIGATION PAY?

THE area of land under irrigation in the north-west provinces of India during the Rubhee season of last year was as follows:—

Ganges Canal	1869-9.	797,219 acres.
Eastern Jamma Canal		215,002 "
Doab Canals		10,494 "
Bareilly and Tersee Canals		37,290 "
Total		1,049,295 "

The importance of these works is strikingly exemplified in these figures, which are given by the *Indian Economist*, which concludes that but for these canals 1,050,000 acres of land under cultivation would have been barren through drought. Now an acre of irrigated land in the north-west, continues our authority, will produce from 1,200 to 1,900 lb. wheat, or the whole area irrigated an abundant supply of food for 3,000,000

persons for a whole year. The average price of wheat, moreover, throughout the provinces for some weeks past had been about 10 seers the rupee. Thus the irrigation of this million of acres has resulted in a crop of food of the money value of 8,000,000L. sterling:—

Acres. lb. wheat. lb.
1,050,000 × 1,500 × 20 per rupee = Rs. 78,750,000

Now here, he adds, is a very simple sum in arithmetic, and yet how slow we all are to learn it. The total cost of the whole Gangetic system of irrigation has been, if we remember rightly, about 2,000,000L. sterling, and here it is recouped four times over in a single season of drought. In addition to this million of acres under irrigation for the rubber crop, there were 326,114 acres irrigated for the khareef harvest, a total area of 1,375,469 acres for the two crops. What proportion of this land would have been absolutely barren but for the canal works, we are not told. Let the State but retain its interest in the land, concludes the *Economist*, and the time will come when we may obtain 50,000,000L. a year from it, with as much ease as we now do 20,000,000L.—a very arithmetical sort of fact, which a troop of Indian statesmen find it impossible to master.

THE SANITARY CONDITION OF GOOD HOUSES.

SIR,—No apology is required for addressing the *Builder* on the question of sanitary improvement. You have so long been a general in the fight that I doubt not you will allow one of the rank and file, a full private, to fire a shot in the cause.

Beginning where things were at the worst, your labours were directed to the amelioration of the condition of the poor in the dark and confined alleys of this great metropolis; and for whatever improvement has been effected, you may fairly take a large share of credit.

I want you to help now to stir up an agitation in favour of a higher class, namely, the occupants of the terraces, places, and villas of the suburbs. So far as the sanitary condition of their dwellings is concerned, this class is at the mercy of the builder and landlord. Feeling strongly on the subject, I will not risk drawing on my imagination, but will describe the state of things actually existing in the house I occupy,—a house built within the last five years, and finished with all the "latest improvements."

Finding that there were unmistakable "sewer smells" both upstairs and down, I made a thorough examination, and discovered, to begin with, that the drain ran right under the house from front to back, and that not even ordinary precautions had been taken to make the pipe-joints tight. The waste-pipe to the sinkstone in the scullery was (supposed to be) protected at the top by an ordinary ball-trap, and its discharging end was passed just through the flags and delivered into an open 9-in. brick shaft, built above a square junction on the drain-pipe. To allow the gas to spread under all the basement floors, half bricks were left out of the sleeper walls and partitions at certain intervals. Two pipes ahead of the sink-stone branch, another junction received the overflow from the scullery cistern, the pipe being carried up without even an ordinary syphon bend. Together, these neat little arrangements fully accounted for the smells in the basement. On the ground floor, there is a water-closet; above it, on the first, a bath-room; and above that again, a cistern supplying both with water. The bath waste and overflow, and the cistern overflow, were connected with the head of the soil-pipe behind the closet trap. Here, then, was another direct flue ventilating the sewers into my bath-room, and accounting for the sickening odour there experienced. I had these things set right by taking all the waste and overflow pipes into a trap outside the house, so arranged as to cut off all connexion between the inside and the drains. The man whom my landlord sent to do the work assured me that many of the houses in the neighbourhood were similarly drained, as he himself had had the doing of them; and from further inquiry, I am satisfied that not only is this not an exceptional case, but an example of an almost universal rule. Could anything possibly be devised better calculated to bring our houses into the condition of the notorious infirmary wards of the St. Pancras workhouse?

With a cistern overflow on the same floor, in direct communication with the sewer, the air breathed in sleeping-chambers must of necessity become highly polluted during the night, and to this may doubtless be attributed hundreds of

cases of illness, preventible under better sanitary conditions. During the winter months, when every occupied sitting-room has its fire, and all means of ingress for external air are closed, a sort of exhausting action takes place, and the foul gas from under the basement floor and ill-ventilated connexions, is sucked up and passed through the rooms and the lungs of their occupants, to supply the place of the air ascending the chimneys. This is no fancy, but a unpleasant experience I have myself enjoyed.

Surely such a state of things only requires to be understood for householders to take steps to remedy it. It is of no use to trust to the respectability or position of your landlord. The class of houses I refer to are erected by speculating builders, whose only care is that the cost shall be kept down, and that the houses shall have an attractive appearance. Such unimportant details as drains are left to the tender mercies of some old navy, who takes them to do by the piece, and the connexions to a plumber, whose faith is built on a bell-trap. If cistern overflows are ostensibly protected by the orthodox syphon bend, it is a delusion, because the waterworks companies have the power to inflict a fine in case the ball-cock is so "set" that the water runs away by the overflow at the time it is coming in by the service, that though the syphon is there, the water is absent, and no trap is made. What is imperatively wanted, sir, is an amendment of our building by-laws, by which district surveyors shall have power to enforce the execution of house-drainage works in accordance with sound principles.

In these days of sanitary commissions and social science congresses, it is a disgrace that the dwellings of the middle and higher classes of London, should be the breeding-places of fever; and it is high time that all medical officers and inspectors of nuisances should deserve, by their exhibition of zeal, the epithet "Sanitary Mad," bestowed by a wise member of the St. Pancras Vestry on one of their officials. J. M.

SANITARY CONDITION OF GLASGOW AND BRISTOL.

LAST week a deputation from the Sanitary Committee of Glasgow, with Dr. McGill, one of their medical officers, and Mr. Ellison, their inspector of cleansing, visited Bristol, and had an interview with the committee of the Board of Health of that city, with a view to learn the sanitary arrangements adopted in Bristol. At three p.m. the high sheriff, Alderman Proctor, entertained the deputation, the Mayor of Bristol, and the committee of the Board of Health, at a sumptuous luncheon at the Royal Hotel, when sentiments of reciprocal respect and good wishes were exchanged between the members and the officers of the two sanitary committees. The Lord Provost of Glasgow intended by an engagement in London in connexion with the visit of the King of the Belgians. The deputation during their stay visited several of the poorest localities in the city, and expressed themselves highly pleased with the sanitary arrangements of the Board of Health. Such exchange of opinions and amenities between different sanitary authorities must result in the improved health of our large cities, and it is highly desirable that such practical authorities should "compare notes" more frequently. It is to be hoped that the deputation will make public the result of their observations.

TELEGRAPH SYMBOLS.

THE advantages of a system of telegraphy, have been widely advocated by the Press. Publicity and mutilation of telegrams and telegraphic matter are two evils in the present system, which, it seems strange, have never yet been abolished by the use of a regular cypher or secret code for the transmission of messages. Recently, however, the Postmaster-General decided in sanctioning for the use of the public a numerical telegraph code. This is Major Bolton's code, which did good service during the campaign in Abyssinia, and is now in use by the military and naval services. The system of the code consists in an alphabetical list of sentences numbered, as is likewise the page upon which they stand. The entire of our language has been, it is asserted, collected together in this way, so that a person is able to code an ordinary message of twenty words into a couple of Bolton groups, or ten figures.

There is also a spelling code, for rendering proper names and uncommon words, and an arrangement of symbols to express decimals, fractions, stops, &c. The code book is a key or dictionary of a language. The pages are numbered in consecutive order, and also the lines of each page, and when it is desired to send a message, all that is necessary is to transmit the number or numbers, referring to the page and line in the code where it is to be found the letter, word, or sentence which the correspondent is to be acquainted with.

THE MATERIAL FOR MEMORIAL TABLETS.

I HAVE recently been trying various experiments in the construction of tablets of a permanent, indestructible, and, so far as practicable, an ornamental character, for street nomenclature and other purposes. I may briefly mention that among other methods which I have tried, the most durable and useful seems to me to be that of stamping letters out of silicate of iron and pressing them upon zinc plates, which upon exposure to the air become perfectly united and extremely hard. For better preservation (although not essentially necessary) from the mirkiness of the London atmosphere, I encase the whole in a zinc case prefaced with common glass, which renders them air-tight, water-tight, and anti-rustive; and, as regards legibility, equal to any tablets for the purpose yet brought under public notice, and at a considerably reduced cost.

It may be urged that the liability of glass exposed in a public thoroughfare to breakage would form the chief objection in the construction of street tablets, but the same objection might be raised with regard to the construction of street lanterns, &c., irrespective of the penalty attaching to the wilful destruction.

In appearance these tablets resemble, as nearly as possible, the enamelled iron tablets now in use, which, owing to the contraction and expansion of the iron by the fluctuation of heat and cold, the exposure to damp (more especially fog), together with the coarseness of their construction, are to some extent objectionable.

I have ventured to address you on this subject believing that it may, perhaps, afford some information, or be made in some way applicable to the purposes of memorial tablets.

W. S. BRAINE.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the last meeting of this society, December 1st, Mr. W. H. Pictou called special attention to the fact that the publication of the Dictionary of Architecture, which had been partially in abeyance for some time, was being resumed, and it was expected that it would be carried on with more rapidity than formerly. The promoters of the Dictionary were desirous to receive the support, in the way of subscriptions, of all who were interested in the art which it was to illustrate. Mr. C. E. Beale read a paper, illustrated by diagrams, descriptive of the new works of the Rhyll District Water Company, now in progress, and in which some peculiar difficulties had to be encountered, owing to the geological formation of the site, and the heavy gradients on which some of the pipe lines had to be laid.

FIRE!

SIR,—Without wishing to find fault with any particular person, I beg to ask whether it really is not time that some serious inquiries should be made as to the most expeditious and best mode of extinguishing fires in the metropolis. I happened to be at a fire that took place in the Brompton-road within this week, when two large shops thrown into one, with four stories above each shop, and the large stock of a linendraper, were consumed. I was not there till after the shops were fully on fire, yet for quite half an hour after there was no other but a hand-power engine. The Life Guards were there, but they either would not or could not get into play. However, when the whole of the ground and first floors were in full blaze, other engines arrived, and the system seemed to be to try and extinguish the fire at the lowest part, instead of playing upon the highest part, when the lower part would then receive the surplus water. As it was, the houses were seen to burn upwards, story by story, till the roofs fell in, and burnt themselves out. Surely some

reasonable men could meet and settle rules to guide the firemen in extinguishing fires, instead of increasing them by draughts below.

The course pursued on the night in question was certainly not the way to tackle such a terrific enemy. S.

FOREIGN JOINERS' WORK FOR ENGLAND.

SIR,—I notice a memorandum in your last, to the effect that some of the joinery for St. Thomas's Hospital was made in Sweden. Will you allow me to add that I have also executed a large order for windows for the same building.

Touching the concluding paragraph (that the Swedish work is cheaper than work made at home), I would observe that I have just received orders for a second and larger quantity of windows, and that for this order the Swedish firm referred to estimated against me, and lost it.

W. H. LASCELLES.

A NAME FOR THE STREET BY THE MANSION-HOUSE.

A CORRESPONDENT, "W. H.," writes:—

I have seen it mentioned that the authorities are in want of a fitting name for the new street leading to the Mansion-house. I am, I confess, surprised at there being any doubt whatsoever as to what the name should be. In all London there is not a street that I know of—I am certain not a street of importance—named after the greatest name in all literature. "Shakespeare Walk" was named after a Mr. S. of the last century—not after the immortal bard. The new street must pass quite close to the house in St. Anne's, Blackfriars, which occupies the site of the house which belonged to Shakespeare's own self. Are not the contracts connected therewith in the City Museum? Could you not advise the real appellation? Some years ago I made a pilgrimage to the court in which the house stands. A boy, seeming to understand what must necessarily be the object of my search, pointed to a house, saying, "That is the house, sir."

TECHNICAL EDUCATION.

SIR,—With reference to the subject of technical education, the meeting held at the Royal School of Mines, Jernyn-street, some time ago, was called a failure, I must admit; but there is no effect without a cause. Had there been a lecture by any of the doctors or professors on any scientific subject, it is a proved fact that the theatre would have been crowded, and many new ways that it would have been impossible to admit. I think that the meeting was called for the purpose of inducing persons to become members of working-men's clubs, at 2s. 6d. each, irrespective of character or calling. Circumstances prove that the working classes are setting to more solid work, as the attendance at the lectures last winter at the Royal School of Mines shows that where there is anything good to be heard, where there is any real knowledge to be obtained, at any time when the working classes have leisure, there you will find them. But "Reasoner" must not look to the employers of the country to promote the cause of technical education. It is not to their interest to do so. If the capitalists, the wealthy consumers, do not look to their own interest, and join with the workers who produce the articles they require, they must bear the consequences; they must be prepared to admit into their associations, to expect the friendly greeting in Rotten Row of some persons whom, only a few years back, they looked upon as their enemies, and who, in the case of the present day, employers and others have acquired their wealth at the expense of the capitalists and the workmen alike. "Reasoner" shows truly that good workmen are frequently discharged, and spoilers of materials kept on. Who pays for that? The employers. But who pays the employers? The capitalists, to be sure. So, therefore, you will see the necessity of the workers to acquire a good technical education; it will therefore be obvious who will be parties benefited by a good system of technical education, the capitalist and the real producer, or workman.

ALEX. KAY.

BRTON'S FARM UNDERDRAINAGE, HORNCHURCH, ROMFORD, ESSEX.

SIR,—For the above, tenders were invited for the construction of the same, for which two estimates were submitted, varying from 6300. to 2000. the "engineers" being 3577., and No. 1 in the list of estimates being also 3500., who submitted a second estimate, which came between Nos. 11 and 12 estimates, and has been accepted. Now, I ask, if fair play has been exercised after the trouble and expense taken by contractors, why should No. 10, like those below, being responsible and competent persons to have carried out the works, have been set aside, otherwise than through partiality. Your giving publicity to the above will greatly oblige. A CORRESPONDENT.

ANOTHER SITE FOR THE GREAT LONDON FISH MARKET.

SIR,—The very best site for a new general fish-market would be the water part of St. Katherine's Docks. All sites which are not upon the river side are objectionable for the purpose; as, though 60 per cent. in weight of our fish now come to London by railway, it is certain that in a few years' time, when the present arrangements are carried out in ships so as to increase their speed to perhaps thirty or even fifty miles an hour, nearly all the fish will come again by water as it did twenty years ago. The up-river docks cannot stand the close of the down-river docks; and while the buildings of St. Katherine's Dock might still be used as bonded warehouses, the water part of the St. Katherine's Docks might with advantage be transferred to a single dock computed to hold, and on it a grand market built. It would be close to the projected Tower Bridge, and so would be very convenient for the dwellers in south London; it would be close to the Blackfriars branch of the Great Eastern Railway, by which a deal of fish comes; and it would be close to the Tower-hill station of the

Underground Railway. Any man who takes a map (and without a map it is impossible to understand the matter), and looks at it with an unprejudiced eye, must see that this is of all others the best spot for the great London fish-market. Nightingale-lane should be done away with, and thrown into the dock property; and a road should be made right across the proposed site, commencing in Lower East Smithfield, just west of Barr-street, and coming out in Upper East Smithfield, somewhere about what is now the principal entrance (not the office entrance) of St. Katherine's Docks. F. D. W.

MIRRORS IN ARCHITECTURE.

I WAS not aware, until I read the letter of Mr. F. R. Wilson, in your impression of the 27th, that mirrors had ever been used as a decoration in a Medieval church. As there is a precedent for such a mode of decoration, it may not be out of place in me to state that I have long entertained the idea that small mirrors might be so used. In the final of a spire, for example, they might be made to play a brilliant part, as when the sun's rays struck upon them, they would glitter like gems. Suppose the final to take the form of a cross, I would insert a mirror of about 9 in. in diameter at the intersection, and one of about 3 in. diameter at the extremities of the three upper limbs. They would require to be framed in the metal, and secured against rain penetrating to the back, and washing off the quicksilver. W. G. S.

DOBROYD CASTLE.

SIR,—With reference to the roof of Dobroyd Castle, we beg to state that the whole of the building has been covered by us in thick Vieille Montagne zinc. The zinc-work to sunlights was also executed by us.

J. W. TYLER & Co.

* Mr. James Davis, of Malvern Wells, also writes to "regret that he is not noticed as the builder." His name appears in the lines we printed. Mr. John Underwood wishes it to be known that he executed the carving and modelling.

RAILWAY MATTERS.

THE Metropolitan Railway Company have at length decided upon running workmen's trains at more convenient hours, and with extended privileges to the holders of the tickets. This will be felt as a great boon by those who are compelled to reside in the suburbs. It is also intended to reduce the fares between some of the stations on the Brompton and Westminster line.

The first ten locomotives ever built in Russia have just been completed at the works of Herr von Struve, at Kolomna, near Moscow. It is said that no pecuniary assistance on the part of the Government was required by these gentlemen for this purpose.

It is estimated that by the end of the year 1869 there will be laid in the United States, in round numbers, 110,000 tons of steel rails, equal to 1,100 miles of steel road; and of this amount about 36,000 tons (equal to 360 miles) will be laid during the present season. These rails are in use on more than fifty different roads, and are partly of American, principally of English, and to a small extent, of Prussian, manufacture.

MONUMENTAL.

Bust of Lord Palmerston for Harrow.—A massive pedestal of Cornish serpentine has just been placed in the library at Harrow; and on it will be placed a bust of the late Lord Palmerston. The stone is from the quarries of Lord Falmouth, near the Lizard. It is of a dark ground, with bright red figure, and contrasts with the white statuary marble of the bust. On the front of the pedestal is the word "Palmerston" in large gilt letters, and on the opposite side, "Presented by W. Grant, 1869." The pedestal was manufactured by Mr. John Murphy, of the Penzance Serpentine works. This is the third pedestal of the same material which Mr. Murphy has made for the same place.

Torquay.—An elaborate canopy in wrought iron has been completed for the tomb of the Rendle family in the Stoke Gabriel Church of Torquay, by Messrs. Barnard, Bishop, & Barnard.

A Poet's Monument at Leek.—A memorial cross will shortly be erected in Horton churchyard to the memory of George Heath, poet, by the subscriptions of his friends. It has been designed by his friend, H. Wilson Foster, of Kensington, and is in course of execution by Mr. Barlow, sculptor. It is a shaft, 9 ft. 8 in. high, on a plinth of one block, surmounted by an ornate cross, 3 ft. wide and 16 in. thick, in the centre of which is the sacred monogram, surrounded by a wreath of bay-leaves in relief. Up the shaft runs a sunken panel, containing the inscription, in old English, with red capitals. The front of the column and the three wings of the cross are ornamented with carved arabesques in relief. It will be executed in the hardest Kettridge stone, polished. The inscription is as

follows, the lines being a quotation from one of the deceased's poems:—

"Erected in memory of Geo. Heath, of Gratton, who, with few aids, developed in these Moorlands poetic powers of great promise, but who, stricken by consumption, after five years' suffering, fell a victim to that disease May 5th, 1859, aged 25 years.

His life is a fragment, a broken clue—
His harp had a musical string or two;
The tension was great, and it sprang and flew,
And a few brief strains—a scatter'd few—
Are all that remain to mortal view,
Of the marvellous song the young man knew."

Monument to King William I. of Holland.—A national monument in honour of William of Orange, first King of the Netherlands, has long been in course of erection at the Hague, and has now been inaugurated by the King and Queen of Holland, in the presence of the diplomatic corps, a large gathering of the nobility of the country, and an immense concourse of spectators. Two flights of stone steps lead up to an extensive basement area, on which is erected a pedestal supporting a statue of King William I. and some allegorical figures. The sides of the pedestals are adorned with reliefs of the most important events in the king's life, and amongst them is one of the landing, while he was Prince of Orange, at Scheveningen, from her Majesty's ship *Warrior*, on the 31st March, 1813, after an exile of nineteen years. An officer of this ship, Vice-Admiral Sir William H. Hall, K.C.B., who was a midshipman at the time of the prince's return, was specially invited to be present at the inauguration ceremony, and he was accompanied by the Hon. Lady Hall, who, it happens, is the daughter of the captain who commanded the *Warrior* when she performed this service;—viz., the Hon. George Byng, the sixth Viscount Torrington.

COMPETITIONS.

Clapton, N.—A limited competition for the new Christ Church, at Clapton, has just taken place, Messrs. Brooks, Dolman, Truefit, Wigington & Morris, and Tanner & Stone, being the competing architects. After several meetings, the building committee selected the design "Sine Dubio," by Messrs. Wigington & Morris, who will carry out the works.

Printers' Almshouses.—At an adjourned meeting of the council of the "Printers' Almshouse Pension Corporation," held on Tuesday last, for the purpose of appointing an architect for the additional wings to almshouses at Wood-green, the design of Mr. Charles Bell, of Craven-street, Charing-cross, was selected out of the five designs sent in competition; and under his superintendence, the work will be proceeded with forthwith.

CHURCH-BUILDING NEWS.

Bilston.—St. Leonard's Church has been reopened for divine service. The work of improvement has been confined as yet to the rearrangement of the former chancel, and a portion of the nave immediately adjoining, for the purpose of completing the requirements, which the insufficient space originally provided had hitherto rendered impracticable. The original chancel (of about 11 ft. in depth) has been extended westward about 10 ft. into the nave, where its line of limit is marked all round by a stone step; thus raising the new portion of the "chancel" (as it may be termed), upon a platform to that height above the general level of the floor of the church. Upon this platform are arranged the new choir seats, which face north and south on each side of the central passage; and on the south side is placed the prayer-desk; while against the northern corner of the chancel arch stands a new pulpit, erected as a memorial of the late Bishop Lonsdale. The altar-rail is also new—partly of oak and partly of metal; and from it rise two ornamental gas standards, with branch lights, which serve to light the chancel. Other gas-standards are fixed in convenient positions, to serve for the choir seats generally. Iron scroll-work is introduced into the open fronts of the book-decks on each side of the central passage. On the several floors there is an intermixture of pattern-tiles with red and plain ones, and with the occasional introduction of glazed tiles, and black glazed strips, ranged in zigzags, and lighted up by white squares at the angles, as within the altar-rail. The work generally has been carried out from the designs and under the superintendence of Mr. J. D. Wyatt, of London, architect. Messrs. G. & F. Higham, of Wolverhampton, were the contractors. The tiles for the paving were pro-

duced from Mr. W. Godwin, of Lugwardine; the metalwork from Skidmore's Art Manufactures Company, Coventry; and the stone carving was done by Mr. Earp, of London. The total cost of the alterations amounts to 275*l*.

Sutton.—The church here has been re-opened by the bishop of the diocese. The edifice has been renovated. The west gallery has been removed, and the tower-arch opened, and the whole area of the building is seated with open benches. A stone pulpit, with the panels filled with alabaster carved figures, stands at the entrance to the chancel. Choir-seats and organ are placed in the chancel. The altar, which is 8 ft. 6 in. long, has a green frontal, embroidered.

Strood.—The new church of St. Mary has been consecrated by the Bishop of Rochester. The building is in the Early English style, with nave, chancel, and side aisles, the entire length being 98 ft. and the width 48 ft., with a tower and spire at the west end. The architect was Mr. Arthur W. Blomfield, and the contractors were Messrs. Foord & Sons. The church is built of Kentish rag, with freestone dressings. The entire cost of the church, with the sum appropriated for the endowment, was about 10,000*l*. Accommodation is provided for 500.

Pedmore.—The church of Pedmore, a small parish adjoining Stourbridge, has long stood in need of restoration, and of late had become so dilapidated that a few weeks ago the greater part of it was taken down, for the purpose of rebuilding. The structure contained some Norman work in the chancel arch, south doorway, and other portions; Early English in the chancel, and the rest fifteenth century. On the tympanum of the door is a crowned figure in the act of benediction, supposed to be the Deity, or the Saviour, surrounded by the *vesica piscis* and symbols of the four Evangelists. Others have thought that the central figure was meant either for a bishop or king of Mercia, as it is difficult to say whether the headcovering is an ecclesiastical or regal device. This curious relic of Norman work is to be preserved in the renovated building, as will also be the chancel arch and tower. According to estimate, the cost of the rebuilding will be about 3,000*l*, and one-half of this amount has been granted by the trustees of Oldswinford Hospital, who are the patrons of the living and owners of the manor. The sum of 1,200*l*. has also been raised by subscription, so that there are only 300*l*. deficient at present.

Great Yarmouth.—The south-west pinnacle of the great church of St. Nicholas has been completed. From want of sufficient funds, the restoration committee has been compelled, reluctantly, to postpone the completion of the angle-tower, which, rising in a straight line of 70 ft. from the ground, forms a feature in the design, both of the south aisle, now under restoration, and also of the west front of the church. The ladies of Yarmouth determined to raise the sum of 200*l*., in order to complete the tower. Contributions rapidly flowed in from eighty donors and collectors. A small balance remains in hand, and further donations will be applied towards the restoration of the second of the four pinnacles of the west front. At the point where the work thus carried out by the ladies' fund was commenced, it is proposed to insert the following inscription:—"To the glory of God. This south-west tower was restored by the ladies of Great Yarmouth. 1869."

Books Received.

Memoir of the late Henry Booth, of the Liverpool and Manchester, and afterwards of the London and North-Western Railway. By ROBERT SMILES. London: Printed for private circulation by Wymann & Sons, 73, Great Queen-street, Lincoln's-Inn-Fields.

This is an interesting memoir of one of those far-seeing, long-headed men, to whom, after the inventors and maturers of the locomotive, the world is indebted for one of its most wonderful agents of progress,—the railway. Without the support of enlightened men of business and capital, what could even a Stephenson have done towards the establishment of the railway system? Mr. Booth was a leading man in the locomotive trial on the Manchester and Liverpool Railway, and in the promotion of that line generally; the result being the establishment of the modern railway system. His long and useful public life was mainly devoted to the promotion of railway interests, and his name was well known to the public in that connexion. He was

born in Liverpool in 1788, and was the eldest son of a well-to-do corn-merchant of that town. He only died in March last, so that he lived to the goodly age of 81. The contents of the volume under notice first appeared in a series of articles, by Mr. Robert Smiles, in the *Railway News*, and have now been reprinted for private circulation.

Vegetable Physiology; in a Series of Easy Lessons. By EDWIN LANKESTER, M.D., F.R.S. London: Cassell, Petter, & Galpin.

This little treatise was written as part of a series of lessons for reading in schools; and although it does not appear to have been newly written, the preface shows that it has been revised by Dr. Lankester, and printed separately from treatises by other authors along with which it first appeared in print. It is illustrated with diagrams, and forms an instructive and interesting outline of vegetable physiology. The rising generation owe much to Dr. Lankester.

Pictorial Scenes from Pylgrim's Progress. Drawn by CLAUDE REIGNIER CONDER. London: Hodder & Stoughton, 1869.

The immortal tinker of Bedford never dreamed, great dreamer as he was, that men would go on, generation after generation, setting forth his work and seeking to illustrate it by pencil, brush, and graver. So, however, it is; and so with little doubt it will long continue to be. The last illustrator,—at least, he was so yesterday,—Mr. Claude Conder, gives a series of pictorial dreams, with imaginative backgrounds, in chromolithography, in a manner founded on that of M. Doré. The first, "Yonder Shining Light," is immeasurably the best of the series, and raises hopes which are scarcely fulfilled by some of the others. Our second favourite is "Out of the Wilderness," with its suggestive expanse of wood and high horizon. They show much poetic feeling.

VARIORUM.

"TWICKENHAM DRAINAGE: Report on a proposed System. By H. M. Ramsay, Surveyor to the Local Board." By the system here proposed, the sewage of the parish of Twickenham would be collected to a point of outfall on land near to Marsh Farm, and would be available whether under a system for irrigation, filtration, or deodorisation. The surveyor proposes the separation of the rainfall from the sewage. If deodorisation should be resolved upon, the milk of lime process is what he advises; and pumping power and settling tanks are provided for. The outfall sewer, according to the plan, is so arranged or laid down as to levels, that it could be extended to any other point deemed desirable for working on the irrigation system, and without any alteration in branch or other sewers. The report is accompanied by a key plan of the proposed scheme.—"Transactions of the Institution of Engineers in Scotland: 13th Session, 1869-70." This portion of these Transactions contains papers on the Donbrury Valley Railway; by Mr. G. S. Hird, C.E.; and on some Improvements in the Scantlings of Iron Steam-vessels; by Mr. John Price; besides the report of the Council; introductory remarks by the President, Professor Rankine, C.E.; and a number of plates, illustrative of the papers read.—"Statistics of Invention; illustrating the Policy of a Patent Law. Part II. of a Letter addressed to the Right Hon. Lord Stanley, M.P. By Henry Dircks, C.E., &c. London: Spon." Mr. Dircks here ably advocates the cause of the inventors, and attacks those who wish to pick their pockets of the fruits of their brain-work.—"How to make Money by Patents. By Charles Barlow. London: Barlow & Clare, Office for Patents, Chancery-lane." Although this pamphlet is liable to be regarded as a trade book, promotive of the business of a patent agent, still it contains much wholesome advice to inventors and would-be patentees; and shows how valuable and lucrative many inventions have been to the patentees and inventors; and how best to proceed in order to secure similar results even under our very defective and obstructive, but improvable patent law.—"The People's Guide to the new Law of Bankruptcy, &c., written in plain English. Houston & Wright, Paternoster-row." This is a timely and useful, as well as a cheap guide. It behoves all who are liable to pecuniary difficulties, and some among them who have unwarlike desires to cheat their creditors, to know how

the new law may affect them; for it is in some respects very different from the old. For four persons starting they can now ascertain this from Honston & Wright's—Whittaker's Almanack for 1869. Office, 12, Warwick-lane, Paternoster-row." This is an excellent almanac of nearly 400 pages, containing, besides the almanac proper, with the usual astronomical and other phenomena, also a large amount of information respecting the government, finances, population, commerce, and general statistics of the British Empire throughout the world, with some notice of other countries, &c.—"Notes on the Geology of Powys Land. By W. Boyd Dawkins, M.A., F.R.S., &c. No. 1." This is the first portion of a paper reprinted from the "Montgomeryshire Collections," issued by the Powys-land Club. It contains a popular account of the geological features of the vicinity of Welshpool.—"Golden Arrows" is the title of the Christmas number of the *Quiver*, and contains for sixpence a large amount of pleasant reading. The last of the stories, "Marion Lee's Good Work," by the author of the wonderfully popular "Trap to Catch a Sunbeam" (Mrs. Henry Mackarness), will commend itself to many of our readers. It tells in a charmingly simple manner how a little helpless peasant-girl built a church, and it inculcates the value of faith and perseverance. The events follow each other so naturally that the result seems quite probable. The story, like the rest of the book, is prettily illustrated.—"The same author has added to her "Sunbeam Stories" (Lockwood & Co.) a pretty little tale, under the title of "Married and Settled."—The title of "The Boy's Home Book" (Lockwood) sounds a little too much like an endeavor to confuse it with a well-known standard work of the same character. However, it is a smart little volume, pleasingly illustrated.

Miscellaneous.

A Pre-Historic Pompeii.—Under this title the *Revue des Deux Mondes* publishes an article by M. F. Fouque on some underground villages discovered in the small Island of Therasia, adjoining Santorin, of volcanic notoriety, in the Greek Archipelago. The writer affirms that we have here a distinct proof, not only that the human race may be traced in the quaternary period, but that even then it had made some advance in civilisation. It appears that these primitive villages were destroyed by volcanic agency. The houses were built in the open air, on the old soil, and were afterwards buried under a stratum of pumice-stone and tuff, ejected from a crater. The inhabitants were taken by surprise in the midst of their daily vocations, and their tools, vases, and domestic utensils have remained for thousands of years on the spot they occupied at the time. At Santorin and Therasia the strata of tuffaceous pumice have been worked from time immemorial as building material, and a good deal of it has been exported to the Suez Canal. But the habitations consist of large blocks of lava, heaped one upon another without any order, the interstices being filled, not with any kind of mortar or cement, but with reddish volcanic ashes, having no cohesion whatever. The only house hitherto entirely exhumed is composed of six rooms, the largest of which is 18 ft. by 5 ft., and the smallest about 8 ft. square. One of the main walls of the building encloses a court. Three windows and one door have been recognised. The ceiling was composed of a series of wooden cross-beams, on which stones and a thick layer of volcanic earth were spread. Among the objects found inside there was the skeleton of a man, besides flint implements, earthen vases manufactured on a turning-wheel, and containing various seeds, such as barley, peas, cardamom, &c. The most curious relics were certain stone disks with a hole through the middle, and which are still used in the country by weavers to stretch the threads of the warp.

Fall of a Bridge on the Rhine: Forty Lives Lost.—The *Rhine Gazette* says:—"The iron bridge, yet unfinished, which the Railway Company of Berg was having constructed across the Rhine, has fallen, in consequence of a laden vessel having come into collision with the scaffolding of the construction. About forty workmen have been killed and twenty wounded in the catastrophe. This accident will retard for six months the completion of the bridge."

Pantomime Architecture.—Very reasonable, indeed, are the resolutions made by a select committee of the House of Commons on the sources of authority in matters of public architecture in the great metropolis. The report of this committee is full of hints for the scene-painter; and perhaps those adventurous artists might easily obtain a loan of the photographs that were submitted to the committee, to furnish hints for comic scenes in the coming Christmas festivities. One of these, produced by Mr. Cole, showed the railway-bridge across Ludgate-hill, with a breadth of wall advertisements, and Alderman Waitman's monument, the bridge blotting St. Paul's Cathedral out of the view, "a sort of thing for a pantomime." London abounds with architectural anomalies and absurdities of the same sort, and we did not need a Parliamentary committee to remind us of them. But the committee has done good service nevertheless, for it has placed solemnly on record, in the most emphatic manner possible, the too well-established fact that in matters architectural London is as much without a government as it is in matters political and social. Although such trite examples are set before us in the report, it is impossible to be angry. It is like a mirror in which, while looking at ourselves, the conviction is quietly forced upon us that we are supremely stupid.—*City Press*.

New Mode of Setting Boilers.—Several boilers in Sheffield have been set upon a new plan. By a simple arrangement of fire-clay plates, says the *Sheffield Independent*, so managed as not to contract the capacity of the flue at any single point, the gases, after being thoroughly intermixed, are at four successive stages in their progress through the flue, thrown, in thin streams, against the surface of the boiler. No part of the gases can escape this repeated forcible contact with the boiler, and in the process the heat they contain is so thoroughly extracted and absorbed that the result obtained, as proved by careful tests, is the evaporation of nearly 12 lb. of water for every single pound of fuel, common boiler slack being used. This gives a large saving of fuel as compared with the heat modes of setting previously in use. The patentees, we understand, guarantee a saving of 25 per cent. The apparatus has the additional advantage of being an effective smoke-consumer. The plan is applicable to any class of boiler; can be applied without unseating boilers already fixed; and the plates being of fire-clay, the cost is so moderate as to be very soon recouped by the saving of fuel.

The Proposed Public Hall for Newcastle-under-Lyme.—A meeting has been held in the town-hall, to further consider the desirability of erecting a public hall in the town. The need for a building with a large hall, rooms for building and friendly society meetings, and for the accommodation of the volunteers, was generally admitted; and it was thought no difficulty would be found in raising the required capital to carry out the project. The only difficulty experienced was as to securing a suitable site. The Rectory Field, situated in the centre of the town, was thought to be the most eligible spot on which to erect the hall. An area of 1,200 ft. it was thought, would be sufficient, and a building to meet all the requirements of the town could be erected for 3,500. On behalf of the Temperance Society of the town, it was said that if they could get the accommodation they needed, they would abandon their own idea of erecting a temperance-hall, and fall in with the present scheme. The meeting resulted in the appointment of a committee, and a deputation to wait upon the Rector of Newcastle, to see upon what terms the land mentioned could be obtained.

Channel Railway Bridge.—M. Bontel's proposed bridge across the Channel is obtaining attention. Lord Henry Lennox, in his address at the Society of Arts, said, "My impression is, that this is the best scheme for a bridge over the Channel that has been proposed. There is in Paris a model, on a large scale, which bore ten times the weight which would require to be borne by the Channel Bridge, constructed with less than one ton of metal, and resting on two abutments of rough timber, which were incapable of sustaining a very great strain. M. Bontel was kind enough to describe his drawings to me at length; and even if the Channel Bridge were not attempted, his plan of building in bridges is capable of such astonishing results as to make it well worthy the study of our own engineers."

New Lighthouse Apparatus.—In the Lochinda Lighthouse, in the island of Islay, Argyshire, Messrs. Stevenson, the engineers to the Northern Lighthouses, have introduced dioptric prisms of a new form. They are described in the "Transactions of the Royal Scottish Society of Arts," by Professor Swan and Mr. Thomas Stevenson. The light which passes behind the flame has hitherto been sent forward by two optical agents, so as to reach the eye with the front light, and thus to reach the eye of the mariner; but the object is now effected for part of the upper core of rays by means of the new prisms alone, so that one agent is saved, and the loss of light by absorption and superficial reflection is prevented. The prisms act by refraction and total reflection, and they consist of glass of the ordinary index of refraction. By means of these prisms and a spherical mirror, the whole of the back light is sent forward. They can be modified in various ways to suit the requirements of different localities.

The New Workhouse, Hertford.—At a recent meeting of the Hertford Board of Guardians, a letter was read from the Poor-law Board, which stated that the inspector had reported that the Hertford Workhouse was over-crowded, the number of inmates exceeding the prescribed maximum by 16; and asking why the guardians did not take possession of the new workhouse. The clerk was directed to reply that a dispute had arisen about the amount to be paid for building the new house, and that an architect was making an inquiry into the subject. A letter was read from Mr. Trollope, the architect engaged by the board to measure the work in the new building, in which he stated that the work had been delayed in consequence of his attendance being required at an arbitration, and that the measurements had occupied more time than he expected, but that he hoped to have his report ready within a fortnight. It was finally agreed to request Mr. Trollope to let the board have the report, if possible, forthwith.

Compensation Cases.—At the Guildhall, Westminster, before Sir W. Bodkin, Justice of the peace for Middlesex, and a special jury, an important case was tried with reference to the liability of a parish to compensate an individual owner for compulsory removal. The claimant (Miss Birch) was a teacher of dancing, residing at No. 5, Hinde-street. She numbered amongst her pupils duchesses, countesses, viountesses, both English and Irish; and even archbishops patronised her establishment! In order to carry out certain local improvements it was necessary to pull down her house in Hinde-street, which she held under a lease, dated the 16th of July, 1852, for twenty-one years, at a rent of 150l. per annum. The lady claimed from the vestry 4,000l. as compensation for her forced removal. After a number of witnesses had been examined, it was agreed to settle all claims by the payment of 1,550l. Mr. Hunt, a surgeon, who lived next door, and also claimed 4,000l., accepted 1,300l.

Carpeaux's Sculptures on the New Opera House, Paris.—It has been decided that M. Carpeaux's group of dancing-girls in front of the new opera is to be removed. The reason given for this resolution is because, quite apart from the question of their artistic merit *per se*, they are an eyesore in their present position, being out of proportion with the other sculptured ornaments of the façade of the edifice. A place will be found for them in one of the interior courts. But as M. Carpeaux is commissioned to execute another statue, or statues, to be placed on the spot where the objectionable group now stands, the change will probably not be made for the next two years.

Death of Mr. David Napier, Marine Engineer.—The Scotch papers contain the announcement of the death, on the 23rd ult., of Mr. David Napier, of Gleneshellie, Argyshire, at the age of 79. Along with his relative, Mr. Robert Napier, of Shandon, he laid the foundation of the world-wide fame of the firm of Napier & Sons as shipbuilders and marine engineers. As far back as 1818 he was the first to introduce British coasting steamers, with the steam packets for our Post-office service. He was also first to establish a regular steam communication between Greenock and Belfast. Mr. Napier invented the steely-engine, which was a great improvement on the side lever, as occupying much less space.

Householding under Difficulties.—A contemporary states that a warehouseman at Bradford has built a house for himself at the top of Pasture-lane, Clayton, near Bradford, which is described as "an attractive structure." This enterprising individual, who is of frugal habits, a teetotaler, and blessed with a family, purchased a piece of land with his savings. He excavated the foundation of his intended house himself, and fetched the building-stones from a quarry 300 yards distant, the total number of harrowfuls required numbering 548. He pitched the stones in his leisure hours, and the structure grew under his hands, until "Virginia Cottage," as he calls his mansion, stands an enduring monument of plodding perseverance. The style is said to be "Gothic," and there is one room on the ground floor, a kitchen in the rear, and a sleeping-room upstairs. The heads of two noble ancients—Demosthenes and Socrates—carved in stone, ornament the front of the cottage, and a carved representation of the head of little Eva, of "Uncle Tom's Cabin," is built into the homestead.

The Age of Iron.—In these islands alone 500 blast furnaces are blazing; reducing, by their intense heat, nearly 12,000,000 tons of iron ore to 4,800,000 tons of metallic iron, which, at its place of production, has a value of about 11,000,000 sterling. These blast furnaces consume more than 14,000,000 tons of coal; and to convert the pig iron obtained into bars, rails, and the like, a like quantity of coal is required. The great iron industry is not confined to the British Isles alone. In France it is no less active, and it boasts of ironworks which rival those of Downais, of Barrow, or of Middlesbrough. The works of Messrs. Schneider & Co., at Le Creusot, the largest in France, have fifty acres under cover. Here are fifteen blast furnaces, with twenty-seven steam-engines blowing air for them, and forging iron besides. At the mines and works over 3,500 men are employed. Belgium, Prussia, Austria, and Sweden are active in this great race; and America is striving, with earnest and honorable zeal, to overtake Europe in the production of iron from her native ore, with her own coal.

Remarkable Discoveries on the Yorkshire Wolds.—Near Bridlington, the Rev. Canon Greenwell, of Durham, and his party, have made the most remarkable of their archaeological discoveries, in the examination of two very large round tumuli, at Radstone, where the only known megalithic monument in the East Riding is,—the famous example of the Celtic menhir, or long stone, in the churchyard. The harrows are in the immediate vicinity. They were full of secondary burials, in deep graves, dug in the chalk rock, in one case 11 ft. This contained a double kist of great stones of oolitic sandstone, which must have been transported 12 miles, from Filey Brigg. Some of these stones must weigh a ton or more. Fine specimens of pottery and stone implements were found, with the human remains. Drinking-cups with ornamental patterns, in zigzag, or waving and chevron lines, &c., one of them still containing some substance in it, were found, together with a bronzeawl.

Parish Rating.—At the annual dinner of the Brompton and Little Chelsea Benevolent Society, Mr. William Corbett (of the firm Corbett & McClymont) presiding, the vice-chairman, at the close of the evening, proposed the health of the chairman in eulogistic terms, and alluded to the benefits he and his partner had conferred upon the parish by their building operations. Mr. Corbett, in reply, said—About eight years ago he commenced to build in the neighbourhood, and had erected upwards of 800 houses, nearly 500 of which were occupied, the remainder being unfinished. Notwithstanding the large number of houses that were occupied, it was a fact that the rates increased. He should much like to know how this was. He had another 250 houses to build, but if rates went on increasing so, he thought he had better leave building alone.

Committee of Mechanics.—The Council of the Society of Arts have determined to appoint a committee to take into consideration and discuss all matters of mechanical invention which may come before the society, and which may be of too strictly a technical character to interest the members at large at the Wednesday evening meetings. The action of the committee will resemble, to a great extent, the mechanical section of the British Association.

Memorial of the late Rev. Dr. Todd.—The services rendered by the late Rev. James Henthorn Todd to the elucidation of ancient Irish literature are admitted by all Celtic scholars at home and abroad. These services claim a distinguished recognition from the people of Ireland, and from all those who appreciate the high and springing agencies for social advancement which emanate from the cultivation of a sound national literature. At a public meeting held at the Molesworth Hall, Dublin, it was decided that the most suitable memorial would be to endow a Professorship of the Celtic languages, the study of which is becoming every day of increasing importance at home and abroad. Efforts are now being made to raise funds for this purpose. The Society of Antiquaries are co-operating. Sir William Tite and Mr. Chappell have been named to represent them on the committee.

The Repavement of London Bridge.—This work is now completed. The mode of paving is much the same as previously, viz., a new tramway, 12 in. in width, next the kerb, to take the near wheels of the vehicular traffic, the old tram being redressed and relaid to carry the off wheels. The whole of the remaining space is paved with new 3 in. by 9 in. Aberdeen granite cubes, with Guernsey guard stones. The length of the carriage-way is upwards of 1,000 ft.; its width 35 ft. There are about 3,500 courses of stone in its entire length, and the number of stones necessary for the roadway (including the trams) is about 105,000. The total number of tons (inclusive of stone, sand, lime, water, &c.) is between 3,000 and 4,000. The stipulated time for the completion of the work was twelve days. The contractors, Messrs. Mowlem, Burt, & Co., have had on this work about 400 skilled workmen.

Gift of Almshouses to Meltham, near Huddersfield.—Mrs. Hirst, wife of Mr. Joseph Hirst, J.P., Wilshaw, near Huddersfield, and Cheshire, has intimated her intention to build and endow six almshouses on a portion of a plantation near Wilshaw Church. Mr. Hirst, at his sole cost, has erected two churches (Wilshaw and Thornton) and schools, and also contributed largely to various charities. The houses are to be built from designs by Messrs. Kirk & Sons, architects, Huddersfield, in three couples, and each dwelling to have connected with it living-room, scullery, larder, and two bedrooms, and conveniences adapted to the requirements of aged or infirm people. The houses will be situated a mile and a half from the Convalescent Home, which Mr. Charles Brook, of Meltham, is building and endowing at a cost of 30,000.

Pulpit, Sutton Courtney.—An elaborate stone pulpit has just been erected in this church, and was first used on November 21st. It has a square base, with semi-columns and carved capitals, over which is a circular platform; the part above is formed by the half of an octagon, panelled and arched, having carved capitals. The four panels will have, on a gold ground, painted figures of the Four Evangelists: these are nearly finished, and will shortly be added to the pulpit, which was designed by Mr. Wm. Gibbs, architect, who was also the architect for the recently restored and enlarged vicarage-house in this village. Mr. C. Selby, of Oxford, erected the pulpit.

Excavating by Machinery.—A machine for the excavation of the earth and for throwing it into trucks or otherwise disposing of it, has been exhibited in operation on the grounds of the Ashburnham estate, next to Cremorne, Chelsea. The inventors consider it likely to effect a revolution in railway and canal work as at present done, as it cuts away, removes, and throws into wagons or upon the bank as required, about 60 centimètres, by 250 high, and 2-95 wide, or 2,655 cubic mètres per diem, at the cost of a few shillings.

Eds. Archaeological and Architectural Society.—The annual meeting of this society has been held in the library of the Literary and Scientific Institute, Bedford. The chair was taken by Mr. A. E. Birch, mayor of Bedford, who is *ex officio* vice-president. After the election of office-bearers, the Rev. J. W. Haddock read the report, which was adopted. Various objects of interest were then exhibited, and a vote of thanks to Mrs. Mendham, for valuable cases of coins, was passed by acclamation. A paper on Bedfordshire in the Danish period was then read by Mr. C. E. Prior, of Bedford, M.D.

Preposterous Tenders.—The following tenders have been received for roads and sewers at Brixton Manor estate. Mr. C. Sewell, architect:—

	Roads.	Sewers.	Total.
Wigmore	£2,499	£1,740	£4,239
Waterfield	1,840	1,801	3,741
Turner & Cole	1,646	1,906	3,552
Mayo	1,565	1,781	3,346
Hardman	1,576	1,593	3,169
Young	1,553	1,815	2,868
Coker, in one sum for the whole			2,342
Porter			1,950

Similar discrepancy has been lately observable in other tenders for roads and sewers, but probably never greater than in these. Such incidents bring scandal on the trade.

The threatened New Prison.—The Middlesex Magistrates, at their last meeting, decided against the proposed and half-sanctioned scheme of rebuilding the county prison. A wiser and more timely decision was never come to by a irresponsible body. The scheme was viewed as both superfluous and untimely. The magistrates have done wisely in listening to the emphatic protests of the ratepayers against it. The amendment passed declares that our whole system of criminal treatment needs revision, and "is a great and needless burden on the honest inhabitants of the country."

Crystal Palace.—Since the erection of the new stage and theatre, Operas in English have been played with great success two or three days in each week. Large as the theatre is, has been constantly crowded. The necessary rehearsals and preparations for the Christmas pantomime, which is always produced at the Crystal Palace a few days before Boxing Day, necessitates the termination of the English Oper performances after next week,—up to which time they will be continued, in order that visitors to London for the Cattle Show may witness one or more representations.

Lighthouse, Ceylon.—Messrs. Shearman & Smith, & Co., of the Dalbeattie Granite Quarries, N.B., have obtained from the Trinity House Corporation the contract for the supply dressed granite for the Great Basses Rock Lighthouse, Ceylon.

Discovery of a Roman Altar at Eastgate, Stanhope-in-Wearside.—A Roman altar has been discovered in a wood near the little village of Eastgate. The stone belongs to the millstone grit strata, and is finely wrought. It is 4 ft. in height, 22 ft. in breadth, and 12 in. depth. It bears the following inscription:—

"DEO
SILVANO
AVBELIUS
GVIENUS
TRIBE."

Which signifies that the altar had been dedicated to the deity Silvanus, the beathen god of the woods, or country, by Aurelius, Prefect the 1st Cohort of the "Gordian Legion." This was in the reign of Gordianus (the third of that name). M. Antonius Gordianus Pius reigns A.D. 238-244.

TENDERS.

For rebuilding the White Horse, Pond-street, Haverstead. Mr. F. New, architect:—

Maidlow	£1,400	0	0
Watson	1,201	0	0
Till	1,121	0	0
Bean	1,095	0	0
Kelly	1,082	0	0
Haley	1,057	0	0
Cook	1,050	0	0
Watts	996	0	0

For the erection of a pair of model cottages, fit with Moulé's earth-closets, &c., at Wilton, Taunton, Mr. Henry Badocek, Mr. Houghton Spencer, architect:—

Rendell	£241	14	6
Davis	430	0	0
Pollard	388	0	0

For country residence, stabling, lodge, &c., at Rhayader, Radnorshire. Mr. E. H. Lingen Backer, architect:—

Washington & Co.	£3,456	0	0
Morgan & Potter	3,407	0	0
Yates	3,278	0	0
Wood & Sons	3,236	0	0
Moreland	3,213	0	0
Birrell	3,124	0	0
Jones	3,117	0	0
Evans	3,115	0	0
Lewis	3,194	0	0
Morgan	2,771	0	0
Williams & Bolton	2,764	0	0
Harrison	2,754	0	0

WANTED, a PARTNER with 9,000l. to work a Site in Germany...

WANTED, a Person of gentlemanly appearance, competent to direct...

WANTED, a FIRM of leading Belgians Estate Agents...

WANTED, a CLERK of WORKS, or FOREMAN, who has been engaged in Theatre work...

WANTED, in a Builder's Establishment, a thoroughly efficient STORE and TIME KEEPER...

WANTED, by the Advertiser, aged 38, a constant SITUATION as JOB, or PRINCIPAL ASSISTANT, and ZINC WORKER...

WANTED, EMPLOYMENT, by a respectable Young Man, aged 34, as PLUMBER, PAINTER, GLAZIER, and ZINCWORKER...

WANTED, PIECEWORK in large or small quantities, by a thoroughly practical BUILDER, Joiner and Carpenter...

WANTED, by a respectable Young Man, a SITUATION as PLUMBER, Good references...

WANTED, by first-class PLUMBER, Painter, Lead and Sash Glazier, and Paperhanger, a CON-STANCY or JOB...

WANTED, a SITUATION as PLUMBER, Willing to fill up in other branches if required...

WANTED, a SITUATION as FOREMAN of PAINTERS, or as Measuring and Estimating Clerk...

WANTED, a RE-ENGAGEMENT, as a GENERAL FOREMAN of SMITHS, one who has had great experience in Engines and Builders' Lines...

WANTED, by BUILDERS WITH STEAM MACHINERY, a RE-ENGAGEMENT, as SHOP FOREMAN...

WANTED, a RE-ENGAGEMENT, as SHOP FOREMAN, or as GENERAL FOREMAN, well up in every description of Job...

WANTED, by ARCHITECTS and BUILDERS, an experienced CLERK of WORKS, or RE-ENGAGEMENT, or as MANAGING FOREMAN...

WANTED, by a steady practical BRICK-LAYER, a BEHIVE as FOREMAN (working or otherwise), or to take Charge of a Job...

WANTED, a RE-ENGAGEMENT, as SHOP or WING FOREMAN, or to take Charge of a Job, by a thoroughly practical, energetic Man...

WANTED, a RE-ENGAGEMENT, as SHOP or WING FOREMAN, or as GENERAL FOREMAN, well up in every description of Job...

WANTED, by ARCHITECTS and BUILDERS, an experienced CLERK of WORKS, or RE-ENGAGEMENT, or as MANAGING FOREMAN...

WANTED, by a steady practical BRICK-LAYER, a BEHIVE as FOREMAN (working or otherwise), or to take Charge of a Job...

WANTED, a RE-ENGAGEMENT, as SHOP or WING FOREMAN, or to take Charge of a Job, by a thoroughly practical, energetic Man...

WANTED, EMPLOYMENT as CAR-PENTER and JOINER, by a steady Man, aged 34, on an Estate or Buildings...

WANTED, a SITUATION as ARCHITECTURAL and ORNAMENTAL PATTERN DRAUGHTSMAN, in an Art Foundry...

WANTED, a SITUATION, in an Architect's Office in Town, well up in construction, perspective, and details...

WANTED, by the Advertiser, a RE-ENGAGEMENT as CLERK of WORKS, or GENERAL AGENT. Is a good draught man...

WANTED, by BUILDERS, SURVEYORS, &c., an experienced and practical MEASURING and QUANTITY CLERK...

WANTED, by a Young Man, who is a good PLUMBER, a SITUATION or JOB as PLUMBER or THREE BRANCH HAND...

WANTED, by a Builder's Son, aged 19, a SITUATION as KEEPER BOOKER...

WANTED, by a Young Man, a constant SITUATION as PLUMBER, or as a JOBBY, Can do painting or glazing...

WANTED, by an experienced Man, a SITUATION as PLUMBER, and is willing to fill up his time with painting...

WANTED, a SITUATION as PAPER-HANOR, No objection to fill up his time at painting Town or country...

WANTED, by IRONMONGERS and BUILDERS, an experienced middle-aged Man, a SITUATION as LOCKSMITH, BELLMAN, GASFITTER, or FRYER...

TO ARCHITECTS, SURVEYORS, and BUILDERS, WANTED, a RE-ENGAGEMENT, by a good general ASSISTANT, permanent or otherwise...

WANTED, a SITUATION, as CLERK of WORKS, or SURVEYOR, in a country town or village. Has served some time in an architect and engineer's office...

WANTED, by a thoroughly practical, energetic Man, an ENGAGEMENT as GENERAL FOREMAN, or otherwise, to superintend all kinds of work...

WANTED, by an active Man of Business, and of a permanent or temporary ENGAGEMENT in any department of the building trade...

TO LAND SURVEYORS, &c., WANTED, by a Gentleman, who has a very fair knowledge of Land Surveying, Levelling, and Book-keeping...

TO MASTER BRICKMAKERS, WANTED, by a respectable middle-aged Man, a SITUATION as FOREMAN, either in close kiln or slack work...

WANTED, by the Advertiser, aged 24, a RE-ENGAGEMENT, Can prepare finished, working, and detail drawings...

WANTED, a RE-ENGAGEMENT as OUTDOOR FOREMAN of JOINERS, or as general FOREMAN, by a thoroughly practical Man...

WANTED, by a JOINER'S MACHINIST, a SITUATION to work GENERAL JOINER, or MOULDING MACHINERY...

TO ARCHITECTS, BUILDERS, &c., WANTED, a RE-ENGAGEMENT as CLERK of WORKS, Shop or General Foreman, or to take Charge of a Job...

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The Builder.

VOL. XXVII.—No. 1401.

The Catastrophe at King's College, London.

It has never fallen to our lot to visit the scene of a more significant and instructive calamity than that which, about eight a.m. on the 6th instant, converted the dining-hall of King's College into a scene of ruin and desolation.

The first and most natural suggestion that must occur to any man of right feeling, on hearing of the event, is that of thankfulness for the escape of the students. The timing of the fall—we may almost say miraculously—happy. That no human being should have been overwhelmed, either in the hall or in the kitchens below, by a downfall as sudden and as irresistible as if it had been



caused by an earthquake, is matter of wonder as well as of satisfaction. Five hours later the hall would have been occupied for its appropriate purpose; and, had the event then taken place, the number of families that would have been put in mourning, and the feeling of horror and of pity that would have thrilled through the country, would have been something the like of which we have not seen.

To the constant readers of our columns the investigation of the details and of the cause of this great disaster presents unusual claims for attention. On more than one occasion we have pointed out the necessity for narrowly observing the effects of the works carried on for the walling of the Thames Embankment. Our notice of a somewhat menacing appearance on the northern abutment of Waterloo Bridge called forth a reply from the officials connected with that structure, which was, perhaps, more vigorous than courteous. No one could have hailed with greater satisfaction than ourselves the announcement that the bridge had been carefully watched, and that the unsightly defect to which we called attention not only might be, but was, attributable to a cause other than that of the subsidence of the foundation. Recent assurances on that subject have been given by an authority that we all respect. But that our counsel was not the voice of unreasonable alarm is demonstrated by what has now occurred within a few dozen yards of the very spot to which we called attention.

The disaster at King's College possesses this rare character. Its cause, and the exact mode in which it occurred, can be defined with almost as much exactitude as if they had resulted from a definite, intentional experiment. And as we can enter into the discussion without throwing any heavy blame on any living culprit, without having our feelings harrowed and lacerated by any calamity to life or limb, and without any fear of well-informed contradiction, we cannot but feel that the event is one which may render

eminent service, as an instructive warning, to all interested in the science of construction.

In front of the river façade of Somerset House stretches an arcaded terrace; a feature frequent in Italian palaces, though rare in our own country, and which is one of the elements of the architectural grandeur of this noble building. Fortunately, as the case now turns out, this terrace is rather an independent building than a part of the main structure itself. A pathway, or area, lies between the rear wall of the arcade and the face wall of the main building, so that it would be practicable (however undesirable) to pull down and rebuild the former, without structurally weakening the latter. The arcaded terrace is, in the main, as solid in its building as it is noble in its proportions. The rusticated stone piers, 17 ft. 6 in. apart, are 4 ft. by 6 ft. in depth and width. Arches issue from these piers at a height of some 16 ft. from the ground, and the interior portion of the soffit of each arch is supported by a transverse, or jack arch, springing some 6 ft. lower than the main arch, and reaching from the rusticated piers, visible from the river, to an inner wing pier, which is of solid brickwork. Thus the face of the arcade is one solid structure of masonry, well-proportioned and massive in its dimensions, and compact by the lapse of time.

Behind the top of the arcade, for the greater portion of the length of the river frontage, the terrace itself, which is covered with turf, is supported by substantial groined arches. At each end, however, is an apartment (below the terrace), 70 ft. long by 26 ft. wide, the floor and the roof of which are, or rather were, supported by cast-iron girders.

Lengthways of the apartment three pairs of piers, 3 ft. deep and 1 ft. 9 in. wide, supported three cross girders. Longitudinal girders rested on these and on the end walls, so that the roof of the dining-hall in question, which was the eastern of the two girder-topped rooms, was divided into sixteen bays of brick arching. Above the arching was a layer of tiles, then a species of sand concrete, then earth, and lastly turf, for a total depth of about a couple of feet.

Now the point, or at least the points, where this superstructure gives way are ascertainable with absolute certitude. Notwithstanding the low state of our scientific knowledge of cast iron thirty-five years ago (which is stated to be the age of the structure), it seems incredible that any founder should have cast, or any engineer designed, girders so unmechanical in their structure; for each cross-girder had a top flange 3½ in. wide by 2 in. deep, which, so far from adding to the strength of the beam, created by its useless weight, a positive tendency to its destruction. The longitudinal girder had bottom flanges and upright webs. The cross-girders, which bore in one case the entire weight, and, in the end bays, half the weight, of the longitudinal beams and their superincumbent load, had bottom flanges—upright webs, deeper in the centre than at the sides, and a rounded top flange, as previously stated.

But,—and here is the knot of the matter,—in the very place where the longitudinal girder rested on the transverse girder,—the very spot where the main weight came upon the latter,—*the top web was omitted!*

It is easy to see that the fatal structural fault was perpetrated for the sake of allowing the longitudinal girders to be dropped and slid vertically into place. But the destruction of the whole value of the upper table is unquestionable. And the matter was made worse by the fact that a pair of vertical snags, or projections, were cast, in each instance, on the vertical web at this point, with a bevel or dovetail inwards, forming a sort of pocket to receive the butt end of the longitudinal girder. This complication in the form of the casting was likely to affect the run-

ning and the cooling of the metal at the very weakest part of the beam. It had this natural effect. In one of the castings (only two or three are as yet accessible) ugly air-holes are detected close by the fracture. In every case the cross girders have broken at the pocket. The regularity with which the longitudinal girders in the two end bays have fallen, pointing inward to the central bay, which was evidently the first to fall, is a remarkable and unprecedented feature in our experience of demolition.

The actual mode of the downfall, then, is perfectly clear. Girders, assumed to be capable of bearing a given weight (we leave the details of the calculation aside for the moment), were weakened at the parts where the actual strain came upon them, by the excision of the top flange, for the convenience of fixing. The whole top flange, which should have constituted some half of the resisting power of the girder, was thus converted into mere useless weight. And when a new stress was thrown on the structure, it suddenly gave way in one or more of these weak points. At them all the fractures occurred, and one of them, the central girder, the south end of which was left *in situ*, and projecting some 3 ft. from the wall, and which we saw removed on Wednesday morning, presented a conchoidal fracture, of a coarse texture, which, in all probability, was the very point that first failed. The downfall of the rest of the structure would have been the instantaneous result.

Thus much for what Lord Bacon would call the formal cause. It now remains to inquire what was the efficient cause of the calamity? What was it that thus brought upon these girders which, however mechanically faulty in their design, had done their work for some third of a century, a new strain which they were unable to bear?

To this question it is as easy to give a reply as in the former instance. Above the surface of that large basin of stiff blue clay, over which the native fogs of London so fondly hang, lies a stratum, varying in its thickness, of gravel, or ancient sea-beach. Above this, again, lies the surface soil, local beds of clay, in some instances immediately covering the gravel. On one of these local beds, consisting of brick clay, or pot earth, which appears to have been worked as far back as the period of the Roman domination, stands the greater part of St. Paul's. We say the greater part, for at the north-eastern corner of the site the ancient potters had worked away the whole thickness of the material, and here the cautious architect, fearing to trust any portion of the great weight of the Cathedral to a water-logged gravel foundation, sank down to the London clay below, and planted a solid pier of 40 ft. in depth to bear that corner of the edifice. And this was done after shifting the centre line of the Cathedral from its due ecclesiastical orientation, so as to take advantage of the largest possible area of the "pot earth."

Through this bed of gravel or heath, penetrated, as it is, everywhere by water, the engineer of the Thames Embankment has cut a broad and deep trench to the clay below. The foundations of the granite quay wall rest on this geological "rock" at the depth of 32 ft. 6 in. below Trinity high-water mark. To excavate and to keep clear these foundations, a steam-engine of 14-horse power, was in each section constantly at work, and the chain-pump which it propelled discharged a perfect river from the subterranean source. The flow of water thus caused would not desist from exerting its own mechanical influences out of respect for the Lord Mayor, or for any of the officers, institutions, or buildings, of the City of London. What the natural effect of this mighty pumping would be, in theory, we all know. Gradual loosening of the permeable stratum, displacement of the smaller particles, consequent tendency of the larger ones to come down together, disposition

of the whole water-applying area to move—microscopically—infinitesimally, may be—but still with mathematical certitude. As to this there could be no doubt,—although we had small thanks for saying so fourteen months ago.

One point might have been considered doubtful, and that was, how far the weight of any very massive building, compressing and consolidating the subjacent gravel, might have prevented the mischievous action of the infiltration (or rather, if there were such a word, *exfiltration*) of the water. On this point we have now not only information, but a flood of light, and a very unpleasant flood into the bargain.

From the time of the formation of the quay wall to the south of Somerset House, indications of movement have been observed in the arcade which we have before described. Since the commencement of the works of the Metropolitan Railway, which lies so much nearer to the noble facade of Sir William Chambers than the quay wall itself, those indications have become more formidable. How much may be attributed to the works under Mr. Bazalgette, and how much to those under Mr. Fowler, it is not necessary now to inquire. It is sufficient to be able to state the date of the commencement of the evil, and to add that it has been so far from being unexpected, that wrought-iron tie-riods have already been provided, for the purpose of binding together the arcade which has actually, to a certain extent, got under weigh. The river face is at this moment from 3 in. to 4 in. out of plumb, inclining, of course, towards the river. The parapet shows a line which is anything but straight, and the pavement on the terrace presents in several places indications of motion.

On examining the substructure of the arcade, we do not find that the massive stone piers and arches show any signs of movement, other than that which may be detected by the application of the plumb-line. Whatever movement has taken place has been in block, and, were it not for the absolute certitude that such a structure could not have been built to overhang, an examination of that exterior arcade would give no cause for alarm. Inward, however, the case is different. Cracks are very visible in the longitudinal arches; and, what is more remarkable, the piers themselves are giving signs of being actually torn in two.

The cause of this fault, which is betrayed by cracks proceeding downwards from the top of the piers, and wider above than below, might have been puzzling, without that knowledge of the structure at which the downfall of the dining-hall enables one to arrive. It is palpably this. The cross girders, before described, are cast with enlarged hearings at the ends (each 18 in. by 24 in.), and at the extremity of each of these slabs of iron is a snag, or downward projection, which is let into, or slips behind, the stone impost on which the girder rests. If the river wall, therefore, should tend to move outward, the girder must act as a tie; and, if the motion were solicited by any great force, must either hold back the outer wall, fall over the inner wall, or break. In point of fact, it has divided its power between the two first duties, and finally divided itself.

Had the girders been without snags, and merely laid on the stone imposts, there is every reason to suppose that the motion which has actually occurred would not have materially damaged the roof. The pavement on the terrace would have yawed, far more than it does; but the girders would not have given way. On the other hand, however, the outer wall might have gone further.

It is thus evident that a double strain was thrown on the bottom flanges of the cross-girders. We may call it an unanticipated strain; for, although the very existence of the snags may be taken to denote an expectation that there might be a tendency to lateral movements in the works, to provide against which the girders were thus disposed to act as a tie, we cannot admit that an engineer who was so ignorant of the first principles of structure in iron as to cut away the top flange of his girder, in three separate places, on each side, could have anticipated the extra tensile strain which might come on the bottom flange—deprived as it was of the aid which it ought to have derived from the upper table.

That explains, too, the peculiar conchoidal form of that which we take to have been the first fracture. The weight of the terrace hung, as it has done since the building was completed, on the system of girders. The strain of the

outward inclining wall was thrown, with increasing force, on the bottom flange of the centre girder, which already was, unsuspectingly, doing the work of both upper and under flange. Add the vibration caused by the pumps and the railway trains, and the tearing asunder of the bottom flange on the instantaneous fracture of the vertical web as weight came upon it, the rapidly succeeding fracture of the other cross girders at the pockets, and the inward, whirlpool-like collapse of the whole terrace, follow with as much regularity as a train of carriages after a locomotive.

The lesson is very important and very serious. It behoves all those who have interest in any buildings, public or private, that may by any possibility be affected by subjacent waterflow, to be on the look out. It is well that it is no worse. It is well that the Embankment has stopped where it has. He would be a hold man who should resolutely assert that St. Paul's could not be affected by the same cause that has undermined Somerset House, if we were to draw out a stream of water from the bed immediately underlying the ponderous weight of this great cathedral. Nor can we omit to add that those are not alarmists who point out, in due time, the dangers arising from neglect of mechanical principle. Forewarned is forearmed. Great watchfulness is now necessary; wary observation, prompt execution with regard to one of our noblest edifices, which is actually on the move. It is to prevent, not to cause, panic, that we suggest that there are others to be looked after, and that a subterranean river cannot be led from the subterranean lake, on the coast of which London may be said to float, without impelling other buildings than that which has given us such a loud and sudden alarm.

MODES OF MURAL DECORATIONS.

A TECHNICAL work of much value has just appeared from the pen of Mr. W. Cave Thomas on the subject of mural decorations, evidently the result of much thought and labour.* Just as archaeological artists now con over the old pages of the monk Theophilus for glimmerings of the various processes disseminated in his work on kindred subjects, so, we venture to prophesy, in time to come will retrospecting minds delight to dwell upon Mr. Thomas's descriptions and instructions. For immediate use, however, the volume has still more value, as the indication we are about to give of its contents will show. The experience of the author in the matters of which it treats, and his power of relating this experience in terms sufficiently close to enable those following his instructions to obtain clear ideas of his meaning, appear to us to be used in a very generous manner, for the benefit of all studying in the same departments of art. But over and above accounts of the processes of fresco, encaustic, water-glass, mosaic, and oil paintings, he has compiled a list of the principal mural decorations of Europe, accompanied by a statement of the name of the painter by whom they were executed, and the method he employed; and besides this he has drawn up a list of painters, showing under whom they studied, the period at which they lived, and the kind of excellence for which they were renowned; and a tolerably full list of works upon painting.

One of the author's leading theories is that art should endeavour to depict or model perfect humanity; and that education should endeavour to make this ideal, ultimately, a living fact. He says at the onset, pertinently, that he cannot understand why poets and painters should wish to infer that their "inspiration" is independent of rules and science; for order being Heaven's first law, it must be certain that no success can be achieved that is not the result of either consciously or unconsciously, working in accordance with scientific principles. Thus pronouncing himself in the ranks of order and moderation, as he has done before in other works from his pen, Mr. Thomas proceeds to state the antiquity of mural painting as the earliest form of pictorial art, and its value as the memorial of national existence, and of the aspirations of that existence. Michelangelo spoke of easel-painting as an occupation fit for women, compared with mural painting; and Mr. Thomas, like our friend, follows in his wake as far as the highest appreciation of the last-mentioned branch of art takes him.

* Mural or Monumental Decoration: its Aims and Methods. Comprising Fresco, Encaustic, Water-glass, Mosaic, and Oil Painting. By W. Cave Thomas. London: Winsor & Newton, 38, Rathbone-place.

He treats of fresco-painting first. Odd confusion has long existed as to the meaning of the word fresco; for people even now constantly speak of all pictorial mural decorations as frescoes; but, as most of our readers must be aware, the term properly applies only to those wall-paintings that are executed by means of a particular process. Encaustic paintings, oil-paintings, and water-glass paintings are easily applied to walls; but that application does not constitute them frescoes. Although we are not going to give the details of the processes described by Mr. Thomas, which should be studied from his work, we may point out that frescoes are paintings made with colours simply mixed with water, upon fresh wet mortar. The necessity for newness in the mortar is so important that only sufficient is placed upon the wall to enable the painter to execute the piece he has undertaken for one day's work. On the following morning, or whenever he resumes his task, another piece of wall is newly plastered to admit of his operations. But it is within the limits we have set out for ourselves to quote the nature of the preparations a wall should receive that is intended for frescoes. The Italian masters preferred this vehicle to any other, if we may consider their most frequent use of it a sign of preference; but, with the exception of the frescoes in the summer-house at Buckingham Palace, and those in the Houses of Parliament, there are scarcely a dozen examples of the process to be counted in this kingdom.

Mr. Thomas states that a brick wall, a brick or brick and a half in thickness, well dried and of equal hardness, is the best kind of wall for the purpose. The use of laths is sometimes resorted to for special circumstances, but never when a dry brick wall is available. Outer walls, having a liability to damp, he would have lined with brick; and he records the suggestion of a detached inner wall, bound here and there to the outer one, without, however, quoting any actual experiment of this plan. Speaking now, out of our own experience, we should hesitate to adopt this last mode, having known the places where the junction is made between the two walls to be so many means of conducting the outer damp to the inner surface and spreading it in patches. Mr. Thomas objects to battens and laths on account of their perishable qualities; but he mentions that many of the fine Italian ceilings are on lath and in good condition. He thus describes their construction:—

"Most vaulted ceilings, in what is termed the *piano nobile*, or principal floor of every palace, are constructed of wood. The lathing in this case is not attached to single thin pieces of timber, cut to the shape of the ceiling, but to a strong grating; in some cases the ribs and transverse pieces of this grating are 4 in. thick each way. The lathing in Italy is a very peculiar process. The material is the reed, which is cultivated so extensively in that country, and used in so many ways. It grows to the length of about 15 ft., and is rather more than 1 in. in diameter at the base. When these reeds are used for lathing, they are split, and not being strong enough for the purpose in this state they are wattled upon the grating. The result of this somewhat complicated contrivance is a framework of great strength."

Assuming, however, that the surface intended for a fresco is a brick wall, the face of the bricks should be chipped, so as to enable them the better to hold the rough coat of mortar. This last requires to be applied with care, for if it be uneven, there will be patches of dust lying on every projection, and if the inequalities are filled up in the after-coat, there will be cracks occurring between the thick and thin places. The tendency dust has to adhere even to a strictly perpendicular surface has been taken into account, and a suggestion made that walls intended for frescoes should incline slightly forwards. The rough cast should be left to harden thoroughly before the next process is attempted. If the lime used in the mortar be fresh, two or three years will be required for it to attain the necessary condition. The quality of the lime is a matter, too, of the greatest moment in the next stage. The limestone used by the cinquecento artists was travertine, which is almost a pure carbonate of lime. Mr. Thomas gives the proportions as,—

Carbonate of lime	99.4
Alumina with a trace of oxide of iron .....	.6
.....	100.0

While the lime used by the Genoese, which has resisted the effect of sea air for centuries in a remarkable manner, yields—

Carbonate of lime	63
Carbonate of magnesia	36
Earthy matter, oxide of iron, and bituminous matter	1

A limestone equal to that of the Romans, is fortunately procurable on the Durdham Down, near Bristol, which is composed of—

Carbonate of lime	99.5
Bitarumens matter.....	0.3
Earthy matter.....	0.2
	100.0

Hence, we have no difficulty to contend against in this particular. Nothing remains but to attend to the causticity of the lime, for if used too soon after being slaked, it blisters, and pictures executed without this proper precaution, have flaked off, leaving, in the white patches exposed, all the effects of a snow storm. Some authorities aver that it should be kept for several years; some for three; some only for a few months. The German painter, Cornelius, prepared his lime for the frescoes in the Ludwig Kirche eight years before he used it; and an Italian writer of the sixteenth century, Leon Battista Alberti, speaks of a honey-like consistency gained by lime that had lain by for 500 years. But Mr. Thomas shows all that is requisite in that it should regain its maximum of carbonic acid. He adds that some degree of causticity is necessary to give the adhesive firmness required for induration; and is very precise in his details of preparation for both the rough cast and the upper coat, or *intonaco*, destined to receive the colours, and the mode of operation, the colours, and the mode of operation, from the time the painter applies his tracing to the fresh mortar, till his day's work is glowing, finished, under his hand, are described minutely. No painter can need further instruction. All this seems very clear in words, and yet the truth is that we do not know how to make our fresco work permanent in England.

The section of the work on encaustic painting is more interesting. Though not used to so large an extent as fresco by Medieval artists, the process was well known to them; and the three kinds of painting described by Pliny are supposed to have been none other than different forms of this. The art was endeavoured to be revived in the middle of the last century, since when various experiments have been made, beginning with those of Count Caylus and M. Bachelier, without, however, any certain or settled mode of operation having been digested. Mr. Thomas records the inquiries and experiments made to elucidate the ancient practice, though he thinks it not unlikely that advanced chemical science may arrive at a manner of making wax without the application of heat. Encaustic painting has the advantage of having a richer range of colour than fresco-painting, and yet is without the gloss of oil-painting; moreover, he describes the process as less encumbered. Count Caylus thus set about his plan of proceedings. He first waxed the cloth, canvas, or wood, designed for his picture, with beeswax, and then covered the groundwork for his colours with chalk or whiting. His colours were mixed with pure water; and when they were applied, and his picture was dry, he placed it near the fire, when the wax melted and absorbed the tints upon it. An important piece of attention consists in heating the wax gently, and allowing it to cool slowly. The advantages of this method over oil-painting were tested by the following experiment:—

"The same colours were prepared in oil and encaustic, and the strips of canvas bearing them were each cut into five equal pieces.

"First.—One piece of each was exposed in the open air to the influence of sun, dew, wind, and rain.

"Secondly.—One piece of each was nailed to the wall of a damp cellar.

"Thirdly.—One piece of each was nailed to a kitchen ceiling, near the chimney, where a fire was kept the year round.

"Fourthly.—A piece of each was nailed to the side of an ordinary dwelling-room.

"Fifthly.—One piece of each was put between several quires of paper, and placed in a close drawer."

After an interval of twenty-seven months the pieces were collected and examined, and compared with the same tints newly painted in both manners, when it was found that the specimens of encaustic painting submitted to three out of the five experiments were as good as new, while all five of the pieces of oil-painting had materially suffered. The two specimens of encaustic painting that presented any appearance of deterioration were those that were submitted to the first and third experiments. The piece that was exposed to the sun and weather, though dimmed by the side of the new tints, was still bright by comparison with the oil-painting that had gone through the same roughing; and when it was washed with a brush and pure water, recovered considerably, though its companion did not. The

experiment of putting it before the fire was next tried, when many of the tints recovered their original brilliancy, the exceptions being pinks, yellow orpiment, lake, terra di sienna, and verditer. The piece hung over the kitchen fire-place, though smoked, recovered after being washed with soap and water, with the exception of its pinks, yellow orpiment, smalt, and verditer. Thus it will be seen that encaustic paintings have many points in their favour.

An important part of Mr. Thomas's book includes an exposition of the water-glass process, first discovered, or invented, at Munich, which many think may prove superior to all other modes of decoration. The information he publishes concerning it is a reprint, he has been permitted to give, of the pamphlet by Professor Fuchs, first translated from the German, printed and privately circulated, by command of the late Prince Consort. And this is supplemented by the report of Mr. Macleise on the process, and the correspondence that took place with German artists on the subject preparatory to its use in the Houses of Parliament. To those of our readers who are not acquainted with the nature of this composition, we may explain (though it has been before fully set forth in our pages), that there are four kinds of it, potash water-glass, soda water-glass, double water-glass, and fixing water-glass. The first is a mixture of fifteen parts of pulverized quartz, ten of well-purified potash, and one of powdered charcoal, mixed and exposed to a strong heat in a melting-pot till melted, when it is taken out, broken up, pulverized, and dissolved in about five parts of boiling water in an iron vessel; where it must be stirred and the water replaced as it evaporates, for three or four hours. This mixture, which is prepared with a care duly inculcated, when applied to surfaces has the property of rendering them compact, hard, and solid. Like glue, the Professor says, it may be employed for imparting solidity and greater cohesion to loose masses, for filling up cracks, and similar purposes. The other water-glasses have such differences in their ingredients as their names suggest, all of which are faithfully given and their effects described; and it is yet a matter of conjecture which will answer the purpose best. The chief purpose for which they are applicable and prized, is that of mural painting. They cause the colours to adhere well; and they give great durability, if not indestructibility, to them; and it is expected that when applied to existing frescoes they will prevent their further decay. But it is as a medium for new paintings that water-glass has raised the most sanguine expectations. As in frescoes, a coating of mortar cement is first applied to a wall intended to be covered with a painting, but before the *intonaco* is thought of this first coat has to be saturated with water-glass several times. When dry, the second coat is proceeded with, and in its turn impregnated with the same binding and cementing material. The German artists, Baron Kaubach and M. Echter, who have done most for perfecting the application, find that the colours must be ground with pure water and the wall kept moist, whilst the artist is engaged upon it, by means of syringing it with water. Professor Fuchs applied water-glass to a stove-tile with some success; and the director of the telegraph-office at Munich has applied it to iron. A suggestion is thrown out, too, that plates of lithographic limestone might be used as a ground for water-glass paintings, which stone plates could be let into walls so as to appear to be part of them, and yet could be removed if necessary. In his list of mural decorations, Mr. Thomas mentions one painting executed with this material besides those in the Houses of Parliament,—a procession subject, by Mr. Gambier Parry, at Coombe Abbey.

Touching mosaic, he speaks of the history of its revival by the Murano glass-blower, Lorenzo Radi, however, and its recognition by Dr. Salvati, of Venice. Its application in this country in the Wolsey Chapel, Albert Memorial, and Westminster Abbey, after designs by Mr. Clayton, is well known. But although France had a school for mosaic artists in Paris thirty or forty years ago, and Russia and Venice have now their rival manufactories, and Rome still encourages the art within the privileged precincts of the Vatican, there is little effort made in England out of South Kensington to further the use of this style of decoration. Two or three English writers have kept the subject before the public, and urged its advantages. Furthermore, Mr. Cole has a strong desire to create a

taste for this kind of decoration, and Messrs Minton, Maw, Simpson, Knut, and others produce ceramic tessera; hence it is probable that in a future edition Mr. Thomas may have to record that the art has taken root in this country. It is best applied in lofty spaces, such as vaults and domes of public buildings, where the limitations of its powers are least apparent; and needs caution and moderation in any treatment of it that may be contemplated, whereby the meagreness of the earliest efforts and the redundancy of the latest may be alike avoided. It has but little of our author's sympathy, and he makes no effort to obtain for English art the honour of having made Abbot Ware's opus Alexandrinum in Westminster Abbey, though the substitution of Parbeck for cippolino, the usual groundwork, has led others to believe it was executed in this country.

After reading Mr. Thomas's book, we think of the great masters of old, not as the portraits of many of them show them, idle, clad in velvet and furs, with plumes in their caps; but in their equally pictorial blouses, pied with daubs of colour, moving about on scaffolding, or ascending ladders, with their clever hands gritty, their speaking faces full of wonder, anxiety, and conjecture as to the result of the processes they are employing; and we feel that some of this uncertainty will be diminished for future painters by the care with which the various processes are described in it, and the fulness with which the results of many experiments are stated.

PROPOSED DESTRUCTION OF THE GALERIE DORÉE OF THE BANK OF FRANCE.

It is with sincere regret that we call attention to the contemplated rebuilding of the celebrated Galerie Dorée of the Hôtel de la Vrillière in Paris, which now forms a portion of the Banque de France, and in which the board meetings of that body have been held since the year 1812, when the Bank was removed from the Hôtel Maitiac.

This gallery is the only remaining part of the original building as erected by François Mansart in 1620, the rest of the hôtel having been restored in 1719 by Robert de Cotte, and is a very complete and characteristic example of the florid architecture and redundant decorative treatment of the seventeenth century. The gallery is a spacious room, about 130 ft. long and 23 ft. wide, divided into five bays. It is lighted on one side by five large windows, corresponding to which on the opposite wall are five blank bays filled in with mirrors in frames. The ceiling is coved, and is richly decorated with bas-reliefs and allegorical paintings, in panels, in the elaborate style of the time of Louis XIV. The piers were decorated by the best French and Italian artists, among whom were Possenti, Carlo Maratti, Pietro di Cortona, Valentin, and Guercino; the ceiling was painted by Perier in 1646.

It is proposed to pull down this interesting building, and to replace it with a new structure, under the superintendence of M. Questel; and the brothers Balze have been commissioned to make copies on canvas of the frescoes on the ceiling to be placed in the new gallery.

It is hardly necessary to point out, that to pull down and reconstruct an edifice of this description is simply to destroy it. No amount of care or respect for antiquity, on the part of the architect, can preserve the spirit and interest of the original. It is, says a French critic, like repainting an old master. The consul Mammia did a similar thing when he proposed to remake at Rome the statues of Phidias he was reproached for having destroyed at Corinth.

The reason alleged for this act of Vandalism is, that the gallery has been represented to be in an unsafe condition. This is the report by M. Questel; but on this point he is contradicted by M. Labrouste, whose opinion is on every ground entitled to equal respect, and who has declared, after a careful survey of the building, that it is possible to replace the defective portions by underpinning, and to preserve intact the two tiers of frescoes. A similar operation was carried out at the Galerie Mazarin, and the pictures by Romanelli were restored with the most scrupulous care. A portion of the ceiling of the Galerie Dorée was also restored by Vien in the year 1766.

Independently of its architectural value, the Galerie Dorée is particularly interesting, from the historical associations connected with it.

Built originally for the Duc de la Vrillière, whose name is given to the street which runs on the north-east side, the Hôtel de la Vrillière became afterwards the residence of the Comte de Toulouse (son of Madame de Montespan and Louis XIV.), and of his son, the Duc de Panthièvre, and remained in the possession of this family until the time of the French Revolution. The unfortunate Princess de Lamhale and the poet Florian have been among its illustrious residents.

The widening of the northern end of the Rue des Bons Enfans, which bounds the Bank on the west side, has been hitherto deferred, although it is an improvement very much required, out of regard to the preservation of the gallery of the Hôtel de la Vrillière, which would be interfered with by the extension of the street northward, from the Rue de Baillif, in the same line as the portion extending southward from that street to the Rue St. Bonoré. This respect for the integrity of an ancient building is a pleasing incident in the history of Parisian improvements. If, however, the Galerie Dorée be once pulled down, and its character as an historical monument destroyed, there will be no reason why the desired improvement may not be effected. It would be a great mistake to re-erect the building upon its present site, and so shut out an obvious and desirable rectification of the line of thoroughfare between the Rue St. Honoré and the Rue Neuve des Petits Champs.

Perhaps, while we are in England committing such a barbarism as the virtual destruction of such an interesting monument of pre-Norman art as Worth Church, a protest in favour of the preservation of a building which dates no earlier than the beginning of the seventeenth century, may come with an ill grace; but it is worth consideration whether a friendly remonstrance from the Institute may not be of service to the very numerous body of people in Paris who are anxious to avert the demolition of one of the few remaining specimens of the magnificence of Paris under Louis XIV.

An interior view of the Gallery will be found in the volume of the *Builder* for the year 1857, vol. xv., page 11.

LECTURES ON ARCHITECTURE AT THE LONDON INSTITUTION.

The fourth and concluding lecture of this suggestive series was delivered by Professor Kerr, on the 2nd inst., and had for its subject, "Modern Architecture." The fifteenth century, said the lecturer, saw the ecclesiastical European system breaking up; but it was not to this that the impending change in architectural style was due. It was to the birth of a new idea rather than the death of an old one. This new idea, in a word, was *Antiquarianism*. It had been hitherto unknown; it was now to advance towards a kind of universal authority,—to become in its turn a ruling principle in the world, and like other ruling principles before it, to pass away, no doubt, in due time. At any rate, it had arisen thus. The poets had led the way. The ancient writings of the Romans, and then those of the Greeks, were being held up to admiration on grounds which former students had not discovered. Other literature, logic, and philosophy followed. The venerable scholasticism of the church was de-throned; and dogmatic religion and casuistry were no longer to be the all and end-all of knowledge. In the middle of this century also, Constantinople, like Rome a thousand years before, was overwhelmed by the assault of barbarian hordes, and the Byzantine scholars were thus dispersed westward. Towards the end of the century Protestantism was coming to an issue; the desperate remedy of the Inquisition had to be established and there came to be such a pope as Borgia. The Italian cities, Milan, Florence, and others, and notably the maritime Genoa and Venice, together with Rome, now the sole centre of learning, constituted the head quarters of commerce, enterprise, and intelligence. As for other countries, it was not till the succeeding century that even the period of Francis I., Charles V., and Henry VIII. came into view. A new condition of civilisation was, therefore, being initiated, to bring with it, by rule, a new development of architecture; and it would be to Italy that we must look to discover the introduction of both. It was well known how on this Italian ground "the revival of arts and letters" was the result; and the next question would be what place to assign to architecture in such a revival. Literature and philosophy went together; whilst,

as a separate group, sculpture, taken directly from the antique, painting following indirectly, and architecture coming with sculpture hand in hand, and equally directly from the remains, were made to form the complete circle of the arts. It was on this basis, indeed, that the "Academies" were founded, to cultivate these supposed inseparables, our own Royal Academy of Arts exhibiting still the same principle; and to a somewhat inconvenient extent in these very different days, when painting, having expanded in our trading community into a profession of prosperous picture-sellers, had left architecture in another field altogether. Turning next to the particular form of revival in the case of architecture, the lecturer dwelt for a little on the provisionally existing Italian Gothic as a sound "grafted" mode, upon which there had been engrained, as the preliminary of revival, the late Roman or early Romanesque; and he could not help seeing in this the architecture of medium stones, as distinguished from the large-stone manner of Greece and early Rome, and the small-stone manner of the middle ages. In religious edifices the disposition towards greater grandeur had approached before long to the larger-stone style in the imitation of the ancient temples; the theories of Vitruvius, also, had been accepted (with "the five orders" of a sort of superhuman merit), although only theoretically; but in ordinary civil architecture there appeared three distinct schools of the new Italian style,—the Florentine, massive and fortress-like; the Venetian, light and elegant; and the Roman, of an intermediate character. The great cathedral of St. Peter in Rome was then spoken of, whose costliness led to the reformation, and the progress of whose building extended through the whole of the sixteenth and a half of the seventeenth centuries, under twenty popes. The new style thus arising in Italy (as all things modern were arising in Italy) had spread meanwhile over Europe, and become, what it still continued to be, the modern European style, reaching France first about 1540; Germany, through France, a century after; and England about 1610. Confining the survey then to England, the career of Inigo Jones was spoken of; his design for Whitehall Palace for Charles I.; the building of the Banqueting-house in 1619-21; the advent of the Puritan domination shortly after, during which architecture seemed to have been wholly discouraged; and the occurrence, at the close, only six years after the restoration, of one of those accidents which at such times often turn the current of affairs,—namely, the Fire of London. The remarkable genius of Wren was then referred to in some detail, his Parisian study of art, the especial grace and elegance thus acquired, and his manifest observation of the scientific principles involved in Gothic design. But one could not help acknowledging, with candour but regret, that this otherwise great architect, the pride of our country, had introduced a practice which could not be spoken of without reproach; namely, that of sham design. The Cathedral of St. Paul had a sham dome, the first of its class in history, and one entire story of its side wall was but a mere disguising screen to cover a range of flying buttresses within. Following the English history of art, the lecturer mentioned Vanbrugh, the architect of Blenheim; Hawksmoor, of St. George's, Bloomsbury; Gibbs, of St. Martin's; Chambers, of Somerset House; Dance, of the Mansion House; Soane, of the Bank; Wilkins, of the National Gallery; Smirke, of the British Museum; Nash, of Regent-street and "compo" generally; Barry, of the Houses of Parliament; Scott, the great church architect of the present day; and a very good friend of his audience (long connected with the London Institution), Sir Wm. Tite, the architect of the Royal Exchange. The discourse then turned to what the lecturer proposed to call the "Reproduction System," arising naturally out of the further pervasiveness of the accepted idea of antiquarianism. Ancient remains had been assiduously measured in the minutest detail,—first, Roman, afterwards Greek; design was then taken to be the exact reproduction of the antique; and no matter for what purposes, no matter in what material, the porticoes of Rome and Athens were re-erected on English soil, with such perfect precision as to be the admiration of diletanti, albeit perhaps in stuccoed brick-work out of doors, and even lath and plaster within.*

* The conclusion in our next. Our attention is directed to a typographical error in the last report of these lectures, namely, the misplacement of a parenthesis at the top of page 961. This parenthesis should close after the word "theories," as most of our readers would perceive.

A CITY ON FIRE.

The fatal incidents which have been associated with many outbreaks of fire in the metropolis of late has resulted, as we had apprehended, in attracting public attention in various directions as to the efficiency of existing means towards the timely extinction of fire and the preservation of human life.

Since a recent notice which appeared in these columns in reference to the subject of metropolitan fires, we had been led to the supposition that certain modifications of the present system had been introduced with a view of limiting disasters of the nature to which we felt called upon to refer. Had anything more been needed to have demonstrated the inadequacy of existing arrangements, apart from the occurrences at Bayswater and Newington to which we adverted, it might assuredly be discovered in the still later calamity in Southwark, also, unhappily attended by loss of life. The extraordinary prevalence of fire within the limits of the metropolis during the past two or three months, in view of the destruction of human life and property by which it has been unhappily attended, might fairly be held to justify an inquiry into the metropolitan mode of suppression; for, notwithstanding some recent official assertions, we are almost constrained to say that little indication has been afforded of any abatement of those evils of which we were led to complain. In reference to the Seething-lane fire, it has been asserted that so alarming did the circumstances appear that ample employment would have been presented for more than one half of the Metropolitan Fire Brigade Corps.

This statement embodies one of those elements of danger with which the case is invested which, in our view, appears to call for speedy recognition on the part of the public. No less than nine fires have been reported recently as having occurred within the same day, many of which were attended by a great destruction of property, and seventeen fires have a short time previously been recorded as having broken out within a period of forty-eight hours. As we have remarked on a former occasion, it is no express wish of ours to impute blame in any quarter; but, from the circumstances of the case, we think it appears obvious that the Fire Brigade system, as at present conducted, cannot comprehend such occurrences as these. A correspondent in last week's impression informs us that he happened to be at a fire that took place lately in the Brompton-road, when two large shops thrown into one, with four tenement-shops, were consumed. Our correspondent remarks, "I was not there till after the shops were fully on fire; yet for quite half an hour after there was no other but a hand-power engine;" and he asks whether it really is not time that some serious inquiries should be made as to the most expeditious and best mode of extinguishing fires in the metropolis.

It is to be deprecated, perhaps, that at so ineluctable a juncture the chief officer of the Metropolitan Fire Brigade should have been betrayed into certain statements to which we have alluded in a former instance, and which, it appeared to us at the time, were calculated to foster a mistaken sense of security on the part of the general public.

The fire to which our correspondent alludes occurred in the premises of Messrs. Howells & Beaumont, drapers, in the Brompton-road; and the case, from its proximity to the scene of the fatal Bayswater disaster, may be calculated to attract a larger share of attention in that locality.

It may be regretted by many that any interference should have been made with regard to the recommendation of the coroner's jury in the instance of the Bayswater calamity by Captain Shaw; as, had the jury been invested with that perspicacity which the Captain claims, or the advantages of its co-operation in the aim which they had in view, no doubt some more effectual arrangements would have been made, and possibly the extent of loss by which the later occurrence has been marked, would have been more limited. Apart from any indirect interest which insurance associations may possess in occasional losses of uninsured or other property by fire, as tending to attract public attention to the advantages which such institutions afford,—a system which embraces the protection of property for which a special payment is made, and property for the protection of which a rate may be compulsorily levied, whether properly protected or not, would be calculated at times, perhaps

to occasion some degree of perplexity; and, as a matter of public interest, this is an element which would be in no way detrimental if severed from that branch towards the efficacy of which the public at large contributes. It would be far from us to impute too sordid a motive in this direction; but we believe that it would not be sought to be contradicted, that one of the corollaries of the insurance system may be said to be traceable to occasional losses in certain directions by fire. In view of the immense revenues possessed by such associations, compared with their restitutions amounts, ample facilities would appear to be afforded for a disassociation of the present united and conflicting elements of the metropolitan fire extinction system. One insurance association, in remarking upon its own extent of business in fire insurance, says—"To show the great value of insurance against fire, as one of the prudential practices of the age (so long as our houses continue to be built for burning, as they now are), it may be stated that the losses paid by this company alone in the years 1864, 1865, and 1866, amounted to the enormous sum of 1,780,000*l.*; a sum, however, which was, fortunately for them, exceeded by the very much larger amount of premiums received in the same time, namely, 2,300,000*l.*"

This instance alone would indicate that a sufficient margin exists to facilitate the establishment of a system of fire protection with especial reference to assured interest, leaving that system for which the general public pay, more unfettered and operative.

The interest which persons of note have sometimes displayed in witnessing extensive conflagrations will no doubt be familiar to many of our readers.

It may be, no doubt, fair subject of inquiry whether by some more active interference the public could not effectually interpose to take away from outbreaks of the nature under consideration that spectacular character to which they now so frequently arrive, and which attaches to a fire sometimes, for a few moments, the grandeur and destructive features of war. We are for our part disposed to regard the question and the existing state of affairs in reference to this subject as a matter of paramount importance, and one which, if not speedily taken into consideration, will at length put forward such claims to notice as may no longer be safely disregarded.

TECHNICAL INSTRUCTION MADE EASY.*

If technical instruction is to be the order of the day, as it should be, it is plain we must have a supply of cheap elementary works on technical subjects. Messrs. Cassell & Co. have anticipated this demand to some extent in the issue of a series of technical manuals, illustrating the various kinds of drawing required for the different arts, trades, and manufactures. The price of each volume is now 2s., but we hope the circulation will ultimately admit of the reduction of this sum to half that amount, as they will thus be brought really within the easy reach of all who can have need for them. To make this reduction possible, or at any rate, profitable, the public must be purchasers on a large scale; and we speak faithfully in its interest when we say so. Every working-man should look into the merits of the question now being agitated, which promises to place the young among them in such a different position, with reference to their labour, to that which is filled by those who have not had the advantage of technical instruction in a scientific manner; and one of the easiest ways of doing so is to examine the contents of such manuals as those we are about to mention, when they will be able to judge for themselves how far such knowledge as is contained in them would have benefited them, or, if not too indisposed to learn, may still do so, or might benefit their sons. We need not add that the aim of these works is not to furnish such insight, but to assist the artisan to develop into the artist, by enabling him to look at his work with intelligence and understanding instead of blunt bewilderment. They have been prepared by writers who are

masters in schools of art; who have, therefore, a practical as well as theoretical knowledge of the best modes of imparting their special information.

To begin with that first on our list, a Manual of Linear Drawing; we observe the author assumes that those he is about to teach are ignorant of geometrical terms, and accordingly phrases his instructions in language the most elemental scholar can understand, till he has explained those in technical use, which are then introduced. He gives upwards of 120 diagrams to illustrate his lessons, each figure being initiatory to that which follows; consequently, a student is gradually led from one to the other, and must be ever indeed to find a difficulty in his path. From the simple task of bisecting a line, or of raising a perpendicular upon it, he is helped up the ladder of learning till he is able to see how to construct ovals and spirals; how to draw the cycloid, spirocycloid, and hypocycloid; and how to describe the conchoid and cissoid. Furthermore, when thus much progress has been made, there are ample instructions how to apply the knowledge gained to different arts and trades. A friendly finger points out to the smith how to arrange the geometrical figures he has mastered to form an iron halcyon; to the joiner, how to draw a cornice; to the mechanical engine, how to show wheels and pinions, and the like parts of a machine; to the mason, how to draw the plan and elevation of an arch; and to the house-decorator, how various combinations of figures form dainty diaper patterns.

A second manual treats of orthographic and isometrical projection, and explains the simplest methods of projecting solids, shows the curves formed where one solid penetrates another, and the shape metal must be cut so that, on being rolled, bent, or folded, it may give the required form. This little volume is written by the author of the preceding one. There is a third department in the delineation of solids, we know as perspective; but he confines himself in this manual to the divisions mentioned above, which, it is unnecessary to observe, call for a little more intensity of study than linear drawing. There are trades, however, such as that of the plateworker, the boiler-maker, and the tinman, to whom a knowledge of the principles of projection are indispensable, if they would, literally, master their businesses. With Mr. Davidson's help, workmen may exchange the famous "rule of thumb" for the more wonderful lamp, the rule of Science.

Systematic drawing and shading are treated, in a third manual, by Mr. Ryan. Here, in the course of the volume, we have an epitome of the teaching in the Government Schools of Art; and at the end, a chapter detailing the means to be taken by any half-dozen respectable persons, who would procure, for the inhabitants of the towns in which they are resident, the advantages of Government instruction, supplemented with hints how such a school should be conducted. Upwards of eighty illustrations gradually lead the pupil from the outline of a leaf to the necessary instruction for drawing from models and landscapes, and thence to figure drawings; and this information is accompanied by the most minute directions as to the road to success. "Drawing," urges the author, "increases the power of the eye by systematically exercising it, while an uncritical habit of observation will permit the beauty and point of many things to escape notice. This is no unimportant matter, and none who know the power the eye gains by learning to draw, would willingly dispense with it." As soon as elementary outline drawing is mastered, but not before, Mr. Ryan suggests shading should be studied. When the effect of light and shade in copies is familiar, drawings from real objects may be attempted. The routine recommended is drawn up in twelve stages. After the three progressions just mentioned, follow studies from advanced models, such as chairs; from casts of ornaments, fruit, &c.; from casts of the human figure; from real fruit and flowers; of practical geometry; of perspective; of orthographic projections; of machine drawing; and of architectural drawings. Such is the bare sequence; but, as unfolded by Mr. Ryan, it comprises sufficient instruction to make a very creditable scholar. Nothing seems to have been forgotten, for the pupil is taught how to cut a pencil before he begins to draw, and to put his copy and drawing in their places after he has finished his lesson. Many excellent suggestions are made in the course of the work, which contain the pith of more pretentious teaching. To increase their powers of observation and knowledge of

the features of the face, for instance, students are recommended to ask themselves what is the predominating expression upon the various faces they see, and to endeavour to answer the question; also to note what is the speciality of each face, and how it differs from the regular Greek type. To draw from memory is another exercise insisted upon; and working men are shown that work and working clothes are some of the most pictorial things to be found in the range of subjects and objects. We quote Mr. Ryan:—

"Never lose an opportunity of drawing rustic figures in their working clothes, as such form most picturesque additions to landscapes, and are eminently pleasing in themselves. Draw them in groups and out of doors when you can, to get the full effect of day or sunlight upon them. Figures in strong action are particularly valuable, and you should frequent places where work of some violent kind is being carried on, and secure in a few expressive lines the balance, action, and grouping of figures acting with energy and rapidity."

The fourth work of the series on our list relates to building construction. We took occasion a few weeks ago to mention this little work with praise. We refer to it only to name it in connection with the set of volumes of which it forms a part. Thus it will be seen Messrs. Cassell & Co. are assisting the technical education movement by the issue of cheap works upon various branches of it. Mr. Davidson, the author of three of these manuals, deprecates the want of enthusiasm in British workmen, and appeals to them to warm up and cultivate the sciences on which their trades are based, that they may hold their own against the men of other countries, which manual superiority alone may not enable them to do. We pass on the watchword.

ON SANITARY POLICE. SOCIAL SCIENCE ASSOCIATION.

At a meeting of the Health Department on Monday evening last, Mr. G. Godwin, in the chair,

Mr. A. H. Safford read a paper "On Sanitary Police," in the course of which he said, when, at the suggestion of a friend, I some time since directed my attention to the improvement of our existing police establishments, I was much struck by the limited meaning attached to the word "police," in its popular acceptation. This term "police," in our best dictionaries, is employed to designate those regulations which have for their object to secure the maintenance of peace, good order, cleanliness, and health in cities, towns, and country districts. A similar definition is given to the word in France and America. But while I found that on the continent and in the United States, their police forces were employed for the maintenance and protection of the public health, I was well aware how little of this important duty was entrusted to our own constabulary. I knew that when in the metropolis the force had been employed in matters connected with the protection of the working classes from the nuisance of overcrowded lodgings, the security of the public from dangerous structures, and the improvement of the air we breathe, by the enforcement of the Smoke Nuisances Act, the work had been thoroughly and efficiently performed. I saw, on the other hand, that the laws relating to health were not executed by the local authorities with that vigour the case allowed. The medical officer of the Privy Council complained in his last report that—

"Not only have permissive enactments remained for the most part unapplied in places where their application has been desirable; not only have various optional constructions and organisations, which would have conduced to physical well-being, and which such enactments were designed to facilitate, remained in an immense majority of cases unbegun, but even nuisances which the law imperatively declares intolerable have, on an enormous scale, been suffered to continue, while diseases which mainly represent the inoperativeness of nuisance law have been occasionally fully a fourth part of the entire mortality of the country." Medical officers of health lamented that they were hampered by the vestries under which they acted. The press, with one consent, found fault with the local authorities.

The execution of our sanitary laws being, therefore, admitted on all side to be unsatisfactory, principally on account of a want of energy in enforcing legislative enactments, and the little effect of public opinion on local bodies, it seemed to me that if the permissive laws were made compulsory, and the prosecution of offenders against those laws was entrusted to the police,

* Cassell's Technical Manuals.—

Linear Drawing, showing the Application of practical Geometry to Trade and Manufactures. By Ellis A. Davidson.

Orthographic and Isometrical Projection: Development of Surfaces and Penetration of Solids. By Ellis A. Davidson.

Systematic Drawing and Shading. By Charles Ryan.
The Elements of Building Construction and Architectural Drawing. By Ellis A. Davidson.

who are amenable to the State (and who to be a true police should be the proper officers of the State to enforce the laws affecting public health), much might be done to reduce the death-rate so fearfully large in our principal towns, and to increase the wealth of the nation by an improvement in its health.

It may be said that the medical officers of health are the proper persons to carry out all laws relating to public health. I am most anxious that we should still retain the invaluable services of these gentlemen, but at present they are not sufficiently responsible for the carrying out of the sanitary enactments; we are left at the mercy of the activity of the medical officer, who may, by a too great zeal for the public good, offend his best patients. They should be paid by the county, and used as witnesses in the prosecution of public nuisances. I am convinced that not infrequently a medical officer proceeding before justices for the enforcement of health laws loses much of the weight which would attach to his evidence from the fact that he is, or appears to be, the prosecutor in the case. He should be appointed for life, and independent of all private interests whatever. Another objection to medical officers being held responsible for the health of the public is that they cannot, however active they are, be ubiquitous: a police force, on the contrary, is, or should be, as nearly so as it is possible to be. The question of the health of a district may be only of a few hours, and it is, therefore, most important that the proper officials should be easily accessible. This is not so at present. I know, for example, in my own neighbourhood great difficulty is experienced in getting the ashes removed from the dwelling-houses. It would involve the loss of some time to ascertain who is the responsible officer; but could I simply apply to the constable upon the beat, the nuisance would be removed in a few hours. Again, take the case of an adulteration of food, or the sale of diseased or stinking meat. The first person to whom a poor man would apply for advice or assistance, would be the first police constable he met. At present he would be handed about from one authority to another, until he became sick of the whole business, and contented himself with his first loss, while the offending tradesman would escape scot-free. This is no hypothetical case. I know many instances where labouring men have been referred to the proper authorities with unwholesome food still in their hands, in which no prosecution has ever been attempted.

I therefore propose that the addition of a sanitary company of police should be made to each constabulary force throughout the kingdom, to be paid for from the general rates of the county or division; that the powers of the local authorities should be transferred to the magistracy or the Commissioners of Police; that nuisance laws should be compulsory, and enforced by summary proceedings before magistrates, and that in the event of the parties being dissatisfied, appeal might be made to the Court of Quarter Sessions; that sufficient medical officers of health should be attached to each constabulary force, and that their appointment should rest with the Privy Council or the Home Secretary. The sanitary police would be men specially selected for the work, with higher pay than the general run of the constabulary, and with special knowledge. It would be their duty, on report being made to the chief constable by any ordinary constable, or by a private individual, to investigate the charge, to call in, if necessary, the medical officer, and, if necessary, to take proceedings against offenders before the magistrates. Men having such important duties to perform should be under strong checks, and be changed from one neighbourhood to another to prevent improper influence. There is no existing body in which such precautions can be taken but the police. I have had many communications from chief constables in favour of my proposition; but with the suggestion that they should, in the event of its being adopted, receive the assistance of a public prosecutor, or be enabled to call in legal aid.

At the close of the paper, an interesting discussion ensued.

Dr. Tripe thought that the plan suggested by the paper of placing sanitary matters in the hands of the police would be more efficient in the country than in London. There, the police would be more likely to be communicated with than the health inspectors. But it was otherwise here. In London there already existed, in some districts at least, a thorough organiza-

tion. He, for example, had an inspector under him, whose sole duty it was to examine houses and report upon them to him. He could show the state of every house in his district under 20l. a year rental since the passing of the Sanitary Act of 1866. He had another whose duty it was to look after the new work done in the district, and so on for other necessary parts of sanitary superintendence. He therefore thought there was no need to substitute the police for the present officers. Indeed, he could easily show that the police did not carry out the provisions of their own Police Act. He had repeatedly seen instances of ammoniacal liquor passing through the streets in the daytime, and the occurrence of the smoke nuisance, both of which had been placed by law under the supervision of the police, but in which the police failed to do their duty. The evils of which Mr. Safford had complained he believed were mainly owing to the conflicting laws which existed on the subject. Overcrowding in workhouses, for example, was not overcrowding in the houses of poor persons not paupers. The medical officer of health should be appointed for life, and should have sufficient salary to enable him to devote his whole attention to the duties of his office.

Mr. Holland thought that consolidation of the statutes relating to sanitary matters was the most pressing want. The United States had been alluded to; but he could say from personal experience, within the last twelve months, that the sanitary state of Philadelphia and of other large towns was much less satisfactory than that of England. We required a concentration of our offices. We had too many authorities. He thought that the guardians in each parish should have the right of superintending many sanitary matters, over which now they had no control.

Mr. Alfred Carpenter thought that a permissive system at first was necessary. They had not made up their minds as to the best system. The measures which were taken were only tentative. It would therefore have been a mistake at the outset to have had a rigid, compulsory system. He thought, however, the time had come when this might be changed. He thought that the first requirement in carrying out sanitary law was to obtain an educated man as medical officer; that such officer ought to be independent, and that he should have nothing to do with private practice. As the police were not an educated body of men, nor, with the training they were likely to have, could they be easily made one, he arrived at a conclusion different from that come to by Mr. Safford.

Mr. A. H. Hill believed that the great want of our present system was organisation; one set of officers had no connexion with another. The relieving officer, for example, in a case which had come under his own notice, had been unacquainted with the address of the health officer. The fact was that on such questions the public took little or no interest. Even the press was profoundly ignorant on all questions connected with sanitary law. But he maintained that the great want was of organisation. He hoped that before long, as one step to remedy this, our telegraph system would be extended to every public office in London.

Mr. Elk pointed out that Dublin and Paris were worse off in regard to sanitary matters than London. The argument that the employment of the police would be advantageous, because they were responsible directly to the Government, was fallacious, inasmuch as it only applied to London, and even then it did not apply to the City.

Dr. Hardwicke thought that there was much to be said for the view advocated by Mr. Safford. There were many advantages in the fact that the poor knew the police, and could readily find them. Really there was not much difference between Mr. Safford's view and those of some of the previous speakers. The police proposed were to be educated men, and what was wanted was to combine the organisation of the police force with the education of the officers of health.

Mr. Arthur Cherry thought that organization was the principal object to be attained.

Mr. Pears moved—

"That the thanks of the Association be given to Mr. Safford for the paper now read."

The Chairman, in seconding, said it would be worth considering how public attention could be called to the discussion of questions of this kind by the society. He thought he had waited long enough for codification. The want of a uniform system, which could be obtained only

when codification had been accomplished, often caused serious injury. He gave some instances from the Building Act and Local Management Act to prove that a Sanitary Police, as aid to existing officers, was needed.

The resolution was then put, and carried unanimously.

THE EASTER ISLAND STATUES.

SINCE my last little paper on this mystery, several supplementary matters respecting it have been brought before my notice, and I think these may interest some readers of the *Builder*.

First. So numerous are those gigantic images on that mere rock in the middle of the Pacific, that a recent visitor (Lieut. Harrison, R.N.) has informed me that he counted nearly 150 of them in the course of a thirteen miles' ramble along the south-west coast of the island; while some of his shipmates of the *Topaze* similarly at the same time met with about 120 from La Perouse Bay, on the north side, to the smaller western extinct volcano. Altogether there are nearly 300 known to us, and each has its separate name among the Easter-islanders; but, as Europeans have not traversed the interior, how many more than this number may exist is uncertain. There are likewise in one place no fewer than 30 of the gigantic red-tufa carvings, quarried for imposition on the images, and seemingly not used; some having rude carvings on them of birds, donkey ovals, and crosses. When the men of the *Topaze* secured the two large images now in the British Museum, their loose and fallen crowns were not to be found near them; and, of the above 30, some are represented as 5 ft. in diameter, and 6 ft. high.

Lieutenant Harrison tells me also of a cave, inaccessible except by swimming, wherein are two large images below the sea-mark, "a proof of submergence; for otherwise the statues would not and could not have been placed in such a situation. I learn likewise that the main reason why the island is so cleared of trees is because the cocoa groves were all destroyed some generations back in a civil war that raged between various factions of these wretched savages; though an additional and more permanent cause of treelessness is that Easter Island is in the very eye of the Trade Winds in their alternate prevalence. As to absence of fresh water, too, it is true that from indolence the inhabitants use almost solely sea-water filtered through the sand; but there are large lakes of fresh rain-water in the two volcanic mouths eastwardly and westwardly, one being three miles round! Imagine, what a vast crater on so small an island.

In my last, I named the place as Teahy in the native language; let me correct it (if need be) as more properly Rapa Nui; Teahy being elsewhere in Polynesia. Lieutenant Harrison states again (and I have not only heard him orally, but have seen his journal written on H.M.S. *Topaze* at the time), that carved emblems of nature-worship and of his-headed figures abound on the rocks,—evidencing thus a connexion with far-off Mexico and Peru, as well as with Egypt at the very Antipodes; and he drew and still possesses a picture to scale of one of the prostrate figures, which is 30 ft. long, and nearly of man-height in thickness as it lies on the ground. Neither is this bulk uncommon nor extreme; there are several larger as well as smaller; and the built platforms on which these colossi have stood (the most having been overthrown, probably by earthquakes) are of cyclopean masonry, of vast square blocks fitted closely without cement.

If we found these mighty remnants of an extinct people, this necropolis of their illustrious but forgotten dead, in the middle of Africa or Australia, we should think the matter sufficiently wonderful; but we could see there around us for hundreds of miles "ample space and verge enough" to have supported in ancient times a population sufficient to have raised such structures, as the ever-during memorials of their kings and warriors. But, how that wonder must increase, when, barring a mere fringe of sand and rocks, the "ample verge" round Easter Island is in every direction ocean for 2,000 miles! Can there be any other solution of the mystery than that I ventured to throw out in my last paper,—a submerged continent? I then fancied the idea original; but since I have learned, and now tell your readers, that Professor Sedgwick, in his geological lectures at Cambridge, announced his "suspect" that Polynesia was once a conti-

ment." This great authority is most satisfactory as to my independent guess; and the wondrous human remains at Easter Island confirm it. How comparatively easy, also, thus to account for the early peopling of America from China, via this submerged belt of land; for the Pacific would seem to have had a volcanic bridge, quite denied to the Atlantic; and man probably traversed it from primeval Asia to America.

With reference to the question of man's extreme antiquity in this mystery of Easter Island, it may be doubted whether, under the given conditions of total isolation and volcanic forces, we have reason to guess at or require any longer period than the popular one. Let us recollect that the western half of our planet was utterly unknown to the eastern half for more than 5,000 years; that the volcanic destruction of a Pacific continent might have happened at any time, without even a suspicion raised amongst our European races; and that entire submersion of all but the summits of a mountainous range (since known as islands) would destroy instantaneously and wholesale man and his works, excepting only (let us theorise, as we now can all but prove) such monumental remains in the imperishable rock as were placed,—*honoris causa*,—on or near the flaming tops of volcanoes (fire-worshipped possibly, like Japanese Yokohama), and thus preserved for our modern reasoning wonder, as evidence of an extinct but once mighty people.

The question receives further elucidation from the recent travels of Messrs. Bickmore and Wallace, among the numerous islands of the Malayan Archipelago. We learn from them that the whole of Oceania is the most igneous region on the face of the earth, containing literally hundreds of volcanoes, active or extinct, some of the craters whereof are several miles in diameter, and extending over a belt known to those travellers 4,000 miles long and 50 broad. Now, nearly 2,000 miles beyond the length of this tether, but in the same direction, lies Easter Island, with its two enormous craters now full of water, the Pacific outlier of a volcanic range which reappears more than 2,500 miles on the other side, near the recently destroyed cities on the Chilian and Peruvian coast under the Andes. That all the islands were once united would seem to be well nigh proved by the identical character of their fauna and flora; for how otherwise should islands hundreds of miles apart be crawled over by the same families of flies and beetles, and produce the same sorts of ferns and flowers? Also that they were once much more elevated is shown by the fact that the plants growing on the sea level in the Polynesians are identical with those on the sides of the Andes at a medium height of 1,200 ft. But, to our mind, the greatest proof both of a submerged continent and of an extinct people, civilized and numerous, however unhistoric, is the great fact of these hundreds of colossal on that desolate Easter Island. Whoever carved and reared them, each must have been a work of the most enormous labour. No metal nor even flint, occurring on the island, but only some hard stones capable of being fashioned into rude adzes, or so-called celts of obsidian or basalt,—those vast images of hard, heavy burnt granite must have been scamped or pounded into form with a patient and persevering amount of toil we scarcely have the means of estimating; as well might we Englishmen now fancy the possibility of cutting down oak-trees with ivory tooth-picks, as in those old days we can imagine how that extinct nation of the Pacific could carve colossal figures in granite rock by means of harder bits of shingle.

And now let us look in some detail on an insulated one of those colossal,—a smallest unit among three hundred known to us, transported in the *Topaze* by Commodore Powell, for its lighter weight, and (from having been buried up to the neck in sand) for its almost perfect preservation. Lieutenant Harrison tells me that this statue,—a sort of rude Polynesian Memnon as we now may see it at the British Museum,—was the superstitiously honoured inmate of a native hut constructed over it, wherein, as before some deified potentate of old times, the modern chief of Rapa Nui is normally elected. The weight of the whole figure as we have it (without its tufous crown of probably a ton more, for some cause, as aforesaid, left behind) is three tons and a half: the material, a black granite within, weathered to light grey without; the height, 8 ft. 6 in. by 3 ft. 6 in. across the shoulders, and 9 ft. round the body; the features of a Mexican or Ainoe cast, with large pendent ears, deep sockets, probably for coloured

eyeballs long lost, and a large straight nose and mouth not deficient in a sort of grotesque and barbaric dignity. Arms and hands are rudely indicated at the sides, and the lines round the body possibly intend a waistcloth. On the back, flattened like a common wooden doll, are some strange sculptures in slight relief, picked out with red and black pigment, representing a pair of paddles, with squared human faces atop, and two bird-headed quadrupeds below, apparently worshipping a central bird-headed idol standing on a circle, with an emblem beneath indicative of natural idolatry. The smaller figure is shorter in size and less in weight, in worse preservation, and of inferior workmanship; but, as a special point of interest, has on its back a rude handled-cross, known to archaeologists as an emblem of the creative power, and changed by Rome into the crucifix.

After considerable inquiry, I find there are no other known instances of such colossi among the Pacific islands; but a naval officer tells me that in the Right of Benin, on the west coast of Africa, there is an island, seldom visited, which contains similar rock images to those we now speak of, the type of such being a deposed Mexican, or (as we now see it exemplified on wooden idols, paddles, prows of canoes, tattoos, &c.) savage Polynesian.

To us modern lovers of prehistoric anthropology nothing can be fuller of suggestive interest than these rude colossi. If those "*langues-de-chat*" of Achenil, if our own frequent stone hatchets and flint arrowheads (I have myself picked up specimens of both on a Sarrey heathland); if the "kitchen-middens" of Denmark, the troglodytic Pict-houses of Orkney, and, in chief, the carved antlers of reindeer from the Anvergne cavern,—if all these are intensely interesting as proofs of man's most primitive existence, how much grander and more wonderful every way are these huge stone statues, some of them 30 ft. high, and one at least not less than 50 ft. (the very nose of this is 6 ft. by measure), standing by hundreds on a small rocky island in the midst of the Pacific, and witnessing to the most ancient process, religion, and civilisation of an utterly extinct people. Once upon a time the spot that now is named by us Easter Island, was the central eminence, lofty as Cotopaxi, of a vast and fertile continental plain, that circled it for a thousand miles on every side: it had its cities, with their kings, priests, and warriors, who served their generation honourably, and then were immortalised in death by those mighty fire-thrones of their god, believed by them to inhabit the smoking crater of the volcano. Suddenly, on one dark day, we know not how long ago, nor how lately (for all that side of the earth was a total blank to this side for 5,000 years), there were fearful signs on the sea and sky, rollings and rockings of that populous land, shaking its cities into ruin; thunders and fiery hail showered from the hursting crater, while the land was shattered in all directions by an outbreak of internal fires, soon quenched by the steaming in-rush of the immeasurable ocean. Down to the depths that happy land (possibly in Peleg's time, "in whose days the earth was divided"), sank suddenly, the smashed-up shell of a volcanic crust, whereon those idolatrous millions so long, perhaps so criminally, had lived, and fought, and multiplied; and nothing thereafter soon remained above the surface of that woe-smitten waste of billows but the summit, as we see it, of an extinguished volcano thus sentinelled by its colossal statues, mute witnesses to that long ago visited those idolatrous fire-worshippers, and sank their country like a millstone to the bottom of the sea. Is not all this written on the wonderful carved rocks of that isolated Mystery in the midst of the Pacific,—Easter Island? And are any of the statues of Egypt, Greece, or Rome, in our British Museum, equal in suggestive interest to these rude colossi of the Polynesians?

MARTIN F. TUPPER.

Value of Property, Worcester.—At a sale last week two semi-detached villas, situate in Chesnut-walk, producing 41l. 18s. per annum, were sold to Mr. Thomas for 600l. Two similar houses adjoining the last lot, and producing 44l., were sold to Mr. Thomas for 640l. Six dwelling-houses, situate at Diglis, and called "Willow-terrace," producing a rental of 62l. 8s., were sold to Mr. W. Z. Baker for 570l.

LAND SURVEYORS' CHARGES.

A "TRUSTEE" who needs the plan of an estate written, and many have written to us before to the same effect, asking what are the settled charges of land surveyors. He says he can get no precise answer, nor can he expect it to such an inquiry. Unless he gives some particulars as to situation and extent of the farm he mentions, as well as the scale to which he wishes the plan drawn, no one can tell him the proper charge for making the survey. Leaving out of question the cost of access to the spot, a survey which would be dear at 1s. per acre in the open parts of Lincolnshire or Leicestershire, might be cheap at 2s. or 3s. per acre among the woodlands of Kent or Sussex, or on the slopes of the Welsh hills. If he wishes to know how cheaply his work can be done, he had better insert an advertisement in our pages giving full particulars of his requirements. If he is content with having his work well done at a fair price, he should apply to some respectable and well-known land agent or surveyor at the nearest large town, who will give him the information required. Our chief object in making this note, however, is to say it would be advantageous if the Institute of Surveyors were to agree on a scale of charges, under various circumstances, and make it public.

OF DEFINITE PROPORTIONS OF LENGTH, WIDTH, AND HEIGHT, TO EFFECT ARCHITECTURAL HARMONY, OR SYMMETRY, IN REFERENCE TO DISTRIBUTION OF SOUND.

"*Difficileque Symmetriarum questiones!*"

VITRUVIUS.

VITRUVIUS held that symmetry in architecture resembles what nature has ordained in a well-formed human body: a union of parts wherein each part combines with all other parts to a good configuration of the whole. He adopts the Greek name *Harmonia* only in reference to sounds; but concord of sounds, and concord of substances, is by other Latin writers alluded to in the same, or similar, terms. Thus, *harmonia corporis* expresses a concord of substantial parts; and *ad harmoniam canere* is to effect concord of sounds. *Modulatio* is measure in music; *commo-dulatio*, measure in architecture.

Vitruvius uses this word *commo-dulatio*; and in reference to it he names exact proportions of length and width in different buildings; but his rules are not precisely applicable to modern structures.

Some thirty years ago I arrived at the conviction that the leading proportions of Lichfield Cathedral, in the thirteenth century, were each a multiple of 8 ft.; the number eight having been then, for ages, considered the Christian mystical number. I have also read somewhere, that in Notre Dame de Paris, certain heights and widths are each a multiple of 7 ft.; and that the length of the transept and the height of the great tower are each a multiple of 12 ft. Again, it is said that the length of Notre Dame de Rheims, and that of Chartres Cathedral (the largest church in France), are each a multiple of 12 ft.; and that the same number was attended to in the first plan of Cologne Cathedral; but on the whole the information obtained about these churches is incomplete.

The following rules are based on the forces of the squares of the numbers 2, 3, 4, and 5:—

First.—In the series 3, 4, 5, the square of five is well known to be equal to the sum of the squares of the other two numbers added together.

Secondly.—In the series 2, 3, 5, the square of five is only one less than twice the sum of the squares of the other two numbers added together.

Thirdly.—In the series 2, 4, 5, the square of five is to the squares of the other two numbers added together as five to four; and moreover, in the series 2, 3, 4, and the series 4, 7, 9, the square of the greatest number, in each case, is to the sum of the squares of the two smaller numbers added together very nearly as five to four.*

Rules of Proportion.

The width being in all cases greater than the height, and the height varying from 21 to 30 per

* A peculiarity of the series 4, 7, 9, is, that the square of four (as height) is precisely a quarter of the combined measures of 7 and 9 (as length and width). In any such series as 1, 2, 3; or 2, 3, 5; or 3, 4, 7, and so on, the measure of the greatest number is, in each case, equal to the combined measures of the two smaller numbers, and its square is only one less than twice the sum of their squares added together.

cent. of the combined measures of length and width. The smaller the room the greater is the proportion of height required.

Class 1. The square of the length is equal to the sum of the squares of height and width added together, or nearly so.

Class 2. The square of the length is equal to twice the sum of the squares of height and width added together, or nearly so.

Class 3. The square of the length is to the sum of the squares of height and width added together as five to four, or nearly so.

EXAMPLES.

CLASS 1.		Squares of Proportions.	
Proportions.			
Height	12	144	} 685
Width	21	441	
Length	24.2	585.64	
Height	20	400	} 1,300
Width	30	900	
Length	36	1,286	
Height	34	1,156	} 4,000
Width	62	3,844	
Length	70.7	4,998.49	
Height	61	2,601	} 9,597
Width	86	7,396	
Length	100	10,000	
CLASS 2.			
Height	12	144	} 685
Width	21	441	
Length	34.2	1,169.64	
Height	20	400	} 1,300
Width	30	900	
Length	51	2,601	
Height	34	1,156	} 5,000
Width	62	3,844	
Length	100	10,000	
Height	39	1,521	} 5,002
Width	69	3,481	
Length	100	10,000	
CLASS 3.			
Height	40	1,600	} 8,000
Width	80	6,400	
Length	100	10,000	
Height	44.3	1,962.49	} 7,999.78
Width	77.7	6,037.29	
Length	100	10,000	
Height	48.75	2,376.56	} 8,001.56
Width	75	5,625	
Length	100	10,000	

Tab. to eight are as five to four, the proportions required for Class 3.

Examples of Rooms, Theatres, and Halls.

It has been more than once stated that the Theatre of the Royal Institution of London is almost perfect for a single speaker. Its dimensions of height, width, and length, are nearly 30 ft., 45 ft., and 60 ft.; and, therefore, nearly in relation to one another at 2, 3, and 4. If the height were only 9 in. less than 30 ft., the proportions of the theatre would correspond almost accurately to the requirements of the foregoing rule for Class 3.

The Free Trade Hall in Manchester is said to be admirably adapted for musical performances, and for public speaking. It is 135 ft. long, 78 ft. wide, and 52 ft. high. If it were 132 ft. 7 in., instead of 135 ft. long, the proportions of the hall would conform strictly to the foregoing rule for the second class.

A new room in Edinburgh is named as one remarkably successful for music. Its proportions are 36 ft., 48 ft., and 90 ft. If the room were 36 ft. high, 52 ft. 6 in. wide, and 90 ft. long, its proportions would be such that the square of the length would be only a trifle less than twice the sum of the squares of height and width added together, as required by the second rule.

There are various accidents to proportion which may completely mar it. Some such are the introduction of a gallery, or the place of an organ. In the year 1840, Canon Hyder having taken much interest in the advantages of restoring the arrangements of Lichfield Cathedral as ordained at the completion of the Reformation, he and I made experiments on the diffusion of sound throughout the church. On one occasion, he stood near the east end of it, while I stood at the west door, and thus placed, we were able to converse in a moderate tone of voice. The aisle of the north transept has since been blocked up with a large organ; and now a confusion of sound is heard in the nave, when men either read, or sing, in the choir.

On All-Saints Day, 1869 (when there were but very few saints in the nave), I could, at the west door, clearly distinguish a ringing in the organ-pipes, while the sub-organist was reading the Epistle for the day, south-east of the organ, and speaking towards it. When the Gospel for the day was read, no such ringing could be discovered; the reader, of course, standing north of the Lord's table.

Again, some few years ago, when a large assembly of chorists met in Lichfield Cathedral, the day being fair, one of the south windows of the church was opened. Service had commenced when I entered the close on the south side; and the singing was to my ear so loud, that I fancied it must be over-loud at the west door. But at this door the chorists were indistinctly heard; the wave of sound from the organ carried, or rather drove, their voices out of the church southwards, and compelled them to "waste their sweetness on the desert air."

It is now the fashion to rail against Wyatt's alteration of Lichfield Cathedral; but assuredly his design for the position of an organ in free space when the chorists ranged between it and the congregation, was far better than the present contrivance. It is undeniable that the instrument ought to stand in free space; and that all sounds issuing from it should be unobstructed in every direction, over it, and around it; and that when accompanying the human voice, they should carry the voice without obstruction to the hearers. Consequently, in Lichfield Cathedral, the best position for an organ would be in a room of ample size, and low down, either south-east or north-east of the places for the voices-choral, even at the expense of trespassing on the chapter-house.

JAMES RAWSON, M.D.

THE PROPOSED NATIONAL OPERA HOUSE.

IN the second edition of the *Opera and the Press*, now published, Mr. Grannison says:—

"What was foreshadowed in the first edition of the *Opera and the Press* is to be a reality. There will be a National Opera House, co-operating with an Italian enterprise, and there will be an extended repertory, which will comprise the productions of composers of all countries, so that a school of acting and singing may be combined, to afford the fullest encouragement to native talent. The motives which have influenced the formation of a new opera-house are especially patriotic. There will be no speculative joint-stock company, and the enterprise will not be in the hands of operatic traders. The capital will be large, and sufficient to carry on the theatre for the time which most necessarily elapses before an English company can be thoroughly organized and trained. There is no lack of fine voices in this country. Now, unfortunately, the music halls are absorbing ability which, properly drilled and directed, would suffice for the formation of a working troupe."

Further on he writes,—

"The great want in this country is a National Opera House co-operating with an Italian establishment. It can be tested when this deficiency is supplied—when this disgraceful gap is filled up, when we can point with pride to such a representation of the lyric drama of all schools as can be based on a permanent establishment—whether there is but one style of music which will satisfy the fashionable frequenters of the Italian opera-house. But in combined action, in a management on the mutual principle, in securing for all classes of the community the execution of music of the master minds, as well as of works specially written to show off the *prima donna* for the time being, we may anticipate art advancement in this country. The Opera House for the purposes described will be built; the enterprise will be undertaken conscientiously, with ample means to carry it out for a term of years."

INVERNESS CATHEDRAL.

WE give in our present number a plan of the cathedral recently completed in Inverness. Next week we shall publish further illustrations of it, and a full account of the building.

ST. COLUMBA'S CHURCH, HAGGERSTON.

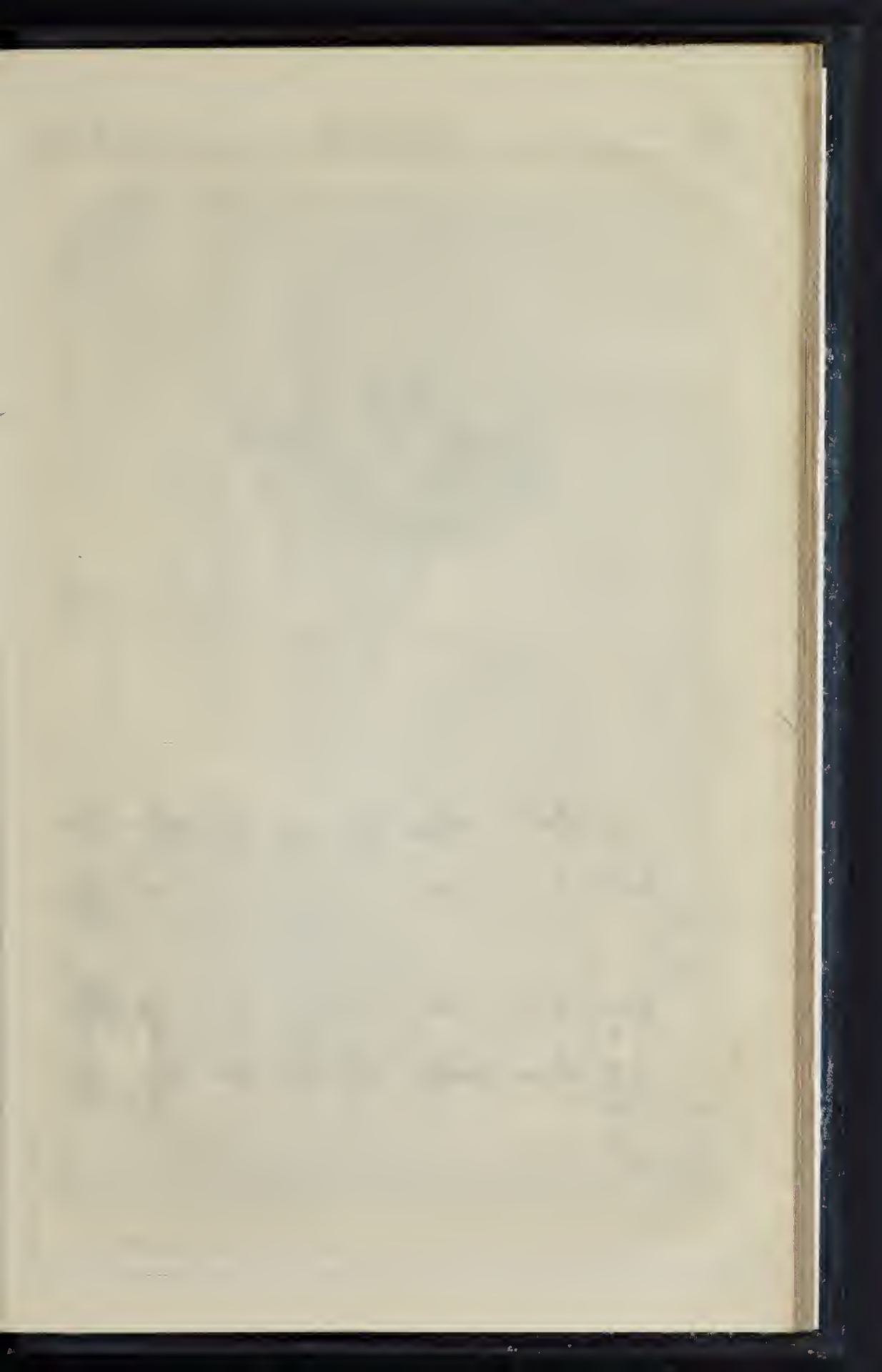
THIS very noticeable church stands in the Kingsland-road, immediately adjoining the Shore-ditch Workhouse. It is built entirely of brick, with stone hands and dressings; is 160 ft. long and 82 ft. in height to the ridge; height being made imperative by the adjacent block of building belonging to the Union. It was designed and superintended by Mr. James Brooks, architect, and was built by Mr. W. Henshaw, at the cost of from 9,000l. to 10,000l., accommodating 1,200 persons.

The east end of the building abuts on the main thoroughfare, Kingsland-road, where the chief entrance is situated, through a picturesque gateway surmounted with a high-pitched and hipped roof, pierced with two dormer windows, which light the upper sacristy. This archway leads into a quadrangle, on the north and east west

sides of which will be grouped the clergy-houses and schools, forming a cloistered court, on the south side of which is the church. Internally the plan is simple: it consists of a lofty nave with narrow aisles; centre lantern, vaulted; and shallow north and south transepts, which do not appear on plan, but form a striking feature in the interior; a spacious chancel, also vaulted, without aisles, with sacristies on the north side. The chancel includes the centre crossing. The arrangement of the east end is similar in idea to the church of St. Cross, Winchester, and to Romsey Abbey, in its double grouping. The altar is not placed against the east wall, but is isolated, with its reredos some 10 ft. from it. The wall, from the floor to the height of 17 ft., is perfectly plain. Above this there are two subjects in mosaic, in Maw's material, representing the Adoration of the Magi, and the Entry into Jerusalem. The vaulting, which is plain quadripartite, with moulded stone ribs and brick filling in, has an extra rib starting from the centre of the east wall, thus dividing it into two bays as before mentioned, which contain broad lancet windows deeply played: this arrangement is continued on the north and south sides of the chancel, as are also the mosaic decorations. The vaulting under the crossing rises considerably higher to the centre, where there is a circular well-hole for the passage of bells. The north and south transepts are respectively barrel-vaulted with stone ribs. The organ is placed in the south transept, on a raised loft. The choir is stabled on the north and south, with six return stalls on the west. A dwarf stone wall, with a high metal screen, separates the chancel from the nave; which is of five bays in length. The arcade, of moulded brick, has clustered columns of stone, with carved caps and moulded bases, the centre shaft being of red brick, in the arcade and the bottom string-course of the clearstory; the latter is nearly of the same height as the arcade, and consists of a large circular window filled with plate tracery placed over two short lancets, the whole placed within a wide-continuing arch deeply played. Above this rises the roof of a bold and good character of the trussed rafter type, with curved principals and moulded and chamfered tiebeams, and wind braces. The chancel arch is lofty and well proportioned. The west wall of the nave is occupied by a large wheel window. The design consists of an inner circle, with six foliations, surrounded with eight smaller circles, perfectly plain. Below this is an arcade of four lofty stilted arches, enclosing four lancet windows. In the spandrels of this arcade are three circular sunk panels, filled in with diaper patterns; below this the wall is perfectly plain.

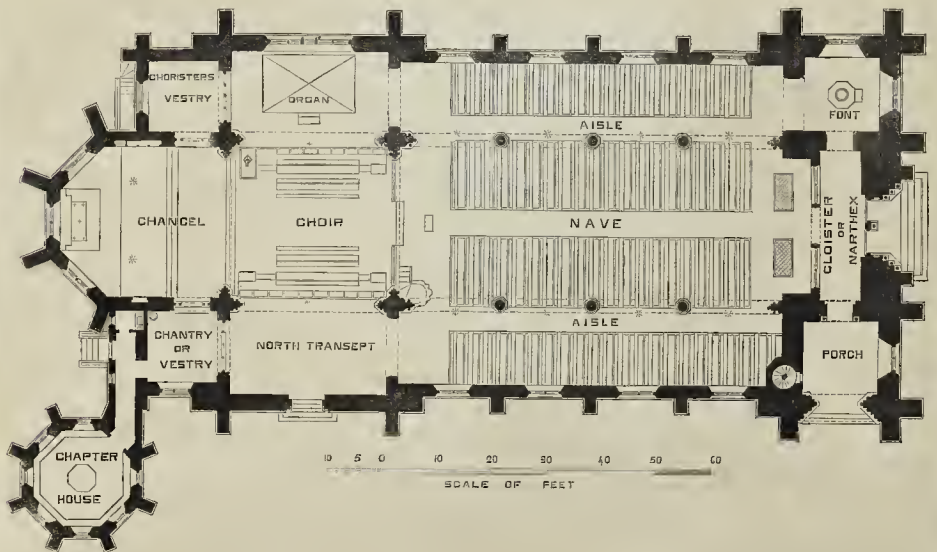
The aisles, which are unusually narrow, are windowless, in consequence of the close proximity of adjacent buildings. The wall space is treated in a very pleasing and artistic manner: a series of *arc-boutant* springing from little corbelled shafts, at intervals, to the main arcade of the church, divide it into panels, which will be eventually filled with subjects in mosaic. At the west end of the north aisle is the baptistery, which takes the form of a large projecting transept, the nave arcade being continued across. It is lighted by lancet-windows in the north side. In this baptistery the two principal doors of the church open; there is another doorway in the north transept, which is used only as a means of exit.

The exterior is very plain, relying solely on its breadth of treatment and its outline. The tower is only temporarily roofed with a pyramidal tile covering, just above the main roofs of the church. The east end towards the Kingsland-road is a little more ornate: the two broad lancets in this gable are recessed, and placed under gabled strings, which are surmounted at the apex with a carved finial; between these windows is a massive buttress, in the upper part of which, under a stone canopy, stands a figure of St. Columba, the first abbot of Iona. On each side of this, below the lancets, are sculptured subjects, representing scenes from his life. The upper part of the gable is pierced with a large circular wheel, with seven foliations, and three smaller quatrefoil openings, and is flanked by buttresses, terminating in pinnacles with stone finials: a large stone cross crowns the apex of this gable. Adjacent buildings hide very much the rest of the exterior, especially on the south and west sides. The principal feature, externally, is the lofty tiled roof of the nave, with its clearstory, from which internally this very striking church derives most of its light.





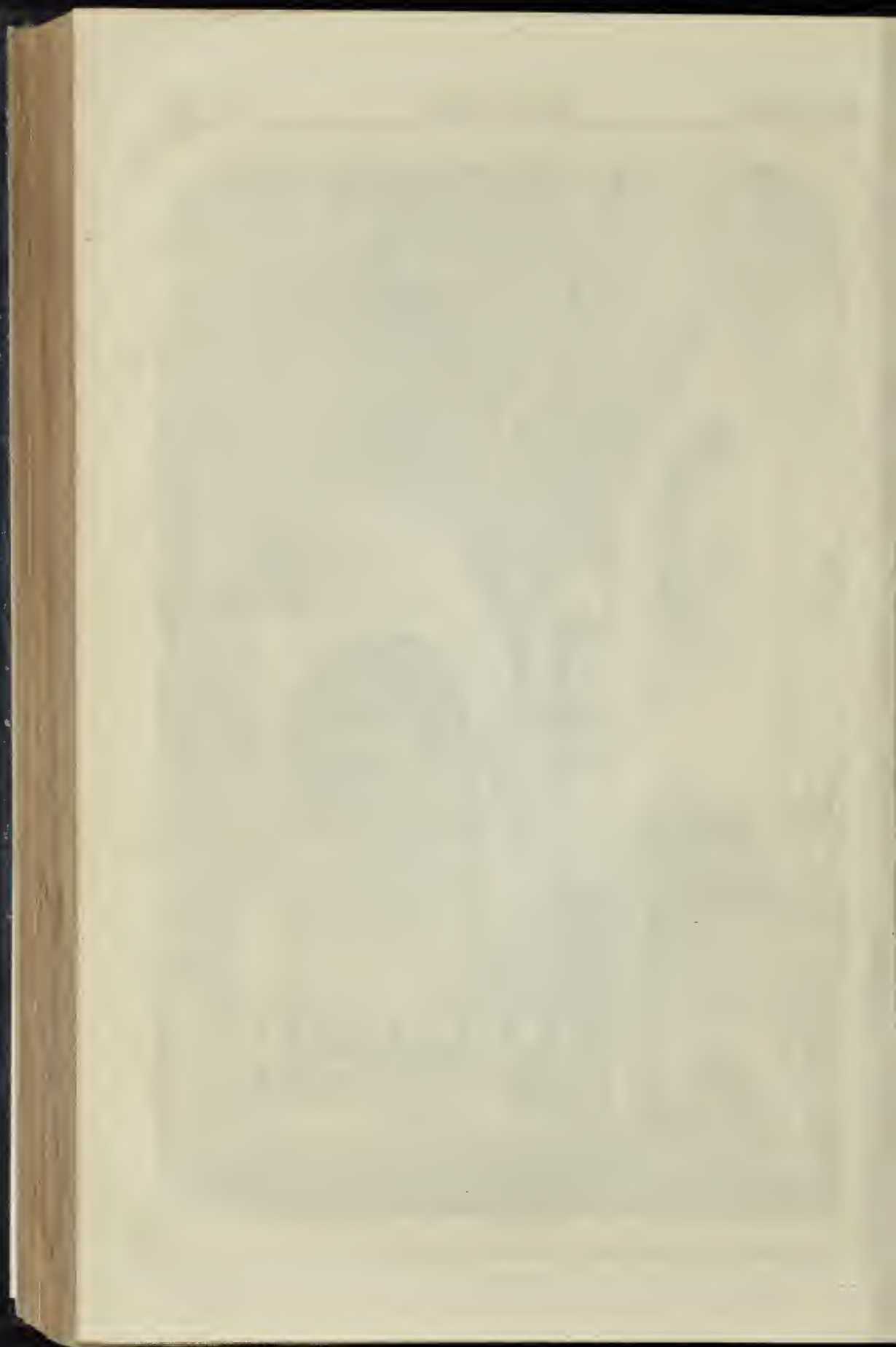
MR. OWEN JONES, ARCHITECT,
Author of "The Grammar of Ornament."



ST. ANDREW'S CATHEDRAL CHURCH, INVERNESS.
Plan.



THE CHURCH OF ST. COLUMBA, KINGSLAND ROAD, LONDON. — MR. JAMES BROOKS, ARCHITECT.



THE PARISH CHURCH OF ALL SAINTS,
LATHBURY, BUCKS.

This church has lately been re-opened, after undergoing considerable repairs. The chancel was restored some years back under the direction of Mr. Hussey. The church contains features of great interest, and is believed to have originally consisted of a western tower, and narrow nave and chancel. Now, however, it presents a western tower, pure Norman below, transitional Norman above; a clearstoried nave, flanked by a transitional Norman arcade, on the south side, and by a Decorated arcade on the north; a south aisle, with Norman door, and Decorated windows and porch; a north aisle and chancel of Decorated style throughout. The roofs are of late date, very low pitched, and masked by heavy hatted eaves parapets, except in the case of the chancel. Several interesting discoveries have been made during the progress of the works, such as a Norman window over the south arcade, an arched entrance and stairs to the roof-loft, a low window in the north-west corner of the chancel, and a fragment of intricate Norman carving in the south-east pier of the nave. The church has long been noted for its frescoes throughout the nave and aisles. The internal appearance of the church is much altered by the substitution of new fittings instead of high pews, &c. the walls have been strengthened, and the porch almost rebuilt, with a new roof. A carved font, standing upon an encasement tile pavement, was a special gift.

The woodwork has been executed by Freshwater, of Bedford; and the general repairs by Shackshaft, of Newport Pagnell; under the direction of the architect, Mr. E. J. Tarver.

CARRIAGE-WAY PAVEMENT v.
MACADAMISING.

Sir,—The question of carriage-way pavement requires, I think, to be better understood by those most interested in the matter,—I mean the large body of ratepayers.

About thirty years back, the prevailing opinion among the commissioners of paving, their surveyors, and, indeed, the general public, was that the larger the stones used, the sounder and better the pavement would be, and the longer it would last. But those two great tenets, time and experience, have now brought us to know better, and the wide stones have been condemned in the City, Southampton-row, and various other places for many years; and, in their stead, stones 3 in. in width substituted. I feel sure, from a very long and practical experience, that these stones are by far the best, there being less friction, less noise, and better foot-hold for the horses; but all carriage-way paving ought to be laid on a bed of concrete, as that cannot work up through the joints, however great the traffic may be.

What I wish particularly to impress on the minds of the different paving boards is the great waste of the ratepayers' money which is made, from time to time, by continuing the process of macadamising the public streets and roads. In illustration of this take the following example:—I should say the paving in Cheapside, Fleet-street, Holborn, and other thoroughfares of equal traffic, would be on the average reduced in depth about 1 in. in ten years; but if the same stone, or Gurnsey stone, which is much harder,—should be broken and spread on the roadway, then the wear would be in ten years from 18 in. to 2 ft.; and the great difference between the two is to be accounted for in this way. In the macadamising you have the friction of the wheels on the surface, and at the same time the small stones are pressed and rubbed against each other, until a great portion of them becomes dust, which works on to the surface in wet weather, or by the too free use of the water-cart. But this cannot be the case with paving, as there is but one friction on the surface, and I dare say it will appear strange to many of your readers to be told that the wood-paving laid in Cheapside and other parts of London some years back would last much longer than broken Gurnsey stone; but that was proved to be the case, and facts are stubborn things; and in confirmation of this statement I beg leave to direct attention to the durability of the present wood-paving in Cornhill and elsewhere.

I would respectfully advise those paving boards who are treated with the power to borrow money, to avail themselves of the privilege, and urge upon them to follow the good example set

them by the gentlemen of the St. Pancras Paving Board, and two or three other parishes, by substituting paving for macadamising, if they wish to prevent the accumulation of slush, reduce their contractors' bills for cleansing the streets, and save the pockets of their fellow-ratepayers.

Last my motive in writing to you should be misconstrued, I may perhaps be permitted to state that I have no interest in the matter beyond the wish to benefit my fellow-men,—if within my power,—by giving them the result of a long and varied experience.

ONE WHO HAS HAD FIFTY YEARS'
PRACTICAL EXPERIENCE.

THE ENGINEERING WORKS OF THE
BOARD OF WORKS.

Sir,—The ruling spirit of the engineering department, having achieved great successes for the Board, from overwork of mind and body, a short time since, became invalided, and leave of absence was granted him for the purpose of re-orienting his health. Whereupon, it became necessary that the chair thus vacated should be filled,—and so it was.

The new broom, moving, no doubt, with praiseworthy zeal, proceeds at once to sweep clean, thereupon kicks up a great dust; finding fault with everything that has been done by the now dormant chief and his executives, save and except that portion of the work which had been under his own immediate supervision, and which work is now declared the standard of excellence, and below which nothing should be allowed. The facts are briefly these. All sewer works on the north side of the river have been specified, contracted for, and worked out with hard-picked stocks,—the inner ring, where subjected to soot, being of blue Staffordshire bricks, which, in the opinion of the most experienced engineers, architects, contractors, and builders, is the best class of work for sewers; and they are satisfied that works so constructed with best Portland cement will last for centuries. But the new chief goes in for the pretty, regardless of cost, and puts in such work as is seldom to be found even in the fronts of most princely mansions; the strength and durability of this class of work over the other not being increased one iota, whilst the cost of its production has been absolutely doubled.

I should not have trespassed on your space to this extent did I not regard it as a subject of great importance, and one to which the attention of the public ought to be earnestly directed; for it is clearly one of two things,—either a class of work has been admitted on one side of the water under the Metropolitan Board of Works which is absolutely inadequate to the requirements, or, if it is all that can be desired as regards substantiality, then they have sanctioned a most lavish waste of public money on the opposite side of the river to a spirit of engineering rivalry.

I enclose my card and address, and am,
A RATEPAYER.

MANAGEMENT OF COMPETITIONS IN
GERMANY.

As it has of late been suggested that the Institute of British Architects should take up the question of public competitions, it may not be interesting to note what has been done in this direction by other countries. At the Congress of German architects and engineers in 1868, the following ten rules were agreed to, and ever since the public and profession in Germany have been guided, we are told, by the principles there laid down.

1. The jury must be chiefly composed of architects.
2. The instructions must be approved by those architects, whose names must be stated.
3. No jurymen can in any way participate in the proposed work.
4. Unnecessary drawings and details should be avoided, and the required scale should be stated.
5. If the intended outlay is named, the instructions must state whether that sum will be adhered to, or whether it is approximate only, in which case the competitor may use his own discretion.
6. A design will be excluded from the competition if sent in too late, or is found to contain considerable deviations.
7. The premiums must be awarded under all circumstances.
8. The various designs must be publicly exhibited for a fortnight at least, and the report of the jury must be published.

9. The premeditated design becomes the property of the client (or building committee) only if carried out.

10. The first premium must not be less than the amount due to an architect called in without competition.

THE MATERIAL FOR STATUES.

I HAVE read with some interest the observations contained in recent letters in reference to our London statues, and cannot help thinking that, after all, the bronze statue for durability and adaptability will hold its own; its chief defects are contained in the following few sentences of Mr. Moore's letter:—“Whatever may be its original colour, &c., soon loses its original agreeable tint, and becomes the most monotonous, melaucholy, and disagreeable tone that it is possible to conceive; the statues constantly reminding us of sweeps;—not a clear, transparent, lustrous black like marble, but a dull, heavy hue that will not allow the light and shade, even in our brightest days, to be seen at a short distance, and obscuring all the details and minor beauties which add so much to a work of art.” This defect appears to me to arise from the want of lustre rather than from the colour of the material. To take a common illustration, the ornaments on a stove, although quite black, when well polished with black lead will allow of the pattern of the ornament being perfectly seen. In imitation bronze figures, the effect is produced by painting them of an olive or dark brown colour, and wiping off or touching the prominent parts, with bronze powder; showing clearly that the fact of a bronze figure having changed to a dark colour does not of necessity render it disagreeable, so long as the surface can be kept bright. And why could not this be done by means of a periodical hard brushing? Bronze is a material that would bear the process; and if the prominent parts thus became of a lighter colour than the depths, we have then the effect so much sought after in all imitations of bronze. Some of the bronze statues in Trafalgar-square, and that of George III. at Charing-cross,—not long since were thoroughly brightened up, but are now as black as ever.

Marble and stone statues, of course, will not bear the process I have suggested, as the tips and prominent parts would become black. I remember the last time I saw the statue of the Queen in front of Holyrood (Edinburgh), before the new fountain was placed there, she was undergoing the process of painting; and some years since it frequently fell to my lot to blow the statue of Sir David Wilkie (then in the entrance-hall of the National Gallery) with a pair of bellows. Even then, by the very frequent, though necessary, use of a dusting-brush, his nose got nearly black, giving Sir David a most stotish appearance. I believe the statue in Cavendish-square has not been replaced; it was taken down a year or two ago, as was stated, to be recast, at the expense of the Duke of Portland, and the staging was left standing as if for its re-erection; this was afterwards cleared away, and I think no statue but that of Lord Bentinck can there be seen.

Speaking or writing of statues, when will a companion be found to George IV. in Trafalgar-square? It is a wonder that the Duke of Kent, being the father of her Majesty the Queen, has not been placed before this time in a more prominent position. If brought from within the railings, and placed some 10 ft. or 12 ft. forward from its present place, it would be an improvement. Can any of your readers tell me when the dagger formerly (as represented in old prints) in the hand of the Achilles in Hyde Park, was removed? For many years he stood empty-handed; but within the last few has been supplied with a formidable instrument like a large oyster-knife. So with the iron St. Georges on the gates at the Marble Arch. They formerly held spears; now they content themselves with shaking their fists at the dragons beneath their horses' hoofs. Does not Richard Cobden deserve a better statue than that at Camden Town? His trousers and coat are “too long and too loose,” requiring the sleeves to be turned up considerably. Would not Livingstone be more suitable to face Franklin, and shift Lord Clyde to Trafalgar-square? In these anti-vaccination days, I suppose I dare not say a word in favour of poor Jenner, or would suggest the courtyard of Middlesex or some other metropolitan hospital. EFF. DEE.

CHEAP MEALS FOR THE POOR.

A MEETING was last week held at the Cannon-street Hotel, for the purpose of considering the best means of providing cheap meals for the poor during the ensuing winter. The chair was taken by Sir William Tite, M.P. Mr. Robinson said he wished, in the first place, to disclaim any commercial interest in the project he wished to promote. His attention had been first attracted to the subject by the success of the cheap dining-room for Australian meats in Norton Folgate, where 1,000 working men obtained, at a very low rate, a good and nutritious meal every day. He had visited that establishment himself, had tasted the food, and had been perfectly satisfied. A resolution in favour of the object of the meeting was carried.

It is proposed to establish kitchens and eating-rooms in Poplar, the London Docks, Farringdon Market, Westminster, Lambeth, and Brompton. It is estimated that about 1,000, will be required to provide the necessary premises and fittings. Of this sum nearly 500*l.* have been subscribed.

Besides the Norton Folgate establishment alluded to by Mr. Robinson, another has been opened in Islington. It is also said that the acceptance which the Australian meat is finding in its cooked form is rapidly stimulating the sale of it uncooked. The savory smell of the Irish stew has formed a more cogent argument than "opinions of the press," and the advice of the *savans*. Hundredweights of the preserved meat are now sold for pounds disposed of four months ago by Mr. Tallerman, who introduced it.

Some specimens of beef have been imported from South America by Messrs. G. F. Dickson & Co., of Great Winchester-street-buildings. The beef had been prepared for exportation by Senor Maximo Terrano, an extensive landed proprietor of Buenos Ayres. The process of preparation is said to be exceedingly simple, and the result neither the "jerk" beef of the West Indies nor the "oharou" about which so much has been said in question. The meat is simply cut from the carcass of the newly-slaughtered animal, next steeped for twenty-four hours in ordinary brine, and finally dried in the open air. When dry it is fit for shipment, and it performs the voyage to England in loose sacks, without any other precaution or covering. The meat is said to be in appearance very like the Hamburg beef of the Italian warehouses, and quite equal in succulence and flavour. It can be sold retail in London at 3*d.* or 4*d.* a pound. It is sold without bone, has plenty of fat, and would make a first-rate *pot-au-feu*, with carrots, cabbage, or other vegetables.

CEMENT.

Sir.—At page 912, *ante*, your correspondent, "W. W." asks: "Does cement compress when loaded into carts, &c.? If so, when it is essential the correct proportions of cement should be used, would there be no diminution of strength as there is of bulk?" I beg to suggest, in reply to "W. W.'s" first inquiry, "How much is a bushel?" that an imperial bushel measure, duly stamped, contains that quantity, or 2,118 cubical inches; and is applicable to seeds, grain, ground lime, cement, &c., or those articles not sold under the custom of heaped measure.

It is the practice at the various cement works I have visited, to place a bushel measure under the spout delivering from the sifting machine; when this is full to the brim, any excess in the form of a cone on the top is struck off, and a fair bushel filled into the sack or cask. Now, as to loss of bulk, when the cement is ground, the particles are covered with scales or feathers projecting, increasing considerably the space they occupy at the first time of measuring.

These projecting particles are broken off when the sack or cask is filled—the sacks being thrashed—the casks shaken and rammed until they hold the quantity in the smaller space. There may be unprincipled merchants in this trade, but that is apart from the question. I was a large consumer of Portland cement from 1854 to 1864: the earlier part of that time I found great deficiencies in the quantities of cement delivered as against that charged for; subsequently, I purchased by weight,—a course now generally adopted.

If the proportion or quantity of cement to be used is specified, doubtless an engineer or architect considers he has a right to have his bushel measure filled at the time of using or on the

work, and would refuse to entertain the plea that it must not be filled because the material had lost bulk in transit.

If the "proper" quantity of cement be ordered to secure strength, and less be used, strength will not be obtained. The means not being equal to the end, the end cannot be attained.

Y.

COST OF THE MUNICIPAL BUILDINGS, LIVERPOOL.

At a recent meeting of the Liverpool Town Council, the cost of the Municipal Building, of which we gave illustrations some time ago, was stated. It is rather large, and stands thus:—It was decided, after due consideration, to give Messrs. Haigh & Co. a sum of money equal to an advance of 988*l.* on the sum awarded by the architect and surveyor, with whose award their claim differed to the extent of 4,000*l.*, and, though not satisfied, they were bound by their arrangement to accept this. Including this vote, the cost of the building up to the present time has been 126,410*l.* 7*s.* 3*d.*, exclusive of the land, which cost about 323,900*l.* The total already mentioned includes the cost of the fixtures, &c., which have been very expensive, because large in quantity. The furniture, fixtures, gasfittings, bells in the tower, the tower clock with its expensive arrangements, and similar extras, came alone to about 16,000*l.*; Messrs. Haigh's bill for fittings amounting to 12,431*l.* 18*s.* 3*d.*

THE INVENTOR OF THE STEAM-ENGINE'S NAME,—NEWCOMEN, OR NEWCOMIN?

FOLK were not particular in their spelling 200 years ago—notably so in the matter of surnames. My family name, e.g., used to be spelled *Lidstone*, though it is now rendered *Lidstone* by all but one branch of the old stock. And, being desirous to have Newcomin's name printed correctly, I examined the gravestones of his family, which was located in Dartmouth for several generations, and on all of them it was given—Newcomin, as in my pamphlet reviewed in your last issue.

T. LIDSTONE.

HAND-RAILS.

For safety of aged or infirm persons I suggest that the flights of stone steps outside our modern villas should be provided with a hand-rail on each side. They are very dangerous to descend after dark by aged persons, and it is a modern custom to dispense with them. I do not know the reason why. OCTOBERIAN.

LAW COURTS.

It is a most unfortunate thing that this work—a matter which would have given employment to hundreds,—should have been stopped; at a time, too, when it would have been a real boon to the working classes. Does the Chancellor of the Exchequer, by the way, really imagine that he will be able to anticipate taxes not due? If so, he can little know the condition of 75 per cent. of the community, who at present are all but unable to pay taxes really due.

INQUIRE.

A CONTRACT IN NOTTINGHAM.

Sir,—May I give an instance of contracting in Nottingham. Last week tenders were invited for 31 houses in Kirke White-street, Nottingham, for Mr. J. Abbott; Mr. John Collyer, architect.

At the appointed time tenders were sent in from twelve different firms, myself being one of the competitors. The following day I met the architect, when he told me that the lowest tender had been withdrawn, in consequence of a mistake, so that I stood a good chance, but it was not quite settled. I waited upon him last Saturday, and was informed by him that they had not yet settled who was to have the job. He (the architect) inquired of me whom I should employ as sub-contractors, and named a stonemason and a painter. Finding I was willing to employ them, he then told me that I was not the lowest contractor, that Mr. Attenborow's contract was a little below mine, but if I could alter my tender I should get the job. I refused to do so, and came away, fully expecting that Mr. Attenborow would get it. But such was not the case, for on Monday the job was given to

Mr. Vickers. As soon as I heard of it I applied for a list of the tenders, and was handed the office list to copy from, which was as follows:—

Hindell	£1,283	0	0
J. Smith	3,000	0	0
Sedgewick	3,640	0	0
Wool & Slight (second tender)	3,640	0	0
Vickers (accepted)	3,745	0	0
Messum	3,821	10	0
Slim	3,820	0	0
Boatock	3,822	0	0
Rushworth	3,807	0	0
Jelley	3,789	0	0
Tutin	3,769	10	0
Attenborow	3,767	0	0
Wool & Slight (withdrawn)	3,400	0	0

Having made the above copy, and carefully looked over the list, I could plainly see that the figure had been altered opposite Mr. Vickers's name: the 7 had evidently been a 9, and the 4 a 2, making 3,925*l.* I turned to the architect, and asked him if the figures had not been altered. He replied that he had taken the iron-work out. I pointed out the altered figure, the old one being plainly visible, and told him that 75*l.*, which is the price of the iron-work, did not account for the alteration; and reminded him that all the contractors would include the provisional sum of 75*l.* for the iron-work.

Being thus pinned, he admitted that he had allowed Mr. Vickers to alter his tender, and that I had had the opportunity of doing so, if I had chosen, but would not; and as I was not the lowest, I had nothing to do with it, but for all that, he had no doubt that I could do the brick-work, for he had spoken to Mr. Vickers about me. I told him that I would have nothing to do with the matter; and, although I have no claim upon the job, I consider that I owe a duty to my brother tradesmen, and, though an unpleasant one, I must not shrink from it.

Nottingham.

THOS. TUTIN.

PRE-MISES v. PREMISES.

Sir,—The arguments of your correspondent "R" will not likely avail much, for the tide sets in strongly for using the double *s* in premisses, "arguments taken for granted."

It is substantially the same word, in root, derivation, and etymology, as premisses, "house and tementage;" but convenience suggests this distinction in spelling. Individually, I would prefer to retain the verbal form, for the noun pre-mise, as two syllables, like eur-mise; and in the plural pre-mises, sur-mises, for which we have a strong analogy. A. H.

THE OPEN SPACE AT THE MANSION HOUSE.

METROPOLITAN BOARD OF WORKS.

At the last ordinary weekly meeting of the members of the Metropolitan Board, a deputation from the council of the Royal Institute of British Architects presented a memorial on the advisability of preserving, as an open space, the triangular piece of ground opposite the west side of the Mansion House. The deputation was introduced by Sir William Tite, M.P. Professor Domelidon said the deputation was influenced by no motives of criticism, but rather by feelings of fellowship towards the members of the Board. They had all seen the great improvements brought about by the Board during the last few years, and they now desired to draw attention to the open space near the Mansion House, and prayed that it might be preserved, not only from the fact that it would give to the public residence of the chief magistrate of the city of London a more appropriate and conspicuous aspect, but from the fact, also, that it would be a great public convenience. Indeed, had the plans of Sir Christopher Wren been carried out, the present memorial would have been unnecessary. Charlotte-row and Bucklersbury were too narrow for public convenience already, and if the space referred to was built upon, the inconvenience to public traffic would be greatly increased. Sir John Thwaites said he had no doubt the deputation were influenced by motives of public consideration, and assented the deputation that none more than the members of the Board of Works desired improvements in architecture. Indeed, they had for some time impressed upon Parliament the necessity of improving the City. What the deputation desired the Board also desired, and while he endorsed the necessity of preserving the open space, still he had no power to move in the matter at present. After other remarks, the question was referred to the Works and General Purposes Committee.

The chairman reported that the loan so far had proceeded most satisfactorily, as they had raised it under 3½ per cent., and he could not but feel gratified that the question he had agitated for nearly eleven years had been attended with such advantages to the public and the ratepayers of the metropolis.

THE NEW WORKHOUSE, HERTFORD.

At a recent meeting of the Local Board of Guardians, the clerk read the following letter from the Poor-law Board:—

"Poor-law Office, 22nd November, 1869.
SIR,—I am directed by the Poor-law Board to acknowledge the receipt of your letter of the 3rd instant, in which you request their sanction to the guardians of the Hertford Union raising a further sum of £5000, to pay any balance that may be due in respect of the erection of a new workhouse above the amount for which it was contracted to be built, in consequence of an error having been discovered in the quantities taken out by the guardians' architect. I am directed to inquire why this error and default was not brought by the guardians under the notice of the Board at the time of its discovery.
The Board also request to be informed whether the contract with Mr. Norris was entered into after the receipt of tenders, all made upon the basis of the quantities erroneously taken out by Mr. Peck, and without reference to such other tenders.—I am, &c.
A. FLEMING, Secretary.
Mr. Thomas Swinder, Clerk to the Hertford Guardians."

After some discussion, the clerk was directed to reply to the letter of the Poor-law Board, referring them to the letter from the guardians of the 3rd of November, and stating that the guardians expected to receive Mr. Trollope's report in a week.

The Rev. L. Deedes said Mr. Trollope's instructions were simply to measure the work, but he had told him (Mr. Deedes) privately that the house was well built, and that he did not see any fault with the work.

A NEW NORTHERN ARCHITECTURAL SOCIETY.

A MEETING of architectural students was held in Newcastle last week, and a society formed for the purpose of enabling the members to advance themselves in all matters appertaining to the study of the architectural and collateral profession. The following members were enrolled and officers elected:—Mr. W. L. Newcombe, president; Mr. W. S. Hicks, vice-president, committee,—Messrs. Thornhill, Oliver, Morton, and Thompson; ordinary members,—Messrs. O. Hall, W. Bedington, M. Reed, and J. H. Robinson; honorary secretary and treasurer, Mr. Joseph Oswald. It is called "The Northern Architectural Students' Society."

There is already one "Northern" society. Why do not the students join that? These infinite divisions are wasteful and weakening.

LADIES' SANITARY ASSOCIATION, MANCHESTER.

THE annual meeting of the Manchester and Salford Ladies' Sanitary Association has been held at the Town-hall, King-street. Mr. Hugh Birley, M.P., occupied the chair, and there was a numerous attendance.

The Rev. C. Keeling (the honorary secretary) read the report, which stated that the association was formed to direct the attention of ladies interested in the welfare of the poor to the great need for sanitary reform, and to attempt something in the way of woman's work in comfortless and lost homes. In November, 1867, the special mission agency was started, and a mission woman engaged to visit the lowest districts, under the supervision of the committee. This was now the chief work of the association, and that upon which the committee had to report. The mission woman in her visits from house to house was directed, first, to give instruction upon the common laws of health, and kindly to draw attention to the want of cleanliness and ventilation, and to provide, where desirable, disinfectants and other simple remedies for bad air. If the poor were better housed, there would be need for home sanitary influence, so long as the two great causes of moral degradation were at work,—ignorance and drunkenness. During this year the mission woman had been engaged in the parishes of Collyhurst and Red Bank. Although there were no stories to tell of wonders worked, still the minds of the people had been roused to a sense of the terrible consequences of the bad smells and filthy surroundings, which they too often regarded as necessary evils. She considers that

drunkenness is one of the greatest hindrances to a proper observance of sanitary laws. The report was adopted, and it was resolved, "that considering the wide prevalence of intemperance and other causes of social and moral degradation, this association sees every reason for going on with increased vigour in the work of home sanitary reforms." The meeting pledged itself to support the suggestion made in the report to endeavour to acquire funds in order to have another sanitary mission woman appointed.

THE OXFORD DRAINAGE SCHEME.

THE Local Board intend applying to Parliament for powers to take otherwise than by agreement 300 acres of land in the parish of Radley, the property of Sir George Bowyer, and 300 acres in the parish of Nuneham Courtney, the property of the Rev. W. Vernon Harcourt, for the purposes of carrying out the drainage of the city. It is understood, that although power will be taken to obtain 600 acres, not more than 300 will actually be required for the utilisation of the sewage; and that endeavours will be made to obtain land by private contract, if possible, the application to Parliament being only a provisional and precautionary measure. On the portion of the land selected a pumping-station will be erected, for the purpose of pumping up the sewage, and thence distributing it by carriers over the surface of the land. The effluent water, after purification, will be led through pipes into the river Thames.

The committee, as far back as May, 1869, resolved that "the principle of excluding all rainfall from the sewers should be adopted as far as practicable." Since then Lieut.-Col. Ewart, who was appointed by the Home Secretary to inquire into "the plans for the drainage of the several towns situated in the valley of the Thames, with a view to the purification of that river," has recommended the adoption of the "separate system" of drainage in the towns of Oxford, Windsor, Eton, and Abingdon.

STATUE OF THE LATE EARL OF DERBY.

WE hear with much satisfaction that it is proposed to erect a statue of the late Earl of Derby; but instead of presenting it to the Carlton Club, as is suggested, where few of the public would have the opportunity of seeing it, surely it should be placed in some conspicuous spot, say St. James's-square; and attached to it should be an appropriate pedestal, with *reliefs*, of some telling incidents of his life, and let the architect as well as the sculptor be consulted, so as to render it a work worthy of the present age, and as an example of what a pedestal should be in addition to the statue.

Hitherto there has been a great lack of judgment in this country shown as to such matters, totally different from what is accomplished in foreign states. There would be no lack of subscriptions towards such a work. It cannot be expected the public will subscribe to present a statue to the Carlton Club.

Since this was written, it has been intimated that the committee have adopted what is obviously the proper course, and will seek a public site for the statue.

THE STAGE.

"MORDEN CRANGE" is the title of Mr. Burnand's drama at the Queen's Theatre, a drama founded on Mr. Mark Lemon's novel, "Wid for the End." The morning papers have scarcely dealt fairly with it; but we shall not be surprised to see it in the bills for some time to come. There are plenty of incidents, two or three strong situations, and some very effective scenery. It requires cutting (How can you get a piece without cutting? asks a joking friend hard by), and a little wedging together, and when this has been done it will interest many an audience. Mr. Ryder has one good opportunity, and uses it finely; and Mr. F. Masthew, Miss Pauncefort, and Miss Henrietta Hudson give effective aid; nor will we smit under that head Mr. W. Belford, who plays the inevitable detective. Some very elaborate scenery has been prepared for it by Mr. G. Gordon and Mr. W. Phillips; some of it, indeed, almost too elaborate, considering the very short time during which it is seen; the exterior of Wray's Mill, for example, at the commencement of the second act. The first scene of all,

Riverside Farm, is a built-up landscape of considerable merit; the Drawing-room in Morden Grange is very agreeable in design and tone. The Hall of the Grand Central Hotel is very cleverly constructed, but is a little marred by the recollection of the same staircase in the "Turn of the Tide," seen for many scores of nights. The red covering should, at any rate, have given place to one of another colour. Be this as it may, all who like the sensational and realistic drama of the day will find plenty to interest them in the mysteries of "Morden Grange."

AN ABATTOIR FOR NEWCASTLE-UPON-TYNE.

THE butchers of Newcastle, incorporated under the title of the "Freelind Butchers' Company," have erected in a suitable situation a large abattoir. The new buildings consist of seventeen separate slaughter-sheds, with corresponding stabling for cattle, cart-sheds, and other conveniences. At the entrance of the premises a gate-house has been erected, and various storerooms are immediately adjacent to this. The slaughter-sheds vary from 35 to 50 square yards in area, the cattle-sheds being about one-half of these areas. The height to the beams in the slaughter-sheds is 14 ft., and to the apex of the roof, 22 ft. The roofs are covered with pantiles, laid without mortar, and in addition to a continuous trellis-work filling in the tympanum of the internal gables between each shed, unglazed windows of large size are placed opposite to each other, in which are inserted upright iron bars for protection, while on the inside window-shutters are provided for when required. The floors are laid in cement, with channels and inclines running towards the doorways; and in each slaughter shed a small blood-tank is provided, the contents of which are removed by specially constructed carts, at periodical hours of the day, no refuse-heap being permitted on the premises. The whole of the open avenues spaces are cemented, with inclined slopes and channels running towards the gully-grates. The cost of the undertaking has been over £5000, and already the premises are rented by forty butchers, as frequently two, three, or four butchers use the same shed at different times. Mr. T. Oliver was the architect.

KEENE'S CEMENT AND PAINT.

SIR,—It would not be seemly that we, the manufacturers of Keene's Cement, should enter into a controversy in your columns with the manufacturer of another cement. We confine ourselves to saying that that firm (unintentionally, no doubt) states what is inaccurate in their letter about Keene's Cement.
"Clerk of Works" is probably correct in defining the cause of the failure complained of to be the use of, and indeed, a somewhat long-haired experience shows us that that point is liable to be thrown off these hard cements when they are laid on a backing of green Portland Cement work.
If the under coat, whether of Portland Cement or other material, be bona dry, the overlying cement may be painted without risk. J. B. WHITE, BROTHERS.

GRANITE COLUMNS.

SIR,—Your correspondent signing himself "J. S." in your last impression, states that he never saw "holes drilled through granite columns from end to end excepting where provision for gas pipes is necessary." Allow me to state that when a column is required, say 15 ft. or 14 ft. long, such column would be in three stones, a hole would be drilled through each stone, and screwed up in the lathe with a bolt through them; this, I find, is a general custom, having myself seen it done.
The words "perfectly smooth," which I used in my letter in reference to the beds or joints, and to which your correspondent objects, are words which convey the greatest meaning in the most simple form, as all experienced persons are better able to understand these words than if I had used the term "fine axed." WILLIAM CROSS.

FOREIGN JOINERY.

SIR,—My attention has been drawn to a letter in your paper of the 4th instant, signed "W. H. Lasseles," respecting the windows supplied to the new St. Thomas's Hospital, in which that gentleman states he has seen the memorandum in your previous impression, that some of the joinery was made in Sweden; and also remarks that he, too, has executed a large order for windows for the same building.
Now, I have not the slightest wish to rob Mr. Lasseles of any credit due to him in the execution of his order for these windows, but I must be allowed, very unpolitely, to contradict the last paragraph in his letter as not being in accordance with the actual facts of the case. He says, after referring to your remarks, that from the inquiries you had yourself made at the hospital, you were able to state that the work was obtained at less cost than it could be produced for in this country; that the Swedish house had "estimated" against him for the second and large order he has received, and "lost it." Now, the truth of the matter is this, Mr. Elman, the proprietor of

the joinery works at Stockholm, has really obtained the order for the whole of the windows for which he did estimate, and the reason why he allowed a considerable quantity of windows to pass him, was because he feared, from the great size of some of them, there would be much difficulty in procuring a vessel for their transport, with sufficiently large hatchways to take in the goods without damage; and in the case of the "second and larger order," of which Mr. Lascelles speaks, I have simply to say that the order was first given to Mr. Ekman, without his preparing any estimate at all, but his reasons for not accepting it, it is not necessary to name here. I think, however, the fact speaks for itself, that there must be some advantage in either price, or quality, or both, in having the windows prepared abroad, otherwise he would not have had the order sent to him without competition.

H. ATKINSON,
Agent to P. J. Ekman, Stockholm.
* * With this the correspondence may end.

THE STREET BY THE MANSION HOUSE.

ALTHOUGH a profound admirer of Shakespeare, I must differ with "W. H.," as to the propriety of calling the new street after the name of the immortal bard. A grove or park would better claim the title. Allowed me to suggest "Whittington-street," Sir Richard lived hard on College Hill, I believe.

CHURCH-BUILDING NEWS.

Victoria Park, N.E.—This new church to be built near Victoria Park-road will be commenced early in the new year. It is designed by Mr. Wigginton, will accommodate 750, and cost, with tower and spire, 5,500*l.*

Islington.—A new church, to be dedicated to St. John the Baptist, is to be erected in Cleveland-road. It will accommodate 800, and will cost 4,000*l.* The architect is Mr. W. Wigginton.

Sasby (Lincolnshire).—The church here has been re-opened, after having been closed for some time for repair. Originally built and used as a mortuary for the Earls of Scarborough, it was fitted in the style in vogue in the last century for similar structures. The seats have now been altered in accordance with modern ideas. They are entirely of old oak, somewhat elaborately panelled. Out of a gigantic pulpit and sounding-board, and the carved mouldings belonging thereto, a screened vestry at the west end, a reading-desk, and new pulpit have been constructed. The vestry will also serve as a baptistry. The small apse forming the chancel has been decorated with paint and gilding. The work has been done by local handicraft. The designs for the alterations and decorations were furnished by Mr. Nevill, of London, and some of the painting immediately over the altar was executed by that gentleman.

Tewkesbury.—A meeting of subscribers to the fund for the restoration of the Abbey Church has been held in the vestry, to consider what steps were necessary to be taken, if any, with reference to the Abbey Church restorations. Mr. G. G. Scott, B.A., and Mr. Skidmore, of Coventry, were present. The chairman stated that subscriptions to the amount of 3,000*l.* could be confidently relied upon. Mr. W. E. Dowdeswell had suggested that Mr. Scott should be asked to furnish an estimate of some part of the work, which might be executed with the funds at the command of the committee, and which, when done, would be complete. It was his opinion that a commencement should be made, otherwise subscriptions would be lost, and the funds, instead of increasing, would grow smaller. It appeared to be the general opinion that the choir would be the best part to begin on, as being the grandest as well as the most useful part of the church. Mr. Scott said that if that was done he should advise that the nave be temporarily fitted up for service; that the whole of the galleries and other obstructions between the choir and nave be removed; the entire length of the structure be opened up from end to end; the organ placed in one of the transepts; and all deficiencies occasioned by these removals be made perfect, so that one specific part of the work should be completed. He should be able in a short time to present an estimate of the cost of this, and tenders might be obtained, so that the committee might know the amount of liability before beginning. The practical result of the meeting was that estimates for the restoration of the choir, and for other sections of the work, are to be furnished, and an immediate effort made to obtain sufficient funds to complete one of them (the choir if possible) and that the work be then at once commenced.

North Ormesby.—The new church at North Ormesby has been consecrated by the Archbishop of York. It is dedicated to the Holy Trinity, and is situated in the Market-place, the site, and also a donation of 300*l.*, having been

presented by Mr. J. S. Pennymann. The style of architecture is Early English, from the designs of Mr. W. White, of London; and the contractor for the work was Mr. A. King, of North Ormesby, builder. Messrs. Readman did the brickwork, Mr. T. C. Taylor the stone-work, and Mr. Unthank the painting. The contract estimate was 1,600*l.*, but the total cost will be about 2,000*l.* The church is built of the common brick of the district, relieved with coloured bricks, in patterns at the gables, and with stone-work in the windows. The building consists of a simple nave and aisle, with a porch on the north side. The south aisle has not been built, but will be added when required. The interior is not relieved with carving of any kind, except plain and shallow mouldings at the capitals of the pillars. The roof is heavy and strong, and the chancel contains stalls for thirty choristers, besides seats for the priests. It is divided from the body of the church by a low wooden screen. The east window is of five lights. Sitting accommodation is provided for 450 persons, in open seats of stained and varnished deal. The pulpit and reading-desk are also of deal. Heat is supplied from a hot-air apparatus furnished by Messrs. Blake & Co. of Coventry, and the gaslighting by the North Ormesby Gas Company.

Maidstone.—The chapel which has been recently added to the main building of the Church of England Female Penitentiary has been opened. The architect is Mr. Arthur Blomfield, and the addition has been accomplished at a cost of about 1,400*l.* The dimensions of the chapel are 45 ft. by 18 ft. A kind of gallery, constructed at the end of the chapel, and communicating on a level with the dormitories, will give any of the sick inmates an opportunity of attending service without the trouble and fatigue of entering by the staircase entrance, and taking their seats with the general body of the hearers. A doorway at the front of the building leads on to the chapel staircase. The ground floor immediately beneath the chapel is used for kitchens and other domestic offices. The building was commenced in the spring, and some of the interior work was only finished on the day before the opening. The chaplain, the Rev. G. B. Howard, states that during the whole of the time the workmen have performed their labour in a very quiet and respectable manner, with an entire absence of drinking and swearing.

Anstey.—The parish church of Anstey "is in a deplorable condition," cracked, broken, altogether in a state of disrepair. But it is difficult to find where the responsibility rests. The living belongs to Christ's College, Cambridge, which would probably contribute to the work of restoration. The landowners are non-residents, and the population, who number about 530, are mostly very poor. A letter addressed to the rector, the Rev. T. T. Sale, by Mr. W. Butterfield, the architect, gives a general view of the state of the church. He says:—

"I have examined carefully and made plans of the church at Anstey. It is one of very unusual character and interest, but is now in a deplorable condition, it requires in some parts very substantial repairs and rebuilding. The south wall of the south transept, the south-east angle of the chancel, and the walls of the tower, are very seriously cracked. The external stonework of many of the windows, doorways, and porch is so much decayed as to require to be entirely renewed. Drains, gutters, and stack-pipes are urgently required. The above works press for attention.

The church has been much defaced, and its proportions altogether destroyed by some works executed about forty years since, which included new roofs to nave, chancel, &c., and new east and west windows. . . . The fittings of the church are of the worst possible kind, and many, with the exception of the font, a screen, and a few of the ancient seats, be entirely removed. The floors must be taken up, and a very inconvenient and unsightly west gallery must be destroyed.

For the absolutely necessary works, a sum of about 2,000*l.* will be required. If, however, the church at Anstey is to be ever really restored, as it is well deserves to be, it will be necessary to spend a much larger sum."

We understand that the rector has been promised about 1,000*l.*, one half the sum which is wanted to prevent the building from falling to pieces.

North Shields.—Christ Church, North Shields, after undergoing improvements, has been re-opened for divine service. The committee obtained the assistance of their fellow parishioner, Mr. F. R. N. Haswell, architect, in the carrying out the resetting and other alterations in the body of the church. Tenders being obtained, that of Messrs. Hedley, Chapman, & Co., North Shields, proving the lowest, was accepted. The seats are arranged in four groups facing eastwards, with those against the east wall looking eastwards. The front benches of the transverse seats are divided into stalls, those on the north side being for the use of the churchwardens, and

on the south side for the members of the corporation of Tynemouth. The organ, which was inconveniently placed in the tower gallery, has been removed into a chamber built on the north side of the chancel, and the choir are to occupy the stalls on each side of the chancel. The tower gallery, by the removal of the organ, is much enlarged, and will be devoted to the almost exclusive use of Sunday-school and other children. Sundry other alterations have been made, such as the paving of the chancel floor with encaustic tiles, in the centre of which is a brass to the memory of the late vicar; the removal of the high wood lining to the walls of the body of the church; the removal of an unsightly and unnecessary staircase to the west gallery; the erection of an inner screen to the west entrance (the south door is to be used only for greges); the decoration of stone pillars, and placing a border of encaustic tiles down the side of the centre passage.

FROM SCOTLAND.

Edinburgh.—The clearing-away of houses in Argyle-square, with a view to the extension of the Industrial Museum, has exposed a portion of the old city wall, the existence of which is probably unknown to the bulk of the rising generation.

Glasgow.—Extensive alterations are about to be made on the suspension bridges. The Bridge Trustees, being desirous of putting these bridges in a thorough state of repair and efficiency, instructed their engineers, Messrs. Bell & Miller, to prepare the necessary plans and take tenders for the work. The Portland-street bridge, which oscillates very much, will be subjected to the greatest amount of alteration. The suspension chains will be lowered in the centre to near the level of the roadway, by which the tension on the chains will be greatly reduced, and the angles at which they leave the towers on the landward and river sides rendered more equal. To give greater strength, the sectional area of the chains will be increased by additional bars. The platform of the roadway will be entirely reconstructed. At present it is formed of timber, which is now much decayed. The new platform, with the exception of the timber planking, will be entirely of wrought-iron framing. A lattice-girder on each side will extend from end to end of the bridge. Other alterations will be made.—A malicious scamp who acts as a steepie Jack at Glasgow so interfered with the tackle of an Englishman who was employed in the same capacity at Port Eglington spinning-mills, that the Englishman's life was endangered. The case was brought before the magistrates, and the presiding judge, at the conclusion of the evidence, said that during the whole course of his official experience no worse case had ever been brought before him. There could be no doubt that serious injury had been intended. Under the circumstances, however, he could not impose a higher penalty than a fine of 5*l.*, with the alternative of thirty days' imprisonment.—The new barracks about to be erected at Glasgow will be provided with a small regimental hospital, which, as we are informed, constructed on the most simple, and at the same time the most modern, principles. According to the *Lancet*, the natural method of cross ventilation by opposite windows is supplemented by the artificial system of fresh-air inlets with Nettleton's stoves, and extracting shafts. The lavatory, baths, water-closets, and sinks are separated from the remainder of the building by the interposition of a lobby provided with means for its own ventilation.

Dalkeith.—The foundation stone of a new west United Presbyterian Church has been laid at Dalkeith. The site is at the west end of the town, and nearly opposite to the railway station. The new church is to be built after competitive designs, prepared by Mr. R. Thornton Shiels, architect, Edinburgh, and the style is Early English, bordering on the Decorated. The church has been planned to accommodate 700 of a congregation. It is estimated to cost 3,000*l.*

Bantaisland.—The representatives of the late Mr. Joseph Young, of Dunsarn, have presented to this town the music-hall built by that gentleman in 1857, at an expense, it is believed, of nearly 2,000*l.* The hall is situated back off the east end of the High-street. It is furnished with a regular stage, footlights, and movable scenery—the latter comprising some ten drops, painted by Channing, scenic artist. The gift has been

conveyed to the Town Council on the simple conditions that it be kept in good repair, and devoted only to the purposes of a public hall.

Alcoa.—A new drinking-fountain has been erected here, but interdicted. The local police commissioners erected the fountain in the square fronting the Crown Hotel, in Bank-street. It has a stone base, 4 ft. 6 in. square, with an elevation of 8 in.; and consists of four columns, from the capitals of which consoles, with griffin terminals, unite with arches formed of decorated mouldings encircling ornamental shields. An open dome surmounts the shields, the apex being occupied by a crown, and the whole being finished by a lamp. The font stands under the canopy, with a basin, 2 ft. 6 in. in diameter, and having four water-supply taps and four drinking-cups. The fountain had scarcely been erected when it was interdicted by Mr. James Blair, Glenfot, who, being the proprietor of the property near the fountain, objected, on the ground that the fountain was erected without his knowledge. The interdict has been considered before Sheriff Clark. The commissioners questioned the right of Mr. Blair to object, and contended that the works were finished some hours before the interdict was served. The petitioner maintained that the interdict was served several hours before the work was completed, and that he afterwards showed his title to object. The consideration of the case, after discussion, was adjourned.

PROVINCIAL NEWS.

Ravenstall.—A new police-court is now in course of erection in this place; the plan comprises a court-room, with retiring-rooms for the magistrates and solicitors; three cells for prisoners, with open yard; police-office, house for sergeant, and rooms for policemen on duty. The cells are heated with hot water, the air from the outside passes over the warm pipes into the cells, and escapes by a ventilator in the roof. The outside of the building is faced with stone. The buildings have been designed by Messrs. Maxwell & Tuks, architects, and are expected to be ready for occupation by next Midsummer.

Whitehaven.—Plans and estimates for the construction of a wet dock have been prepared by Mr. Stiver, the harbour engineer, for the consideration of the town and harbour trustees. The probable position of the dock, says the report, is nearly parallel to Tangier-street, and takes up as little of the North Harbour and Shipyards outside of North Wall as possible; at the same time not encroaching on the inner harbour. It is four acres and a half in extent, and will be a clean gain to the water space of the harbour of 2a, 1r. 19p. The sill of the dock will be 4 ft. below zero of the tides gauge (on the bath-house show-board) which will be the same level as the entrance between the Old Quay and the North Jetty. This with an ordinary spring tide, which is taken at 16 ft., will give 20 ft. over the sill, and with a 16 ft. neap tide will give 14 ft. over the sill. The bottom of the dock will be 1 ft. lower than this, or 5 ft. below zero. The following is the estimate:—

Wet Dock, with quay walls, entrance-gates, railway, &c., including the diversion of Craney Beck	£42,994 8 2
Add 10 per cent. for contingencies	4,299 8 2
	£47,293 16 11

The masonry in the viaduct, bulwark, and part of the North Wall, and the material in the timber jetty are not taken into account, nor is anything allowed for the cost of land, buildings, &c., taken up by the proposed dock. The present entrance to the North Harbour is very much confined, and vessels of any great length have a difficulty to enter. An alteration to obviate this appears on the plan.

Bristol.—Messrs. Wait & James's new granary, which is situated on the Welsh Back, is nearly ready for occupation, and is described in the local Times. The premises have been designed in the Italian Gothic style of architecture. The building is 40 ft. by 100 ft., and about 100 ft. in height. It consists of ten stories, and provision is made for the warehousing of as many as 120,000 bushels of grain. The walls are thick, and are constructed of brick, with moulded and coloured surface. The floors are supported by one range of brick columns, and by this means lifts without obstruction, 20 ft. in width, are obtained, whereas, under the old system, the whole surface would have been interrupted with numerous iron pillars. The lifts to receive the grain are

formed in niches in the thickness of the wall, so that the safety of passengers is secured, and the provision of the usual external doors rendered unnecessary, as the sacks ascend within the building. The sacks of grain will be delivered into carts from the granary through circular openings under the first-floor string-course, the ordinary skid being used to bridge over the foot pavement. The offices are on the ground floor. The architects were Messrs. Ponton & Gough, of Bristol; and the builder, Mr. J. Thorn, of Clifton.

STAINED GLASS.

Wolston Church.—This church has lately been enriched by a window on the north side of the chancel, filled with stained glass, to the memory of the late Rev. Walter Thursby, who was for many years curate here. The window is in the Perpendicular style of architecture, and consists of three lights, which have been filled with subjects illustrative of the office of the deceased. In the centre light is a figure of Our Lord, as the good shepherd, with a pastoral crook in his left hand, and a sheep on his right. At the base of the same light is a kneeling figure of Mr. Thursby, in a surplice. The side lights contain two groups of subjects each. In the dexter group, the upper subject is the charge to St. Peter. Our Lord is represented giving to St. Peter the keys of the Kingdom of Heaven, and the charge, "Feed my sheep." The lower group in the same light is St. Philip baptising the eunuch; in the background are seen attendants and camels. In the sinister light there is represented, in the upper part, the Breaking of Bread at Emmaus; and in the lower, St. Paul preaching at Athens. The framework surrounding the groups is of an ornamental character. The work has been carried out by Messrs. Hardman & Co., of Birmingham.

Burdock Church.—Two painted windows have been erected in the chancel of this church. One is the gift of Sir Henry C. Blake, bart. (one of the lords of the manor), and Lonias, his wife. The subject is our Lord joining the disciples on their journey to Emmaus, and their petition to Him, "Abide with us." The other is the gift of Mrs. James Dunlap, of Windsor, in memory of her late husband. The subject of this is our Lord as the Good Shepherd giving his commission to St. Peter—"Feed my sheep." The artists were Messrs. O'Connor, of London, who also previously executed the east window, the subject of which is "The six works of mercy." It was the gift of Mrs. Hutchins, a sister-in-law of the rector, to her husband's memory, who lies in India. The whole chancel is thus furnished throughout with painted glass.

Baldon Church.—A painted window has recently been placed in the chancel of this church, in memory of the late Rev. G. E. Green, rector of the parish. The window, which is in the Early English style of architecture, has two lights, in one of which is represented Christ's Entry into Jerusalem; in the other, the Last Supper; and in a quatrefoil is a monogram with the initials "G. E. G." The window was executed by Mr. Wailes, of Newcastle.

All Saints', Sheffield.—This church, erected and endowed some time ago by the liberality of Sir J. Brown, has just received the addition of a stained glass window. Sir John's recovery, after a prolonged illness, determined Lady Brown to express her thankfulness by presenting a stained window to the church with which he was most intimately associated. The subjects were suggested by her, and carried into effect by a lady friend—an amateur, who made the original sketches, and arranged them for execution. The window occupies the eastern end of the chancel. The whole has been executed, under the immediate superintendance of Mr. Robert Drury, by the firm of Baillie & Mayer, of London. The window consists of five panels, upon each being two groups representing prominent incidents in the life of the Saviour, with mosaic ornamentations.

Langton Church, near Malton.—A two-light memorial window of stained glass, by Mr. J. W. Knowles, of York, has been erected in this church. The subjects are "Christ blessing little Children," and "Christ setting a Child in the midst of his Disciples." At the base of the panels is the text, "Of such is the kingdom of heaven," and at the bottom of the window is the inscription. The stone work, which is new, was executed by Mr. Keswick, builder, York.

St. Mary's Church, Witney.—Recently, the west window in this parish church has been filled

with painted glass, the gift of Miss Raine, as a memorial of her lately deceased father, Mr. Richard Raine. The window contains five principal compartments, the left representing Joseph interpreting the dream of Pharaoh, and the one in the extreme right the storing of the corn in the granaries of Egypt. The three central compartments comprise one group. Above the compartments are the badges of the twelve tribes of Israel, as prophetically set forth by the patriarch Jacob in Genesis xlix.

Books Received.

Wonders of Italian Art. By LOUIS VIARDOT. Illustrated with Engravings. London: Sampson Low, Son, & Marston. 1870.

This translation of M. Viardot's "Merveilles de la Peinture," illustrated not so much with engravings as with fine photographs from engravings, makes a charming gift-book for either sex. It is very agreeable reading, and conveys a large amount of information on the subject of which it treats. It may be considered either praise or blame, according to the age and tastes of the readers, when we add that the engravings photographed are of the most widely-known pictures.

Normandy Picturesque. By HENRY BLACKBURN. London: Sampson Low, Son, & Marston. 1869.

ANOTHER pretty gift-book; nicely printed, illustrated, and bound. Mr. Blackburn has the pen of a ready writer, plenty of recollections to afford comparisons, and good command of the pencil, to illustrate his amusing words. The volume is very pleasant reading, but it is very light. The buildings are scarcely described, or commented on, so fully as we might have expected. Still, it has much local colour, recalls the country, and leaves the right sort of impression. We have often before now advised such of our readers as have not visited Normandy to do so at once. The trip is inexpensive, and affords not merely pleasure, but good materials for study and the sketch-book, especially at Caen and Bayeux. We have no doubt that Mr. Blackburn's interesting hook will aid in bringing about what we wish.

Miscellaneous.

Additions to the London Fever Hospital. The Board of Management of the London Fever Hospital have displayed energy and resource in the provision they have for dealing with the prevailing epidemic. They proceeded to erect two new wards at the back of the hospital, capable of accommodating sixty patients, with the required attendants, and giving to each patient 2,000 cubic feet of air. The Lancet says, these wards stand upon a plot of ground on which, on Tuesday, November 16th, cabbages were flourishing; and they will be occupied by patients before this page is in the hands of our readers. The building is well raised from the ground on brick foundations, and is constructed of corrugated iron, lined first with felt, and then with deal boards, accurately fitted and jointed. These boards are stained, sized, and varnished, so that they can be washed all over with carbolic-acid soap. The two wards adjoin one another, and are separated by a partition that does not rise quite to the roof. Each ward measures about 140 ft. by 42 ft., and is 16 ft. high. The bedsteads are of iron. There is a small table to each bed, and a nightstand to each two beds. There are also small shelves over each bed-head, in a position easy of access by the patients. Each ward contains six stoves, with open fireplaces, arranged in three pairs. The numerous windows are made to open at the top; and there are also ventilators in the roof, and openings through which the chimney-pipes of the stoves are carried. Gas has been introduced, and there are two star-burners in each ward. At the entrances there are inner doors to exclude draught. The nurses are provided for in a separate building close at hand.

Fall of a Railway Station.—The wooden station for the Caledonian Railway, at Edinburgh, has fallen. The building was about 400 ft. long, by 80 ft. wide, and was approaching completion. Shortly before the accident most of the workmen had left; four made a narrow escape.

Re-opening of the East Suffolk Hospital, Ipswich.—This hospital, after enlargement, has been re-opened. The additions have been so extensive as practically to form a new hospital. The old hospital forms the centre of the present one, and is now principally appropriated to the apartments of the resident staff, and what may be termed the domestic department of the hospital, the number of beds it is intended to place in the small wards it now contains being about twenty, whilst the total number of patients for which there will be accommodation is about 100. The entrance is under the portico, and on either side of the old hospital (the length of the frontage of which is 80 ft.), a new wing of greater length than the old building has been added, and to break the somewhat monotonous extent of white brick front, the end of each wing in which are the baths, &c., has been brought forward 2 ft. or 3 ft. The total length of the building is 250 ft.; the width at the centre remains as before the enlargement; the new wings contain wards 24 ft. wide, and at the back is an entirely new building some 60 ft. square for out-patients, a chapel, board-room, &c. Mr. F. Barnes, Ipswich, was the architect, and the hospital, which has been erected from his plans, is regarded as a model building, so far as the provision for the patients in the wards is concerned. The arrangement of the offices, &c., is, perhaps, not all that could be desired, but for that Mr. Barnes is in no way responsible, they having originally been intended for a much smaller building, and it was no easy task to render them suitable for the extended requirements of the enlarged hospital. The contract was taken by Mr. G. Hewitt, Ipswich, for 3,000*l.*, but some alterations were made after the contract was signed, which considerably increased the amount, and the total expense, including the apparatus for supplying hot water, &c. (which was executed under contract by Mr. West for 150*l.*), will be somewhat short of 4,000*l.*

The Earthquakes.—Earthquakes at Gross-Gerau, in North Germany, continue. From last report down to the evening of the 28th ult. the shocks were frequent, but slight. In the evening of the 28th, however, without any previous warning, the ground began to tremble far more violently than it has done since the 22nd ult. Three separate shocks were distinguished, and they lasted together seven or eight seconds. The sensation is described as resembling what would be felt if the whole surface of the earth were sliding down an inclined plane. The inhabitants have begun to look on every accession of these interesting but uncomfortable phenomena as a sign that an outbreak of more than usual violence is at hand. The whole site of the small town of Gross-Gerau, according to measurements by engineering officers, is now two or three inches lower than it was before the earthquake visitations. None of the houses have fallen, but walls curve outwards, and between 40 and 50 chimneys are in a precarious condition. Nervous diseases, and even insanity, have been produced by anxiety and fear.—A serious earthquake has occurred in Algeria, Barracks, and other military buildings have been much injured and split up in some places, and other buildings have been damaged. There has also been a violent storm in Algeria, which has destroyed the harbour of Oran.

Parquet Floors.—Messrs. Born & Co. have submitted to us a number of specimens of flooring, and other wooden ware, by the Iffeld Company, Prussia, which are very good both in design and workmanship. According to their advertised prices, handsome floors may be had from them, made of walnut, rosewood, and sycamore, for 1*s.* or 1*s.* 3*d.* a foot. One great point in having work of this kind done is to obtain assurance that the woods are thoroughly dried and shrunk, and this they profess to give.

Public Hall and Institute for Baldoek near Hitchin.—A large and influential meeting of the inhabitants of Baldoek has been held for the purpose of considering this matter. The meeting resolved itself into a committee, to ascertain and report upon the most eligible site, the probable cost of erecting a suitable building, and the steps to be taken to raise the necessary funds. Subscriptions to the amount of 300*l.* and upwards were promised during the evening.

Art and Industrial Exhibition at Cardiff. An Exhibition of Art and Industry is announced to take place in Cardiff during the autumn of next year. The Marquis of Bute has accepted the presidency of the undertaking.

New Moravian Schools at Little Horton.—The Moravians at Little Horton, where they have had a chapel for some years, have built new schools. The schools are part of a scheme which includes the erection of a new chapel and minister's house adjacent. A design for the whole pile was prepared by Messrs. C. S. & A. J. Nelson, architects, Leeds, but the promoters thought it desirable first to proceed with the schools, and these have been built at a cost of 1,150*l.* The building is two stories in height, each of the school-rooms measuring 40 ft. by 30 ft., of good elevation, well lighted and ventilated. Each room has two class-rooms and other conveniences. The upper room is approached by a stone staircase. The roof-timbers are shown. It is lighted by seven windows, the outer edges filled with coloured glass, while at one end of the room is a slightly elevated platform, serving for concerts, lectures, or meetings. The lower room is lighted in a similar manner, and the pillars supporting the beams of the floor above are finished with capitals and other ornaments. The walls round each school-room are panelled in stained wood, a few feet in height. The chapel forms a narrow oblong square, with a gallery at one end almost reaching to the ceiling. It must have needed self-denial on the part of the congregation to think first about the juveniles when the adults were so badly provided for.

The Suez Canal.—The traffic from the opening to the 29th—that is, in eleven days, was as follows:—Fifty-two vessels arrived from Port Said at Lake Timsah, between the 17th and 19th of November, and seven between the 20th and 28th; fifty-one vessels left Lake Timsah for Suez from the 19th to the 21st, and five from the 22nd to the 28th. The arrivals at Port Said from Suez in the interval between the 18th and 28th were altogether forty-five. Of these vessels seven were from eastern seas on their way to Europe; nine were from the Mediterranean on their way to the Indies. The total number of vessels that passed through the canal during the period referred to was 130, the aggregate tonnage of which was 80,000. A telegram from M. de Lesseps, with reference to the passage of these vessels, says,—“Notwithstanding this extraordinary traffic, only six vessels touched the ground slightly; of these, four got off without aid, and but two required a little assistance to set them afloat. No loss of cargo, no vessel damaged. Neither the bottom nor the sides of the canal injured.”

Iron and Steel Institute.—By permission of the Privy Council, a general meeting of the Iron and Steel Institute was held in the Lecture Theatre at the South Kensington Museum. In the absence of the Duke of Devonshire (the president), Mr. Bell occupied the chair. After the transaction of some routine business, Mr. W. Menelaus (vice-president) read a paper on “Improved Machinery for Rolling Rails.” Mr. G. H. Benson, of Staleybridge, read a paper on “The Generation of Combustible Gases under a Pressure.” Details of experiments in the use of gaseous fuel were given. Another paper on “A Firebrick Hot-blast Stove” was read by Mr. Whitwell, of Stockton. Discussions followed. Amongst those present were Mr. Samuelson, M.P., Mr. Pothergill, M.P., Mr. J. Lancaster, M.P., and Mr. Roden, M.P.

Report on Coventry Free Library.—The first annual report to the City Council of Coventry of the Free Public Library Committee has been printed. It shows that the library is being appreciated. The total number of issues of books for ten months has been 57,954; the daily average, 231. Of course, by far the largest number are under the head of “miscellaneous, poetry, fiction, &c.” being 37,501; but there is a goodly sprinkling of readers in history, biography, voyages and travels, &c., and in magazines and reviews. Only twelve volumes are “missing.” Of 3,172 borrowers 1,170 were of the age of 14 to 20, and 345 of 21 to 25.

New Schools and Church at Highgate.—We learn from the *Hampstead and Highgate Express* that Miss Burdett Coutts has given a site, worth about 700*l.*, for new schools to be erected upon at Highgate-new-town. A new church is also to be built in the same locality.

Kendal Drainage.—The corporation of Kendal are about to carry out a new scheme of sewer works throughout the whole town, and to apply the sewage to the purpose of irrigating some low-lying lands adjoining the river Kent. Mr. Brierley, of Blackburn, is the engineer.

New Bells in the Parish Church, Earls Colne.—The inauguration of a new set of bells in the parish church of Earls Colne took place on St. Andrew's Day. There were formerly six bells in the tower, which have from time to time become so dilapidated that a peal has not been rung on them, it is said, for upwards of thirty years. The new bells are six in number, and were manufactured by Messrs. John Warner & Sons, London, and were hung under the superintendence of Mr. Boswell, their foreman. The weight of the tenor bell is 14*cwt.*, and it is cast in the key of F natural. The weight of the whole peal is about 60 *cwt.* There is also a new clock bell, weighing about 2 *cwt.*, forming a spiral finish to the tower, and surmounted by an ecclesiastical coronet. A slight mishap occurred during the hanging of the bells. The large tenor bell was being hoisted in its place, when a rope breaking, it fell and struck a piece of wood, causing it to rebound and strike one of the workmen rather severely. Several others were near the spot, and narrowly escaped injury. No blame is attributed to any one, it being purely the result of an accident.

Opening of a New Gymnasium in Sheffield.—Recently a movement was set on foot for the amalgamation of the existing gymnastic clubs into one body, to be called the United Gymnastic Club. A meeting of the members and subscribers of the clubs was accordingly held, and it was decided to take a large building in Hill-street, Highfield, and to adapt it to the purposes of a gymnasium. The arrangements have been completed, and the building has been opened to the public. It is 91 ft. in length, and 40 ft. in width, is lighted by nineteen windows and twenty-three gas jets, and the height is 16 ft. from the floor to the beams. All the requirements for a modern gymnasium are provided; there being two horizontal bars, a trapeze, rings, climbing ropes, ladder, jumping apparatus, parallel bars, ohls, and dumb-bells. Arrangements have also been made with a member of the dragoons for the teaching of the use of foils and singlesticks, and facilities will be afforded for bicycle practice. Already 200 members have given in their adhesion to the new club. Mr. Councillor Chatterton opened the club, in the absence of Captain Preat, the president.

The Trade of Clerkenwell.—A Clerkenwell watchmaker, writing to us respecting a proposed meeting of the trade at Clerkenwell, to consider its present stagnation, asks—

“What possible good can arise from a meeting to discuss a fact well known, but which chiefly arises from causes almost beyond our power entirely to prevent or control. Let it be borne in mind that the staple trade of Clerkenwell consists in the manufacture of articles of luxury, and that we are now feeling the effects of the ‘panic’ of 1868, and of the ruin, misery, and straitened means it entailed upon thousands previously in comparative affluence. Let us also remember the frightful civil war in which we are now engaged, and which has done our principal trade, and then reflect whether the depression in the watch trade is relatively greater in proportion than in other branches of English industry. Great and incalculable injury has been inflicted upon our manufacture by the constant reiteration of the alarming decay in the watchmaking trade, leading many to suppose that a first-rate English horologist belonged to an almost distinct species of the *genus homo*. Foreign competitors press us closely; but this must be met by manufacturers selling at a minimum of profit, and uniting with the workmen in devising expeditious methods of execution. Lastly, I would suggest that retailers should treat us as they do our rivals, and sell our manufacture at a small profit. Quality is the real test of cheapness. If we stand by that there is still hope of a bright future for our trade.”

Surely he gives very good reasons why a meeting should be held, if but for the purpose of considering these very points.

Reopening of the Thames Tunnel.—The extension of the East London Railway, which utilises the Thames Tunnel, has been opened for public traffic. Special trains run over it, starting from New-cross on the south side of the Thames, running northward as far as the western extremity of the Surrey Commercial Docks, and thence by Rotherhithe to the Thames Tunnel, and passing under the river to Wapping, where for the present the line terminates. The cost of these works (including interest and discount on shares), has been 1,357,900*l.* In this little bill the cost of the Thames Tunnel is put down at 200,000*l.*

Athens.—Herr Ernest Ziller, architect, while conducting some excavations in Athens at his own cost, has hit on the site of the stadion of Lyongurgus. This is the most important archaeological discovery that has been made there since Strack, of Berlin, had the good fortune to find the Theatre of Bacchus in 1862.

Christmas Decoration.—A "Country Lady" asks us how she should make wreaths to decorate a house this Christmas. An extract from Cassell's Household Guide for December comes opportunely as an answer:—

"The best wreaths for decorating the banisters of a house, or any pedestals, pillars, or columns, are those made in a rope of evergreen sprigs. There are several ways in which such wreaths are made. One way is as follows.—Get a rope or stout cord, of proper length, and a quantity of twine and a handful of evergreen twigs. Begin at one end of the rope, which should be attached firmly to something. Dispose a bunch of the twigs round the rope, and tie them on with the twine; then dispose another bunch so that the leaves may conceal the stalks of those already on, and give the twine a turn round them, fastening it with a running knot, and so on until the rope is finished. This must be done at the fastening of each bunch of twigs. Another way very frequently adopted is, in place of a rope, to use only a piece of stout twine to run through the wreath, so as to prevent its falling to pieces, and, instead of twine to tie the twigs on, to use fine wire, which must be firmly twisted round the twigs."

The Pulpit, Sutton Courtyn.—The designer of this pulpit was Mr. John Gibbs, Oxford, not "William" Gibbs, as stated in our notice of it.

Prevention of Floods at Leicester.—A report has been made by Messrs. Hawksley & Hawkshaw, in reference to the prevention of floods, and improving the land belonging to the Leicester corporation adjoining the bed of the river. The object of the corporation was to ascertain whether an effectual scheme for the prevention of floods in the borough could be advantageously carried out, so as to reduce the line of extrusion in the valley of the Soar, and thereby render available for building purposes the land lying on each side of the river or canal, and at what cost. The reporters indicated on an accompanying plan, a complete scheme of drainage which, if the cost were not, in the opinion of the corporation, too large, would, in their judgment, effectually attain the objects in view. The scheme was in three divisions, and the cost would be—

- For the 1st division £35,110
- For the 2nd division 36,150
- For the 3rd division 60,110

In any case, according to the report, the first or upper section of the scheme should be the first to be undertaken.

Destruction of a Theatre by Fire.—On the night of the 15th ult. the Gaiety Theatre, Milwaukee, Wisconsin, America, was burnt to the ground. The building was crowded to excess. The proprietor had turned the gas off from the building, and lighted it with brilliant oil, a new article just introduced, and distilled from naphtha. Lamps with this oil were scattered about through the building. As the drill was in progress one of the actors struck a lamp, and it fell to the stage. So rapidly did the fluid burn that the building seemed one mass of flames. Within an hour after the fire broke out it was quenched. Thirty persons were seriously injured and two killed.

A Curious Museum.—M. Nestor-Roqueplan, the author of "Parieine," &c., has hit upon a line of collection for a museum, in which he has certainly had no predecessors, and in which, for a time at least, he needs fear but few rivals. M. Roqueplan collects warming-pans! In his apartment in the Boulevard Haussmann, says the Pall Mall Gazette, he has devoted a gallery to the exhibition of these utensils de la vie intime. There you may see more or less authentic warming-pans of Diane de Poitiers, Mary Queen of Scots, Catherine de Medicis, Gabrielle d'Estrees, Madlle. de la Valliere, Madlle. de Fontange, Madame Pompadour, and Marie Antoinette. Chacun a son goüt.

Newpaper Press Fund.—Mr. George Tomline, M.P. for Great Grimsby, has recently had engraved by Mr. Vernon Murray a magnificent picture of the "Pool of Bethesda." This plate Mr. Tomline, through the engraver, has presented to the society, and it is intended to devote the proceeds of the liberal gift to the foundation of a separate fund, to be called the "Tomline Fund." With the view of giving effect to this resolution, and carrying out those arrangements which Mr. Tomline's generous presentation necessitates, a sub-committee, consisting of Lord Houghton, the president, some vice-presidents, and the working members of the committee, has been nominated.

Incorporated Society of British Artists. At a meeting of the Society of British Artists, held on the 1st inst., Mr. Alfred Clint was elected to the office of president, vacant by the decease of the late Mr. F. Y. Hurlstone.

New Church at Hornsey.—The foundation of another church for the accommodation of residents in the newly-built district of Brownwood Park, South Hornsey, has been laid by Mr. R. N. Fowler, M.P. After consideration of four sets of plans and estimates, the committee finally selected those presented by Mr. Frederick Wallen, of Furnival's-inn, who was appointed architect for the intended church. The building is cruciform in plan, with a central tower and lofty spire. It consists of nave, north and south aisles, transepts, chancel with aisles, eastern and western apses, with a vestry on the north side. The style is Early Pointed, and it will be built of Haesoch and Kentish rag facings, with Bath stone dressings. The contract for the whole work has been taken by Mr. Carter at 8,590*l*.

British Rainfall.—Mr. G. J. Symons, on the part of the Rainfall Committee of the British Association, wishes it stated that recorders of rainfall should communicate with him (62, Camden-square, N.W.) if willing to assist in the general ascertainment of British rainfall, by forwarding copies of their observations, and their names and addresses, so that duplicate gauges may not be started unnecessarily near them.

Iron Stains in Marble.—A correspondent says:—"I shall feel obliged if any of your readers can tell me how to remove iron stains from white marble." The question has been often asked without eliciting a satisfactory reply. Details of the process by which the ink-stains were removed from M. Carpeaux's statue, Paris, might be useful.

TENDERS.

For new bank buildings for the Hull Banking Company, at the corner of Silver-street and Lowgate, Hull. Mr. W. Botherick, architect. Quantities supplied by Mr. G. W. Kanwell:—

W. & J. Hall	.....	£6,314	0	0
Clarkson	.....	5,265	8	0
Stamp	.....	6,204	0	0
Shattoe & Barry	.....	6,168	0	0
Waller	.....	6,137	0	0
Habershaw	.....	5,419	0	0
D. Jackson	.....	5,368	0	0
Keswick	.....	5,750	0	0
Foster	.....	5,748	0	0
Wheatley & Hymer	.....	5,544	0	0
Hutchinson & Son	.....	5,523	0	0
Schofield & Taylor	.....	5,504	0	0
Hockney & Liggins	.....	5,493	0	0
Sargent	.....	5,480	0	0
G. Jackson	.....	5,399	0	0
Simpson & Malone	.....	5,172	1	0
Misgrae (accepted)	.....	4,971	15	2

For basement and new party walls, No. 113 and 114, Cannon-street. Mr. E. A. Gruning, architect:—

Mausfield, Price, & Co.	.....	£1,940	0	0
Conder	.....	1,836	0	0
Trotter & Sons	.....	1,837	0	0
Brass	.....	1,298	0	0
Newman & Mansel	.....	1,266	0	0
Foster	.....	1,230	0	0
Holland & Hannen (accepted)	.....	1,192	0	0

For building thirty-four houses on the Ashburnham Estate, Chelsea. Quantities by Messrs. Gardiner & Bell:—

Brass	.....	£19,777	0	0
Carter & Son	.....	19,619	0	0
Simpson	.....	19,368	0	0
Pasman & Fotheringham	.....	18,792	0	0
Macey & Son	.....	18,393	0	0
Keble	.....	16,560	0	0
Clemens	.....	16,575	0	0
Longmore & Burge	.....	17,017	0	0
Axford	.....	17,918	0	0
Masley & Rogers	.....	17,120	0	0
Ebbs & Sons	.....	16,945	0	0

For alterations to three warehouses in Fell-street and Hart-street, City. Mr. Herbert Ford, architect:—

Myers & Sons	.....	£2,034	0	0
Bleasie	.....	340	0	0
Condor	.....	334	0	0
Morley	.....	283	0	0
Brass	.....	278	0	0

For new entrances and sundry alterations to a warehouse in Friday-street, City. Mr. Herbert Ford, architect:—

Myers & Sons (accepted)	£232	0	0
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For a detached villa residence, with stabling, &c., on the old Manor House Estate, Brixton, for Mr. J. G. Pearce, Mr. C. Sewell, architect:—

Hutchinson (accepted)	£2,600	0	0
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TO CORRESPONDENTS.

The Gibraltar notice.—We are forced again to postpone an article on this subject, although advertised.

A number of letters and papers are unavoidably displaced by each presentation on our space.

G. H. (Manchester).—R. N. J. R. M. J. R. —A. S. —A. R. —K. —G. W. —T. L. —E. K. —J. W. K. —J. D. P. —O. H. —A. K. —Mr. P. —O. J. —B. M. —N. J. —H. —T. & P. —W. J. —A. —T. J. H. —T. G. —T. B. —W. C. —O. M. & H. G. —O. S. —K. —G. —B. —H. —R. —Messrs. W. —R. —J. —T. —M. —G. —W. —T. —E. & Co. —Messrs. F. & F. —W. —R. —C. —O. —E. —A. —G. —T. & R. —G. —H. —J. S. —R. —E. —W. —S. —J. —D. —A. —Bulster. —J. N. (his proposal is not rejected). —Towers (it will be the plan of invasion, and reply that he will be at once—B. (we do not give such information. At all events). —F. —J. & F. (next week). —J. K. (next week). —T. R. (next week).

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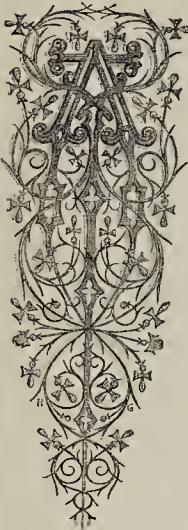
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The Builder.

VOL. XXVII.—No. 1402.

In Chester.



ARCHITECTURAL work in the walled city on the Dee seems to be for the present pretty nearly all concentrated on the restoration and re-erection of St. Werburgh's Cathedral. The rebuilding of a few shops in the Rows of Eastgate and Bridge-street, during the last few years, in a style, for the most part, carefully assimilated to that of the old work, has not as yet been adopted as a precedent by the owners of the property in those picturesque old-world streets, much of

which still looks as though, were the end hoise removed, the rest of the buildings must of necessity come down in succession; while the consequences of a fire breaking out amid this beam and story-post construction would be of a nature not pleasant to contemplate. Having the aspect of these older buildings in view, it seems a questionable proceeding to perpetuate this carpentry construction in modern buildings, wherein, even if special care be given to ensure stability, the danger from fire must remain the same. There are other elements, however, as are, if more slow in their effects than fire, and from which no structure can be guarded; and those who have spent money on half-timbered "fronts," may say, with some show of reason, that the old houses of the same class seem to have resisted the ravages of time and weather better than the stone walls of the cathedral adjoining.

In fact, the decree which went forth a little while since, for rejuvenating at least the external aspect of Chester Cathedral, came not a day too soon, whether the question be considered from a practical or an artistic point of view. Travellers who on approaching the city sighted the outline of the old heavy-looking square tower as a landmark, would have found on a nearer approach scarcely a recognisable detail left in many parts of the building; and at this moment, while the work of restoration is proceeding, the original design of many of the mouldings and decorations is being painfully traced out by the comparison of one old rain-beaten stone with another. The tower in its recent state presented to the eye hollows and pitfalls in the masonry alarming as well as unsightly to contemplate; and the aspect of this, and of much of the work in the aisle and clearstory of the nave, where a string-course is represented by an uncertain wavy projection in the masonry, and the voussours of the windows by shapeless lumps of stone from which nearly all trace of the hood-mould which must have crowned the window has been obliterated, might

lead to the idea that restoration was a hopeless attempt, but that the cuts made into the masonry to prepare for refacing reveal the essentially solid and well-bonded character of the work. The sandstone used, doubtless from some part of the adjoining district, has, in fact, utterly failed as a weather-resisting material, though it is noteworthy that some of the oldest portions have stood better than more recent ones, as if an inferior vein of stone had been struck upon afterwards. The stone used in the restoration is mainly, if not entirely, from the Runcorn quarries, a few miles distant, and though belonging, of course, to the same formation as the original stone, is one of the hardest and best qualities of the red sandstone to be found in the neighbourhood, both as to texture and colour. It is singular that the Medieval builders, careful in the construction of masonry above ground, should (in this case, at least), have shown themselves so careless as to obtaining adequate foundation and footing underground for their walls; at the east end the walls of the Lady Chapel have long been out of the perpendicular, and must remain so now, as it is not found convenient to take them down and rebuild them, though a great deal of underpinning has been resorted to, as a preventive against further settlement. The east window of the Lady Chapel was, in fact, restored some twelve years ago, being then in a most dilapidated, if not dangerous, condition; and, having regard to the heavy expense to be incurred in other parts of the work, it was thought advisable to make the most of this former partial restoration, although standing rather in the way of Mr. Scott's present designs, practical and aesthetic, upon the east end. The inefficient nature of the foundations at this point is further indicated by the fact that even in this comparatively new window the arches of the two outer lancets have visibly dropped away from the keystones. What, by the way, would some of our ultra-Gothic brethren say to the keystone arches, not only in this, but in Mr. Scott's restoration? We confess to liking the sight of the vertical joint at the apex in Gothic work, as visibly indicating the constructional theory of the pointed arch, the balancing against one another of two segments of arches; as a matter of construction the point is indifferent, save that the masons probably will prefer the keystone system as giving them less trouble.

The work now going on at the cathedral is divided into two portions. One section, for which a contract has been taken out amounting to 21,000*l.*, includes the refacing of the tower and of all the work to the west of it, also the rebuilding of the upper portion of the angle turrets in the tower and of the parapet connecting them. The tower has now been faced for about three-quarters of the distance from the nave roof to the parapet: below this the work is at present confined to the south porch, the heavy buttresses of which are being gradually refaced, indeed, nearly rebuilt, and the niches and other ornamental work over and in connexion with the entrance restored. The work about the eastern part of the building, which was not of a nature to be easily estimated for, is to be valued on subsequent measurements. This consists partly in similar refacing, the greater part of which has been completed in the clearstory; in the underpinning before mentioned, which has been a troublesome and expensive portion of the work; and in the rebuilding of the end of the south aisle adjoining the Lady Chapel. This last is the most interesting portion of the work. It has been rebuilt, at a late period, in a very debased style, and this portion it was the intention to restore, preserving what appeared to be the original plan, with a square end and a lean-to roof, but, of course, substituting true Gothic detail for the more recent "improvements." In taking down the masonry, however, with this object,

indubitable proofs have been discovered of a former apical termination to this aisle, evidenced not only by the position and course of some of the old groin ribs still retained, but by the discovery of part of one of the original buttresses, standing obliquely at the angle originally formed by the first face of the apse with the main wall of the aisle, and preserved in almost its pristine freshness by the newer masonry built over it. Over this part of the aisle a weather-line on the south wall of the Lady Chapel furnishes evidence of the former existence of a high-pitched pyramidal roof over this apse, unlike anything usually found in English Gothic, and which has been conjectured to be in some degree connected with the fact of the rule at one period of an abbot from Normandy, who may have brought with him the taste for a style of roofing of which examples are not wanting in his own land. This can be little more than conjecture; nor would we undertake to say, from the rather hasty examination we were able to give to the building, whether we can quite concur in accepting this single trace of a steep-pitched roof as warranting the production of such a disproportionately lofty roof, almost a spirelet, in fact, as is indicated in the model which has been made for the restoration. Still less can we positively concur as to the advisability of replacing this roof, supposing the evidence of its original form to be conclusive. Had the original been left it would have had an undoubted historical interest of its own; but this interest cannot exist in a copy made, moreover, in some degree from conjecture; and in any other point of view than an archaeological one, it must be regarded as an exercise, out of keeping with the state and with the sober lines of the rest of the structure, and therefore on artistic grounds to be deprecated. Yet more strongly should we be opposed to the carrying out of the spire indicated in the perspective view of the cathedral as restored, which is exhibited in the Chapter-house. This is, of course, a timber and slate spire, as no one would dream of trying the old tower with the burden of a stone one. Now we don't very much whether, merely as a matter of outline and composition, Chester Cathedral would not rather suffer than otherwise by the superimposition of a spire; the whole expression of the edifice is that of solidity and repose, and this unity of expression would be interfered with, and the old local associations, too, with the massive square tower which has marked the site of the city for so long would be lost; and such associations are not altogether to be despised. But to place a large slated or shingle spire on such a building as a cathedral, would be at once to deprive it of its monumental expression, to rob it of part of its architectural dignity and grandeur, and give it a patchwork appearance, picturesque in a certain way, perhaps, but far inferior in architectural effect to the expression of a homogeneous stone building. We object on this ground even to the crowning of the pinnacles at the end of nave and transepts with small conical roofs, as apparently contemplated; we would far rather see them finished with stone finials, whether of solid or open work; and, with regard to the central tower, we do earnestly hope that those with whom the decision finally rests will interpose a "thus far shalt thou go and no further" when the parapet is reached, and save it from being bonneted by the threatened termination. A rough sketch for an octagonal stone lantern to form an alternative finish to the tower, attached to the drawing before mentioned, would be in every way preferable to the spire, but we have our doubts whether even that would produce an effect commensurate with the expense of constructing it; and whether in fact the simple tower, restored as nearly to its original condition as may be, would not prove more effective, and

group better with its surroundings, than any finish that may be put to it.

The central tower of the new Town-hall, recently completed, is a new feature in Chester, and peers over—a modern visitor—into the sacred *temenos* of the cathedral cloisters, with a decidedly Norman-French air. Its general aspect is pleasing, though the circular plate-traceried windows in the gable on each face, consisting, of course, of a big round hole in the middle, and little ones round it, look painfully like a set of clock-faces, so that we almost miss the hands which we expect to see on them. It is to be regretted that architects often seem to overlook the very great effect which small details may have in increasing or diminishing the scale of a building. In the Town-hall tower the triple windows on each face have been filled up by two immense wooden louvres of great depth, an exaggeration of the Norman fashion. We have no hesitation in saying that these materially dwarf the scale of the tower, when seen (as it is from many points) out of connexion with the substructure, and that its apparent scale would have been rendered decidedly greater by the employment of a large number of smaller louvres. *At rest*, the building is a pleasing specimen of the modern style of Gothic Town-hall so much in vogue at present,—more pleasing decidedly, than the average of such buildings, as it is quiet and unpretentious in treatment, and with thorough unity of expression throughout; moreover, the contrast of tint in the different stones employed is singularly happy and effective now that the building is new; it may, perhaps, be too delicate to retain its full effect for more than a limited period. As to the question of preserving and reproducing the Medieval style in a city like Chester, much may be said on both sides. Were a general rebuilding of the principal rows to take place, we would decidedly advocate the adoption of a style more in accordance with modern feeling and modern wants; sham antiquity is always contemptible. But as this does not seem likely to take place at present, it may seem only reasonable to endeavour, in isolated buildings, to avoid clashing with the *genius loci*. If such a feeling is reasonable anywhere, it is in Chester, for the preservation of the antique Medieval aspect, to this extent, in a modern town, is so rare now, that it would seem a pity to lose this example of it, even to gain a little in comfort, convenience, and stability. To keep up the delusion fully, however, and cheat us pleasantly into dreams of the Middle Ages, we ought to have the costumes in keeping; whereas at present the chignons, mantles, hats, not to speak of other articles *propria que maribus et mulieribus* respectively, peripatetic in Eastgate-row, are unmistakably what an architect might call "nineteenth-century work." Perhaps some Medievalising young ladies and gentlemen may take the matter up, and devote one day in the month (to be duly advertised) to parading their favourite Row in costumes judiciously selected from illuminated MSS. of the fifteenth or sixteenth century. The principle is the same as that adopted in rebuilding some parts of the said Row, and it would be much the less expensive amusement of the two.

CHRISTMAS DECORATIONS.

ALTHOUGH the decoration of churches at this season of the year has become the rule instead of the exception, there are several points of consequence connected with the custom that are not yet properly considered, and some cogent of warning, indeed, appears to be in some danger of running to extremes before a due amount of sober usefulness is obtained from it. People are beginning to think of Christmas decorations only as manufactured articles that can be had by the yard or square foot cheaper than they can make them. This is, of course, losing sight of much of their poetry and picturesqueness, and of all the opportunity of artistic expression that the occasion affords. "There's rosemary," cried Ophelia, "that's for remembrance, pray, love, remember; and there's pansies, that's for thought." After this manner we should bear in mind the associations of idea and the meaning of the materials used in the decorations to which we are referring, as well as the proper methods of using them. Over and above these desiderata it should be remembered that the temporary decorations at Christmas time afford an excellent opportunity of realising the effect of many proposed permanent additions to the interior

features of a church. Is a reredos contemplated? Make one at Christmas, and the improvement will be recognised and welcomed. Is a screen thought of? Try the effect in a skeleton framework of wood dressed with evergreens, when those interested will be the better able to decide on its merits. Is a church bald and cold-looking? Enrich it with parts most appropriate for its beautification temporarily, as Christmas decorations, and there will be eyes to see the improvement, and most probably purses ready to make the additions permanent. Are the wall spaces bare? Show specimens of a scheme of enrichment, and the issue will be, doubtless, prosperous. We might continue this string of questions for a column; but we hope enough has been said to convey a hint that may be useful to many.

Although most of the handbooks published on this subject dwell upon the importance of preserving the architectural lines of a building in the floral decorations of the season, several of them furnish illustrations in which such propriety is altogether lost sight of. Banners, medallions, texts, and bosses of foliage are dabbed here and there, in some cases with no preservation of lines whatever; and in other instances with only a feeble attempt to hang them in rows. These are the consequences of attempting to design schemes of decoration that will suit any church; and also of providing for the manufacture of many of the items in wholesale quantities in certain centres. We would impress all in charge of churches that there is no merit in decorating them all in the same fashion, any more than there would be in building them exactly alike. Originality, appropriateness, and beauty can be combined with as much diversity as charm. We suggest that the lines of a building are best followed by such methods as placing crests where objects would be artistically enriched by them, and courses of foliage where these are not desirable. Detached dots are as patchy as festoons are theatrical, and suggestive of the *ballot*. Texts, as well as foliage, look well when following some of the leading architectural lines as facio of cornices or string-courses. Screens formed of evergreens, with cornices inscribed with illuminated texts, may be made very satisfactory features in large and lofty churches. In smaller edifices the decorations are more suitably confined to existing spaces and features.

When writers who have given time, if not taste, to the consideration of decorations go astray, we cannot be surprised that without trained guidance of any kind amateur decorators make very serious mistakes. Sometimes there is a committee of ladies formed, every member of which carries out a small idea of her own, which is independent of any general scheme. Some are Maries; others are Marthas; some are for tender lavishness; others for prudent frugality. One will take the font; another the pulpit; a third the reading-desk; a fourth will undertake a scroll to paste up over the doorway; a fifth will volunteer a star of Bethlehem to bang from the apex of the chancel arch; and so on: here a variety is certainly obtained, which may be like a peep-show, but is anything but pictorial. Red flannel, white cardboard, tinsel, coloured papers, everlasting flowers, others that are immediately perishable, more that are artificial, bunting, wire, cord, silk laces, cloth, calico, velvet, suggest the probable performance of a mystery play rather than special services in remembrance of the Nativity of the Founder of our faith. In another place there will be a committee of rustics who, in the fulness of their hearts and strength, will drag trees into the sacred edifice that convert it almost into a thicket. Again, the decorations are placed in the hands of the gardener of the neighbouring square, and straightway the church becomes an irregular green-house. We have heard of wheaten flour being sprinkled upon the evergreen decorations of a country church to give the effect of snow, which was considered by the volunteer artist reasonable, and quite indispensable to carry out the idea of Christmas, even indoors. We have known other volunteers of this thorough-going kind cut out letters in scarlet cloth or flannel, and glue them one after another upon the mouldings of a chaste chancel arch, to spell out what they considered appropriate texts. All this earnestness properly directed would have produced a very different result. Thus left to run unrestrained, damage is often done to the fabric, great pieces are knocked out of plaster work, and good oak-work is riddled with rough nail-holes.

George Herbert is one of the chief autho-

rites on the lips of most church decorators. His quaint conceits and similes furnish many a hint for typical devices, though the subject of decorations is not approached nearer than in his verses, entitled "A Wreath," beginning,—

"A wreathed garland of deserved praise,
Of praise deserved, unto thee I give,"

He speaks of the Oriental fragrant of ambergris, the speaking sweetness of pomander, of cloves, nutmegs, and cinnamon, flowers, and garlands, but not of foliage, as applied to decorations. He gives us a warning, incidentally, however, that should be taken to heart:—

"Love built a stately house; where Fortune came,
And, spicing facies, she was heard to say
That her fine oolives did support the frame,
Whereas they were supported by the same:
But Wisdom quickly swept them all away.

Then Pleasure came, who, liking not the fashion,
Began to make balconies, terraces,
Till she had weakened all by alteration."

Here is an intimation of the value of the point we urge. In all decorations there should be one considered scheme that takes in all the parts of the fabric, and is especially adapted to each of them. This settled, and shown upon paper, for reference, a division of the work can be next made, and much more easily carried out than without such guidance.

We perceive imitation evergreens and imitation holy-herbs are now regularly manufactured to meet the demand for foliage at Christmas. Dried moss, too, has become an article of commerce for the same purpose. Everlastings, once sacred to the memory of Père la Chaise, are now pressed into the decorative service, and are not only dyed various colours, but spotted, to increase their motley appearance. Roses are made of white paper for half-a-crown a dozen, and more cunningly devised in pink paper for three shillings per dozen; and camellias deftly made of white paper, range, to adopt the phraseology of the market, from three shillings per dozen. These scentless theatrical adjuncts have elbowed and flanted out three sweet old floral favourites,—rosemary, lavender, and rue. Once upon a time rosemary was as much a part of strictly Christmas belongings as roast beef and "plum-porridge," but now, probably, almost the only instance wherein it makes its appearance in public is on the dish on which the celebrated bear's head is served at Queen's College, Oxford,—if, indeed, it has not been displaced there, too, of late years. The poet Gay speaks of rosemary and bays being "baw'd in frequent cries through all the town" before he mentions holly, "lawrel," and mistletoe as signs of the season. The Christmas song, in Poor Robin's Almanack for 1695, mentions bays and rosemary, as well as holly and ivy, for decking of houses. The carol appointed to be sung when the bear's head was brought into the hall, as given in the book of "Christmas Carols, printed by Wynkyn de Worde, 1521," speaks of "garlands gay and rosemary" as the proper equipments of the dish. Ophelia, looking over her collection of the shrub, as before quoted, continues,— "There's rue for you, and here's some for me. We may call it herb of grace of Sandys: you may wear your rue with a difference." The association of rosemary and rue with the tall delicate spiked blue lavender occurs over and over again in old English ditties and sayings. A graceful chapter, giving a gathering of quotations showing the association, may be found in Mr. Longstaff's *Hylton Chaplets*.

"Rosemary green,
And lavender blue,
Thyme and sweet marjoram,
Hyssop and rue,"

form a combination that is mentioned by Gerard with especial favour. In a word, rosemary, lavender, and rue, were fragrant favourites in the days of yore. The first-mentioned was so much so, that it stood for a sign for inns; as the celebrated hostelry in Finsbury Fields, called the Rosemary Branch, shown on old maps, as well as others, under the same sign in Islington and elsewhere still existing, bears witness. There was some subtle fancy connected with it, too, for a great body of Roundheads besieging Pontefract wore rosemary in their hats. Washington Irving failed not to see that it was something specially English, and noted it in his Sketch-book.

"And lavender is passing sweet,
And so's the rosemary."

Using a singer long ago; but both have been elbowed out of place by paper roses and cambric holly. Surely it would be better to reinstate some of our old favourites than to have recourse to sham substitutes.

THE LIGHTHOUSES OF THE BRITISH ISLES.*

The Gunfleet Lighthouse is erected upon the same principle, with this difference, that it is entirely built of wrought iron, upon seven piles, 15 in. diameter, sorowed down 40 ft. into the sand, as being on the edge of a bank; its position is unusually precarious, in the event of a shift taking place in the sand.

The piles are in three thicknesses of wrought iron, and the whole of the bracing is tubular, of the same material. The angles where the brass cross are made of forged sockets of wrought iron, in one piece, hollow, to receive the ends of the braces; they resemble a huge four-way cock, and are certainly curiosities in their way.

The light is 41 ft. from the water. The internal arrangements are similar to the Maplin, but the cost was about 11,000*l*.

As a parallel example of insecure foundation, satisfactorily dealt with, we may here notice the lighthouse at the mouth of the river Usk, in Monmouthshire, though the means adopted were diametrically opposite.

It is built upon a foundation of soft, pulpy clay, the stratum being 37 ft. deep.]

The old tower became insecure, leaned dangerously towards the water, and had to be taken down, and the method adopted for the new one was as follows:—

From a circular pit of 60 ft. diameter, as much of the clay was removed as the nature of the material would permit, and a depth of 9 ft. was reached; at this level an elm curb was placed, and the whole filled up with solid concrete, forming as it were a circular landing, 60 ft. across, and 9 ft. thick.

Upon this has been erected a circular brick tower, 40 ft. in diameter, and two stories high, containing commodiously the living-rooms, stores, &c., necessary for the keepers, and the whole is surmounted by the lantern. The light is 45 ft. above high-water mark.

When the work was in progress, and for some short time after its completion, it gradually sank in the clay to a depth of 7 in., without any disturbance of the general level; it has remained at that point without further subsidence, and is now perfectly secure.

As a contrast between an ancient and a modern lighthouse, we cannot give a better illustration than the "Smalls." We will describe first the old house and then the new one. The old house was commenced in 1772, by Mr. Whiteside, and finished in 1775. The highest part of the rock is 12 ft. above the sea at high water, and the lighthouse was 70 ft. high.

It was carried upon nine oak piles, about 2 ft. 6 in. diameter, sunk 7 ft. in the solid rock, with six raking braces of somewhat similar dimensions, and when subjected to a storm the whole structure rocked so that a pall of water standing on the floor would be more than half split by the simple rocking.

This has repeatedly produced the effect of sickness upon those unaccustomed to the motion, as proved the case when the workmen sent down to erect the new lighthouse were lodged in the old light room.

The house was only about 18 ft. inside diameter, and 10 ft. high, and was entirely constructed of wood secured together with wrought iron. It needed constant repairs: every summer new stays and other matters had to be provided from the time of its erection; a new house was more than once prepared upon the mainland, taken out in the summer, and fixed.

In this place occurred that terrible incident, of one of the keepers being taken suddenly ill and dying, when the season was so awfully stormy that no boat could approach. The survivor did not dare commit the body to the deep for fear of suspicion of foul play; however, having previously been a cooper by trade, he managed to construct a coffin and secure it to the external gallery, and here for four mortal months he was alone with the dead. The signal of distress was seen flying, vessels approached, but no boat could land; he was at length rescued, but so altered that he could hardly be recognised. We may think it wonderful that reason did not give way under the fearful ordeal; but ever since that time three men are invariably stationed in similar situations.

Fifty years ago the dues claimed for this light were 2*l*. per ton, now they are one-fourth of a farthing; yet the amount received is not

materially altered, so vast has been the increase of our tonnage in this direction in the interval.

As a contrast to the above, we will now describe the new lighthouse.

It is 125 ft. high, of granite, the lower 29 ft. solid; above this, there are in succession the water-store, the oil-room, the general store-room, living-room, bedroom, and watch-room, each a separate story, and above the lantern; the accommodation thus provided replacing the little cabin on a tree top, which occupied the post and did the duty for nearly 100 years; and for which, with its dues, the Trinity Board had to pay the enormous compensation before quoted* (170,48*l*. 7*s*.). With regard to the practical construction, we may say the courses of which it is built are at the base 2 ft. high, each stone weighing from two to three tons, and that the courses gradually diminish till at the top they are 1 ft. 3 in.

The joints are plain square joints, radiating from the centre, and each stone is secured to its neighbour vertically and horizontally by strong dovetailed lead dowels.

The stories are divided by landings, each in twelve stones, eleven radiating from the circumference to the centre, and a rebated stone dropped into the centre making up the number, leaving a well-hole for the spiral staircase, which ascends throughout the house; thus replacing the old rope ladder of the old house, which was drawn up and secured when not in use, and formed the only means of access.

Where the light has to be placed upon the top of a cliff, the erection becomes a far more simple affair. We may instance the new house recently erected at St. Bees, near Whitehaven. The elevation of the light is 336 ft. above high water.

The residence for the keepers, which may almost be called a small villa, has a tower 30 ft. high, attached by a covered corridor. At the top is the lantern.

The total cost, including apparatus, was under 5,000*l*. It was built with the red sandstone of the district. It is only within the memory of the present generation that the old coal beacon was discontinued, and replaced by modern appliances.

The development, if we may use the term, of the lighthouse system and its extension in the future will probably take the following direction. The erection of rock lighthouses upon reefs farther removed from the mainland, where the construction of the foundations is the greatest difficulty, and demand the utmost efforts of the science of the day.

The Wolf Rock Lighthouse, just completed, is the last, probably the best, as it was the most difficult of recent undertakings. A carefully detailed account of its design and construction will be brought before the Institution of Civil Engineers in the course of the ensuing season.

The next important feature is the substitution of pile lighthouses for floating lights. Here the difficulties of sand foundation have generally to be dealt with. This, however, is rather a measure of economy than extension, and has for its motive the annual economy of a fixed light, as compared with a floating one, as before mentioned.

Those who would like to study in full detail, course by course, and almost stone by stone, the erection of a great rock lighthouse, we may refer to Mr. Smeaton's well-known work on the Eddystone, and to the similar one by Mr. Stevenson on the Skerryvore.

The Lights.

After our rapid sketch of the constituted authorities, and the funds at their command, and notes upon various matters of interest in the erection of the lighthouses, we now come to the question of lights. What were the lights of olden times? Beacons, simply: large fires—primarily wood, latterly coal.

The last coal-beacon used was at St. Bees, and was extinguished so lately as 1822. They were efficient in their way. The old coal-beacon at Spurn Point, the mouth of the Humber, could be seen for thirty miles.

When the Eddystone was first lighted, it was with a chandler of twenty-four wax candles, five of which weighed 2 lb. At that time the great Cordovan lighthouse was lighted with hillets of wood, and oil-lamps with reflectors were just coming into use.

The lights under the control of the Trinity Board vary from a simple gas or oil lamp, pro-

bably kept up by a local board, and costing a mere trifle, to the larger Argand burners used singly or in groups, sometimes as many as thirty each, with its separate reflector, till we come to the first-class dioptric lights of the largest class, with their elaborate and expensive arrangement of lenses, costing about 2,000*l*., the expense of erection, maintenance, and attendance proportionally increasing.

The great object in lighting arrangements is, of course, to obtain the maximum of light with a minimum of cost, and to ensure the direction of the light to the proper point. Some attempts in this direction were made with the old beacons, but we have no record of anything satisfactory or successful. But with the Argand and similar lights, and our recent scientific researches, immense improvements have been made in the direction, and by the judicious application of the proper means, the scope and direction of the lights can be managed to a nicety; and not only is the efficiency of the light increased, but, by the careful direction of all, as they may be called, stray rays in a proper direction, a distinct economy is the result.

The invention of the Argand lamp, in 1780, was the first great step to the improvements above alluded to.

As is well known, in principle it consists of a cylindrical wick open in the centre, and covered externally by a glass chimney. To the present day its modifications are the principal instrument in our lighthouse system. The later discoveries are the Drummond light produced by jets of oxygen and hydrogen upon a hall or cylinder of lime, and the magneto-electric light produced by the direction of a powerful magnetic current through two opposing points or pencils of charcoal; they have both been employed in first-class lighthouses to a limited extent. Gas-lighting has also been tried; but at the present moment nine-tenths at least of the light of our lighthouses comes from the Argand burner with colza oil. It is employed in various ways with many scientific applications, which grow day by day in perfection and complexity. The systems of lighting all houses of the first-class may be divided into two—the catoptric and the dioptric; the principle of the first being reflection, that of the second refraction.

On the catoptric plan a number of lights are usually employed, ordinary Argands, of about 1 inch diameter, each with its separate silvered parabolic reflector. The power of the light becomes a question of simple multiplication; a second-class catoptric has eighteen burners, a first-class one thirty.

On the dioptric principle one central light is used—either an Argand of great size with four concentric wicks, a Drummond, or a magnetic light; and the direction and concentration of the rays are controlled by a scientific arrangement of prisms of glass disposed all round the light generally in a circular form. The angles and proportions form an element of the nicest mathematical calculation, and we may fairly say that upon the head there is yet much to learn, and that it is in this direction that future improvements will develop themselves. Messrs. Chance, of Birmingham, have been distinguished for the great attention they have paid to the manufacture, and the success that has attended their efforts. The cost of these various lights varies in proportion—the new light recently erected at the Smalls costing 1,600*l*. (dioptric), the catoptric apparatus being much cheaper; the larger outlay, however, repays itself in course of time by the economy of working, an extensive average calculation, showing that the annual outlay of a first-class catoptric is about 310*l*., while a first-class dioptric costs only about 265*l*.; the principal item of difference being the oil, of which the large central lamp consumes less than the thirty small Argand burners. And here we may notice the great advance that has been made in the construction of the lanterns that enclose the lights as well as of the lights themselves.*

When the dioptric light was first introduced at the Eddystone, the upright divisions of the glass were about 5 in. wide; the following was the result:—From a Government vessel in Plymouth harbour a letter was written to the authorities in London, stating that at a day and hour named, the Eddystone light was out. An immediate inquiry was ordered, and it was ascertained beyond a doubt that such had not been the case. It was suggested

* See p. 958, ante.

P. 958, ante.

* Illustrations will be found in earlier volumes of the Builder.

that the vessel might have anchored in the line of shadow caused by one of the bars. A yacht was sent round to make accurate observations as to whether this effect really was produced, and a cruise round the light at some distance convinced everybody that this was what had really taken place.

To obviate the difficulty, a lantern was designed by Mr. Stevenson, the engineer to the Northern Commissioners, composed entirely of triangles, without any upright bars, each pane, as it were, forming a three-cornered facet of flat glass, and this was a great improvement; the drawback was that a large proportion of light was lost by reflection; it was almost impossible to fix the glass in the facets perfectly true, and consequently the light was reflected in quarters where it became useless, the loss being estimated at about 10 per cent.

Mr. Douglass, the engineer to the Trinity Board, then invented the present lantern, which is a perfect cylinder, divided into lozenge-shaped panes, by a bar following a true helical coil, so that at every point of contact the side of the bar is at a true tangent with the circumference of the cylinder, and the maximum of strength is gained with the minimum of obscuration.

The bars are of rolled steel, $4\frac{1}{2}$ in. by 5-16ths of an inch, with a head of gun-metal, L shaped, and $\frac{3}{4}$ in. thick to secure the glass; the outer edge is finished with the ordinary astragal and hollow, and the inner edge, the gun-metal, is rounded; the bars are all rolled in halves, and each lozenge-shaped pane is complete in itself; they are built up, as it were, and fastened together with rivets, the right and left hand lozenges meeting at any given point, thus forming a complete stay and connexion with the panes above and below. The glass is bent exactly circular to the lines of the lantern, consequently both lozenge frames and glass are everywhere interchangeable. In case of any strain occurring to the lantern and breaking the glass, a fresh pane can easily be substituted by the keeper without a skilled workman. To show the perfection of the construction, however, we may say that though fourteen lanterns have already been constructed upon this principle, there has not yet been one broken pane of glass. We may add that this construction of lantern was most carefully investigated by the late Professor Faraday before its final adoption, and that it reduces the loss of 10 per cent. of lights upon the old system to 3 per cent.; while the bent glass has been proved by experiment to be 68 per cent. stronger than the flat. There are six different recognised sizes of dioptric lights, and as many or more of catoptric; and, besides the distinction of size, different lights are exhibited, in different ways, and in different colours, to enable mariners to distinguish one light from another.

They may be distinguished as fixed, revolving, flashing, intermittent; the times of different lights varying in their intermittence from five seconds, with many variations up to four minutes. Many lights, harbour lights principally, are coloured, blue, red, or green. It will be seen what infinite varieties of combination may be introduced by these various means; the intelligence so conveyed may fairly be called the language of the lighthouses.

To give our readers a general idea of the lighting of our coast as a system, we will ask them to accompany us in an imaginary cruise from the Nore to Dover, noting simply the lights as we go.

We start from the "Nore Light-vessel," which shows one bright white light revolving at intervals of half a minute. We next pass the Girdler Light-vessel, showing a similar light; then the Princes Channel Light-vessel, showing a red light revolving every twenty seconds; and the Tongue Light-vessel, which shows two fixed lights, the upper one white, the lower one red.

This brings us to Heme Bay, showing one white fixed light on the pier head; then Margate, with a red light on the pier head; next the Mouse Light-vessel, with a green revolving light. Then the "Maplin" pile lighthouse (before described) with one red fixed light.

The Swin Middle Light-vessel, one bright light, with a revolution of one minute; the Gunfleet pile lighthouse (described at the commencement of this paper), with a red light revolving at an interval of two minutes; the Sunk Light-vessel, one bright fixed light; and the Kentish Knock ditto, with one bright revolving light, of one minute revolution; and the Galloper, two fixed lights;—these bring

us to the North Foreland Lighthouse, with tower 73 ft. high, light 184 ft. above high-water mark, fitted with a dioptric apparatus of the first class, showing one bright fixed white light; then the Ramsgate Tide-light, one red and two green lights; the Godwin Light-vessel, three bright white fixed lights; the Gulf Stream ditto, one bright light, with revolution of twenty seconds; to the South Sand Head Light-vessel, at the other extremity of the Godwin Sands, showing one bright fixed light. Next, the South Foreland, with two bright fixed lights, 1,300 ft. apart, until we arrive at Dover, with one green light, two red lights, and one blue light on the Admiralty Pier. It would be tedious to follow this detail further. The sketch we have given may, however, be sufficient to convey an idea of the variety of method and adaptation of light.

In England there is upon an average a lighthouse to every fourteen miles of coast; in Scotland, to every thirty-nine miles; and in Ireland, to every thirty-four miles. In this calculation, however, the light-vessels are not included; and, of course, in the more frequented channels, as in the case just quoted, the lights are much nearer together than elsewhere. On some portions of the Scottish and Irish coasts more lights are certainly required; but as far as England is concerned, the general opinion seems to be that the system of lighting is sufficient and satisfactory. Of the lights under the control of the Board, about 50 per cent. are dioptric, and the remainder catoptric, and of the local lights, about 25 per cent. In Scotland, about two-thirds are on the dioptric principle; and in Ireland, one-third. The consumption of oil has occupied in past days much attention as a question of economy; but the principle has lately most judiciously been adopted of sacrificing this point to the thorough efficiency of the light. Something resembling the French moderator principle is adopted. The oil is supplied to the lamp by mechanical pressure, and it is found in practice that the best light is obtained where the overflow is about three times the consumption.

The old Smalls Lighthouse (described above) only burnt about 200 gallons of oil per annum. About nine years ago the average consumption at the Start Point and North Foreland was about 500 gallons; but at the present time the usual consumption of a first-class dioptric is 700 gallons. The cost of a first-class dioptric apparatus complete, with lights, apparatus, and lantern, is about 3,000l. It is about 9 ft. high and 6 ft. diameter. The second size is about 4 ft. 6 in. diameter; the height in proportion; the cost about 2,200l. The third size about 3 ft. 3 in. diameter, costing 1,500l.; the fourth, 20 in. diameter, costing 400l.; the fifth, 15 in. diameter, costing 350l.; the sixth, 12 in. diameter, costing 220l.

Combinations of the catoptric and dioptric systems are respectively called the catadioptric and holophotal. Mr. T. Stevenson also invented a light, called the Azimuthal Condensing, the object of which was to direct the whole of the rays down one narrow channel, confining, as it were, the horizon in every direction. The distance to which lights are visible is bounded by the horizon. Sufficient elevation being given, it has been ascertained that in clear weather a first-class light may be visible at 100 miles. Practically, 250 ft. from the water are considered the maximum; this gives a horizon of eighteen miles, or twenty miles from the mast-head. When a light is too high it is liable to be obscured by fogs, with the most dangerous results; as a case in point, the light at the Needles may be quoted, which was actually removed from a tower on the top of the cliff to a much lower level, so as to be more readily observed by passing vessels.

The last novelty in pharology is the division of the lantern into sectors of different coloured light. Thus throwing a light of a different colour towards different quarters of the horizon. We will give one or two examples. The approach to the port of Sunderland presents two dangers; the Mill Rock on the one side, and the Hendon Rock on the other, situated at some distance along the coast; it is a dangerous coast in the immediate vicinity of Whitburn, a name connected deservedly and undeservedly with false lights. There are two lights now designed and in course of erection: the upper one, a first-class light, with a one-minute flash; the lower light so arranged that the sector which exactly attends the Mill Rock throws a white beam over that portion of the horizon; while in the sector which subtends the Hendon Rock a red colour is shown. With these guides ships approaching

from either direction, by skirting, as it were, the division of the lights, are safely guided to the point where the harbour lights, closer in shore, show the exact entrance. A similar arrangement is made at Caldy, though modified by circumstances; there is a white light out to sea, a red ray or sector eastward, and another red ray or sector westward. By skirting the division of lights west, the shoals off the old Castle Barge are cleared, and the east ray clears the Woolhouse Rock. The anchorage is gained by passing through the red ray at this point, until the fainter white light at the back appears, which defines the safe anchoring-ground.

Another instance, at another port, shows two wide sectors of red light, with a narrow white sector between them, which safely conducts the vessel that follows it to the very mouth of the harbour.

In concluding our paper upon the lighthouses of the British Isles, we may remark that the most perfect system of lighting cannot insure the safety of our ships: it can only warn in case of danger. Sometimes the fury of the storm defies all precautions; and hence all else the safety of a vessel depends upon the knowledge, the judgment, and the vigilance of its captain.

INTERNATIONAL CONGRESS ON EDUCATION IN INDUSTRIAL ART.

THE general silence of the press of this country as to the proceedings of an important Congress, held in Paris during the month of October, 1869, is such as to prove that the busy gleaners who cater for the demands for public information, may sometimes overlook fields of no ordinary richness. Few of the popular questions of the hour, asked as they are into fictitious life by the scourge of the journalist, as a top is kept in movement by whipping, have the real national and international importance of the proceedings of this unnoticed assembly.

The Central Union of Fine Arts applied to Industry (*l'Union Centrale des Beaux-Arts appliqués à l'Industrie*), opened at Paris, in the Palace of the Champs Elysées, an international Congress, which held session from the 29th of September to the 5th of October last. The president was M. Louvrier de Lajolais,—it looks almost as if his name should be spelt with the apostrophe,—the vice-president, M. Paul Bénard, architect. The honorary presidents were M. Guichard, the president of the Central Union, and Mr. Cole, director of the museum at Kensington; the honorary vice-presidents, M. de Schwartz, councillor of his Imperial and Royal Apostolic Majesty, and Austrian Consul-General at Paris; M. Cannel, director of the Royal Academy of Ghent; General Novitzky, aide-camp of his Majesty the Emperor of Russia, and attached to the Russian Embassy in London; M. Baumer, professor of architecture to the Polytechnic School of Stüttgard; and M. Sajon, vice-president of the Central Union. Among the secretaries we find a manufacturer and a designer of lace, a professor of drawing, and a professor of sculpture. Thus art, both fine and industrial, is adequately represented by the composition of the "Bureau."

M. Émile Galichon, whose eminent services to art literature are well known to all who are familiar with the subject, has expressed opinions with reference to this industrial congress, with which we are disposed very fully to sympathise. Having exposed nothing, or next to nothing, to result from the discussion, he took the occasion which offered itself on his being asked to return thanks to the president, to declare, with the most perfect candour, that he had been entirely mistaken. In the six sessions to the proceedings of which he had been a silent and attentive listener he learned, he declared, more than he had done in ten years of his life. Little by little the horizon extended itself before his view. New ideas arose, and mutually illustrated one another. The gaps and breaks of his thoughts became filled up, and points that had long been obscure became clear and intelligible. A great and important step in the knowledge of the arts of design has been attained by the labours of the congress.

In the Palace of the Champs Elysées have been united to an Oriental museum, and to an exhibition of modern works, specimens of the work of pupils belonging to more than three hundred schools. The presence in Paris, at the same time, of so many professors and teachers, both French and of other nationalities, has thus been wisely turned to advantage, in order to

draw up an exact report of the present state of art education in France, and to suggest the best means of developing and improving the same. In the assumption, by private co-operation, of that initiative which has hitherto been considered to appertain exclusively to the Government, not only in France but generally on the Continent, lies the first step of a veritable revolution, commenced without tumult or violence, from which it is not difficult to augur the happiest results.

Acquaintance with the arts of design can no longer, in this nineteenth century, be considered a non-essential part of education. The progress and the permanence of those important branches of industry which so largely contribute to the national welfare depend mainly on the possession of an enlightened and educated taste. Without culture in this respect it is in vain to hope for any but a limited, and strictly home, demand for the various art manufactures, whether textile, ceramic, metallic, or of mixed and compound origin. A lump of clay, in the hands of an uneducated rustic, remains a mere clod of earth, or, at the best, is fired as an unsightly brick, or an archaic garden-pot; placed in the hands of an educated workman, in the same space of time it may be fashioned into a work of art, of value and of beauty.

The questions, then, which were debated, and to a great extent decided, by this self-convened International Congress, have a high economic and social value. Those narrow and limited views as to the wealth of nations, which were received with so much respect, by men in the van of intelligent life, because they were new to men unacquainted with the works of Aristotle, and because they were true, in themselves, although false, if regarded as constituting the whole doctrine of political knowledge, are being reduced, year by year, more distinctly to their proper proportions. Year by year we are learning that a market is not a school; that to buy cheap and to sell dear is not the chief end of man.

Nay, what is of even more importance, the idea has become intelligible, and soon must become dominant, that an exclusive devotion of the energies of a people to those lower and less noble objects has a certain and fatal tendency to defeat itself. The man who is content to turn out the cheapest and the least artistic productions, hoping to command custom by the mere brute force of low prices, finds his customers falling away from his wares. People are beginning to find out that excellence is economical; that low price does not mean actual cheapness; that the productions of a good chemist, a good mechanic, or a good artist, are actually worth much more money than cheap drugs, clumsy machinery, or ugly and ill-constructed articles of domestic use. And, as it is not possible to select and extract the money-getting faculties or functions of the mind, and to cultivate them exclusively, but, on the other hand, it is always uncertain when and how the special advantages resulting from general culture may become available, so it is that, in spite of the venomous hostility entertained by a certain class of politicians to all artists, all men of taste, all men of refined culture, all men of classical education, the guidance of the future instruction of the people is gravitating irresistibly to the hands of this intellectual aristocracy.

In a word, Art, using the term in the widest sense, from being the delight of the few, is about to become the benefactor of the many. The neglect and despite of art is no other than the retrogression of a people towards barbarism. There are, it is true, many minds whom that argument must altogether fail to reach. It is well, therefore, that it can be put in different terms. Neglect of art-culture is a certain cause of national poverty. It is in this view of the case that the advance of any one of the European family of nations in education, whether scientific, technical, artistic, or literary, acts as a spur and a goal to the progress of every other nation. The electric chain has become complete, the contact being effected in the sensitive region of the pocket; and any advance made by Prussia, France, Italy, Belgium, must, *periculis nostris*, be responded to by a great effort in England.

Four distinct questions have been submitted to the International Congress. Each of these has been clearly stated and intelligently discussed; and with regard to each the congress has expressed both a judgment as to actual fact, and a desire as to the course to be adopted in the future. We proceed to refer to these questions in the order in which they were discussed.

The first question thus raised was that of the character and conditions of modern productions in industrial art. On this subject the congress forms the opinion that the dominant character of contemporary production is that it is essentially "mobile," by which term the reporters seek to express the capricious variations of fashion. Further, it is pointed out that the desire to produce objects in great numbers, in great variety, and at a low price,—a desire which is ministered to by the employment of machinery and by the infinitesimal division of labour,—is, in general, diametrically opposed to the existence of any true art sentiment in the objects fabricated.

Under this head the congress further calls attention to the preference given to routine as compared to the encouragement of personal initiative; the preference given to a mechanical perfection of surface detail, to the neglect of the general subordination of harmonious finish; and the frequently misunderstood application of scientific discovery. Thus far the work of the congress seems directed rather to the indiction of some of the rampant evils of the day than to any attempts to remedy them.

The second question relates to the nature of public taste, and of its influence on production, and to the means of developing and of improving the same.

Public taste, the congress holds, is the exact reflexion of the intellectual and moral condition of society. So striking a proposition demands attentive meditation.

The principal causes to which the imperfection or the capricious character of taste may be referred are, first, the tendency to prefer the perfection of mechanical finish and detail to the true sentiment of art. Secondly, the general inclination towards apparent, rather than towards essential, excellence. The union of these two causes exercises a deplorable influence on production.

The remedy for this state of things lies in the creation of a general and complete system of education in all matters relating to art, by means of which sound views may be communicated to all classes of society. It is difficult to impugn the abstract truth either of the described evil, or of the proposed remedy.

The third question raised by the congress is that of the actual organisation of the theory of the arts of design, of the development to be given to that study, and of its direction, considered with regard to teachers, to methods, and to examples.

The congress declares that the actual organisation of tuition in art is not adequate to the requirements of the day, because, in the first place, the examples handed down to our times are imperfectly known and generally ill understood, from want of well-regulated education; and, secondly, the study of nature is generally insufficient and ill-directed.

The congress declares that it is necessary, first, to insist on primary instruction in the preparatory study of drawing; secondly, to develop the taste from early infancy by the daily view of what is beautiful in all its forms; thirdly, to give a great and entirely new importance to museums of instruction, in villages no less than in towns.

The congress expresses the desire that instruction in drawing should form an integral part of the obligatory course of primary instruction.

It declares in the most distinct manner, that, in its opinion, instruction in the art of design admits of no radical division, admitting in the matter of tuition but one law, and one principle, viz., the *Unity of Art*.

The congress denounces that mode of primary instruction which is limited to the servile and textual imitations of the graphic model.

It expresses the desire that, from the very commencement, the pupil of the primary school should have placed before him the geometric models which constitute the *Alphabet of Forms*, as well as examples of the most simple ordinary objects.

It recommends, as indispensable, oral explanations on the part of the teacher.

The congress disapproves the present direction of secondary education, in so far as it leads to the abuse of the graphic model.

It declares that a proportioned mode of rendering (by reduction or enlargement in size), drawing from memory, and the free choice of methods of execution, should be substituted for literal and servile copying.

With reference to *professional instruction*, the congress expresses the desire that, in all the schools, attention should be given rather to general instruction than to any particular in-

dustrial application, such as the demands of manufacturers require.

In such premature labour it can see only danger both to art itself, and to the future excellence of the pupils.

For the instruction of teachers for the primary schools, the congress demands the extension of instruction in design in normal schools, by the assistance of special professors.

It consequently requires the foundation of a superior normal school, for the education of these professors.

As to *method*, the congress neither recommends nor proscribes any special method; although it warns against those which, by the employment of rapid and mechanical processes, tend to diminish direct, personal, and sincere observation on the part of the pupil.

With regard to models, the congress blames the use of all such as involve the serious fault of leading to the substitution of the study of the picturesque effect, which is only accidental, for that of form, which gives permanence of character.

The fourth question relates to the comparison of the efforts hitherto made, in different countries, to advance industrial art, to develop public taste, and to improve the method of instruction in the arts of design.

The congress remarks with satisfaction that, for some years, a movement has been manifest in public opinion, tending, in all civilised society, towards the extension and the progress of industrial art, the improvement and the generalisation of instruction in the arts of design, and that development of good taste which exerts a distinct moral effect; and that, under the influence of this excellent spirit, efforts have been made and are daily making, due to the initiative of Governments, of associations, and of private individuals, which have already led to the creation of important institutions, museums, schools, societies, and the like.

The congress expresses the desire that effect should be given to the proposal made at the close of the Exhibition of 1867, and approved by the honorary presidents of all the International Commissions, to the effect that each country should execute reproductions of the objects of art which it may possess, and should spread the knowledge of such treasures as far as possible through other countries.

The concluding recommendation is to the effect that serious attention should be paid to the improvement of the condition of the professors and teachers of the arts of design, because it is on this condition that the quality of the instruction which they impart must essentially depend.

It is undeniable that the philosophic grasp and sound practical good sense of nearly the whole of the conclusions and recommendations of the congress are such as to justify the strong terms in which M. Gallichon has allowed himself to speak of the result of their labours. To ourselves, almost the most interesting reflections that are suggested by the report will be those which concern the application of the conclusions of the congress to the actual system which, under the impulse of the Department of Science and Art, has been within the last fifteen years introduced in our own schools.

As far as regards the first two questions, the ill-regulated character of contemporary production, and the untalented caprice of public taste, no less than the fourth, the development of public taste, the general remarks we have already cited are most pointedly applicable to our own country. Nor are we altogether unaware of the primary necessity of a well-designed education of public taste.

For the third point, the education of the taste from early infancy, by the view of what is pure, noble, and beautiful, it is one on which we have been long accustomed to dwell with a persistence which has not always met with warm and intelligent sympathy. We rejoice to see the necessity of this course indicated as a canon of education. Nor must it be forgotten that the law is universal. It is negative no less than positive. It applies to literature, music, dramatic representation, all forms of moral and religious teaching, no less than to art-education. It involves the proscription of the coarse, the base, the meretricious, the tawdry; in one word, the false—in every department of human thought. Frustrating games, of chance or of violence; demoralising exhibitions of all kinds; literature, illustrated or otherwise, which, under the stolen appellation of comic, never rises above buffoonery; high-strung moral or religious discourses,

the tenets of which are contradicted by the tone, the appearance, or the daily life of the teacher,—all these stumbling-blocks in the path of true intellectual and moral culture, are condemned by this noble utterance of the International Congress.

With regard to the abuse of the graphic model, we think we have reason for great satisfaction in the superiority of the method adopted in our schools of art over that which the congress appears to consider to be almost or altogether universal. The selection of the best and purest examples of what is happily termed the alphabet of form, the definite study of the principles, in preference to the mere details, of design; the successive or alternate presentation of designs on the flat, of well-executed relief, of models in the round, of natural forms of vegetation, and of the living model, to the student, are distinct elements of our normal art-education. We call attention to the report of Mr. R. Redgrave, R.A., in the year 1857, on the state of design as applied to manufactures, treating of the great questions of style, of constructive truth, of the subordination of decoration to utility, of the special character of ornamentation suited to different materials, of unity of style and decoration, of subordination, and of the exigencies of size and of scale.

As to the danger, indeed, pointed out by the congress, which menaces both the progress of art and the future of the student, arising from the displacement of general and thorough art education by the study of those special branches which may command a direct pecuniary return, we hold, as we have previously stated, that it is the evil which most imminently threatens the development of our own art schools. One defect, as it appears to us, of our own system, is the strong tendency which it has to blind the pupils to the fact that, after all, decoration is but the 'prentice-work, or the amusement, of the artist. The rude diction of the Scottish poet shadows forth a truth far more noble than often lies concealed under the fugitive disguise of lyric song. The "prentice-hand" of Nature was tried in the production of strength and of ability,—the more perfect exercise of her skill was devoted to the creation of beauty.

As to that which relates to the status of the teacher, it is unnecessary for us to express our hearty concurrence. We recognise in the decisions voted by the congress one of the most promising signs that have yet appeared as to the education of the future. We desire to supplement one omission, that of recognising that it is to the wise and patriotic effort of the late Prince Consort of England that the plan, recommended by the congress, of the reproduction and interchange of national art treasures owes its origin. But had the congress only emitted two of its many valuable votes it would have rendered a noble service to humanity. To those two utterances we are desirous to give the widest circulation, and the most faithful echo. We refer to the importance of elevating the mind, from early infancy, by the daily view of what is beautiful, and to the enforcement of "one law and one principle, the unity of art."

THE ROYAL ARCHITECTURAL MUSEUM.

SOME evidences of life are apparent in the Museum, in the shape of a further appeal for money. Subscribers are invited to double their subscription; and one original member writes to us to say that he certainly will do nothing of the kind till he sees some endeavours to obtain more satisfactory results than are at present apparent. The hours during which the Museum is open and the arrangements made virtually shut it against working men, even if they were anxious to avail themselves of the collection, which unfortunately few of them seem to be. It is impossible to ignore a very widely-entertained impression that the building is unsatisfactory—in no way adapted for study. One "Would-be Student" writes us that he found it simply impossible to sit on the tiled floor, in a frightful draught, to make a sketch he desired to have. Some alterations must be made in this direction, also in the arrangement, if the word may be used, of the casts. The staircase is perhaps the most abominable thing in plan that ever was seen. It is so out of square with the side walls and the pavement that a view backwards from the landing is calculated to produce vertigo. One would be curious to know which of the two architects employed will take the credit of it.

However, all this will get righted in time: the value of the Institution properly adminis-

tered remains, and the Council are anxious if not lucky. They have just now issued a proper invitation to members, that, being desirous of making their collection available for the study of architectural pupils, students, and draughtsmen, to such all the advantages of the Museum through its lectures, collection, &c., are offered for a subscription of 10s. a year, and they ask the names of any gentlemen who wish to join for the year commencing January 1. They are also co-operating with the Institute of British Architects and the Architectural Association to bring about the establishment of a school of architectural drawing to meet in the Museum. A joint committee has been formed and rules have been framed for discussion. This school might be rendered subservient to the maintenance of the Museum, as well as highly advantageous to the rising generation of architects. Strenuous efforts should at once be made to render the collection more completely a museum of architecture than it can be deemed at present, representing as it does little more than one division of the art. As one of the first and fastest friends of the Institution, we shall be credited with a desire to say nothing but what is likely to advance its interests.

THE FEMALE SCHOOL OF ART.

MISS JULIA POCOCK stands so completely at the head of the exhibitors on the present occasion, that 1869 will probably be spoken of in the school hereafter as her year. By a very clever drawing from the cast, she has obtained the Queen's Gold Medal, while for a charmingly painted head of a girl in prim, if not Puritan, costume, she has the Queen for purchaser; and her Majesty may be congratulated as well as the artist. When we add that Miss Pocock also exhibits the model of a hand, which has obtained the M'Arthur prize of 5 guineas, and that she also gets a prize from the Department, it will be seen that Miss Gann has, at any rate, one pupil of whose progress she may be justly proud. But there are others with nearly equal claims. Miss Whitman Webb gets the National Silver Medal for fruit admirably represented, and one of her flower-pieces we like even better than the fruit. Miss Alice Locke has a charming arrangement of flowers; Miss Blanche Macarthur exhibits two very effective heads in oil from the life; Miss Alice Manley maintains her position gained last year; and Miss Lavinia Dixon makes an advance.

Miss Slous worthily gets a prize for modelling; and in the same department Miss Ellen Macra deserves praise.

Some friends of the school have lent a number of paintings and drawings, which will remain for a time for the study of the pupils. It may be well to mention that a class meets on three evenings in the week, Mondays, Wednesdays, and Fridays, from seven to nine, for the study of elementary and model drawing, geometry, and perspective, and that schoolmistresses, teachers, and pupil teachers of National and British Schools are admitted at half fees. The fee for the advanced class for the study of water-colour, figure from the round, &c., is 6s. per month, or 11. for five months.

LECTURES ON ARCHITECTURE AT THE LONDON INSTITUTION.*

PROFESSOR KEER proceeded to consider the Gothic revival. Still confining his attention to our own country, and now with more especial reason, he returned to the seventeenth century, and remarked that while the revived or more properly modern Classic style was becoming established by the spirit of antiquarianism in Italy, and beginning to spread westward therefrom, English building was pursued in the well-known Elizabethan manner, and especially, perhaps, in those country mansions which we still hold in such high esteem. Even when the new fashion had taken complete possession, this old one was not entirely forgotten; and in 1753-70, for example, Horace Walpole was employing himself pedantically, if no more, in building at Strawberry-hill a sort of Mediæval retreat, eminently absurd, but equally suggestive. Then the French Revolution became the great historical landmark of the age. War between the new principles and the old, exhausting all other nations, left England alone in possession of what might be called unconquered feudalism.

* See p. 890, ante.

It was only natural at such a time that good old-country gentlemen should build Castles; and accordingly, through the whole period from 1770 even to 1830, under such architects as Wyatt, the now execrated restorer of cathedrals, Wilkins, of the National Gallery, and Nash, of Regent-street, sham fortresses, in the finest imitation of the "baronial" manner, were built all over the country, in stone, or brick, or Roman cement, or lath and plaster, with wood painted for masonry, cast-iron painted for oak, and, in short, anything that came to hand painted to represent anything else that might be convenient, with such an exuberance of sham accessories of every kind as to be bewildering to the most patient of critics. But, in the meantime, John Britton had been perseveringly laying before the public admirable engravings of English antiquities (1805-35); and the appreciation of the picturesque and the veneration of the traditional combined to give a fixed direction to antiquarianism in favour of Mediæval lessons in design. Then came the great apostle of modern Gothic, Welby Pugin; truly a very remarkable man, possessed fanatically with the one great idea, whether ultimately for good or evil he cared not. Before long he exhibited the precise effect of his enthusiasm in becoming one of the first of our "perverts," as the phrase goes; and the result of his whole life from its eccentric opening to its melancholy close,—every day of it, the life of an indomitable genius,—was to fit irreversibly the revival of Mediæval art upon the assertion of Mediæval social principles,—ecclesiology, symbolism, sacerdotalism, ritualism. By this time, however, the mere fact of the Gothic revival had been accomplished; for after 1835 the new Houses of Parliament were brought under discussion as affording an opportunity for a signal assertion of baronialism; and, as all the world knew, Pugin was Sir Charles Barry's right hand in the design and development of that great example,—now a good deal carpèd at by those who forgot the fact that the fashion of its architecture was not the free choice of the architect, but rather the contrary, forced upon him by Parliamentary amateurs. Since that period, at any rate, all our churches had been of the Gothic style; and of late there had been colleges, schools, parsonages, and even convents, built all over the country in the same fashion, until at length secular and civil architecture was being claimed in its entire field for Gothic administration,—a condition of things which sooner or later must lead to something unexpectedly amazing. At the present moment, antiquarianism, in this fashionable form, was urging its most uncompromising maxims: severity of manner, muscular harshness, and intentional ugliness, being openly and expressly advocated by extremists every day, with at length the most minute reference to ancient models, not for principles or suggestions, or even for canons of style, but for copies, so that cruder Norman, French, and Spanish turrets should be literally reproduced, in precisely the same way as the fastidious porticoes of Classicism less than half a century ago,—so turns the wheel!—were so slavishly, as the saying goes, and unintellectually accepted. Thus, then, stood "The Battle of the Styles," the inevitable effect of an antiquarian age which must inevitably run its course; and, in pursuance of the certainly remarkable uniformity of chronological periods exhibited by the scheme offered by the lecturer at the commencement of the course, he would venture to suggest that it seemed not at all unlikely that the termination of the current five hundred years, in about a century and a half from the present time, would prove the end of the antiquarian period, and the commencement of some novel development both of society and of art, in which existing actors must be content to have no part. But in the immediate form of the controversy as to style, the arguments might be stated thus:—Gothicists affirmed that their mode was "our national style;" but this was obviously fallacious, for it was not in England alone, nor in England even chiefly, that Mediæval architecture was produced, but in the whole of Mediæval Europe: it was simply the style of all Europe for a period,—one that had passed away. Then the rejoinder of the Classicists was this,—that their mode is Italian merely because modern Europe was cradled on Italian soil; that it is modern European, certainly not English peculiarly, but again the style of all Europe for a period,—one that has not yet passed away. Observing briefly that no revival of Gothic, in our sense of the term, had been found possible on the Continent, the lecturer remarked upon the exquisite

elegance with which Classic architecture had been pursued in France; while, on the other hand, the highest possible praise seemed to him to be due to English architects, even those of inferior pretensions in some cases, for the great artistic success with which they were effecting the production of a constant succession of picturesque Gothic works. The particular form of this rivalry he considered to be most interesting and suggestive to the student, and most creditable to both countries, in the eye of the critic. As to the demand sometimes advanced that a new style should be expressly invented, he need only say that a style in art was not to be so produced, but only by the slow operation of natural laws, of which, in the present age, Italian-European, galvanized Gothic, and universal Antiquarian, were the inevitable products, for good or ill, and in spite of us. Then, if he were called upon to offer a prognostication of the future, he would accept the formula of Archbishop Manning, that there was but one alternative offered to modern intelligence, namely, that between faith and science; and, taking these terms in their most comprehensive sense, he could not help thinking that what was erroneously called faith must inevitably yield, while that which was more properly called science must inevitably prevail. New principles of society, philosophy, and art were every day being introduced, the current of debate was setting in one invariable direction; and if he were to suggest that in architecture the next period would be that of science as the successor of Antiquarianism, he might, perhaps fairly, so leave the question to its destiny.

FALL OF A RAILWAY STATION AT EDINBURGH.

Sir,—I have just read with much profit your article on the catastrophe at King's College. Will you allow me to bring under your notice a similar accident which has just occurred in Edinburgh (where I am at this moment residing), with the view of directing public attention to the scandalous want of supervision in all matters relating to building in this northern capital? You will probably remember that I addressed you on one or two former occasions of a like nature, particularly with regard to the fall of an ancient tenement in the High-street, and also after the severe storm of February, 1868, in which I made a very narrow escape from the fall of a chimney. Edinburgh is, no doubt, a pleasant place of residence; but the risk of life in it is very great from a number of causes, one of which is the constant occurrence of such accidents as I shall proceed to describe. I shall quote as much from the local reports as may make the narrative intelligible, interspersing a few observations of my own in the way of supplement. In the *Scotsman* of Friday, December 7th, appears the following startling announcement:—

"Yesterday evening, just after darkness had set in, people at the west end of the town were startled by a tremendous crash, caused by the unaccountable fall of the enormous wooden shed which was in course of construction on the Lothian road for new station premises of the Caledonian Railway Company."

I dwell nearly two miles from the scene of the accident, and the report reached me like the firing of a battery of artillery:—

"The beams and timbers of the great shed were all down upon the ground in the utmost confusion, and large masses of timber were hanging over the retaining wall against St. Cuthbert's-lane, where they had been lodged, seeming as if they would come down any moment. It was deemed advisable to warn the public against going into the lane, which, indeed, was already partly blocked up by the material which had fallen into it."

St. Cuthbert's-lane here mentioned is the locus of the old poorhouse of that parish, which is now removed to the snarbs of the city, fortunately for the paupers. Part of the building plan provides for blocking up this lane, and the ground for the station has been otherwise obtained by an extensive and destructive clearance of valuable property, Dr. Caudlish's Free Kirk among other things.

The site of the building (*i. e.* of the wooden erection) is the space which has been recently cleared between Rutland-street, Rutland-square, and the Lothian-road, with a prominent corner to Princes-street, where the principal entrance is exposed.

"The permanent way and platforms were to be covered with a shed constructed in two spans, one 32 ft. and the other 40 ft. wide, with a height of 28 ft., and it is this shed which has fallen. The erection measured about 450 ft. in length, and the platforms were to extend some 350 ft. beyond its lower end, thus attaining a total length of 800 ft. The roof of the shed was designed on the wrought-iron girder principle, provision being made for lighting in the shape of longitudinal glazed spaces on each side of the

roof. The whole of the buildings were being constructed of wood, with the exception of some partition walls in the offices, where drop-lights and chimneys necessitated the introduction of brick. The walls between the platforms were being formed of what is termed louver boarding, the boards overlapping each other to the extent of an inch. The principal elevations, relieved with pilasters, colonnades, and parapets, present, as we have said, a tolerably neat appearance, considering that they form part of what could only be considered a temporary structure."

Temporary as it is, however, this structure is to cost 10,000*l.*

Messrs. Blyth & Cunningham, engineers to the company, made the plans; and the contractors are the well-known firm of Messrs. William Beattie & Sons. The intention was that the station should be ready for occupation by the 1st of February next. It was commenced in the month of August. The work was advanced with a view to completion against that day, and the whole of the rough part of it would have been finished in about three weeks. Already a portion of the shed,—though only a small portion,—was slated, and part of the glass had been put in.

But on the evening already mentioned, *viz.*, on the 6th day of December, the whole of this passenger-shed fell with a tremendous crash, shortly after the workmen, to the number of about eighty, had given over and left the ground.

"The building itself has been reduced to a sorry plight, the whole of the great passenger-shed having gone entirely to ruin. The front portion of the station with the offices connected therewith, and the baggage-sheds, refreshment-rooms, and the carriage-shed or store forming the long line of boundary towards the Lothian road, are fortunately untouched; but nothing else is left, so that what is gone was no, insignificant part of the building."

The *Scotsman* goes on to say that the cause of the accident in all probability was owing to some of the iron castings forming the junctions of the connecting rods giving way. Next morning, however, we have the result of investigations (it is not stated by whom), which is thus described:—

"There is no no doubt that the accident was caused by some flaw in the iron rods. The damage is found to be less considerable than was at first feared, as not more than a tenth of the dislodged material has been rendered useless. Some of the iron beams have been so twisted as to be made unserviceable, and a quantity of the timber and slates is destroyed. Early yesterday morning, 100 men from Carrstairs and elsewhere were set to work to clear away the material, and this operation, it is expected, will be completed to-day; so that the reconstruction of the shed will be proceeded with on Thursday. A peculiar circumstance is, that the glass for the whole shedding was stored within the building at the time of the catastrophe, and that none of it is broken, a heavy beam having fallen in such way as to protect the crates."

And so ends our local authority in the report of this most serious accident.

Now, sir, permit me to say one word in further explanation. I believe the cause of the accident was neither due to the iron castings, which gave way, no doubt, as cast iron always does upon a strain being applied, nor to the timber-work of the superstructure, which appears to me to be as soundly done as such temporary timber-work can be, but to the deplorably unsatisfactory character of the foundation. The whole thing is built—not upon sand, but upon genuine and unmistakable rubbish,—the *débris*, in fact, of the demolished buildings, combined with the aggregation of innumerable "rooms," as they call a cartload of rubbish when it is deposited in Scotland. It is true that the foundations were partially piled; but those who know anything about driving piles will know how to estimate this precaution at its proper value.

But I will not encroach further on your space at present. Supposing my view of the case correct, I should like to inquire who is to blame? In my opinion, the whole responsibility and the entire odium of the matter properly belong to a wretched remnant of municipal antiquity we have in Edinburgh, which goes under the name of the Dean of Guild Court. This respectable institution—which is chiefly composed of grocers and cheese-mongers—is supposed to fulfil the functions of the district surveyors in London. But you will judge with what success. I have already compared it in your columns to the Court of Arches; and the Lord Dean of Guild to the man-at-arms in the Lord Mayor's Show. Having by a seal of course, or some such antiquated instrument, a sort of legal existence and a corporate constitution, it has no personal responsibility,—*i. e.*, it has neither a body to be kicked nor a soul to be saved. Why the citizens of modern Athens submit to have their lives and property at the mercy of one of those curious social paradoxes of which Scotland is so fruitful, and so conservative, and concerning which I may take some future opportunity of enlightening your readers. In the meantime I hope you will assist in enforcing the true cause of these building accidents in Edinburgh.

AN OBSERVER.

THE CHANNEL PASSAGE.

MR. ZERAH COLBURN, C.E., has read a paper on this subject at the Society of Arts, in which, after describing "an improved means for laying a tunnel for the transit of passengers across the Channel," he says, in conclusion,—

"It has been mainly the object of the present paper, however, to examine into the engineering merits of the various schemes proposed for crossing the Channel, and the writer cannot close without expressing the belief that the balance of certainty, economy, and, all things considered, the safety and even the comfort of the travelling public, remains with a large and suitably organized Channel ferry service."

The plan described by Mr. Colburn consists of an iron tube to be laid at the bottom of the Channel, which could be laid in two or three years, at a cost of six millions sterling.

"It is not to be lost sight of," he remarks, "however remote the bearing of the question upon the present subject may appear to be, that a sudden demand, within a couple of years, for half a million tons of cast-iron, not for export, and not for immediately productive employment at home, would most certainly inflate the iron trade, and indirectly affect nearly every branch of our industry. The very home demand, whereby we would be literally throwing our iron, and with it our money, into the sea, to no immediate profit, would give to other nations an advantage of which they would not be slow to avail themselves."

The sudden abstraction of such a quantity for a single work, having no immediate prospect of success, might be attended with consequences which the whole country would long have occasion to deplore."

We may here add that Messrs. Ward, Hunt, Fowler, and Abernethy have had an audience of the French Emperor, to explain to him their plan for the passage of the Channel by large ferries. The project is particularly recommended by the small sum of money and short time required to carry it out, as compared with the schemes for bridges and tunnels of doubtful possible realisation, and of the ultimate time and cost of which it seems scarcely possible to form a reliable estimate. Not only would passengers and their luggage gain a couple of hours by the proposed ferry between Paris and London, but heavy goods trains would be enabled to take their course through France and England without the expense and considerable delay caused by transhipment.

THE ROYAL ACADEMY.

THE prizes presented to the students on Friday evening, the 10th inst., in the new rooms of the Royal Academy, included:—

For the best design in architecture; the subject, a design for a theatre—the gold medal, books, and a scholarship of 25*l.* to Henry L. Florence.

For the best architectural drawing of the garden front of Bridgewater House—the silver medal and books to Merton M. Glover.

For the second best architectural drawing—the silver medal to George Stanley Rees.

The one year travelling studentship in architecture, to Henry L. Florence.

The President, Sir Francis Grant, in his address, said the first attempt to establish a College of Science and Art was made during the reign and under the auspices of Charles I., but the civil strife which soon followed put an end to this institution. Charles I. was an enlightened patron of art, and the President naturally deplored the loss to the nation of the art treasures which the king had accumulated, and which were sold and dispersed during the Commonwealth. According to Walpole, art was expelled along with the Royal Family; but it languished in the reign of Charles II., and was almost a blank in the reigns of James II. and William and Mary. After various attempts to establish an Academy of Art by Sir Godfrey Kneller, John Evelyn, Sir J. Thornhill, and afterwards by the Dilettante Society, an important epoch in the history of art was reached when Hogarth, with eighteen other artists, agreed to adorn the walls of the Foundling Hospital with paintings. These, being publicly exhibited, proved a source of great attraction, and first suggested to British artists the idea of holding an annual exhibition of their works. It was in 1760 that the first exhibition was held in London, and it had a great success. Then came the establishment of the Incorporated Society of Artists of Great Britain, but strife and contention among its members led to its disruption, and it was followed by the founding of the Royal Academy, with George III. for its patron, and Sir Joshua Reynolds its first president. Referring to the periodical attacks made on the Academy, the President spoke of the attention paid by members of the Academy to the teaching of the pupils. Men, he said, who had gained a European reputation, and

whose names would reflect honour on their country in coming ages, became under this system painstaking instructors of the youthful student. "Do we hear of such disinterested zeal," asked Sir Francis, "in any other profession? Do judges, or men of science, or skilful physicians devote their time gratuitously to the education of the young?" Such has been the practice of members of this Academy, and how small has been the acknowledgment of its services?"

The impression abroad has been, that the professors, keeper, hangers, librarian, secretary, &c., received, and rightly, very respectable fees for their services in assisting the students. Was this impression wrong?

The President further said that the members of the Academy are now actively engaged in the improvement of their schools, and will spare no labour or expense to make them, if possible, the first in Europe. Measures, he said, would shortly be adopted in order to attain this all-important end; and he dwelt on the necessity of retaining the system of visitors, which conduced to originality and freshness among the students, while insuring for them a friendly sympathy among the masters of the art, and stimulating their best energies.

At a full meeting of the members, held on Wednesday evening last, Mr. James Sant was elected as an Academician. The following honorary foreign members were elected:—Messrs. Gallait, painter; Guillaume, sculptor; Viollet le Duc, architect; Henriquet Dupont, engraver; Meissonier, painter; and Geromo, painter.

PRINTS AND THEIR PRODUCTION.

UNDER this heading Mr. S. T. Davenport, of the Society of Arts, read there, on the 8th, a very instructive paper on the processes of engraving, wood engraving, colour printing, lithography, surface blocks, photography, photogalvanography, and other methods of producing prints, which he illustrated with a large and interesting collection of engravings and photographs, that will be open to the inspection of members and their friends till the end of this week.

Mr. Davenport, in accounting for his enthusiasm on the subject, said—"I may perhaps be open to the charge of attaching more importance to reproductive art than the subject merits. But, if so, the fact is easily accounted for. My boyhood and early youth were spent amidst engravings—for many of you are probably familiar with the works of my late father, who was a contemporary of Finden, Heath, Le Keux, and other eminent engravers. Many of his productions are before the meeting. I was myself educated for the same profession, and before I became an officer of this Society (now more than twenty-five years ago) I practised the art for some time. Indeed, I may mention that I was one of the first to produce, by electro-deposition, copper-plates from engraved steel-plates. These facts must plead my justification for what I have said; and it will appear not unnatural that I should continue to take a warm interest in every new process that may promise to give greater facilities to reproductive art, and thus to increase the means of affording one of the purest and best sources of gratification, not only to the rich, but to the people at large."

NEW CO-OPERATIVE STORES AND PUBLIC HALL AT RAWTENSTALL.

THE Rawtenstall Industrial Co-operative Society have inaugurated their new stores by a *soirée*. The society commenced short of twenty years ago with a capital of one guinea, and it now possesses a capital of 30,000l., and its profits at the rate of 4,000l. per annum. Larger premises were secured as their business increased, but for some years they found that they were out-growing the premises they still occupy, in Lord-street. Resolved on building new stores, a suitable site was found in Blackburn-road, which forms the principal street in the town, and which is also central. Application was then made to eight architects to submit designs in competition for the proposed erection, two premiums being offered, in addition to the premium for carrying out the work. When the designs were sent in, the two best were found to be by Messrs. Maxwell and Take, of Bury, to whom the two premiums were therefore awarded; they, however, consented to forego the second premium,

which was divided as an honorarium amongst the unsuccessful competitors.

One part of the premises consists of stores and shops for the grocer, draper, tailor, shoemaker and clogger, butcher, &c. Another portion of the premises comprises a news-room and library, club-room, large assembly-room 90 ft. long and 55 ft. wide, &c. The description of the exterior of the building may be summed up in a few words. The instructions to the architects were to spare nothing in construction, but economise in ornament; and the result is a large and strong but not an elaborate building. The walls are faced with parquetry, with Longridge stone-dressings, nearly 7,000 cubic feet of which have been used. The cost of the whole work, including heating, painting, fittings, &c., will be a little under 7,000l., the principal part of which has been done by Mr. Roberts, of Rawtenstall.

BARKING REPORT.

MR. ROBERT RAWLINSON, the Government engineer appointed to inquire into the complaints of inhabitants of Barking, with reference to the outfall of the metropolitan sewage, has made his report, and it is now with the Home Secretary. We are able to say that Mr. Rawlinson considers the allegations to be not proved; that he considers the cesspools and general want of drainage in the town of Barking to be more prejudicial to the health of that town than the proximity of the outfall of the sewage of London; and that there has been no diminution of water by silting in the main channel of the Thames consequent upon the outpouring of the sewage. We further understand that the Government engineer reviews the reports of the Metropolitan Board of Works, pointing to the fact that while they have protested against the fouling of the Thames above London, they themselves continue to pour into it the sewage of the London population. It appears that the question of the utilisation of sewage was not referred to Mr. Rawlinson, but he expresses an opinion to the effect that to accomplish this the Board must either subsidise or guarantee any company undertaking the work, or carry it out themselves. Experienced engineers have stated that the cost of taking the sewage to Sea Reach would have greatly exceeded the total cost of the metropolitan system of main drainage as executed, and that the area requisite to utilise the sewage would not be less than 70,000 acres. It appears in the evidence attached to the report that as compared with guano at 11s. a ton, the chemists' annual value of the London sewage is not less than 1,000,000l.

"A NEW STYLE."*

"ART is long, and time is fleeting," says the poet. That time is fleeting seems to be pretty well understood by the present generation, but that art is long, is understood by few indeed. We are in a hurry with everything nowadays, in haste to be at the end by the shortest possible road; but there is no short road to art, it cannot be reached by driving a straight line through hill, and o'er valley. It can only be got at by wandering, by devils paths, and gathering flowers by the wayside.

The young man just come of age, who has hurriedly passed through the routine of an architect's office, does not hesitate at attempting to design a large and important building in as many days as it required months of the anxious thought and care of the great men of old to accomplish a like object. Nothing great in art has ever been done in haste: read the lives of the sons of genius, and you will find them, one and all, great workers, striving towards perfection. But even those amongst us who know the necessity of care and deliberation in the maturing of a design are forced, by the ignorance of the general public, into the vortex. Your building committee only gives a week or two in which to design the most important building in a city; nay, more, they must also have an estimate of the cost and other particulars; and great is their indignation against the profession if everything does not tally to a tittle. So, too, with the private client who has for years been deliberating upon building a new mansion: the design must be produced forthwith, hundreds of artificers are set to work, and the plaster is not dry before he hastens to enter into occupation; he, too, is indignant when

he finds the work badly finished and unstable; but greater is the harm done to art by the crudity of the design.

We are in haste, too, to create a new style! Who is to do it? Who ever did it? Turn we to the past, and we find that a new style was the slow growth of centuries, fostered by the circumstances and peculiarities of the times. Why the architectural profession, more than any other, should be subjected to the parrot cry of copyism is more than I can comprehend. It appears to me that there is as much ability and originality displayed by some of its professors, as is done by any of the *littérati* who decry them. Architects are moulded in the fashion of the times just as are men of letters, and when the general public show as deep an interest in the production of fine architectural works as they do in the publication of books, men fit and able to meet their requirements will surely be found. Do the people of this country exhibit any love for our art? Do our legislators, as representing the people, give encouragement in promoting public buildings worthy of the richest and greatest of modern nations? With what prodigality are iron-clads constructed that are unseaworthy! what niggardliness is exhibited when a building that might be "a joy for ever," is in question.

In tracing the history of any nation, it becomes apparent that its literature and art act and react upon each other; there is a distinct sympathy between them. Compare the literature of Greece, with its architecture, and you find the qualities of the one those of the other,—proportion, symmetry, and harmony. The grandest structures of Rome are but a petrified echo of the orations which resounded in their halls. So was it in the republics of Italy; and so is it, too, in the Britain of today. A few of our architects translate the poem in stone of ancient Greece and Rome into the vernacular; the style of others is influenced by that of the homes of Dante, Petrarch, and Boccaccio; and many give the legends in stone of the Middle Ages a modern significance. The designs for the new Courts of Law, which were the occasion of a new outbreak of the cry, were no more copies than were the "Idylls of the King." And such works as the Strand Music Hall, and the Alhambra, in Leicester-square, find their prototypes in "East Lynn," and "Lady Andley's Secret." And many works there are issuing from the press that will not outlive the structures that spring into existence with them.

Our sculptors and painters, too, are engaged *more majorum*. Venus and Cupid, Nymph and Satyr, are year by year produced in marble; and knights in armour and gallants in doublet and trunk hose figure in every exhibition of pictures. Pre-Raphaelitism has had its day, and the classical style is now coming into fashion.

The artist must be in sympathy with the spirit of the hour if the seal of genius is to be set upon his work: he will come in a manner unlooked for, his advent may be nearer than we suspect, the indications of the agenda are faintly apparent even now, I think.

To the furtherance of this desired end one thing is absolutely necessary, and that is, that our architects boldly face the exigencies of modern requirements. It will not do, for example, to assert, as I have heard done, that a church must not have galleries; if such are an indispensable condition, the object of a true artist should be to make that adjunct part of his design, combining the whole into a harmonious work. That an interior, sacred or secular, is more dignified without being so incumbered, is certainly the case; but that one possessing this feature is necessarily devoid of that quality, I emphatically deny.

The study of Greek art is the prelude to the attainment of symmetry and proportion; that of Gothic to freedom, variety, and lofty aspiration. The combination of these would lead to the production of a work of high art. Power restrained within due limits by the exercise of reason and judgment contains the elements of the sublime. Weakness is ever apparent where there is no restraint; but it is not by mere plodding or confining yourselves merely to the work before you, that you will succeed; by so doing the mind is sure to become cramped, and narrowed, and so the capacity to design enfeebled. There

* Miss Braddon, in one of her novels, makes the hero, after coming into possession of a large estate, build "a beautiful stuccoed villa," in place of a Tudor mansion destroyed by fire.

* From a paper read by Mr. W. G. Shields before the Edinburgh Architectural Association on the 8th inst.

is a time for everything, and however busy you may be, a portion of your time should be devoted to literature and science, poetry and music. The man who knows nothing beyond his own profession can scarcely be great in that; but the main object should be kept steadily in the foreground,—the attainment of proficiency in your own particular art.

The successful architect, then, must be a man of cultivated mind; possessed of a vivid imagination, he must be able to conceive, in his mind's eye, how his work will appear when completed, how it will look as seen from different points of view in combination with surrounding objects; for it is a great mistake to suppose that a design, excellent in itself, is suited for every situation. Obvious as this may appear, it is the cause of the poor effect produced by many works of merit; and I know of few cities, the architectural effect of which would not be enhanced by the transposition of some of the buildings in them. Of one thing be assured, if your heart is not in your work, failure is certain; if you do not take delight in your profession give it up ere it be too late. Art is a jealous mistress, and unless you are devoted to her she will reject you.

What has been done, then, to forward the desired result? Is the prospect all bleak? Is there no "silver lining to the cloud?"—No gleam of sunshine to enliven the scene?

There is, doubtless, a large crop of rank rubbish sprung up, but it may serve as fuel wherewith to light us on the way. That we have produced any work of high art in a new style can hardly be affirmed, but it cannot be denied that great mastery over the old styles has been shown by not a few; and we can point to structures which, had they been erected a few centuries ago, would have been looked upon by us as masterpieces. If so, is not this so much accomplished? Compare some of our best works with the cream of those erected at the beginning of this century, and I think it will be seen that some progress has been made. By and by, when every ancient style has been thoroughly mastered, we may look for something new springing up; a thorough knowledge of what has been done is the necessary prelude of what is to do. We must begin with the lesser and gradually proceed towards the greater, ever keeping the highest object in sight, so that each step may be one in the progress to perfection.

Strive on, then, drinking freely as you go from the pure fountain of Nature, wherein the excellence of beauty is ever reflected,—

"A thing of beauty is a joy for ever."

The influence of the masterpieces of Greek art is felt to this day, and will continue to be felt so long as the human race exists; the more remote the period the more difficult will it be to trace that influence; but still it will be there, and so will it be with every true and noble work of art. Here, then, is an incentive to earnest work: the creations of the brain live for ever: the immortality of the soul is no myth.

Art is the aim at perfection, and a work of high art comes nearer to perfection than any other work of man; in it we can tolerate nothing false or mean, "the beautiful includes the good and the true." A new style, if new style there is to be, must be built upon the foundation of both, and the most hopeful sign of the times is the hatred of shams entertained by every real student of art.

Now it is alleged by your commonplace unimaginative individuals (*practical* they call themselves) that art is destructive to usefulness. The reverse is the case; the most beautifully formed object is ever the most useful,—

"It is no part in prudence to decay an art,
And what it may perform decay,
Because you understand not why."

These people mistake a superabundance of ornament for art, and do not seem to be aware that many things "when unadorned are adorned the most," that simplicity is the greatest beauty. This lavish use of ornament is one of the phases of the hour which tend to retard the progress towards the attainment of a new style. If we trace the development of any existing style it will be found that at first ornament was sparingly used, and that in its decadence quantity, rather than quality, is the characteristic of the detail.

"Art is long" there is hope in the future: what is good lives, that which is bad dies; the good which we do will exercise its influence on the art that is to come, the harm will be overcome and set aside. It is a grave error to measure the progress of art by years only; centuries are requisite for its development, and

it is only by taking a broad and comprehensive view of it that a true estimate can be arrived at.

It would require more time than I have at my disposal to make clear what is the true meaning of the phrase "a new style." So gradual is the transition from one style to another that you cannot fix a bard and fast line where one ends and another begins. A language has never sprung into existence at once; but as new ideas, new inventions, and discoveries have appeared, it has gradually developed. And so in architecture, "the language of stones," as new materials have come into use, and new requirements have arisen, new phases and combinations have produced new styles. It is impossible, therefore, I maintain, for any one to create a new style, but it does not follow that an individual may not lend powerful aid towards its formation; there is abundant scope for each and every one of you to exhibit the latest power that is in him.

If I may venture to give a simple hint, I would say that after having acquired a thorough knowledge of the old styles, then throw all books of reference aside, and with plain paper only before you, and pencil in hand, draw a design of the building wanted, with nothing but what is absolutely necessary in its construction; then look to its proportion, and finally to its ornamentation. The result will, doubtless, in most instances, be that the designer will fall into the old rut; but in some few instances a new light may dawn upon the artist. At all events, if the building is structurally true, it will not be altogether contemptible. A plain harsh truth is better than an eloquently-expressed falsehood.

In art, as in politics, there is a party of progress and one that desires no change, of those who strive to create a better state of things, and of those who revere the part and maintain the perfectness of the works of our ancestors. The goal reached by one generation is that from which the next starts; but in running the race it is sometimes advantageous to retrench our steps, for a space, in order to acquire the impetus necessary to surmount an obstacle. This is what we have been doing. Has it been a leap in the dark? For my part, I think we are at the starting-point of a new style.

"There is a history in all men's lives,
Figuring the nature of the times diseased,
The which observed, a man may prophesy,
With a near aim, the main chance of things
As yet to come to life; which in their seeds
And weak beginnings lie intreasured."

INVERNESS CATHEDRAL.

The foundation-stone of this building was laid on the 17th of October, 1866, by the late Archbishop of Canterbury, Dr. Longley, in the presence of five of the Scottish bishops, the Bishop of North Carolina, and about 60 clergymen of the Scottish Episcopal Church. From that time till September of the present year the works were prosecuted vigorously, and were then so far advanced as to permit opening for service. At the ceremony were present the Bishop of Winchester, then Bishop of Oxford; the Bishop of Rochester; and a large number of clergy, both of the English and Scottish Churches.

The work, except the altar, reredos, candelabra, and windows, has been entirely executed by Inverness workmen; and the effect of the cathedral, which stands near the river, is, from whatever point of view, very effective.

The building is in the Decorated Gothic style, and has been erected from the designs and under the superintendence of Mr. Alexander Ross, architect, Inverness. The cathedral is built of a pink freestone from Conon quarry, and the dressings are of a warm cream-tinted stone from Covesea Quarry, in Morayshire. The slates are the Westmoreland green, and were selected to harmonize with the quiet warm tone of the walls. The following are the external dimensions:—166 ft. long by 72 ft. across the west front; the height of the towers is 100 ft.; and the architect's design shows a further elevation of 100 ft. by the erection of spires on the towers. The height to the ridge of the roof is 88 ft. The transepts are arranged after the old Scottish model, to project only slightly beyond the aisles. Viewed from the outside, the building shows a nave, with aisles, transepts, and apsidal chancel of equal height. The chapter-house, of an octagonal shape, is situated at the north-east angle, and at the west end are the towers, carried up to the springing of spires. It is to be regretted that funds are wanting for the erection of these

spires, which are required to finish the external design of the building, and harmonize the whole structure. At the base of the north tower there is a side entrance, and the main entrance is situated between the towers, facing Ardross-street. It is formed of a deeply-recessed archway, in a wall upwards of 8 ft. thick, and is approached by a flight of steps. The sidea are formed of a series of shafts with carved capitals, resting on a dado of rich panelling, and the archway is enriched with five courses of beautifully-carved foliage. A pointed gable rises over this to a height of 35 ft., ornamented with perforated tracery. The doorway is divided by a pier into two openings, and in front of the centre is a column of Peterhead granite, intended to carry a life-size figure of St. Andrew, the patron saint of the cathedral.

Proceeding into the interior by this entrance we find ourselves in a porch, formed by a handsome stone screen fitted with plate glass, and through which the whole extent of the building can be seen.

Passing through the screen, we come into the nave, which consists of five bays, the western one being flanked by the towers. These bays are divided by monolithic columns of Peterhead red granite, 7 ft. 9 in. high by 2 ft. 4 in. diameter, surmounted by foliated capitals of freestone, from which spring the nave arches. Over these run the clerestory windows, consisting of triplet windows, with stone rear arches resting on detached columns with carved capitals. There are twelve lights on each side, with traceried heads, forming, with the columns referred to, a very effective arcade along the upper story of the nave. The transepts are carried, both externally and internally, to the full height of the nave, and the interior stone arches, where they intersect the nave, choir, and transepts, are carried up on clustered columns the full height of the roof, viz., 58 ft., a novel feature in timber roofs, but which has a most satisfactory effect, by giving dignity to the choir, and continuing the line of the nave roof to the end of the chancel.

The choir is raised two steps above the nave, and is divided from it by a low ornamental stone parapet. The chancel rises six steps to the sacarium, in flights of three steps, and two more to the altar, giving the latter a total rise of ten steps from the floor of the nave.

The building is lighted by three five-light traceried windows, measuring 16 ft. by about 30 ft. each, at the ends of the nave and transepts; and further, by double-light traceried windows in each bay of the nave; by triplet in clerestory; by three double-light traceried windows in the apex of the chancel; and by two wheel windows in the ends of the aisles.

The roof of the building is composed of an outer roof to carry the slating, and an inner of varnished red pine, covered and divided by principal complex and ribs over each column into bays, each bay being divided into panels. It is designed for coloured decorations; but in the mean time it is simply varnished, with anticlinal patterns on each panel, to relieve the plain timber.

The nave will accommodate about 800, and the north transept 90; the seating throughout being of pitch pine, varnished.

The flooring throughout, except immediately under the seats, is of Minton's tiles. Those in the chancel and sacarium are extremely rich, being laid in panels, each containing a Scriptural representation.

The heating of the building is by hot-water pipes, passing round the building under the passage floors. Advantage was taken of the space underneath the building to form tunnels, and into these the gas and water pipes are introduced. These tunnels are sufficiently large to allow a man to pass along; so that access can be had for repair to all the pipes without disturbing the tiles of the flooring.

The lighting is entirely by standards, placed at the side of the aisle passages, and between the piers of nave; the chancel being lighted by very good standards of solid brass. These, as well as the gas-fittings of the nave, are supplied by Hart & Son, of London.

In the contemplated event of the windows being filled with stained glass, as memorials, a design was prepared which should illustrate, on the one side, the early life of our Lord up to the period of his Baptism, and on the other his Acts of Mercy, reserving the windows at the east end for illustrations of the Passion, and the three large windows for illustrations of "The Ascension," "The Descent of the Holy Ghost," and "Our Lord in Glory." With the exception of these last, every window—except those in



CAPITALS OF THE NAVE, ST. ANDREW'S CATHEDRAL, INVERNESS.

the chapter-house, vestry, and clearstory—has already been secured by different parties, and the design will be fully carried out. Ten are already in the cathedral, while the others are in course of execution, and will be completed before the end of the year. The preparation of the glass was entrusted to Messrs. Hardman & Co., of Birmingham; and, so far as executed, the windows fully sustain their credit.

The outlay on the building up to the present time, including gifts of furniture and fittings, amounts to 18,000l.

The special gifts are very numerous. The pulpit is a costly work of art, composed chiefly of Caen stone and green marble. It is a gift from Mr. Fontaine Walker, of Foyers; is from a design by Mr. Ross; and has been entirely executed by Messrs. D. & A. Davidson, of Inverness. The pulpit rests on short columns of Abriachan granite, is trefoil in plan, and on the panels are carved three bas-reliefs. The first is a representation of "St. John preaching in the Wilderness;" the centre shows the figure of Christ as "The Good Shepherd," and the third "St. Andrew preaching from his Cross." The subjects are separated by columns of green marble, and between these are figures of angels,—the one holding a palm branch, the emblem of victory; the other, a lily, the emblem of purity. The cope is formed of green marble.

The altar is the gift of the Primus, and Mr. Fletcher, of Rosehaugh, gives the retables. The front of the altar is formed by trefoil arches, supported on serpentine marble shafts, the panels between the columns being of alabaster; the centre one containing a cross of pure white alabaster, set with crystals. Those on the right and left contain the "Lamb of God," and "The Pelican" respectively. The spandrels are relieved by crystals of Derbyshire spar. The top of the altar is formed of a single slab of Caen stone, with incised crosses at each angle, and also in the centre. The super-altar is composed of rich alabaster slabs. The retables is formed of Caen stone, and rises a height of 17 ft. 6 in. The lower portion, forming the altar background, consists of rich incised diaper work. Above rise three arches, enclosing panels, containing a subject in alto-relievo in each,—in the centre, "The Crucifixion," and on either side "The Agony" and "The Resurrection." Purbeck marble columns support these arches. Over the centre panels rises a richly-carved and crocketed gable

terminating in a cross, flanked by buttresses, resting on spiral columns of white alabaster, jewelled. These buttresses run up into carved pinnacles, and are surmounted by the figure of an angel. The sacred vessels for the Holy Eucharist, the handsome candlesticks, and the other altar furnishings are the gift of Miss Charlott's Temple, Aberlour. They consist of the flagon and ewer, of ruby glass, set in silver, gilt; the chalice of solid silver, gilt, and studded with pearls and carbuncles; two patens, both of solid silver, one gilt; the brass alms-dish; polished brass candlesticks, studded with crystals and carbuncles; polished brass cross, set with carbuncles; two flower-vases, beautifully painted; and a double set of the necessary linen. The altar-desk is of solid brass, and has been presented by Miss Macsedilia, placina, and ordence have only been temporarily fitted up. The altar-rails and sanctuary standard lights are of solid brass, given by Mrs. Perry, Devon Cottage, Inverness. They are very fine specimens of work. There are twenty-five lights on each standard, the ornamental foliage being of beaten brass, set with crystals and carbuncles.

On the south side of the entrance to the choir is the lectern, a very fair specimen of brass work, the gift of the Rev. G. S. Simcocks. The litany-desk is made of solid British oak, massively framed, and carved, with pillars and capitals. The panels contain various devices. It is the gift of the Misses Shilleto, Inverness. The bishop's throne—the gift of Mrs. Campbell, Devon Cottage—is placed at the south-east angle of the choir. The form of the cathedra or chair has been adhered to, with an attached prayer-desk in front. It is made of solid oak, moulded and carved. The back is 7 ft. high, and finished with figures of angels on each post. In the centre of the back on a shield are placed the arms of the Bishop of Moray and Ross, surmounted by a mitre. The prayer-desks for the officiating clergy are placed next the nave, and the Provost's stall is at the north-east angle. There are besides twenty-two stalls for clergymen, and twenty-two seats for choristers.

The organ, the gift of Miss Macpherson-Grant of Aberlour, has been made by Messrs. Hill & Son, of London, under the superintendence of Professor Oakeley. It is placed in the south transept, and contains the following stops:—

GREAT ORGAN—CC TO G.

Feet.		Feet.	
1. Bourdon	18	6. Wald Flute	4
2. Open Diapason	8	7. Twelfth	3
3. Cone Gamba	8	8. Fifteenth	2
4. Stopped Diapason	8	9. Mixture, 3 ranks	13
5. Principal	4	10. Trumpet	8

SWELL ORGAN—CC TO G.

1. Bourdon and Double	16	5. Mixture, 3 ranks	0
2. Open Diapason	8	6. Cornopean	8
3. Stopped Diapason	8	7. Oboe	8
4. Principal	4	8. Vox Humana	8

CHOIR ORGAN—CC TO G.

1. Dulciana	8	4. Suabe Flute	4
2. Gedact	8	5. Clarinet	8
3. Gemshorn	4		

PEDAL ORGAN—CCC TO E.

1. Open Diapason	16	3. Violone	8
2. Bourdon	16		

COUPLERS.

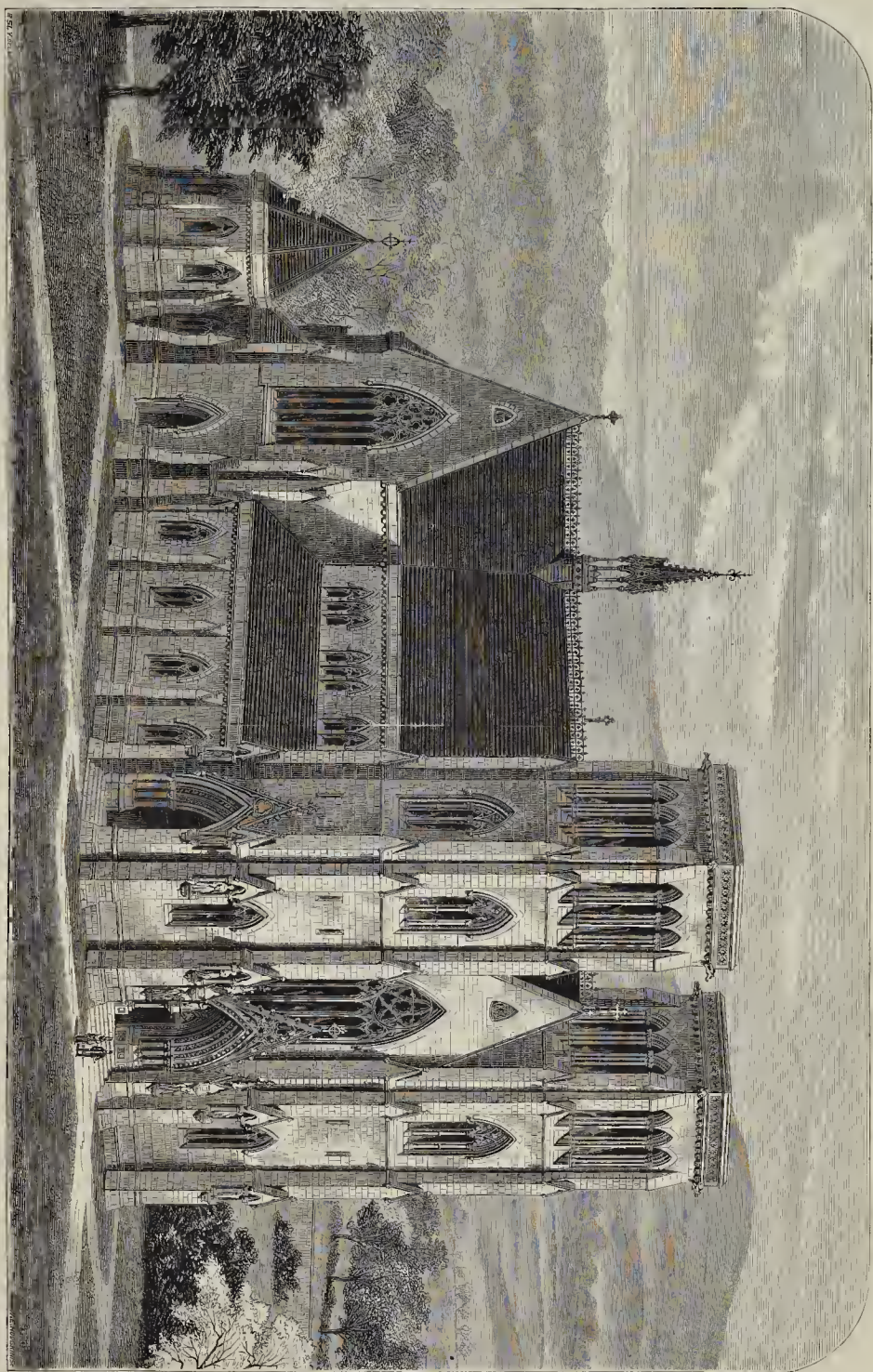
1. Swell to Great Organ.	3.	Swell to Pedal.	
2. Swell to Pedal.	4.	Choir to Pedal.	
Three Composition Pedals to Great Organ, two Composition Pedals to Swell, Tremulant on Swell.			

It is contemplated to place a peal of eight bells in the north tower. The tenor, of 20 cwt., is the only one as yet hung. The estimated cost of the peal is 800l.

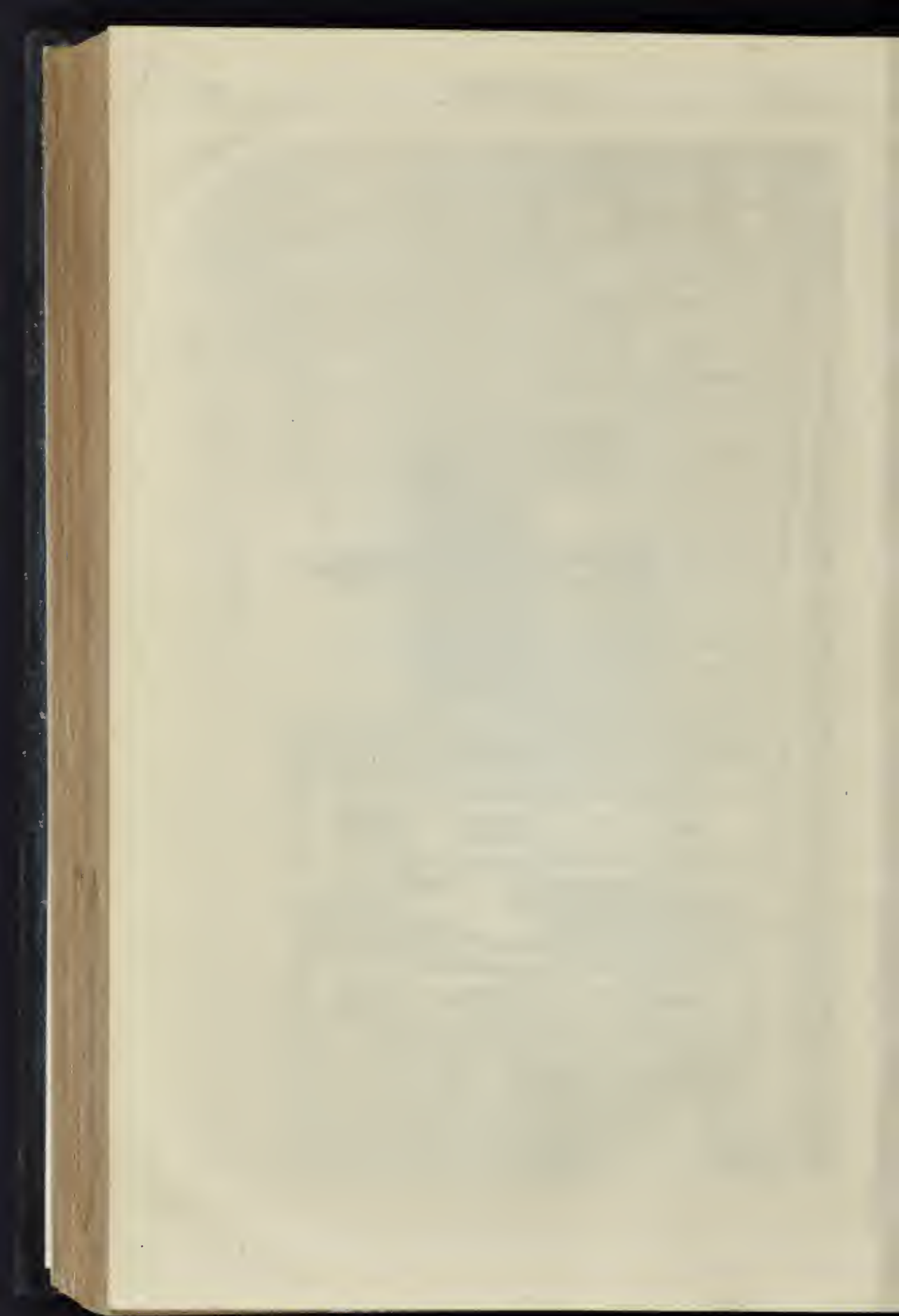
Mr. William B. Mackintosh was clerk of the works. The various contractors were:—Mason, Mr. Andrew Fraser; carpenter, Mr. G. B. Mackintosh; plumber, Mr. Simon Mackenzie; slater, Mr. John Russell; plasterer, Mr. Allan Mackintosh; painter and glazier, Mr. Donald MacDonald; stone-carving, Messrs. D. & A. Davidson, all of Inverness; the retables, Mr. Earp, of London; standard and altar rails, Messrs. Hart, Son, Peard, & Co.; tiles, Messrs. Minton, laid by Mr. Hawley, of Edinburgh; heating, the Inverness Iron Company; stained glass, Messrs. Hardman & Co., of Birmingham; clearstory glass, Messrs. Powell; bells, Messrs. Warner & Son; organ, Messrs. Hill & Son, all of London; bishop's throne, Mr. Andrew Fraser; litany desk, Mr. Ritson, both of Inverness.

Much remains yet to do; but, from the want of funds, the committee are obliged to pause for the present. The completion of the spires is estimated to cost 1,600l.; enclosing walls and entrance gates, 300l.; hesides sedilia, font cover, interior painting and decorations, &c.

We give a view of the building from the Castle-hill, and a representation of two of the capitals of the nave. In our last issue we published the ground-plan.



ST. ANDREW'S CATHEDRAL CHURCH, INVERNESS.—MR. ALEXANDER ROSS, ARCHITECT.



THE WORKMEN'S INTERNATIONAL EXHIBITION, 1870.

WE have received a letter from the honorary secretaries of this Exhibition, Messrs. Auberou Herbert, Thomas Paterson, and J. W. Probyn, in which they say:—

"The Council of the Workmen's International Exhibition, to be opened on the 7th of July, 1870, at the Agricultural Hall, Finsbury, has determined to send a conference of delegates from the towns of the United Kingdom, and of other countries, on the 10th of January next, at the rooms of the Society of Arts (in John-street, Adelphi), which have kindly been lent for that occasion."

The subjects to be considered will relate to the method of arrangement of this Exhibition; the system of prizes, and appointment of jurors; the opening of workshops in the Exhibition; suggestions, &c., from local committees; and the means to be adopted to make the Exhibition promote the interests of technical education.

Mr. Mundella, M.P., and Mr. S. Morley, M.P., will successively occupy the chair during the day's sitting.

The following among other resolutions will be moved:—

"That the principles laid down in the prospectus of the Workmen's International Exhibition of 1870, which require the worker's name to be attached to the article produced, are both just and useful; as tending to give workmen their share in the credit of production, and to increase the pride and interest which attach to skilled labour.

"That it is of the highest importance to develop amongst all the people a true perception of what is beautiful in colour and form, and a scientific knowledge of the machinery and material employed in existing industries."

The Council will provide accommodation for the night of the 10th of January for those delegates who wish them to do so, and will otherwise do all in their power to facilitate the attendance of their visitors, on receiving communications on the subject.

WIDENING LONDON BRIDGE.

THE Common Council have given permission to Messrs. Farren & Featherstonhaugh to submit designs for widening London Bridge to 88 ft. Their proposition is to sink caissons to low-water mark, the width of the present piers, in front of the end of every pier, and as close to their cutwaters as the foundations will allow: to fill these with concrete and brickwork in cement in the usual way, and connect the new work with the old at Trinity low-water mark spring tides; and to erect upon these foundations piers and cutwaters faced with granite ashlar, in courses exactly corresponding to those in the existing piers, so that when complete the piers would present a perfectly uniform appearance, but would be 40 ft. longer than at present, 20 ft. having been added at each end. These piers would carry iron girders corresponding in form with the arches of the present bridge; one of these girders would be placed close against the face of each of the existing arches, altogether concealing the masonry faces of the present arches. Upon the girders supported by the piers a superstructure would be formed carrying the footpaths, parapets, lamps, recesses, or pedestals for statues, &c. So that if the bridge were altered as suggested, it would appear as a granite and iron bridge with five arches, retaining its present shape, approaches, and levels. The estimated cost is put at \$0,000.

NORTHERN ARCHITECTURAL ASSOCIATION.

At the last meeting, on the 10th inst., Mr. F. Charlton in the chair, the following officers were elected:—President, Mr. A. M. Dunn; vice-president, Mr. R. J. Johnson; honorary treasurer, Mr. F. Charlton; honorary secretary, Mr. Thomas Oliver; honorary solicitor, Mr. G. W. Hodges; committee, Mr. J. E. Watson, Mr. C. H. Fowler, Mr. J. Hogg, Mr. M. Thompson, and Mr. W. Parnell. The secretary drew attention to the report of the Architectural Alliance, but as it was a voluminous pamphlet, he recommended that it should be reported upon by the committee, and it was agreed to. He also drew attention to the proposed establishment of an association of younger men, and hoped, if they could see their way clear to it, they would become connected with the Northern Association. The members of the class could have that room, they could have the benefit of the books of the association, and also of the instruction certainly of Mr. R. J. Johnson, the vice-president, and the president, Mr. A. M. Dunn.

A short discussion ensued upon the question of the suggested class, and it was pretty generally understood that should the members of the society recently formed apply to the Northern Architectural Association, they would be admitted as associates, and reap, for the small entrance subscription, the benefits of the society. The discussion (to be introduced by the ex-president) "On the Principle involved in the Establishment of Professional Charges for Valuations in connexion with Compensation Cases," and the paper by Mr. Oliver "On Architectural Retrogression in the North of England," were deferred until the next meeting.

CONSECRATION OF ST. LUKE'S CHURCH, NEW KENISH TOWN.

On Saturday a church was consecrated, in lieu of the old church of St. Luke, King's Cross, which was demolished by the Midland Railway Company in making their station at St. Pancras. The new building is situated in Kenish Town, to the west of the Camden-road. It is in the Early English style, and is constructed of red brick in the main parts of the structure. Stone is, however, used in the interior around the windows, for the ribs of the groining, and for the span of the arches. The dressings are of Tisbury stone, supplied by the Wardour, Chilmark, and Tisbury Stone Company, London.

The chancel is groined, and the nave is separated from the side aisles by four bays, with marble pillars on each side, surmounted by a clearstory. The interior roofing is wagon-shaped, and of timber. A square tower marks the intersection of the chancel and nave. Beneath it are the reading-desk on the south, and pulpit on the north side; and in the sacristium are three sedilia, a piscina, and a credence-table.

The sum of money paid as compensation by the Midland Company was not sufficient to rebuild the edifice, and there still remain about 1,400l. to be cleared off before the church will be free from debt. Mr. Champneys (a son of the Dean of Lichfield) was the architect.

THE DISPOSAL AND PRODUCTS OF DRY SEWAGE BY BURNING.

THE production of gas by burning and distilling dry sewage in India has excited some interest in this country. A pamphlet giving an account of "the carbonisation or dry distillation system of conservancy," by W. R. Gilbert Hickey, C.E., of Darjeeling, the inventor of the system; with a note on dry sewage, by F. J. Monat, M.D., inspector-general of jails in the lower provinces of India, has been printed at the *Darjeeling News Press*. Mr. Monat speaks very favourably of Mr. Hickey's process, and Mr. Hickey thus speaks of it himself as "the carbonisation or dry distillation system of conservancy."

"This system proposes to render filth of all kinds innocuous, by carbonising in close retorts,—using the residue in the retorts for deodorising fresh filth in transit to the apparatus, utilising it and the products of the distillation for manure. The gas being available for heating or lighting purposes, or for both.

- The system may be divided under three heads.
- 1st. When the gas is to be utilised only for heating the furnaces.
 - 2nd. When the gas generated from the filth itself is to be partially or entirely used for illuminating purposes.
 - 3rd. When the gas from the filth is to be utilised for heating the furnaces, and fresh gas made at small expense for illuminating."

The filth carbonised by these systems, Mr. Hickey remarks, is at once and for ever rendered innocuous even on its journey to the apparatus. It can never regain any of the objectionable qualities of filth. The vitality of all organic bodies is destroyed. The poudrrette (carbonised residue in the retorts) is a black powder, perfectly free from smell, and is an admirable deodoriser for solid and liquid filth.

The gas yields a very brilliant light, and is perfectly unobjectionable. The poudrrette and the refuse in the condenser, &c., contain animal and vegetable charcoal, with phosphates, carbonates, and sulphates, of potash, soda, magnesia, lime, iron, &c., the mineral or earthy materials of plant food, and also ammonia and carbonic acid. The price cost of the apparatus, he says, is trifling, and the system will be self-maintaining as regards fuel for the furnaces.

By means of a desiccating or evaporating pan on the top of the furnace, and mixing some

hydrochloric acid with the refuse from the hydraulic main, sal ammoniac may be made in large quantities.

He claims for his invention that it is perfect in a sanitary point of view; that it is economical; that the manure is of first quality, portable, and innocuous; and that the gas is luminous and innocent; and that the poudrrette is a perfect deodoriser for solid and liquid filth.

ON THE PUBLIC WORKS DEPARTMENT OF INDIA.

IN your article of October 30th, attention is drawn to the manner in which the Public Works Department of India is carried on. A few observations on the salient faults of the system may not be out of place.

Up to comparatively lately the East-India Company were so occupied with the extension of territory, that it was necessary almost every man in their employ should be a military man, at a moment's notice to throw aside the pen and the rule, to gird on the sword; to be more capable of attacking and defending positions than of erecting civil works. Hence, it followed, military engineering was the only road to preferment. As territories were subdued, it became necessary to make roads: on occasions no engineer was to be had.

Officers of the other branches of the service, who at school had obtained an inkling of surveying and military engineering, proffered their services. With the energy of young men placed in difficult positions creditable work was accomplished. As a reward they were kept to engineering duties.

On the demand for the greater extension of public works, engineers of all classes were pushed up by the rules of seniority into high positions, and had to undertake the construction of works for which many of them had not knowledge. Thus it is, that men who had earned high position by gallant and faithful service in the field, lost their good name from failing to carry out works they were never brought up to.

The Public Works Department is composed of men of different grades, but all depend for their position on knowledge of the surveying branch, which enables that service to be carried out in as able a manner as in any part of the world, as each one has to work at it, and is master of the subject; but the constructive branch presents a contrast, from none of the department having been educated in the art of building.

The officer brought up at Addiscombe, and sent out to India, has not been in a position to learn the practical part of building, but is only acquainted with it theoretically, and all subsequent knowledge is only obtained from the natives, the very ones he is supposed to teach. The civilian engineers educated in India are in a like position.

As plans are prepared at head-quarters, the probability is a resident engineer has only to erect a building (the word building is meant to include every description, from hangarons to bridges) similar to what has been done before, the cases cited of buildings falling are solely owing to faults in construction; and, from having charge of a large district, perhaps 100 miles in one direction by 50 in another, he can not visit it now and then. An overseer, perhaps an excellent man for laying out and repairing of roads and keeping accounts, is put in charge; but, being entirely ignorant of building, the construction is left entirely to the native workmen, who are not very particular about building perpendicular and straight. As the bricks are very soft, it is easy to edge the walls, if they will get wide at the top than the bottom. Also, they are not at all particular about the bond. Very often the walls are built with mud, only the top course and wall-plate being laid in mortar. Saplings are at times used for the rafters. In these cases it is but a question of time for the roof to come down, as white ants are sure to get into it.

The difficulties to be contended against in the construction of works, and the incessant minute attention required, are only known to those who have encountered them. The facilities afforded by residing in towns is no criterion for the country at large.

The faults of the present system are, that the members of the engineering staff are all brought up to one department of their profession, leaving up to one department of their profession, leaving up to one department of their profession, leaving up to one department of their profession for a man who only understands building, and native

workmen are expected to carry out English design.

The remedy is to divide the Public Works into two departments: one for the surveying, road-making, &c.; the other for works of construction. To form this latter, inducements must be offered, for such men as clerks of works, foremen, &c., who have a thorough practical knowledge of the trade in all its branches, who can use their hands as well as their heads, to enter the service. To obtain them, liberal terms must be given, and no demands made as to proficiency in languages. The advantages would be great. The Eurasian, whose ambition is now to be a road overseer, would be taught the European method of building, and would learn that the craft he now despises is as great a science as that of surveying; the native would learn that, wonderful as are the buildings erected in former ages by his forefathers, the method is too cumbersome for the present age. A new era has arisen in his craft as well as in that of English policy in India.

MIKROS.

SYMMETRY, IN REFERENCE TO SOUND.

Sir,—Referring to Dr. Rawson's paper on the above, I am unable to see what is gained by considering the squares of the numbers instead of the direct relation of the numbers themselves to each other. If the latter be in proportion to one another, will not their squares be so of necessity (but geometrically, not arithmetically)? Agreeing with the principle that the length, breadth, and height of apartments should bear proportions to each other in whole numbers rather than in broken ones; as 6, 4, 3, rather than 6, 4, 3, for instance, I would point out, in addition, that this brings all the surfaces of the room into proportional relations. In a room 24 by 16 by 12 (proportion 6, 4, 3), the floor and ceiling are each 384; the side walls, 288; and the end walls, 192; or in the proportion of 4, 3, 2—still whole numbers. Is not this circumstance more likely to influence the acoustic properties of a room than the arithmetical relation of the squares of the numbers to one another; the former being in fact what constitute the room, and the latter being non-existent materially?

I beg to suggest, however, another system, in which the dimensions bear a geometrical relation to one another, viz., by using the square and its diagonal, or the base and height of an equilateral triangle. By the former, a room 24 ft. long would be 17 ft. wide and 12 ft. high (not exactly, but sufficiently near for practical purposes), and the wall, &c., surfaces would bear also geometrical proportions (in figures 408, 288, 204, or as 34, 17, 12).

By the equilateral triangle it is believed that the section of Milan Cathedral was determined, and some indeed consider it to have been used generally in the Middle Ages.

W. R. COBSON.

A PLAN FOR WIDENING THE STREETS.

Sir,—The plan proposed by Mr. Fred. Taylor requires careful consideration before it be pronounced upon.

Practical experience has not shown that it is desirable in large towns to have covered pathways in the public thoroughfares, as they usually become the resort of not the most respectable portion of the community, possessing an attraction from the partial seclusion they afford, and as a shelter in all seasons. But as a temporary remedy for the evils of our crowded thoroughfares, a plan open to fewer objections might be suggested.

The number of columns to support the upper line of houses would, as shown in the diagrams, most materially intercept the light to the shop windows, which are 10 ft. from the columns, greatly to the disadvantage of the unfortunates who would be compelled to work partially or wholly by gaslight.

If the streets are to be widened by taking a portion of the shop frontage and converting the space into a covered canopy, attention should be directed to three important matters, viz., the adoption of a plan giving the maximum amount of light and ventilation, and the least obstruction to a crossing traffic.

The diagrams show the minimum of each, and a heaviness of cloth, combined with great loss of light and ventilation, would be the inevitable result.

The number of columns should be reduced and the height increased, and instead of 9 ft.

apart, a distance of 30 ft. or more is desirable. The upper line of houses might be supported on wrought iron horizontal girders, the depth for which would be found between the top of the columns and the under-side of the sill-line of the windows above, and the width in a partial projection of the girder as an ornamental front, and in the thickness of the brick and stone wall to be supported.

A very handsome and elegant effect might be obtained by a judicious treatment in design of the columns and the front of the girder, and the result desired would be attained, probably, in the most satisfactory way. To give additional light, the girders might be pierced at intervals of 10 ft., and a circular light introduced, which would occupy a space between the lower flange of the girder and the floor-line above, giving light to the upper portion of the shop-windows, which would otherwise be in shadow.

The shops in the narrow streets are probably already too small for the business transacted therein; and if a space of 10 ft. is taken from the front, the gutting and reconstruction of the whole of the ground-floor would be necessary, and it is questionable in many cases if the area available would permit so large a space to be abstracted.

The cost would be much greater than appears at first sight, and ultimately the money spent would not confer, I fear, advantages of sufficient magnitude to warrant the outlay.

JOSEPH S. FORBES.

UNEMPLOYED LABOUR.

Sir,—At this period of the year, when over 100,000 hands are out of work, and the pressure upon the money market has shut up private sources of work, an observer of the desolation apparent upon the site chosen for the Law Courts begs to suggest, through the *Builder*, the expediency of redeeming some of the time already lost by setting to the works with a will. The employment of even 100 men would give stimulus to trade, and perhaps lead to the engagement of 500 hands more in tributary employment; it is hard to see great public works slumbering whilst so many operatives are idle at this inclement season.

EDIFICATOR.

THE ART-UNION OF LONDON.

The Art-Union Council have issued their capital little Almanac for the coming year, containing, as we have often said, information on societies and collections in connexion with matters of art and science, not to be found collectively noted elsewhere. Every subscriber of one guinea will receive, besides the chance of a prize, a beautiful volume of twenty illustrations of "Hereward the Wake," drawn by Mr. Henry C. Selous, a volume intrinsically worth much more than the amount of subscription.

The *New York Citizen and Round Table*, gives an Art-Union anecdote. The writer says,—"Among the pictures purchased by the American Art-Union for distribution in 1845, were three pictures by Mr. George Harvey (formerly a resident of this city, but now living in England, and a good artist), one of which was a flower-piece. As a return for the compliment paid him by the association, Mr. Harvey subscribed for three chances in the Art-Union, placing his own name down for two, and for a little girl of his acquaintance the name of Daisy, presenting her with one of the tickets. When the distribution (by lot) took place, the flower-piece by Harvey became the property of his little friend Daisy; but the most singular circumstance of all was that the companion of the said picture had been purchased by the father of the child, so that a pair of the artist's productions are now hanging side by side in the same drawing-room." The *Comopolitan* adds, "We have heard Mr. Harvey tell a similar case, which occurred to his sister in England, to whom he had made a present of two tickets in the London Art-Union. The first one gained nothing beyond the sugar print given to every one. The next year his sister stipulated with Mr. Watson (assistant secretary), that by paying 7s. in addition to the ticket (we think that was the sum), she could have the statuette which she desired to possess. Mr. Harvey persuaded her not to conclude the bargain till after the drawing of the prizes. Her ticket drew the statuette." We could relate dozens of such coincidences.

We have received a letter from New Bedford, Massachusetts, United States, wherein mention is

made of the interest with which a landscape of English scenery, by W. Laker, gained in the last distribution of the London Art-Union by Mr. C. Hazleline, of New Bedford, has been viewed. The wide-spread relationships of this Association are amongst its most interesting and valuable characteristics.

GASIELLERS IN THEATRES.

FEELING sure that theatrical managers are ready to abate any supposed risk of danger to their patrons, allow me to point out to those whom it may concern the following risk easily removed before being too late. Some of our theatres have large central glass gaseliers, with pendants, which are, by the draught of air drawn up, in a constant swinging motion. Friction is going on with the slight supporting wires, and sooner or later a few of the pendants will quietly drop on the head of an attentive auditor, and may cause a scene never contemplated by any when first entering the theatre. A word from you, I am certain, will be sufficient to lead to a remedy.

S.

IMPROVEMENTS IN BUENOS AYRES.

THE municipality are seeking to raise a loan of 35 million piastres, to carry out some important public works which will amount to 24 millions, and the rest is required to cover the deficit of the ordinary expenditure for 1870. Nothing can be more landable than this disposition to improve the state of the city, but those who know most about it see great difficulties in the plan, and urge that it would be better for the municipality, instead of raising 35 million paper dollars for contractors in the shin-plaster way intended, to negotiate with some respectable London firm for the whole job at a million sterling. The public will have every confidence that the money is not squandered, and that the improvement will be done in a workman-like way.

The proposed works are the following:—

	Piastres.
New Men's Hospital	4½ millions.
New Cemeteries	3 "
New Law Courts or Cabildo	2 "
Paseo Julio decorated	2 "
Plaza Victoria	1½ "
Lunatic Asylum	1 "
Lazzaretto	2 "
Taving the Suburbs	5 "
New Plaza	1½ "
Repairs (old) Men's Hospital	1 "
Town-hall	½ "
Total	24 "

Besides the sum of 69,000*l.* already laid out on the waterworks, the estimates for extending the water supply, and draining and paving the city, are:—

Waterworks	£ 35,000
Drainage	839,748
Paving	178,571
	£272,317

Mr. Oogblau's waterworks are said to be a great success.

THE TREATMENT AND UTILISATION OF SEWAGE.

THE Hon. Secretary to the Committee of the British Association on the Treatment and Utilisation of Sewage, Mr. G. F. Barnes, has issued a circular in which he sets forth the circumstances under which the committee were appointed, at the meeting of the British Association at Norwich, for the purpose of reporting on the treatment and utilisation of sewage. Through the kindness of her Majesty's Government, the committee have been enabled to obtain reports respecting the methods of dealing with town refuse practised in most civilised countries, and information has now been collected in a more complete form than hitherto existed in any country. This preliminary work having been completed, the committee was reappointed at the meeting of the Association, this year at Exeter, and they now propose to investigate the entire subject in all its bearings,—whether chemical, physiological, or engineering, sanitary, municipal, or agricultural,—and in a manner worthy of the body they represent. Properly to carry out such an inquiry to a practical end, numerous observations, gaugings, and experiments, aided by simultaneous analyses, are essential; and these cannot be accomplished, especially the analyses, without the continued aid of efficient and therefore highly-paid assist-

CHERTSEY CHURCH.

The old parish church was re-opened on the 2nd inst., after a complete internal cleansing, and restoration of the nave and chancel, and repairs of the roof, at a cost of £1,300. The ground-floor of the nave has been re-seated throughout in oak; the galleries in the nave, which contain private pews held under an Act of Parliament, have been repainted, and the pews in part cut down. A new pulpit by Messrs. Farmer & Brindley has been erected at the cost of Mr. T. J. Worthington. Messrs. Herring & Son, of Chertsey, presented the hot-water heating apparatus. A recess in the east wall, with columns of Devonshire marble, and oak seats for the choir, have been put in the chancel, the ancient oak roof of which has been thrown open by removing the ceiling. The floor of the chancel has also been raised.

The nave was built in a curious manner in 1808. Across the church, at a point where the columns and buttresses were designed, strong oak beams were laid resting upon wooden frames, and on these stout posts of whole timbers were erected, which carried the massive wooden roof and plaster vaulted ceiling. Rumour says that the contractor then drew the money that was due on "covering in" the building, and disappeared. The walls were afterwards built so as to enclose the nave, and the external upright timbers were encased in the buttresses.

The work has been executed by Messrs. Doye, Brothers, from the designs and under the superintendance of Mr. Bishall, of London.

AUCTIONEERS AND PUFFERS.

GILLIAT V. GILLIAT.

The question in this case, tried in the Rolls Court, was of interest to auctioneers and others having to do with sales of land by auction. An estate in Sussex was offered for sale by auction by Messrs. Norton, Frist, Wainey, & Co., subject to a reserved bidding fixed by the judge, and this was stated in the conditions of sale, in compliance with the requirements of the Sale of Land by Auction Act, 1867. Mr. Bridges, to whom the estate was knocked down for 29,000*l.*, having found out that a "puffer" was employed, although no right of bidding on behalf of the above Act, took out the summons to the provisions of the Act, which was now adjourned into court. It was proved that a "puffer" had been employed, who had bid on himself and made in all four bids, though he did not go beyond the reserved price.

Sir Richard Baggeley, Q.C., Mr. Jessel, Q.C., Mr. Whitehorse, and Mr. Langworthy appeared in the case. The Master of the Rolls said that the Act was clear to the effect that sales should be void in equity as well as in law where a "puffer" was employed, although no right of bidding on behalf of the owner was reserved. The sale must be set aside, and the deposit returned.

CHURCH ARRANGEMENT.

Sir,—May I venture to suggest that "Galilee" is the proper term for the western entry of Inverness Cathedral (which resembles the plan of Melbourne Church) rather than "narthex," or "cloister," both of which are inappropriate. The word "chantry" is evidently an oversight on the part of the architect, in conjunction with a vestry, or any sacred building of the reformed church.

May I urge, in unison with Dr. Rawson's letter, how desirable it would be to have a large organ set free for music adapted to its capabilities, and a small choir-organ to accompany the chanting, psalms, services, and anthems, near the choir. At Meaux Abbey, in England, such was the custom before the Reformation, and in the north of France it is still observed. The huge organs now in vogue are utterly out of proportion to the size of the choir of singers, whom they overpower, and are too often insisted upon merely for the sake of display in performing elaborate music. They occupy a great amount of space, and constitute a piece of furniture for which it is difficult to find room.

MACKENZIE E. C. WALKOTT.

THE LEEDS VOLUNTEER ARTILLERY HEAD QUARTERS.

A BUILDING for this purpose is about to be erected on the drill-ground of the Leeds Volunteer Artillery, Fenton-street, in that town, from the design of Mr. James Fox, C.E.

It will include on the ground-floor:—Drillshed, (inside) 120 ft. by 83 ft.; armourer's shed, 18 ft. by 18 ft.; armoury, 30 ft. by 18 ft.; adjutant's room, 18 ft. by 17 ft.; orderly-room, 18 ft. by 17 ft.; non-commissioned officers' room, 17 ft. by 15 ft.; harness-room, 15 ft. by 10 ft.; sitting-room, 18 ft. by 13 ft.; kitchen, 15 ft. by 13 ft.; and on the first floor,—mess-room, 45 ft. 6 in. by 18 ft.; quarter-master's store-room, 59 ft. by 17 ft.; vestibule and stairs, 18 ft. by 15 ft.; officers' room, 17 ft. by 15 ft.; dressing-room, 15 ft. by 10 ft.; bedroom, 18 ft. by 13 ft.; ditto, 15 ft. by 13 ft.; promenade, 18 ft. by 10 ft.; balcony, 30 ft. by 4 ft.; band-room (in open yard on ground), 25 ft. by 16 ft.; two rooms in tower, each, 12 ft. by 8 ft.

The building, which will be of stone, and with some pretensions, professes to be Norman in

style, with tower over an open porch in centre, the whole desperately battlemented. While we are glad to recognise the evidence such a building shows of a liberal spirit, we cannot refrain from expressing a hope that the design may be revised before it is put into stone. The proposed building on paper has a toy-like, not to say gaudy, aspect.

EUSTON SQUARE.

Poor Euston-road is losing one of its lungs. The north lung—in other words, the northern part of Euston-square, to all appearance, in the hands of the railway company; boarded in, dug into, and cut about, and I am afraid not to improve the breathing of the inhabitants. Some say it is for a road to the station; the deep digging appears to say no to this. Others think it is for the station itself. What do you, Mr. Editor, say? Can it be possible that the central third part of that side of the square is to give way to another monster building, both in size and look, as the one a little higher up the road? To stop it I am afraid is too late, according to the saying, "that possession is nine parts of law;" then I ask, how many points has law? Perhaps the railway will answer, "Nine, only; and we have them all." I long to hear what is to be this new feature in our street despoilation.

FOR TAKING STAINS OUT OF WHITE MARBLE.

In answer to your correspondent's inquiry, as to the most effective method of taking stains out of marble, I have generally found the following recipe the most effective, viz. :—

- 1 gall.
- 1 wineglass of soap lye.
- ½ wineglass of turpentine.

Note.—The mixture must be made into a paste with a little pipe-clay. Spread the marble with this, which should not be removed for a few days, and if on wiping it off the object is not effected, a second application will generally be found sufficient.

GEORGE HAND.

"CABBY" IN LITCHURCH.

At the usual monthly meeting of the Litchurch Local Board, Mr. Thompson, the chairman, referred to the recent endeavour of the Board to get the Midland Railway Company to provide shelter for the cabmen at the station, and said that he had noticed a paragraph in the *Builder*, which stated that the experiment had been tried in Edinburgh, where an erection for the accommodation of the cabmen at one of the stands had been raised by public subscription, and had been attended with good results. Cabmen, in consequence of their exposure at the cab-stands to all kinds of weather, were great sufferers from consumption, acute chronic rheumatism, and bronchitis, aggravated by their intemperate habits, which, there could be no doubt, were indulged in under the (greatly mistaken) belief that intoxicating liquor was a great preventive against cold. The *Builder*, he was glad to say, hailed with pleasure this movement in favour of poor "cabby."

Mr. T. Roe, jun., had no doubt some good would result from their late application to the Midland Railway Company, and that even in Derby something would ultimately be done to provide shelter for the cabmen.

COMPETITIONS.

Bexley Church Competition.—The committee for building a church at Bexley Heath are obtaining for themselves an unenviable notoriety. After receiving designs from Messrs. Walford & Eville, and Mr. Hewitt, they invited a competition, to which 79 architects responded, from amongst whom they then selected the following gentlemen to re-compete, the majority of whom, if not all, sent in drawings:—Messrs. Joseph Hewitt, H. W. Burgess, C. H. Cooke, Walford & Eville, Price & Linklater, Wigginton, E. L. Blackburne, Drury, Goodchild, Knight, Joseph James, and T. E. Knightley. A pledge had been given that the committee would call in an architect to assist them in their selection, and Mr. W. Burgess was appointed by them to do so. This gentleman selected three as best deserving consideration, the mottoes being "*Veritas vincit*" (1); an oval with orb and cross in it (2); "*Simpler sud*

Veritas" (3). The committee, however, by a narrow majority, threw overboard the three named by their referee, and have, we believe, made a selection for themselves. At any rate, the honorary secretary, Mr. Blyth, resigned his office, as his predecessor in that office, we understand, had done before.

Ventnor Cemetery Competition.—The designs selected by the Burial Board have been rejected by the Bishop-Elect of Winchester, his lordship requiring the buildings to be detached. Mr. Newman, the architect, has, therefore, been instructed to so modify his plans as to comply with the hishop's requirement, and the consequently altered views of the Board now is to have two distinct but uniform chapels, one placed conveniently on the consecrated ground, and the other on the unconsecrated portion.

Printers' Almshouses.—We mentioned the decision of this matter last week. Considerable dissatisfaction is expressed on the ground that Mr. C. Bell's design was not selected as the best, but that by a small majority he was appointed architect to carry out the work. Every competition appears to bring its scandal.

THE ARCHITECTURAL EXHIBITION SOCIETY.

A STRONG appeal is to be made to the profession generally for earnest support to prevent the collapse of this institution,—in the proper maintenance of which all are interested. We shall hope to find it responded to with warmth.

FROM NEW ZEALAND.

Dunedin.—A Presbyterian church is now in process of erection at Dunedin, the capital of the Scottish colony of Otago, on the south-east side of Middle Isle, or New Munster. The edifice is called the new "First Church." It occupies a prominent site in the centre of the city, within a large reserve set aside for church purposes at the time the province of Otago was first colonised. The foundation stone was laid by Dr. Burns, who accompanied the first colonists, in 1848, to their new home in this distant isle. The length of the building now erecting is, over all, 173 ft., its width 91 ft., and its height inside from the floor to the top of the exposed work, 51 ft. The tower in front is 20 ft. square, independent of the buttresses, and its height 180 ft. About 50 ft. of the rear end of the building, at a reduced width, is intended for a lecture-room. The church is being built of white stone, known as Oamaru stone, with inside lining of brick. The cost is 11,000*l.*, and when completed the church will be the largest ecclesiastical structure in New Zealand. The building was begun in January, 1868, and its walls are now some 12 ft. above the foundation. The architect is Mr. R. A. Linton; and the contractors are Messrs. Hunter & Goodfellow.

CHURCH-BUILDING NEWS.

Bampton.—Clanfield Church has been for many months closed for repairs and restoration, and has been re-opened. The plans for restoration were drawn up by Mr. John Laker, of Faringdon; the contractor for the church was Mr. Smith, of Highworth, and for the chancel Mr. H. J. Clinch, of Charlton, near Islip, son of the churchwarden of Clanfield.

Ryde (Isle of Wight).—The new parish church is making satisfactory progress. When the corner-stone was laid on the 4th of August last, the walls were up to a level with the top of the plinth. Shortly after the ceremony had taken place, Messrs. Jackson & Shaw, the contractors, made an offer to the committee to substitute Swanage stone for the facing to the walls, in lieu of Binstead rag and lime stone, which were specified to be used. Their motive for making this offer was understood to arise from a desire to push on the works faster than they would be able to do with the limited supply of stone from the Binstead quarries, which may be said to be now all but worked out. Mr. Scott having reported favourably of the qualities of Swanage stone, which had been used by him some years since in the restoration of Chichester Cathedral, the committee accepted the offer of the contractors, who have pushed on the works with vigour. The walls are carried up to a considerable height; those of the north aisle to a level with the springing of the window tracing.

The nave piers, with their capitals, are also fixed, as well as the responds of the tower and chancel arches. The latter show a contrast by the introduction of red Mansfield stone for the columns, or shafts, supporting the capitals. The committee have it under their consideration to proceed with those portions of the church which were not included in the present contract. Efforts must be made, however, to raise the necessary funds. Mr. Bindley is acting as Mr. Scott's representative in the superintendence of the work.

Hunslet.—The new church of St. Silas, at Hunslet, has been consecrated by the Bishop of the diocese. The foundation stone of the new edifice was laid in July of last year, since which time the work of erection has been rapidly pushed forward by the Leeds Church Extension Society, who have defrayed the entire cost, supplemented by some pecuniary aid from kindred associations. The new church of St. Silas consists of nave, aisles, and chancel, with organ-chamber on the south, and vestry on the north, side of the chancel. There are also at the west end two porches, entering from the north and south respectively. The nave is divided from the aisles by an arcade of five arches on each side, supported by pillars, alternately round and square, on plan, with moulded bases and caps, the former being visible above the seats, not hidden by them as is usual. The space that otherwise would have formed a sixth bay to the west end is occupied by doors from the north and south porches. The chancel is finished as an apse of five piers, with a single-light lancet window in each, and stone shafts in the angles, with bases corbelled out from the wall, bands and carved caps supporting the ribs of the roof. These ribs form pointed arches spanning the chancel, and meeting in a carved boss at the centre of the apse. They are each formed in several thicknesses of deal, and are bolted to the tie-beams and rafters of the principals, so as to form an additional tie or brace. The spaces between are boarded to the sawn curve so as to form a vaulted ceiling. The chancel arch, between the nave and the chancel, springs from the caps or pillars corbelled out from the wall on each side. The caps are carved with natural foliage, the fern being used on one side and the maple on the other. The corbels are formed as shields, bordered with foliage; the emblems of the Fall are carved on the shield on the north side, the emblems of the Redemption on the shield to the south. The organ-chamber has an arch opening into the chancel and one into the aisle, and the vestry has a similar arch towards the chancel, with a screen framed in pitch pine rising to a certain height. The fittings of the chancel are all of pitch pine. The other fittings of the church are all of red deal, and the whole are varnished. The font is of Caen stone, the bowl being octagon on a circular shaft. The floors of the porches, passages, chancel, &c., are laid with Staffordshire tiles, in red and blue. The church is heated throughout by hot-water pipes laid in grated channels in the floors; and it is lighted by large gas brackets over each pillar, smaller ones between the windows of the aisles, and a corona suspended from the boss of the chancel roof. The west end of the church has two tall narrow windows, with circles in the heads; and a centre buttress, with a circular window over it, quatrefoil. Over these stands the belfry, with steep gable and iron cross, the body being pierced with a double arch and circle, within a larger arch. One bell, weighing 3 cwt., has been supplied by Messrs. Taylor, of Loughborough, and hangs in one of the smaller arches. The aisle windows are three-light, within one arch, the spandrel being filled in with a large cusped circle. Those of the clearstory are two lights, within one arch, and a circle in the spandrel. The glazing is throughout in lead, the heads and circles being treated geometrically, and halions used in those of the aisle windows; but the lower portions are in rectangular quarries, within a border. The principal dimensions are as follows:—Nave, 32 ft. by 29 ft. 6 in. between bases of pillars, and 62 ft. high to ridge; aisles, each, 79 ft. by 11 ft. 6 in. from wall to pillar, and 24 ft. high to ridge; chancel, 33 ft. 4 in. by 24 ft., and 53 ft. high to ridge; organ-chamber, 14 ft. 6 in. by 12 ft.; vestry, 24 ft. by 15 ft.; porches, each, 12 ft. by 10 ft.; belfry, 90 ft. high to top of cross. The contractors for the various works are as follows:—Messrs. Longley & Sons, for mason work and joiner work; Messrs. Watson & Wormald, slaters; Messrs. Dawson & Son, plumbers (for whom Mr. T. Wilson did the glazing in lead); Mr. Miller, plasterer; Messrs. Galloway & Son,

painters; Messrs. Heaps & Robinson, for heating apparatus and embit work; Messrs. Mawer & Ingle, carving and font; Mr. Kidney, lightning conductor,—all of them being Leeds tradesmen. The gas-fitting, locks, hinges, and cross were supplied by Messrs. Charles Smith & Sons, of Birmingham; and the tiles were laid by Messrs. Charles & Taylor, of Leeds. The chancel floor within the rail, and a broad footway from the nave up to the rail, are covered with a carpet designed by the architect, and made by Messrs. Wilkinson & Co., of Hunslet, who have given it to the church. The architect was Mr. Corson, of Leeds, who also designed and built for the society St. Clement's Church, Sheepshead, which was consecrated in September, 1858. The organ is being built by Messrs. Radcliffe & Sagar. It is blown by a patent hydraulic engine. The cost of the church, exclusive of the site and the organ, will somewhat exceed 4,100l. The edifice will afford seating accommodation for 700 persons.

Brackley.—The Brackley Chapel of St. John and St. James (known as the College Chapel) has been opened to the parishioners of Brackley, after having been closed for nearly thirty years. The chapel is the only relic of the Brackley Hospital or Monastery of the Knights' Hospitalers of St. John of Jerusalem, at Brackley,—a religious house of very ancient foundation, which afterwards passed to Lord Lovell, and eventually to Magdalene College, Oxford, the present proprietors. The work of restoration, which commenced in April, is now completed. The work has been carried out under the plans of Mr. Charles Buckridge, of Oxford and London, architect. Mr. Nurse was clerk of works.

Smethwick, near Birmingham.—St. Paul's Church, West Smethwick, has been re-opened by the Bishop of Wellington, New Zealand, after undergoing some important alterations. One of the principal features in the recent improvements is the roof, which is entirely new, and contains a considerable amount of ornamental and constructive detail. The interior has been thoroughly remodelled and beautified. The church is lighted at night by means of eight gasaliers suspended from the roof. The whole of the work has been carried out from the designs and under the superintendence of Messrs. T. C. & J. P. Sharp, architects, Birmingham.

Barnard Castle.—The general committee for the restorations of the parish church have reported that the works have thus far progressed satisfactorily. The foundations of the walls and pillars in the nave and aisles, being found very bad and insecure, have been underpinned and rebuilt where needed, the surrounding accumulation of earth removed, and stone channelling laid outside the walls to convey away the water and prevent damp. The outer and inner walls have been and will be repaired, restored, strengthened, and cleansed, and new windows, where needed, introduced. The lead and oak roofs, being found in a decayed and dangerous state, have been entirely taken off and renewed. The unseen had condition of the roofs and foundations has occasioned a considerable and unexpected increase of expense. The chancel is being restored by Trinity College. In reference to the ancient steeple, it was hoped that if repaired in some defective parts, it might stand; and therefore the estimates included a small sum only for underpinning and repairing the buttresses, but upon a further examination the steeple was found altogether so insecure in the foundations, and so ruinous and tottering in the foundations, that it was deemed necessary for immediate safety to prop it temporarily with timber until funds be raised to take it down and rebuild it, which must be at once effected. The first estimate for restoring the nave and aisles, and underpinning the steeple, was 1,800l., which is found to be insufficient. The voluntary subscriptions (received or promised) of the principal landowners and others, supplemented by a collection from house to house, and including special subscriptions for the new clearstory windows, amount to 1,959l. 11s. 3d. It is now ascertained that in order to complete the nave and aisles (exclusive of the steeple) the further sum of 700l. is wanted; and that the erection of a new steeple will require 1,000l. more, making together a total of 1,700l. now to be raised.

St. Colomba's Church, Kingsland-road.

We are asked to mention that the roofs of this church are covered with Whitland Abbey green slates.

DISSENTING CHURCH-BUILDING NEWS.

Farsley.—A new Baptist Chapel has been opened here. The building is 90 ft. long by 54 ft. wide, and 40 ft. in height from the ground-floor to the crown of the ceiling, affording room for 1,200 sittings—650 on the ground floor and 550 in the gallery. A lobby 17 ft. by 8 ft., with folding-door and plate-glass panels, leads at each end to the body of the chapel and to the gallery stairs. In the rear of the chapel there are two vestries,—one for the minister, 14 ft. by 13 ft., and the other for week-night meetings, 35 ft. by 14 ft., the latter being convertible into two rooms by a moveable wooden partition when required for baptismal purposes. The ceiling of the chapel is a flat eegment: the roof-beams are dressed and varnished, showing beneath the ceiling. The gallery is supported by ten ornamental cast-iron pillars each 9 ft. 6 in. in height. It is circular in shape at each end, and has an open area in the middle, 48 ft. long by 26 ft. wide. The gallery front is formed into panels, decorated with ornamental trussae painted white and tinted with gold size, and finished with a mahogany capping for books. The pews on the ground floor, as well as those in the gallery, have sloping backs, yellow pine being used for the pews and internal woodwork. Externally the chapel is of Italian design, having a projecting porch at the front 25 ft. wide, consisting of six rusticated piers next the wall, and finished with an entablature and ornamental vase over the piers. Over the portico is an ornamental Venetian window, the remainder of the windows having moulded circular architraves and pediments, with horizontal cornices. A cornice runs round three sides of the chapel, rising into a pediment in front. The chapel stands in the centre of an acre of ground, which is being laid out ornamentally. The architect is Mr. John Simpson, of Leeds. The total cost of the chapel, including the boundary walls, warming, lighting, architect's commission, and legal expenses, will be about 4,000l.

Lanncoston (Cornwall).—A new Wesleyan chapel has been begun in this town, from designs selected in competition by Messrs. Alfred Norman & James Hine, architects, Plymouth. It will be in the Early Decorated style, and consist of nave, with clearstory, aisle, transept, and chancel. Including a small west gallery, the accommodation will be for about 700. It is proposed to build a tower and spire at the north-west angle, and there will be a school and classrooms adjoining the church. The contract account is 3,005l., and Mr. Blatchford, of Tavistock, is the builder.

Sheffield.—The memorial stone of the new Baptist Church, in Glossop-road, has been laid. The edifice is in course of erection on a site immediately above the junction of the Glossop and Northumberland roads, and will be a conspicuous building. The style is Geometric, adapted to suit the requirements of dissenting worship and the peculiarities of the site. The front to Glossop-road presents a large gable containing a tracery window of five lights, beneath which is the principal doorway, which has two openings with trefoil heads, surmounted by a port canopy, are of polished Aberdeen granite, the central shaft resting upon the memorial stone. At the sides of the front gable are the gallery staircases, the one nearest the town being carried up in the tower, which rises to a height of 140 feet, terminating in a pinnacled octagon spire. The arrangement of the doors will admit of easy access to the church, either by steps from Glossop-road or from the level of the side street. The sides of the church have alternately two- and three-light tracery windows, and the roof at the sides is relieved with five gables. The slating is arranged in ornamental patterns. Internally, the ceiling will be boarded. The baptistry, lined with Milton's majolica tiles, will be placed in a chancel-like recess behind the pulpit; and at the side of it the organ is to be fixed on a raised tribune. There are three vestries, respectively for the minister, the deacons, and ladies. Seats are provided for 500 persons in the body of the church, on benches 3 ft. wide, and for 320 persons in the gallery, which occupies three sides, making a total of 820 adults. The internal woodwork will be of pitch pine. The school behind the church is arranged to accommodate 250 scholars in one room, besides which are infants' school-room and six separate class-rooms. The scholars can pass from the school to the church under cover. The care-taker's house con-

lains five rooms distinct from the other parts of the building. The cost of the structure will exceed 5,000l. The contractors for the masonry are Messrs. B. & T. Nelson. Mr. Wm. Dickinson is the clerk of the works. The other contractors are for joiners' work, Messrs. Carside & Shaw; slating, Mr. Ellis; plastering, Messrs. Harrison & Chadwick; plumbing and glazing, Mr. Cropper; and staining, Mr. Jenkinson; warming, Mr. Hydes. The architects are Messrs. Innocent & Brown, of Sheffield. With organ and fittings, the building will probably cost little short of 6,000l., exclusive of the site.

Chesterfield.—The foundation-stone of the new Wesleyan Methodist chapel to be erected on the site of the old one, in Saltergate, has been laid by Sir Francis Lytett, of London. Mr. Edward Taylor, of York, is the architect.

Walthamstow.—The memorial-stone of Trinity Congregational Church, Walthamstow, has been laid. The building is of Kentish rag, with free-stone dressings, and will be capable of accommodating nearly 600 persons. The contract has been taken by Messrs. Dove Brothers, at 3,100l. The total cost will be about 3,800l., and a previous expenditure of 900l., for school-houses, &c., will bring it to about 4,700l.

Tendring.—A newly-erected chapel, belonging to the Wesleyan Methodists, has been opened for public worship in this parish. The building, which is capable of seating 200 persons, together with a school-room, was erected at a cost of 850l., which sum, with the exception of 200l., has been entirely raised by voluntary subscriptions. The design for the building was by Mr. Barnes, of Ipswich, architect; the builders being Messrs. Saunders, of Dedham.

Grantham.—The memorial stone of a new Congregational church has been laid at Cranham. The church is planned to seat upwards of 600 persons, and consists of a nave and two side aisles, divided by painted arches on columns having carved capitals and moulded bases. The design is in the thirteenth-century style of English architecture. The walling is of Ancaster rag, and the dressings are of Ancaster freestone.

Vestries are attached to the church, and schools have been planned in connexion with it. A minister's house is also in course of erection on the same site. The contract for the entire work has been taken by Messrs. Rudd & Son for 3,220l. The architect is Mr. Tait, of Leicester.

Northampton.—The new Iron Chapel for the Independents, which has been erected in Victoria-road, [in this town], at the sole expense of the Rev. E. T. Prust, minister of Commercial-street chapel, has been opened for divine service. The chapel has been erected from the designs of the iron-church builders and engineers, Messrs. Francis Morton & Co., of London, Liverpool, and Glasgow. The principal framing of the church is of timber scantling, covered on the outside with Morton & Co.'s galvanised plates and iron tubes, the roof being also felted and boarded. The main supports are secured to masonry foundations. The ground body of the church is a parallelogram of 57 ft. by 35 ft., with a tower, 60 ft. high, facing the street. The tower is ornamented with finials. The chapel is lighted with Gothic side windows and ornamental circular or rose windows in the gables. Attached to the chapel is a school-room, constructed of the same material. Ventilation is provided for by a double ridge piece, and along the lines of the eaves, and by openings in the windows. The wood-work is stained with oak colour of various tints, and the side walls are finished with plaster. At night the building is lighted with burners suspended from the roof. The chapel is warmed.

Bedford.—During the past ten months a new building has been in course of erection in Mill-street, to supersede the very old and inconmodious chapel, formerly and for many years occupied by Baptists. The work having arrived near completion, the opening ceremony has taken place. The old building being found inadequate it was resolved to purchase the property in the foreground in order that by its removal an increased area might be obtained, with an elevation also to the main street. This having been accomplished, instructions were given to Mr. Usher, architect, Bedford, to prepare plans for the new building at a moderate cost. The design is Romanesque in character. The chief materials used in the structure externally are bricks, stone of several colours, and slate. The front elevation assumes the gable form. The entrance doorways are formed of wrought Mansfield columns on stone bases, with moulded and carved capitals, and extended and continuous frieze, carved; the voussoirs with which the

arches are constructed are in alternate Bath and Dunston stone, with moulded and incised key-stones and moulded label. The central and principal feature of the elevation is a five-light window, constructed with similar materials to the doorways; it is 20 ft. wide and 17 ft. high, with carved capitals and a vandyke frieze extending to each extremity of the front; and above this window is an open arched recess, containing a Bath stone scroll, with raised letters, "Baptist Chapel, erected 1869." The ascent to the chapel is by a flight of stone steps, and the area will be enclosed by a wrought-iron fence with folding gates. The interior of the building is approached through a lobby, at the end of which are stone stairs for access to the galleries. The plan consists of two aisles with open seats, with moulded ends of pitch pine, a book-board, hat-rails, and sufficient space to kneel. The platform is on a slightly raised dais, approached by a double flight of steps. The baptistry is immediately in front of the platform, with a double flight of steps, and is supplied with water from the public works; it is lined with Keene's patent cement, and surrounded by a stone curb. There are galleries on three sides of the building, and an upper gallery for the children over the front entrance. All the timbers are free from plaster, and varnished, and the fronts are of arabesque open work, supported on cast-iron columns with foliated capitals. The roof construction consists of six laminated iron and wood ribs, in the form of an arc, resting on carved corbels. In consequence of the nearness of the surrounding buildings, the architect has implanted an ornamental clearstory, 40 ft. in length, in the roof, composed of thirty-two ogee-headed lights, by which means light is diffused throughout the building, and ventilation effected. The altitude from the floor to the ceiling of the clearstory is 54 ft., and to the external apex it is 58 ft. The number of sittings is 720. The mode of lighting at night is by star burners suspended from the roof. In the rear and on the east side of the chapel there is a commodious suite of school-rooms and class-rooms, with minister's vestry; and in the basement kitchen and store-room, accommodation for tea-meetings, &c. The total cost of the chapel and site is about 2,700l. The builders were—Bricklayers and plasterers, Messrs. Smith & Mercer; mason, Mr. S. Jarvis; carpenter, Mr. John Hull; plumber, &c., Mr. T. Carling; ironwork, &c., Mr. W. W. Kilpin.

Wolverhampton.—The congregation of the United Presbyterian Church are about to erect a chapel adjacent to their school-room, where divine service has hitherto been held, on the Merridale-road. The chief stone has been laid. The general plan of the new building is 75 ft. in length by 48 ft. in breadth, and it will be roofed in one span. The elevation of the west front will be that of a centre gable, with a tower and spire at the north angle, and a staircase wing at the south angle. The height of the tower and spire will be 68 ft. The chief features of the west front will be a central doorway with a grouped four-light and rose-headed window. On each side will be gallery staircases doorways, with single-light window on the second stairs. The building will be faced with Cefn stone. Internally the plan of the sitting on the ground floor will be divided into three bays by two side passages. It is intended to erect galleries, though only a west gallery is included in the present contract. The interior will be ceiled at the level of the wall-plate, a deep cove, springing from the impost of the second tier of windows, being continued all around. The centre of the ceiling will be of an arched form, and the total height from floor to ceiling will be 34 ft. On the south side of the church will be a vestry for the ministers, and hereby also will be out-buildings in connexion with the Sunday School and Lecture-room. The contract has been taken by Mr. Cookerill, of Wolverhampton, builder, for about 2,400l. The architect is Mr. Bidlake, of the same town.

Bolton.—A new chapel in connexion with the Baptist denomination has been opened in St. George's-road, Bolton. It is in the Italian style, with a portico to the front entrance, and around the chapel is a gallery with a semicircular sweep at each end. Accommodation is provided for upwards of 1,000 persons. Beneath the chapel is a school-room, containing eight class-rooms, three of which are obtained by the introduction of a mezzanine floor and balcony at one end. This room will seat 500 children. The architect of the building is Mr. George Woodhouse, of Birmingham; and the contractor Mr. J. Robinson, of Hyde. The total cost, including furni-

ture, has been about 6,500l., of which a considerable sum has yet to be raised.

Walsall.—The Baptist chapel, Stafford-street, has been re-opened for divine worship. The building, the foundation-stone of which was laid by the borough member a few months ago, is an improvement upon the old structure, which stood on the same spot, and part of the shell of which has been made available for the new chapel. The new edifice contains about 750 seats, being something like 250 more than the old building; and in addition to being more lofty than it, it is furnished with open stained pine seats, and is decorated. It is also supplied with commodious vestries, and school-rooms, capable of accommodating 600 children. The work of rebuilding has been carried out by Messrs. Trow & Son, of Wednesbury, under the direction of Mr. G. Ingall, of Birmingham, architect. The cost will be about 1,800l., of which in round figures 1,000l. have yet to be raised.

SCHOOL-BUILDING NEWS.

Bloxham.—The new wing of All Saints' School has been opened. The new wing, as the rest of the buildings, has been erected by Mr. T. Barrett, of Bloxham, after designs of Mr. G. E. Street. It forms the third side of the quadrangle, and comprises on the road level, kitchen, larder, and other offices; and on the ground level of the rest of the buildings, a large dining-hall, 70 ft. by 23 ft., and 18 ft. 6 in. in height, with a lift from the kitchen into it. Above this again are two floors containing dormitories, master's rooms, wardrobe-room, &c., access to all of which is gained by an oak staircase, connected with the old part by a porch and passage as well as by the staircase of the older buildings. The building has been furnished with steam boiler, steam kettles, and hot-water apparatus, by Messrs. Benham & Sons, of London; and with gas-fittings by Mr. Potter, from designs by the architect.

Reading.—The new school-room erected at the rear of the Baptist Chapel, King's-road, has been opened. The building is 60 ft. long by 25 ft. wide and 30 ft. high. The rafters are of stained deal, corresponding with the seats and pulpit. There are two porches, 6 ft. wide, on either side, and three class-rooms beneath. A small iron girder trellis bridge crosses the Holy Brook. The architects were Messrs. W. & J. T. Brown. The site, which was estimated at the value of 150l., was the gift of Mr. J. H. Blagrave, Calcot Park.

Books Received.

Our Iron-clad Ships: their Qualities, Performances, and Cost; with Chapters on Turret Ships, Iron-clad Rans, &c. By E. J. REED, C.B., Chief Constructor of the Navy, &c. With illustrations. London: Murray.

This volume will satisfy public curiosity and respond to an immense deal of public disquisition on the subject of iron-clad ships. The iron-clad ship question is so continually under discussion in the public press, and is justly deemed of so much importance to the country that the publication of further information respecting it appeared to the author to be in many ways desirable; and here it is, and given by the fittest hand to satisfy the requirement. The work forms an appropriate sequel to the author's previous book on "Shipbuilding in Iron and Steel." It frankly and freely discusses the respective merits of our individual iron-clads, and forms a very interesting and important volume. One of the results of its publication, Mr. Reed trusts, will be to induce persons to look a little more closely than heretofore to the true causes of the different performances of the ships, both under steam and under canvas. He considers it not only idle but against common sense and experience to visit upon the designer all those shortcomings which are obviously the consequences of imperfect management. The best seamen in the navy know well that ships perform very differently in different hands. "It is only those who have combined great ability with great devotion and professional love of their work who have been eminently successful in establishing that delicate and beautiful relationship between the ship, the sails, the helm, and the wind, which is essential to great success in this branch of the sailor's art."

The volume treats in separate chapters on the varieties, the armour, armament, structure,

steaming, sailing, rolling, dimensions, forms and proportions, and cost of the iron-clad; also on turret ships, iron-clad rams, and the conversion of line-of-battle ships into iron-clads. There is an appendix on the stability of Monitors under canvas.

Miscellaneous.

Prehistoric Monuments of the Channel Islands.—At the meeting of the International Congress of Prehistoric Archaeology, held last year at Norwich, a committee was formed for the purpose of inquiring into the present condition of the prehistoric remains in the British Isles. Subsequently the functions of this committee were transferred to the Ethnological Society, and the first fruits of its labours in this direction have just appeared in the shape of a valuable report on the prehistoric monuments of the Channel Islands, prepared by Lieut. Oliver, R.A., and read before the society. The Channel Islands are remarkably rich in megalithic structures of noble proportions, but from their unprotected state they have for the last fifty years been subject to the most ruthless destruction. No only have they been demolished by the hands of the navy and of the more treasure-seeker, but they have also suffered considerably from injudicious attempts at restoration. The report is divided into chapters, treating successively of the remains in Guernsey, Herm, Sark, Jersey, and Alderney. Lieut. Oliver alluded to the resemblance between many of these megalithic monuments, and those in Madagascar, erected at the present day by the hill tribes of Hovas. Other reports on our prehistoric structures are in preparation, and will probably be submitted to the society at an early date.

Costly High Altar in New York.—St. Stephen's is the largest of the Roman Catholic churches in New York, and has been erected at great cost. The correspondent of the *Morning Post* describes the completion in of a high altar of white marble, costing 35,000 dollars, with two side altars of the same material. The grand altar is 45 ft. high, and is a magnificent temple in itself. It has been executed by artists of great skill and taste, and I have seen nothing here or in Europe which is superior to it in beauty. Above and behind it, filling the entire space to the roof of the chancel, is a colossal painting of the Crucifixion, by Bramidi, an Italian artist well known in the States, and who has in this painting, despite some glaring faults, achieved a wonderful work. The paintings above the side altars, of the Blessed Virgin and St. Joseph, are by the same artist, and represent the Immaculate Conception and the Martyrdom of St. Stephen. Throughout the rest of the church, in niches, are the figures of five female and five male saints; and the roof, arched and groined, and supported by groups of delicate and graceful columns, is a heaven of blue, studded with golden stars.

The Site of Trajanopolis.—The often sought-for site of the Roman city of Trajanopolis has recently, it is said, been discovered. The remains have been found in an extensive marshy district near Eaos, a league and a half from Dymes, at the mouth of the Hebrus. That these are really the ruins of Trajanopolis is supposed to be proved by an inscription found on a stone built into a monument being in exact accordance with the position assigned to the city in ancient books of travel. The ruins are very extensive, and a mere cursory inspection shows that an acropolis formerly existed there, the remains of edifices of the third century, consisting of architraves, broken columns, pedestals, and some inscriptions, fully establishing this.

The Serpentine.—A correspondent writes,—"Can any one of your numerous readers inform the remainder what is being done, and to what end, at the Serpentine in Hyde Park? You may pass week after week, and see the same men shovelling the same mud into a heap, to be shovelled into another heap, and so on, to all appearance *ad infinitum*. Truly, it does seem queer. Why was it not made publicly known what was to be done in detail, and the number of weeks it would take? The public would then have been prepared, and would not grumble as they now do, knowing nothing of the curious process.

The Suez Canal.—Mr. C. Clarke, President of the Liverpool Chamber of Commerce, has read a paper there on the "Suez Canal," from which he has just returned. Mr. Clarke's conclusions are that, as regards either to fill up Said, it may be necessary either to fill up permanently the interstices between the blocks which form the western breakwater, or dredge away the bank as it is formed. Either course is practicable, and may be taken at a moderate expense. With respect to the injury of the banks by wash, it may be necessary, in several portions of the canal, to reduce the slope of the banks, and to pitch them with stone to a height of 2 ft. or 3 ft. above the water line. This is already being done between Suez and the Bitter Lakes. There are inexhaustible supplies of stone in the mountains near Suez, and the cost of transport now would be trifling. The fear of the canal drying up by evaporation Mr. Clarke regards as chimerical. The filling of the canal by shifting sands is a real danger, though greatly exaggerated. Of the hundred miles which form the entire length of the canal, about 57 miles are made through lakes which have existed as natural basins for at least 2,000 years without being filled with sand. Of the remaining 43 miles the greater part consists of a mixture of sand and gravel, in consistency resembling a garden walk. The enormous dredging-machines will dredge out in a month all the sand which is likely to be blown in a year. The cost of maintaining the canal when completed, an eminent English engineer on board estimated at 60,000l. per annum. As regards the prospects of the canal as a paying investment, Mr. Clarke confesses himself unable as yet to arrive at a satisfactory opinion.

Death of Mr. George Smith, C.E., Belfast Harbour Engineer.—Mr. George Smith, C.E., was for twenty-four years the resident engineer of the Belfast Harbour, and during that long period of active service did a large amount of work. He was an Englishman, and was appointed Harbour Engineer in 1839, on the recommendation of Messrs. Walker & Burgess, the engineers, who at that time designed some improvements in the harbour. Mr. Smith was previously engineer of the Leeds and Selby Railway. It was under his superintendence that the new cut at the Queen's Island and the channel between the Twin Islands were formed, the contractor being the late Mr. Dargan. The Queen's Quay, Clarendon Dock, and all the timber wharfs on the Down and Antrim sides of the river, were also constructed under his superintendence. He was the architect of the new Harbour Office; he designed the lighthouse on Holywood Bank, and all the great improvements in the harbour of Belfast completed during the past thirty years, were carried out under his management. From failing health he became unable to continue the more active duties of his office, and in 1863 he was appointed Consulting Engineer to the Harbour Board. For some time past increasing infirmities and age proved too much for him, and on the 3rd he expired at the age of seventy-seven.

Gift of a Public Park to Warrington.—Colonel Wilson-Patten, M.P., who resides in the town, and is a large landholder, has expressed his intention of presenting the borough with eleven acres and a half of land to be used as a public park for the people. The right hon. gentleman added that his property had so increased in value lately, owing to the prosperity of the town, that he felt himself compelled to do what he proposed to do, so that the inhabitants of the borough might enjoy the benefit of a public park, and participate in the benefit of Colonel Patten wishes that the land should not be laid out as an ornamental park, but left open for purposes of recreation and out-door amusement, stipulating that the Militia and Volunteers should have the use of it as a drill-ground. The mayor and corporation have expressed the gratitude of the inhabitants, and formally recorded their feelings, upon the minutes.

The Ventilation of the Law Courts.—It is asserted that the death of Mr. Justice Hayes was accelerated by the foul air of the court over which he presided. Whether this be true or not, we know, and have often pointed to the fact, that the atmosphere of the law courts is very far from being as pure as could be desired; in truth, at times it is little less than pestiferous. We have here an additional reason for the speedy erection of new courts.

The Cooke Memorial, Belfast.—The committee of May-street Church, where the late Dr. Cooke preached, have given the erection of his memorial to Mr. John Robinson, of Belfast. It will be a mural monument, and will be erected in the vestibule at the sides and over the door leading into the central aisle, and will be 23 ft. long by 15 ft. high. There will be a pedestal long by 15 ft. high, and on each side, of red Peterhead granite; and on each of these will rest two Corinthian columns each of these will rest two Corinthian columns each of Carrara marble, about 9 ft. high, surmounted with an entablature of similar marble. Surmounting and showing breaks over columns, will be the door, and from door to columns, will be verde antique marble, and to columns, will be columns will be white marble slabs, eventually intended to be filled in with sculptured bas-reliefs, and over the panels will be carved festoons. The columns and entablature will be after the best examples of ancient Roman work, the various members of the entablature being carved; the frieze, also, and other parts, will have carved ornament. The cost, when completed, will be over 500l. The design and working plans have been supplied by Mr. J. Boyd. Messrs. Boyd & Batt are the architects.

Local Taxation in the Metropolis.—An elaborate return, in a tabular form, has been prepared by Mr. John Pollard, clerk of the Metropolitan Board of Works, "showing the total amount of local taxation in the metropolis for the year ending March, 1867 (including the poor, county, and police rates, and the amounts raised to meet the precepts of the Metropolitan Board of Works); the rateable annual value of property in the metropolis according to the county and poor rate bases, with the rate in the pound on each of those rentals; also the population, the area in statute acres, and the number of persons per acre according to the last census (1861). We may give a few of the totals and averages. The population was 2,808,941; the rateable annual value, as per county-rate, 16,196,547l.; as per poor-rate, 16,019,895l.; the total amount of local taxation by various authorities, 1,526,843l. 10s. 3d.; rate in the pound, as per county-rate, 1s. 10d.; poor-rate receipts, 1,683,750l. 17s.; rate per pound, 2s. 1d. Mr. Pollard has performed well a very laborious work.

Windsor Parish Church.—The foundation-stone of the new chancel of the parish church of New Windsor was laid on Monday by her Royal Highness the Princess Christian. The proposed work consists of a new chancel, the reseating of the interior, and such other alterations, both in the exterior and interior, as will bring it more into harmony with the present character of ecclesiastical buildings. The entire scheme of the new chancel will be a considerable enlargement of the church. The cost of the entire scheme is estimated at about 8,000l.; but at present only a portion of the erection of the chancel and organ chamber, the reseating of the church, and the reconstruction of the western gallery, which has been contracted for by Mr. Kelly, builder, of Windsor, for 4,168l. The chancel will be proceeded with during the winter without interfering with Divine worship.

The Accident at King's College and the Metropolitan Board.—At the usual weekly meeting of the Board, a letter was received from Mr. Cunningham, secretary to King's College, dated December 6th, stating that on that morning a most alarming accident had occurred at the college, in consequence of the works which had been going on with the Embankment and railway. A large portion of their terrace had fallen, carrying away the dining-hall and kitchen; but happily no loss of life had occurred. Had it happened at one o'clock, 160 lives might have been lost. The solicitor to the Board had replied that no works had been executed by the Board near there for some years, and they were in no way responsible for the accident. A copy of the letter had been sent to the collectors to the Metropolitan District Railway Company.

A Cordoves National Exhibition.—The rules and regulations of an Exhibition at Cordova (Argentine Republic), in South America, have been issued, and an English form printed at the Standard Office, Buenos Ayres. The Exhibition is to be opened on the 15th of October, 1870. From what is said as to foreign exhibitors, it would seem to partake, to some extent, of the nature of an international exhibition.

The Sanitary State of Paddington.—Practical sanitary hints have been issued in a printed form by the medical officer of health as to the best measures for preventing the spread of the "catching" or epidemic diseases, such as scarlet fever, small-pox, measles, typhus, &c. These hints relate to pure drinking-water, drains, sinks, closets, &c., dust-hins, ventilation, food, the sick-room, infected clothing and bedding, &c.; and particularly as to disinfectants. Of these the medical officer says:—

"The most generally known disinfectants are chloride of lime, Condy's fluid, Burnett's fluid, and carbolic acid. Of these four, Condy's fluid is one which, in all circumstances, is most efficacious and unobjectionable. Its very agent is oxygen, which has no odour, and is the active principle is oxygen, which has no odour, and is the very agent by means of which ventilation and fresh air promote natural disinfection; chloride of lime and carbolic acid require care and experience in management; when used too freely in inhabited rooms, they give rise to irritation of the air passages and lungs, among the inmates. Burnett's fluid and carbolic acid are poisonous as well as comparatively inefficient. . . . By the addition of a small quantity of muriatic acid (spirit of salt), to solution of Condy's fluid, chlorine gas is slowly disengaged in a state of great purity."

The circular is signed "Wm. Hardwicke, M.D., medical officer of health." Poor persons are offered small quantities of disinfectants at the Vestry-hall.

A Convertible Billiard Table.—Many persons would be glad to have a billiard-table in the house, but have not space they can specially devote to it. Messrs. G. & H. Story, of Coleman-street, have devised something that may meet these circumstances, namely, a combined billiard and dining table; and they place among its advantages economy, as the game of billiards can be played on a table costing half that of an ordinary billiard-table, with a large handsome dining-table combined. The dining-table is converted into a billiard-table in a minute by a simple screw movement, which can scarcely get out of order. When raised, the billiard-table is complete and perfectly level, without the least vibration. It ought, of course, to stand on a sound, stable floor.

Worcester Cathedral Clock and Bells.—The peal of twelve bells, and the extra bell required for the Westminster quarter chimes, are now completed, and have been sent to Worcester during the week. Men have been for some weeks engaged in fixing the massive oak frames for their reception in the cathedral tower. The huge beams forming the frame-work filling up the shell of the tower are so constructed as to carry the weight of the whole to the base of the tower, resting mainly upon the four great piers which support that structure, and conveying the thrust as nearly as possible to the ground, so that the stability of the tower may not be affected.

Honorary Work in the City.—At the last meeting of the Court of Common Council, Mr. Isaacs, chairman of the City Lands Committee, presented a report from that body, recommending that Mr. Thomas Henry Fry, Deputy, be presented with a service of plate, at an expense not exceeding 500 guineas, as a suitable mode of testifying the appreciation of that Court for his services throughout the execution of the Holborn Valley Improvement works. The report was adopted with acclamation, and the Court adjourned.

Death of Mr. W. Jones, of Derby.—We hear of the sudden death of Mr. William Jones, of Derby, building surveyor; a gentleman much esteemed by all who knew him, on account of his many excellent traits of character, both in business and social life. Mr. Jones was the brother-in-law of the Derby borough surveyor (Mr. Geo. Thompson, C.E.). The professional skill of the late Mr. Jones was estimated at a very high rate, both by the master builders and operatives of his neighbourhood.

The St. Petersburg Exhibition, 1870.—There seems to be some misconception afloat concerning this Exhibition. It has been announced officially that the Exhibition is to be strictly Russian, not international; and yet we have received from America full particulars of the arrangements that are being made by the different States to send to it suitable specimens of their produce. Commissioners have been selected to attend the Exhibition. How are the two accounts to be reconciled?

The Slade Professorship, Cambridge.—Sir M. D. Wyatt has been elected to the Professorship established under the will of the late Mr. Slade. What is the London University doing in the matter?

Wonders in Wine.—At the last sitting of the Academy of Science a paper was received from Dr. Scoutetten on a curious effect of electricity on wine. The house of a wine-grower at Digne (Basses-Alpes) was struck by lightning a few months ago. The fluid penetrated into the cellar and broke several casks, the wine of which flowed into a small vat which was purposely sunk into the floor to receive any liquid by accident spilt. The proprietor, thinking his wine was spoiled, at first sold it at the rate of 10 centimes a litre; but on tasting it some time after, found it excellent, and sold it at 60 centimes. Struck with the curiosity of the occurrence, he asked Dr. Scoutetten whether he could explain it, and was told that it could only be the result of electricity, a proposition which should be tested by direct experiment. This was done, and succeeded to such an extent that absolutely bad qualities have been transmuted into valuable drinks. To perform the operation the wires of the voltaic pile were tipped with platinum, to which were attached electropes of the same metal, and both dipped into the liquid to be improved.

Utilising Waste Heat.—Mr. E. Crowe, of Middlesbrough-on-Tees, employs a boiler of two horizontal tubes arranged one over the other, and connected by a number of upright tubes arranged at short distances apart along the horizontal tubes. The water-line of the boiler is at the diameter of the upper tube or thereabouts, and the boiler below this line is inclosed in a chamber of brickwork, into which at one end the products from the furnace enter, and which, at the other end, is connected with the chimney, so that the chamber is, in fact, the flue of the furnace. The sides of the chamber at the level of the vertical tubes are corrugated so as alternately to approach and recede from the vertical tubes, so that the draught is caused to pass in an undulating direction. This causes it to impinge more effectually on the vertical pipes, and at the same time sufficient space is obtained for a man to pass through the chamber to clean it from time to time.—*Mechanic's Magazine.*

Roman Remains, Maidstone.—Some interesting Roman remains have recently been found in Maidstone. As some workmen were lately trenching in the grounds of Mr. Fanchon, Upper Stone-street, they struck upon a hard foundation which appeared to be ancient remains. Before they had proceeded farther with the excavation, Mr. Lightfoot, the curator of the Charles Museum, was called to the spot, and on a careful examination found that they were strictly Roman remains. Subsequently, Mr. Roach Smith examined them, and fixed the date at A.D. 300, or a little later.

Polytechnic Institution.—Last week Dr. Brewer, M.P., distributed the prizes and certificates to the successful candidates connected with the evening classes of this institution. The Prince Consort's prize was won by W. J. Wilson, who also took many others. This was the second occasion upon which this prize had been carried off by a member of these classes. Thanks to the chairman, to Professor Pepper, and the Rev. Prebendary Mackenzie, M.A., were carried. Some of our readers would do well to inquire as to these classes.

St. Martin-in-the-Fields Library and Reading-room.—The series of meetings arranged by the Rev. R. G. Maul, incumbent of St. John's District Church, Broad-court, terminated on Tuesday, the 14th, with "readings and vocal and instrumental music," affording a pleasant evening to a well-filled room.

The Marquis of Westminster's Statue at Chester.—We regret to hear that the state of the Marquis of Westminster's statue in the New Park, Chester, has led to a communication with Mr. Thorneycroft, from the legal adviser of the corporation, upon the subject.

District Surveyors.—At the meeting of the Metropolitan Board of Works, on Friday last, consent was given to the appointment of Mr. Arthur Allom, by Mr. Kendall, as his deputy, in the district of St. Martin-in-the-Fields and St. Ann, Soho, Westminster.

Aboyne Castle, Aberdeenshire.—Extensive alterations, rebuildings, and additions have just been commenced at Aboyne Castle for the Marquis of Huntly. The architect employed is Mr. George Trefnit, of London; and the builders are Messrs. Warrack & Daniel, of Aberdeen.

TENDERS.

For sewers at Ferry-rale and Catford-hill, for the Lewisham Board of Health:—

Kesbie	25,938 0 0
Kent	5,180 0 0
Deane	4,929 0 0
Beeton	4,800 0 0
Noel & Robson	4,640 0 0
Veery	4,600 0 0
Wignore	4,275 0 0
Gates & Bell	4,249 0 0
Anderson & Son	4,229 0 0
Young	4,220 0 0
Doverwood & Co.	4,177 0 0
Morris	4,168 0 0
Croker	4,100 0 0
Blackmore	4,100 0 0
Clark	3,993 0 0
Parker	3,983 0 0
Bloomfield	3,951 0 0
Hubbard	3,900 0 0
Caruthers	3,830 0 0
Taylor	3,815 0 0
Carter	3,800 0 0
Ford	3,773 0 0
Cole	3,760 0 0
Hayward	3,650 0 0
Porter	2,900 0 0

(Another propositious example.)

For mansion, with stable, &c., at Old Lands, Uckfield, Sussex, for Mr. A. Nesbit. Sir M. Digby Wyatt, architect. Quantities by Mr. H. F. Gritten:—

Watson	216,800 13 4
Card & Sons	14,763 0 0
Asby & Horner	14,513 0 0
Caruthers	14,343 0 0
Trollope & Son	14,140 0 0
Jackson & Shaw	13,467 0 0
Cole & Sons	12,870 0 0
Boers & Booth	12,694 0 0
Cheeseman & Co.	12,301 0 0

For a detached villa residence, museum, stabling, &c., on the Old Manor House Estate, Brixton, for Mr. J. C. Pearce. Mr. C. Sewall, architect. Quantities supplied:—

Jaylor & Pitts	23,914 0 0
T. & A. Wright	3,855 0 0
Staines & Son	3,768 0 0
Obbit & Son	3,763 0 0
Heater & Coates	3,749 0 0
Deaton	3,690 0 0
Wignore	3,400 0 0
Parker	3,355 0 0
Nightingal	3,333 0 0
Cooper	3,285 0 0
Blackmore & Morley (too late)	3,215 0 0
Rankin	3,209 0 0
Rowe & Verrill	3,183 0 0
Stone	3,063 0 0
Perry	3,047 0 0
Cook & Green	2,967 0 0
Pearce	2,923 0 0
Smith	2,828 0 0
Turner	2,875 0 0
Hughesden	2,849 0 0
Brown	2,710 0 0
Gates & Bell	2,650 0 0
Hutchinson (accepted)	2,600 0 0

For offices at Homerton, for Hackney Board of Guardians. Mr. Wm. Lee, architect. Quantities supplied by Messrs. Lindell & Gifford:—

Crabb & Vaughan	25,399 0 0
Newman & Mann	4,765 0 0
High	4,749 0 0
Henshaw	4,727 0 0
Heater & Coates	4,365 0 0
Nightingal	4,467 0 0
Perry & Co.	4,424 0 0
Brown & Robinson	4,410 0 0
Kelly & Sons	4,332 0 0
Blackmore & Morley	4,310 0 0
Webb & Son	4,240 0 0
Hill, Keddel, & Waldram (accepted)	4,145 0 0
Turner	4,219 0 0
Hart	4,100 0 0
Hughesden	4,045 0 0

For Infirmary, North Aylesford Union, Strood, Kent. Mr. M. Bulmer, architect. Quantities by Mr. George Buck:—

Pearson	21,103 0 0
Pink & Co.	1,090 11 0
Church	1,070 0 0
Stamp (Exors. of)	1,000 0 0
Wilkins	967 0 0
Miler	957 0 0
Clemens & Mann	943 0 0
West	927 0 0
Gates	911 9 0
Sollitt	827 0 0
Rowe	809 0 0
Naylor	793 0 0

For bar-fittings, counter, &c., at Dyers' Arms, Cannon-street, for Mr. Guss. Mr. Fred. Sparrow, architect:—Bridgman & Nuthall (accepted) . . . 2,225 0 0

For Infirmary and Hospital Buildings for the Guardians of the Bangor and Beaumaris Union, Mr. R. G. Thomas, architect:—

Thomas & Son	21,569 0 0
Wilkins	1,368 0 0
D. Roberts	1,305 0 0
Griffiths	1,350 0 0
Kyans	1,259 0 0
Rogers	1,223 0 0
Chester	1,193 0 0
R. Roberts (accepted)	1,051 0 0

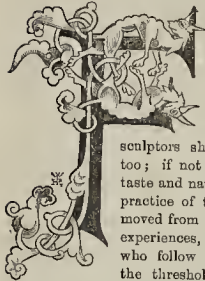
For new roof, &c., to Welsh Presbyterian Chapel, Manai Bridge, for Mr. Robert Davies. Mr. R. G. Thomas, architect:—

B. Thomas	239 0 0
Pritchard	238 0 0
R. Roberts (accepted)	167 0 0

The Builder.

VOL. XXVII.—No. 1403.

The Autobiography of John Gibson,
Sculptor.*



OR the same reason that sculptors should judge a sculptor's work it seems to us those who write of sculpture or sculptors should be sculptors too; if not by profession, by taste and natural feeling. The practice of the art is so removed from everyday life and experiences, and leads those who follow it so far beyond the threshold of the antique

world, that sympathy with the modern one, doubtless, becomes more and more difficult, as proficiency is gained. Hence, we are bound to judge a sculptor as one whose art takes his thoughts into a different sphere of action to that in which most of us live. We were glad, therefore, to learn, that Mr. John Gibson did not leave his biography to accidental authorship, but drew up a sketch of the chief events of his life; and that this outline was to be placed in the hands of the public, edited by Lady Eastlake.

This autobiography is now published. We confess we are disappointed with the work. Perhaps one reason of this disappointment is the fact that Lady Eastlake claims so much for the sculptor, and makes out so little that is really in his favour, save negative qualities. Throughout life Gibson appears to have been the recipient of constant kindness from friend after friend. While still serving his apprenticeship at Liverpool, he was noticed by Mr. Roscoe, invited to his house, and privileged to make use of his superb collections; and directly he arrived in Rome, with the aid of his Liverpool friends, he was received with open arms by Canova. "I am rich," said he; "I am anxious to be of use to you, and to forward you in your art as long as you stay in Rome." Now, with the single exception of Miss Hosmer, the editress has failed to show that Gibson ever aided, or was the means of bringing out, any English artist or foreigner during his forty-eight years' residence in Rome, in return for this supreme obligation. He may have done so; but Lady Eastlake has not seen the responsibility of the payment of such a debt sufficiently vividly to make a point of recording it. Again, his editress claims for the sculptor that he was so above all money-getting considerations that he did not make *replicas* of his subjects. She remarks, "He might have done as other sculptors did, and do (at least, in Rome), and have kept a supply of *replicas* of his most popular works all ready in his studio, for sale to those who like to come, to see, and to carry away,—such *replicas* representing literally so much ready money to a sculptor of established fame. But Gibson refrained from such practice." But when we turn to a list of his works we see *replicas* of most of them were sold by him. The instances in which he made no repetition of a popular work were the exceptions, and not by any means the rule. He made eight repetitions of his "Cupid

disguised as a Shepherd" after he had finished the original; four copies of his Venus; three of his Narcissus; three of his "Hunter and Dog," and a fourth was unfinished in his studio at the time of his death; two of his Pandora; two of his Hebe; two of his "Sleeping Shepherd Boy"; and single repetitions of several others. Lady Eastlake mentions, too, that Gibson's employer in Liverpool, Mr. Francis, sold several of the former's works under his own name; thus several pieces of sculpture are to be seen in that neighbourhood that were in reality the work of Gibson, though now assigned to Francis; but she omits to state that in the galleried ebeds forming the sculptor's studio in La Via Fontanella, there was a staff of *Giovanne* and *formatore* that must have numbered from twenty to thirty members, some of whom probably furnished him the like clever assistance. One of them, Nncol, has since executed the figures for one of the sculptured chimney-pieces in Alnwick Castle, illustrated in the *Builder*,—consequently must have been an adept in his art; and during Gibson's annual long absences from Rome, after he became unable to hear the heat, these assistants must have made much progress without him. Yet she does not hint at the existence of such an establishment, except in one line, where, dwelling on his generosity, she says, "he paid his men not only liberally, but lavishly, making them frequent presents." Nor does the editress make her case good when, to prove the beautiful sincerity and "guileless simplicity" of her subject, she quotes a passage from one of his letters to this effect: "The sons of Adam are very bad animals: the beasts would be as bad as Christians if they could speak." This opinion from one who had been encouraged so kindly by Roscoe, and received such warm welcome and long teaching from Canova, not to bring in other instances in which he was the object of unaccountable assistance and lavish patronage beyond those already mentioned, certainly does not sound well. "Write me as one who loves his fellow-men," cried Alton Bon Adhem to the angel writing in the hook of gold. A second thought on the part of Lady Eastlake, we are sure, would have caused her to give a less questionable illustration of Gibson's amiability.

"If you are to be a sculptor," Mr. Roscoe used to say to Gibson, as he was showing him the contents of his portfolios in his library, on his weekly visits to Allerton, "I must remind you there is but one road to excellence, and that is the road trodden for you by the Greeks, who carried the art to the highest perfection. Michelangelo, with all his powerful genius, missed the purity of the Greeks. But it is their principles established from nature that you should endeavour to imitate." Gibson took this road, so clearly pointed out, kept to it, turned neither to the right nor to the left, and attained excellence, celebrity, and fortune. It was smooth and rendered pleasant by prompt recognitions as he went, as well as by the beautiful ideal who tripped before him. He wrote to Mrs. Sandbach, the granddaughter of Mr. Roscoe, in 1842,— "In my art, what do I feel? what do I encounter? Happiness, love which does not depress me, difficulties which I do not fear, resolutions which never abate, flights which carry me above the crowd, ambition which tramples no one down." And so he travelled onwards, with scarcely more encumbrance than the Greek hat and little cloak with which Cupid was disguised as a shepherd; for he lived and died a bachelor.

The autobiography, curiously, begins with an inaccuracy, which Lady Eastlake corrects in a note. Gibson states he was born at Conway, which is famous for the beauty of its scenery; whereas it was a little hamlet, Gylfin, near that place, that was in reality his birthplace, though his mother and father soon after removed to Conway. They all spoke Welsh; and thought speaking English a very laborious business. But as they after-

wards removed to Liverpool, intending to take passages there for the United States, which intention, however, was subsequently relinquished, English must have ultimately become less foreign to their tongues. The sculptor relates that when his mother, who was a very earnest, passionate, strong-minded woman, saw the great ships in the docks, she formed the most determined resolution never to put her foot in one of them; and as her will ruled the family, the plan of emigrating was given up. Gibson was put to school in the great mercantile city, where he got into trouble with his master, and favour with his fellow-scholars, for drawing, instead of attending to his lessons. But his good luck predominated even in these early days, for the stationer of whom he bought his materials lent him drawings to copy, talked to him of the Academy, and, generally, gave him ideas that he could not have picked up in his little Welsh home-circle. Then he was apprenticed to a firm of cabinet-makers, who ultimately allowed him to cancel his indentures, and place himself with Mr. Francis. He had been but a few months employed in his workshop, when Mr. Roscoe visited it, to order a chimney-piece for his seat, Allerton; and his drawings and models being shown to that friend of art, his kind encouragement commenced. After this, to use a North-country phrase, Gibson never once looked behind him: all was progress with him. His route was pointed out, as we have seen; funds furnished him; and Liverpool, London, and Rome were only so many successive stages to the road that had been trodden by the Greeks; and his adoption of colour in later life was only carrying into effect his ingrained creed that "Whatever the Greeks did was right." Friendly hands were held out to him in many directions, as we have said, from the first. Dr. Voss instructed him in anatomy gratuitously; the family of Mr. Solomon D'Agular cultivated his mind; John Kemble sat to him; and Mrs. Siddons and Sir Thomas Lawrence landed his work, and many copies of it were sold; in London, Mr. Christie, the auctioneer, introduced him to fresh supporters. Fuseli, West, and Flaxman all gave him the strongest encouragement. Flaxman confirmed him in his desire to go to Rome; but Chantrey disapproved of it, saying there was wanting in London requisite for the education of a sculptor. Arrived in Rome, Canova received him as a pupil, giving him instruction for five years; and Thorwaldsen greeted him as a friend, and whenever Gibson modelled a new work came to him and corrected whatever was amiss. Canova advised him to study the Greeks, and to frequent the studios of the other sculptors, "and especially go as often as you can to that of Thorwaldsen: he is a very great artist." This he was enabled to do by virtue of the custom of the sculptors in Rome to visit one another, criticising or admiring work in progress. By and by people came to view his work in like manner. He records first a visit from the Duke of Devonshire in 1819, who tapped at his door and told him Canova had sent him to see what he was about. We will quote Gibson's appreciation of this friendly custom:—

"One of the great advantages I subsequently enjoyed in Rome, was the listening to conversations on art, not only between Canova and Thorwaldsen, but between artists of talent from all countries. In Rome all the studios are open to each other, every man sees another's work, and holds free communion with him, giving and receiving advice, and carrying on the labour of art by a combination of minds. On my return to England, how surprised was I to find that none of the sculptors visit each other in this way, nor does one sculptor consult another in the process of a work. This isolation is one reason, I believe, for the errors in public works, though some of them show talent and power. To advance sculpture in England, it is necessary that the artists should come in contact with each other, and also, if possible, with artists from other countries."

Lady Eastlake arrests the progress of the narrative, to insert letters that throw light upon various passages or elucidate views advanced by the author. Gibson's chief commissions, and the circumstances attending their acceptance and execution, are given. We need scarcely remind our readers that he executed

* Life of John Gibson, R.A., Sculptor. Edited by Lady Eastlake. London: Longmans, Green, & Co., 1870.

two statues of her Majesty, whose graces way on the occasions of her sittings are recorded, and will be read with interest by many. He wrote to Mrs. Sandbach, December, 1846,—“Since my return to Rome, I have given myself up body and soul to finishing the Queen's statue, and have wrought her up as high as possible. My enthusiasm has also carried me beyond the practice of sculptors, for I have added colour. The diadem, sandals, and borders of drapery, are tinted with blue, red, and yellow. Since this statue has been finished, my studio has been constantly visited, and it makes a greater impression than the model did.” A replica of this well-remembered statue was in some danger during the bombardment of Rome; but, during Gibson's absence from the scene of strife, the more martial Wyatt entered his studio, and caused a pent-house to be erected over the work, upon which the shells would have been harmless. An inundation of the Tiber, too, threatened it, without, however, any actual damage. Wyatt and Gibson worked together under Canova; lived for many years opposite to each other; and on the death of the former, we may add, our sculptor placed a monument to his memory. He performed this last tribute, too, to the memory of his brother Benjamin, who lived with him, in Rome, for some years, pursuing classical scholarship. Many such details are related in the narrative; but we must limit ourselves now to an indication of Gibson's impressions of the prospects of art in this country.

“Speaking from an experience of forty years' study and practice at Rome, where I had also the advantage of intercourse with the greatest artists, and most enlightened connoisseurs, I have come to the conviction that one great evil as regards the art in England arises from the class of committees to which the decision in such matters is intrusted. These committees are composed of miscellaneous individuals, united only in the common qualification of having no knowledge of or connection with the art, beyond that which most educated individuals possess. . . . At the Academy of St. Luke (in Rome) the system of competition for public monuments is condemned.”

He would have every young sculptor repair to Rome and place himself under a great master, if he wished to become one. At the age of thirty, by this plan, he ought to be able to commence a work for posterity. And every committee appointed to judge each and all other sculptural works, he would have composed of sculptors, as now arranged at the Academy of St. Luke.

There is a profile outline of the sculptor given in the volume, taken from a bust modelled by Theod. But this, too, is disappointing—not in its beauty, for it is beautiful; but the handsome youth, with the almost Greek features shown, is not the grey-headed artist of La Via Fontanolla. Many persons interested in Gibson have carried away from his studio a remembrance of a quiet, almost languid, elderly, grey-bearded man, in a blouse; wan and worn, perhaps, with the creation of the groups of sculpture with which he was surrounded; and this portrait, fresh and youthful, breaks the thread of reminiscence.

THE ACCIDENT AT THE HOLBORN VIADUCT.

The fair and candid, if not exhaustive, report of Messrs. G. P. Bidder, T. E. Harrison, and E. Clark on the state of the Holborn Viaduct, was received, on the 16th inst., with great satisfaction by the members of the Improvement Committee of the Corporation of the City of London. That feeling will, to a certain extent, be shared by the public at large, and by men professionally interested in the science and art of the builder in particular. The unhesitating testimony borne, by men of such well-established reputation, to the solidity and safety of the foundations of the Viaduct, is matter for congratulation. We thought the matter, as a whole, more serious than they appear to do. We fear it is so still, but we are very glad to hear that they do not find it so. The investigation given by the reporters to the details of the setting of the columns, is, perhaps, from an engineering point of view, the most valuable feature of the report. Much has been said, and much written, on the subject, by more or less competent judges; the voices of the latter, as naturally constituting the majority, having for the most part prevailed. We have, for ourselves, delayed any detailed criticism of the misfortune since our announcement of the occurrence, on the ground that no such professional judgment was possible (otherwise than as a leap in the dark), without such a careful examination of the entire case as would be only within the

competence of men professionally employed to report on its character. Careful examination of the drawings and working plans, determination of the weights, verification of the levels, perfect or otherwise, of the cornice and other main horizontal lines of the Viaduct, were, of course, indispensable. These points might, more or less fully, have been within the cognisance of not a few engineers. But with, and even above, all these requirements, the power of putting questions was indispensable to the cautious investigator. Not a byword to a laborer, or a hint snatched from a mason,—not even a courteous explanation from one of Mr. Haywood's staff, but that full information which can only be elicited by something like a judicial inquiry,—was a due preliminary to the process of making up one's mind. For this we felt that it was necessary to await the report which has now been issued.

Messrs. Bidder, Harrison, and Clark have presented us with a sort of abstract of their minutes of evidence. In this part of the report its main value to the profession consists. While the reporters have thus explained the reasons for the conclusions at which they have arrived, they have enabled us to push the inquiry somewhat further.

Explanations, the reporters tell us, have been furnished them by the engineer, by the two clerks of the works in charge during the construction, and by the mason who executed the works for the contractor. Careful examination of the viaduct itself, and of the plans and designs, combined with this oral explanation, has thus placed at the command of Mr. Bidder and his associates something of the history of the failure.

In one respect the reporters have omitted to give an item of information of no slight importance to a correct judgment of the case. The omission is the more remarkable as it does not appear, from any paragraph of the report, as if the attention of the reporters had specially been directed to one of the most critical points of the case. It is mentioned, quite incidentally, that the weight imposed on each column is about 180 tons. We conclude that the eight interior columns, in which the fractures occur, are thus indicated, and that the pressure on the four angular, or external, columns is only about half that weight, plus the extra weight of parapet, cornice, and footway. But an essential feature in the case is the distribution of this weight. Not only does the skew of the span—the angle at which the upper roadway crosses the lower one—throw the actual weight of the superstructure on a portion of the columns, leaving a large section of each to discharge a merely ornamental, if not injurious function; but the great difference between the span of the central and of the side arches is such as to throw a much larger part of the 180 tons upon the portion of the column facing the roadway (where the fractures occurred) than that which rests upon the opposite face of the granite hexagons.

It is unnecessary now to inquire what would have been the result of this uneven weighting of the columns had the mass of each been perfectly homogeneous, and the bed mechanically true. But, under the actual circumstances of the case, we have here, perhaps, the knot of the matter. Without denying that motion may have taken place from the effect of temperature, and that thus a rocking of the piers upon their bases may have increased the effect of a crushing, wedge-like action, we must yet observe that no evidence is afforded of the occurrence of such motion. The holting of the central girders together by a vertical joint in the centre, like what masons call a she-arch, is probably more obnoxious to the mechanically trained eye than it is deserving of any more grave condemnation. Still, the behaviour of these joints is a point to which attention should have been directed.

But as to the fact that it is the effect of positive and ascertainable weight, rather than of possible and problematical motion, which has split the 13-in. stones, the bridge tells its own story. Let any one compare the state, almost or altogether uninjured, of the outer or less heavily weighted piers with that of those under the interior of the bridge, and he will see that weight has been the element of disintegration. The very close resemblance to one another of the form and position of the cracks in the inner columns struck us from the first moment as being one of the most remarkable features of the case, and it is one as to which the report in question enables the public to form a definite and positive opinion.

The 13-in. beds of Ross of Mull granite, in which the main fractures occurred, were finished to a true bed for a depth from 1½ in. to 2 in. all round their periphery, the centres of the beds being left purposely hollow to an extent not exceeding one-eighth of an inch on each bed. Opposite each angle, and at a distance of 1 in. from the face, pieces of lead, weighing from 5 lb. to 7 lb per foot, were placed, the interior of the bed being filled in with fine mason's putty. Thus the bearing surface of the column, instead of being that due to a hexagonal prism of 4 ft. diameter, was reduced to an interrupted ring of from ½ in. to 1 in. in width, and from 6 in. to 8 in. in length for each point of support. On the half of these points, which, speaking approximately, afforded a bearing surface of some 30 superficial inches, upwards of 130 tons, the weight of the half of the central arch and spandrel, directly pressed. On the equal area of bearing surface towards the footway less than fifty tons have to be supported. The granite prism thus resembled, at the points where it transmitted the weight of the superstructure to the adjacent plinth, a ring of piles firmly bound together, rather than a monolithic column. A tendency to cant the columns towards the roadway would be one result, but, even independent of this, the actual direct pressure on the angle immediately under the girder was too much for the stone. The regularity with which the fractures occurred in the interior columns seems thus accounted for.

It appears to us to be of much more importance thus definitely to point out the fact that a weight, perfectly manageable if distributed over the area of the column, became destructive when thrown by ill-judged setting upon half a dozen points, than to enter into the vexed question of expansion and contraction of the girders. On this point men capable of forming an opinion materially differ. All that has been said on this part of the subject has been the assertion of what the girders must have done theoretically. No observation of what they actually do or did has, so far as we can learn, been attempted. The referees speak of a maximum contraction in the width of the centre girder, due to the variation of temperature between the time of fixing and that at which the fracture was detected, amounting to a quarter of an inch. It is very curious that they omit to explain that on any other hypothesis than that the iron arch was a perfectly unyielding and non-elastic structure (which, of course, they would not contend to be the case), the effect of such contraction would be to lower the crown of the arch, and thus throw an increased pressure against the columns, the effect of which, if ascertainable, would have been on the side opposite to the actual fracture. We therefore think it is matter of regret that the vague nature of this part of the report tends to leave in some degree of obscurity an occurrence which is perfectly intelligible by the light of the very simplest laws of mechanics.

Another point on which the report is silent has not, we believe, been at all alluded to. On a visit to the Viaduct on the day on which the report was issued, a phenomenon became apparent which it is impossible to disregard. The upper line of roadway demands careful examination, no less than the state of the columns which support it. The beautifully regular surface which the pitching over the Viaduct presented a month ago will not now be found equally faultless. As far as variations of level are concerned, the change is not greater than—not, we think, so much as—we have often observed in newly-pitched roads upon terra firma; but that which is peculiar to the Viaduct road, and not only peculiar, but to some extent at least new, is the appearance of a system of sharp, well-defined cracks, separating the sets, or pitching stones, from one another, and extending over the greater portion of the area covering the arch. On the occasion to which we refer, these cracks were as fresh and distinct as if they had been just formed. In very muddy weather they would probably not be perceptible, but on the morning of the 16th inst. there could be no doubt as to their presence.

What is the exact indication given by these cracks it would be unwise to attempt to decide, without full and patient investigation. It is clear that they cannot result from any bodily settlement of the viaduct, as the foundations are perfectly solid; and any displacement due to the fracture of the piers is infinitesimal. That they result from the vibration of the platform, caused by the rapid passage of heavy vehicles, we suppose, no one can doubt. The combination of

granite sets, with a substructure possessing a certain amount of elasticity, under the stress of a traffic such as that of Holborn, is one without any very close parallel. It will be very interesting to compare the early experience of the very elastic bridge over the Thames at Westminster with that now to be derived from the City structure. It may turn out that this disposition of the sets to play on one another is only a practical mode of increasing the elastic resistance of the roadway. But it may turn out, on the other hand, that some modification of the pitching is advisable. The more or less elastic action of the corrugated plates forming the iron platform of the Viaduct, must also be regarded. On the whole, these very numerous cracks, whether they have been overlooked by Mr. Bidder and his colleagues, or whether they have made their appearance since the preparation of the report of those gentlemen, require careful investigation. They afford no ground for panic, or for serious alarm, but they certainly do demand examination and continued observation.

A lesson of great importance is to be deduced from the Holborn fractures. Many men have spoken of the "thin bed of Ross of Mull granite," as if a block of stone 4 ft. in diameter and 13 in. thick was a mere mason's span. On the contrary, these damaged blocks are in themselves noble stones. To suppose that granites of these dimensions is too slaty and paltry to be used when great weight has to be borne, is simply ridiculous. But the evil lies in the juxtaposition of beds comparatively thin with ponderous monoliths. And here it is most interesting to observe how closely the taste of the artist accords with the science of the builder. The architectural beauty of the piers was somewhat diminished by the same cause. We do not say that it was thus necessarily diminished, but practically it was greatly injured. Had the hexagonal piers been built in 13-in. courses of the rose-coloured granite, no undue stress would have been thrown on the exterior part of a single layer. Whether they had been bedded in mortar or in lead, the weight would have been freely distributed, course after course, instead of being thrown on a few points under the angles of a monolith. The very care requisite for the formation of the single joint led to the evil. It is not, therefore, merely as an eyesore, but as an offence against structural rule, that we must hereafter carefully avoid the juxtaposition of stone courses of very unequal magnitude. The ancient builders were well aware of this important canon of their craft.

Avoid the intermixture of monoliths and of slabs. See to the execution of your most important works with your own eyes. These are the inscriptions written on the Holborn Viaduct in a character more hold and more durable than golden letters.

ART TEACHING: ITS PURPOSES AND ADVANTAGES.

At the annual distribution of prizes at the Gloucester School of Art, Mr. Gambier Parry put these questions: "What is this art teaching? What is its purpose? What are its advantages?" and answered them by reading a paper, part of which we print:—

What is this art teaching? It is a significant fact that the Government have of late years put into active operation schools of art over the whole country. There are at present as many as eighty-five schools of art in England alone; in Scotland, eight; in Wales, four; in Ireland, five. The arts,—I mean those of high aim, above mere arts of ingenuity and handiwork, and therefore called fine arts,—had fallen to a very low degree of estimation and in practice in this country. There had been a time when the case was entirely otherwise—when we had national arts clustering beautifully round a national architecture; but then came a time of great trouble and confusion, which forced men's attention and energies into a very different channel. Great social and political troubles supervened. The foundations of society had been very much shaken at the time of the Reformation, and by the events following or resulting from it. The shock had been great, indeed. The habits, the principles, the tastes of the people were changed by the political, quite as much as by the religious, results of that great event. For some time society appeared to be going through a process of reconstruction. Among other results of this great social disturbance the finer arts suffered much. They were in some cases discouraged for reasons supposed to be based on religious objections; and in other cases they drooped for want

of national interest and sympathy. What taste for them remained was to be found exclusively among a limited number of the wealthier families. But their patronage was not sufficient to call out native talent, because the nation was itself indifferent. The result was that, in answer to the demands of the small upper-class, such men as Vanduyck, Sir G. Kneller, and Sir P. Leij were induced to come to England to paint their portraits, and Canaletto to paint views of their houses and landscape scenes in London. There were at the same time a few English artists in oil painting and miniature, for portraiture; but for higher inventive and illustrative art on a large scale there was no one. A few anecdotes may serve to illustrate the decadence of art in England after the time of the Reformation. Much had been destroyed then. But later, in the time of Queen Elizabeth, in the thirteenth year of her reign, at a Convocation of the Bishops, a canon is recorded to this effect:—"The churchwardens shall see that the churches be kept clean, &c., the pictures of false and feigned miracles be demolished, and that the walls of churches be fresh whitened,"—and so forth. This was a sweeping order; but I beg you to observe that it only applied to false and feigned and untrue inventions. Still, the result was most distressing. Religious and political partisanship existed then, in its own degree, as we have it in our own degree in our days. The order for destruction was exaggerated out of spite, and party antagonism was carried to great excesses. Horace Walpole mentions a story of a certain ruffian named Bles who was hired, at 2s. 6d. per day, to destroy the painted windows of the church at Croydon. Of course, this, like scores of others, was one of the Puritan excesses never contemplated by the order of the bishops. We find the tide turning soon after, and the expression of grief and vexation at this destruction being loudly expressed. Among the State trials in the time of Charles I., there is a case of a certain H. Sherfield, against whom proceedings were instituted for breaking sacrilegiously the painted windows of a church. One of the witnesses against him speaks thus:—"I undertake that there are some spirits abroad now, that if they had been alive in King Solomon's time would have gone night to have done violence even to the Cherubims in the Temple. God only knows what would have become of them!" But, to bring the illustration of the decadence of art still nearer to our own time, I must quote from the report of the first Commission on Arts and Manufactures in the year 1836, in which one of the witnesses examined about the condition of the art world in this country refers to his early days, and tells this story:—"A fellow-student of mine, named Baxter, who was educated in art at the Royal Academy, being in distress, went to one of the leading patrons of art in his day, and, speaking about ornamental porcelain, the gentleman said to him:—"I obtain all my vases beautifully painted from France: there are none equal to them." He then took some of them down from his cabinet, and showed them to the poor artist. Baxter was delighted to see them, and said,—"Sir, they are all of my doing: I painted them all. But they have the French mark upon them, because such is the estimation in which art is held in this country, that works will not sell without undergoing this wretched transformation." Poor Baxter was much employed in the early days of art manufacture in the Porcelain works of Worcester: to such a point had all national care for finer arts fallen in this country. It is only when things have arrived at their lowest point that they begin to rise. That rise in the matter of art has been steady and permanent. In the year 1813 an accomplished man, Prince Hoare, writing in his work entitled "The Epochs of Painting and Sculpture," thus ends his essay on the revival of art in England, saying, in words which now sound like an inspired prophecy,—"The arts of design await the encouraging mandate of the State. To attain the position due to them, there are these three essential means: 1. Let the knowledge of design be generally diffused. 2. Educate artists honourably to themselves. 3. Employ them honourably to their country." Thus was the note struck for the turning point of fine art as a matter of national interest and concern. Those words of Mr. Hoare have been carried into most effective practice. The recommendations of Commissioners of Parliament have been adopted, and a department for the cultivation of the fine arts has become a national institution, fostered by the authority of the Government, aided by

the votes of Parliament, and, I am happy to say, responded to by the approval and satisfaction of the country. Thus, sir, we see that instruction in fine art has been adopted by the voice of the country as one of the branches of national instruction. This is my answer to the first question which I proposed to you. The second question was—What is the purpose of this teaching of art? My answer is, that necessity is the mother of invention in more ways than one. As times of peace and the arts of peace progressed together, our national aptitude for mechanics developed itself in manufactures: we were, with all our power, and many valuable qualities, a rude and rough people. Our climate was rough and chilling; our geographical position obliged us to great exertion in the world's competition: the great principles of our constitutional liberty, not only opened the way, but forced the way, to national advancement by individual exertion. The consequence was that to recover our national and individual losses, our people threw their whole energy into trade. Our manufactures were developed by the application of machinery, and our commerce was spread over the whole world. We became proud. But as pride cometh before a fall, so surely were we to be humbled. We became great, and proud, and vulgar in the wealth we gained. But our work was that of the hewers of wood and drawers of water. We could labour and produce, but the finer sense of other nations demanded something beyond mere gross material production. Our commerce flagged; we found that there was an element in production superior to our own. As a nation, we had despised and neglected the finer arts. But we soon found that without them our productions failed. We learnt the humiliating lesson that our part was the gross material part of labour, but that there was an intellectual quality which in our folly and pride we had despised, but without which, to give life and value to our productions, they were worthless. So we had to beg from other nations: French, and Germans and Italians were invited to our principal seats of manufacture; and to them, by their accomplishment in the arts, we are indebted for those qualities which enabled our manufacturers to retain their place in the world's estimation; to those foreigners I say we were thus humiliated by obligation, while our workmen merely performed the material labour of production, and our tradesmen performed the labour of the counting-house. The grosser material labour was ours; the higher qualities, which made our manufactures saleable, were due to foreigners. This was humiliation; but it was humiliation of pocket no less than humiliation of intellect. Our manufacturers awoke to the idea of how great gain it might be to train our own men rather than thus be dependent on foreigners. Our more intelligent workmen next awoke to the idea of how much was lost to their class by the national hinder. The finer qualities of intellectual cultivation had been neglected. Our people at last acknowledged the error and the humiliation. If there is one characteristic quality of our very mixed race, as English people, more valuable than another, it is that, be the demand upon us what it may, some of us are certain to be found who will answer to that demand. The variety in our blood insures us variety in our powers. Our national difficulties may have depressed us, and our political and religious habits may have discouraged the cultivation of our finer qualities; but those qualities were within us, only dormant, and when the call should be made upon us we should rise to it. Small as our country is compared with other nations, we have gained, always and only under God's Providence, a gigantic position in the world. By energy and enterprise, by naval and military prowess, in war, in peace, in industry and commerce, we have gained the highest honours of our national position. But we have something yet to gain in the world's race: we have been excelled by others in the finer qualities of intellectual cultivation. But who need fear if only our energy is called forth? If in those finer qualities of cultivated genius England has produced in poetry (which is the living spirit of the arts) such men as Chaucer, Shakespeare, Milton, Spenser, and a host of others, grave and gay—and in the arts themselves such men as Wren and Chambers, Gainsborough and Reynolds, Flaxman, Chantrey, Turner, Wedgwood, and scores besides them,—surely there can be no fear that if the nation calls forth the spirit of the finer arts, it will not come forth. Such is, then, my answer to the second inquiry—What is the purpose of

education in the arts? It is to raise our people in those attainments of intellectual cultivation in which we have been surpassed, and to call forth their dormant genius. This is a great aim and purpose.

THE LAST PROPOSAL FOR UNITING ENGLAND AND FRANCE.

A FRENCH engineer, M. Eugene Burel, has been in England to explain his plan for shortening the distance between England and France. He has nothing to do with bridges over the sea, or tunnels under it, but would simply improve it off the face of the earth; in other words, fill up the Channel on both sides, and reclaim the land, leaving only a passage a mile wide to be traversed by ferry-boats every five minutes. M. Burel is a grave, serious gentleman, and really believes in his scheme, whatever our readers may think of it. They may like to hear him speak for himself, and this is what he said on the subject the other night at the dinner of the Society of Engineers, when he returned thanks as a visitor. "My scheme," said he, "is for neither a tunnel nor a bridge; it is the old mother-land restored from the sea as it was seven thousand, seven hundred, and twenty-four years ago. Allow me to add one new county to England and one department to France across the Channel, and thereupon to establish a railroad. By the time this will have been accomplished, with the increase of speed that will be attained I will make you go from London to Paris in five hours. I do not wonder that you laugh at the first communication of such an idea; for some of our master engineers said to me, in the similar instance, that this was a folly a little worse than the other proposition to the same end.

However, I want you to think of it, and not to be too hasty in decreeing the impossibility. One thing is in my favour, and that is the numerous examples of such restorations of land, although on a minor scale; and it requires nothing but a combination of the most approved systems of assisting nature (as your celebrated engineer Telford said) to accomplish this, at first, extraordinary-looking work. Some say that England would never admit of being altered from its present situation of an insular land to which she considers she owes her independence and her supremacy on the seas. I will not discuss now any political question, although I consider the unlimited increase of the means of communication between all the nations of the world to do the best some day or other, and set at rest every bit of unworthy consideration of this kind, especially when time will have still more proved the benefit of the general union of the trades and commerce between all nations.

But I will say one thing, and that is, that assuming the isthmus to be still there as it was formerly, before the Diluvium Cimbricum, as

reported from ancient traditions by Florus, and demonstrated by all the geological transactions, we should have to call M. de Lesseps to bore it, as there should be still a greater need of his scheme there than at Suez. Now, under such considerations, I would restore the land, not completely, but only so far as to leave a narrow channel one mile wide in the middle, and thus both the free circulation of the seas and the political question would be safe. In fact, my solution of the difficulty is a solution of contiguity. You say one mile is too little; I answer,—No, it is not; for, I do not care whether it be one or twenty miles, when I think of the ferry-boats that are spoken of for the next year, which will be able to transport an army, or when I think of the guns that will soon afford us the possibility of firing against each other without parting from our shores. Had we not better advance at once, facing kindly to each other, so near as to shake hands over the water, while the ferry-boats would cross it every five minutes, transporting backward and forward all the treasures of our industries?"

With the best possible feeling we advise M. Burel to waste no money on the prosecution of his scheme. We will not venture to say what changes in opinion may take place one of these days, but at the present moment England has no desire to give up her insular position.

SOME ACCOUNT OF A NEW TESTING MACHINE.

THE recent accident at King's College brings vividly before us the necessity of the greatest precaution being taken as to the strength and quality of the materials of which our buildings, particularly our public buildings, are constructed. By a special providence no lives were lost; but had the failure occurred only a few hours later, more than one hundred families would have been driven to mourning.

But for faulty cast-iron girders the accident probably would not have happened. When the building was erected, about thirty-five years ago, the use of iron was less understood than it is at present; and even had the material been sound and perfect, it appears to have been charged with more weight than would now be considered prudent, so that the moment adverse circumstances occurred it failed.

The difficulty of obtaining correct data for the calculation of the strength of various materials in their practical application to constructive works has been very considerable. In one instance where the quality of iron was in question, and before the erection of Mr. Kirkaldy's apparatus, it was desired to test certain girders, not as to the actual weight they would carry, but as to the tensile strength of the iron (wrought) of which they were made (they

were riveted girders), and, after a good deal of trouble and delay, as it was for a Government work the use of the cable-testing machine in Woolwich Dockyard was granted. The result was satisfactory—more than 25 tons to the square inch. Had it not been, however, for the peculiar circumstances of the case, it would have been almost impossible at that time (about eight years ago) to obtain within reasonable distance of London an independent satisfactory solution of a similar question.

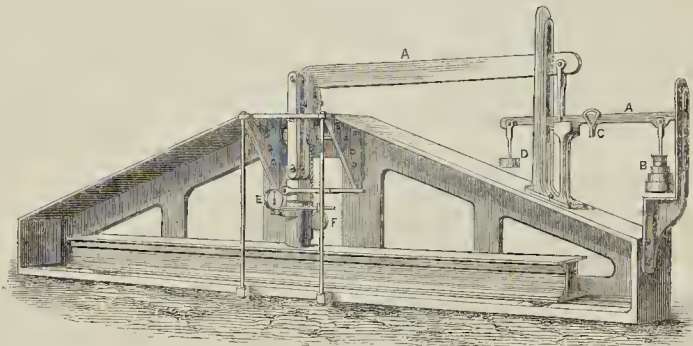
Hodgkinson's experiments on cast iron have considerable completeness, and as cast iron breaks and does not bend, the test is tolerably absolute, and, with the usual large allowance for bearing weight in proportion to breaking strain, his results may be taken as satisfactory data. But the great objection to the use of cast iron is the uncertainty of the manufacture. One girder, apparently equal to its fellow in strength, may have a hidden flaw in the casting which reduces its strength one-third or perhaps one-half; while in wrought iron, from the method of manufacture, this is impossible, and equal sections may be reckoned to carry equal weight. The use of cast iron, especially for long bearings, is rapidly going out of date; it is superseded, for ordinary building as well as for engineering works, by rolled iron, either in the form of solid rolled beams or as riveted girders, with which we are all familiar, built up of plates. In many instances these girders are of such large dimensions as to preclude any test being applied previous to their completion *in situ*, except,—and this is most important,—as to the quality of the iron of which they are composed.

Again, Belgian and other foreign irons are being introduced into the market, and it becomes therefore more and more desirable that the architect, the engineer, and the contractor should have some ready means of ascertaining the quality of the material he is purchasing; such means, however, being rarely within the compass of a private establishment.

There is another point also of much interest in the general building trade, which will, no doubt, have some additional light thrown upon it by actual experiment,—the opinion that most of the constants in use for calculating the strength of beams are too high. A comparison of Tredgold, Barlow, and Clark will show a difference of something approaching 100 per cent.; Tredgold being the highest, Clark the lowest, and Barlow about midway.

It is very desirable that a fresh set of experiments should be instituted extensive enough to furnish us with a really authoritative formula, especially for the large scantlings, which are not so strong in proportion as the smaller ones, upon which, however, the higher constant is based. Some of the failures of heavily-framed timber constructions may probably be traced to this cause.

MESSRS. SHAW, HEAD, & CO.'S TESTING MACHINE FOR GIRDEES, &c.



Operation of the Machine:—

- 1st. By levers (A), which re-act, direct with the press, and are so arranged that 2 lb. at B equal one ton on the specimen, the weight C counting the extra, D being the adjusting counterpoise.
- 2nd. By pressure-gauge (E), which registers the pressure per square inch, or can be changed to register the tons.
- 3rd. By lever-gauge (F), which is arranged in the proportion of area of valve to area of piston of press, and thus registers tons on the object tested.

Messrs. M. T. Shaw, Head, & Co., of Cannon-street, have recently erected a machine at their Bankside wharf which provides the necessary facility for submitting these various materials to the test; its more special object, however, being to bring home, as it were, to every man's door the opportunity of ascertaining the tensile strength of the wrought iron he may be purchasing. The machine is an ingenious combination of the cast-iron girder, the hydraulic press, and the compound lever, as shown by the accompanying diagram.

The frame, somewhat resembling a queen-truss in shape, is built up of three heavy castings (bolted together) at the points, occupied in a truss by the queen-posts. The width of the upper and lower flanges is 2 ft. 9½ in., and the cast iron is 1½ in. thick; it is further strengthened by two six-bars of 2-in. wrought iron from top to bottom at the same point. It is, in fact, a gigantic application of the principle of the scull-beam, the weights being adjusted at the extremity, and simply exerting their force by the principle of balance, as applied by the compound lever on the hydraulic press in the centre, by which the "proof" is applied with accuracy and facility, by the simple depression of the ram at that point. The maximum pressure that can be thus exerted is 50 tons in the centre, equal to 100 tons distributed, and the machine will prove anything up to 34 ft. long, 1 ft. 6 in. wide, and 3 ft. high. In the diagram the girder is not shown sufficiently raised up at the two ends.

The proportions are as under:—The length of the first lever is 3 ft. 11¼ in., and that of the second lever 13 ft. 4 in., the first lever giving a multiple of 40 to 1, and the second of 28 to 1. It thus follows that whatever weight is applied at the extremity multiplied by these figures, gives the amount of pressure exerted downwards upon the centre of the material to be proved; e.g., 28 lb., one quarter of a hundred weight, 28 × 40 × 28 gives an exerted force of 31,360 lb., or as nearly as possible 14 tons.

The levers are of polished steel, manufactured with the greatest care, and the dial gauge indicates the most minute alteration of pressure. The ram is 6 in. diameter, and there is an escape valve, that, when the pressure reaches the limit of safety, releases the oil with which the ram is charged, and precludes all chance of accident. A clever adaptation of reversing power enables the force to be exercised as a tearing strain, thus giving facility for exactly determining the strength of any section of iron submitted to the strain.

Many questions which are continually occurring in practice, both to engineers and architects, as to the comparative strength for various purposes of different sections of wrought or cast iron may here be readily decided at a moderate expense, as Messrs. Shaw, Head, & Co. propose to put the machine at the service of the profession at a low charge, so as to enable any to ascertain with accuracy the comparative strength of the many varieties and manufactures of rolled and wrought iron. It is right, however, to say that what they mainly desire is not so much entering into rivalry with elaborate testing machinery set up for public use elsewhere, as to enable their own customers to make themselves certain as to the strength of girders and other works manufactured by the firm.

We subjoin the record of an experiment made in our presence as an example of the working of the machine.

It was made upon a wrought-iron rolled solid beam, 21 ft. 6 in. clear bearing, 12 in. deep, flange 6 in. wide. Total sectional area, 17 square inches; sectional area of each flange, 6½ in.

At 5 tons the deflection was	Inches.	(No set.)
8	"	1½ (trilling)
16	"	2½ "
20	"	2½ "
22	"	4 "

The top flange buckled with less than 24 tons in the centre.

The calculated breaking weight of the girder, bearing as above, was 22 tons.

ON THE LIMITS OF VARIETY IN ARCHITECTURAL DESIGN.*

WE are going to inquire how far it is possible for us to produce perfect originality in design; and to that end we must examine the different sources of variety in design, some of which appear to be unlimited, others more or less limited, in extent. There are two important matters that would appear to require special attention in these inquiries; that is to say, outline and style. The first, however, of these we must leave, as requiring a separate treatise of sufficient extent to occupy a whole evening's attention; and the other—that is, style or school—being a result, and not a primary source of variety in design, we shall only introduce incidentally, and by way of occasional illustration.

In the more detailed view of art that we are about to take, we shall observe six of those sources of variety:—1. Order of proportion. 2. Mode. 3. Order of projection. 4. Method of construction. 5. Material. 6. Individual taste. And we do not pretend to make any new or wonderful discoveries, but only to lay before ourselves that which we all know already in such a manner that we may be better able to make, perhaps, better use of it than we have hitherto succeeded in making.

We shall use the word order in such a way that it may apply not only to those two schools of architecture with which conventionalty associates it, but to all schools, as far as possible, that now exist, or that may hereafter be produced, or discovered in plans at present unexplored.

We shall before very long be met with the remark that our predecessors in art designed what they thought looked well, without regard to any rule. But real experience in designing will show us that a good sound fundamental, not scholastic rule, is a great help, and far from being a means of restraint.

Most buildings of any importance are divided into a certain number of bays, compartments, or sections, for the convenience of construction, and of lighting the interior, and for other economic purposes.

The word section is more properly applied than to the cutting through of a building to show its construction. The Latin word *sectio* means a portion or division of a treatise or object for architectural section, longitudinal or transverse, would be more properly termed a *scissura*, from *scissura*, a Latin word of identical meaning with this.

It will not be too presumptuous to suppose that the class of objectors above mentioned will admit that in any one of these sections or divisions there must exist some proportion between the height and width,—that is, from centre to centre of column, buttresses, pilaster, pier, or attic. The height being that of a single story from base line to top of column, springing of arch or underside of epistylium, according to the mode of construction.

We must now beg leave to be allowed to divide that width into as many parts as we like to form a scale for our orders, and having obtained permission, we will divide it into four parts, and according to the number of times these parts are contained in the height, so we may classify our orders.

Now, you see, in this source of variety there is no certain limit, though at the same time it is not of infinite extent. It is left to individual taste where to place the boundary.

Except in such a building as a bridge, which may be considered a sub-ordinary, less than three parts should not be used for the height. Our old church architects in their simplest structures, and the Italian masters in their attic stories, seldom went below this. Calling this the first order in ordinary designs, nine of these parts will give the seventh order,—a proportion seldom exceeded either by precedent or good taste, except in a peristyle of detached columns, which may be looked upon as a superordinary structure.

Now, concerning ordinals, that is, accompanying details to the several orders. The Greeks to a certain extent, the Romans to a greater extent, the Italians to a still greater extent, and the modern uninventive imitators to a positively insane extent, associated a certain mode inseparably with each order, so that we have come to use the proper adjectives, Doric, Ionic, Corinthian, as though they were ordinal numerals, and suitable for distinguishing one degree of successive rank from another.

* Read before the Architectural Association, Friday, December 3, by Mr. W. Scargill.

If we use a simple shaft for our first order, as the English church architects generally did; four shafts for the next order; eight for the next, as the above masters also frequently did, and if we add four shafts, also, to each successive order, our sixth order will contain twenty and our seventh twenty-four. Now, substituting hollow flutings for shafts in these upper orders (they are more suitable), this is exactly what we find in those two well-proportioned Greek examples, the temple of Theseus and the Ionic temples of the Lysseus. The first of these is in the Doric mode, and the other in the Ionic; but in the Temple of the Winds at Athens, the columns have but twenty flutes, and are lower in order as regards their distance than any Ionic example; and yet, here you see the mode is Corinthian. This example draws our attention to another ordinal,—foliation. It belongs to a particular mode, and we must not forget to revert to it in its proper place.

The Assyrians put their columns still closer together, and used rectangular indenters for ordinals, and went as high as thirty-two or thirty-six to each shaft. Some good examples were burnt at the Crystal Palace, which is to be deplored. The convex flutings of the Egyptians, generally more in number than the Gothic shafts, and generally though not always less in number than the Greek flutings, are specially adapted for the middle orders in our scale. Now, it so happens that having granite instead of stone, and not requiring the arched construction, we find that the Egyptians actually did use these middle orders of proportion. The chief ordinal of the Roman school may be taken to be the leading horizontal lines in the entablature. The several orders show 3, 4, 5, 6, and 7. These are the faces of the architrave, the frieze, the modillion, muntin, dentel, and corona courses. The leaves used for decoration in the initiative mode of architecture, are in most schools more simple and less indented, or cut up, in the lower orders than the higher; this is noticeable in the example above quoted in the temple of the eight winds. This minor detail of decoration then forms another ordinal, and it is a useful study for the designer to sketch everything of this kind in nature that presents itself to his notice, and then to classify them according to his own taste and judgment.

The profile of mouldings should also vary according to the order of the composition. Both precedent and good taste authorise this arrangement. For while Mediaeval and modern masonry in the Italian school use in the lower, and even sometimes in the higher orders, mouldings of circular outline, we find little or no precedent for it in antique examples. In modern Tuscan and Doric, we find a quadrant-shaped echinus to the capital, but in Roman examples of these modes, we find ellipses of greater or less variation. In the high order of the Greeks, parabolas and hyperbolas are used, and in the low order of the English schools the circular profile finds its proper place. Now, we propose a scale of ornamented mouldings to agree with our orders of proportion, called the *declension of the conic scissure*. To provide for a series of seven orders, we take a cone of 60 degrees. The vertical scissure gives a hyperbola for the seventh order. The next, declining 15 degrees, gives an oblique hyperbola for the sixth order. The next, declining 15 more degrees, a parabola for the fifth. The next three, each declining 15 degrees, give three ellipses of decreasing variation for the next orders; and the oblique, prostrative, horizontal scissure, a circular contour for the lowest or first order.

The next source of variation is that of mode. All ornament may be said to belong to three simple modes, or to combinations of two or of all three of them, making four additional composite modes, and the plain unadorned, or Tuscan mode, as we should say, in reference to the Roman school, makes an eighth. And of those simple modes we have, first, the Geometric; 2dly, the Decorative; and, 3dly, the Imitative. The Geometric mode is illustrated in the Greek and the Roman schools in the ornaments of the Doric examples; in the Norman school, in the capitals and ornaments of the arch, such as the chevron and hilt; and in the earlier Gothic schools, in the geometric tracery of the windows.

The Decorative mode includes all ornament not geometric or imitative, such as is illustrated by free-hand drawing, without copying from nature. This is the true architectonic style, and is found in every school of architecture, in the time of the ancients, and in nearly all varieties of the

The Site of the Fleet Prison.—The Common Council have agreed to convey to the London, Chatham, and Dover Railway Company, or the sum of 60,000l., the freehold interest of the corporation in a piece of ground on the east side of Farringdon-street, the site of the late Fleet Prison.

Arabic, Hindoo, and Moorish schools, in the Romanesque, the Byzantine, and Lombardic.

And the remaining mode in the Corinthian mode of the classics, in the Egyptian, the Romanesque, and the middle periods of Gothic, in which latter it is used irrespective of order.

By the imitative mode we mean that class of ornamentation which is copied from nature, more especially from natural foliage, and to which we have before alluded in our remarks upon ordinals.

The third source of variety in design is that of Projection. As regards this matter, we must have recourse to precedent, which furnishes us with six orders or degrees. 1. Incised ornament; 2. Superficial ornament, such as mosaic work and ornamental paving; and this order, though a minor order of architecture, embraces the whole art of painting,—a great art in itself, extending itself, in a manner, beyond the province of this art of architecture in which it finds its place as a subordinate feature; 3. Positive projection next begins in basso-relievo; that is to say, for the most part imitative ornament, in which the outline is preserved literally, but with a depressed projection or profile; 4. Mezzo-relievo, where both outline and profile are strictly true to nature, but the objects projecting but half their bulk from the plain surface which they serve to decorate; 5. Alto-relievo, which differs from the last only in the figure being nearly detached, or sunk but a fourth of its depth into the superficial plane; 6. And beyond this comes detached ornament, and this applied in the imitative mode develops itself in another of the fine arts, expanding beyond the province of architecture, and bearing the honoured title of the *Art of Sculpture*.

In the methods of construction we can hardly find room for an ordinated or classified arrangement. There would seem here to be two extreme points of limitation in construction: that is to say, the reponent and the salient, but with one or two points of transition. And beyond these we can find no new orders or arrangements sufficiently distinct to characterise a school either entirely new or entirely original and unique as regards its method of construction. But we must now explain the meaning of these terms *reponent* and *salient*.

Reponent, then, is the proper term to apply to solid masonry, in which every portion of material has a solid bearing. This construction only provides us with an enclosing wall to our building; for as soon as the necessity of a door, window, or roof presents itself, one step is taken in the direction of the other mode of construction, and this step is the habitative method. This construction, however, is associated with the reponent, and forms the great line of distinction of the Greek, Egyptian, Hindoo, and Syrian schools, from the Saracenic, Moorish, Romanesque, and Gothic.

The semicircular arch, belonging rather to the salient method, has this imperfection in its character; that, at one single point, viz., at the crown of the arch, it is related to the trabeative construction. The zenith of a vertically-placed circle being in that one point, and only one point horizontal in its direction.

The Gothic schools may be looked upon as perfect illustrations of the salient method, both in their arches and in their timber roofs,—that is, in those that have no tie-beam.

And all arcuate constructions, whose arches are formed by one curved line, whether circular, segmental, hyperbolic, or parabolic, may be looked upon as homogeneous one with another, as the same remark applies to them, as we just noticed, as applying to the circular.

These methods of construction, then, show us but little variety for our designs, the most we can make of them being these three,—the trabeative, the nullineal arcuate, and the bi-lineal arcuate. We must leave this head of our treatise for the present,—we shall revert to it in our concluding remarks,—and proceed to consider the question of material.

Both Vitruvius and the dogmatizing revivers of classic art, insist very strongly upon a column of a certain mode, contain in its height a certain number of diameters, whether constructed of brick, stone, marble, granite, iron, or wood; and whether supporting a simple epistylum, a roof, or one, two, three, or twenty stories of superstructure. Now, if we wish to design with truthfulness, originality, or common sense, we must at least throw off such oppressive fetters of conventionality as these.

There are two circumstances in nature or in the conditions of architectural construction that

will determine the thickness of a column or pier, after we have determined its height to suit our convenience, and its order and mode to suit our taste. One of these is the superincumbent weight to be sustained, and the other the material selected for construction. We may reduce these materials to about four orders, so that here we shall have another multiple wherewith to extend the limit of design.

The weight of superstructure being a fixed quantity, the greatest diameter will be required for columns of brick; the next less for those of stone or inferior marble; the third for those of granite or hard marble; and the least for those of iron, and also of wood,—for this, though less hard or durable than the others, is, or ought to be, used only to support superstructures of the same material.

There remains one more source of variety in design that has no limit and never will have. We have seen how many combinations and a chosen number of orders of proportion and of projection, and a determined number of modes, methods, and materials. But we shall never determine how far these may be extended by that inexhaustible multiple *individual taste*. We might propose not only to each of those present in this room, but to all the profession that now exist, have existed, or are predestined to come after us to produce a composition of one fixed proportion, in one particular order, one mode, one order of projection, one material, and one method of construction; and if each one's own individual taste were followed, there would still be no two exactly alike.

We now see how unbounded in some directions, and in others how narrowly hemmed in, are our resources of originality. We see clearly how in one sense any number of new schools of art may be produced, and in another sense how impossible it is to do much more than reproduce; and this leads us to a few concluding remarks on the much-ventilated subject, the possibility or probability of a new school.

We almost disbelieved our own experience, when it first occurred to us that there does not exist to our knowledge a school of architecture in which the semicircular arch forms the leading feature, and which at the same time has a regular system of orders. In the Roman school the arch is a subordinate feature springing from an impost built against the column to receive it. The column of the Roman school is by no means adapted to carry an arch. In the first place, it diminishes upwards, as in the Greek school. The ill effect of a column of this kind supporting an arch may be seen at St. Leonard's at Shoreditch, Spitalfields, and other churches of the eighteenth century. Then the capitals and abacs are most evidently of a suitable form to carry an epistylum, but not tabularia is stuck into each column, the effect of which is both hideous and laughable.

Now, by the time we have cleared away such an obtrusive feature as that above mentioned, done away with the tapering of our column, and designed a capital of the right form to connect the arch with the column, we shall have done something towards the production of a new school. But you will object that all has been done already in those several schools that may be called Romanesque, but in these schools there is no ostensible system of classification: there are no orders or ordinals that we can lay hold of so as to know at once how to treat a given subject, when perhaps we have little time for thinking. It is chiefly to save your time that the foregoing classifications of order, and mode, and other matters have been placed before you. And here we have just pointed out to you an admirable opening for originality in as perfect a form as that quality can be said to exist. Revert to what we have said concerning order, make your scale of orders, say seven, as above suggested. Draw these out in the eight modes we have described, simple and composite. There are fifty-six changes for you at once. Now vary these in five orders of projection, and you have 112 changes. Now try each of these in four different kinds of material, as we have also described, and you have 448 varieties of treatment, or, as some would say, 448 orders; and we may flatter ourselves that 448 orders are pretty good for a new school of architecture.

We said that we should leave out of the question the subject of outline, but it occurs to us at this moment that there is a noticeable analogy between this and method of construction; the trabeative being associated with a

square, flat skyline; the salient with a pyramidal outline; and the circular-arched formation with the dome.

It remains for us now only to request of you that in any critical remarks you may be led to make upon this treatise, you will observe that it is composed of these distinct elements:—1. Matters of natural fact; 2. References to precedents; and 3. Our own suggestions; and that you will as much as possible recognise the difference between these as they occur, and not mistake one for another.

NEW BUILDINGS IN OXFORD.

ACCORDING to custom, the local *Journal* and the local *Herald* give accounts of the progress of new works in Oxford during the past year. From the *Journal* we condense the following particulars. Restorations and building operations still continue. New thoroughfares are being thrown open, streets are being formed, houses built, and here and there a church, chapel, or school added to meet the spiritual and educational necessities of freshly-established localities. On the site of the old workhouse a large square, to be called Wellington-square, is being made, of a metropolitan character, with a garden in the centre, and "sub-ways" beneath the houses, as an improved means of inspecting the pipes and drains of middle-class dwellings. Houses of all kinds continue to be constructed, and the large villas on Norham Manor, as well as on the more recently laid out Bavington Estate, are cited as offering facilities to those desirous of residence here.

Balliol College.—The new Buildings in Broad-street, designed by Mr. Waterhouse, of London, are now completed.

Merton College.—The restorations commenced in 1863 in the ante-chapel of this college have been fully completed by Mr. J. Fisher, of this city, under the direction of Mr. C. Buckenidge. The stonework of the windows, columns, and other parts of the structure, has been entirely renewed.

Easter College.—The filling in of the arches of the arcade in the chapel of this college has been proceeded with during the vacation. The apical termination of the chapel, at the eastern extremity, has five sides, and each of these sides contains three arches, immediately below the windows. Nine of the arches are now filled with enamelled glass mosaic, and the others will be used as sedilia, with appropriate hangings. These also will possibly be filled in with mosaic at some future period. The central arch contains a representation of our Saviour, sitting, the right hand lifted in blessing and the left one holding the globe, surmounted by a miniature cross. The figure is crowned, and has a nimbus round the head. Right and left of our Saviour are smaller half-length figures of St. Peter and St. Paul. The figures (and the observation applies to all) stand out boldly from a gorgeous ground of gold; below them is a border of gold and colour, and beneath that again alabaster, inlaid with floriated crosses of Sienna and other foreign marble. Beneath is a second band of mosaic, diapered with deep-colored marble. The northern division of arches is filled in with full-length figures of the Evangelists St. Mark and St. Luke. It is only on a very close inspection that the spectator discovers the separate pieces of mosaic which go to form the whole. The arch between the two Evangelists is ornamented by representations, also in mosaic, of the Lamb, with passion-flowers, cross, &c. The corresponding central arch, on the southern side, is occupied by an alabaster credence-table, with pedestal of carved Corinthian stone. The work was designed almost entirely by Dr. Salviati, of Venice; the inlaid alabaster and marble was executed by Mr. J. B. Philip, of Hans-place, Chelsea; the credence-table was carved by Mr. O'Shea, of Oxford; and the enamelled glass mosaic was the production of Salviati; and was placed in position by Luigi Verona and another Italian artificer, of London. The cost of carrying out the work has been defrayed from various sources.

New College.—The bells in New College tower have just been taken down and their hangings restored. Messrs. White & Son, of Appleton, bell restorers and ringers, have been employed, and have completed the work. In the course of these operations, the following inscriptions were found on the different bells, viz., on the treble: "Manners maketh Man, A.R., 1712." [The initials refer to Abraham Rudhall, of Gloucester,

who cast the hell in that year.] Second bell: "Manners maketh man. W.W., A.R., 1712." Third bell: "Michael Darbie made me. W.W., 1655." Fourth bell: "Manners maketh Man. W.W., A.R., 1703." Fifth bell: "Michael Darbie made me. W.W., 1655." Sixth bell: "Henry Knight, of Reading, made me, 1672." Seventh bell: "Prosperity to New College. A.R., 1712." Eighth bell: "Michael Darbie made me. W.W., 1655." Ninth bell: "Manners maketh Man. A.R., 1723." Tenth: "Michael Darbie made me. W.W., 1655."

Magdalen College.—A marble tablet has been placed in the ante-chapel of this college, bearing an inscription in memory of Dr. Daubeny, the late Professor of Botany and Rural Economy. Considerable additions have been made to Dr. Bulley's residence. The collegiate style of architecture has been adhered to by Mr. Buckridge. The masonry has been executed by Messrs. Knowles, the carpenter's work by Messrs. Castle, and that of the plumber by Mr. Taylor.

Brasenose College.—A considerable work of restoration has just been accomplished at this college. The south and west elevations of the ante-chapel have been refaced with stone by Mr. Geo. Wyatt, from the designs of Mr. J. C. Buckler, the college architect. It may not be generally known that the roof of this chapel is a specimen of timber-work of the age of Henry VII., not constructed for its present situation, and was not applied to it without considerable injury to the design.

Corpus Christi College.—It was last year found that the roofing of the fellows' building was becoming so decayed as to let in the rain, and repairs were at once commenced; they are now complete, together with a new stone open balustrade round the whole of the top of the building, and renovated chimneys. These repairs and restorations have been carried out by Messrs. Castle & Co., Cowley-road.

Christ Church.—Several improvements have been effected at Christ Church, and carried out, as usual, under the direction of Mr. E. G. Bruton, architect. A stone building, in keeping with Wolsey's architecture, is in course of erection on the site of the stables in the lane leading from St. Aldate's-street into Christ Church meadow. The structure is for the use of the servants. It will be supplied with books and newspapers. The builder is Mr. John Fisher, of Oxford. The heraldic window placed in the hall by Archdeacon Clarke, has been completed during the past vacation, by Messrs. Powell, of London. The window is an emblazonment of the principal quarters of the arms of the Prince of Wales on the dexter, and of those of the Crown Prince of Denmark on the sinister; with a statement of the donor's long connexion with the College.

Pembroke College.—New buildings, from Mr. Buckridge's designs, have been erected on the west side of the hall, with mace-keeper's room, plate scullery, strong-room, and butler's bedroom above. Mr. George Wyatt was the builder.

Forester College.—The Renaissance decorations of the College Chapel are now nearly complete. Mr. Henry Holiday, who painted the Prophets, and designed the windows of the chapel, is now painting a frieze or series of panels above the stalls, the subject of which is the *Te Deum*.

Keeble College.—The work at Keeble College has progressed considerably towards completion. The buildings include, at present, rooms for 100 undergraduates and six tutors, with lecture-rooms and temporary hall, chapel, kitchen, and offices. The gateway is at the south-east corner of the quadrangle. It is intended to add another story and a permanent roof to it at a future day. The quadrangle is about 220 ft. square. Rooms for undergraduates are arranged on the east, west, and north sides of it. The temporary hall and chapel are on its south side. A large opening on the north side is left for the proposed chapel, which is to be raised on a crypt, and approached by a staircase. The piece of ground to the west of the buildings will be laid out as a college garden. That to the south is left for future buildings. Red brick is used for the main body of the walls, relieved with a considerable amount of stone and of black and white bricks in bands and diapers. Brick, although largely used in collegiate buildings at Cambridge, has hitherto not been used in Oxford. But in the absence of large funds, brick was a necessity. The effect, however, of the too free use of black and white bricks is not considered satisfactory. It is regretted that the east front is so near to the trees, and a strong expression of opinion has been given that the whole of that

front ought to be pulled down and re-built some 15 ft. or 20 ft. further back.

New University Schools.—The site for the new University Schools (where the Angel Hotel stood for more than 200 years) still remains unoccupied.

The Clarendon Laboratory.—This may be considered an extension of the New Museum, being, in fact, a connected wing at its north-west corner, providing a habitation for the department of physics, presided over by Professor Clifton, F.R.S. The lectures theatre will accommodate 150 students or other persons. Forty students can work simultaneously in the experimental rooms. The cost of the building will be about 11,000*l.* The architect is Mr. T. N. Deane, Mr. Bramwell acting as local superintendent; and the work of the builder is being carried out by Mr. R. J. Symm. The dimensions of the principal rooms are as follow:—Ground floor, lecture theatre, 30 ft. by 50 ft.; examination-room, 20 ft. by 26 ft.; central court, 36 ft. square. First floor, lecture-room, 20 ft. by 27 ft. The effect of the building in connexion with the New Museum, and its proximity to Keeble College, are not considered satisfactory. The style of architecture corresponds with that of the Museum. A view and plan of it have appeared in our pages.

Proctorial Rooms and Cells.—The establishment of a force which has absorbed the once separate element of University police has necessarily entailed considerable alterations in the accommodation required for the Proctors' men. The basement of the old Clarendon Buildings has undergone a complete change. The two cells in the eastern extremity will, as heretofore, be devoted to the detention of any females who may be found *flagrante delicto*. The old entrance at that end of the building has been closed, and one made at the western extremity, reached by a flight of stone steps. These will lead immediately into an ante-room and offices for the Proctorial staff, which is now entirely separate and distinct from the police, and is kept up for University purposes only. The basement premises will be warmed and ventilated, gas and hot-water pipes being laid throughout, on the "Perkins" system. The architect is Mr. Bruton, and the builder Mr. Wyatt.

Radcliffe Infirmary.—To the north wing have been added two turret-like structures at the north-west and south-west angles of the wards, containing ward-sculleries, lavatories, baths, &c. It is intended eventually to make similar additions to the wards in the south wing. The foundations also of a new pavilion for fever wards has been laid, and the building, which is of considerable size, is beginning to rise out of the ground. It will contain two wards, 51 ft. by 26 ft. and 15 ft. in height, with nurses' rooms, ward-sculleries, lavatories, baths, and all other offices; also a spacious hall, with an ample and easy staircase, and arrangements for ventilation. This pavilion will be eventually connected with the main building by a cloister-like corridor on the boundary between the infirmary and the observatory grounds. These works are from the designs of Mr. C. Buckridge, the builder being Mr. Wyatt; whilst Mr. G. G. Scott has acted as consulting architect.

THE WORKS OF THE METROPOLITAN BOARD OF WORKS.

THE matter of the following communication is serious, and seems to call for the careful consideration of the Board of Works. We have the personal guarantee of the writer to establish the correctness of his statements should they be questioned:—

Sir,—Attention has been called at the Fulham Board of Works, to certain works in Westminster, Rotherhithe, and Kennington, under the control of the Metropolitan Board, at a suggested expense of a quarter of a million of money—partly executed, but either stopped or delayed from a difficulty in obtaining "Gault bricks."

The increased cost of these works is suggested at 35,000*l.* to suit the wishes of Mr. Grant, recently appointed for three months, to act, *pro tem.*, as chief engineer, at the rate of 4000*l.* a year. The advance on his previous salary of 1,000*l.* The works of the Metropolitan Board that can well be executed, and costly character of the sewers,—which, when completed, merely form a culvert for conveying filth from our midst, and very shortly become thickly coated with a dark slime,—is constructed either of white Suffolk bricks, at a

cost on the work of probably 8*s.* per thousand; of pressed Gault bricks, at 50*s.* per thousand; or of wire-cut Gault bricks, at 3*s.* per thousand; and a selection from the best stocks, at 27*s.* per thousand, is permitted to be used at the caprice of the officer or officers for backing.

The bricks are tried by a gauge, and unless perfectly true as a cube, are rejected, if not entirely, at least for face work: any dirt or discoloration or chipping renders them objectionable. The bricks are packed and delivered on straw, and probably other expenses render the work needlessly costly.

In every possible way the work is made to look smart and pretty; kept clean, brushed, rubbed, swept out, tivated, and brilliantly lighted up for the inspection and approval of a committee. All this has to be paid for, and adds another straw to the camel's back.

The labour in the works is of the same wasteful character, and varies in amount from 5*l.* to 7*l.* per rod, occasionally much more, and then is not safe from being condemned, and done over again.

Much of the brickwork in the sewers of London has cost from 25*l.* to 30*l.* a rod, while under the late Commission of Sewers the contracts ranged from 11*l.* to 13*l.* a rod.

The quantity of work executed on the south side of the Thames under the assistant engineer in a portion of the main drainage may be approximately taken in the "Low-level-sewers and Southern Outfall" as 10,700 rods, and the facing or extra labour on the joints in "Pressed Gault Bricks," "struck, cut, flush, &c.," as 1,290,000 feet superficial; the arch covering cleaned off and pointed in Portland cement: this last quantity is exclusive of that due upon a length of about nine miles of sewer. These quantities, be it remembered, represent but a portion of the Southern drainage. If the assumption as to quantity be correct, and that a saving of 10*l.* per rod might have been effected in the cost; the suggestion at the Fulham Board, instead of 35,000*l.*, should be on the brickwork only in Mr. Grant's district, 100,000*l.*, and on the whole Metropolis a sum for Mr. Silas Taylor to calculate and possibly comment upon, or some other energetic member of the Board.

Granted that it is all-important such works be of the most enduring character; that the work should be in all respects equal to the object in view; still a due regard should be had to economy, and an overtaxed ratepayer's public;—*ergo*, the bricks should be of the best description suited to the purpose, bearing in mind their relative value; and it is a fair question to ask,—Are Gault Clay bricks best suited for this purpose? and is it absolutely necessary to pay the increased cost of the work by their adoption?

Pressed Gault bricks, delivered for sewerage works, cost about 50*s.* per thousand; Wire-cut Gault bricks, delivered for sewerage works, cost about 3*s.* per thousand; best selected stocks, delivered for sewerage works, cost about 27*s.* per thousand.

So much for cost. Now a word as to strength and quality.

Pressed Gault bricks, under a recent trial, crushed with 102 tons on the superficial foot; wire-cut Gault with 153 tons; and best stocks with "137 tons." Are not the latter a material entity both as regards strength and price for sewer work, and the general works of the Metropolitan Board? and is not the using any more expensive material simply wrong? Again, why should the labour be more costly in sewer work than in our finest edifices, or in the palaces of our beloved Queen? If certain indefatigable members of the Metropolitan Board will look into this matter, and see who is the officer or party propping up this wasteful expenditure, they will do more service to the ratepayers than by superintending the works in progress as amateur engineers.

Rumour is abroad that one of the great outfall works is rather shaky; perhaps some member will suggest that the engineer-in-chief be requested to report upon the present condition and state of efficiency of the "Northern and Southern" outfall reservoirs and buildings, so that we may be assured the rumour is incorrect, or prepared for a further outlay on one of these gigantic works just and hardly completed, of probably 100,000*l.* The value of the works of the Board, especially on the south side of the Thames (where it has ranged 15 to 20 per cent. above the other districts, chiefly, it is assumed, through the severity in the supervision); is a matter fully understood by contractors; and the prices, although proportionately high, yet fre-

quently cause the failure—or, as it is termed, “smashing up”—of the parties, and all sorts of evils and inconveniences to the public. If what has been suggested be the case, the recent loan of 10,500,000 will prove but an instalment of something more for the metropolitan ratepayers to contemplate and repay in part, leaving no mean legacy to future generations.

These matters will force their way on public attention, and the ventilation of the subject cannot be in better hands than those of the “editor and readers of the *Builder*.”—In fact, the engineers and architects of our time; the leaders and framers of public opinion in such matters; against which neither vestry, local or Metropolitan Board, nor Government itself, can long stand.

Finally, is it a fact that the cost of the works of the Board is excessive and unreasonable? If so, who is responsible? Secondly, is either of the “great reservoirs” shaky, and about to follow the College Dining-room,—i. e., come to grief? Y.

THE WORKING OF THE HIGHWAY ACT.

THE Government is again preparing to take up the question of roads, both turnpikes and highways. The turnpike system will doubtless be abolished as speedily as possible, having now outlived its time in liquidating generally the expense of forming good trunk or national roads throughout the kingdom, and these roads since the introduction of railway communication have become highways of only a local or district character, though still important and in many cases as heavily subjected to traffic, and in some cases more so, than ever. In Ireland there have been no turnpikes for a good many years, while in Scotland toll-bars are rapidly disappearing, and in France none exist. The mode of collecting road tolls, moreover, becomes much more costly than that of any other public rates.

With respect to highways in England, now of equal importance generally as turnpikes, and already comprising many of the latter whose Acts have lapsed, a circular letter from the Secretary of State has been issued to district highway Boards, requesting both information and suggestions as to the working, practically and financially, of the Highway Acts of 1862 and 1864 (which apply only to England). These Acts, in most of their provisions, such as the formation of district Boards, facility for the appointment of qualified surveyors, and the more enlarged and improved practical powers in their hands, are substantially the same as the Highway Acts for Scotland, which have worked so very successfully and satisfactorily for long, and we cannot see any reason why England should not have had sooner the benefit of an assimilation of law and practical experience on the subject; or certainly why, having received it, it should not realise in good time similar successful results as to roads, first in efficiency and ultimately in economy.

But the new Highway Act for England has an important drawback to general or speedy success,—which must be remedied,—in that it was made so far a permissive measure in the hands of Quarter Sessions for the counties, and not at once compulsory throughout the country, as Road Acts are in Scotland. The consequence is that its adoption led in many quarters, such as Yorkshire, Northumberland, &c., to much contention and delay, while in various counties it has not been adopted at all, and even in such counties as have been placed under its operation, the Act allows the local parish or township Highway Boards, with their nondescript surveyors, in existence at its passing, still to continue, though these, from the same inherent causes as above quoted, have proved little or no better than the annually elected, so called “surveyors.” When the new Act was passed, it should have been compulsory and complete, and all such limited primitive institutions abolished.

It is therefore premature to ask or answer the Government inquiries, unless in districts where the Act has from its passing in 1862 been all the while in full operation. In Northumberland, notwithstanding the best intentions of the county justices, a great mistake, and consequent failure, was at the outset made, from the highway districts being constituted of an extraordinary size, that were impracticable alike for a Board or a surveyor to manage with either credit or comfort, certainly at all events for a good number of years, when an amalgamation and extension of districts might possibly afterwards have been made, where not counterbalanced, in the meantime by growing importance.

The Act commenced in April, 1863, in Durham and other counties which adopted it immediately after its passing, and, therefore, can only have been anywhere in operation, at most for a period of six years and a half. With districts of reasonable size, varying according to the extent of population, agricultural or manufacturing traffic and general importance; by the active administrative agency of *reasonably* constituted, unprejudiced, and intelligent District Boards, composed, as the Act at present provides, of a “waywarden” elected annually by each township, and the various county justices, *ex officio*, resident within the district or towns adjacent; and the appointment of qualified surveyors, with professional training and practical experience; the new Highway Act for England has, we believe, worked successfully, both as regards efficiency and economy, wherever thus fairly, fully, and judiciously tried, effecting already many necessary permanent improvements, as well as accomplishing much towards putting the highways generally into proper form and condition, and regularly so maintaining them.

We trust the Government letter will receive that candid, unprejudiced, and respectful consideration from public bodies which the adoption by the Legislature of such means of obtaining general and practical information on the question highly merits.

Special meetings of District Highway Boards are being held on the subject of the Government inquiries for information and suggestions relative to the Acts, and from what we know of several, altogether favorable replies and intelligent suggestions have been forwarded. D. B.

CONCRETE MACADAMISED ROADS.

My attention has been directed to several letters that have lately appeared in your columns commenting on the present inefficient system of constructing and maintaining the streets in London. I beg to bring under the notice of your readers a new system of constructing streets with macadamised concrete, invented by the engineer, Mr. Jos. Mitchell, of Inverness. An experiment, extending to 100 yards in length, was made with this concrete, on one of the principal thoroughfares in Edinburgh, three years and a half ago, and although subjected to heavy traffic during that period, the general surface has not worn half an inch. There can be no doubt the result of this experiment has clearly proved that it is the best formation of streets. It is free from dust in summer, and from mire in winter, and carriages running over it produce no more noise than over a well-made macadamised metal road in perfect order. Any irregularities that may occur in the surface can be easily repaired; and where there are gas and water pipes, the concrete can be cast in blocks, and laid over them, and so prevent the necessity of cutting up the surface. Of course the macadamised concrete is more expensive in its original construction than the ordinary macadam; but the saving to the community consists in the total freedom from mud and dust, the easiness of traction, and the saving of constant repairs and consequent annoyance and expense they entail. I wish also to refer to street-making with blocks (which, I think, is not required, except where the declivity is such that there would be a danger of slipping on the concrete); I think it has been proved that, for making durable work, a solid and unyielding bottom is necessary.

An experiment of this kind was also made in Edinburgh at the same time as the above was done. 3 in. of the macadamised concrete was first laid, and the blocks set and grouted with cement, and since then no stone has sunk or worn irregularly, simply for the reason that the beds and joints were set in this concrete, which when set is inflexible and impervious to water. There can be no doubt but the present mode of constructing streets generally adopted is very inefficient and a great waste of material.

Having brought those two modes of constructing thoroughfares with heavy traffic under the notice of your commissioners of paving and their surveyors, I would only suggest, in order to satisfy themselves fully on the subject, that they should see the experiment I have referred to in George IV.'s Bridge, Edinburgh; for I feel confident that some further experiments with this concrete will result in great economy to the public, as well as infinite comfort in the absence of mud and dust.

JOHN MENZIES, C.E.

THE FORMATION OF TASTE.*

If you, or any of you who are engaged in any work of the hands where beauty, even in this least degree, can enter in,—if you will become once for all well grounded in the principles of ornament, your mind and judgment will tell what is right, and your eye will guide your hand to execute it. I do not say that knowledge alone will form true taste, and leave you to derive forms of beauty, but I will affirm that natural taste is at all events either very rare, or very rarely capable, unless instructed, of being turned to account in manufacture or in judging the merit of manufactured articles. True taste, it is certain, seems to be as it were an instinct with some men; even if they have no conscious knowledge of the rules of proportion and harmony as applied to form and colour, yet the moment they see an ornamental or decorated object they can tell whether it be false or true. In the last lecture I gave you some notions of what these rules of proportion and harmony are as applied to ornamental art, saying a good deal about form, and very little about colour, for reasons I will presently give. I showed you that good ornament has always more or less of meaning in it: it can be understood,—it conveys, though often in very humble form, some particle or other of truth. This I called the *human* side of ornament, possessed in the highest degree by the highest kinds of ornament, paintings, and buildings, and sculptures. The other condition which ornament must fulfil was that of fitness,—*appropriateness*. This is a fetter, a bondage, but it is necessary,—necessary on three accounts. Firstly, because of the artifice; secondly, because of the use of the object to be ornamented; and thirdly, because of the material to be employed. The less artistic the workman, the lower and rougher the use of the object; the more stubborn the material, the more removed must ornament be from the wildness, the freedom, the variety, the richness, and the grace of nature—or even from that close representation of nature which a good picture very properly shows. Nature must still be the storehouse from which our ornaments are drawn: the egg must give us our cups, and bowls, and vases; the hramble, the rose, the lily, and the flag a thousand beautiful combinations of form and colour, which we can adapt to the particular object we are fashioning or decorating. But I will not further travel over the ground of my lecture on “Ornament,” but proceed at once to see how far we can in our daily life and work carry out the principles of true art in metal work, wood-work, leather-work, and some of the other manufactures of the day.

Art in Manufacture.

Art in manufacture means something more than mere skill and cleverness,—it requires something more than a good workman. The steady hand, the strong arm, the powerful blow, the ready jerk, the proper twist, the true aim, and sound material, are all essential to good work of one kind or another, but the article turned out by their aid may be, and often is, though well made, plain, if not ugly. It answers, we grant, the purposes for which it was made, but we do not and cannot take any pleasure in looking at it, and as a result of this where we can we try to hide it. Is it a hinge? We make it so small that it becomes weak, and so very plain, that we countersink it to get it out of sight. Is it a chair? We use no tenons, no wedges, we seem ashamed of the means by which the chair has been put together, and it is only when it comes to pieces, or breaks up,—which, if it is what is called an elegant piece of furniture it is very likely to do before long,—that we discover that the secret of its make was this *glue-pot*. The plainest, the simplest, the cheapest objects are often better than those that cost more and pretend to be better, especially where the manufacture is an old one, handed down from generation to generation, and the forms of the article have changed but little for centuries: mats, water-pitchers, baskets, and pails and tubs of the cooper illustrate this fact. But especially when we compare these simple objects with the attempts at ornament seen on many or most of our household articles now-a-days, do we learn that the simple and unadorned often more nearly approaches what is beautiful. Bad attempts at ornament—ornaments which have no connexion with the thing ornamented—stuck-on ornaments—are worse than no ornament at

* By Professor Church; in a Lecture to the Cirencester School of Art.

all, but where ornament is true and appropriate, then not only is it a source of pleasure in itself, but may actually extend the usefulness of the object of which it forms an essential part. For if this object has become really pleasing, we no longer care to make it small and contemptible, no longer wish to put it out of sight. In speaking of two or three kinds of manufactures to-night, I want to show how soundness and strength of material, honesty of construction, appropriate design, and good form and colour, may be so combined as to make common and cheap things as well as costly things, not only answer their particular purposes, but give a real, thorough, quiet pleasure to those who daily use them. I can select a few only of the numerous manufactures of the country for my illustrations to-night. I propose to speak chiefly of the artistic treatment of the following materials.—1. Stone; 2. Wood; 3. Metal; 4. Pottery, Porcelain, Glass, Enamel; 5. Leather, Bookbinding; 6. Textile Fabrics, Lace, Embroidery, Basket-work.

Stonework.

It scarcely comes within my plan to speak of stonework, since it usually and rightly forms part of a fixed architectural structure, and is rarely fashioned into objects which can be moved. But a few words about the ornamental treatment of stone and marble may not be altogether out of place, since I shall thus be enabled to speak more intelligently concerning the ornamental treatment of wood, pointing out the great differences in the nature of decoration which should be given to materials so different in kind as stone and wood. That the differences between these materials are great is evident enough when we think of the ways in which stone is fixed in stone, and, on the other hand, wood to wood. Stonework properly executed is capable of giving a sense of great pleasure even when it is not carved stonework, and not intentionally ornamental. If we wish to follow out the rules of good taste we should not build a very small house with very large blocks, nor put a very fine face on the stone if we intend it to remain quite plain. I know it is often the practice here to dress the stone of the smallest and plainest cottages until it presents the appearance of a new cheese just cut. This is called "saw," I think it feels. This high finish of the surface is out of place where there is not a hint of ornament—no high gables, no shadow from projecting eaves, no chamfered edges, no rich mouldings,—but just a thin painted square frame set in a square opening for a window, and a long painted piece of boarding set in an upright opening for a door. But though art may be shown in the simplest structures of stone if the proportions be just and the construction sound, yet it attains a more evident excellence in the carved capitals and mouldings of a richly-ornamented building. Here the nearer the eye and the finer the stone the finer the work may be; but to put fine work at the top of a building, 50 ft. above the eye, for instance, is not merely labour wasted, but is artistically wrong, for ornamental stone carving must be suited to the place it has to occupy, and must be worked not only in a rougher and bolder way, but in a different way, when it can only be seen from a good distance. Sculptured ornament must usually be strong, and if the stone be coarse-grained, broad and rough, no delicate tendrils and slight veils, but broad expanses of leaves and large massive flowers, arranged in true accordance with the spirit of nature, on carved stems, full of strength and springiness; no mere inconsiderate imitation of natural objects, but the disciplined expression of natural forms and facts; yet no false-ness to nature, on the other hand,—no putting of leaves opposite where they should be alternate,—no combining the fruit of one plant with the foliage of another,—none of the common tricks of the carver to make his work look effective, if they cause it to be false. When you carve a capital, never forget it is a capital, and should look the thing; but never forget, too, that the lily-work with which you adorn your pillar should be as full of facts about that flower as its material, its position, and its use permit. No good carver will make two capitals exactly alike—that is to sink intelligence and feeling. You can carve a line of capitals, can you, because you can copy ten times over some poor copy of a capital that is put before you to imitate? A man who can do this and nothing more has no more learnt the nature of carved work than a man who can only turn the handle of a barrel organ knows how to discourse in harmonies of

sweet sounds. In the times when the art of carving in stone was at its best in this country, we know from almost every building that remains that the workmen felt a real interest in their work, strove amongst themselves who should excel in novelty of thought, in richness of invention, in the nobleness of work. The master-mind of the architect directed indeed all, that there might be oneness in the design; but the working sculptors put their minds also to active use, that there might be variety in the details. Go out into the hedges and the road-side wastes, gather oak, and rose and ivy; bring in the broad leaves and pure flowers of the water-lily; take the hollyhock, and the arm, and the hart's tongue; put them before you as you cut the stone, for they are no less necessary than the mallet, the chisel, and the gong. 'Tutor the wilderness of these natural forms to your purpose; keep balance of form, strength of construction, temperance of curve. You may make mistakes; you may forget the nature of your material and the use of your work; but to make mistakes when striving after truth is better than to be correct, and cold, and meaningless. Do not copy over and over again old examples which have lost, at all events, their freshness, and their meaning too; ornament the buildings of your town with the plants of your country. I must add a word about marble. Marble when of one colour admits of similar (but more delicate) treatment to that of stone. But when marble is veined or mottled its surface must not be carved, nor is it a suitable material for foliaged capitals. If you cut a fine diapered ornament on veined Derbyshire alabaster, its regularity, which is one of its chief characters, is interfered with by the irregularity of the veining, which is its chief character. So with capitals carved out of variegated marble: the hollows and shaded parts may happen to be wrought in the white veins, and so their depth and repose be broken, while on the other hand the projecting masses may happen to be wrought in the dark parts, and so their relief be lost. Do not as a rule mix marbles with artificial materials, as tiles.

Wood.

I have lingered too long over stone-carving for I have much to say about wood-work. If you think for a moment of the texture and grain of wood you will see that it must not be worked into ornaments like those we should execute in stone. But before I speak of the kinds of decoration which are suited for wood, I must refer to two very essential points in all carpentry and joinery, namely, *construction* and *shape* or form. Unless we have sound notions about the way to put woodwork together, and to shape its general outline, we are not ready for decoration. From the earliest times of which examples remain almost to the present century joinery was put together honestly, and showed its wooden pins, its tenons, its joints, and its wedges. It could be taken to pieces for removal or repair without the least injury or disfigurement. Now the construction of a piece of furniture is concealed as much as possible, and is found to depend upon glue, nails, and screws almost exclusively. Not only is modern furniture, &c., less picturesque, less interesting, less convenient, less durable, and less strong on this account, but putty and paint have been thereby brought in to hide still further all construction, and to complete the disfigurement of the work. Mind, I do not say that you should always make a show of construction, nor that glue, nails, screws, putty, and paint are not useful in their way, but that when the balance of convenience and beauty is in favour of these things you should use them, when against them discard them. One common error in the shape or outline of most pieces of woodwork for the house is their roundness, their curves, their extravagant contour. There is a want of simplicity and quiet in them. They worry you by hanging about in all strange directions. Sofas, chairs, sideboards, even chests of drawers show this error, and are often rendered uncomfortable if not useless by it. The legs of various objects of furniture, instead of being turned with slight mouldings and fillets are often either violently twisted or even spiral, or else are made of a podgy pear shape at once ugly and weak. Having drawn diagrams of the backs of sofas, pianoforte legs, chairs, and so on, on a black board, the professor said as many curves as possible had been introduced, but without successful result. The curved back of the sofa would not allow you to rest upon it, for which purpose it was intended. The legs of chairs, instead of being straight, to support the weight, are made weak by being twisted, and in some cases made

spiral. Some people, too, admire the spiral-shaped legs, and yet they cannot support the weight put upon them. Another form in which extravagance of curve is shown, is on the peculiar pear-shaped legs of pianos, and I do not know anything more wrong than the leg of a piano. Now just look at the next leg of a piano you come across, and you will observe it has certain faults of construction. The curves are very extravagant, and such as you do not require. Sound construction and sober form being granted, we may now consider what kinds of ornament are best suited to wood. I can only refer to a few, such as carving, veneering, inlaying, staining, and painting. Some woods are too soft and too easily split to be carved well; to relieve large plain surfaces of such woods, grooves and mouldings may be run. A tough and hard wood like oak is well suited to carving, but it is not well as a rule to carve wood very round or in high relief. A wooden capital with such work would look weak, and the decoration would appear not to be part of the pillar, but stuck on. Wood works less easily than stone, and so our decoration of it must be more stiff. In the fifteenth century wood-carvers tried to overcome this difficulty by taking a curved piece of wood half an inch thick, carving it slightly, cutting out the pieces between the leaves, &c., and then mounting it in front of a hollow moulding.

FORD HOUSE, LINGFIELD, SURREY.

This house, which occupies a favourable site in the centre of a charming residential property, has been well built by Messrs. Haward, of Old Quebec-street, under the directions of Professor Kerr as architect. A description of sandstone found on the estate, although not of any high quality, has furnished an effective material for the wall-facing, with hacking of brickwork; and, indeed, the effect is rather increased, as not unfrequently happens, by certain defects in the colour of the stone, which at first almost led to its rejection. The ground plan which we furnish will sufficiently explain itself; the aspect being north for the chief entrance, dining-room, luggage entrance, and offices; and south for the drawing-room, morning-room, gentleman's room, conservatory, &c., towards the terrace; an ornamental lawn lying westward. The billiard-room is one of the standard dimensions, with the ceiling light according to rule; the wall windows being not for light, but for cheerfulness. In the school-room, we see a feature which is capable of being adopted in many forms, according to family circumstances,—namely, the ground-floor day-room for the children,—of which we need only remark that in suitable circumstances it is one of the most convenient of all domestic arrangements. In the offices, we have an instance of the application of the principle which the architect of this house has dwelt upon in his writings, that these should always be under rather than fully up to the scale of the house. The bedroom arrangements, although not of any such peculiarity as has limited amongst our engravers, provide, southward, two complete self-contained suites of apartments, one including a hoidoor, over the school-room, which is also entered from the staircase landing. There is a second floor over part of the house, occupied by secondary bedrooms; the servants' bedrooms being separately provided over the butler's rooms and the gentleman's room. The cellarage is small, accommodating no more than wine and beer cellars. The internal finishings are of that character of every-day custom which fortunately accords efficiently well with a plain Elizabethan exterior to divest that style of all embarrassments in this important respect.

The contract amount was a little over 11,000l.; the conservatory, part of the outbuildings, and the usual interior fittings, decorations, &c., being afterwards added.

REFERENCES.

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| A. Ante-room. | cc. Coal Cellar. |
| B. Billiard-room. | cl. Cleaning-room |
| Cc. Conservatory. | (glazed roof). |
| Cl. Cloak-room. | d. Dust-bin. |
| D. Dining-room. | f. Furnace-room. |
| Dr. Drawing-room. | g. Gun-room. |
| E. Entrances. | h. Game Larder. |
| G. Gentleman's Room. | k. Kitchens. |
| K. Kitchen. | l. Larder. |
| L. Lavatories. | p. Pantry. |
| M. Morning-room. | sc. Store-room. |
| S. School-room. | ss. Scullery. |
| T. Terrace. | sh. Servants' Hall. |
| b. Bakehouse. | sr. Servery. |
| bb. Butler's Bedroom. | st. Wood Shed, &c. |
| bp. Butler's Pantry. | y. Yard. |

FORD HOUSE, LINGFIELD, SURREY.—GROUND PLAN.



17



FORD HOUSE, LINGFIELD, SURREY. — PROFESSOR KERR, ARCHITECT.

W. & A. G. & Co. Litho. & Printers. 1869.

[The text in this section is extremely faint and illegible due to the quality of the scan. It appears to be a list or a series of entries.]

HOW A VELOCIPEDE WAS BUILT.

The *Builder* is a great power, and you, Mr. Editor, have much to answer for. A decade of years has almost elapsed since my attention was first turned to the construction of velocipedes by reading one of your articles. The result was fearful, and had nigh been terrific.

I had long been brooding over some plan of locomotion that should entirely and for ever throw Hansom cabs into the shade, and place me upon the biggest pinnacle reserved for the greatest economist of animal power.

I lived at a respectable elevation above the sea, and my ahodo was reached with some difficulty by both man and beast. In watching the overloaded borses toiling painfully past—I for I was by no means at the top of the hill—and in often being the anxious spectator of a timber-wagon slipping its "skid," and thundering down, prevented simply from becoming an extempore avalanche by the poor brute in the shafts, who, upon its haunches, with fore arms extended, trumpet nostrils, and darting eyes, exerted its whole energy to keep the pressing mass from overwhelming it, my sympathies were enlisted for beasts of burbon, as well as for man; for I had seen both equally overloaded in ascending and descending. Your paper roused me to action, and I determined to make the weight do the work. Being a draughtsman, I did not theorise entirely. I soon found, by reducing my ideas to a 1-in. scale, and some of Whatman's drawing-paper, that even without a knowledge of mechanics it was easy to conceive that cranks and levers would not do. Of course, my idea was to make the load run up the hill by its own weight. I could make it run over a little hill,—a very little hill, but not over my hill,—that took me very little time to ascertain, and eventually I abandoned the investigation, so far as my four-footed friends were concerned. The difficult part of the question, I am ashamed to admit, I shirked, after a suggestion to the town council that they should construct tramways on the main thoroughfare, the loads going down pulling up those bound heavenwards, which suggestion was not discussed with that courtesy which I had expected from such an intelligent body of gentlemen. However, time being money, I could at any rate save some by giving to the world a machine that should entirely supersede walking, except for pleasure.

Weight here, I had willfully, should be to a great extent self-motive; but since I had to do with a living mass, who, by its own volition, could change position, the problem seemed at first sight much easier than I found it. Fewness of parts and simplicity were essentials; multiplication of parts and intricacy hope, over which there was no hope of riding. My idea was hot; it had germinated. My scale and pencil forwarded it to such an extent that you only wanted to hear the sound of the beak pecking at the shell. By the aid of a builder I had this extreme pleasure, after a proper time of incubation. Night after night, week after week, went by in anxious expectancy; chips of the shaly lay scattered in all directions, with here and there a tenpenny nail and some copper wire; the prodigy gradually unfolded itself; and the night it burst its shell in a harn, and appeared the fearful, the ghastly skeleton it did, in all its parts fleshless, but a living reality, which never be effaced from my memory or that of the one true and honouring friend who had had the felicity of working with me and sharing my confidence. "Is it done?" he exclaimed. My answer was a lofty nod. There it stood ready to bear me without fatigue, forty miles an hour, and with a little extra exertion ten or twenty more. I will not say I was proud of my achievement; the feeling was too ethereal. I was aroused from my ecstatic trance by my fellow labourer saying—"Try it." No, no; that would have been abrupt; the poetry would have been spoiled. I intended to dally with my love. Softly and silently I led him from the presence, noiselessly closed and locked the door, and then we had a night. Probably the excitement was too much, or "Moets" was a little too sweet; but we could not manage breakfast on the morrow, neither did the design for the Manchester Assize Courts progress in that rapid manner which was its wont.

The day passed, however, and a moonlight night followed; and precisely at twelve, midnight, "it" was led forth, and was smiled upon by as much of nature as was visible. Its fleshless nakedness was not inviting—it was not beautiful; but the proud satisfaction was that

it was useful. I adjusted the gear; I attached a stout rope to the axle; and I mounted, having previously, much to my friend's amusement, handed him the end of the rope to hold by, and keep me from going too fast. He pooh-poohed the idea, and let the cord dangle in his hand. "It" was not strong. It awayed weakly. One or two spokes started. The tire had a peculiar wave. The nave hardly looked in the centre. But we were together; had it collapsed, so should I, but it bore up gamely. In a second I should be darting forward, with an admonition to D. to hold fast. It moved. I remembered no more until D. poked me up. I was a little stunned as much by my success as by coming crack against a wall. My first sentence was, "Why didn't you hold?" Whereupon a lacerated and bloody hand was presented. The rope had been whipped out of his hand, and in his anxiety to stop me he had grasped at the revolving wheel; our workmanship not having been particularly smooth, his hand was scored rather deeply, and I was borne forward—nearly thrown into my bed-room window, and "it" was very severely damaged. Thus, sir, I proved beyond dispute that my principle was right. Tenderly we placed the remains in the building which had sheltered it in its growth, and then to supper. I became generous before seeking my couch, and, had my promises been kept, one of the twain would have been somewhat richer than he is this day; but we cannot all keep our promises.

I knew that discretion was the better part of valour, so ere launching my invention upon the world I thought I would take time to consider; for although I had proved a principle, I had hardly reduced it to everyday life: thus it happened my pet invention gave me much trouble and much pleasure, as I was continually asked what the machine was, producing no end of mirth when I boldly stated that it would carry me 50 miles an hour.

I candidly state that hills have been my *bête noir*, and corners, sharp corners, troublesome affairs, otherwise something would have come of my thought and work; as it is, I am holding back in case a better man should step forward, still ready to prove that I can produce a velocipede that can go on level ground at the rate of 30 or 40 miles an hour.

Supposing you have obtained a machine which will do all you expect on the level, the next question will be to render it efficient in ascending hills. At the end of the question I found no entry; I therefore need my wings of fancy, and bore both myself and my machine to the top of the hill. As its own weight would be more than sufficient to take it down, my weight could be used to create a reserve force in the shape of a chamber of compressed air. By the use of a crank and piston this could be accomplished. The chamber being of what? I found upon consideration iron was the only material suitable for the reception of this compressed air. Here I had a good theory; but what with cranks and pistons, valves and chambers, my velocipede had become a weighty matter, so weighty as to be beyond my powers; for, had I been lucky enough to have had a down-hill always before me at the start, each hill I ascended must of necessity have been of less altitude. A rough road would undo me. My roads must be of the smoothest; and, in fact, the creation of reserve force, owing to the weight of material to receive this force, was not worth creation. A lever which acted in a small cog-wheel being a ridiculous theory was dismissed as soon as ascertained; but how about powder? Here was an instant solution: grand idea! pile-driving gave me the key to the riddle. Here I am, then, probed on a seat 7 ft. high. I gradually descend turning the wheels of my velocipede by my own weight. I arrive at my lowest point: pop goes a charge of powder, and I am instantly projected to a 7 ft. throne. Again I descend, and again I am projected upwards. As I could also use my arms and legs for propulsion I had certainly bit the right nail on the head, but how long my head and frame could stand such jerks, I was, I flatter myself, too wise to try by actual experiment. Feeling that I was not equal to the solution of rendering the ascent of hills easier by some light and simple reserve or storage of waste power, I have confined myself to the construction of a velocipede, simple, light, frictionless (?), and of such construction as to allow me to throw weight as well as muscle into its motion on the level or up hill. In the ascent of hills all velocipedes fail; you push against yourself; in other words, you pull yourself up by strength of thigh; you push against the hill, which has a tendency to send

you down one yard for every two which you ascend. Hence you not unfrequently see a velocipede going up hill backward: his body by this means, being inclined at a less angle to the plane of ascent, assists him by its weight.

I cannot say my invention is even yet perfected. My first attempt was extremely crude; it nevertheless embodied an idea. It existed for several months, being the wonder, not admiration, of all who beheld it. The wheels were not ordinary ones, and attracted attention. The fact is, I had to forsake my harn. In the small hours of the morning, when most respectable people had sought their couch, my friend and I tenderly and cautiously guided the offspring of my fancy to a new house. Nothing but a garden wall shielded it from the vulgar gaze. Its hearing being decidedly too lofty under these trying circumstances, I determined to dismember it, and one chilly afternoon I did what I almost looked upon as a deed of sacrilege. In the commencement of this communication I hinted that the result of my becoming the inventor of a velocipede had nearly proved terrible. The Crimean war was then, or soon after, raging; and from the construction of velocipedes I turned to that of infernal machines. I made drawings, wrote reports, and through an M.P. introduced them to the consideration of the Lords of the Admiralty. I was kept in suspense some time, but eventually received a communication stating that their lordships had duly set upon my invention, and could not recommend its adoption in Her Majesty's service. M. U.

SELF-SUPPORTING PRISONS.

THERE is a strange though unintentional perversity about the national treatment of criminals and paupers. In both cases the industrious ratepayers, while in too many instances overworked themselves, provide for all-bodied criminals and paupers, but especially for criminals, good food and lodging, with attendance, and nothing profitable to do. In the case of criminals, the most attention is paid to their sanitary welfare; and while their paymasters are stifling themselves and their families in stuffy back shops and unventilated underground bedrooms, lighted by dim "dips;" they provide for Bill Sykes and his friends well aired and ventilated, clean, tidy, winter-warmed, snug, and cheerfully-lighted places of abode, where, if they sing "We've got no work to do," it must be with a wink of the eye, if it is not with the tongue in the cheek. And Bill may well think what donkeys his bread-winners are! How long is this ridiculous and absurd system to continue? Not only ought both criminals and paupers to labour while able for their own food and lodging, but criminals ought to make restitution for the wrongs they have done. If criminals knew that in prison they must earn their bread like honest working people, they would soon learn to prefer work with liberty, to work with imprisonment. If paupers were called upon to provide for themselves and their families in work houses, there would be fewer suicides and family murders on account of starvation, because there would be less disgrace in the name of a workhouse than there now is. It is shameful that such is the state of matters, that the name of a prison is not more disgraceful nor more repelling than the name of a workhouse, if so much, and that so much better is the treatment of villainous criminals than the treatment of honest but unfortunate paupers, that there is thus an evident temptation of the starving poor to steal and so prepare for a prison, rather than go to a workhouse. The nation is thus truly inculcating—teaching—crime. In this money-worshipping age, to be poor is itself virtually a crime; and really, as bankrupt debtors used to be put into prison where criminals are put, it would be more consistent, and almost better, to do away with workhouses altogether, and send all paupers to prison. They might at least obtain treatment on a level with that of criminals, and not fare worse than they in all respects.

On the subject of self-supporting prisons, there is an able article in the *Christian Times* of November 12th, from which we shall quote a few passages:—

"The State prison of Massachusetts returns a clear revenue of \$500,000 per annum to the State, after paying all costs and salaries. Many French prisons are nearly self-supporting. Even in the distant Antipodes the goal of Dunedin, with 750 inmates, defrays all its charges by the profit of its prison labour, and retains a surplus of nearly £4000. In France, the prisoners are provided with lodging, bread, and water; by the State; what further is needed must be earned by their own hands, opportunity

being given. Why should it not be so here? Because the House of Lords Committee in 1863 reported against remunerative prison-labour, contrary to the evidence of the two experienced prison inspectors and many able officers; and the 1865 Act carried into effect their lordship's views. Will the ratepayers of Middlesex and other counties cheerfully permit their pockets to be thus lightened to support strong and law-abiding men, merely because such a system has once been agreed to by a Lords Committee?

It is a question which materially affects the morals of the kingdom, the security of property, and the country rates. The chaplain of a self-supporting American gaol last year visited this country and inspected its prisons. On his return he published the result of his observations, and after remarking "I was greatly surprised in my visits to learn how very little the prisons in Great Britain generally yield to their own support" (about 1½d. per day per head), he states that he was told that the present system was considered more "deterrent." He adds, "I asked if this was the practical result of the course, and was assured it was not; for that the number of recommitments was large—not less than 30 per cent."

During the past three years the London Howard Association, for the diffusion of information on criminal treatment, has widely aroused public attention to this question, and much progress has been made, considering the restrictions of the prison laws. At Wakefield Gaol the inmates earn about 8,000*l.* per annum, chiefly by mats. At Holloway nearly 1,000*l.* have been received in one year for tailoring (coloured uniforms) done within the walls. At Bedford Prison the inmates earn about 600*l.* per annum. Manchester New Bailey, Preston, Durham, Newcastle, York, Birmingham, Hull, Peterborough, Liverpool (borough), Devonport, Leeds, Chester, and other prisons are also making much progress in this direction. It is found by experience that useful labour may be rendered quite as punctual and deterrent (by means of task-work) as the hardest treadmill exercise; and, indeed, far more so. The governor of Devonport gaol recently related to Mr. Tallack, Secretary to the Howard Association, an incident which well illustrates the effect of requiring prisoners to contribute towards their own maintenance and punishment. A vagrant, who had been confined for a fortnight, was obliged to work at hard but useful labour in his cell; and on his discharge the governor informed him that his earnings during his imprisonment had amounted to double the cost of his food, "so that you have also contributed so much towards my salary." This was quite a new idea to the vagrant, who at once perceived that he was making a fool of himself by entering a gaol where he must compulsorily pay for his own punishment, in addition to his support. He replied, "Then you shall never see me here again." And he kept his word. Now this by and by means a solitary instance. Let this plan be more extensively adopted, a greater variety of prison industry enforced (in lieu of the too general mat-making), and a more practical prison legislation enacted, and the result, instead of increased prisons, will be not only diminished rates, but also a most gratifying reformation of criminals as a class.

HOLKHAM CHURCH, NORFOLK.

THIS church, after having been closed for the last eighteen months, was re-opened last Tuesday, the 14th inst., by the Bishop of Norwich. It has been restored, and many portions, where necessary, rebuilt, at the sole expense,—amounting to about 9,000*l.*—of the Earl of Leicester. The church previously to the late works was in a lamentable condition, having been plastered both inside and out, and the roofs concealed by plaster ceilings. Many of the windows were bricked up, and plaster panels substituted upon the walls inside. The walls of the tower, as well as many other parts, were in a very unsound condition. In the restoration the plaster casing has been removed, the stonework renewed, where necessary, and new windows were inserted where the old ones had been destroyed. The east end of the chancel has been rebuilt, with decorated buttresses and five-light windows of geometrical tracery. The tower, which is attached to the south aisle, has been underpinned, and the south wall taken out and rebuilt as high as the belfry window. The lower portion is of the thirteenth century, and there was sufficient evidence to show that the entrance to the church was through a large double door; but it had become nearly obliterated by alterations and repairs. A new double door has now been added, with a centre clustered shaft and arch mouldings, enriched with dog-tooth moulding. A new open-arcaded stone staircase leads to the ringing-chamber.

The whole of the roofs of the church and chancel are new, of pitch pine, and have carved ribs resting upon stone carved corbels. The west window, which is new, as well as the east window, is filled in with grisaille glass by Messrs. Lavers, Barrard, & Westlake; the west windows of the aisles have stamped grisaille glass by Messrs. Powell & Sons.

The pulpit is of Caen stone, with foliated panels and capitals, supported on polished red granite shafts. The seating is of oak, and every bench-end is enriched with carved arm-rests and tracery panelling, containing carved representations arranged conventionally from nature, embracing a great variety of designs—every bench-end being different. The lectern consists of an oak double desk of a pyramidal form, with carved ends and diapered surfaces, supported on a carved twisted oak central shaft, surrounded by four other carved shafts at the base.

The font, which is situated at the west end, opposite the west door, is of Caen stone, with panels enriched by carved panels containing the emblems of the four Evangelists, carried on nine polished red granite shafts, with rich foliated capitals. The chancel sashes, which are open to the nave and chancel, are separated by carved openwork screens executed in oak. The spandrels and other portions contain a variety of designs, carved on both sides of the screens, arranged—with an admixture of birds—from natural foliage. The reredos, consisting of an arcade of enriched trefoiled arches, with foliated spandrels embracing among other subjects from nature the lily and passion flower, is executed in Caen stone, with polished red granite detached shafts. The floors of the church are laid with Maw & Co.'s tiles, and the communion space is laid with a combination of marble and tiles, by Messrs. Simpson & Co. The whole of the work has been carried out by Mr. Robinson Cornish, of North Walsham, from drawings and under the superintendence of the architect, Mr. James K. Colling. The iron work is by Mr. John Parlour, of Norwich. A peal of six bells has been put up in the tower by Messrs. Warner & Son, the tenor weighing 20 cwt.

A WORKING MAN ON EDUCATION.

SIR,—For at least forty years many leading minds have mourned over the ignorance of the masses, and devised schemes to remedy the deficient education of the people. The question is once more becoming interesting; and perhaps in these latter days the education of the working classes will receive that attention which so mightily a matter deserves. Already two great organisations are formed, and have begun to agitate the question; and it now becomes a matter for consideration as to which is most worthy of public support. I read with much interest the programme and proceedings of the National Educational League, and I felt the conference was in earnest; and I believed that, to make the movement successful, it required the earnest support of all who believe in the necessity of a permanent provision for securing to the great body of English people the means of early moral and intellectual culture. Without quoting educational statistics, it is well known that millions of our fellow countrymen are debarred from all intellectual pleasures. They feel no interest, and can take no part, in the great questions of the day. Their pastimes are grovelling and degrading, and their highest aims sensual gratification; and it is appalling to know that millions are still growing up in the like condition. It appears to me that it is a public duty to support the National League, as the members and council are for immediate action. Ever since the question of national education has been agitated, there have been alarmists, whose prophecies have been most doleful, and all sorts of things were to happen when the working men had become educated. The present movement is no exception. Priests, clergymen, and laymen, Liberals and Conservatives, have met at Manchester, and inaugurated an opposition scheme; they state, which is no doubt true, that a good deal has of late years been done in the way of education; and if they are left alone, they will do a great deal more. But whether they are left alone or not, they intend to oppose with all the forces at their command the Birmingham godless plan to make all the working classes atheists. When the late Lord Brougham forty years ago proposed a scheme for the education of the poor, he was assailed by various writers as one who was going to turn the country upside down, and create a nation of atheists. A country gentleman of that time, in a letter to Lord Lansdowne, to show the consequences that would ensue if the theories of Mr. Brougham were to be put in force, among other things said,—"Unwilling as I am to trespass further upon your lordship's patience, I cannot resist calling your attention to a few further observations which occur in opposition to this baneful project. Suppose, for instance, that some friend to humanity were to attempt to improve the condition of the beasts of the field: to teach the horse his power, and the cow her value; would he be that tractable and useful animal he is, and would she be so profuse of her treasures to a helpless child? Could anything be more impolitic? Yet there is not, that I know of, any express law against it; nor would it be one jot more ridiculous than teaching tailors and cobblers 'the beautiful system of geometry.'"

In the year 1820, Mr. Brougham, in the House of Commons, moved for leave to bring in a Bill for the education of the poor in England and Wales. He said there were at that time 2,750,000 children that ought to have been receiving an education. Of that number, 750,000 were receiving an education, and 2,000,000 were totally unprovided for; in other words, every fifth person was without the means of education; so that the then condition of "Switzerland in respect to education was twelve times better than our own." Since that defeat of the friends of national education in Parliament, forty years have elapsed, and the difficulty is almost as great as it was then, and friends to education are still obliged to state that England, which ought to take the lead in all that is intellectually great, is still, so far as the bulk of her people are concerned, almost the worst educated country in Europe. It is a well-known fact that Parliamentary grants for educational purposes are increasing year by year, and yet the people are not educated. It has been clearly shown that, under the present system, the districts most requiring help have not, from a variety of causes, received any benefit from the grants; one cause being the low estimate of the inhabitants of the poor districts of the value of education; and, as no system of compulsion is in force, the young are left to street education, whilst the fat districts get all the educational grass, and the poor are left to starve; while education, the key to national prosperity and well-being, is withheld for want of a compulsory system to keep it in motion. When one remembers how little was taught in working-class schools twenty-five years ago, and how few our educational wants were supposed to be, it appears to me that for all those who, like myself, have retained the little we then learned, there is work for us in supporting the National Education League; and determining that England shall have as good an educational system as other nations possess, and that it shall not be left to the caprice of volunteers or any other class to mar its progress; so that it may no longer to England's disgrace be said that her working classes are the worst educated of all the progressive nations in Europe. It is a foul blot upon the national escutcheon; and, in spite of all obstacles, it is to be hoped the earnest friends of the movement will not rest until it is wiped out, and a universal system takes its place.

I hope the above remarks of a working man will not be out of place in the columns of the *Builder*, and that in another letter I may be allowed to state my reasons for supporting the programme of the League in preference to the one proposed by the Manchester Educational Union. JACK PLANE.

BUILDING OPERATIONS IN THE YORKSHIRE COLLIERY DISTRICTS.

THE building trade in the Yorkshire Colliery district has, during the past few years, been largely indebted to the opening out of new coal-mines for a good share of the prosperity which it has received, and which it still enjoys. This important branch of the trade seems to be almost entirely overlooked, but there can be no doubt that to it the builder is largely indebted for the numerous small towns which spring up in districts where new coal-fields are being opened out. On the other hand, the builder is also one of the most important artisans that are to be found about a new colliery where engine-houses, &c., are sure to be needed. The Yorkshire coal-field is of a very large extent, commencing as it does not far from Nottingham, and extending near to Normanton, a distance of about 70 miles. It would be more appropriately known by the Midland coalfield. It is, however, to the Yorkshire coal-field proper that we more particularly refer, and in which within the past two years some thousands of pounds have been expended in building operations connected with new collieries alone. Many of the engine-houses and colliery offices are no mean specimens of architectural skill or workmanship. We have first to notice the very beautiful works at the Denaby Main Colliery, which is not only the nearest to the magnesian limestone formation, but the deepest pit in Yorkshire. The engine-house is a large and well-constructed building, and supplied with two beautiful engines, each 100-horse power, which were made by Messrs. Bradley & Craven, of Wakefield. Eight large boilers are also fixed on the premises, and are set on a new principle. The shafts are 13 ft. 6 in. in diameter, and are partly walled with brick and partly "tubbed"

with metal plates. The offices and manager's residence are a fine block of buildings. In addition to these the company have also just completed about 150 cottages on the pit premises for their workpeople, who number between 600 and 600 hands. About two miles nearer the centre of the coal-field, viz., at Wath, a very large undertaking is now being opened out. The new project, which is to be known as the "New Miner's Main Colliery," will be one of the largest pits in Yorkshire, and has involved a very large sum in building operations. Here the visitor and admirer of neat and substantial workmanship and design will amply be repaid by a visit. The engine-house is a very large and commodious one. It is to have an open roof, similar in design to those in churches. The whole will be boarded and polished, which will give the building a neat and healthy appearance. Two of the largest engines in the district are now being fitted by Messrs. Black, Hawthorne, & Co., of Gateshead. Each is 180-horse power, and can, if needed, be worked up to 200-horse power. The shafts—an upcast and a downcast—will be nearly 300 yards deep; and those, with the exception of 50 yards, are walled all round with bricks. Nearer Barnsley, the Oaks Colliery Company are also sinking two new shafts, which are now about 140 yards deep. Here, also, a very neat engine-house and other buildings have been erected, which have found a good deal of work for masons. At Mearns Dyke, the Darley Main Company have sunk new shafts, and are building engine-houses and offices, which for style and finish cannot be excelled. At Barton Bridge, near to the Cadworth Station on the Midland line, a large plant has been fixed, and sinking operations are going on rapidly. In the West Yorkshire coal-fields there are at the present time a number of new collieries being opened out, which are finding employment for a large number of masons, &c. At Featherstone, a new coal-field is being opened out by Messrs. Shaw & Co., who have erected a handsome engine-house, which has just been finished by Messrs. Tattersall & Horsley, builders, of Featherstone. In the Normanton and Castleford districts, great improvements have been made, and whole streets of buildings have sprung up within the last two years, in consequence of the opening out of the numerous new collieries, which are to be further augmented in a short time.

NEW MASONIC HALLS.

Durham.—The new hall which has been erected in this city in connexion with the Marquis of Granby Lodge of Freemasons, has been formally opened with the rites and ceremonies of the Royal Arch Chapter. The new hall is situate in Old Elvet, opposite the Court Houses, and the foundation stone was laid on the 22nd December, 1868. The building has been designed by, and the work carried out under the care of, Mr. T. C. Ebdy, of this city, architect. The style of the architecture is Early Geometrical Gothic. The front facade, which is not very extensive, owing to the limited site, is executed in dressed ashlar from the Brasside quarries. The principal entrance is formed by four polished red granite columns supporting a bold pointed arch, above which is a large bay window, which is formed by cusp lights, and the spandrels are filled with Masonic devices. Over the entrance is carved in stone "The All-Seeing Eye," surmounted by crosses formed of intersecting triangles. The portico leads to an ante-room, 21 ft. 9 in. by 16 ft. 3 in.; and a corridor, 11 ft. wide, leads to the principal staircase and banqueting hall. The hall, which is 46 ft. 3 in. long by 25 ft. 5 in. wide, and 15 ft. high, is lighted from the east by two three-light pointed windows, warmed by open fires, and ventilated by a system of syphon tubes. Adjoining the hall are the steward's room, lavatory, and wine-cellar, &c. Between the ante-room and banqueting-hall is a triple staircase, leading to the lodge-room on the left, and to the robing and preparation-rooms on the right. The lodge-room is approached by an ante-room (or tyler's room), through a pointed Gothic doorway supported by semi-detached columns, with carved capitals. In the tympanum of the arch, carved in bas-relief, is a figure representing Moses descending from Mount Sinai with the tablets. The lodge-room is the same size as the banqueting-hall, and 30 ft. 9 in. high to the apex; the roof is open-timbered, the principal forming an arch. All the woodwork is wrought, stained, and varnished.

Halifax.—The Freemasons' Hall in Halifax has

been formally dedicated to Masonic purposes by Earl de Grey and Ripon. It is in the Italian style, having in the front a projecting portico of 7 ft. 6 in. The large room, which is on the principal upper floor, is 48 ft. long by 24 ft. wide, and 24 ft. high, and is enriched with a coved and paneled ceiling, with ornamental marginal counter lights. The walls are divided into compartments by pilasters, having carved bases and capitals, and a Corinthian cornice with full enrichments. The east end is adorned with a large canopy, supported by two pillars with carved capitals; and the west end of the room has single columns, forming central projections. This room is approached by a spacious staircase of stone, and opposite the foot of the staircase is the entrance to the dining-room, which is the same size as the lodge-room, except that it is only 14 ft. high. The interior also contains instruction and other rooms, for both the lodges of Prohiby and St. James, together with smoking-rooms, cloak-rooms, lavatories, &c.; and the basement contains living apartments for hall-keeper, with requisites for cooking, &c. The architects were the late Mr. J. E. Oates, Mr. B. W. Jackson, W.M. of Prohiby, and Mr. W. H. D. Horsfall. The cost of the building is about 4,251l., exclusive of furnishing, which is calculated to cost 500l., so that when completed the entire cost will be 4,751l.

AN EFFORT FOR ARCHITECTS' ASSISTANTS.

Sir,—The interest which you appear at all times to take in everything which may conduce to the advancement of the architectural profession impels me to request the insertion in your valuable paper of a few remarks upon a very important question; namely, the status, social and professional, of the class of architectural assistants. I am not of those who would claim for assistants some share of the honours of the practising architects in whose offices they may happen to be; but I do think that an assistant ought to be looked upon as something less of an inferior being, and as something more of an equal, and a fellow-worker in a noble emulation, and more especially as a gentleman, by profession, at least, if not otherwise.

But my more immediate purpose in addressing you, sir, is to propose the formation of an association for the social and, still more, the professional advancement of architectural assistants, and to ask for your kind assistance, and that of the profession generally, in what I believe to be a proper and praiseworthy object.

I would propose an Association of Architectural Assistants; that its great centre of operations should be in London; and that there should be branches in every town in the kingdom; and that as early as possible it should be extended to the Continent. The branches to have direct intercommunication with each other, and with the London centre, and to have a direct voice in the government of the association.

The present objects of the association should be,—1st, the drawing up of some standard of qualification for an architectural assistant, and for a practising architect; 2nd, the advice and pecuniary aid to assistants out of employment; and 3rd, the professional advancement generally of the class of architectural assistants, and such others as might afterwards be thought suitable.

For the first of these objects a sufficient reason may be found in the numbers of assistants and practising architects who, neither by nature nor by education, are fitted for the positions they occupy.

As to the second, I may ask a question which seems to puzzle every one: what becomes in old age of assistants who have not the means nor the opportunity to commence to practise, and so gain themselves a competency? Their salary as assistants will allow very few of them to retire altogether.

The third object requires farther explanation. Generally, the assistant has to work close at his desk eight or nine hours a day, and very often eleven or twelve hours. Many of them have not the Saturday half-holiday at all. The rest very often, even if they nominally have it, have it not practically. This long and close application during the day is so severe, that the assistant can neither have the power nor the inclination, in the evening, to enter into those more refined studies of art, through which alone he can hope to make himself worthy of his profession. The greater part of the bright day of his life he is a

slave; how can he, in the dark and drear evening, "when no man can work;" how can he labour and toil to become a master of his art, a worker in and a lover of art? The mechanic, the artisan, and the working man generally around us, are having their daily toil shortened, and time given them for self-improvement; but the architect's assistant, the professional man, and the worker in art, forsooth, stand still. Is architecture a profession and an art? It is because I believe that it is, that I would seek for its advancement to its proper position, and would ask every earnest worker in it to labour to obtain the art-education and knowledge of the architectural assistant. Let the office-work of the day be limited. To the shame of the practising architect be it said, there is but one way to obtain this, and that is the offensive and defensive union of assistants. Of all arts and professions, architecture sorely pays worst, *as far as the assistant is concerned*. But this is an unpleasant part of my subject, and may well be left to your readers.

As to the social position which an assistant occupies in an office, I would remind practising architects that, if architecture is a profession, the assistant, as such, is socially equal to themselves, and ought to be regarded and treated as such. Very often outside the office the social rank of the assistant is superior. At least, let both of them remember, at all times, to behave as architects and gentlemen.

I have written these few remarks with the hope that some abler man, and some abler pen, will espouse the cause, and will help to stir up the architectural mind to the consideration of this important matter. If the assistants will unite, they must obtain that which is justly theirs. And here I would yet deprecate all such pressure being brought to bear as is unhappily being done by trade-unionists. I would simply say, let the architect's assistant conduct himself always as one who believes himself to be a member of an honourable profession, and as an Englishman and a gentleman.

AN ARCHITECTURAL ASSISTANT.

THE SEWAGE QUESTION AT WATFORD.

At a recent meeting of the local board of health, the clerk read the report of the committee (accompanied by Mr. Lovejoy, the surveyor) appointed to visit Stroud, and inspect the system of sewage deodorisation and utilisation adopted there. The report, which was signed by all the members, recommended this system to the consideration of the Board. The clerk read a letter from the secretary to the Stroud Sewage Company, to whom the patent belongs, stating that the royalty which must be paid by the Board for permission to adopt the Stroud system would be 50l. a year, and one-fourth of the profits on the manufactured manure. The directors of the company would give such instructions as would enable the Board to render the affluent water as pure as that of Stroud.

An elaborate and able report by Mr. Lovejoy on the same subject was read by the chairman. The report stated that the Stroud system involved an expenditure of 250l. a year. Neither the tanks nor the levels belonging to the Watford Board were adapted to the process, and he estimated the cost of adopting the Stroud system at 1,150l., in addition to the working expenses. The quantity of sewage at Stroud was less than one-third that of Watford, without taking into account the London Orphan Asylum and the increase of population at Watford. He calculated the working expenses at 750l. per annum, and to that must be added the interest on the original outlay, which would make a total yearly payment of 820l., in addition to the royalty. With regard to the sale of the manufactured manure he was not at all sanguine, after seeing the quantity on land at Stroud; and, although the quantity of sewage at Watford was much greater than at Stroud, there would not be a much larger amount of manufactured manure. The estimate of the expense of adopting and working the Stroud system contrasted very unfavourably with that of the scheme proposed by Mr. Cadia (one of the committee), which was from 350l. to 400l.; while, as regards the return for outlay, irrigation was far more likely to prove remunerative than deodorisation or precipitation. At places where the irrigation system had been adopted it was stated that they were realising sums of money, the lowest of which would amply cover the working expenses and the interest on the outlay. It was the opinion of

many scientific men that all processes of deodorising sewage, except the application of earth pure and simple, rendered it nearly if not quite valueless as manure. If the Stroud system were adopted at Walford, it would be necessary to separate the sewage from the storm-water. At Leicester, after ten years' trial of the deodorising process, and a loss of 12,000*l.*, the Board of Health were now about to adopt irrigation. In conclusion, Mr. Lovejoy said he could not advise the Board to adopt the Stroud system. He believed that in the course of a few years the value of the application of sewage to the land would be better understood, and there would be as great a competition amongst farmers to obtain it as there is now a difficulty in disposing of it.

RAILWAY MATTERS.

WHILE the Metropolitan Underground and the Metropolitan District companies seem both to meditate the repudiation of their obligations to extend their lines to the east of London, uniting them at the Tower, a new company is being started for the purpose of obtaining an Act to enable them to form these same extensions, and combine them with further extensions. The scheme is one to incorporate an East and West Metropolitan Junction Company, which proposes not only to complete the "inner circle," but to extend the Metropolitan District Railway to Bow, to connect both Metropolitan lines with one another, and with the Great Eastern, the North London, and the East London, and to make a central station for east and west near the Mansion House. This larger extension of the scheme already authorised would probably be more profitable than the mere extension to Tower-hill, as it would unite the whole east and west of London in one great system.—At a recent meeting of the North Eastern Railway Company in the North of England, the chairman said, "several years ago, when the company was prosperous, the directors pledged themselves to the public to reduce the fares to 2*d.* per mile for first-class, 1*d.* for second class, 1*d.* for third-class; but falling on adverse times, it was decided to postpone the reduction. Now that the company was again prosperous, the directors felt that the reduction could be no longer delayed." The fares on the Newcastle and Carlisle section have been particularly oppressive on the travelling public. This line opens up some of the favourite places of resort for both the tourist and the excursionist.

HOUSE BUILDING AND BUYING.

YOUR correspondent, "J. M.," advertising in the *Builder* of December 4 to the miserable condition of the houses in certain "terraces, places, and villas" in the suburbs of London, has described a state of things which no doubt exists largely. In his estimate of the causes which have led to the building of houses such as those described, however, I venture to think that "J. M." is to a great extent mistaken; whilst he is certainly wrong in concluding that the class of persons who occupy these houses is at all at the mercy of either landlord or builder.

It is true that the circumstances under which the trade of the "speculative builder" is too frequently carried on may often cause economy to degenerate into "scamping," but the fault is in principle, and in arrangement, indicated by your correspondent—together with many others of varying character—as frequently arise from ignorance on the part of the builder as from the desire to save money.

The fact is, that many of these "terraces, places, and villas" are built, and the work personally directed, by men who have never previously had any experience in building, but who, encouraged by the prospect of "advances" held out to them by ground-rent-creating speculators, go into business as builders.

Now, sir, building being a business the conducting of which in a proper manner necessitates the possession of a large amount of very varied knowledge, in combination with much practical experience, I do not think that it is in the least degree remarkable that tailors, shoemakers, and publicans, or even smiths, painters, or other mechanics, who have possibly worked almost exclusively at one branch only of the building trade, should not be able to secure this knowledge by simply assuming the title of "builder."

It may, perhaps, at times occur, that men who really do know better, but who are building side by side with such builders as those above

referred to, are rendered careless by knowing that they will have to "sell" at the same price as their neighbours; but this is of comparatively rare occurrence, and would cease at once, and for ever, if tenants and purchasers were disposed to stop it. The simple and obvious remedy is, for those about to rent or purchase a house, to employ a respectable surveyor to report upon it; but in the course of a rather long experience, I have found that it is quite an exception for this precaution to be taken, even by persons who are not in other respects negligent.

As soon as it becomes the rule to employ a competent and independent surveyor before purchasing, or otherwise incurring responsibility in connexion with house property; the erection of houses such as those described by "J. M." will no longer afford even the slightest hope of a profit to the builders of them, and therefore the trade must collapse for the operation of the natural laws which influence any industry so situated.

Enlarging the powers of district surveyors, and inspectors of nuisances as suggested, or even the indefinite multiplication of those very useful officers, would effect but little in the required direction, so long as houses may be sold or let, as they now frequently are, by the simple expedient of papering the walls in an agreeable manner.

In conclusion, I have to state my conviction, that respectable builders who know their business, would be extremely pleased to see such a common-sense plan universally adopted, whilst the would-be tenant or purchaser would, by paying the small fee which a surveyor would charge him, frequently save very much money, and sometimes avoid illness or possibly death.

A BUILDER.

FALL OF A MILL AT BRADFORD.

IN the vicinity of Park-road, Bradford, Osborne Mill has fallen in. It was built about six years ago. The building consisted of three floors. Above the third floor was placed a large tank or cistern, which has been the cause of the destruction. The cistern extended the whole length and breadth of the building, and was about a foot high, being intended to hold 10 in. of water. It was to supply the boilers and the premises generally with water. The sides of the tank were bound with iron, and it possessed a wooden bottom. This tank has for some time been observed to stand in an unsafe condition. The tank broke through the two first floors that intercepted its progress, and carried all before it to the ground. Fortunately all who were in the building succeeded in securing their safety before the fall took place; but though no lives have been lost, the accident has been of a disastrous character. The interior and part of the sides of the building (which was 70 ft. long and 24 ft. broad) have been destroyed. Three machines, valued at upwards of 200*l.* each, and 300*l.* worth of press paper, have been rendered useless, and a large number of pieces have been seriously damaged. Two of the machines were not working, and the workpeople were thus enabled to hear, what they could not otherwise have done, the first warning of the crash.

INDIAN ART WORKS IN BIRMINGHAM.

A COLLECTION of East-Indian works, selected from the Indian Museum, Whitehall, is now being exhibited in the Birmingham Corporation Art Gallery; and Mr. W. C. Aitkin, who is always to the fore when he can serve the cause of art, has written a very useful guide to it, which is sold at 1*d.*, and materially increases the value of the collection. At the conclusion Mr. Aitkin says,—

"Viewed with intelligence, these examples, their teachings properly understood and applied, would go far to correct the vulgarities recognisable in the art-manufactures of England, France, and other countries. In the metal, ceramic, and textile manufactures of India can clearly be traced those invaluable rules of art, a proper definition and recognition of which form the great want of our more civilized industrial systems, more especially as regards the elements of truly appropriate designing for articles of manufacture, in which youth and beauty go hand-in-hand. This want is not recognisable in the manufactures of India.

In a commercial point of view, the contents of this collection may be rendered useful, apart from the purposes which have been pointed out. With the intention of encouraging the manufacture of textile fabrics for export to India, and with the cognizance of its Council of State, Dr. J. Forbes Watson (who made the selection from the contents of the East-Indian Museum now exhibiting here) wrote and published, in the year 1863, a most able and interesting volume on 'The Textile Manufactures and the Costumes of the People of India.'

"Now, it does occur to us, in glancing over the objects now open for exhibition in the Corporation Art-Gallery,

(that, that which has been done for manufacturers of textiles ought to be done for our own manufacturers of hardware."

Mr. Aitkin thinks that the objects which form the Indian Collection now exhibited there should be supplemented with others from the East India Museum; and that the Council of State for India, by a permanent gift of these, will only be doing a graceful act, and that which has been done for the manufacturers of textiles. These objects would form a most excellent addition to a Free Industrial Museum, which Birmingham must have, and would afford its manufacturers the opportunity of entering the East Indian markets, did they see it to their advantage to do so.

LIGHT AND AIR.

A PLEA FOR THE POOR.

GIVE TO CROWDED LANE AND COURT

Light and Air.

Give to all, for life's support,

Light and Air.

To the toiling craftsman pale,—

To the poor on half a meal,—

To the workhouse and the gaol,

Light and Air.

Hear our gasping children cry,

Light and Air.

Give us, Lord, or we shall die,

Light and Air.

Rend Thy clouds and let Thy sun

Shine on homes by plague undone;

Give to each and every one,

Light and Air.

Why will man withhold from man

Light and Air?

Is it not a crime to have

Light and Air?

Give our city's darkest spot,—

To loam creatures long forgot,—

To brain and brow with fever hot,

Light and Air.

Give to hut and hall forthwith

Light and Air.

"Let there be light," said Holy Writ;

Light and Air.

Come, Hope, and cheer the wan and frail,

That Heaven's judgment may not fail;

Blest health, blest health—All Hall, All Hall,

Light and Air!

EUSTON SQUARE.

SIR,—In reply to your correspondent, "S.," the works now being executed are to form a carriage and footway approach from the Euston-road to the Portico in Drummond-street. The only buildings to be erected, are two lodges, and the deep digging is to form an underground passage of good width and height for the frequenters of the gardens, to pass from one side to the other. ONE WHO KNOWS THE WORK.

THE JOINERS' TRADE.

SIR,—The remarks of your correspondent "Query," in the *Builder* of November 20th, has, in a great measure, solved a difficulty to those of your readers who could not account for the high rents and increased value of house property all over the country. His statement is a fair explanation of where the 35 per cent. goes, and also accounts for the fact of finished joiner-work being imported from Sweden at less cost than it can be manufactured at home.

I do not labour under the same disadvantage as your former correspondent, who states that he is merely a spectator. Having been nearly thirty years an operative in the joiner department of the building trade of Glasgow, I have had an opportunity of observing all the different phases of the trade, some of which I heartily support, others as firmly detest, as tending ultimately to ruin our home trade.

Blood-money, referred to by your correspondent, was never understood to be paid to foremen or for the purpose of "driving" men, but rather for putting on men. I will describe it, and your readers will easily see the effect on the cost of building between twenty and thirty years ago and the present time. At the time referred to it was often the case that some of our leading hot-headed unionists would leave our ranks and become contractors and employers; but seldom were their views modified by the change; they were only transferred from the side of the workmen to that of the employers. It was these hot-headed men who introduced the tyrannical system of paying blood-money, which was carried to a great extent. The method of doing it was this:—In a squad of, say, from twenty to forty men, the employer would select a pair of ready-handed go-a-head fellows, and pay them a few shillings a week extra. These were generally put to doors and windows, or such work that several pairs could be put to the same quantity of work at the same time; but the blood-suckers proved their value to their employers by putting on the ordinary workmen, and those that were left behind either had to submit to reduction of wages or leave the work. This state of things induced many to become unionists who were not otherwise favourable, except to get rid of these oppressors. The first effort made was to agitate for a

uniform rate of wages, whereby the good and the bad, the fast and the slow, workman, would be paid the same wages. This was no far success, as it was agreed to by the good men and the bad men, and the bad men, who did not prevent the employers paying blood-ankers as before, which still showed they were the good men. The next attempt was more successful. In the second time the blood-money was raised among the workmen for the purpose of paying the foremen to stay their hands. For a time it was known to be the case, and the men received their blood-money from both their fellow workmen and their employers. This did not last long. The employers seeing all men work alike, the blood-money ceased, and workmen became more comfortable, and the more the other extreme has been reached, as illustrated by "Query," in the case of the union visitor, and that of the workman not being allowed to do more than his neighbour; or if he does the place will soon be made too hot for him. There is now no need for blood-money. If a man does more than is considered right by his shopmates, a meeting at the next meal-hour will put it all in order, or he will be reported.

On one occasion I saw a decent conscientious shopmate persecuted at the instance of an apprentice who worked beside him. This man spoke to him in a very friendly way, and concluded by telling him that he was acting the part of a very mean robber towards his employer. The boy who was given, and represented to his shopmates that this was a master's spy; and he was watched, and his tools destroyed, and he was put on the road, and he had to get all he left the trade in disgust, and is now carrying on a small business in another trade.

If workmen continue to limit the quantity of work to less than what they are capable of doing for some time past, we shall very soon see joiners' work brought from Sweden to Glasgow as well as to London. J. M.

CATASTROPHE, CALEDONIAN RAILWAY TERMINUS, EDINBURGH.

Sir,—I am glad that your correspondent, "Observer," has drawn attention to the recent catastrophe at the New Station. As the cause has been fortunately ascertained, it will be a very important matter for a Government inquiry, quite as much so as the bursting of a boiler, or the stranding of a clipper-typhoon. The loss of a building of such magnitude, intended for the use of the public, should come down with a ran, after a few squares of plating had been put on it, is surely a subject for serious consideration.

The theory that a broken casting, or faulty tie-rod caused the complete downfall of a roof, covering a space 150 ft. by 72 ft., is of course sheer nonsense.

The building stood upon piles; the more need for careful being of the superstructure. These piles, it is stated, have not moved. I have no reason to doubt it; but it is the more evident that there has been some frightful error in the design of the roof and supporting pillars. The shed is now in process of reconstruction. Before it is finished and opened for traffic, the public mind ought surely to be set at rest as to its stability and safety.

CASES UNDER THE METROPOLITAN BUILDING ACT.

NOTICE FROM BUILDERS.

At the Marlborough-street Police-court, a summons was taken out by Mr. Kerr, district surveyor of St. James's, against Messrs. Strode & Co., patentees and manufacturers of gun-burrs, 19, Onaburg-street, for neglecting to give notice of alterations and to pay certain fees claimed by Mr. Kerr.

The committee of the Army and Navy Club, in Pall-mall, decided upon making a new super-room in the building, and the alterations were carried out by Mr. Kerr, the district surveyor. The committee of St. James's, under the 33rd section of the Act, of the Metropolitan Building Act, of 1859, and Mr. Kerr, from time to time, inspected the progress of the work. The contract for the supply of the gun-burrs had been given to Messrs. Strode & Co., the manufacturers and patentees of that article, who fitted them up at the time the alterations in the room were going forward. Their contract with the committee of the club was entirely distinct from that of the builders; and whether they were therefore to be considered as bound to give notice under the 33rd section of the Act, and pay a separate fee to the district surveyor, was the question to be decided.

Mr. Knox, in giving his decision, said that to allow the contention of Mr. Kerr to prevail would be to let in a very dangerous principle, and one that he could not believe the Legislature ever contemplated, for if he decided that a separate notice and fee were due from Messrs. Strode & Co., on account of their having a separate contract with the club, he would have such a contract with every tradesman who had any work to be performed, would become liable for a separate fee to the surveyor. There was no doubt as to the importance of the decision at which he might arrive in the present case, if it did the same to every tradesman, as well as the district surveyors. It seemed to him that the general principle he should keep in view was rather the protection of the public than the multiplication of fees. It was absolutely necessary, under the Act, that a proper notice should be given to the district surveyor, pointing out to him the nature of the alterations he had intended to execute. The only question was—who was to give this notice? Suppose that the builder who gave notice to the district surveyor chose to include in his notice other alterations which he had not intended to execute, and the builder who chose to include any alterations, additions, &c., would be answerable if there were any infringement of the law. There must, however, be a notice given, and the notice given must be clear and intelligible. He was inclined to think that the correct view of the general principle, but in the present case he was not absolutely constrained to give a decision on the general principle. In the present case it was by no means clear that Messrs. Strode & Co. were in the position of trades-

men "executing" works. They applied the sunlight, no doubt, and under the separate contract, but the builder had in fixing them. Then, again, as to the notice, and the terms in which it was framed. It was admitted that the attention of the surveyor was called to the setting of the sunlight, and all matters appertaining to concealment. Again, if the notice might be taken as a notice of setting, and general in its terms, it must not be forgotten that this notice was prepared by Mr. Kerr's own clerk, no doubt acting under perfectly honest motives. Mr. Kerr could scarcely challenge the sufficiency of a notice prepared at his own office, when it was clear no concealment was intended by the parties. The summons must be dismissed.

KEENE'S CEMENT AND PAINT.

Sir,—As there does not appear any satisfactory reply to "Printer" respecting the mode of painting "Keene's cement," allow me to request for the benefit of those concerned that it should be painted in the same manner as that recommended in my "instructions for the use of Keene's cement," as I believe that the same mode of painting will hold good in both cases. It is as follows:—

The first coat to consist solely of *finned oil*. *Bully colour should be avoided*. My reasons for this are, that "hard colours," when diluted for painting, have a very fine surface, which is almost like glass, and has, consequently, very little disposition to absorb a hard drying colour, such as that described by your correspondent. The oil, on the contrary, does not dry, but becomes absorbed all over the surface, and forms a "key" for the succeeding coats, and presents the possibility of *peeling off*.

This mode, as I think, the most reasonable, and certainly in every way the cheapest that can be adopted, and I can confidently recommend it, knowing that wherever it has been followed it has never failed.

The succeeding coats may be put on at the discretion of the painter and according to what is required.

J. C. PARR.

Sir,—We do not desire any controversy with our competitors as to the merits of the different hard cements; but since "A Clerk of Works" spoke of Keene's and Paris cements as identical, it was not unfair on our part to inform him of the difference between them.

The letter which last number from the manufacturers of Keene's cement states that "A Clerk of Works" is probably correct in attributing the peeling off of paint from the surface of the cements, intended to dampness, and that this is likely to occur when the ground-work is not thoroughly dry. We must suppose, therefore, that there would be constant failure in newly-constructed buildings, the walls of which are generally in a damp state. Paris cement is not affected in the same way, and may be painted on with safety within a few hours after the work has been finished.

FRANCIS & CO.

BUILDING COMMITTEES.

Sir,—When the initiate read the decisions of building committees on the several topics of the day, or when they scan morning reports of "Yesterday's Board Meeting," how highly amused they must be. When half a dozen intelligent committeemen hold solemn councils respecting the erection of the little church, they little think that all their ignorance, wormed from each individually and painted in its brightest hues, will be to-morrow in public print. You will see the question as rationally as we can, it would appear that nothing but censure awaits, as a rule, building committees. What are their duties? Undoubtedly to supervise the execution of the building, from cutting the first sod until the last coat of plaster be dry. Their inability to judge between good and bad work prevents their exercising full control over the unhappy labourer—for unhappy he is in no way, and in no judgment, and as his errors are bound to condemn at times to illustrate the power of authority, the natural result is that bad material is allowed to be used, and the building, such as indignation, is sound work is cursed and condemned, and is the cause of the "once youthful locks now grey with age," standing erect on six old heads, and causing such indignation as they are sworn to resent on this hold and fearful man-by-stopping payments. The architect? Of him anon. There is one point about a building committee that is highly satisfactory to all concerned with them, viz, their power of argument. Whether the philological development of a committeeman be entirely different from that of another man, or whether it is only that portion of the head which contains argument, I know not; but certain it is, that seldom met with a committee man who possessed the bump of reason. Intelligence, he it understood, is often largely developed (by the way, I am not a phrenologist), but reason "dwelleth in another sphere." So intelligent have I seen one at times, that he has called a brick a brick, and a stone a stone, and when finding that he was the possessor of so much information, I talked of listels, rafters, tie-beams, spars, dogs, and the like, my amateur friend became seized with a violent fit of sneezing, which abruptly terminated the interesting interview. The architect is not free from annoyance by these six men of surpassing intelligence, but, on the contrary, is often perplexed and annoyed by these gentlemen, can understand a drawing, or yet make head or tail of it, even the addition to the quick committeeman's eye of his spectacles scarcely enables him to translate a single line out of the carefully drawn plan; and, yet, he suggests alterations. Again, removing his glasses for the purpose of rubbing and re-licking them, he scans with professional scrutiny, a gem of an elevation, and, after a few minutes' perusal, he did the part, thinks he will wear the air and manner of a critic; so proposes with reference to the wall space—upon the division of which you pride yourself so much—some additions. Then does your whole frame tremble, and with clenched fist you feel as if with one fell swoop you could mow down your six commanders like so many blades of grass. Still it may not be, but you excite their wrath and displeasure, you at once coincide with their every wish, and so ignorance wins the day. These few observations may appear trifling and unprofitable, and that they are some the less true. When we take into consideration that ten churches out of twelve that spring into existence in the United Kingdom are built by

subscription, and that each must have a committee of superintendence, we may well wonder at their ever being built. Committees there unquestionably should be, but for the purpose of directing or influencing the work. Carrying subscriptions is their duty, and seeing that the money is properly used after they have got it. When an architect is chosen for the purpose of designing a building, he should have full power to act independently, and to apply to any committee for advice, from the architect, and him alone, should the builder take instructions; and committees only hinder work by interfering, and in reality cause two-thirds of the differences that arise during the construction of a building.

EDWIN S. FRANCE.

THE COLUMN OF THE COUNCIL, ROME.

MEN are hard at work on the Janiculum Mount, erecting the column intended to commemorate the present Council. It will take the shape of a Doric column on pedestal, surmounted with a bronze statue of St. Peter, and will be about 78 ft. in total height. The shaft will be formed of rare coloured marbles recently discovered at the Emporium; the base and capital covered at the Emporium; the base and capital formed of white Carrara marble. The square pedestal will be adorned with four bas-reliefs, including a representation of the ceremony of opening the Council.

NOTES ON CAMPANOLY.

"RING on, ring on, ye merry, merry bells, We love your music well."

Since my article on "The Bells and Quarter Chimes of Great St. Mary's" was printed in the *Builder* of the 4th inst., a friend has kindly sent me a copy of a new work, just published, on "The Church Bells of Cambridgeshire," by the Rev. J. Raven, B.D., of Emmanuel College, Cambridge, Head-master of Yarmouth Grammar School; and I must say it is a valuable contribution to the Campanology of England. On the present occasion, however, I will merely give one or two extracts which may be interesting to general readers:—

"Of course," says the author, "when bell-loving Elizabeth had paid her great visit to Cambridge there was grand laughing. On Friday, the 4th of August, 1661, she made her entry amidst the clanging of all the church and college bells in the town. Considering that there was not a decent peal in the place, the noise must have been intolerable. There could have been no merry ring of eight to divert the ear; though by the Babel of the various representatives, chiefly of C, B, B that, A, and intermediate dominions. It would have driven an Elizabethan gloom composer mad. Such churches as were negligent here were afterwards called upon, and were faced, some 5s. 4d., some more, some less. St. Mary's escaped the highest penalty, the churchwardens paying only 7s. 3d., to the Queen Almoner servant for not ringing at the Queen's coming."

And now, having reached a period at which Change-ringing begins to make its appearance, let us see a little of the rise and progress of this healthy and ingenious amusement. The first to reduce the art to a system was Fabian Stedman, a printer, resident in Cambridge, who is said to have printed his changes on slips of paper in his leisure hours, and taught them to his company in the tower of St. Benedict. "Within these fifty or six years," says the writer about 1667, "Changes were not known, or thought possible to be Rang. Then were invented the Sixes, being the very ground of a Six-course; Then the Eights, and Twenty-fours, with several other Changes." ("Tintinnologia," 1688.) We may mark the rise of Change-ringing in Cambridgeshire, then, by the improvements in the Bells' peal from 1667 to 1685, by the making of the new peal of four into five in 1681, &c., &c., but more conclusively from the general fact that 18 per cent. of the bells now existing in the county were cast in the early half of the seventeenth century. Among the benefactors of this age we may reckon Sir Thomas Sutton, the founder of the Charterhouse, who gave

"To the Parson and Churchwardens of Balsam, for the time being towards the buying a Bell, to be changed in the Steeple, to amend the Ring there, 20*l*." [Stow's "Survey," ed. 1618.]

So much for Mr. Raven's account of the wild jangling in the "Golden Days of Good Queen Bess," and the subsequent improvement in bell-ringing.

I would now introduce one who was the most celebrated composer and manager of the "Ancient College Youths" made the greatest progress during the first half of the last century: I allude to Benjamin Annable. Relating to this remarkable man the following paragraph appeared in the *Public Advertiser* of Monday, February 9, 1756:—

"A few nights ago was varied under the Tower of St. Bride's, Mr. Benjamin Annable, the best ringier that was ever known in the World. His Time Ringing was only called an Art, but from the Strength of his great Genius, he varied it to the mathematics, and is now a Science. This Man in Figures and Ringing was like a Newton in Philosophy, a Raffle in Physic, a Hardwicke in Wisdom and Law, a Handel in Music, a Shakespeare in Writing, and a Garrick in Acting. Or Ben!"

This is, indeed, "coming out strong." However, to quote Mr. Raven once more, "a mourning peal was rung for this worthy man in Great-St. Mary's Tower, Cambridge;" and I doubt not the same thing was done at many other churches in our "bell ringing island."

THOMAS WALESBY.

LONDON TRAMWAYS.

LAST week saw the commencement of the construction of the tramway, in the East of London, authorised in the last session of Parliament. This is, we believe, the first breaking of ground for this purpose since Train's trams were removed in Westminster and the Kennington district. The new line, which will be double, has 4-in. rails, level with the roadway. The rail proper is smooth and on the outside of the surface; then a groove for the reception of the flange of the wheel intervenes: the inner surface of the rail is corrugated to afford foothold for horses. The rails are laid upon longitudinal sleepers, of Baltic timber, 6 in. deep by 4 in. thick; these are laid upon Portland cement, and are kept at equi-distance by cross ties of iron, about 1½ in. by ½ in., which are bound to the cast-iron shoes in which the rails are laid. Mr. Hopkins is the engineer of the line, Mr. Page, resident engineer, and Messrs. Fisher & Parrish, the contractors, with Mr. M. W. Anderson as their managing overseer.

CESSATION OF WORKS IN PARIS.

WE learn by a letter from Paris "That the authorities there are about to enter upon a system altogether opposed to that of the last fifteen years. After having built outrageously, they are now going to do nothing, and will hardly finish the works already begun, at least in Paris. The Opera 'grugs its slow length along,' and the Hôtel Dieu, which it was intended to complete at the same time, does not proceed more rapidly."

It does not appear whether this sudden change proceeds from financial or political considerations. But, perhaps, the recent conduct of the *classe ouvrière*, in regard to the election of candidates personally hostile to the Emperor, may have disgusted him.

SCHOOLS OF ART AND OF SCIENCE.

The Newcastle-under-Lyme School of Art.—The annual meeting of the friends and supporters of this institution has been held at the Town-hall, and was, as usual, well attended. The chair was taken by the Rev. E. J. Edwards. The walls were adorned with the principal productions of the students, and although there were fewer of the works in the elementary section than usual shown, the drawings which were exhibited were as a whole of a better class than on any former occasion, and reflected credit upon Mr. Bacon, the head master, as well as upon the students themselves. They included outline drawings from flat examples, outline drawings from the cast, shaded drawings of ornament from the flat and from the cast, flower-painting from the flat and from nature, shaded drawings from the cast of figure, painted monochrome from the cast in oil, and designs for the decoration of porcelain. The last-named should, perhaps, take the first position as regards excellence, the student who produced the designs (W. P. Rhodes) having, as the reports showed, obtained a medal in the national competition, and also been honoured with a national scholarship as an art student. The report of the committee, which was read and adopted, stated that as far as the success of the school was concerned this year in competition, the committee had every reason to be satisfied. The report of Mr. J. P. Bacon, head master of the school, was also read and adopted. It stated that the attendance in the classes and the progress of the students had been satisfactory. In the month of March the annual examination was held. Twenty-four students were examined; thirteen passed satisfactorily; and one obtained a prize. All the drawings finished in the school during the year are required by the Department of Science and Art, to be sent to London in April for examination. At the first or separate examination the works of sixteen students were satisfactory, four obtained prizes, and one honourable mention. The chairman distributed the prizes. The meeting pledged itself to support the school.

The Bristol School of Art.—The distribution of the Government prizes and certificates awarded to the pupils of this school has taken place in the large hall of the institution. There was a numerous and influential gathering. Mr. S. Morley, M.P., occupied the chair. In opening the proceedings, Mr. Morley expressed his deep conviction of the importance of institutions like that,

and said he hoped soon to see an arrangement which would secure the education of every child in Great Britain. But the object of that institution had a special reference for those who needed what had recently been known by the term "technical education,"—an education that shall adapt them for the future occupation that may lie before them, and in connexion with which their power would be greater in securing an honourable maintenance for themselves. He was quite unconscious of being in any sense an alarmist, but he confessed he looked with a great deal of anxiety to the commercial future of this country; he believed they needed to pay attention such as they had never yet paid to the precise objects which their schools of art and science were seeking to secure. They needed cultivated workmen; and when he referred to the working class, he believed that the sons of our manufacturers, and those aiming to be foremen in the various manufactories equally needed cultivation in the race upon which they were entering. Nevertheless, he believed that England, at the present time, distinctly held her own; but with the prospect, he hoped, of a large disarmament on the Continent, there would be a large addition to the force of labour brought into the labour market. They would have to look very keenly at all those points in connexion with which they were exposed to competition and difficulty, and he was therefore present to press upon all who had influence, whether manufacturers or occupying positions among the poor, who by a little kindly help or suggestion might be induced to avail themselves to an extent that had never yet been witnessed, of the power ready at their own hands, upon certain conditions. Two students of the school had obtained Queen's prizes; twelve had their works selected for national competition; and many prizes and extra prizes were gained by others among the students.

The Oxford School of Science and Art.—Evening classes in several scientific subjects have been formed, numbering in all some seventy or eighty students. The present arrangements include Building Construction and Drawing, Animal Physiology, Elementary Mathematics, and Inorganic Chemistry.

The Birmingham School of Art.—The usual meeting of the Art Students' Literary Association has been held in the Reference Library of the school, Mr. C. E. Emery, chairman. The business of the evening consisted of a selection of readings from art works. Mr. Jenks's selection was from "Dresser's Art of Decorative Design," on the "Power of Ornament to Express Feeling." Mr. C. B. Agnesse's readings were "Selection from Ruskin" and the "Rev. E. Young on Pre-Raphaelitism," comprising the thoughts of the two authors on the subject of historical painting. A discussion followed each of the readings.

The Cambridge School of Art.—The annual distribution of prizes to the successful students in this school took place in the small assembly room, Guildhall, on which occasion the room was filled to overflowing. Professor Lightfoot occupied the chair. Mr. W. M. Fawcett (hon. sec.) read the report, which said:—

"The committee had to congratulate the students and friends of the School of Art on its continued prosperity. The success on the Government examination, and in prizes awarded by the Government for works done during the year, has been greater than for several years past. Thirteen have this year received third-grade prizes, against six last year.

Two have been honourably mentioned, five having been last year.

Ten have received second-grade prizes, against six last year.

Forty-one have received certificates of having satisfied the examiners, against twenty-eight last year, and one free student has been elected, against two last year.

The names of these prize-holders will be announced when the prizes are distributed."

Mr. F. T. Palgrave afterwards read a paper on "The Practical Laws of Decorative Art."

The Salisbury School of Science and Art.—The annual distribution of prizes to the pupils of this school took place at the Council Chamber, in the presence of a numerous and influential assembly. The Bishop of Salisbury presided. The Rev. R. G. Swayne read the report, which said, as to the progress of the school:—"It has now been at work for more than four years; for nearly the three last of these under the present master, Mr. Fraser, and the results attained have fairly answered the expectations formed. The number of students at the evening classes, who are, almost without exception, young men and lads, the sons of tradesmen and artisans, is at present 31; that of the day classes, 22. During the summer and winter sessions of this year 46

students in all have attended the evening classes." There were 13 successful competitors for the prizes, which were distributed by the bishop, after which appropriate resolutions in support of the school were passed.

The Evans School of Art.—The presentation of the Government prizes to the successful pupils of this school has been made by the Marchioness of Bath. There was a numerous attendance. The school has got new and spacious premises in the literary and scientific building. The Rev. Prebendary Horner, the president of the school, was in the chair. In course of his address he said he was glad to state that they had better prospects of success than they ever had before. They had had, as they knew, a great deal of trouble arising out of a change of masters. The school, in consequence, went down, and the committee were in the utmost perplexity. However, they succeeded in obtaining the services of a gentleman, whose careful attention to the school and every pupil in it had re-established their school; and now that they had a fitting place to meet in, and a very good master, they hoped they were entering on a prosperous way. In the evening there were forty-six pupils, all of the artisan class, besides twenty-six morning pupils; and twenty of the artisan class attended the science class. The result of the examination held here was that 480 works had been sent up to London—which in itself was good proof of Mr. Geopel's activity, for last year they had only 360. Thirty-four of their pupils had passed the examination, and thirteen had obtained prizes, while three had full certificates in all the grades. It should be remembered that this was in a competition wherein 50,000 or 60,000 specimens were sent in. Moreover, one of their pupils had gained a scholarship of 50l. a-year at Kensington; and they had been paid for twenty-three pupils, as against thirteen last year. This showed the interest taken in the school by the artisan class,—the class they hoped to do so much good for. Science and art ought never to be separated, and therefore it was he was glad to see that twenty of their pupils had been examined in science.

FROM SCOTLAND.

Carlaverock.—The publishing firm of Messrs. A. & C. Black have just done a kindly deed to mark the spot where rest the remains of Robert Paterson, the "Old Mortality" of Sir Walter Scott's novel, a deed similar to that of the great wizard himself, when he caused to be erected in the churchyard of Irongray, stewardry of Kirkcudbright, a tombstone over the resting-place of Helen Walker, the prototype of Jeanie Deans. The venerable renovator of the tombs of the Covenanters, in the last of his peregrinations at his halloved work, was in the neighbourhood of Bankend, parish of Carlaverock, about eight miles from Dumfries, when he was seized with illness, and was found on the roadside. He was removed to a friendly house, where he died in a few days, and was interred in the churchyard of Carlaverock. No stone marks the spot where he reposes; but the particular place is known. Messrs. A. & C. Black recently gave orders that a monument should be erected over Old Mortality's grave, and with good taste directed that the memorial should be in keeping with the simple taste of him it was designed to commemorate. In accordance with Messrs. Black's instructions, Mr. Thomas McMeekan, monumental mason, Dumfries, has finished a headstone of red freestone, and which has been placed in Carlaverock Churchyard. The stone has a circular top, with a beaded moulding. Near the upper part a mallet and chisel, crossed, are cut in relief, and underneath is the following inscription:—

ERECTED
TO THE MEMORY
OF
ROBERT PATERSON,
THE
OLD MORTALITY
OF
SIR WALTER SCOTT,
WHO WAS BURIED HERE,
FEBRUARY, 1801.

Why seeks he with unwearied toil
Through Death's dim walks to urge his way,
Reclaim his long arrested spoil,
And lead oblivion into day?

Perth.—Workmen have been taking down an old house in the Watergate, for an ingress to the Free West Church, which is to be built in Tay-street. The house in question, says a local paper, is, without doubt, one of the oldest, if not

the most ancient house in the town. It had a wooden front, which hid the massive wooden work behind. Judging from its style of architecture, the house must have been built either in the twelfth or thirteenth century. The architect is the Early Scottish, approaching to the Norman. As originally built, the house had on the ground floor three circular archways, which served either for doors or windows. The arches were built of ashlar-work, and were faced in front with two large polished stones meeting in the centre. On the ground-floor there are no windows to the back. The town houses of the higher class, down to the sixteenth century, had balconies in front, and so had the one taken down in the Watergate. According to tradition, the house was, at the time of the Reformation, occupied by Mr. Patrick Murray, whose son, as John Knox states, was killed when the queen regent and a portion of the French army entered Perth, on May 29th, 1559.

Books Received.

Marvels of Glass-making in All Ages. By A. Sauzay. Illustrated. London: Sampson Low, Son, & Marston. 1870.

The marvels of glass are great and innumerable. The transparency whereby to the eye alone this hard and solid substance seems as if it had not even form or aerial, far less solid existence, is not the least of its marvels. By its telescopic arrangements, we see into otherwise impenetrable space, and bring invisible worlds into sight. By its microscopic forms, we bring up of the invisibility of minuteness, new worlds of being and of life as far beyond our limited sight as are the star-dust suns and worlds with which it shows us that the firmaments of heaven are strewed. Even yet its marvels are on the increase. By the spectroscopic prism we now can see infinitesimal traces of substances where before not a ghost of them could be seen; and can identify the existence of known elements of earth in the sun, and even in the wisps of hydrogenous nebulae which form the far-off background of the firmaments.

The marvels with which the work under notice chiefly deals, however, are marvels of another kind, such as forms of art; and many of these are not only described, but beautifully illustrated by autotypes and wood engravings. The chief interest of the book in any one subject may be said to be centred in goblets and drinking-glasses, many fine examples of which are illustrated. Next in interest come glass-cutting and engraving, with more illustrated examples. Then there are elaborate mirrors and looking-glasses, to which other arts lend their aid. The colouring of precious stones, and the formation of false pearls, the marvels of spun glass, iridescence of glass, water-glass, optical glasses, lighthouses, and various other cognate subjects, are also treated of; as well as the composition of glass itself, and the processes of its manufacture, both as a raw material and as a work of art. These, with an introduction and an alphabetical index, pretty well exhaust the work as a treatise.

The author is not quite correct in all his statements. He states, for example, that soluble glass was invented in 1825 by Dr. Fiesch, of Munich, who called it water-glass; whereas soluble glass was well known of old,—it is hard to say how long,—under the name of "oil of flints."

We may here quote the recipe for making water-glass given by M. Sauzay:—

"Soluble glass is obtained by melting in a refractory crucible a mixture of ten parts of potash, fifteen parts of quartz finely pulverised, and one part of charcoal powder. When it is melted, the glass is cast: it is afterwards pulverised and treated with four or five times its weight of boiling water. A solution is thus obtained, which, applied to other bodies, dries rapidly in contact with the air. Let skilful workmen take up this idea and perfect it."

The less quartz there is, we may here note, or the more potash, the more apt will the glass be to be affected by damp, or even to deliquesce. It may be a question, therefore, how far pulverised quartz may be incorporated with the already formed glass, as a paste, after its basis has been set by furnace or other heat. Spread on a wall, for example, in solution, with a brush, or powdering with finely-pulverised quartz, would probably convert even weak or deliquescent water-glass into an anhydrous substance no longer affectable by damp.

The remarks on spun glass are curious and interesting. We dare say it is not generally known that at one time not only were glittering dresses of a mixture of silk and spun glass worn, as well as aigrets for ornamenting ladies' bonnets, which waved about with the lightest breeze, but "the flowing black curls, which, when worn by a prince, became the admiration of all Paris, were likewise made of spun glass, curled with irons." Here is your material, ladies, for no end of "golden hair," and without fear of natives inhabiting it, or obligation to still on their heads it and perhaps die with it still on their heads. In the Conservatoire des Arts et M^{étiers} at Paris, it seems, in the glass-room there is a lion of life-size "with splendid hair and bristling mane," whose capillary attractions are all of spun glass, which, by the way, is truly capillary or tubular, just as real hair is, and can even be filled with mercury by help of an exhausted receiver.

The publishers merit a little compliment for the way in which they have got up M. Sauzay's volume.

Art in England. Notes and Studies. By Dutton Cook. London: Sampson Low, Son, & Marston. 1869.

The title of this little book is too large, and, moreover, will keep off buyers; for many, if they know that the volume simply consists of a number of pleasantly-written papers about artists and art-doings, might in this age of careless reading be disposed to look to it who certainly would give no thought to the study of "Art in England." The headings of some of the chapters will better show the nature of the book:—"Mrs. Hogarth and her Lodger" (Alex. Runciman); "George Romney"; "The Story of a Scene-painter" (Louthborough); "Sir Joshua's Pupil" (Northcote); "The Peppit of Sir Thos. Lawrence" (Harlow); and so on. An interesting paper on that very indigent man and wonderful artist, Turner, closes the volume, which is instructive as well as readable.

The Lord's Prayer Illustrated. By F. R. PICKERSGILL, R.A., and HENRY ALFORD, D.D. London: Longmans, Green, Reader, & Dyer. 1870.

Dr. ALFORD, in his preface, says Mr. Pickersgill's designs were submitted to him during the last autumn, with a suggestion that he should connect them together by writing some letter-press in accordance with the leading idea of the artist. It seemed to the dean, however, that this idea would be most clearly brought out by throwing the illustrative text into a poetical dramatic form, and he has accordingly, in a charming poem, entitled "The Children of the Lord's Prayer," developed at once the meaning of the artist and the spirit of the words which enter into the daily prayer of all Christians. Parts of the poem are of the highest order of merit, and will live. Mr. Pickersgill's designs are nine in number, and are characterised by great breadth and beauty. We should especially point to the first, "Our Father which art in Heaven;" and the third, "Thy Will be done on Earth as it is in Heaven." The drawings are engraved with great skill and excellence by the Brothers Dalziel. With beautiful print, paper, and binding, this book is not for 1870 alone, but for a long string of years after.

Mottos and Aphorisms from Shakespeare. London: James Hogg & Son.

The wonderful wisdom and variety of Shakespeare is well shown by this little book, wherein, as well through and pains than some would suppose involved, "T. E. J." has set forth 2,700 mottoes and aphorisms culled from our great bard's works. They are all brief,—two or at most three lines each,—are ranged alphabetically, and made further available by a copious index of words and ideas.

The World of Wonders. London: Cassell, Petter, & Galpin.

A book better adapted than this to open the mind of the young to a perception of the wonders of nature, science, and art, we do not know, while as a half-hour's reading-book for all, to be taken up and put down again, it affords an endless resource. Truly, as Coleridge says,—"In wonder all philosophy began, in wonder it ends, and admiration fills the interspace; but if the first wonder is the offspring of ignorance, the last is the parent of adoration."

VARIORUM.

We have before us a number of Letts's popular Diaries for 1870; some a shilling each, one sixpence. They include a variety of useful information, and will meet the wants of a large class. The "Appointment Diary" gives the means of entering engagements for every hour. The Medical Diary is extremely portable, and well suited for the purpose intended. It gives an opening of two pages to each week, the left hand being divided into the days of the week, the right equally applicable to daily entries, but arranged more especially for lists of patients. The Large Print Almanac is specially prepared for dark offices and short or aged sight. The days of the week and month are printed in bold black type, so as to be promptly legible where ordinary calendars would be useless. We must add a word of recommendation for the gummed labels (250 for 3d.) issued by the same firm. They will be found very handy for many purposes.—"Gutch's Literary and Scientific Register and Almanac" for 1870 is literally crammed full of all sorts of information.—"Dietrichsen & Hanway's Royal Almanac" holds its own.—The Christmas number of the Publishers' Circular is full of specimen engravings from new illustrated works, which give it a special value.—Mr. J. W. Anson's "Dramatic and Musical Almanac" includes a notice of the fall of the Brunswick Theatre in 1828, "Sauterlings in South-west," and notes on "the difficulties experienced in building the Victoria Theatre."

Miscellaneous.

The Glasgow City Improvement Scheme. Down to the date of their last report the trustees had expended in purchases, &c., 565,017, including 25,000 paid for ground to form the new park for the north-eastern district of the city. Against this expenditure, there had been borrowed 462,980, the assessment having yielded an additional sum of 92,937. The purchases are scattered over most of the areas intended to be operated upon, and comprise a population estimated at 20,000. In some cases nearly the whole of the property required has been secured, while in others considerable purchases yet remain to be negotiated. Speaking generally, the greatest progress has been made in the most necessitous localities; that is to say, in areas adjoining the High-street and Saltmarket, in Gallowgate, and in the Main-street of Govanhill. The new park is on the lands of Kennymill, on the banks of the Monklands Canal, about a mile eastward from the Cathedral. For twelve months past the park has been in course of formation, and now a considerable portion of the grounds is open for public resort. In conjunction with Mr. Dennistoun of Golt'hill, whose property adjoins, the trustees have made arrangements for laying out a suitable approach. The carrying out of this design, while obliterating numerous eyesores, will result in the establishment of a noble thoroughfare, which cannot fail to improve the general character of the Townhead district. With regard to the future action of the trustees in the direction of reconstruction, nothing has been positively decided on; but it is expected that a beginning will be made in the course of a few months. Of their extensive operations, the trustees' committee would seem to have pitched upon two as specially eligible for speedy execution. One of these is the extension of Ingram-street eastward to the College, and the other the continuation of Bell-street through the district north of Gallowgate. In each of the areas in question, the trustees have acquired nearly all the necessary property. Mr. Carrick, the city architect, is the practical adviser of the trustees.

Columbia Market.—It is stated that the Artisan and Labourers' Dwellings Company (Sir Sydney Waterlow, chairman) are in treaty with Miss Burdett Coutts for a long lease of a portion of her vacant land, outside the market, and near Shoreditch Parish Church, with a view to erecting buildings of a cost value of 20,000, to be completed by the close of the year 1870. Other building negotiations are in treaty, and the approach to the market, nearest to London, is being widened for the covering of the Market-square are already cast, and Messrs. S. C. Hemming & Co., of Moorgate, will, early this week, commence to roof in, preparatory to the opening of the Market-square, as a great wholesale fish-market, some time in January next.

The Drains and the Habitability of a House.—In the Court of Queen's Bench, Westminster, on December 10 (sittings at Nisi Prius, before Mr. Justice Mellor and a special jury), the case of *Davies v. Remmett* was concluded. It was an action by a gentleman against the landlady of a furnished house at 24, Queen's Gate-terrace, South Kensington, for letting it to him in a state unfit for occupation, by reason of the drains being in such a bad condition that they gave rise to foul air, which rendered the house unwholesome and uninhabitable. The case lasted nearly three days. It came out in the course of the defence that the traps to one of the drains had been mended carelessly (with cement instead of solder), and it also appeared that there was a hole in one of the traps. The jury had a view of the house. Sir J. Karlake, upon the part of the plaintiff, put the case upon the ground of an implied warranty, and cited the recent case of "*Campbell v. Lord Wenlock*," 4, *Foster and Fintison's Nisi Prius Reports*, as supporting that view. Mr. Serjeant O'Brien, on the part of the defendant, the landlady, denied the alleged warranty, and appealed to earlier cases where it had been doubted. The Judge said he should abide by the recent case, where the point had been distinctly ruled. The jury, at the close, requested a physician's certificate to be read, in which it was said:—"My attention has been called to the state of the drains from my own observation. We could smell the drains. It might be from a sink, but I satisfied myself that it was from the drains. Such smells would not originate fever, but would tend to aggravate the symptoms." After being absent a great part of an hour, the jury returned into court with a verdict for the defendant, the landlady.

Charge of Conspiracy against Master Brickmakers.—Thomas Hayes, Francis Gregory, and Enoch Bowker, were indicted at the Manchester Assizes, on Tuesday, before Mr. Justice Willes, for conspiracy, inasmuch as being members of the Brickmakers' Associations they conspired to refuse a supply of bricks to the prosecutor, a bricklayer, for the completion of a particular work. The defence was, that bricks had been supplied for the same building to a contractor who had failed to pay for them. Defendants then refused to supply more bricks until the others had been paid for. Mr. Justice Willes said, if one man supplied bricks to build a house it would be lawful, and if, having supplied bricks, he refused to supply more till those were paid for, it would be justifiable; but if three persons combined to do the same thing did it become unlawful? Mr. Lereche, counsel for the prosecution, thought if a number of persons combined to coerce a man to pay a debt which was not his own, by not supplying bricks, it would be wrong. Mr. Justice Willes.—Is coercion wrong, except in the abstract? Mr. Lereche thought so. Mr. Justice Willes.—It appears to me that it is not. Coercion by illegal means is wrong, but coercion by legal means is right. Mr. Lereche quoted a number of cases more or less supporting his view of the case; but the learned judge said he was well up in all these points, and counsel's reasons had no more effect on him than a shower of rain would have on a duck's back, the rule of law being quite clear to his mind. He suggested that the prosecution should be withdrawn on both parties agreeing to take no further proceedings. This was agreed to, and Mr. Justice Willes directed the jury to find a verdict of acquittal, in which they acquiesced.

Society for the Production of Art Books.—In Paris a society has been established, under the title of *Société d'Encouragement pour la Propagation des Livres d'Art*. Its object is to favour the publication of books calculated to spread a knowledge of and taste for art. The seat of the society is at Messrs. Goussier & Co.'s, Boulevard Montmartre. M. Davion, architect to the city of Paris, is the president, and the committee includes other architects, painters, and sculptors.

The New Street by the Mansion House.—At the last meeting of the Metropolitan Board of Works it was decided that the name Queen Victoria-street be applied to the new line of street from the Thames Embankment to the Mansion House. With all our loyalty, we cannot applaud the Board for their decision. There is already a Victoria-street hard by (the continuation of Farringdon-street), not to speak of Victoria-street, Westminster.

Rome, the City of Dirt.—A correspondent of the *Times* says, with equal force and truth:—"I do really believe that the Pope and his people far surpass the efforts of ordinary national profligities in their zeal for their place, their city, their temples, and their thrones. But what churches, what domes, what columns, what statues, what marbles, what mosaics, what paintings, what tissue of gold, what jewelled tiaras, what processions of cardinals and bishops from all the world, what candles and lamps, what guns and bells, what fountains shooting upwards or running down, can make up for dirt, dirt, dirt, as ubiquitous always as the plagues of Egypt were for one dreadful hour or so? Whatever else this is, it is a city of dirt, and whoever tries to change the air by a stroll into the suburbs only finds them a good deal filthier than the city itself. And this is the State which proposes to lay the greater part of the civilised world under terrible curses, unless it will receive some mysterious dogmas on the most inscrutable subjects, and he also content to repose on an infallible judgment upon any political, social, or economic question that may happen to divide society! We may not tell the physician first to heal himself, but we request him, at least, to clean himself [since "cleanliness is next to Godliness"] and to establish some claim to teach us mysteries by a little improvement in matters cognizable to bodily sense.

A Town Swallowed by an Earthquake.—The *Impartial* of Smyrna gives an account of a frightful catastrophe. The town of Onla, in the district of Mentché, a dependency of Aidin, has disappeared, entirely swallowed up in the earth after three successive shocks of earthquake. The inhabitants were to some extent warned of what was about to occur by dull rumbling and alarming sounds, which were soon followed by a first shock that made them fly terrified to the neighbouring hills. Except three persons, therefore, all the inhabitants escaped with their lives. Marmaritz and Moula, in the same district, have also suffered severely. The governor *ad interim* has sent provisions, tents, and money to the unfortunate people, who are thus left without a roof, or even the common necessaries of life. This extraordinary persistence of earthquakes in divers places is getting serious. The worst of it is that if Professor Phillips, the geologist, be right in thinking, as he is said to do, that a period of recurring activity in the disturbing causes which affect the earth at great intervals of time has commenced, a long continuance of them may at least be anticipated, if not an increase in their intensity, beyond their mere initial action.

Flint Arrow-heads in Egypt.—Messrs. Hamy and Lenormant write to the *Académie des Sciences* to prove that Egypt has had its age of stone as well as Europe. Their letter is dated from Luxor, and they say:—"The existence of an age of stone in Egypt has often been the subject of controversy. The facts we are about to relate will, we think, give some information that will exercise an influence on the opinions entertained hitherto on the question. On the elevated plateau which divides the celebrated valley of Bihan-el-Molouk from the escarpments which overlook the Pharaonic edifices of Deir-el-Bahari, we have ascertained the presence of an enormous quantity of wrought flints, lying on the surface of the ground, to the extent of upwards of a hundred square yards. These wrought flints, which are of the well-known type designated arrow-heads, lance-heads, lanceolated axes, knives, scrapers, &c., evidently constitute the remains of an ancient manufactory, according to all probability pre-historic, and exactly resembling those known in France under the denomination of 'Factory of the Neolithic Period.'

The Ceiling of the Paris Opera House.—A curious account is given of the ceiling of the new Opera House in Paris. It will be composed, we are told, of a vast number of plates of copper screwed one to another in such a way as to be easily put together and taken to pieces again. Part of the advantages of the plan is said to be that the ceiling can thus be raised or lowered at will. The whole is divided into several sections, which are now being painted with allegorical representations of the hours of day and night, more than a hundred figures being included in the whole. The place in which M. Leneveu, the artist, carries on his labour is situated in the grand cupola over the pit, and forming an immense rotunda, 120 ft. in diameter and 65 ft. in height.

Gasometers Blown Down.—At Cambridge, during a recent gale, the largest gasometer in the University and Town Gasworks was capsized and the gas was set fire to, although there was no light within thirty yards of the gasometer. No explosion occurred, but the immense flame caused a fire on the premises. As so often and so seriously happens by coincidence, a gasometer was shortly thereafter blown down at the Gloucester Gasworks. It had been recently erected at a cost of nearly 4,000*l.*, and was capable of holding 240,000 ft. of gas. One of the chains gave way, then another, and while the gasometer was descending an iron pulley broke a hole in the top of it, and the gas all escaped. There was a light near, but no explosion nor firing took place. As such accidents not infrequently happen, more care ought to be taken in the steadying of such enormous and top-heavy structures as large and filled gasometers, which cannot, in such cases, have any fixed basis on which to rest, and must naturally tend, like balloons, to wobble about, even though made and weighted with iron. The giving way of chains under such circumstances might well be anticipated, and ought in some way to be obviated.

Extraordinary Scene in a Church.—On Sunday, the 5th instant, the inhabitants of the village of Horndon-on-the-Hill, according to the *Chelmsford Chronicle* of 17th December, were thrown into a state of great excitement in the church during divine service, when a very strong sulphurous smell spread over the edifice. It was with difficulty the vicar was enabled to continue his sermon on "The evidence of things not seen," towards the close of which the school children, who were seated beneath the belfry and near one of the stoves, began to be much affected. Some vomited, others fainted, and had to be carried out, causing no little commotion. The congregation now began to find that the fumes from the coke of the church stove, instead of being conveyed up the chimney, were beaten down into the church, caused by a heavy atmosphere and a defect in the flue, thereby checking the necessary draught. Several ladies, upon leaving the church, inhaled the vapour, and were thrown prostrate, some were attacked when coming in contact with the air, while others were able to reach their destination before feeling the ill effects. Upwards of thirty people were more or less victims to the carbonic and sulphurous vapours. Fortunately no one was fatally affected.

Wolverhampton.—At Wolverhampton the Great Western Railway Company have established extensive works for the building of their large engines, the manufacture of railway fittings, and other purposes. The works are under the superintendence of Mr. G. W. Armstrong, and employ altogether upwards of 2,000 men and boys, for whose mental improvement a commodious lecture-hall, reading-room, and library, are provided. The Stafford-road Institute, as it is called, is not only supplied with the principal daily and weekly newspapers, and books of an entertaining character, but care is also taken to provide for the use of the members the best magazines and periodicals on mechanical and scientific subjects, diagrams, &c. such as will prove advantageous to them in connexion with their daily employment. Lectures are also delivered occasionally; and on the 9th inst., Mr. C. Manton, architect, delivered a lecture on "The Architectural Antiquities of Athens"—the subject of the lecture being illustrated by a number of panoramic views (each view occupying a space of 12 square feet of canvass) painted by the lecturer.

A Universal Telegraph.—Mr. T. W. Tobin, of the Royal Polytechnic Institution, is said to have invented a telegraph without a battery, so that we cannot call it an electric telegraph. It simply comprises the usual wires and two terminal discs, judicious, and semaphores, with two boxes, the contents of which would seem to be a secret at present, but which, of course, must contain no electric batteries. Not being as yet in the secret, and not, therefore, being bound to secrecy, we are free to guess or suggest what it may be; but all that we can suggest is that unless it be a magnet that is contained in each box, we must "give it up."

A Statue of the late Earl of Dundonald.—Considerable funds have been raised for a statue in Valparaiso to the great naval hero, Lord Cochrane, whose merits, like those of Admiral Napier, we have not yet fittingly acknowledged in this his native country, although tardy justice was done to the maligned reputation of Lord Cochrane.



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